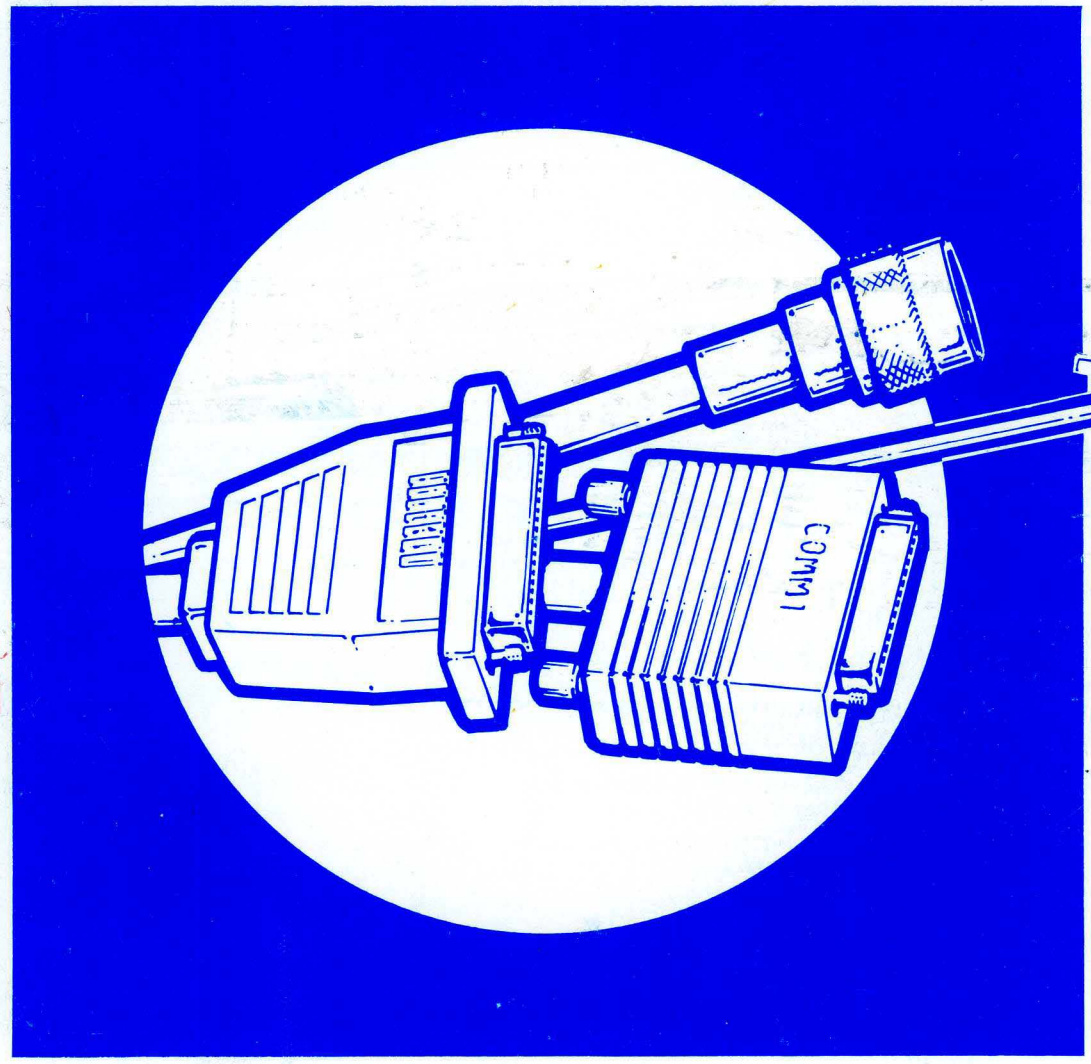
DECUS U.S. CHAPTER

SIGs



Your best connection for:

peer-to-peer interaction

technical exchange

DECUS

SIGNETTER

JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER

VOLUME 5
NUMBER 5

Printed in the U.S.A.

Production Staff:

Clyde Poole: Communications Committee Chair
The University of Texas at Austin

Frank Borger: SIG Publications Chair
Michael Reese Hospital

Judy Mulvey: Publications Manager
DECUS

Judy Tessier: Phototypographer/Graphics Designer
DECUS

Address general correspondence to:

DECUS U.S. Chapter
SIGs Newsletters
219 Boston Post Road, BP02
Marlboro, MA 01752-4605

Address editorial replies to:
Frank R. Borger
Physics Division
Michael Reese Hospital
Lake Shore Dr. @31 St.
Chicago, IL 60616

Circulation: 5302

NETWORKS SIG

OFFICE AUTOMATION

PERSONAL COMPUTER SIG

RT SIG

UNISIG

VAX SIG

LIBRARY

GENERAL TABLE OF CONTENTS

SIG INFORMATION SECTION

QUESTIONNAIRE SECTION

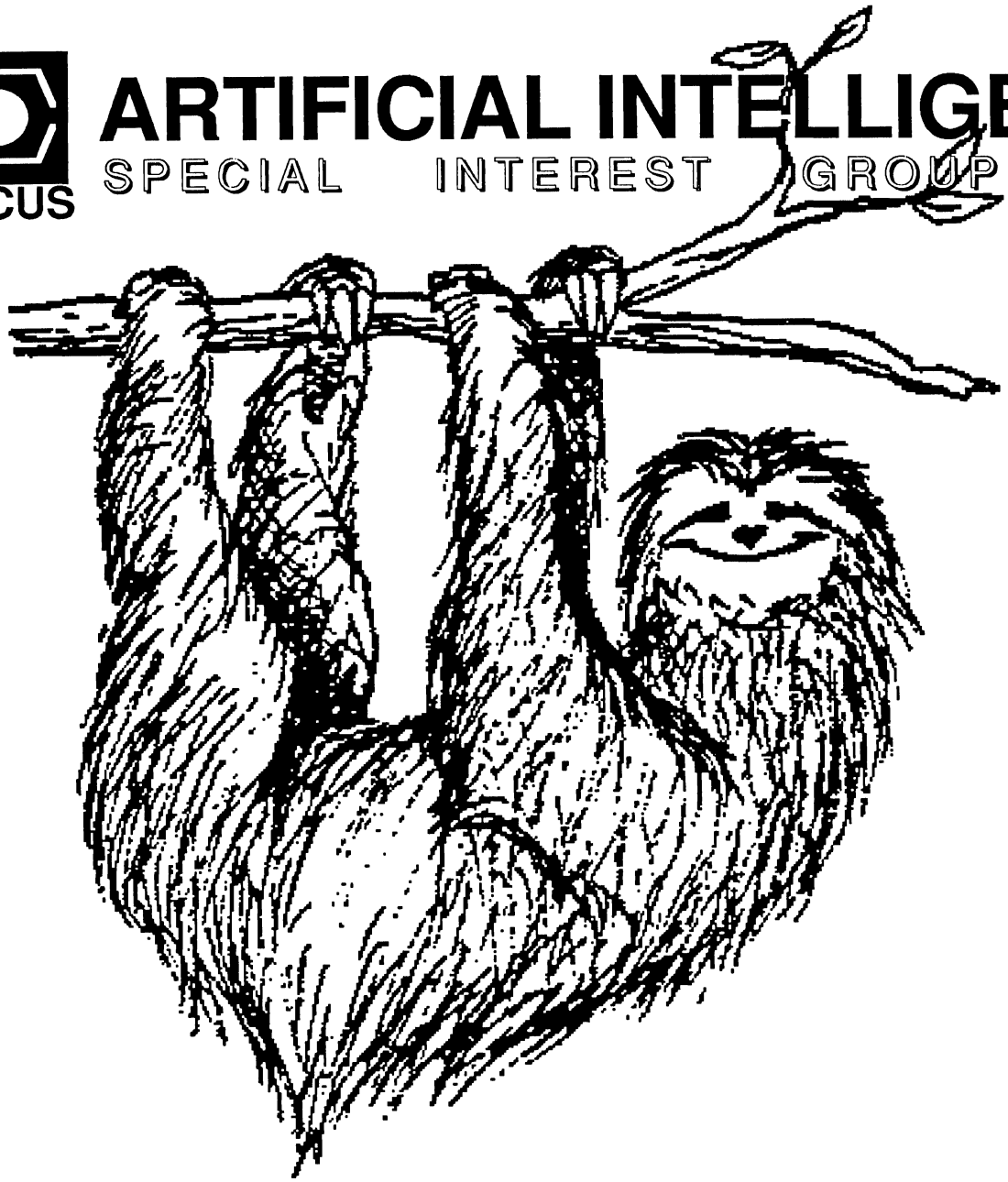
SUBSCRIPTION AND MEMBERSHIP FORMS

DUE TO A PRICE INCREASE, SUBSCRIPTION SERVICE FEE IS NOW $40.00

DECUS

ARTIFICIAL INTELLIGENCE

SPECIAL INTEREST GROUP



"Sloths are so human in appearance--
and in some of their ways--
that inevitably one tends to judge them
by human standards."

--Hermann Tirler, A Sloth in the Family

Symposia is over and isn't that a relief. The Neural Networks PSS and the Intelligent Databases PSS were both filled to capacity. This may indicate that DECUS in general is becoming more AI knowledgeable. Perhaps its time to get more highly technical sessions. Personally I like the application sessions. I find them to be informative and it's interesting to see what others are doing with AI tools.

This month we have some notes from the European AI SIG groups, both in Switzerland and Denmark. These two groups are comparatively small, but appear to be accomplishing a great deal anyway. In addition we have an article on Neural Networks from Van Hulle Marc of Belgium. This paper was presented at the 1988 Decus Europe Symposium in Cannes, France. This makes the entire issue a European issue!

AI IN DENMARK

During last year we had two activities during the year and two sessions at the Danish DECUS symposium. One of the activities during the year was a whole day meeting during which AI and AI-techniques were discussed, as well as the AI activities by the different participant.s The second meeting was an introduction to Neural Network, techniques and possibilities. At the DK-symposium we had an paper on image processing and a training seminar on AI, as well as reusing the paper on Neural Networks.

For the future I am planning a visit to the Danish defense departments R&D section, who are working with many different tools. Further, my plan is to look for interesting things in the south of Sweden as I have heard some interesting rumors, but first of all I will contact the swedish Decus to hear if they have an AI-SIG.

I think that's what had happened here in Denmark, but I hope we will be able to have a higher activity level in the future.

AI IN SWITZERLAND

The Swiss Artificial Intelligence SIG was formed in 1987 at the Neuchatel symposium. During the past eighteen months, we have organised 2 SIG meetings and taken part at the DECUS national symposium of St. Gallen (in the German speaking part of the country), and at the Geneva symposium, in the French part of Switzerland.

The first SIG meeting was a detailed visit and discussions concerning the AI activities at CERN/ Geneva. The second SIG meeting took place in the capital, Bern, with focus on Expert systems shells, tools and methodology for KBS.

A wide range of topics was covered at our last national symposium in Geneva. We had AI sesions over 2 days, with a total of 10 papers, a road map, a business meeting and finally an AI forum.

The first day was concerned with industrial applications of expert systems. The first paper did cover two industrial applications (PROLOG based), integrated into a traditional software environment, (Unix, X-Window) presented by a firm of the town of Solothurn.

The second paper was concerned with work at ABB's corporate research center (Asea-Brown Boveri). Topic: how to formalise and describe diagnostic knowledge, using a novel method, implemented with a PROLOG tool.

A review of the good and bad points of the expert system shell NEXPERT Object did lead us to a coffee break.

How to link a 4th generation language to an expert system was the next topic, application in the domain of banking (portfolio management, options market). This presentation was in French, all others were in English.

To complete the first day, the KADS methodology (derived from the European ESPRIT project No 1098) was presented. This method is applied to the development of Industrial Knowledge Based Systems (KBS).

The second day started with an introduction to the language OPS5, by means of an example concerning a small expert system for DEC's PCSA network. The speaker was a university student, living in Geneva.

Where are we going? Is it Artificial Intelligence or artificial stupidity? This was the question advanced and answered by the next speaker.

What is new for us (in the AI world) at DEC? Caroline Stutz will gave some answers and explanations.

A speaker from a local users' group (LUG) based in the town of Lausanne and dealing with expert systems, summarised the activity of this university - industrial liaison group, in existence since 1987.

After a copious lunch, we were lucky enough to see and hear G. Forsyth from Australia, who presented his AI work at the Melbourne Aeronautical Research Laboratory, about an intelligent assistant for fault diagnosis of jet engines.

The AI Forum did set off with a discussion about a controversial claim, and this gave everyone the opportunity of airing his/her point of view.

We plan to organise another SIG meeting in a few weeks time and the preparation of the next national symposium (for March 1990, in the Brunnen/Lucern area) is well under way.

SENSORY ANNs AND SYMBOLIC DECOMPOSITION

M.M. Van Hulle[1,2] and G.A. Orban[1]

[1] Laboratorium voor Neuro- en Psychofysiologie
Katholieke Universiteit te Leuven
Campus Gasthuisberg, Herestraat
B-3000 Leuven, Belgium

[2] Department of Electrotechnology
E.S.A.T. Division
Katholieke Universiteit te Leuven
Kardinaal Mercierlaan 94
B-3030 Heverlee, Belgium

ABSTRACT

Artificial Neural Networks (ANNs) are defined and distinguished from the formal, serial, symbolic approach of classic AI and cognitive science. Those points of similarity between the two approaches are identified in order to combine the power of symbolic computation with subtlety, robustness and flexibility typical for ANNs. Variables are thus introduced into sensory ANNs and used to define a representation structure for sensory objects. It is shown how the structure of symbolic objects can be decomposed in a way analagous to the structural decomposition of symbolic objects and plausible with respect to the neuroscientific evidence. A hierarchical expansion of the structural decomposition process is proposed.

1. INTRODUCTION

The human brain consists of an enormously complex network consisting of billions of neurons which interact with one another through trillions of synapses. Somehow, such a complex network thinks, feels, invents and remembers. For many years, many researchers have attempted to build models to study these networks. However, the resultant constructs have not always been in agreement since two categories of models have been proposed.

First, there are models build by neurobiologists. Neuroscientists are interested in the structure and function of real nervous systems. Models are build to explain experimental data related to such aspects as e.g. vision, audition or even behaviour. Models also suggest new insights and new experiments to test the validity of these models.

Second, there has been a convergence of theoretical biology, statistical physics, cognitive psychology and engineering towards the investigation of neural networks which has led to new concepts to be applied to computational methodologies. As these researchers are usually content with networks that are highly abstracted forms of real biological networks, their networks are called Artificial Neural Networks (ANNs). ANNs are then defined as large densily interconnected networks of simple processing units, each possessing an activation value which results from interactions with activation values of connected neighbours according to some simple numerical formula. By functional similarity, processing units and interconnections are called "neurons" and "synapses" respectively.

The development of ANNs began with the work of McCulloch and Pitts [18], Hebb [10], Rosenblatt [25], Widrow and Smith [35] and has resurged recently due to the work of Hopfield [13], Feldman and Ballard [5], Amari [2], Kohonen [16], Rumelhart et al. [26], Hinton et al. [12], Sejnowski and Rosenberg [28], Grossberg [6] and many others. Two objectives of the ANN research can be discerned. First, ANNs are introduced to study the computational power of networks "as such" although the structure of these networks bear features which are in contradiction to the neuroscientifical evidence. These ANNs are bear more resemblance to Ising models than to models of the structure and function of the human brain. The second objective, which is persued in this article, is to understand how an ANN can achieve human-like performance in such areas as vision, speech, associative recall, generalisation and reasoning. In order to achieve this objective, it is necessary to understand how "computations" are performed in ANNs and what level of abstraction one should adopt with respect to neurobiological fidelity.

Computation in ANNs rely on parallel numerical computation rather than the formal serial symbolic computation of classic AI. From the mid 50's on ANN research has been distantiated from the symbol-rule-representation approach of classic AI and cognitive science and at present there is still a large controversy about the role ANNs should play in modelling human-like intelligent behaviour [24]. Some researchers even hold that both approaches are diametrically opposed (for a discussion, see: [29]). However, in this article we will argue that both approaches must be combined to yield ANNs that can achieve true human-like behaviour. As a first step in bridging the gap, it is shown that variables can be introduced into ANNs as the analogues of symbolic variables and how a representation structure for sensory "objects", using these variables can be brought about in an ANN mimicking sensory processing and representation [31,32]. As such, the authors are able to introduce into ANNs the power of symbolic computation and combine it with the collective properties of ANNs.

In section 2. we start with an explanation of the origin of separation of the ANN research from classic AI and from classic cognitive science in modelling human-like intelligence. Furthermore, we explain why these approaches should be combined. In section 3. we indicate the points of similarity between both approaches that are important to introduce into ANNs the power of symbolic computation. To achieve this, in section 4. we introduce variables as collective properties of the ANN. In addition, the requirements which should be met by a representation structure for sensory objects are presented. Finally, in section 5., we demonstrate how the structure of sensory objects can be decomposed in a manner analogous to the structural decomposition of symbolic objects and plausible from a physiological and anatomical point of view. Moreover we suggest how the decomposition process can be hierarchically expanded.

2. CLASSIC AI AND PHYSICAL SYMBOL SYSTEMS

Classic AI researchers and cognitive scientists study symbol systems, rules and representations that serve as the building blocks of cognitive algorithms that execute human-like intelligent behaviour.

The variables used in these algorithms are symbols i.e. abstract representations of groups of individuals or entities, regardless of their individual properties. In human language processing, (linguistic) entities are objects like words, strings, trees which are described by ordered sets of symbols i.e. symbolic structures. In order to analyze these objects syntactically and possibly interpret them semantically, symbol manipulations are performed on the symbolic structures representing these objects. The set of rules and laws that guide this manipulation process as a linguistic task define the language processing algorithm as a (linguistic) symbol system. More generally, those entities that become semantically interpreted are also those entities that are determined by the formal rules and laws that define the system as a symbol system. Symbol systems are implemented by physical symbol systems i.e. machines or, better, the programs that are executed on these machines which are suited to manipulate and represent symbolic structures.

The idea behind this reasoning draws its inspiration from the conviction that the hardware to support these machines would be functionally analogous to neural or brain structures. Establishing such a relationship between neural and machine hardware would suffice to establish the relationship between neural and mental structures [20] (for a discussion, see: [30]). Newell formulated the latter position as follows:

> "The necessary and sufficient condition for a physical system to exhibit general intelligent action is that it be a physical symbol system".

However Newell's position must be regarded as an ideology instead of a testable hypothesis since it originates from the classic ideology of cybernetics: "the brain is a computer". From the mid 50's on the computational aspects of the hardware analogy became neglected and AI researchers quickly abandoned the hope that networks of simple, biologically inspired components could elucidate complicated pattern formation dynamics and concentrated on symbol systems, rules and the representation of knowledge within these systems.

The recent surge of interest in ANN research is fueled not only by significant conceptual, mathematical and neuroscientific progress but also by a growing body of demonstrations which clearly affirm the dramatic importance of the ANN approach to modelling human-like performance in e.g. visual perception, speech, natural language processing and cognitive tasks like association, generalisation and learning [17,6]. Furthermore, it has been shown that ANNs can reveal complex dynamic behaviour. Indeed, different classes of pattern formation can be discerned and their generation shown to depend upon initial stimulation and type of interconnection pattern [14,2]. Pattern formation dynamics is believed to constitute the foundation of cortical information processing. Furthermore, the ability of some ANNs to converge onto different states in a fault-tolerant way, and hence to implement Content Addressable Memories (CAM), has made the field attractive to many researchers. It is now believed that ANNs represent an opportunity to escape from the rigidity of symbol systems and offer a chance to mimic human-like intelligence to an unparalleled degree.

In order to realize this opportunity, ways have to be found not only to implement the sources of power of symbolic computation within ANNs [30] but also to capture other aspects of human cognition such as subtlety, robustness or graceful degradation and flexibility. Indeed, the symbolic approach provides powerful insights into the nature of the problems that must be solved in creating intelligent systems. On the other hand, ANNs reveal subtlety, robustness and flexibility in a very natural way.

However, if the ANN approach were simply used to build faster and more robust symbol systems, then they would still be as rigid as classical symbol systems.

In this article we will show how the representation structures of ANNs can accommodate variables and how structured inputs can be decomposed symbolically as first steps on the way to bridge the gap between both approaches.

3. ANN VS. CLASSIC AI: DISTINCTIONS AND SIMILARITIES

In this section, we will distantiate the ANN approach from the classic symbol–rule–representation approach of classic AI and cognitive science. Subsequently, we will indicate the points of similarity between both approaches, which may prove to be important to implement the sources of power of symbolic computation in ANNs.

Although a full demonstration of the distinction will not be developed here, two major points can be quickly made: 1) ANNs differ from classical physical systems in their style of computation and 2) they differ from symbol systems in their style of representation and computation and representation overlap considerably in ANNs.

First, consider an arbitrary network consisting of two components: 1) connections, links or "synapses" and 2) nodes, processing units or "neurons". The degree of activation at a given time or simply "activity" denotes the status of each unit (Fig. 1). To represent the items or features being processed in this network, one can associate with each item a separate processing unit. But local representation, as it has been called, is inefficient in hardware and does not allow arbitrary associations between units, nor fine, continuous discriminations between units of the same set [12]. These are the main arguments for using a distributed representation. Each item is now distributed over several items and conversely each unit takes part in the representation of different items (coarse coding, see [11]). Furthermore, it is apparent that the properties of the network are more then a simple superposition of the properties of the individual units (holist view): cooperation and competition between the unit's activities generate new macroscopic qualities, characterized by collective modes of operation. Indeed, the genesis of a specific collective mode depends not only on initial stimulation but also on the topology of the interconnection pattern: the activity is the result of cooperation between activities of its afferents based upon affinity and competition based upon incompatibility between activities of other afferents.

Now consider one layer of a network and suppose that the network has converged to a particular mode of operation (pattern of activity): some units reveal a significant degree of activation, others do not. At this point, two powerful observations can be quickly made.

First, the rules that govern convergence to collective modes are the interconnections that define not only the network's topology but also its processing and representation abilities. Indeed, as indicated by Haken [9] there exists a strong relationship between the topology of a network and the collective modes or patterns of activity a network can generate. It is important to stress the formal distinction between the type of rules, as applied in ANNs, from the rules used in classic AI: the set of "rules" in ANNs is defined by collective modes of operation of the network as a whole, while in classic AI, it is the set of rules that define the physical system as a symbol system. On the other hand, ANNs can exhibit (classic) rule–like behaviour but without actually containing these rules at all. As an example, consider Rumelhart and McClelland's ANN that models children's acquisition of the past tense in English [27]. The past tense rule is then the outcome of a learning process in which the actual output i.e. the past tense, evoked by the input i.e. the verb's stem, is compared with the correct tense provided by a "teacher". The connections between input and output units are then adjusted so as to

reduce the discrepancy between the actual and the correct past tense form. As such, the rule-like behaviour is simply the result of association between activity patterns of input and output units. Since ANNs do not allow an explicit representation of classical rules, some ANN researchers therefore abandoned any hope of achieving symbolic computation using ANNs. Consequently many investigators feel that ANNs are mere natural implementations of purely computational theories [8]. However, we do not subscribe to this point of view since it is in fact working backwards. Indeed, a particular network is well suited solving a computational problem if it fits the structure of the algorithm, as has been shown in the case of optimization of quadratic functionals (see e.g. [15]). Or in other words, it would reduce an ANN so as to be merely an implementation of a numerical algorithm. But what about an algorithm for visual perception or speech recognition? Notwithstanding rules as such may be well suited for human language processing [24], but are ill-suited for "non-grammatical" tasks such as vision. Indeed, what are the rules for visual perception, or the grammar of audition? Attempts in this direction are in practice elusive.

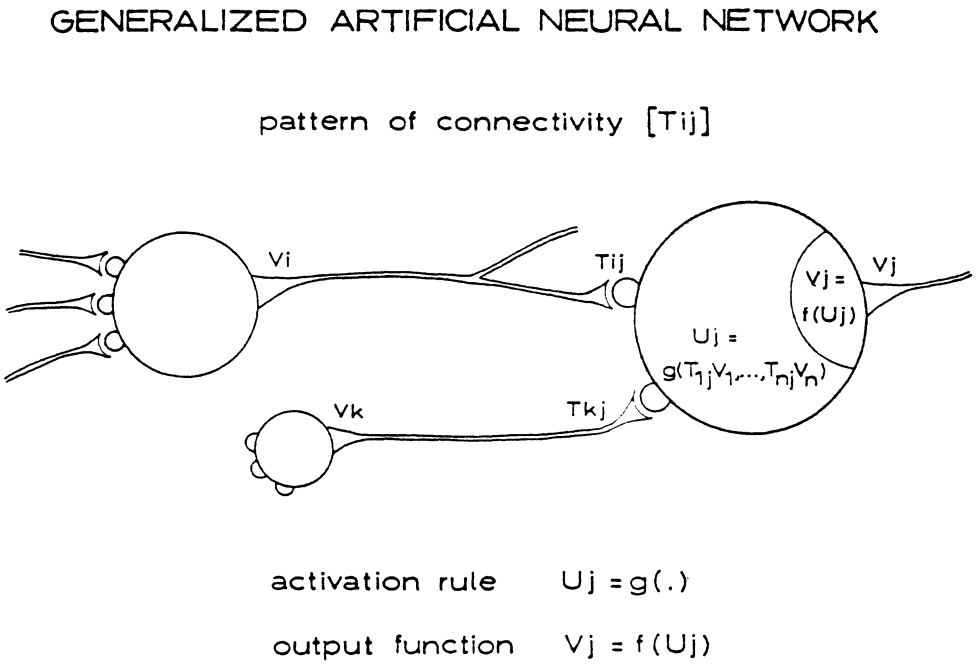


Figure 1: General Artificial Neural Network composed of n processing units, with status U_j, and a pattern of connectivity represented by $[T_{ij}]$ i.e. the matrix of connection weights. U_j is computed from weighted interactions with the n-1 other neurons according to an activation rule g(.). The output function f(.) is a nonlinear function of its argument.

The second observation is of paramount importance in the introduction of the analogue of a variable into ANNs. Depending upon the topology of the interconnection pattern, activated units tend to group into localized or more diffuse clusters. According to the original interpretation, introduced by psychologists, "cell assemblies", as these clusters have been named, represent a "concept" [10,22]. Edelman's group theory is in accordance with such a representation of a concept [4]. He considers the brain as a large network that processes information through temporally coordinated interactions between collections of functional units consisting of "small" groups of neurons. Similarly, we consider that a particular distribution of cell assemblies can be regarded as the basis of recollection, an outgrowth of the cooperative/competitive behaviour of the network, in response to the present input distribution (the "key"). However instead of associating a

concept with a "cell-assembly", we go a step further in suggesting that a variable can be associated with a "cell-assembly" provided that two requirements are met. This will be discussed in the next section within the framework of sensory ANNs, i.e. ANNs for sensory processing and representation.

In conclusion, if we ignore the power of symbolic computation, we are likely doom the ANN approach to forever grappling with simple tasks which fall short of true human-like intelligent behaviour. In order to achieve such a performance, variables and rules are introduced which take into account the peculiarities of ANN computation and representation.

4. VARIABLES IN SENSORY ANNs

In symbolic computation, symbols are regarded as variables and objects such as words, sentences, trees are represented by ordered sets of these symbols. Symbolic representation structures, as the latter have been named, are highly abstracted structures probably related to higher cortical areas.

It is much less evident how a representational structure for an ANN should look. Indeed, the style of representation of variables for such parallel acting systems as ANNs are very different from the representations used in symbolic computation and in serial or coarse grain parallel processing. Variable representation structures are often distinguished on the basis of whether they represent these variables in a local or a distributed way.

One specific local representation structure for ANNs is termed value-unit representation and was first suggested by Barlow [3]. Value units are regarded as a general way of representing different sets of possibly multi-dimensional variables and functions [5]. The range of a variable becomes subdivided into intervals and each interval is then represented by a separate processing unit. However, since it is local, this representation structure is not suited for our purposes.

Beside local representation structures, various distributed representation structures were proposed by ANN researchers. As an example, consider Hinton's [11] coarse coding scheme which is a conjunctive and overlapping representation structure. It is conjunctive since different dimensions are mapped onto one dimensional variables, represented by the activities of separate processing units. Furthermore, it is overlapping since the value of these variables is represented by the non-zero activities of a number of distinct processing units. However, as these units can only take binary values, the overlap is an all-or-none overlap which is not supported by the neurophysiological evidence (see e.g. [21]). According to Walters [34] the overlap-nonoverlap and the variable-value-unit distinction are sufficient conditions to capture all the senses of local vs. distributed representation structures. Furthermore, her representation scheme assumes that a processing unit can only signal a finite number of distinct activity levels. However, as it is apparent from neurophysiology, the membrane potential, regarded as the status of biological neurons [32], has to be regarded as a continuous saturating function of the neuron's afferents. Evidently, Walters' discrete view is in contradiction to the evidence. Furthermore, her scheme fails to recognize the important contribution of complex dynamics within ANNs. Indeed, as it was already pointed out, cooperation between processing units generate new macroscopic qualities, characterized by collective modes of operation. As a consequence, memory capacity has to be regarded as a collective property and is defined as the discrete number of patterns that can be stored and retrieved correctly in these networks (see e.g. [1,19]). Unfortunately, representation structures for sensory ANNs suffer from an additional complication: the entities to be represented as variables do not yet reveal the high level of abstraction necessary to envision them as symbols. However, in our view, variables can still be introduced,

provided two requirements are met. These requirements are closely related to the purpose of the sensorium.

The purpose of a sensorium is to construct a stable representation of the environment to be perceived. To perform this task, the inputs captured by the sensorium (e.g. visual images) are subjected to a multi-dimensional analysis. The first requirement of sensoria is the generality of their representation structure. Indeed, since sensoria must cope with a wide range of possibly unforeseeable sensory inputs, their representation structure needs to be relatively general (for a full discussion, see: [31]). To achieve this requirement, one can "hard wire" the sensory ANN such that each object in the input is represented differently at least by parts of the network. However, this approach will lead to a combinatorial explosion in terms of hardware. A much better approach is to use a two-stage process (Fig. 2). In the first stage, a distributed and precategorical representation of the environment is constructed in layer D_1, which is then adapted at the second stage by a multiplicative mechanism, using layer C neurons, yielding a more concrete representation in layer D_2 [31]. As a consequence, the differentiation in representation is not only provided by representation by different parts of the network but also by differentiation based upon the cooperative/competitive action generated by multiplicative feedback mechanisms [31,33].

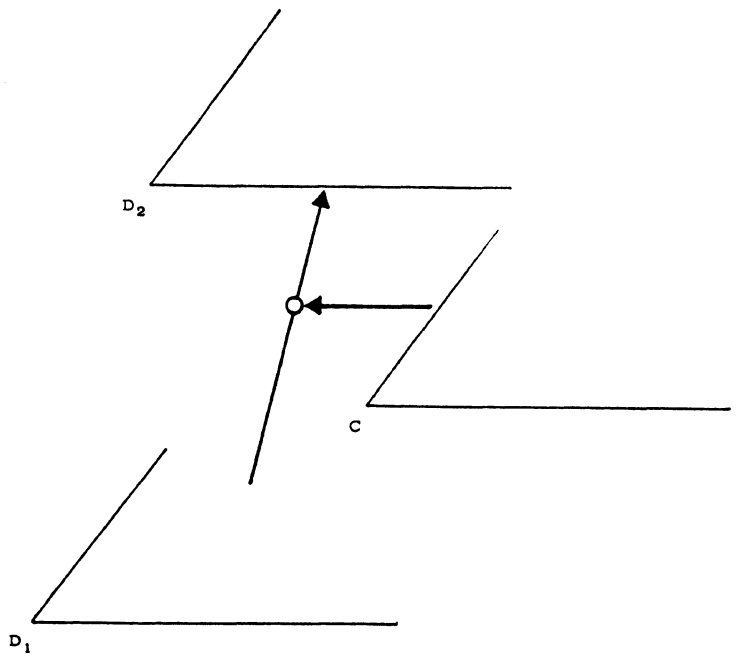


Figure 2: A subsystem of a sensory ANN on one hierarchical level. Each subsystem consists of three layers for which the intralayer connections are fixed. Layer D_1 receives input from a lower order subsystem. The strength of the connections between layer D_1 and layer D_2 is modulated using layer C neurons.

The second requirement is a computational one. Consider a visual scene containing moving objects. Our perception of how a particular image feature, e.g. a scratch on the surface of these objects, moves depends upon the motion of other nearby image features. Computationally, coherent motion of image features is then a valid assumption and may participate in moving object discrimination; if nearby image features tend to move coherently, then they probably belong to the same object. The importance of coherent motion as a basic perceptual mechanism has since long been

appreciated by Gestaltists as the law of common fate (for references, see: [36]). Now since measurement of motion based upon local features is inaccurate, motion information has to be integrated, and thus filled-in to improve upon the discrimination process and thereby yield a crisp perception of a moving object. In addition, many percepts indicate that perceptual qualities are appreciated only after a filling-in process takes place whereby feature informations, possibly originating from different feature dimensions, cooperate and diffuse laterally within the emergent contours of the objects that contain them (see e.g. [7]). Filling-in processes can be implemented using the principles of variational regularization and has been applied to solve early vision problems along various feature dimensions (for a review, see: [23]). In conclusion, representation structures have to be general and adaptable in sensory ANNs (first requirement) and allow filling-in (second requirement).

It is evident that at each level of the sensory ANN recollections, as stable states reached in response to an input distribution, should allow filling-in of missing information along the dimensions used to represent the object. Variables can now be associated with these recollections provided two complementary requirements are fulfilled i.e. a computational and a collective one.

First, if recollection is regarded as a filling-in process, and filling-in integrates information locally, then recollection should be able to cope with inaccurate measurements and yield an acceptable performance even within complex and noisy environments. As an example, filling-in can discount the illuminant i.e. suppress the "extra" amount of light in each wavelength so as to extract percepts of brightness and colour that remain invariant under many lighting conditions [7]. As a consequence, abstraction is made of the lighting conditions. A similar reasoning is applicable to the perception of motion, depth, shape, etc..

Second, variables should be associated with the collective or macroscopic properties of the network and thus make abstraction of complex properties of individual processing units or neurons and their intricate interaction patterns. As will be discussed in the following paragraphs, both requirements are met in our sensory ANN.

It has been demonstrated [31] that, in our ANN, lateral interpolation allows for an example orientation information, to be integrated and thus filled-in. The filling-in of missing orientation information is thus a property of pattern formation dynamics and implements the generality requirement of the sensorium. However, in order to distinguish a 1D orientation field, e.g. a curved line, from a 2D orientation field, e.g. a piece of fur, the adaptive mechanism comes in to suppress or enhance the excess orientation information needed to draw the distinction.

Moreover, it has been shown [32] that temporal behaviour of our ANN can be described using macroscopic or collective concepts without taking into account either the precise nature of the interactions or the input-output functions of individual processing units. As a consequence, variables can be associated with recollections by defining them as the stable states of pattern formation dynamics in our ANN. It is noted that our definition of a variable differs considerably from the above representation schemes since, within these schemes, variables were associated with the number of distinct activity levels a processing unit can adopt. Furthermore, our definition avoids the rigidity of Walters' variable-value-unit distinction. A recollection can now be regarded as the analogue of a symbolic variable, defined as an abstract representation of a group of individuals, since from a computational point of view, individuals can be regarded as objects or sets of features and from a collective point of view, as individual clusters of activated neurons. The validity of the analogy depends on the geometrical extension of the filling-in process and on the degree to which the representation of the object is invariant under decreasing quality of the image features (fault tolerance). It is noted that the analogy is drawn apart from the question of whether our variable is a symbolic variable or not. Indeed, such an analogy would be a questionnable one, since it would heavily depend upon the validity of envisioning sensory entities as symbolic entities.

As a conclusion, variables in sensory ANNs are associable with recollections, provided these recollections support a general but adaptable representation structure that allows for filling-in of missing information in order to improve upon the quality of its featural representation.

5. REPRESENTATION OF STRUCTURED OBJECTS, SYMBOLIC DECOMPOSITION

In this section we will discuss how the representation of an object, as described by an ordered set of variables, can be brought about in sensory ANNs. A correlative binding process is introduced to accommodate the analogue of a symbolic decomposition of objects within the network. This type of binding is believed to possess biological relevance. Moreover, a hierarchical expansion of the representation structure is presented. In the following, only a broad outline of our representation structure is presented; a formal discussion can be found elsewhere [33]. In addition, restrict the discussion to the representation of only a single structured object at a time.

Let us consider the environment the sensory ANN has to represent, as a set S of "objects s. As an example, a visual "object" can be a scratch on a stone, the stone itself, or a footpath consisting of these stones, depending upon the hierarchical level of perception. Suppose on a particular hierarchical level, the structure of an object s is describable as an ordered set of variables e.g. the two dimensional array of possible loci of scratches on the stones of our last example. For a particular distribution of scratches, some positions of our two dimensional array become filled, others do not. In more formal terms, a particular instance of an object is described by the ordered set of variables which are individually bound by "values". To avoid confusion with Feldman and Ballard's work on value-unit representation, the concepts value and variable are called "filler" and "role" respectively. Furthermore, let us define R and F as the continuous set of roles and fillers. In our example, R is the continuous set of two dimensional loci and F the set of types of scratches as scratches can be distinguished according to e.g. their orientation, contrast and colour.

Since we defined the structure of an object as an ordered set of variables, the definition of symbolic decomposition applies to our case. As already outlined, our structures are then described as the analogues of symbolic structures, and thus without implying that our objects are symbols. In accordance with Smolensky's paper on symbolic structures [30], we then need two mappings α and β defined as follows:

The role decomposition F/R for the set S is a pair of sets (F,R) and the mapping:

$$\alpha : F \times R \rightarrow \mathrm{Pred}(S);\ (f,r) \mapsto f|r$$

For a particular filler $f \in F$ and $r \in R$ and a mapping α the predicate on S is expressed as $f|r$ or: "f fills role r". It is assumed that α is a single valued function. Then define the mapping β:

$$\beta : S \rightarrow 2^{FXR} ;\ s \mapsto \{ (f,r) \mid f|r(s) \}$$

as the filler/role representation of S induced by the mapping α. The set $\beta(s)$ is called the symbolic decomposition of s i.e. the set of filler-role pairs which are bounded for the particular instance s.

We will now introduce a fully distributed representation of filler/role bindings and object structures such as introduced by Van Hulle and Orban [33] into sensory ANNs. The description of the model will be limited here to a single subsystem. For reasons discussed in the previous section, each subsystem contains three layers: D_1, D_2 and C (Fig. 3). The most peripheral layer, D_1, generates a distributed representation of

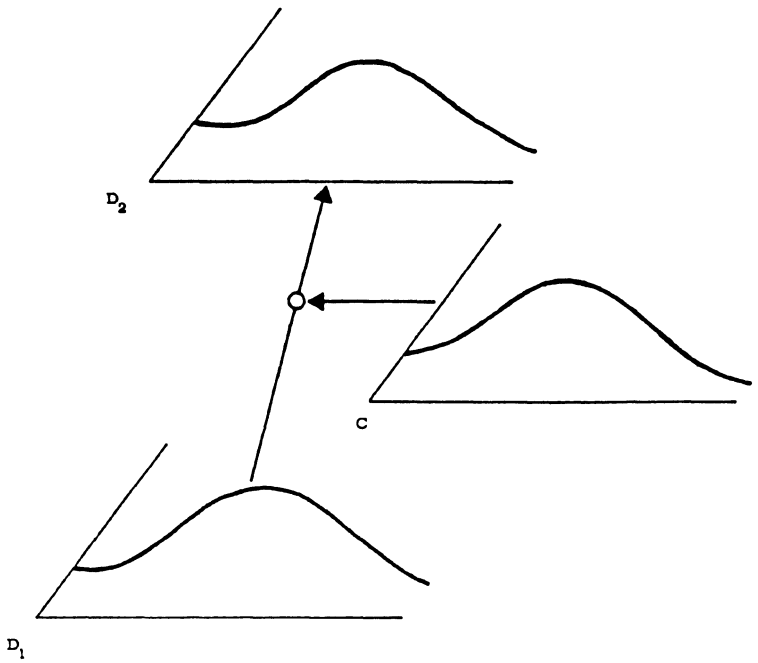


Figure 3: Outline of the distributed representation of a filler, a role and a filler/role binding into a subsystem of a sensory ANN. Activity levels of the neurons within the layers are depicted by smooth functions.

values or fillers. The strength of the connections of layer D_1 neurons to layer D_2 neurons is modulated using layer C neurons. Layer C neurons generate a distributed representation of the variables or roles. The result of the modulatory action by C i.e. the representation of the filler/role binding is represented in layer D_2. Each of these layers form neural continua which are treated with field equations. The validity of the field approach to neural tissues is discussed in Van Hulle and Orban [32].

In symbolic structures, objects in general can, for a particular instantiation, be identified with a predicate, consisting of a conjunction of lower order predicates (filler/role bindings). Define ψ as a sensory mapping function i.e. a function that maps predicates onto an internal state of the sensory ANN. In order to represent objects as conjunctions of predicates, specific assumptions about ψ need to be made. For reasons discussed in Van Hulle and Orban [33], the superposition principle does not hold. Instead, a function f is introduced as a rule of combination i.e. a rule that allows recollections to combine.

The fillers and roles are now represented using two scalar functions ψ_F and ψ_R respectively:

$$\psi_F : F \rightarrow \mathscr{V}_{D_1}$$
$$\psi_R : R \rightarrow \mathscr{V}_C$$

where $\mathscr{V}_{D_1}$ and $\mathscr{V}_C$ denote the neural fields of D_1 and C neurons. Then we associate the recollections R_{D1} and R_C with $\psi_F(f)$ and $\psi_R(r)$ respectively (Fig. 4). The representation of the filler/role binding $f|r$ which is input to layer D_2 now runs as:

$$\psi_b(f|r) = \int_T \psi_F \psi_R \; dt$$

where the integrand is assumed to be integrable over the time interval T.

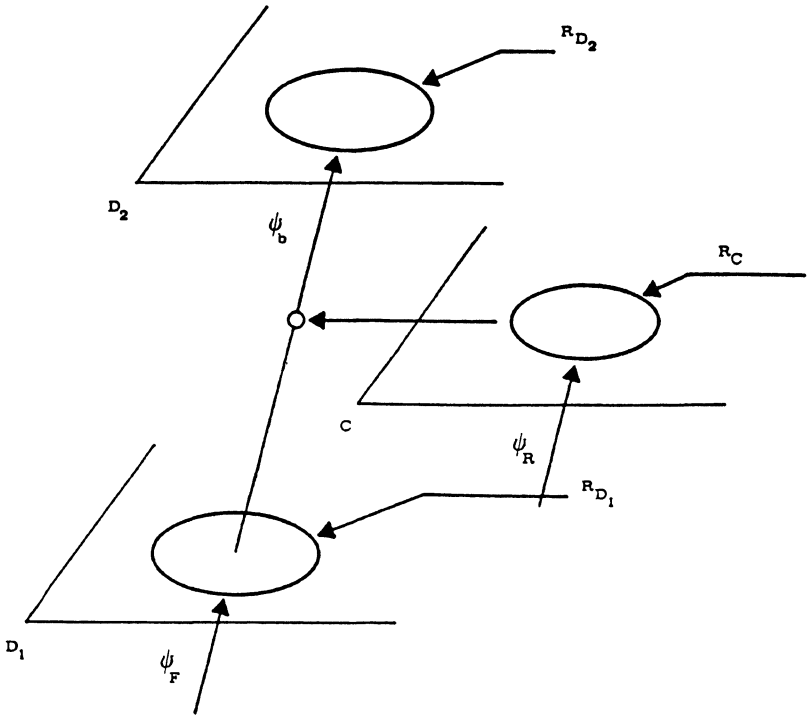


Figure 4: Association of recollections R_{D1}, R_C and R_{D2} with a filler, a role and a filler/role binding respectively. Recollections are depicted by their contours.

Since pre- and postsynaptic activities in biological neural networks are in fact stochastic processes, ψ_b represents the correlative binding process (there is an additional justification as well, see [31,32]).

Just as recollections were associated with ψ_F and ψ_R, we can associate with ψ_b a recollection R_{D2} as well (Fig. 4). As such, these three mapping functions and the rule of combination f, constitute the basic tools needed to represent object structures on one hierarchical level.

In addition, the hierarchical expansion of the foregoing is straightforward. Indeed, as inspired by the hierarchy of cortical feature extractions, a hierarchy composing of our subsystems can be readily introduced. Formally, recollection R_{D2} becomes, for the next subsystem, the representation of fillers or values and so on. It can be shown that since the binding is a correlative one, the hierarchy has an objective existence as well i.e. available for the sensory ANN as an abstract system (see [31]).

6. CONCLUSION

In classic AI and cognitive science, a symbolic approach is adopted in studying human-like intelligent behaviour. Notwithstanding this approach provided powerful insights into the nature of the problems that must be solved yielding human-like intelligence, the representation structure used to represent variables symbolically, fall short of subtlety, robustness and flexibility.

Recently, ANN research has received renewed interest due to a growing body of demonstrations of its performance in modeling subtlety, robustness and flexibility. ANNs are densily interconnected networks of simple parallel-acting processing units for which cooperation/competition between their activities generate new collective properties. Just as ANNs differ from classic AI in their style of computation, they also differ in their style of representation. The representation structures used are distributed ones which escape the rigidity of symbolic representation structures in a very natural way.

It is now believed that ANNs can achieve true human-like intelligent behaviour provided ways are found to instantiate the sources of power of symbolic computation and to combine them with the collective properties of the network.

As a first step in achieving this purpose, the authors have shown how, in a sensory ANN, variables can be associated with collective properties (recollections) and how they can be envisioned as the analogues of symbolic variables, if two requirements were fulfilled. Furthermore, we advocated a new definition of variable different from existing concepts to construct a representation structure for ANNs in general.

Using a correlative binding process, sensory objects whose structure was defined as an ordered set of variables, then become decomposed symbolically and represented into the network. Moreover, a hierarchical expansion of our representation structure was presented.

Although our sensory ANN is not intended as a biological model for sensory cortices, it is plausible with respect to the present knowledge of physiology and anatomy of sensory cortices. Finally, the proposed representation structure provides a unique way to envision how a representation structure which captures the power of symbolic computation, is brought about in sensory ANNs.

ACKNOWLEDGEMENTS

The authors would like to thank S. Raiguel for his valuable comments on earlier drafts of the article. The first author holds a Junior Research Fellowship of the National Research Council of Belgium.

REFERENCES

[1] ABU-MOSTAFA Y.S. and ST. JACQUES J.-M. Information Capacity of the Hopfield Model. IEEE Trans. on Inf. Theory, 31, July 1985, pp. 461-464.

[2] AMARI S. Field theory of self-organizing neural nets. IEEE transactions on Systems,Man, and Cybernetics, 1983, vol. SMC-13, No. 5, September/October, pp. 741-748.

[3] BARLOW H.B. Single units and sensation : a neuron doctrine for perceptual psychology ? Perception, 1, pp. 371-394, 1972.

[4] EDELMAN G.M. Group selection and phase reentrant signaling : a theory of higher brain function. In : schmitt, F.O. (Ed.) : The Neurosciences : Fourth Study Program, MIT Press, Cambridge, 1977.

[5] FELDMAN J.A. and BALLARD D.H. Connectionist models and their properties. Cogn. Sci., 1982, 6 : 205-254.

[6] GROSSBERG S. The Adaptive Brain I : Cognition, Learning, Reinforcement, and Rhythm, and The Adaptive Brain II : Vision, Speech, Language, and Motor Control, Elsevier/North-Holland, Amsterdam, 1986.

[7] GROSSBERG S. Cortical dynamics of three-dimensional form, colour, and brightness perception : I. Monocular theory. Perception & Psychophysics, 1987, 41 : 87-116.

[8] GROSSBERG S. Neural networks for visual perception in variable illumination. Optics News, August 1988, pp. 5-10.

[9] HAKEN H. Synergetic Computers for Pattern Recognition and Associative Memory. In : Computational Systems, Natural and Artificial, H. Haken (Ed.), Springer Verlag, Berlin, 1987.

[10] HEBB D.O. The organization of behaviour. New York : Wiley, 1949.

[11] HINTON G.E. A parallel computation that assigns canonical object-based frames of reference. Proceedings of the Seventh International Joint Conference on Artificial Intelligence. Vancouver, British Columbia, 1981.

[12] HINTON G.E., McCLELLAND J.L. and RUMELHART D.E Distributed representations. In : Parallel Distributed Processing : Explorations in the Microstructure of Cognition. Vol. 1. : Foundations. D.E. RUMELHART & J.L. McCLELLAND (eds.), MIT Press, 1986, pp. 77-109.

[13] HOPFIELD J.J. Neural Networks and physical systems with emergent collective computational abilities. Proc. Natl. Acad. Sci. USA, 1982, 79 : 2554-2558.

[14] KISHIMOTO K. and AMARI S. Existence and Stability of Local Excitations in homogeneous Neural Fields. J. Math. Biol., 1979, 7 : 303-318.

[15] KOCH C., MARROQUIN J. and YUILLE A. Analog "Neuronal" Networks in Early Vision, PNAS, 1986, Vol. 83, pp. 4263-4267.

[16] KOHONEN T. Self-organization and associative memory. Springer-Verlag, Berlin, 1984.

[17] LIPPMANN R.P. An introduction to computing with neuronal nets. IEEE ASSP Magazine, April 1987, 4-22.

[18] McCULLOCH W.S. and PITTS W. A logical calculus of the ideas imminent in nervous activity. Bull. Math. Biophys., 1943, 5 : 115-133.

[19] McELIECE R., POSNER E.C., RODEMICH E.. and VENKATESH S.S. he Capacity of the Hopfield Associative Memory. IEEE Trans. on Inf. Theory, 33, July 1987, pp. 461-482.

[20] NEWELL A. The knowledge level. AI, 1982, 18 : 87-127.

[21] ORBAN G.A. Neuronal operations in the visual cortex. Studies of Brain Function, Vol. 11. H.B. Barlow, T.H. Bullock, E. Florey, O.J. Grusser 7 A. Peters (Eds.). Springer-Verlag, Berlin, 1984, 367 p.

[22] PALM G. Towards a theory of cell assemblies. Biol. Cyb., 1981, 39 : 181-194.

[23] POGGIO T., TORRE V. and KOCH C. Computational vision and regularization theory. Nature, 1985, 317 : 314-319.

[24] PRINCE A. and PINKER S. Rules and connections in human language. TINS, 1988, Vol. 11, 5 : 195-202.

[25] ROSENBLATT R. Principles of Neurodynamics. New York, Spartan Books, 1959.

[26] RUMELHART D.E., HINTON G.E. and McCLELLAND J.L. A general framework for parallel distributed processing. In : Parallel Distributed Processing : Explorations in the Microstructure of Cognition. Vol. 1. : Foundations. D.E. RUMELHART & J.L. McCLELLAND (eds.), MIT Press, 1986, pp. 44-76.

[27] RUMELHART D.E. and McCLELLAND J.L. Psychological and Biological Models. In : Parallel Distributed Processing : Explorations in the Microstructure of Cognition. Vol. 2. : Foundations. D.E. RUMELHART & J.L. McCLELLAND (eds.), MIT Press, 1986, pp. 216-271.

[28] SEJNOWSKI T.J. and ROSENBERG C.R. NETtalk : a parallel network that learns to read aloud. Johns Hopkins Univ. Techn. Report HU/EECS-86/01, 1986.

[29] SMOLENSKY P. Information processing in dynamical systems : Foundations of harmony theory. In : Parallel Distributed Processing : Explorations in the Microstructure of Cognition. Vol. 1. : Foundations. D.E. RUMELHART & J.L. McCLELLAND (eds.), MIT Press, 1986, pp. 194-281.

[30] SMOLENSKY P. On variable binding and the representation of symbolic structures in connectionist systems. Univ. of Colorado Technical Report CU-CS-355-87 (1987), submitted to Artificial Intelligence.

[31] VAN HULLE M.M. and ORBAN G.A. Entropy driven artificial neuronal networks and sensorial representation : a proposal. Special issue on "Neural Computing" of the Journal of Parallel and Distributed Computation, in press, 1988a.

[32] VAN HULLE M.M. and ORBAN G.A. A field approach to higher order ANNs for sensorial representation. Proc. First European Conference on Neural Networks, Paris, June 6-9, 1988b.

[33] VAN HULLE M.M. and ORBAN G.A. Correlative value/variable binding in higher order ANNs. Proc. IEEE International Conference on Neural Networks, July 24-27, San Diego, Ca., USA, 1988c.

[34] WALTERS D.K.W. The representation of variables in connectionist networks. Proc. of the First Conference on Computer Vision, London, 1987.

[35] WIDROW B. and SMITH F.W. Pattern recognizing control systems. Computer and Information Sciences (COINS) Symposium Proceedings, Spartan Books, Wash. DC., 1963.

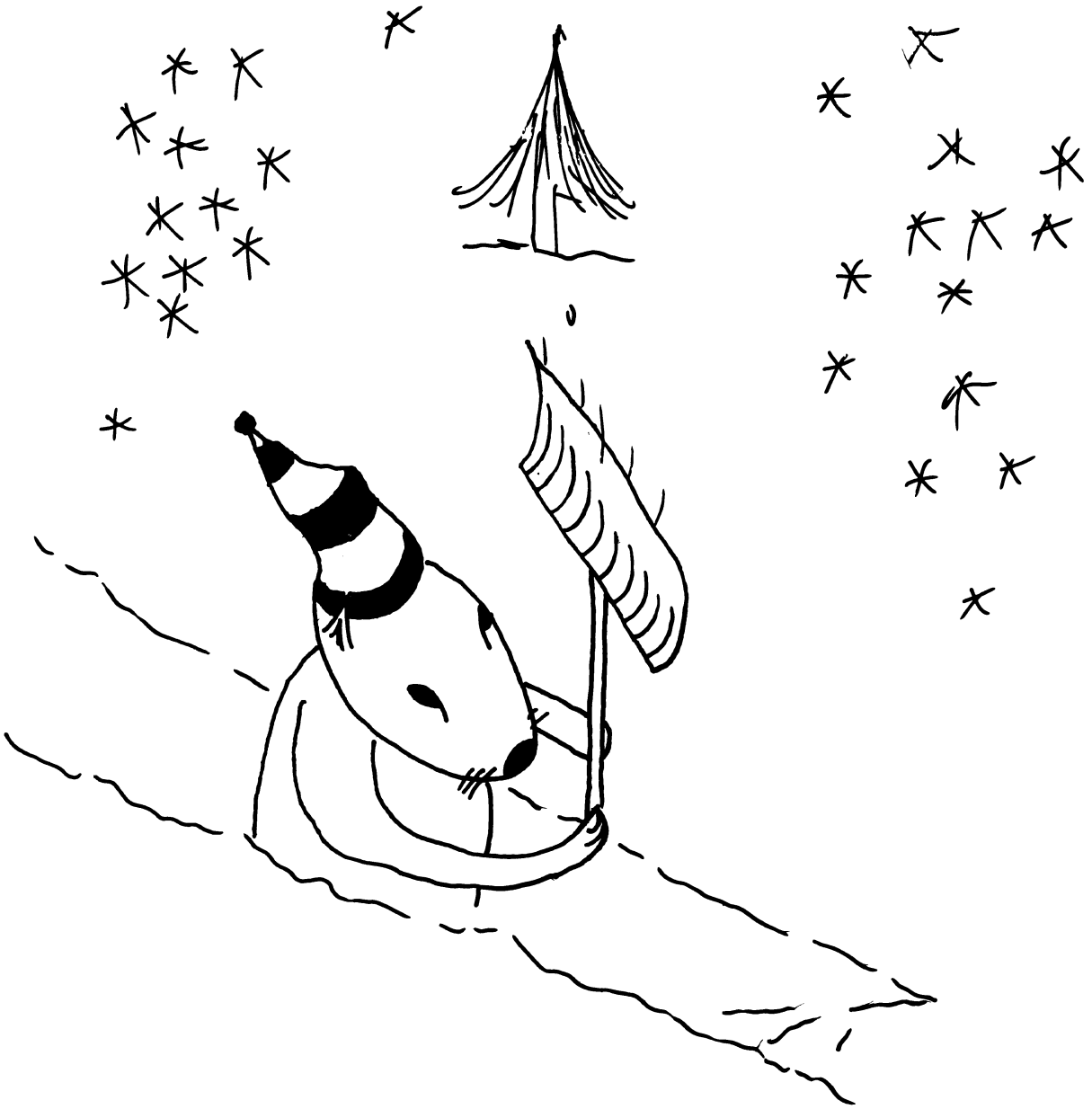
[36] YUILLE A.L. and GRZYWACZ N.M. A computational theory for the perception of coherent visual motion. Nature, May 1988, Vol. 333, No. 6168, pp. 71-74.

The Wombat

EXAMINER and 4GL Dispatch

DTR

"Increases the Circulation of Anyone in America" *Volume 11 Number 5*



DECUS U. S. Chapter
SIG's Newsletters, Volume 5, Number 5 January 1990
Wombat Examiner & 4GL Dispatch Volume 11, Number 5

Table of Contents:

Contributions

This newsletter is a volunteer activity. There are no compensations given to any author or editor. Articles and letters for publication are encouraged from anyone. They may include helpful hints, inquiries to other users, reports on DECUS and SIG business, summaries of SPRs submitted to Digital, or any other information of interest to users of DATATRIEVE or 4th Generation Languages. This newsletter, however, is not a forum for job and/or head-hunting, nor is commercialism appropriate.

Machine readable input is highly desirable and machine-to-machine transfer of material is preferred, but most anything legible will be considered for publication.

Please send contributions, of for further information please contact either:

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

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

Editorials and letters to the editor within the Wombat Examiner and 4GL Dispatch are solely the opinion of the author and do not necessarily reflect the views of Digital Equipment Computer Users Society, Digital Equipment Corporation, or the author's employer. All editorials are marked as "An Editorial"; letters to the editor always begin "Dear Editor."

Chairman's Corner

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

The recent Fall 1989 DECUS Symposium in Anaheim was a success for the Society in general but especially for the DTR/4GL SIG. Digital announced the Spring 1990 submission of DECReporter to the DECUS library, the SIG's sessions were well attended, and other activities (clinics and working group meetings) came off without a hitch. The efforts of John Henning and Andrew Schneider, our current Counterpart and former Counterpart, are much appreciated; Digital provided the hardware and software used in the SIG's suite.

Most significant at the Symposium, in my mind, is the growth and level of interest in the non-DATATRIEVE 4GL's. I want to thank the various chairs of the 4GL Working Groups for their support and continued interest in the activities of the SIG. I especially want to recognize the efforts of Larry Jasmann the SIG's Working Group Coordinator. He has tirelessly nurtured the working groups and provided support when needed. Thanks, Larry.

Joe Gallagher, our newsletter editor, was honored for his outstanding efforts at the November 10th general meeting of the Communications Committee. Clyde Poole, Chair of the committee, presented the award and read the citation,

> *"Outstanding Contribution by an Individual*
>
> *This person's activities with DECUS have spanned many years and varied duties. As a newsletter editor, he has demonstrated various levels of editor leadership. He has more than once taken a novice editor under his wing and helped guide him through the process of getting articles from members, formatting, and publishing the newsletter. His editorials always exhibit the highest caliber of journalism and are always in the best interest of the Society. To his list of credits, he has also submitted numerous articles to the various newsletters, many under the guise of nameless "help" columns or articles transcribed from DECUS Symposium using session tapes.*
>
> *He has always taken an active role in CommComm committee meetings, volunteering to spearhead special projects, and has offered many suggestions to improve the overall quality of CommComm products. Presently he is working on two CommComm special projects: a handbook for new newsletter editors, and a SIG leadership database.*
>
> *He has served as Newsletter Editor for at least two SIG's and is currently the Editor of the DATATRIEVE/ Fourth Generation Language SIG Newsletter, the Wombat Examiner and 4GL Dispatch.*
>
> *I'm happy to present the 1989 award for an Outstanding Contribution by an Individual to Joe Gallagher."*

DTR/4GL SIG News of the Anaheim Symposium

Pat Scopelliti, Associate Newsletter Editor, Corning Inc., Corning, NY

Well, 7400 of us managed to survive another DECUS. As usual, there were many things going on within the DTR/4GL SIG.

Top of the list was the news that the "Wombat does Windows". The DTR/4GL suite featured two networked VAXstation 3100s with DATATRIEVE V5.0. In addition, there were two VT340s and an LA50 printer. Andy Schneider wowed us all with the quality and quantity of hardware he managed to purloin from some developers. Luckily, no one dropped any Cheez-wiz into the keyboards!

Everyone had their chance to try out the new windows interface and all seemed pleased. It was a different feeling to use the point and click method to navigate through CDD dictionaries and objects. This new version offers CDO support for domains and records under CDD-PLUS.

In SIG leadership news, Don Stern was unanimously re-elected to a two- year term as Chairman which will run from the Spring 1990 Symposium in New Orleans to the Spring Symposium in 1992. Mary Roberts has resigned as Session Notes Editor; she

received a career opportunity to get back into personnel work and has left the Crime Analysis Section of the Ontario California Police Department where she worked with Harry Miller and Bernadette Reynolds. Our thanks to Mary for a job well done. Taking over as Session Note Editor is Gary L. Wenger, 3M Corp, St. Paul, MN. Welcome, Gary. At least now the session speakers won't have to explain the letters they get from the Ontario Police. Judy Cutuli, Assistant Volunteer Coordinator, missed the Anaheim Symposium; however, she had a very good excuse. Her first born, Jennifer Lynn Cutuli, arrived on November 16th a week late for Wombat Magic and weighed 7 pounds, 9 ounces. Mother and daughter are doing fine.

The continuing evolution and strength of the SIG was signified by the excellent development and work of the 4GL working groups. More than half of sessions were devoted to the 4GLs. There were no changes in the Working Group Chairs, but a significant number of Vice-Chairs, Counterparts, Editors, and others have volunteered. Check the list in the back of the newsletter for the new working group volunteers. In addition, a 1032 Working Group has formed; the Chair is Darwin L. Hatheway, Jr. In order to emphasizes the equal standing of the 4GLs and DATATRIEVE within the SIG, a DATATRIEVE Working Group was formed; John Babiarz is initially chairing that working group.

Three other important activities occurred at the Symposia which are reported in other articles in this issue of the newletter. The award for "Outstanding Contribution by an Individual on the Communications Committee" was given to Joe Gallagher and reported in the Chairman's Corner. The Silver Pen and Golden Quill awards for excellence in the our newsletter are reported in the next article. And the announcement of Digital's intention to submit DECreporter to the DECUS Library is described in a later article.

First Annual Newsletter Awards for Excellence

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

The DATATRIEVE/Fourth Generation Languages SIG devotes a large amount of its people resources to newsletter activities. We are particularly proud of our accomplishments and high technical content.

In order to stimulate and recognize the creators of the material which appears in our newsletter, the Staff of the Wombat Examiner and 4GL Dispatch have initiated a pair of awards which are to be presented annually for the outstanding article in each of two categories. The Silver Pen is to be awarded for the outstanding short article. Eligible for the Silver Pen award are Letters-to-the-Editor, Wombat Wizard columns, news articles, activity reports, editorials, hint & kinks, and other short pieces. The Golden Quill is to be awarded for the outstanding original article. No specific length is required, but it is expected that the topic is to be fully developed and present a logical, complete exposition of the material. Material which appears in a transcription of a Wombat Magic session is specifically not eligible for either of the newsletter awards since Wombat Magic presentations are judged and prizes awarded at symposia.

Eligible for the first annual newsletter awards were 12 short pieces and 10 original articles which appeared in Volume 10 of the Wombat Examiner and 4GL Dispatch between September 1988 and August 1989. The Newsletter Staff and present and past SIG Chairs served as both the nominating committee and awards judging committee.

Nominated for the Silver Pen Award were *Dear Wombat Wizard - installing DTRV4.2 with CDD V3.4,* by Dana J. Schwartz, Number 5, page 1; *Dear Wombat Wizard - entry of date and time to date datatype*, by Herbert G. Reines and Joe H. Gallagher, Number 5, page 4; *Letter to Editor - use of MATCH for entry of lists from FMS*, by Larry D. Roduner, Number 7, page 2; *ACCENT R Tips & Techniques*, by Donna Lehman, Number 10, page 4; and *Letter to the Editor - ATTACH for DATATRIEVE*, by Jeff Chimene, Number 12, page 1. Nominated for the Golden Quill Award were *Adding a Soundex Function to DATATRIEVE*, by Bart Z. Lederman, Number 7, page 5; *Cross Referencing DATATRIEVE Applications*, by T. Chris Wool, Number 10, page 1; *Database for a Scientific Bibliography Using VAX DATATRIEVE*, by Steve Cordiviola, Number 10, page 5; and *Identifying Bad Dial-In Lines with DATATRIEVE (and DCL)*, by Bart Z. Lederman, Number 10, page 13.

Awards were presented during Wombat Magic on November 12th. The citation for the Silver Pen award reads as follows: "The Staff of the Wombat Examiner and 4GL Dispatch Awards the Silver Pen to Larry D. Roduner for *Letter to the Editor: Variable Lists in Forms* the best short article in Volume 10, 1988-89 of the SIG's newsletter." Larry was not present at Wombat Magic, but his walnut plaque has been sent to him in Shaker Heights, Ohio, were he works for Tremco, Inc.

The citation for the Golden Quill award reads as follows: "The Staff of the Wombat Examiner and 4GL Dispatch Awards the Golden Quill to Bart Z. Lederman for *Adding a Soundex Function to DATATRIEVE* the best original article in Volume 10, 1988-89 of the SIG's newsletter." Bart was present to accept his plaque.

Product Status Report

Joe H. Gallagher, Ph. D., Newsletter Editor, Overland Park, KS
John L. Henning, Digital Counterpart, Nashua, NH

The following is a list of Digital Equipment Corporation's software products of interest to the DATATRIEVE/ Fourth Generation Language Special Interest Group. You can use this list to have some idea of what products were announced when and determine how up-to-date is your layered software. Special thanks is due to Joe Mulvey of MSD Languages and Tools for the latest DTR-11 information.

Product	Latest Version	Announce Date	Prerequisite Software
VAX DATATRIEVE	5.0	10/89	VAX CDD/Plus Version 4.1 VAX/VMS Version 5.1
	4.2	7/88	VAX CDD/Plus Version 4.0 VAX/VMS Version 4.7 - 5.0
	4.1	11/87	
	4.0	2/87	
	3.4	6/86	VMS V4.4
	3.3	11/85	VMS V4.2
	3.2	5/85	VMS V4.0
DATATRIEVE-11	V3.3	8/89	RSTS/E V9.7 RSX-11M V4.5 RSX-11M-PLUS V4.2
	V3.2	11/87	RSTS/E V9.4, V9.5, V9.6 RSX-11M V4.3, V4.4, V4.5 RSX-11M-PLUS V4.0, V4.1
	V3.1	8/84	RSTS/E V9.0 RSX-11M V4.1 RSX-11M-PLUS V2.1
Micro/RSTS DTR-11	V3.3	8/89	Micro/RSTS V2.2
	V3.2	11/87	Micro/RSTS V2.2
	V3.1	8/84	Micro/RSTS V1.0
Micro/RSX DTR-11	V3.3	8/89	Micro/RSX V4.2
	V3.2	11/87	Micro/RSX V4.0, V4.1
	V3.1	8/84	Micro/RSX V1.1
PDP-11 DTR/VAX	V3.3	8/89	VAX-11/RSX V2.4
	V3.2	11/87	VAX-11/RSX V2.4
	V3.1	8/84	VMS V4.0/RSX V1.0
DECreporter	V2.1	4/90	to DECUS Library
	V2.1	10/88	Retirement announced
	V2.1	8/88	VAX DATATRIEVE V4.2 VAX CDD/Plus V4.0 VAX/VMS V4.7 - 5.0
	V2.0	2/87	
	V1.1	4/86	VMS 4.3
	V1.0	11/85	VMS 4.2
VAX RALLY	V2.1	4/89	(development system) VAX Rdb/VMS V3.0 VAX CDD/Plus V4.0 VMS V5.0 (run time) VMS V5.0
	V2.0	7/88	VAX Rdb/VMS V3.0 VAX CDD/Plus V4.0 VAX/VMS V4.7 - 5.0
	V1.1	1/87	VMS/Rdb
VAX Teamdata	1.3	7/88	VAX Rdb/VMS V3.0 VAX/VMS V4.7 - 5.0
	1.2	12/87	VMS/Rdb
	1.1	2/87	

DECreporter to be Submitted to DECUS Library

John L. Henning, Digital Counterpart, Nashua, NH

The retirement of VAX DECreporter was announced in October, 1988. Retiring a product is an 18–month process. At the end of the retirement phase down period, in April, 1990, Digital plans to submit the sources for VAX DECreporter V2.1 to the DECUS library.

In a few cases, customers have already made arrangements with their individual country or district Software Services organization for continuing support or enhancements to DECreporter. Submission of DECreporter sources to DECUS should have minimal effect on any such arrangements, since the sources will be submitted to DECUS on an "as– is", unsupported basis, and will reflect the code as it existed in October, 1988.

The submission of DECreporter to the DECUS library has been arranged with the cooperation of, and at the request of, the leadership of the DTR/4GL SIG. Digital thanks the SIG for their unflagging persistence in pursuing this request.

ACCENT R Working Group Report

Winston Tellis, Working Group Chair, Fairfield University, Fairfield, CT

The ACCENT R Working Group offered several sessions at the Fall Symposium in Anaheim, California. The user on the 4GL user panel presented ACCENT R favorably and honestly. We had a repeat session entitled "Mission: Replace a 3GL with a 4GL" on Monday Night. It emphasized ACCENT R's ability through its robust, compiled programming language to completely replace COBOL or other 3GL.

Wednesday was "ACCENT R day." Starting at 10:00 AM we had a talk on creating and maintaining coding standards. While this talk was not presented as an ACCENT R talk, it did bring into focus that fact that it can be used as a tool to accomplish this goal. Following that, Dave Gorin presented a most enlightening talk on code management using utilities written in ACCENT R. It addressed the inability of existing products in the market to facilitate code management within a 4GL and how it was done. NIS then presented a session on using Code Segments in ACCENT R; those present found the session to be enlightening.

In addition, we had a "Town Meeting" for ACCENT R users. Users discussed their experiences or difficulties, and other users helped them to resolve any problems. Numerous interesting interchanges resulted and the users asked for a session at the next DECUS Symposium for the presentation of "ACCENT R Magic." The users also made many suggestions for topics at future symposia. The list will be submitted to the DTR/4GL SIG Leadership for further consideration.

Cortex Working Group Report

Eric S. Dubiner, Working Group Chair, du Pont IEA, Wilmington, DE

The Cortex Working Group met again in Anaheim with the intention of introducing our new Counterpart, Jeff Lewis, and going over some of the events that have occurred since Atlanta. Also present at the meeting were a number of people who were interested in 4GLs in general, and we were able to direct a portion of the meeting towards them.

Plans for New Orleans include session presentations, as well as participation in a panel discussion with other 4GL users and the ever– present working group meeting. We are actively seeking volunteers to speak at future symposia.

We are now officially recognized and supported by CORUS, the Cortex Users Society, and will be working with them to expand our scope.

FOCUS Working Group Report

Les Hulse, Working Group Chair, The Gillette Company, Boston, MA

The Fall 1989 DECUS Symposium was a fulfilling event for VAX/FOCUS users. Session were given on a variety of topics ranging from FOCUS/VMS interaction & Rdb database access to integrating FOCUS and the All-in-1 environment. A special thank you is extended to James Wilson of Pfizer, Inc. for representing FOCUS in a user panel comparison of 4GLs.

Attendees had the opportunity to meet with FOCUS developers and experienced users in informal campground meetings to discuss problem solving, techniques, and "wish list" items. Five representatives from I.B.I. were available to respond to wish list items in a scheduled session on Thursday evening. User's wish list items were answered, technical features of the next FOCUS release were presented, and suggestions for future product improvements were made in a very productive session.

Planning is already under way for New Orleans DECUS Spring Symposium (May 7-11, 1990), and we hope to make it the best symposium yet for FOCUS and all other 4GL products.

INGRES Working Group Report

Larry W. Hicks, Working Group Chair, Turn Key Solutions, Inc., Releigh, NC

The Fall 1989 DECUS Symposium in Anaheim was the first symposium since the INGRES Working Group was formally organized. As such, it had its rough moments but turned into a very productive symposium.

Sessions in Anaheim:

The INGRES Working Group sponsored four regularly scheduled sessions in Anaheim and two BOFs (Birds of a Feather sessions). One of the four regular sessions was canceled, when Dave Kellogg of INGRES Corporation, formally Relational Technology, Inc., had to go help spread the news of the new corporate name and the release of 6.3 of INGRES.

- Optimization of INGRES using the Query Optimizer (Canceled)
- INGRES Working Group Meeting (40+ attendees)
- INGRES User Panel (60+ attendees, Chris Rebholz and an INGRES technical marketing support person replaced Dave Kellogg)
- INGRES Working Group Wishlist (40+ attendees, over 45 wishlist items submitted -- 1st Wishlist session)
- Configuring INGRES on VAX clusters (BOF -- 30-35 attendees, submitted as a regular session for New Orleans)
- Using SQL and INGRES under ULTRIX (BOF)

I would like to thank the many people within INGRES Corporation who helped us obtain the necessary vendor representation at the sessions above. I especially want to thank Chris Rebholz and Chris Cory for attending the sessions and BOFs, respectively, and Ed Horst for committing to strengthen the support and coordination with the INGRES Working Group for future DECUS Symposia.

Working Group:

At the Working Group formation meeting in Atlanta, we received several volunteers to serve on the Working Group in important posts. Unfortunately, these people were not in Anaheim. We therefore have added additional volunteers to the Atlanta group and should be able to form a cohesive Working Group Steering Committee in the next few months. (Several of the volunteers are tentative pending company approval, so I will wait until next month's newsletter to list their names.

Wishlist:

The first INGRES Working Group Wishlist was begun at this DECUS Symposium. The overall response was great with over 45 wishlist items submitted. The wishlist items will be submitted to INGRES Corporation for review in early December. At the same time, the items will be sent to everyone, who signed an INGRES Working Group Interest form or the attendance rolls at each INGRES session.

Wishlist ballots should be returned within four weeks from the date of the cover letter. At that time, the wishlist items will be ranked based on the total votes cast for each item and the results will be published in this newsletter and sent to INGRES for reply.

The status of the wishlist items will be discussed at each symposium and additional items added. We

also hope to join our wishlist with the North American INGRES User Association's list and combine our voting process. (We would then represent 800-900 INGRES users, instead of 100-200.) No additional wishlist items will be accepted for the Anaheim '89 Wishlist. Additional wishlist items will be added to the New Orleans '90 list until the last day of that Symposium.

DECUServe:

The Working Group discussed the need for a more timely communication medium than semi-annual symposia or monthly newsletters; we decided to try the DECUServe system from DECUS. We expect to upload onto DECUServe the wishlist, questions and answers from Anaheim, and the Working Group position statements.

As we understand it, their is currently a conference for DATATRIEVE/4GL. All the 4GL Working Groups may have topics under this conference. If our use of the system warrants it, we will be able to have our own conference in future. This system will only be useful if we all use it to exchange information and helpful hints.

Seminars:

The Working Group discussed the need for DECUS Seminars on INGRES and we have approached INGRES Corporation about preparing one on the new Knowledge-based and Object-Oriented features of Version 6.3 or Optimizing INGRES routines or queries. If a user has a seminar on these or other INGRES related concerns, please notify the Working Group Chair at 919-460-9896 or send me a FAX at 919-460-8607.

We have a possibility of giving a seminar in New Orleans and a strong possibility in Las Vegas. Let us know what you want or what you can present.

Newsletter:

With this issue, the INGRES Working Group hopes to have a status update in at least every other issue of the SIG newsletters. If we have a lot of activity on the DECUServe system or among the Working Group members, we may have an article or two in each newsletter.

If you have some useful information or articles on INGRES such as how to use, why you choose it, what your company does with INGRES, we would like to see it published here in the newsletter.

Closing:

In closing, I want to thank everyone on the DTR/4GL SIG, the INGRES Working Group and INGRES Corporation who helped make the Anaheim Symposium the best yet for the INGRES Working Group and INGRES users.

ORACLE Working Group Report

Mark Keller, Working Group Vice Chair, FDA, Rockville, MD

The ORACLE Working Group continued its efforts to provide a forum for ORACLE users to obtain technical information at DECUS. In addition to sessions on product architecture, V5/V6 migration issues, distributed applications, query optimization, and system management issues, a very productive clinic was held. ORACLE users were able to discuss their problems with experienced ORACLE users and ORACLE technical staff in a highly interactive environment. The product was available on a VAXstation at the clinic in the campground.

The Working Group also participated in the 4GL panel discussion and will participate in the Problem Panel in New Orleans.

At the Working Group meeting, the ORACLE technical staff addressed the wish list from the Atlanta DECUS and most of the issues were clarified. Wish list items were collected for New Orleans and an informal Q & A was held.

Shaul Ganel, the ORACLE Working Group Chair, has established liaison with the ORACLE International User Group VMS SIG in order to provide a clearinghouse for information exchange between the two groups. This should maximize the amount of information available for both DECUS and IOUG members.

The ORACLE Working Group looks forward to seeing you in New Orleans. In the interim, we urge all ORACLE users to take advantage of DECUServe to exchange information. We can be found in the Database conference.

PowerHouse Working Group Report

David Hatfield, Working Group Chair, Merrimack County Telephone Co., Contoocook, NH

Greetings from Anaheim. The PowerHouse Working Group of the DTR/4GL SIG had another successful representation at the Fall '89 Symposium. Many sessions of interest to PowerHouse users were held

including a couple of very popular introductory/novice talks. We also had a well attended Working Group meeting and the always popular clinic.

The Working Group meeting was held on Thursday evening. We spent a good part of our hour discussing working group participation in DECUS, both at symposia and during other times of the year. We discussed session topics and format, as well as different ways to increase Library and Newsletter submissions and DECUServe usage.

Perhaps the most significant development during the meeting were the election of a Working Group Vice-Chair and Newsletter editor. Doug Brantly of Cerritos College is the new Working Group Vice-Chair and Cecil Hawkins of General Instrument will be our Newsletter Editor. With the addition of these two very capable individuals to our working group leadership, we are building a solid foundation that will allow the PowerHouse Working Group to continue to grow and become even more useful to it's members.

We are eagerly looking forward to the spring symposium in New Orleans. For the first time, the PowerHouse Working group is planning to participate in two interesting and informative sessions in cooperative with the other DTR/4GL working groups. We also have plans to increase our campground utilization, and, of course, we'll have the usual compliment of topical PowerHouse oriented sessions. Please try to join us in New Orleans.

RALLY Working Group Report

B. Paul Bushueff, Working Group Vice-Chair, DOT Center, Cambridge, MA

The RALLY Working group sponsored a series of sessions on RALLY given by DEC and by users. A RALLY user also sat in on a 4GL panel. The next DECUS meeting in New Orleans will include a problem solving session for all interested 4GL working groups.

The working group met twice during the DECUS Symposia. Of particular interest in both sessions was the new list of PIRs (Product Improvement Requests) that have been established. We hope you already turned in your PIR Ballots by December 15th. Digital will comment on the Top 10 PIRs and consider them for inclusion in a future RALLY release. The PIR process is your best opportunity to influence product direction. Thanks to John Henning for getting this RALLY PIR process going. In the future the Working Group and the SIG will coordinate the PIR process. New PIRs may be submitted now for the next ballot.

The DTR/4GL conference on DECUServe is the place to discuss RALLY problems and issues. We encourage your participation. George Kossl, Chairman of the St. Louis RALLY Working Group, has agreed to coordinate DECUServe activities.

Word is that a new conference is going to be established called DATABASE/4GL. This will be where RALLY info will eventually reside.

SMARTSTAR Working Group Report

Charles R. Gross, Working Group Chair, Dow Chemical, Midland, MI

The SMARTSTAR Working Group presented several activities at Anaheim. The Introduction to SMARTSTAR session was again well received and provided attendees an excellent overview of the product. The panel discussion resolved several user questions and allowed company representatives to obtain user input about product futures. Other sessions included a discussion of the SQL Report Writer and application integration in the SMARTSTAR environment.

The Working Group is participating in the 4GL problem for New Orleans sponsored by the DTR/4GL SIG. Working Group response is being coordinated by Jim McIlvaine of Moyer Packing. If you are interested in assisting, contact Jim at 215-723-5555.

The group also heard a presentation on SMARTSTAR Version 5.3 and future release features by company representatives as well as the company plans for the future creation of a national user's group. A regional user's group has been formed in the midwest and new groups are forming in the mid-Atlantic and northeast areas.

The material in this months RALLY Check Point column is taken from "VAX RALLY Hints and Techniques" produced and created by Digital employees in Australia, New Zealand, Canada, Europe, and the US; the material was edited and compiled

by Ian Smith, Marg Williams, and Vince Moran of Digital's Northern District Professional Software Services, submitted to the Wombat Examiner and 4GL Dispatch by Associate Editor Lorey B. Kimmel, and edited by Kyle R. West, RALLY Editor.

The RALLY Check Point

Continuing last month's column with another way to confirm delete.

PROBLEM: You want a "Confirm Record Delete (Y/N)" on a F/R.

SOLUTION

The obvious place to put it is as a Before Delete action on the group that the record is in. It also seems best to use a simple two choice menu to ask the question, accept and validate the Y/N answer and then perform some action which can be used to set success or failure for the Before Delete.

I've seen some other ways of doing this that involve FORKing to another F/R, and passing back a global variable. That is far more complicated compared to the menu approach I'll show below.

The Before Delete action should CALL our confirm menu, say CONFIRM_DELETE_MENU. CONFIRM_DELETE_MENU had a one line text area "DO you really want to delete this record (Y/N)?", and had two letter choices:

```
"Y" causes EXECUTE, ADL PROCEDURE,
SET_SUCCESS_ADL

"N" causes EXECUTE, ADL PROCEDURE,
SET_FAILURE_ADL
```

where SET_SUCCESS_ADL looks like:

```
{This ADL should be EXECUTEd rather
than CALLed}

{Make the current action return suc-
cess}

PROCEDURE SET_SUCCESS_ADL;

BEGIN

   SET_SUCCESS();

END;
```

and SET_FAILURE_ADL is the twin to this one.

```
{This ADL should be EXECUTEd rather
than CALLed}

{Make the current action return fail-
ure}

PROCEDURE SET_FAILURE_ADL;

BEGIN

   SET_FAILURE();

END;
```

You must EXECUTE the ADL so that the SET commands work on the Before Delete action rather than the Menu (which is what would happen if you CALL the ADL). You could also make the ADLs one-liners as follows:

SET_SUCCESS_ADL would be

```
SET_SUCCESS();
```

SET_FAILURE_ADL would be

```
SET_FAILURE();
```

1989 Fall DECUS DATATRIEVE Problem

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

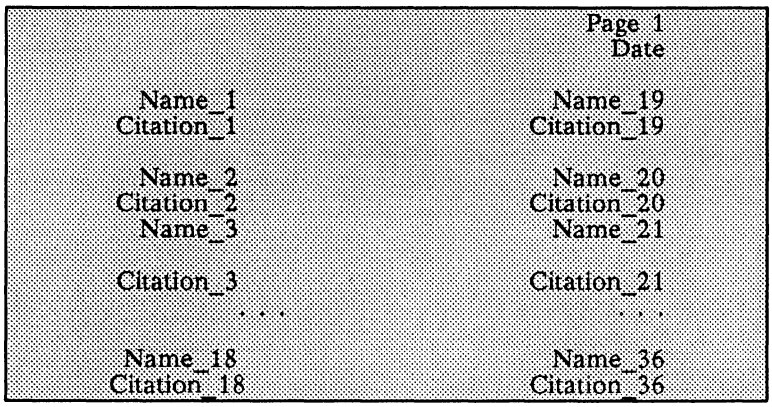
The DATATRIEVE Problem for the 1989 Fall DECUS Symposium is to print a report in serpentine mode.

The data base consists of an arbitrary number of records in the domain REFERENCES with the following record definition:

```
DEFINE RECORD REFERENCES_RECORD USING
01 REFERENCE_REC.
   03 REFERENCE_ID pic 9(5). ! key no dups
   03 NAME pic X(30).
   03 CITATION pic X(30).
;
```

The report may be done with the report writer or with print statements. A subset of the records, which can be up to 5000 records, is chosen with a record selection expression on NAME. The order (sorted ascending by NAME) must be down the first column to the end of the page and then down the second column. Eight-

een entries fill a column. The first page of the report should look



like:

The last page of the report must have the two columns as nearly equal as possible. If there are fewer than 36 records to print, half of the records should be printed in each column. If the number of remaining records is an even number, then the two columns should contain the same number of records. If the number of remaining records is an odd number, then the left hand column will contain one more record than the right hand column. Of course, the remainder of the page is blank.

There are two categories for the solution to this problem:

Category A.

The solution makes no assumptions about file protection or access.

Category B.

The solution uses only read access.

John Putnam, Harris Bank, Chicago, IL

John Putnam submitted the solution for Category A. He writes the data pointers into a derived domain TWOCOL and then CROSSes TWOCOL with REFERENCES and then prints the report. The TWOCOL records consists of three fields: REFERENCE_ID, PAGENO, and LINENO. John's procedure is:

```
DELETE JPUT;
REDEFINE PROCEDURE JPUT
!
!  this procedure writes an intermediate sequencing file first then
!  sorts and processes the input data in that order
!
READY REFERENCES SHARED
!
DEFINE FILE TWOCOL KEY=REFERENCE_ID(NO DUP);
DECLARE NRECS PIC 9999.
DECLARE NPAGES PIC 9999.
DECLARE NLINES_LASTPAGE PIC 9999.
DECLARE PN PIC 9999.
DECLARE LN PIC 9999.
DECLARE LN2 PIC 9999.
DECLARE OFFSET PIC 9999.
DECLARE LPMOD PIC 9999.
DECLARE USEMOD PIC 9999.
DECLARE NUMBER USAGE IS INTEGER.
```

```
!
NUMBER = *."number"
!
!  first scan finds number of records to print
!
NRECS = COUNT OF FIRST NUMBER REFERENCES SORTED BY NAME
NPAGES = FN$FLOOR((NRECS - 1)/36.0) + 1
NLINES_LASTPAGE = NRECS - (NPAGES - 1)*36
LPMOD = FN$NINT(NLINES_LASTPAGE/2)
!  PRINT NRECS,LPMOD,NPAGES,NLINES_LASTPAGE
READY TWOCOL WRITE
!
!  second scan build file with ref_id and pageno and sequence
!  number within page. col 1 is odd numbers col 2 even.
!  interleaved so that row 5 will come from records 9 and 10.
!
OFFSET = 0      !offset is 0 for first col of page and
                !1 for second column this generates the
                !interleaving for sequential processing
USEMOD = 18     !usemod is modulo to use for each page to
                !find start of column 2. 18 for all but
                !last page then switches to lpmod
!
FOR FIRST NRECS  RX IN REFERENCES SORTED BY NAME BEGIN
   STORE TWOCOL USING BEGIN
    REFERENCE_ID = RX.REFERENCE_ID
!
!  calc page number and line number within page,
!  same for col 1 and 2
!
    PN = FN$FLOOR((RUNNING COUNT - 1) / 36.0) + 1
    LN = FN$MOD(RUNNING COUNT - 1 ,IF PN NE NPAGES THEN 18 ELSE LPMOD) + 1
!
!  detect change in column and flip offset to next column offset
!
    IF LN = 1 THEN OFFSET = 1 - OFFSET
    PAGENO = PN
!
!  perform interleaving col 1 number odd record
!  followed by col 2 record #
!
    LN2 = LN*2 - OFFSET
!   PRINT NAME,PN,LN,LN2
    LINENO = LN2
    END
```

```
   END
!
!  third scan crosses page sequence file with reference file
!  over ref_id. records are double buffered and a write happens
!  when both columns are input or a cleanup write at the end
!  if we have an odd number of entries on the last page.
!  the odd entry is  at the bottom of col 1 but could be col 2
!  without much change.
!
DECLARE TEMP_NAME PIC X(30).
DECLARE TEMP_CIT PIC X(30).
DECLARE ISWTCH PIC 9.
DECLARE CURPAGE PIC 9999.
ISWTCH = 0
CURPAGE = 0
!
!  temp_name and temp_cit are the col 1 holding areas
!  iswtch tells us when we have to write out a row and
!  is used to detect if we need the cleanup print for
!  the odd item on the last page
!
FOR ALL RI IN REFERENCES CROSS TWOCOL OVER REFERENCE_ID SORTED BY
   PAGENO, LINENO BEGIN
    IF CURPAGE NE PAGENO THEN PRINT NEW_PAGE,COL 60,"PAGE",COL 70,
     PAGENO(-) USING ZZZ9, SKIP 2
    PRINT NAME,PAGENO,LINENO
    IF ISWTCH = 0 THEN BEGIN
     TEMP_NAME = RI.NAME
     TEMP_CIT = RI.CITATION
    END ELSE BEGIN
    PRINT TEMP_NAME(-) ,COL 40,NAME(-),SKIP,
     TEMP_CIT(-)   ,COL 40,CITATION(-),SKIP
    END
   ISWTCH = 1 - ISWTCH
   CURPAGE = PAGENO
   END
IF ISWTCH = 1 THEN PRINT TEMP_NAME(-),SKIP,TEMP_CIT(-)
END_PROCEDURE
```

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

Joe Gallagher presented the solution for Category B. He used the function FN$STR_REPLACE to create an in-memory pointer array.

```
DEFINE PROCEDURE SERPENTINE_PRINT
!
READY REFERENCES READ
```

```
DECLARE RECORD_COUNT USAGE IS INTEGER.
DECLARE WHOLE_PAGES USAGE IS INTEGER.
DECLARE RECORDS_ON_LAST_PAGEUSAGE IS INTEGER.
DECLARE BUFFER PIC IS X(25000).  ! 5000 * 5
DECLARE PAGE_NUMBER USAGE IS INTEGER.
DECLARE RECORDS_ON_A_PAGE USAGE IS INTEGER.
DECLARE HALF_RECORDS_ON_A_PAGE USAGE IS INTEGER.
DECLARE COUNTER USAGE IS INTEGER.
DECLARE TODAYUSAGE IS DATE.
DECLARE POINTER1 USAGE IS INTEGER.
DECLARE POINTER2 USAGE IS INTEGER.
DECLARE NAME_BUFFER_LEFT PIC X(30).
DECLARE NAME_BUFFER_RIGHT PIC X(30).
DECLARE CITATION_BUFFER_LEFTPIC X(30).
DECLARE CITATION_BUFFER_RIGHT  PIC X(30).
DECLARE REF_LEFT PIC 9(5).
DECLARE REF_RIGHT PIC 9(5).
TODAY = "today"
RECORDS_ON_A_PAGE = 36
HALF_RECORDS_ON_A_PAGE = RECORDS_ON_A_PAGE / 2
RECORD_COUNT = 350 * FN$RANDOM + 1
BUFFER = " "
COUNTER = 0

FOR FIRST RECORD_COUNT REFERENCES SORTED BY NAME BEGIN
   COUNTER = COUNTER + 1
   BUFFER = FN$STR_REPLACE(BUFFER, 5*COUNTER - 4, 5*COUNTER, REFERENCE_ID)
END
RECORD_COUNT = COUNTER
WHOLE_PAGES = FN$FLOOR(RECORD_COUNT/RECORDS_ON_A_PAGE)
RECORDS_ON_LAST_PAGE = RECORD_COUNT - WHOLE_PAGES * RECORDS_ON_A_PAGE
!  PRINT RECORD_COUNT, WHOLE_PAGES, RECORDS_ON_LAST_PAGE
PAGE_NUMBER = 1
WHILE (PAGE_NUMBER LE WHOLE_PAGES) BEGIN
   COUNTER = 1
   PRINT ""
   PRINT COL 69, "Page "|FORMAT PAGE_NUMBER USING X(4)
   PRINT COL 69, FORMAT TODAY USING DD_MMM_YYYY, SKIP 2
    REPEAT HALF_RECORDS_ON_A_PAGE BEGIN
    POINTER1 = RECORDS_ON_A_PAGE * (PAGE_NUMBER - 1) + COUNTER
    POINTER2 = POINTER1 + HALF_RECORDS_ON_A_PAGE
    REF_LEFT = FN$STR_EXTRACT(BUFFER, 5 * POINTER1 - 4, 5)
    REF_RIGHT= FN$STR_EXTRACT(BUFFER, 5 * POINTER2 - 4, 5)
    FOR REFERENCES WITH REFERENCE_ID = REF_LEFT BEGIN
     NAME_BUFFER_LEFT = NAME
```

```
        CITATION_BUFFER_LEFT = CITATION
        END
      FOR REFERENCES WITH REFERENCE_ID = REF_RIGHT BEGIN
        NAME_BUFFER_RIGHT = NAME
        CITATION_BUFFER_RIGHT = CITATION
        END
      PRINT COL 5, NAME_BUFFER_LEFT(-), COL 45, NAME_BUFFER_RIGHT(-)
      PRINT COL 5, CITATION_BUFFER_LEFT(-), COL 45, CITATION_BUFFER_RIGHT(-)
      PRINT " "
      COUNTER = COUNTER + 1
      END
  PAGE_NUMBER = PAGE_NUMBER + 1
  END

  IF (RECORDS_ON_LAST_PAGE GT 0) BEGIN
     COUNTER = 1
     PRINT ""
     PRINT COL 69, "Page "|FORMAT PAGE_NUMBER USING X(4)
     PRINT COL 69, FORMAT TODAY USING DD_MMM_YYYY, SKIP 2
     HALF_RECORDS_ON_A_PAGE = FN$FLOOR(RECORDS_ON_LAST_PAGE/2)
     HALF_RECORDS_ON_A_PAGE = RECORDS_ON_LAST_PAGE - HALF_RECORDS_ON_A_PAGE
     REPEAT HALF_RECORDS_ON_A_PAGE BEGIN
      POINTER1 = RECORDS_ON_A_PAGE * (PAGE_NUMBER - 1) + COUNTER
      POINTER2 = POINTER1 + HALF_RECORDS_ON_A_PAGE
      REF_LEFT = FN$STR_EXTRACT(BUFFER,5*POINTER1 - 4,5)
      REF_RIGHT= FN$STR_EXTRACT(BUFFER,5*POINTER2 - 4,5)
      FOR REFERENCES WITH REFERENCE_ID = REF_LEFT BEGIN
        NAME_BUFFER_LEFT = NAME
        CITATION_BUFFER_LEFT = CITATION
        END
      NAME_BUFFER_RIGHT = " "
      CITATION_BUFFER_RIGHT = " "
      FOR REFERENCES WITH REFERENCE_ID = REF_RIGHT BEGIN
        NAME_BUFFER_RIGHT = NAME
        CITATION_BUFFER_RIGHT = CITATION
        END
      PRINT COL 5, NAME_BUFFER_LEFT(-), COL 45, NAME_BUFFER_RIGHT(-)
      PRINT COL 5, CITATION_BUFFER_LEFT(-), COL 45, CITATION_BUFFER_RIGHT(-)
      PRINT " "
      COUNTER = COUNTER + 1
      END
     END
  PRINT "<FF>"
  END_PROCEDURE
```

[Editor's note: This problem as specified is particularly difficult. During the Anaheim Symposium, several from non-DATATRIEVE working groups indicated this problem was trivial in their 4GL. Several 4GLs have a

clause which is added to their equivalent of the DATATRIEVE REPORT statement which causes items to be reported column-wize. However, on the last page of the report, the left-hand column is filled completely before any items are written in the right-hand column. So I do not believe that any 4GL can easily solve this particular problem with the restriction that the columns of items on the last page of the report must be equal in length or the left-hand column contains one more than the right-hand column.]

Don't Forget to Submit Your PIRs.

The deadline is January 29, 1990.

The form is in the back of the Newsletter.

Coming next month is

Part 1 of Fall 1989 Wombat Magic

with a Lunar Lander written in DATATRIEVE!

The Graphics Applications Special Interest Group Newsletter

The Graph Paper

Special Business Issue, January, 1990

a personal look at the fall symposium

Bob Hays, editor, The Graph Paper

A DECUS Symposium is a wonderous place, filled with technical over-achievers and computer-generated fantasy. As I de-planed at the Los Angeles International Airport on Friday night and rode to my hotel, I began to plan the week's events. This would be a busy symposium, what with leadership meetings, both for the SIG and for the Communications Committee, and the release recently of new architectures for documents (CDA), printing (DECprint), and of course VAX-based vector processing.

I attended the seminar for new DECUS leaders on Saturday. Everyone felt the experience was worthwhile and I certainly learned a number of things from the session. We discussed meeting management, volunteer leadership skills, and other ways to help **Put Your Best Foot Forward**. After the seminar, most of the DECUS leadership met for a buffet dinner which was quite good (DECUS travels on its stomach, after all). Afterwards, the Communications Committee met to discuss a number of issues, including its own Policies and Procedures and some unfinished business from the last Woods Meeting. I got to bed at about 10 PM....

(Cont'd p. 9, c. 2)

editor's address

Robert L. Hays
700 KMS Place
P.O. Box 1567
Ann Arbor, MI 48106
(313) 769-8500 x. 458

publication info

This newsletter is prepared using Mass-11 and Mass-11 Draw from MEC on VAXes and VAXstations, Illustrator from Adobe, MacPaint II from Claris and a VersaScan scanning subsystem on various Macintoshes (file transfer courtesy of PacerLink software and Kinetics FastPath hardware), and is printed on an LN03R from our VAXcluster using the PostScript page description language from Adobe.

submissions

Articles, copies of viewgraphs, tips and tricks, and graphics output can be submitted to the GAPSIG newsletter; here's how YOU can make submissions:

1) Send 1600 or 6250 BPI tape in either ASCII or Mass-11 (TM) format. Include a letter with your name and address, and please send any charts or graphics in hard copy form.

2) Send hard copy.

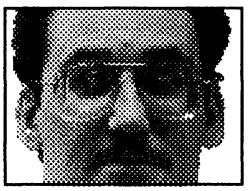
3) Mail the article, etc. to user HAYS on DCS.

editorial policy

This editor has a simple editorial policy: we print our own views (**from the editor** and **from the chair's desk**), letters to the editor, and articles submitted by graphics users. If you don't agree with something printed here, mail your letter to the editor at the address at the top of this column; don't use expletives and don't list pricing or delivery information. We are here to serve the DEC graphics community, so please contact us with any comments, praise, or, well, yes, criticism. We welcome your inputs!

Subscriptions

Subscription information is available at the end of the magazine.



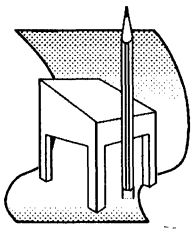
from the editor

Robert Hays
700 KMS Place
P. O. Box 1567
Ann Arbor, MI 48106
(313) 769-8500 x458

I'll keep this short; there is a two month lead time for the newsletter, so I am generating this just after the Fall Symposium. This is the business issue, so you will see a lot of information on the GAPSIG itself instead of the technical goodies to which you are accustomed. I felt an article describing the Symposium from an attendee's view (mine!) would provide a little levity among the minutes and reports.

If you have a submission or would like to see an article on a topic of interest, contact me at the address shown to the left.

Happy Computing
Robt L Hays



from the chair's desk

Bijoy Misra
Chairperson, GAPSIG

The Fall DECUS Symposium at Anaheim has been a milestone for the SIG. We had several events connected with the SIG's tenth anniversary celebrations and a thorough fact-filled symposium. I'll appreciate hearing from you if you did attend Anaheim and have any comments or suggestions on SIG's activity and sessions.

Organizationally we had a tight team. Bob Goldstein did a splendid job in putting together the Symposium schedule. Laura Vanags acted as the on-site co-ordinator. The campground chores were aby handled by Steve Hankin, who arranged several software demos from various vendors and institutions like Precision Visuals and NCAR. We had superb campground equipment thanks to the organization of Irene McCartney, Rick Landau and Jim Flatten, our DEC counterparts. They also added many extra hours on Sunday before the Symposium to connect all the equipment and install software. There were seventeen sessions including several held in the Graphics Campground.

(Cont'd on p. 12, c. 1)

minutes from the GAPSIG fall woods meeting

Sunday, July 9, 1989

The GAPSIG woods meeting began at 9:15 AM. The meeting was brought to order by Bijoy Misra, the SIG Chair. Bijoy began by welcoming the attendees:

- Dan Land, Seminars Committee
- Steve Hankin, Standards Committee
- Bob Hays, Communications Committee, Newsletter Editor and Hardcopy Working Group Chair
- Hal Dell, Worksystems Working Group Chair
- Warren Yogi, GKS/PHIGS Working Group Chair
- Irene McCartney, Digital Counterpart
- Laura Vanags, DECwindows Working Group Chair
- Rick Landau joined us part way through the day; he is another Digital Counterpart.

Bijoy discussed the agenda briefly. After adding time to discuss possible store items for the Spring Symposium, the agenda was approved unanimously.

We then discussed the last symposium in Atlanta. The following issues were raised:

- The campground was roundly praised. There were many people that visited and the hardware and software available were outstanding; we all wanted to thank Digital deeply for supplying excellent hardware and software. Hopefully the VAXimage scanning hardware and software can be made available at the Fall Symposium campground.

- It was felt that we did not furnish enough user graphics software in the campground, however. Therefore, an action item was generated to try to get demo software and public domain software for the campground equipment. Some products mentioned include VIEW from the LVM Labs, a P-V Wave demo, and demos from other companies. The SIG will need to coordinate all this with our Digital counterparts so that software can be installed on-site. Another concern raised about third-party software demos is that DECUS would need to be responsible for the demo, not Digital. A separate machine dedicated to third-party software was suggested.

- It was suggested that program documentation be provided for the software. There was a general discussion of ways of doing this including purchasing documentation kits from Digital and then raffling them off at the end of the Symposium. Our counterparts suggested that some documentation might be made available free of charge if it was returned after the show. Documentation suggested includes GKS, PHIGS and DECwindows. This issue was left open and requiring further work.

- The DECwindows BOF in Atlanta was well attended and the VWS clinic was not so well attended, so the DECwindows Working Group Chair, Laura Vanags, and our counterpart Irene McCartney, suggested changing the VWS clinic for the Fall Symposium into a DECwindows clinic. After some discussion, it was agreed that the clinic should be for both VWS and DECwindows.

Warren Yogi and Laura Vanags volunteered to help set up the campground this fall. They should contact Steve Schultz to coordinate this.

Bijoy asked about our views on the GAPSIG suite. Since we only use it on Wednesday night for a volunteer reception and then on Thursday night for our SIG steering meeting, it was proposed that we try to join with another SIG and share a suite. E-PUBS, PC and DAARC were suggested as possibilities.

We discussed the Spring Symposium theme, Network Graphics. This led to a general discussion of topics and themes for sessions. Some issues raised were:

- Session conflicts between our SIG or another

(Cont'd p. 4, c. 1)

minutes from woods ...

(Cont'd from p. 3, c. 2)

- Watch scheduling sessions vs. major VAX sessions
- Spread out focus over a couple of days with breaks so that people don't get burned out
- A more deatiled roadmap
- Providing PSSes that discuss the Symposium theme
- Our streams need to be organized

We then put this discussion on hold until Monday when our Symposium Representative, Bob Goldstein, would be present.

This symposium session streams will be segmented, meaning that sessions on a given topic will appear more than once throughout a symposium. This was determined to be a good idea by the group. In addition, Bob Goldstein had requested via DCS that Woods attendees select streams to chair at Anaheim; as long as this assignment is tentative, we felt it was a good idea. Bob Hays mentioned that, when a company pays the way to a symposium for an attendee, that attendee must spend some time attending sessions and seeing people for the company, not just for DECUS, and therefore one cannot be certain what sessions will be attended until after the preliminary schedule is announced.

Bob Hays then gave a short Communications Committee report. The next CommComm woods meeting is scheduled for the weekend of September 9th in San Diego. There are a number of rumors that were discussed about various units merging with CommComm or spliting off. Bob reported that the Newsletter Subcommittee had tentatively approved a price increase for the SIGs Newsletters from $35 to $40; this was necessary to prevent severe page limits for all SIGs, including ours, and the increase was considered appropriate given the rate of inflation over the last four years. The newsletter subscription rate is now pretty steady at just over 6,000 subscriptions. Overall, our newsletter is getting high response from other members. Bijoy moved to nominate Bob for a DECUS rookie award for his work reviving the GAPSIG newsletter. This was passed unanimously.

The GAPSIG also got an "at-a-boy" for submitting a ten-page layout and editing outline/guide to DECUS; this is located in the COMM_NEWSLETTER VAXnotes conference. The handout was prepared by Bob Hays and used at the LUG newsletter clinic in Atlanta.

Bob then requested more help to keep the newsletter rolling. In particular, he asked all the Working Group Chairs to begin asking members to submit articles to support working group activities.

Daniel Land provided the Seminars report. Dan expounded first on a serious problem: while the GAPSIG had originally scheduled five PSSes for Anaheim, two were canceled because the DECUS computer software could not accept PSS numbers over 99; this would result in ten seminars being canceled overall. The two canceled from GAPSIG were PHIGS and ADVANCED POSTSCRIPT due to the prevous lack of attendance. There were a number of angry words over why two seminars were trimmed from one SIG where other SIGs with many more seminars had one or even no seminars removed. The greatest ire was raised over the apparent knowledge that this problem existed on June 30 but was not brought to the Seminars Representatives until July 7, with a decision deadline of July 9. One member suggested cutting the non-technical Digital Educational Services seminars first before those presented by members. While we were very upset by this development, we all felt that Dan had handled himself in an exemplary fashion and had made excellent decisions given the limited time available. This discussion would be continued on Monday when the final schedule would be ready.

Dan mentioned our successful seminars on Imaging and X-Windows. All four seminars from Atlanta have been revamped except for the Advanced PostScript seminar. One was added based on campground requests that will cover porting UIS applications to DECwindows.

Steve Hankin gave the Standards report. As a newcomer to the Standards Committee, Steve was prevented from attending the June X3H3 meeting in Hawaii by DECUS travel policies. DECUS must formally notify the ANSI committee of the change

(Cont'd p. 5, c. 1)

minutes from woods ...

(Cont'd from p. 4, c. 2)

of representation; Steve has the paperwork and will proceed. Steve asked that an alternate be nominated that could attend meetings when Steve could not and also split symposium attendance so that someone with experience and knowledge could attend each symposium. In addition, since each representative would have different interest areas, this would provide a means for activity in multiple portions of X3H3. Laura Vanags volunteered to be the alternate. It was decided that both representatives should, if possible, have voting status on the committee, that ANSI should be so notified, that the standards meeting schedule should be divided between the representatives, and that there should be at least one session on standards activities at each symposium with time set aside in the campground for further discussions.

Since Robert Krieg could not attend the woods meeting, Bijoy led a discussion of our library efforts. First, the group wants to thank Bob for the excellent work he has done so far both as Library Representative and as Session Notes Representative. He received some flak from the national office over the 3D DECUS logo provided on the cover of our Atlanta session notes (we all liked it better than the normal logo - ed.); no one intended to deface the trademark, and the SIG, now that it has been informed more fully on trademark law, will not do such a thing again.

A major effort is underway to create the first graphics tape from archived material currently in the library. Bob Krieg has a list of programs he wants to combine onto a tape but has been unable to get help from the national level to get source tapes. Then, we also want to start collecting new software to add to a SIG tape that would be provided each year. Bijoy asked if anyone can donate some time to help. Dan offered to look into ways to get ahold of library tapes. Warren Yogi offered to help create the tape.

The steering committee then discussed our working groups. We talked about the Working Group Goals that appeared in The Graph Paper on page GRA-12 in the July issue. We decided that Working Groups are essential for symposia success and are the driving force behind the SIG. Bijoy suggested decentralizing our efforts and making the Working Groups semi-autonomous with guidance from the steering committee. In this way, Working Groups would drive the SIG instead of expecting the steering committee to provide direction. The group in attendance, each a working group chair, agreed that this was a sound strategy.

The steering committee and our counterparts will try to direct Working Groups towards resources that can help them achieve their goals. Resources desired include educational, textual, and also professional contacts, especially within Digital. One way to find help from Digital was to seek out interested parties on the exhibit hall floor. Rick Landau suggested that the Working Groups should have Mission Statements so that both the Working Group and the SIG Steering Committee can understand what needs to be done. This led to a general discussion of what a mission statement should be. After this discussion, the Working Group Chairs were asked to write mission statements and DCS them to the group for further discussion.

The group decided to freeze the number of Working Groups at the current count until all mission statements were obtained and the current Working Groups were "up-and-running" effectively.

Since the Policies and Procedures would be discussed later, the leadership roles for Working Group Chairs vs. the Steering Committee was discussed. Bijoy said that the SIG could have two woods meetings and then each working group chair could travel once to further the working group mission statement. There is an apparent a cap of seven or nine attendees at a woods meeting; another member mentioned that other SIGs often bring 20 or more people to its woods meetings.

There was brief discussion of a GAPSIG member attending the DECUS EUROPE Symposium, since funding had been approved. Dan Land was elected to go to DECUS EUROPE around September 17, 1989.

Three to four people signed up for our new Masters Program in Atlanta. We discussed the specific responsibilities for masters. We suggested that each Working Group Chair be added to the list. Since a background check on masters is impossible, we will not do that; we assume that someone that is willing to help other DECUS members with problems should be included in the

(Cont'd p. 6, c. 1)

minutes from woods ...

(Cont'd from p. 5, c. 2)

list. We did feel that we should remind the masters of the DECUS non-commericialism policy. We will use the newsletter and another sign-up form at the Fall Symposium to further this project. Bob Hays will continue to coordinate the information.

A discussion of the handout for the SIGGRAPH booth in July followed. Bob Hays and Bijoy Misra provided rough drafts for the fact sheet text. The group discussed the desired goals of a questionnaire. We then discussed the format and decided to abandon the multi-page format discussed on DCS for a single folded page and a second page for the questionnaire. The group broke up into two parts so that the questionnaire and the "Join us in Anaheim" paragraphs for the fact sheet could be written. The "Join us in Anaheim" paragraph was provided on diskette to Bob Hays. A final questionnaire was adopted. The back page of the fact sheet should have the names and addresses of the steering committee members and the working group chairs.

Bijoy then gave a summary report on the SIGGRAPH booth. It will be a 10 x 10 foot space which costs $2000 including miscellaneous charges. The SIGs Newsletters will be displayed and other promo material would be provided. General registration forms will also be there; these forms will be coded so that the SIG can measure the number of contacts generated by attendance at SIGGRAPH. The focus of the booth, however, is the GAPSIG.

Bijoy then discussed distributing buttons at SIGGRAPH. We decided that, due to the short lead time, the current design using the logo but with the purple color changed to a pastel blue and the addition of "DECUS" below the SIG name would have to do.

Bijoy asked if a member would be willing to attend SIGGRAPH at SIG expense to help with the booth and also perform research at the DECUS office in support of our tenth anniversary celebration this fall. Laura Vanags volunteered. The booth will be manned by a combination of Bijoy, Laura, Warren Yogi, and other associates of Bijoy and also members of the local users group (thanks all for helping! - ed.). For those members that will help man the booth, Bijoy provided some initial suggestions. The most important thing is to be careful because the press often asks backdoor questions to try to trip up booth operators.

Bijoy showed some slides from the Computer Museum to give us some ideas for the tenth anniversary celebration this fall. There will be a history of Digital graphics exhibit in the exhibit hall this fall; this will be a long, skinny display of demos running on "antique" equipment along with poster boards describing the importance of the equipment and the graphic that is executing. Also, a hardware timeline will be provided. The equipment should include:

a PDP-1,
a GT40,
an LA34-VA,
a VT240,
a GIGI,
a VAXstation 2000, and
DEClander.

We also want to include a "10 Years of Milestones" timeline for DECUS, GRAPHICS, and the GAPSIG. We then raised the question of insurance for donated machines and covering the costs of poster printing. A member suggested putting a legend on each machine.

Laura then led a discussion of the tenth anniversary buttons. Laura passed around a selection of holographic images that could be used for button material; the cost would be about $2000 - $3000 for a set of 1000 buttons. We decided to investigate having our own design made into a hologram on a button, but we also agreed that this might be too expensive.

The Steering Committee talked about the celebration that is planned for 6:00 to 8:00 PM on Thursday night in Anaheim. The group suggested video and slides for at least part of the time. Bob Hays (of course - ed.) suggested a period of five to ten minutes of SIG history comic relief. Andy Van Damm is the scheduled speaker for the session. Because of this, the group decided that the meeting should be a bit more formal. Food and drink should be provided by buffet to save money and time. Also, during the informal gathering portion of the meeting, graphics tapes could be shown in the background on a big screen. Laura suggested providing a laser light show for part of the event.

(Cont'd p. 7, c. 1)

minutes from woods ...

(Cont'd from p. 6, c. 2)

Bijoy suggested contacting one of the laser light show companies on the west coast for a five to fifteen minute show at the end of the session. If we did this, the cost would be such that we would need to collect a fee for attendance; we all felt that $5 to $10 dollars would be a reasonable charge.... We also discussed magic session conflicts as a reason not to schedule the meeting for later in the evening. In this scenario, DECUS would bear the cost of show and the SIG would bear the cost of Andy Van Damm. If enough of the session is firm, a sheet may be stuffed with the pre- registration kit if possible.

That completed the Sunday agenda. The group discussed the anniversary further over dinner.

Monday, July 10, 1989

Bob Goldstein joined the Sunday attendees on Monday.

The Policy and Procedures of the SIG were discussed. Bob Hays provided a draft strawman that was then reworked in sections by individuals. Many changes were suggested. Bob Hays will make the suggested changes with additional sections provided by Steve Hankin and Warren Yogi and then place the new version on DCS for further scrutiny.

The group then formally approved the questionnaire for the SIGGRAPH flyer with minor modifications from the original suggested on Saturday.

We then reviewed the SIGGRAPH fact sheet once more with Bob Goldstein. The group agreed to a few more changes. Bob Hays will provide a complete copy on Tuesday by Federal Express; if there are changes required, they can be handled by phone and then a new copy mailed to Bijoy by early the next week.

We turned our attention to the tenth anniversary folder and materials. The cover folder will be in color and have two pockets. The tenth anniversary souviner booklet will be in one of the pockets:

- There will be cover, based on the folder cover.
- A preface which Bijoy will write will be next; Bijoy will provide a signature to include on the page.
- The next two pages will be a history of the SIG which will be provided by Bijoy, Laura, Bill Kramer and Jim Flatten. A time line will be placed across the bottom of the two pages to provide graphic interest.
- Biographies, photographs and descriptions of the SIG Steering Committee will follow; all photos and textual material for this is due to Bob Hays by August 15th. Howell Dell took a set of photos at the meeting of those attending; if they are not satisfactory, the required members will be contacted by phone to notify them that photos are still needed. The information will be presented in a three column format.
- Bob Hays will make a collage page of past and present newsletters and provide a paragraph description of the newsletter.
- Working groups are welcome to provide additional material but all textual material is due August 15th to Bob Hays.

The second pocket of the folder will contain:

- A roadmap card like that done for Atlanta will be made by Bob Hays (this was considered a successful experiment and will be continued).
- Bob will also make an invitation to the special events for the SIG in Anaheim. There will be two receptions, one on Monday and one on Wednesday. Thursday night will be the special anniversary celebration and our normal business meeting.
- A special advertisement for our keynote address will also be done by Bob with inputs by Bijoy.

(Cont'd p. 8, c. 1)

minutes from woods ...

(Cont'd from p. 7, c. 2)

- The masters project application will be provided.

The DECUS office and a local printer will be sourced to determine a price for the 10 to 15 sheets.

We took a short break (we all needed it - ed.).

We had presentations from our Digital counterparts for the next hour.

This led into a discussion of SIG futures. Our Spring 1990 Symposium theme is Network Graphics. We decided that we should feature Motif, X and CAD/CAM factory automation among others. In the fall of 1990, Color Printing will be the theme. We put off more specific details until closer to the event.

We briefly reviewed symposium scheduling, led by Bob Goldstein.

Art McClinton and Mary Oskirko then joined us for a discussion of the SIGGRAPH booth. The SIG wants to thank Art for acquiring the floor space for the booth at SIGGRAPH. We viewed the membership videotape and replayed the questionnaire for Mary and Art. Mary agreed to look into the changes to the button we had discussed on Sunday. The following things will be at the booth (other than our members - ed.):

- member applications
- sample library catalogs
- sample newsletters
- the videotape
- buttons
- fact sheet/questionnaire

There was no booth number known yet. We would have five passes per day for manning the booth. We discussed booth staffing.

At this point, Art and Mary left the meeting. Dan Land called into the DECUS office and found out that the software limitation on seminars had been fixed and that all our PSSes are now scheduled (many thanks to the staff member that fixed this - ed.).

We wrapped up symposium planning for the Fall. All working group chairs were reviewed vis-a-vis their working group meetings in Anahiem. We discussed chairs for streams and for the graphics video tapes; Bob Goldstein took notes on who was doing what. There was a brief discussion of a member's request to start a CAD/CAM/CAE working group; we felt that the Engineering Working Group Chair should contact the member and try to combine efforts for now. The graphics hard copy contest viewing and judging will run from 9:00 AM until 11:00 AM Thursday. The campground reception will be on Monday from 6 - 8 PM; the Wednesday reception at 7:30 PM in the suite.

We reviewed the streams for conflicts; the one mentioned was the Workstations stream Monday faces a Hardware and Microsystems session on X-terminals. The sensory session may be pulled.

Bob Hays then donned his CommComm hat and asked to discuss store items for Spring, 1990. Due to the long lead time required for store items, the group agreed. Many execellent suggestions were made including:

- sell ACM siggraph tapes,
- sell Bob Ulichney's book from MIT press
- watch or clock with hologram on crystal from Citizen, or
- Lucite clock with GAPSIG logo etched in face.

Bob will contact Steve Schultz with this information.

Dottie Elliot has been a GAPSIG leadership figure for a number of years; currently she is the VAX SIG Liason. However, she is no longer able to perform that position. Laura Vanags volunteered to take over.

We recommented that Vince Mamone to be the fourth counterpart. This was accepted unanimously.

(Cont'd p. 9, c. 1)

minutes from woods ...

(Cont'd from p. 8, c. 2)

The meeting pluses and minuses were taken. The SIG thanks Howell Dell for taking extrodinary minutes on his laptop (and, since he and Bob Hays share the same home word processing software, things went pretty smoothly; Bob even got the text to his VAXcluster on the first try - ed.). Also, we all want to thank Irene McCartney and Rick Landau for working so hard for the GAPSIG and for putting up with us for two busy days!

SPECIAL NOTE: Due to the GAPSIG Tenth Anniversary Celebrations the SIG reception on Monday has been moved to Thursday to accomodate the expenses involved.

a decade of computer graphics

Laura Vanags, DECwindows WG chair
The following is reprinted from the Wednesday issue of UPDATE.DAILY

Tom Provost, Vice President of DEUCS, U.S. Chapter, inaugurated the Graphics Applications SIG special exhibit entitled "A Decade of Computer Graphics at DECUS" at 11:45 AM November 6th. This marked the opening of the Graphics Tenth Anniversary Celebrations held both in Anaheim and New Orleans.

The exhibit was a joint effort by volunteers of GAPSIG and the Digital counterparts. The SIG thanks Rick Landau, Irene McCartney, and Jim Flatten for procuring the equipment and the required software demos for the exhibit, to Mary Oskirko and Cheryl Smith for helping out in the inauguration arrangments, and to Paul Waterstraat, Joel Michelson, Bob Goldstein, Hal Dell, and Bob Hays for volunteering their time at the booth. The overall management of the setup was led by Sam Carr.

The equipment and posters followed a timeline based on research provided by Warren Yogi, Laura Vanags, Bijoy Misra, and the Digital counterparts. The exhibit equipment was grouped in two-year milestones, starting with our favorite PDP-1 (whose scope is the basis for the DECUS logo).

For a number of attendees, the exhibit rekindled memories of years of graphics evolution and Digital's commitment to quality graphics products.

a personal look ...

(Cont'd from p. 1)

Sunday

Sunday, I attended a Pre-Symposium Seminar (PSS) on Digital's Compound Document Architecture (CDA) presented by Barbara Bazemore and Marty Jack; these two Digital employees should be congratulated on the fine PSS they provided. I learned everything I wanted to know about CDA compliant software and more.

After the PSS, the GAPSIG steering committee met (minutes will be provided elsewhere). Then, we adjourned to the SIGs Reception at the Marriott hotel, where I got to cross paths with a number of old friends I only see at Symposia. Afterwards, a fellow member asked me to find an RSX license plate for him (these were small pins in the form of an automotive license plate with the inscription "California | RSX SIG F89"). Since I have an RSX system under my control (sometimes), I asked James McGlinchey if he could help; he pointed me at a pair of old-time RSX SIG members that were discussing various problems and successes at Digital. I got both a license plate and a lot of neat conversation. I got to my bed at about 1:30 AM ...

Monday

Now we are up to Monday and the first sessions. I worked at the First Timer's Booth Monday morning from 7:30 AM to 8:30 AM; that was quite a treat because I had always thought DECUS distributed information quite well. I came away a bit sobered about how we as a society present information to our new attendees, but I think the First Timer's Booth helps smooth the way a lot!

I attended 11 sessions on Monday, including two that I chaired. I especially enjoyed the VMS Scheduling session (VA067) and the DECprint Program Overview (GR060). The GAPSIG opened the "DECade of Computer Graphics" exhibit at 11:45 AM, but I could not attend because I was chairing a session. That's the way it is at a symposium. At lunch, I spoke with an ergonomics

(Cont'd p. 10, c. 1)

a personal look ...

(Cont'd from p. 9, c. 2)

design engineer that deals with the VAX 3000 series packaging; I gave her an earful, I think. I got to the sack around 11:00 PM ....

Tuesday

On Tuesday, I started my day at the Digital exhibit hall at 8 AM sharp. I got two of the Low End Systems portable offices (those little black and white things with a knife, paperclips, a ruler, and a pen), one for me and one for a good friend in my office. The scuttlebutt was that this trinket is the suicide tool, since the pen and ruler can be used to draw lines on the wrist and the paper clips are for pinning the note to the lapel; you know how the knife is used (software people often have a bad sense of humor).

I babysat the campground for two hours first thing in the morning. I chaired a session for Hal Dell on imaging with DECwindows. I stopped in on an L&T session on pointers (remember that one, Geri?) and stayed for the VAX C I/O for Experts session. Overall, I attended 5 sessions on Tuesday.

Tuesday night was Disneyland, and it couldn't have come too soon! A group of the GAPSIG steering committee and some other volunteers (including a member of the local user group I belong to, MIVAXLUG), traversed the park all night, not leaving until almost 12:30 AM. We rode all the important rides (its a small world, after all) like Space Mountain and Star Tours; we developed on axiom during our park visit: "no belt, no line, no ride!" We rode Splash Mountain at 11 PM, and, with seven "juveniles" in the boat, we splashed each other until we were all soaked! Many park attendees thought we were from the UNISIG because we were so rowdy! I dropped at about 1:15 AM ...

Wednesday

My day began at 7:30 AM at the awards committee breakfast. I volunteered to work on the committee (just can't say no, I guess). That breakfast lasted about an hour.

I attended four sessions on Wednesday and provided my first presentation, "Making Newsletters on a VAX" for the Electronic Publishing SIG (congratulations on making it out of the UIG doldrums). I did DEXPO in two and a half hours, having my card ran through a number of machines and returning with lots of loot in the form of shirts, mugs, and other goodies.

At 7:30 PM, Bill Brindley, the President of DECUS, U.S. Chapter, opened our SIG Reception in our suite in the Marriott hotel. We recognized the efforts of out Digital counterparts Rick Landau, Irene McCartney, and Jim Flatten.

By 8 PM, the party was in full swing, and techie conversations mixed with Pepsi and other beverages. A few of us made it to the Site SIG suite later in the evening to continue conversations on various topics. I crashed and burned at about 12 midnight ...

Thursday

I attended five sessions on Thursday, including starting the day presenting "Beginning PostScript Programming." I pulled campground duty for a while also. From 2 to 3 PM, three volunteers, including myself, made buttons for the upcoming tenth anniversary bash from 6 to 8 PM. The celebration is covered elsewhere in this issue, but suffice it to say that I got to stand up and spend five to ten minutes telling everyone "How I do my part, or the lunatics are on the grass."

Four of us then decided to create a hot tub SIG at the Marriott poolside for a couple of hours. At 10 PM, the SIG steering committee met to discuss a number of issues (minutes are located elsewhere in this issue). I washed up in my room at about 1:30 AM ...

Friday

I met a new volunteer and together we attended the Communications Committee breakfast meeting. I am proud to say that I received both a two years of service award and an outstanding editor award this year.

(Cont'd p. 11, c. 1)

a personal look ...

(Cont'd from p. 10, c. 2)

After the meeting, a good friend and I rode the Hilton elevators for fun. I started chairing and giving sessions from 9 AM until 12:30 PM. I picked some things up from the campground, gathered handshakes and hugs, and rolled out to the airport. My flight was canceled, so I re-booked through Minneapolis-St. Paul to Detroit Metro. On each leg of the flight, I sat next to members of Guide (an IBM users group), which was very informative. I finally ended the odyssey when I pulled up at home at 2:30 AM.

Moral

A DECUS Symposium is not to be taken lightly. I have only hit upon the highlights of the week. Volunteer leaders grind all week to provide for a successful symposium. This member wants to thank all of the DECUS leadership volunteers for their efforts in making DECUS the largest users group in the world!

campground report, Anaheim 1989

Steve Hankin, Campground Coordinator

The GAPSIG campground was a great success at Anaheim with a steady stream of graphics enthusiasts stopping by to browse, try hands-on demos and talk to other graphics users. Users were able to take a test ride on a DECstation 2100, a VAXstation 3500 and a VAXstation 3540 (Firefox) all running DECwindows in color. Later in the week, the DECimage software and an MD300 scanner were added to the campground equipment array. Our gratitude to our DEC counterparts Irene McCartney, Rick Landau and Jim Flatten whose energies made the campground equipment possible.

Demonstration software allowed the users to experience several 3rd party offerings: scientific visualization packages PolyPaint from NCAR, WAVE from Precision Visuals and the program Pleades by David Weaver. The room was well appointed with graphics output supplied by our newsletter editor as well as a fascinating notebook of clippings showing what's "out there" in the computer graphics world.

The campground was the setting for a number of working groups and clinics:

- Imaging
- Engineering graphics
- CAD/CAM/CAE
- DECwindows
- UIS
- Animation/visualization
- GKS/PHIGS/graphics standards

And as DECUS attendees have come to expect many hours were spent glued to video presentations on computer graphics from SIGGraph.

HELP!!!

We need a few good folks to help the SIG in New Orleans and beyond. Contact Bob Hays at the phone number on Page 2 if you can spare some time to help. Thank you!

animation/visualization working group report, Anaheim 1989

Steve Hankin, Animation/visualization WG chair

The Animation and Visualization working group met Wednesday afternoon in the graphics campground at Anaheim. A membership list of the 11 people present was created and will be distributed. If you would like your name added to this list call me at (206)526-6080. The members will be using this list to share their ideas, successes, and failures at implementing animation systems on DEC platforms. After a cheerful half hour was passed blue-skying on the computer visualization capabilities that we wished were available the topic of desktop video became the focus of the discussion. Several users are involved independently on developments in this area. We expect a productive exchange of ideas during the next year.

from the chair's desk ...

(Cont'd from p. 2)

The major focus of the Symposium was our exhibit "A DECade of Computer Graphics", displayed as the first exhibit in the Exhibit Hall. The exhibit was conceived by the SIG Steering Committee and was made possible through the untiring efforts of Rick Landau. The exhibit showed a chronology of technology advancement in Digital's contributions to computer graphics and aso presented a time line on industry, DEC and GAPSIG from 1979 through 1989. The organiation and the dispay of the exhibit was appreciated by all attendees. The exhibit was inaugurated by Mr. Tom Provost, Vice-President, DECUS US Chapter on Monday morning. Special appreciations were presented to Rick, Jim and Irene in a reception held at the Grapphics suite in Marriott. Mr. Bill Brindley, President, DECUS US Chapter raised a toast for the volunteers and the SIG's tenth anniversary at the reception. I wish to offer my personal thanks to Ms. Mary Oskirko, Ms. Cheryl Smith and Ms. Joanie Mann of DECUS staff and Ms. Mary Margaret McCormick of Update.Daily for help in organizing these events. Volunteers from the E-Pubs UIG, specially Patty English must be specially thanked for the arrangements for the reception.

Thursday night's Tenth Anniversary celebrations were inaugurated by Mr. Art McClinton, Member, DECUS US chapter Board of Directors. Art gave a good historical review of the graphics devices for the last thirty years that he has been involved with the graphics area. Art's presentation was followed by that of Mr. David Cassing from Tektronix, who presented an extremely illuminating talk entitled "A Decade of Color Graphics". Mr. Bill Kramer, the past SIG chair gave remarks on the history of the SIG and was followed by various other members from the SIG leadership who presented their views on the SIG and its activities. Everyone participated in a computer history quiz, winners of which will receive the GAPSIG mug by mail. The event ended with a cocktail reception for all attendees.

We had a few mishaps also. The GAPSIG Tenth Anniversary brochure meticulously prepared by your newsletter editor did not show up in the Campground until Friday. The only consolation was that the Communications Committee awarded our good friend, Bob, with an outstanding editor award for his work on the SIG newsletter. Please send your congratulations to him. He deserves it.

Hal Dell is our new Image Processing WG Chair and also has volunteered to be the Campground Coordinator. Bob Walraven is the new Worksystems WG chair. Warren Yogi is our new Library Representative. The rest of the positions remain unchanged. Please refer to the back of this newsletter for the listing of the Steering Committee members and contact them with your ideas and suggestions.

As announced, the theme for the New Orleans Symposium in May is "Network Graphics". We will need help in the Campground on software demos and connectivity solutions. The Graphics Hardcopy Contest will be repeated and the exhibit "A DECade of Computer Graphics" will be reexhibited. The Tenth Anniversary celebrations will conclude in New Orleans and I am hoping that you can join us in the festivities.

computer graphics standards meeting (ANSI X3H3)

Steve Hankin, Standards Representative

A gathering of X3H3 is like a small DECUS symposium - the latest meeting in Nashua, New Hampshire September 25 - 29, 1989 was no exception. Meetings on various topics are scattered about a large hotel - popular topics in large salons, obscure interests in remote basement rooms. Liaison meetings and ad hoc committees are scheduled and announced by breathless runners who deliver hand-written announcements while meetings are in progress. Enthusiasm is high; technical opinions are in constant conflict but there is a strong sense of camaraderie. It is on the last day of the 5 day meeting, alone, that all forces join for a plenary session to present the work accomplished and vote on issues.

A myriad of standards issues are brought together within computer graphics. X3H3, itself, comprises seven distinct task groups, X3H3.1 through X3H3.8 (X3H3.5 is a null op!) working on separate but related standards. Standards activities in both ANSI and ISO in areas such as page layout, networking and product data exchange

(Cont'd on p. 13, c. 1)

computer graphics standards ...

(Cont'd from p. 12, c. 2)

have compatibility requirements for the work in computer graphics. The resulting thick soup of acronyms and numbers is a satisfying meal for any computer professional.

An informal frequency count (the author's own) of the 60 to 80 participants in Nashua revealed that most represented large, corporate vendors. A significant number were self-employed consultants, a handful represented universities and two were representing the National Institute of Standards Technology (formerly NBS). Users were represented only through DECUS (The National Computer Graphics Association (NCGA) sends a non-voting representative to ensure an image of impartiality). DEC is well represented with participants in several task groups. DEC has been a mainstay of support for X3H3 over the past 3 years, providing most of the copying and mailing services (approximately two reams of paper per member per year). Thank you, DEC!

Clearly, much more user input is needed in the standards process. X3H3 realizes this, too, and passed a resolution in Nashua to be forwarded to ISO with words such as "The US reaffirms its position that user requirements are a necessary prerequisite [for] any New Work Item ..." and "The US also continues to endorse the concept of independent outside organizations such as universities developing and maintaining requirements data bases". THIS IS AN INVITATION FOR YOUR INPUT, DECUS GRAPHICS USERS! The University of MA at Lowell (et al.) in conjunction with ISO and with the cooperation of NCGA has put together a detailed questionnaire to help ISO determine the needs of graphics users for the next generation Application Programmmers Interface (API - the follow-on standard to GKS-3D and PHIGS). The questionnaire was available at the GAPSIG campground in Anaheim.

PHIGS TASK GROUP, X3H3.1

PHIGS was accepted as an ANSI standard in 1988 and as an ISO standard in 1989. The PHIGS group is currently developing enhancements to the standard through the additions of depth cueing, surface textures, extended bundles and more detailed lighting. The proposed enhancements are referred to as PHIGS+. Of particular concern recently in the development of PHIGS+ is compatibility with PDES/STEP, the new standard under development for product geometry. X3H3.1 will try to schedule a meeting to coincide with the STEP meeting in Paris in January 1990.

GRAPHICS ARCHITECTURE TASK GROUP, X3H3.2

A somewhat more abstract piece of work is underway in X3H3.2. In conjunction with their ISO counterparts this group is constructing reference models for computer graphics systems. The hope is that by producing a standard describing graphics systems in the abstract issues of compatibility between computer graphics standards in the future will be more easily resolved. There are no plans for conformance requirements to be attached to these reference models. The efforts are currently at the Working Draft stage.

VIRTUAL DEVICE INTERFACE TASK GROUP, X3H3.3

X3H3.3 is really two quite separate standards development activities that live within a single task group for historical reasons. The Computer Graphics Interface group (CGI) is working to develop a standardized, device-level interface promoting modularity of computer graphics systems. CGI is nearly completed and is expected to be available as a Draft International Standard by January 1990.

The other half of "thirty three" is the Computer Graphics Metafile group (CGM). CGM has been an ISO standard since 1986. Currently there are three addenda to it under development. CGM Addendum 1 covers extensions that are required for compatibility with GKS: bundled attributes and segment storage. This addendum is at the Draft International Standard stage - only editorial corrections remain.

CGM Addendum 2 covers three-dimensional extensions to CGM. Serious compatibility difficulties have surfaced between the static picture

(Cont'd on p. 14, c. 1)

graphics standards meeting ...

(Cont'd from p. 13, c. 2)

capture model of the 1986 CGM standard and the graphics presentation needs of PHIGS and GKS-3D. Furthermore there is general agreement that the 3D graphics metafile standard should meet the emerging needs of PDES/STEP presentation. With these major difficulties to solve the CGM group is soliciting assistance from X3H3.1 (PHIGS) and plans to re-work addendum 2 in its entirety.

CGM Addendum 3 covers topics in advanced 2D graphics such as splines, font architecture, line caps and joins and raster primitives. The work is at the Proposed Draft Addendum (PDADD) stage. The Nashua meeting produced a US position which will be taken to the October ISO meeting in Brazil. The US position suggests major modifications to the addendum, removing font exchange primitives and consolidating geometric primitives. CGM Addendum 3 has significant overlaps in functionality with the work of X3V1 on a standardized page description language (SPDL). The authors of Addendum 3 feel, however, that the two standards address different markets.

LANGUAGE BINDING TASK GROUP, X3H3.4

GKS-3D bindings are now available for FORTRAN and Ada (Draft IS) with work in progress for bindings to Pascal and C. PHIGS bindings are at a similar level. Work is in progress for FORTRAN and C bindings to CGI.

GKS TASK GROUP, formerly X3H3.5 GKS has been a stable ISO standard since 1985; the task group has been officially dissolved and its responsibilities transferred to X3H3. GKS is now scheduled, however, for a mandatory 5-year maintenance review. The UK has responded to ISO with an update proposal that X3H3 feels represents a major modification to several of the underlying concepts of GKS - not compatible with the original standard. The UK has offered a "shell" to address these compatibility issues. The US position is to reject the proposal from the UK. This is an issue to monitor at future ISO/SC24 meetings.

WINDOW MANAGEMENT TASK GROUP, X3H3.6

This group is working to produce an standard based on the X- Windows Data Stream Encoding. To speed the process they would like to use the ISO "fast track" method and achieve ANSI and ISO standardization simultaneously. A stumbling block in this is that while the X-Windows system adheres well to current graphics standards it is not in conformance with the ISO/OSI networking model. Evidently, the current X-Windows system contains the functionality of OSI layers 5 and 6 (Session and Presentation) and is designed to sit directly on the functionality of the OSI layer 4 (Transport). With minor code modifications X could be made to lie at OSI layer 7 (Application) but with an unknown performance loss due to duplicated functionality of layers 5 and 6. Until benchmarks have been run it is unclear how to proceed. These topics will be discussed in future ISO meetings.

An interim solution which was discussed in Nashua proposed leaving X-Windows in its current non-OSI conformant form lying directly on the OSI stack at layers 5 through 7. The hope is that a TCP/IP to OSI gateway would then be simple to construct allowing TCP/IP-based X-Windows systems to function on European networks. ISO has its own "Terminal Management" (TM) project under development but it is unlikely to be available before 1992.

VALIDATION, TESTING AND REGISTRATION TASK GROUP, X3H3.7

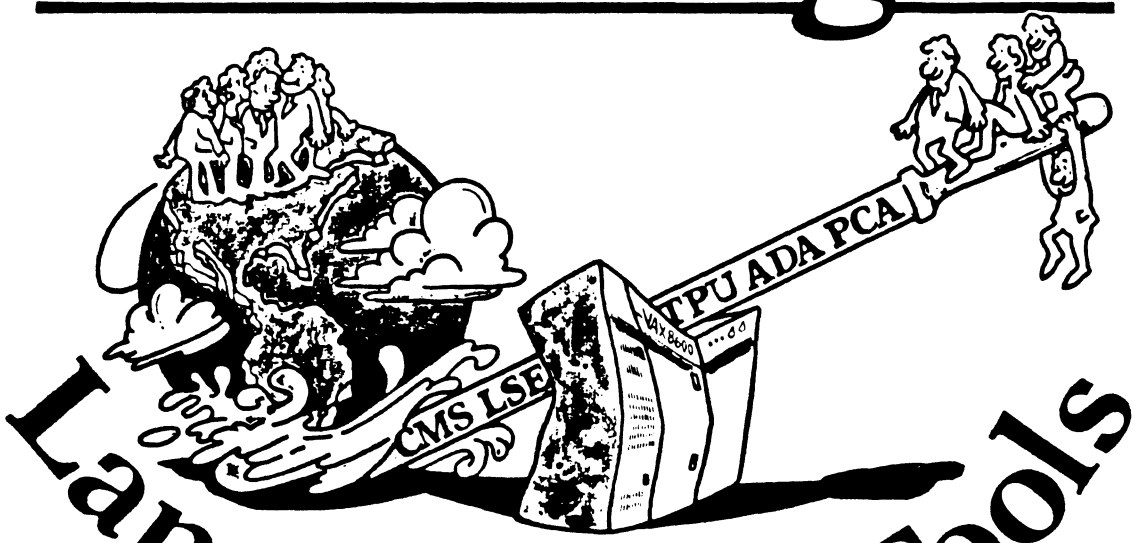
NIST is now offering a certification suite for GKS. As of September 1989 no implementations had been certified. At present certification is available only in FORTRAN. A C certification suite is under development.

There is general concern about the expense and time needed to register escapes and GDP's. Proposed solutions include loosening restrictions which require that all language bindings must be provided as a part of the registration process.

IMAGING TASK GROUP, X3H3.8

Efforts at producing standards for image processing are still in early stages of development. A draft document entitled "The Programmers Imaging Kernal" (PIK) has been written but the group is still in the process of deciding what structures and functionality are suitable for standardization at this time. X3H3.8 hopes to produce a draft proposal by May 1990.

Leverage



Languages & Tools

TABLE OF CONTENTS

EDITOR'S NOTES

Much has happened since the last issue of *Leverage*! First, my apologies for missing the last publication deadline. I try to publish in each issue of the combined Newsletters, but at times the influx of material does not match my own deadlines and work pressures, and in this case I could not put together an issue for last month.

I hope you managed to make it to Anaheim for the fall symposium! It was an absolutely outstanding week; the symposium committee deserves a round of applause for the organization, and all of the SIG's and their volunteers did a tremendous job with sessions and technical support. Of course, L&T volunteers and speakers gave their usual sterling performance. The presense of the "guardian angels" protecting the symposium was a highlight.

In this issue of *Leverage* we have a continuation of John Roman's "Software Tools in VAX Macro" series. This time, he discusses the use of VAXSET tools in developing Macro Code. John is winding up his series, which has been terrific. Thanks, John. Also in this issue is the latest L&T Masters Directory. It has been some time since we updated this list, so please note the many changes. L&T Masters are people experienced in certain areas who have volunteered to help you if you have problems. This is a DECUS resource which can be invaluable, whether or not you get to the symposia. Finally, we have a collection of trip and working group reports. Thanks to all who faithfully submit them.

Al Folsom, *Leverage* Ed.

SOFTWARE TOOLS IN VAX MACRO

John Roman
M/S GG3I
Monsanto Company
Chesterfield, MO 63198

VII. FIND Tool: Development Environment

Introduction

Finally, over a period of months, I have put together all the parts of the Find tool from Kernighan and Plauger's book *Software Tools*. I coded all of the modules in VAX Macro and built a working version of the tool. During the process I have created a development environment, which included the necessary directory structures, logical names, command procedures and the like. I used several VAXset tools during the development. Not unexpectedly, I found that some of the tools were better suited to engineering software in VAX Macro than others. In this article I will discuss the development process, the environment I set up, and the use of the VAXset tools in VAX Macro development.

The Software Engineering Process

This is the model of software engineering I used during the construction of the Find tool:

1. Allocate appropriate source module or start from scratch

2. Edit Source

3. Assemble source to create object module

4. Link object modules to create an executable

5. Debug executable until it works satisfactorily

6. Replace and deallocate module

As you all are aware, this process is iterative. The edit/assemble steps continue as long as there are assembly errors. Then the objects are linked. These are tested using the debugger. As errors are found, the source is re-edited, assembled and linked, and testing continues.

Several VAXset tools are helpful in this part of the development cycle. The Code Management System (CMS) can be used for controlling software -- allocating and replacing modules. The integration of the Language Sensitive Editor (LSE), the assembler and the VAX Debugger simplifies the editing through debugging steps.

Several people may be working on different parts of the same program simultaneously using this process. However, at some time all the work from all the team members has to be put together and reconciled. At that time a *system build* is done to consolidate all the changes, and *integrated testing* is used to test out all the capabilities of the program.

VAXset tools used in the build and integrated testing steps include the Module Management System (MMS), DEC Test Manager (DTM), and the Performance and Coverage Analyzer (PCA). MMS is used for the build, while DTM can do the integrated testing. PCA is valuable to make sure all parts of the code are exercised during the test and for locating code paths which are candidates for optimization.

This process of software engineering depends on a number of factors, including your development environment and the language(s) used. It is not unique to VAX Macro development, but we will see how both of these factors influence the development of the FIND tool and the use of VAXset tools.

The Directory Structure

All of the tools in Kernighan and Plauger's book, *Software Tools*, are actually driver routines using common utility subroutines. For this reason, I divided the modules in the Find tool between two *packages*, the Find package and the Util package. My definition of package is a group of related modules that are managed as a group. The Find package contains the Find module, the Find CLD and associated modules. The Util package contains all the routines that are common to all the various tools.

I have several preferences in software engineering on the VAX. One is to manage ascii source of all kinds using CMS, and to keep as few intermediate files as possible. If an object can be built from the element in the CMS library, there is no reason to keep the source or object files as well. A second preference is to use object libraries for each package. Each package has nodebug and debug object libraries so the nodebug, debug and PCA versions of the tool can be easily built.

The directory structure for the Find package was as follows:

[.CMS] -- The CMS library containing all managed source
[.SRC] -- Currently reserved modules
[.OBJ] -- Objects temporarily during the build
[.EXE] -- Object libraries and executables
[.LIS] -- Latest version of List files
[.DTM] -- DTM library
[.PCA] -- PCA files as required
[.SCA] -- SCA library

Managed source includes macro source, CLD files, message files, command procedures, MMS description files, and PCA and DTM files.

The structure of the Util package directories is similar, except that there is no executable, and therefore no need for DTM and PCA directories.

[.CMS] -- Managed source files
[.SRC] -- Currently active source and macro libraries
[.OBJ] -- Objects temporarily during the build
[.EXE] -- Object libraries
[.LIS] -- Latest versions of List files
[.SCA] -- SCA library

If this was a multi-person project, there would be one common package directory structure, with individual development structures for each programmer. Logical name search lists would allow the linker to first look for object libraries in the personal directory structure, and then the project-common directory structure. This way the programmer could build his version of the tool and when satisfied with the changes, replace the module in the package CMS library.

The Build Process

At some time the package will have to be built to integrate all the individual changes. An possible point in development is when there are no modules reserved from the package CMS library. In the development of the Find tool, there were builds for each package. The Util package was built, and then the Find package. I will discuss the build process further under MMS, below.

VAXset Tools

The process of software development is most efficient when it is easy to move between the various steps. For example, if the only way to check for assembly errors is to create a listing, print it out and manually search for error messages, development will be slow and tedious. If it is easy to discover errors and change them in the source, development will be more efficient. Digital has an integrated set of tools for the software development process which are known collectively as the VAXset tools, which are:

1. LSE or the Language Sensitive Editor

2. CMS or the Code Management System

3. SCA or the Source Code Analyzer

4. MMS or the Module Management System

5. PCA or the Performance and Coverage Analyzer

6. DTM or the DEC Test Manager

Throughout the development of the Find tool I tried out the various VAXset tools. I was interested in two things. The first was the learning curve required. I was familiar with several of the VAXset tools, but not all. I wanted to see how long it would take to get "up to speed." Second, I was interested in how well the tools fit into the process of developing software in VAX

Macro. As you will see, although the tools have come a long way, some of them work better with VAX Macro than others.

The Language Sensitive Editor

LSE was very valuable in the development of the Find tool. The VMS V5 version of the assembler now produces diagnostic files which LSE uses to relate errors to the source. So if you are familiar with the editing/compiling/revising cycle from VAX higher level languages, the process is very much the same with Macro.

Not only does LSE help with finding assembly errors, it "holds your hand" as you build a Macro program from scratch. As with higher level languages, LSE has a template that structures your code appropriately. You can expand assembler directives, VAX instructions, system services, and run-time library calls. This makes it very easy to make sure the parameters are correct.

I was familiar with LSE from work with higher level languages. All of that experience transferred very well to working with VAX Macro, so the learning curve was very short.

Source Code Analyzer

SCA is a tool which provides a static analysis of a package and provides such information as "who calls who" and "which module writes on this variable." SCA was not very useful when building the Find tool. First, there were no global variables, so there was never the problem of a location getting munged and trying to find out why. Second, I was building the tool from scratch (more or less) so I did not have the problem of understanding how the modules related. If I had questions I could turn to K&R to find the answer.

In addition, SCA (V1.3) did not work very well with VAX Macro in general. It did not understand Macro subroutine calls, so the VIEW CALL_TREE command did not work. The passing of arguments to Macro subroutines can be difficult to follow, so it is not surprising that the CHECK CALLS command did not work either. However, if you have global variables in a Macro program, SCA can help you keep track of them and where they are read, modified, or written.

Code Management System

CMS was a valuable part of the development environment of the Find tool. It kept track of modules that were actively under development and modifications made to modules. Its use was the same as with any higher level language, so it was easy to transfer the knowledge to VAX Macro. I set up a CMS library for each package and then would create elements, reserve them to make changes, and replace them when done. Since I did not worry about variants, or generations, or any of the advanced uses of CMS it did not take long to master the commands I needed to do the work.

Module Management System

MMS organizes the build of packages. Its value is first, that it forces you to understand the structure of your code and its dependencies, and second, it can examine the revision dates of files and only compile and link where required because modules are changed.

MMS can work well with new development, but with large existing development efforts it may be difficult to go back and insert MMS in the development cycle by creating the MMS description file. You just may not have the confidence that all dependencies are understood to make the description file accurate.

I found MMS to be difficult to use with the environment I set up. The dependencies in the modules of the Find tool can be described in this fashion:

1. The executable depended on the object library modules.

2. The object library modules depended on the object modules.

3. The object modules depended on the macro source and the macro library modules.

4. The macro source depended on the elements in the CMS library.

5. The macro library modules depended on their source.

6. The macro source depended on the elements in the CMS library.

This is somewhat involved, but not too difficult. The trouble was that the directory structure I had set up required that the executable be in [.EXE], the object library in [.EXE], the object modules in [.OBJ], the source and macro libraries in [.SRC], and the original source in the CMS library. Try as I might I couldn't get it the MMS description file to work correctly; MMS would always look for something in the wrong place.

Instead, I went to a "brute force" build procedure. This essentially does a complete build every time. The disadvantage is that it does more work than may be necessary. The advantages are first, that the intermediate files (object files and source out of the CMS library) are only around during the build and second, that we don't have to worry about missing a dependency. The biggest advantage is that it helped me keep my sanity.

This is the build procedure for the Util package:

```
$! UTIL_BUILD.COM
$!
$! Builds the UTIL package.
$!
$ @UTIL_SETUP                    ! Set up Logical Names
$ IF F$SEARCH("UTIL_EXE:UTIL.OLB") .EQS. "" THEN -
     LIBR /CREATE/OBJECT UTIL_EXE:UTIL.OLB
$ IF F$SEARCH("UTIL_EXE:UTIL.OLD") .EQS. "" THEN -
     LIBR /CREATE/OBJECT UTIL_EXE:UTIL.OLD
$ SET DEFAULT UTIL_SRC
$ IF F$SEARCH("UTIL_SRC:TOOL.MLB") .EQS. "" THEN -
```

```
     LIBR /CREATE/MACRO UTIL_SRC:TOOL.MLB
$ CMS FETCH TOOL_MACROS.MAR ""
$ LIBR /REPLACE TOOL.MLB TOOL_MACROS.MAR
$ IF F$SEARCH("UTIL_SRC:SMAC.MLB") .EQS. "" THEN -
     LIBR /CREATE/MACRO UTIL_SRC:SMAC.MLB
$ CMS FETCH SMAC.MAR ""
$ LIBR /REPLACE SMAC.MLB SMAC.MAR
$ MODULES = "ADDSET/AMATCH/DODASH/ERROR/ESC/FILSET/GETCCL/GETPAT/INDEX/" + -
     "LOCATE/MAKPAT/MATCH/OMATCH/PATSIZ/RMS/STCLOS"
$ NUM = 0
$LOOP:
$     FILE = F$ELEMENT(NUM, "/", MODULES)
$     IF FILE .EQS. "/" THEN GOTO DONE
$     CMS FETCH 'FILE'.MAR ""
$     MACRO /LIST=UTIL_LIS:'FILE'.LIS/OBJECT=UTIL_OBJ:'FILE'.OBJ-
          /ANAL=UTIL_SCA:'FILE'.ANA -
          'FILE'+UTIL_SRC:TOOL.MLB/LIBRARY+UTIL_SRC:SMAC.MLB/LIBRARY
$     LIBR UTIL_EXE:UTIL.OLB/REPLACE UTIL_OBJ:'FILE'.OBJ
$!
$!  Now create debug object and put in debug object library
$!
$     MACRO /DEBUG/OBJECT=UTIL_OBJ:'FILE'.OBD -
          'FILE'+UTIL_SRC:TOOL.MLB/LIBRARY+UTIL_SRC:SMAC.MLB/LIBRARY
$     LIBR UTIL_EXE:UTIL.OLD/REPLACE UTIL_OBJ:'FILE'.OBD
$
$     NUM = NUM + 1
$     GOTO LOOP
$DONE:
$ DELETE /NOLOG UTIL_OBJ:*.*;*
$ DELETE /NOLOG UTIL_SRC:*.MAR;*      ! Leave the macro libraries
$ EXIT
```

The build procedure for the Find package is similar except that at the end the linker creates the Find tool, and then the DTM and PCA procedures are invoked. I used this build procedure in a batch job which I would submit when I had no modules outstanding from the CMS library. I could come back a short while later and examine the output and make sure everything was still working.

Performance and Coverage Analyzer

PCA appears to have two major functions: it can indicate where a program spends its time (for optimization purposes), and it can tell what parts of the program do not get exercised for the purposes of testing. The second is particularly valuable, as it lets the programmer know how the test cases need to be structured and also about unnecessary code.

I used PCA for both reasons. When development was complete I was interested in seeing where the program spent its time for possible optimization. Throughout the development as I added each new function or routine I wanted to make sure that my test cases indeed used that function or routine. PCA enabled me to do this.

PCA was reasonably easy to set up. Since I did not have much experience with it with higher level language programs, I had to go through the initial learning curve. This took some time. However, because PCA supports VAX macro on the source level in the same way as it supports higher level languages, knowledge of PCA should transfer easily between the two.

DEC Test Manager

DTM is a facility for organizing and automating tests. This is a very valuable thing to have. It removes the manual element so tests can be done consistency every time the program is changed. This was very useful during the development of the FIND tool. It was important to make sure the tests were complete. As functions were added, DTM tests were added.

I was not previously familiar with DTM, so I went through the learning curve for it. This can be lengthly. However, the use of DTM is completely independent of the language, so any knowledge of DTM will transfer entirely between higher level languages and VAX Macro.

Conclusions

I hope this discussion gave you a feeling for how I set up the development environment and the utility of the various VAXset tools during the process of engineering software with VAX Macro. Next time I will complete this discussion by looking further at the last two VAXset tools, DTM and PCA.

TRIP REPORT, ANSI PASCAL STANDRARDS COMMITTEE September 1989, Minneapolis, Minnesota

Wayne Sewell
Principal DECUS Representative
Joint Pascal Committee (ANSI X3J9/IEEE P770)
E-Systems, Garland Division
Mail Stop 43700, Box 660023
Dallas, Texas 75266--0023

Introduction

During the week of 11--15 September, I attended the third-quarter meeting of the Joint Pascal Committee, which was held in Minneapolis, Minnesota.

The Joint Pascal Committee, hereafter referred to as the JPC, is jointly sponsored by ANSI and the IEEE. JPC works closely with its ISO counterpart, ISO/IEC JTC1/SC22/WG2. In fact, this was a joint meeting of JPC and WG2.

Extended Pascal

No changes were made to the Extended Pascal draft at this meeting, except for a few minor editorial changes. The committee voted to forward the draft to its parent bodies, X3 and IEEE. Unless the standard is unexpectedly voted down, it should be officially released by the end of the year. Adoption by ISO will take a little longer, as international matters always do, but no problems are expected.

New Extensions to Pascal

Much of the meeting time was taken up by the Extensions Task Group. Now that Extended Pascal is in the can, the committee has already started on new development.

While it will be several years before the next Pascal standard is started, the committee will be issuing a series of technical reports and information bulletins (I am uncertain of the distinction between the two) for various extensions that didn't make it into this version of the standard. While these reports/bulletins do not carry the weight of a formal standard, they at least provide a informal framework for extensions to the language. In essence, they say to the implementor, "This feature is not part of the Pascal standard, but if you are going to implement it anyway, we suggest doing it this way."

If some or all of the implementors do use the report/bulletin as a guideline, then its purpose has been served. What is a standard if not everyone doing something the same way so that the user can depend on it staying the same from implementation to implementation?

Some of the topics currently under consideration for reports/bulletins are object oriented programming and exception handling.

Next Meeting

The next meeting of the Joint Pascal Committee will be held at Asilomar Conference Center in Pacific Grove, California, December 12--16.

Future Meeting Schedule

December 12-16, 1989	Asilomar (Pacific Grove, CA)	HP
March, 1990	Washington D.C.	CBEMA
June, 1990	San Jose	Tandem
September, 1990	Boston Area	DEC
December, 1990	Orange County	Unisys

PDP-11 SYMBOLIC DEBUGGER VERSION 2.1

PRODUCT DESCRIPTION

PDP-11 Symbolic Debugger V2.1 is a maintenance release that provides bug fixes, eliminates all references to FORTRAN-77 DEBUG, documentation revisions, and is more user-friendly.

The PDP-11 Symbolic Debugger is a fully symbolic debugger for COBOL-81, FORTRAN-77, and MACRO-11 programs running on RSX-11M, RSX-11M-PLUS, RSTS/E, Micro/RSTS, Micro/RSX, CoProcessor/RSX and VAX-11 RSX. The debugger is a tool to aid in locating programming errors in successfully compiled programs that do not execute properly.

PDP-11 Symbolic Debugger runs as a two-task debugger. A small portion of the code, necessary to debug applications, is linked with the user task and the major portion of the debugger runs as a separate task.

PDP-11 Symbolic Debugger was formerly known as FORTRAN-77 Debug. The name was officially changed to PDP-11 Symbolic Debugger in March, 1986 with the release of Version 2.0. VERSION 2.1 eliminates all references to F77DBG in the task name.

FEATURES AND BENEFITS

Following is a brief description of the enhancements to the PDP-11 Symbolic Debugger V2.1:

- Documentation set revised to correct errors and incorporate changes in Version 2.1.
- Eliminate all references to F77DBG
- Added Data-type tables showing languages and their equivalent data types to the online help file.
- Contains fixes for known problems.
- Support of VMS V5.0 and the License Management Facility in the PDP-11 Symbolic Debugger VAX/RSX version.

ORDERING INFORMATION

PDP-11 Symbolic Debugger VAX to RSX Licenses

- The Unique Product Identifier is 139.
- Please refer to SPD/SSA #26.75.03 for determining the appropriate Product Number.

PDP-11 Symbolic Debugger Licenses

Model No.		Description
QP232-UZ	PDP-11 RSX	Class H single CPU
QY232-UZ	PDP-11 RSX	Class L single CPU

QP233-UZ	PDP-11 RSTS	Class H single CPU
QY233-UZ	PDP-11 RSTS	Class L single CPU
QY804-UZ	Micro/RSX	Class L single CPU
QY811-UZ	Micro/RSTS	Class L single CPU

MEDIA AND DOCUMENTATION

Customers purchasing this product for the first time must order a software license, plus a media and documentation option. Customers who have purchased the product, but who do not have a service contract and wish to update to this new version, must also purchase a media and documentation option.

For PDP-11 products, a complete list of media, documentation and service options for PDP-11 systems can be found in one of the following SPDs:

PRODUCT	SPD
PDP-11 Symbolic Debugger/RSTS/E	12.79.02
PDP-11 Symbolic Debugger/RSX	12.78.02
Micro/RSTS Symbolic Debugger	18.11.02
Micro/RSX Symbolic Debugger	14.79.02
PRO/Tool Kit Symbolic Debugger	40.25.02
PDP-11 Symbolic Debugger/VAX to RSX	26.75.03

SERVICES/SUPPORT

A full range of Software Product Services are available. Please contact your Account Representative for a complete description of offerings and/or to obtain ordering information for the following services:

- Self-Maintenance
- BASIC
- DECsupport
- Right-to-Copy Update
- Service Right-to-Copy
- Installation
- Media Update
- Documentation Update

AVAILABILITY

PDP-11 Symbolic Debugger is available now.

REPORT OF FALL 1989 DECUS DIBOL WORKING GROUP MEETING

Mark E. Derrick, Working Group Chair

The DIBOL working group meeting was well attended. Among the 27 people attending were George Pappis the DIBOL product manager, and Bruce Ferguson a member of the maintenance group for DIBOL. The chair, Mark Derrick, started by discussing work which was had just been completed by X3J12, the Technical Committee for the ANS DIBOL standard. An important focus for the next version for the standard is the inclusion of features which improves DIBOL's ability to coexist with mixed 3GL, 4GL and database environments. For example, the committee had just approved addition to the DIBOL standard of the COBOL data type numeric overpunched. Stuart Flood, the new X3J12 secretary was introduced and he made a solicitation for additional membership for X3J12.

The results of a wishlist mailout were discussed in general. Once again, the major issue seemed to be the poor support between DIBOL and Digital's other products. DIBOL users have had problems with interfaces to CDD and RDB. Also mentioned was poor or no support for the DIBOL zoned ascii data type in tools such as DTR, DEBUG, and RDB. Noted by several users was the problem with DTR not properly handling a D type numeric field which has been cleared to spaces. The issue of lack of examples in the general VMS documentation on interfacing to system services from DIBOL was raised. Also raised were several issues regarding the SORT interface. The maintainer requested that those people having problems with the SORT interface to PLEASE PLEASE send in SPR's, as they were not aware of any problems with SORT. Digital planned on having answers for the new wishlist items shortly after DECUS.

There was some discussion regarding advancement toward goals which had been discussed at earlier working group meetings. It was pointed out that the VAX DIBOL product a year ago had only a part time maintainer, no product manager and a large backlog of SPR's. Today, VAX DIBOL has a product manager who was appointed in January of 1989, the DIBOL group now has a full time staff of three programmer/maintainers, and there has been a drastic reduction of outstanding SPR's. Further reduction in the number of SPR's was expected with the release of VAX DIBOL 4.1, just entering field test as of the Fall DECUS. One result of this discussion was that the working group would be solicited by mailout to provide a "priority ranking" on the wishlist items.

A combined DIBOL working group and X3J12 DIBOL interest list is being maintained by Mark Derrick. If you would like to be on this list or get further information about the ANSI DIBOL standards effort contact the WG chair at:

Mark E. Derrick
Post Office Box 263
Meridianville, AL 35759
Telephone (205) 533-3131

ANSI X3J4 COBOL COMMITTEE MEETING 162

The meeting was held in Hyannis, Massachusetts, on September 25 through 29, 1989. Thirteen of the sixteen members of the committee were present. We no longer have a permanent secretary, due to illness, and are now rotating the job amongst the members. This means that once every three years, the DECUS representative will take notes and collate and reproduce the large stack of documents that pass through our hands at every meeting. I was the acting secretary at this meeting.

There was a long agenda, but we only got through about half of what we usually do because of three items. The first was a presentation on the Forms Information Management System (FIMS) standard and its subset. The second was responding to X3 and international ballots on the next COBOL Information Bulletin (CIB) and the proposed second addendum (corrections) to COBOL-85. The third was a very long and detailed letter from Microfocus which was part of their international ballot.

The main point of controversy, which took up more than a day, in several passes, deals with calling non-COBOL programs in a UNIX environment. The committee passed an interpretation which states that when a COBOL program calls a COBOL program, the name of the program in the CALL statement is treated as case-insensitive. UNIX systems can have two subroutines Ab and AB, which are different and must be found by the linker. There are many work-arounds, such as a special leading character which means that the identifier is case-sensitive. Some systems, such as the Ryan McFarland compiler, do dynamic linking, and thus can adapt to mixed case as need be. The argument was for either adding new syntax to the CALL statement, or not stating the case-insensitive identifiers when COBOL calls COBOL. The resolution at this meeting was to keep the restatement and to think about adding the new syntax in the full revision.

The Microfocus letter had a very long list of editorial corrections which had to be gone over in exacting detail.

The next meeting will be held in Carmel, California December 4 through 8, 1989. Dale Marriott will represent DECUS at that meeting.

Submitted by Bruce L. Gaarder, DECUS Primary Member, X3J4

Contact:

Bruce L. Gaarder
Donahue Enterprises, Inc.
2441 - 26 Avenue South
Minneapolis, MN 55406
612-721-2418

Languages & Tools
Masters Directory

28 Sep 1989

Those listed here have agreed to answer questions from users, normally by telephone, on the products or subjects under which their names are listed. Expertise is generally in VMS layered software, unless otherwise noted. Complete addresses and phone numbers appear in an alphabetical list following this directory. The alphabetical listing includes [notes] on other software in use at the Master's installation, where this information could be helpful to a user in selecting a Master and where the Master has supplied it.

The list will become fuller as time goes on. Not all L&T products are listed here, and we await volunteer Masters in all the missing areas. A few non-L&T products are mentioned to accommodate individual Masters with interests broader than L&T's. Mumps is included by special request of the Mumps SIG, as a service to Mumps users.

The expertise of these volunteer Masters overlaps; you may find it necessary to call more than one. Please remember that these Masters can provide you with brief assistance, not with long-term support. Some Masters are professional consultants who have agreed to donate their time and talent in their areas of expertise; it is not L&T's intent to provide a reference service for consultants, and any instance of unwanted commercialism should be reported to the L&T Masters Coordinator (see below). Neither L&T nor DECUS make any claim that the information you receive will necessarily be correct or complete.

Please also notify the L&T Masters Coordinator of any errors in the entries in this Directory, or if you experience real difficulty in your effort to obtain help through this list.

> **Please note that this list expires three months from the date appearing above. After that time, please consult a more recent issue of the Newsletter for a current list.**

If you can participate as a Master yourself, please fill out the attached Masters Program application. Submit it to the L&T Campground Host during a symposium or mail it to:

George Scott
L&T Masters Coordinator
Computer Sciences Corporation
304 West Route #38, P.O. Box N
Moorestown, NJ 08057
(609)234-1100

Languages & Tools Masters by Subject

28 Sep 1989

[Names listed under each subject can be found in the *Masters by Name* which follows.]

ADA

James Ayers
John Bilger
Shirley Bockstahler-Brandt
Philip D. Brooke
Lisa Kerby-Rodgers
James L. Silver
Bruce Soares
Louis Tribble
Garry A. Weil

APL

Daniel P. Thompson

BASIC

Michael Amerine
Walker Bennett
R. Alan Bruns
Richard DeJordy
Robert Fidelman (VAX)
Neil Freeman
David D. Helsley
Stephen C. Jackson (VAX)
B. Lee Jones
Bill Klaege
Brian Lomasky (VAX)
James E. Meeks
Gary A. Slater
Kelvin Smith
William Tabor (VAX)
William A. Troy

BASIC-PLUS

Robert Fidelman
Stephen C. Jackson

BASIC PLUS 2

Walker Bennett
Robert Fidelman
Joel Garry
Stephen C. Jackson
Brian Lomasky (RSX)
Kelvin Smith
William Tabor (RSX)

BLISS

Vicki Gary
Matthew Madison

C

Paul Adamson
William Alexander
Donald E. Amby
Neil Freeman
Robert J. Hartman
Lawrence J. Jones
Richard Kemp
Ken Key
Kevin Kindschuh
Kevin L. Lundeen
G. Del Merritt
Peter Mossel
David Schwab
Bob Siroky
Jesse Tutterrow

CMS

Paul Adamson
Donald E. Amby
James Ayers
Ted Bauer
Earl Cory
J.M. Ivler
Mark Katz
JoAnn Kubecka
Brian Lomasky
Kevin Lundeen
G. Del Merritt

COBOL

William Alexander
John Claxton
Linwood Ferguson
Harry D. Fisher
B. Lee Jones
Walter W. Leroy
Marc Lippman
Derek Liu
Patrick Stair
John Wilson

CONFIG MGMT

J.M. Ivler
Mark Kidwell
G. Del Merritt
George Scott

CROSS-ASSEMBLERS

Jack R. Davis

DCL

Donald E. Amby
John Claxton
Earl Cory
J.M. Ivler
B. Lee Jones
Brian Lomasky

DEBUG

Philip D. Brooke
John Claxton
Jack Davis
J.M. Ivler
B. Lee Jones
Richard Kemp
Philomena Lee
Marc Lippman
Derek Liu
Kevin Lundeen
G. Del Merritt
Lorin M. Ricker
Bob Siroky
Jesse Tutterrow
Kerry Wyckoff

DIBOL

Tom Byrne
Dave L. Dirks
Neil Freeman

EDT

Donald E. Amby
Michael Amerine
Jim Anlona
Earl Cory
Richard DeJordy
Robert Eden
Richard Evans
Neil Freeman
J.M. Ivler
Stephen C. Jackson
B. Lee Jones
Lawrence J. Jones
Gilbert McLaughlin
James Meeks
Peter Mossel
Bob Siroky
Gary A. Slater

EMACS

Richard DeJordy
Robert J. Hartman
B. Lee Jones
G. Del Merritt

EVE

R. Alan Bruns
Robert Chisolm
John Claxton
Gerald Lester
Marc Lippman
James Meeks
Gary A. Slater
Rick Stacks
Louis Tribble
John Wilson

FMS

Brian Lomasky

FORTRAN

Luther Atkinson
James M. Bishop
Philip D. Brooke
Earl Cory
John M. Crowell
Jack Davis (VMS)
Richard DeJordy
Robert Eden
C. Kay Fair
Robert J. Hartman
David D. Helsley
J.M. Ivler
B. Lee Jones
Charlse Kapps
Richard Kemp
Dwayne K. Lanclos
Brian Lomasky
Philomena Lee
G. Del Merritt
Terry L. Minnick

Peter Mossel
Rick Stacks
Marilee Thompson
Louis Tribble
Jesse Tutterrow

LATEX

Donald E. Amby
Jim Anlona
Barbara Beeton
Rick Evans
B. Lee Jones
Lorin M. Ricker

LSE

Donald E. Amby
Earl Cory
Jack Davis
Mark Katz
JoAnn Kubecka
Dwayne K. Lanclos
Kevin Lundeen
Louis Tribble

MACRO

Philip D. Brooke
John Claxton (-32)
John M. Crowell (-11)
Richard Evans
B. Lee Jones
Charles Kapps
Gerald Lester
Lorin M. Ricker
Gary A. Slater (-32)
William A. Troy
Jesse Tutterrow (-32)
Kerry Wyckoff

MMS

Donald E. Amby
James Ayers
Mark Katz
JoAnn Kubecka
Dwayne K. Lanclos
Kevin Lundeen
G. Del Merritt

MODULA-2

Richard Bielak
Jack Davis
Neil Freeman

MUMPS

Brad Hanson

PASCAL

Robert Eden
Rick Evans
Neil Freeman
B. Lee Jones
Lorin M. Ricker (incl VAX/ELN)
William A. Troy

PCA

J.M. Ivler
JoAnn Kubecka
Phil Kurjan

PL/I

Steven Duff
David K. Ream

RPG

Charles O. Williamson Jr

RUNOFF & DSR

Donald E. Amby
Earl Cory
J.M. Ivler
B. Lee Jones
G. Del Merritt
Peter Mossel
Patrick Stair

SCA

J.M. Ivler
JoAnn Kubecka

SCAN

James Ayers
Ted Bauer
J.M. Ivler
Kevin Lundeen
David K. Ream

SMG ROUTINES

Richard DeJordy
J.M. Ivler

SOFTWARE PROJ MGR

J.M. Ivler
Gary A. Slater

SQL

Michael Amerine

TECO

Walker Bennett
John M. Crowell
Mark Katz
Kevin Kindschuh
Peter Siemsen
Kelvin Smith
Phil Wettersten

TEST MANAGER

Linwood Ferguson
J.M. Ivler
Kevin Lundeen
David J. Powell

TEX

Donald E. Amby
Jim Anlona
Barbara Beeton
Rick Evans
Lorin M. Ricker

TPU

Donald E. Amby
Robert Chisolm
John Claxton
Rick Evans
Dvaid D. Helsley
Charles Kapps
Mark Katz
Gerald Lester
Kevin Lundeen
James Meeks
Lorin M. Ricker
Rick Stacks
Louis Tribble
John Wilson

VAX DOCUMENT

Kevin Lundeen
Matthew Madison

VAX NOTES

Donald E. Amby

Languages & Tools Masters by Name

28 Sep 1989

[Subjects in bold face are those under which the master is listed in the *Masters by Subject.* Subjects in braces are others running at the master's site.]

Adamson, Paul US Air Force, 4702 CPUSS /AXDP /64, Tyndall AFB, FL 32403; (904)283-3923; [Ada, Basic, Debug, EDT, EVE, TPU] **•C •CMS**

Alexander, William Vice President, R&D, Hypersoft Corporation, 675 Massachusetts Ave, Cambridge, MA 02139; (617)864-8860; **•C •Cobol**

Amby, Donald E. Delco Systems Operations, P.O. Box 471; M/S 1A21, Milwaukee, WI 53201; (414)768-2682; AMBY%WIZARD.GM@HAC2ARPA.HAC.COM **•C •CMS •DCL •EDT •LaTeX •LSE •MMS •Programmer Env't •Runoff & DSR •TeX •TPU •VAX Notes**

Amerine, Michael LB Oil Development Company, 5528 Adenmoor Ave., Lakewood, CA 90713; (213)436-9918 x302; [Cobol, Fortran] **•Basic •EDT •SQL**

Anlona, Jim Wyman-Gordon Company, 105 Madison St., Worcester, MA 01613; (508)756-5111 x3495; [APL, Basic, Debug, EVE, Fortran, TPU] **•EDT •LaTeX •TeX**

Atkinson, Luther Virginia Commonwealth University, MCV Academic Computing, Box 16, Richmond, VA 23298-0016; (804)786-9843; atkinson@vcuvax, atkinson@ruby.vcu.edu **•Fortran**

Ayers, James Aerojet Electrosystems, 1543 Tam O'Shanter, Ontario, CA 91761; (818)812-2510; **•Ada •CMS •MMS •Scan**

Bauer, Ted Space Telescope Science Institute, 3700 San Martin Drive, Baltimore, MD 21218; (301)338-4511; bauer@stsci.edu **•CMS •Scan**

Beeton, Barbara American Mathematical Society, P.O. Box 6248, Providence, RI 02940; (401)272-9567, (401)272-9500; bnb@math.ams.com **•LaTeX •TeX**

Bennett, Walker Aviation Computing Services, P.O. Box 8062, 216 E. Main St., McMinnville, TN 37110; (615)473-8616; [Debug, EDT, Fortran, PCA, Runoff & DSR] •**Basic** •**Basic plus 2** •**TECO**

Bielak, Richard AVP, Irving Trust, 101 Barclay St., New York, NY 10006; (212)815-3072; •**Modula-2**

Bilger, John GTE Government Systems, P.O. Box 7188, Mountain View, CA 94039; (415)966-4492; [Debug, EDT, EVE, Fortran, LSE, Pascal, PCA, TPU] •**Ada**

Bishop, James M. University of Notre Dame, Physics Department, Notre Dame, IN 46556; (219)239-5657; BISHOP@UNDHEP.BITNET •**Fortran**

Bockstahler-Brandt, Shirley JHU/APL, Johns Hopkins Road, Laurel, MD 20707; (301)953-6585; SHIRLEY@CAPSRV.JHUAPL.EDU [Fortran] •**Ada**

Brooke, Philip D. President, Future Generations, Inc., P.O. Box 669106, Freedom Station, Charlotte, NC 28266; (704)536-5806, (800)726-1827; [Basic, EDT, EVE, LSE, Pascal, Runoff&DSR, TECO, TPU] •**Ada** •**Debug** •**Fortran** •**Macro-11,32**

Bruns, R. Alan Allied Electronics, Inc., 401 E. Eighth Street, Fort Worth, TX 76102; (800)228-6705; [Powerhouse, TeX&LaTeX, TPU, VAX Notes] •**Basic** •**EVE**

Byrne, Tom Data Processing Manager L. Karp & Sons, Inc., 1301 Estes Avenue, Elk Grove Village, IL 60007; (312)593-5706; •**Dibol**

Chisolm, Robert 1st DP, 224-4S-18, 3M Center, St. Paul, MN 55144; (612)733-0725; [Dbg,Pas,Fort,Notes,Basic,Cobol,EDT,TECO,C,TeX&LaTeX] •**EVE** •**TPU**

Claxton, John Technical Consultant Collier-Jackson, Inc., 3707 West Cherry Street, Tampa, FL 33607-2596; (813)872-9990; INFOPLEX (EASYPLEX) 70002,4140 [Basic,CMS,EDT,Fortran,LSE,MMS,Pascal,PCA,SCA,Test Manager] •**Cobol** •**DCL** •**Debug** •**EVE** •**Macro-32** •**TPU**

Cory, Earl Contel Federal Systems, Information Management Systems, Box 5027, 31717 La Tienda Drive, Westlake Village, CA 91359; (818)706-5385; •**CMS** •**DCL** •**EDT** •**Fortran** •**LSE** •**Runoff & DSR**

Crowell, John M. Vice President Multiware, Inc., 2121-B Second St., #107, Davis, CA 95616; (916)756-3291, (916)756-7644; [CMS,Debug,Macro-32,MMS,LSE,EVE,EDT,C,PCA,SCAN,TPU,Notes, Runoff&DSR] •**Fortran** •**Macro-11** •**TECO**

Davis, Jack R. Philips Consumer Electronics Co., One Philips Drive, P.O. Box 14810, Knoxville, TN 37914; (615)521-3680; [CMS, MMS] •**Cross-Assemblers** •**Debug** •**Fortran** (VMS) •**LSE** •**Modula-2**

DeJordy, Richard American Mathematical Society, 201 Charles St., P.O. Box 6248 Providence, RI 02940; (401)272-9500 X295, (401)351-1250; [Bliss,Cobol,C,CMS,Debug,Emacs,EVE,LSE,Macro-32,MMS,Pascal, Runoff&DSR,Teco,TeX&LaTeX,TPU,VAX Document,Notes] •**Basic** •**EDT** •**Emacs** •**Fortran** •**SMG Routines**

Duff, Steven Ergodic Systems, Inc., 23666-A Birtcher, El Toro, CA 92660; (714)380-9719; •**PL/I**

Eden, Robert General Dynamics, 5905 Beverly Drive West #3133, Fort Worth, TX 76132; (817)777-1249; [C,CMS,Debug,EVE,LSE,MMS,SPM,TPU] •**EDT** •**Fortran** •**Pascal**

Evans, Rick Consultant, Evans & Ricker, Inc., 7000 SW Hampton St., Suite 118, Tigard, OR 97223; (503)639-9296; [Debug] •**EDT** •**LaTeX** •**Macro-11,32** •**Pascal** •**RDB** •**Smartstar** •**TeX** •**TPU**

Fair, C. Kay Enraf Nonius Co., 390 Central Ave., Bohemia, NY 11716; (516)589-2885; •**Fortran**

Ferguson, Linwood ARA Services, Inc., Route #3, Box 452, Trevilians, VA 23093; (703)967-0087; [Debug, EDT, EVE, LSE, PCA, Runoff & DSR] •**Cobol** •**Test Manager**

Fidelman, Robert RAF Associates, Inc., 4721 Santa Rosita Ct., Santa Rosa, CA 95404; (707)538-2820, (415)454-9055; [EDT] •**Basic** (VAX) •**Basic-Plus** •**Basic Plus 2**

Fisher, Harry D. Computer Sciences Corporation, 1109 Sprint Street, Suite 500, Silver Spring, MD 20910; (301)585-9771; •**Cobol**

Freeman, Neil Neil Freeman Consultants, 45-449 Hoene Place, Kaneohe, HI 96744; (808)235-3401; •**Basic** •**C** •**Dibol** •**EDT** •**LISP** •**Modula-2** •**Pascal** •**Prolog** •**Snobol**

Garry, Joel Garry Multiuser Systems, P.O. Box 2831 Vista, CA 92083; (619)630-3918, (619)724-0442; [EDT] •**Basic** •**Basic Plus 2**

Gary, Vicki Interlink, 47370 Fremont Blvd, Fremont, CA 94538; (415)657-9700; •**Bliss**

Hanson, Brad Group Health, Inc., 2829 University Ave. S.E., Minneapolis, MN 55414; (612)623-8427, (612)424-0652; [EDT] •**Mumps**

Hartman, Robert J. University of Tennessee, Knoxville,, 124 Perkins Hall, Middle Drive, Knoxville, TN 37996; (615)974-5493; VMSI.ENGR.UTK.EDU •**C** •**Emacs** •**Fortran**

Helsley, David D. Computer Task Group, 1608 Turquoise Dr., Cincinnati, OH 45205; (513)474-6985; •**Basic** •**Fortran** •**TPU**

Ivler, J.M. Douglas Aircraft Company, MS 36-49, DPT: E43, 3855 Lakewood Blvd, Long Beach, CA 90846; (213)469-8727, (714)839-7883; [C, EVE, FMS, LSE, MMS, TPU] **•CASE •CMS •Config Mgmt •DCL •Debug •EDT •Fortran •PCA •Runoff & DSR •SCA •Scan •SMG •Software Project •Test Manager**

Jackson, Stephen C. SCJ Consulting, Inc., Suite A, 2655 No. Innsbruck Drive, New Brighton, MN 55112; (612)631-8962; **•Basic** (VAX) **•Basic-Plus •Basic Plus 2 •EDT**

Jones, B. Lee Director, Information Systems Sierra Semiconductor Corp, 2075 North Capital Ave., San Jose, CA 95132; (408)263-9300 x152; [C, TeX&LaTeX, TPU, VAX Notes] **•Basic •CDD •Cobol •Datatrieve •DBMS •DCL •Debug •EDT •Emacs •Fortran •LaTeX •Macro-11,32 •Pascal •Runoff & DSR**

Jones, Lawrence J. Sr. Technical Consultant, Structural Dynamic Research Corporation, 2000 Eastman Drive, Milford, OH 45150; (513)576-2070; SCJONES@SDRC.UU.NET [Debug,EVE,Fortran,Cobol,Emacs,Macro-32,PCA,TeX&LaTeX,TPU] **•C •EDT**

Kapps, Charles Temple University, CC 304, Philadelphia, PA 19122; (215)787-9999; **•Fortran •Macro-11,32 •TPU**

Katz, Mark GTE Government Systems, 100 First Ave., Waltham, MA 02154; (617)466-3437; [Debug, SCA] **•CMS •LSE •MMS •TECO •TPU**

Kemp, Richard Softport Systems, 99 Madison Ave., New York, NY 10016; (212)889-6375; [EDT, Emacs, EVE, TPU] **•C •Debug •Fortran**

Kerby-Rodgers, Lisa ESL, Inc., Mailstop 508, 495 Java Drive, Sunnyvale, CA 94088; (408)738-2888 x4555, (408)274-6865; [Debug, DECwindows, LSE] **•Ada**

Key, Ken University of Tennessee, Knoxville, 2339 Dunford Hall, Knoxville, TN 37996; (619)974-6616; KAY@UTKUXI.UTK.EDU **•C**

Kidwell, Mark , 9821 Walnut St., #K205 Dallas, TX 75243; (214)644-1305; **•Config Mgmt**

Kindschuh, Kevin Capital Cities/ABC, 7818 SE Stark Street, Portland, OR 97215; (503)251-7530; [Fortran, EVE, TeX&LaTeX] **•C •TECO**

Klaege, Bill Interlake, Route 66 & Route 23, Pontiac, IL ; (815)844-7191; **•Basic**

Kubecka, Jo'Ann Contel, 1100 Abernathy Road Atlanta, GA 30300; (404)551- ; **•CMS •LSE •MMS •PCA •SCA**

Kurjan, Phil Project Manager Consilium, Inc., 640 Clyde Court, Mountain View, CA 94043; (415)691-6292; **•PCA**

Lanclos, Dwayne K. Boeing Electronics, 3131 Story Road West, TR-58 Irving, TX 75038; (214)659-2919; **•Fortran •LSE •MMS**

Lee, Philomena Battelle Memorial Institute, 505 King Ave., Columbus, OH 43201; (614)424-5196; LEE on DECUSERVE [VAX Notes, Bliss, Basic, Cobol, Emacs, CMS, MMS, LSE, PCA, TPU, EVE, EDT, TECO, C, Ada, Runoff&DSR **•Debug •Fortran**

Leroy, Walter W. President, TSH Systems, Inc., 2964 Peachtree Road NW #300, Atlanta, GA 30305; (404)231-1484; [EDT, Runoff&DSR] **•Cobol**

Lester, Gerald Computerized Processes Unlimited, Suite #205, 4200 South I-10 Service Road Metairie, LA 70001; (504)889-2784; **•EVE •Macro •TPU**

Lippman, Marc Jamesbury Corp., 640 Lincoln St., P.O. Box 15004 Worcester, MA 01610; (617)852-0200 X2804, (508)797-0056; [Basic,C,Dibol,EDT,Fortran,Macro-11&32,Runoff&DSR,TECO,TPU, Notes] **•Cobol •Debug •EVE**

Liu, Derek Assistant Director, UJA - Federation, 130 E. 59th Street, New York, NY 10022; (212)836-1756; **•Cobol •Debug**

Lomasky, Brian Teradyne, Inc., 179 Lincoln Street, MS 635, Boston, MA 02111; (617)482-2706 X3259; **•Basic** (VAX) **•Basic Plus 2** (RSX) **•CMS •DBMS •DCL •Fortran •FMS**

Lundeen, Kevin L. Massachusetts Financial Services Co., 500 Boyleston Street, Boston, MA 02116; (617)954-5641, (617)423-3500; **•C •CMS •Debug •LSE •MMS •Scan •Test Manager •TPU •VAX Document**

Madison, Matthew Rensselaer Polytechnic Institute, Engineering Computing Services, Troy, NY 12180-3590; (518)276-2606; MADISON@VMS.ECS.RPI.EDU **•Bliss •MMS •PL/I •VAX Document**

McLaughlin, Gilbert Cayman Islands Government, Government Administration Building, Cayman Islands, CI Cayman Islands; (809)949-8277; [Cobol, Debug, EVE, Fortran, Pascal, TPU] **•EDT**

Meeks, James Management Services,, 437 Millwood Drive, Nashville, TN 37217; (615)320-2606, (615)360-2354; [Cobol, Dataflex, Macro-32, Oracle] **•Basic •Clintrol •EDT •EVE •TPU**

Merritt, G. Del TASC, 55 Walkers Brook Drive, Reading, MA 01867; (617)942-2000; net: ..!SUN!PIXAR!HORTON!DEL **•C •CMS •Config Mgmt •Debug •Emacs •Fortran •MMS •Runoff&DSR**

Minnick, Terry L. The Williams Companies, One Williams Center, P.O. Box 2400, MS33-5, Tulsa, OK 74102; (918)588-2233, (918)451-1573; **•Fortran**

Mossel, Peter Columbia University, 630 West 168th St, New York, NY 10032; (212)305-3763; Bitnet: CUHSDA::SY$MOSSEL; [LSE, TPU] •**Fortran** •**EDT** •**C** •**Runoff & DSR**

Powell, David J. Scientific Programmer The Upjohn Company, 7294-25-7, 301 Henrietta Street Kalamazoo, MI 49007; (616)385-7214; •**Test Manager**

Ream, David K. Manager of Publication Systems, Lexi-Comp, Inc., 26173 Tallwood Dr., N. Olmsted, OH 44070; (216)777-0095; •**PL/I** •**SCAN**

Ricker, Lorin M. Consultant, Evans and Ricker, Inc., 7000 SW Hampton St., Suite 118, Tigard, OR 97223; (503)639-9296; •**Debug** •**LaTeX** •**Macro-11,32** •**Pascal** •**RDB** •**Realtime Appl.** •**Smartstar** •**TeX** •**TPU** •**VAXELN**

Schwab, David Interactive Development Environments, 595 Market St., 12th Floor, San Francisco, CA 94105; (415)543-0900; •**C**

Scott, George Sr. Computer Scientist Computer Sciences Corporation, 304 West Route 38, P.O. Box N Moorestown, NJ 08057; (609)234-1100 x2298, (609)235-9334; [Ada,CMS,MMS,EDT,LSE,VAX Document] •**Config Mgmt**

Siemsen, Peter University of Southern California-UCS184, 1020 Jefferson Avenue, Los Angeles, CA 90007; (213)743-0731, (213)433-3059; SIEMSEN@USC.EDU •**TECO**

Silver, James L. Assoc Professor of Computer Science/Consultant, Indiana Univ-Purdue at Ft. Wayne/Magnavox, 2101 Coliseum Blvd E/1313 Production Rd, Ft. Wayne, IN 46805; (219)481-6177, (219)429-6957; •**Ada**

Siroky, Bob Miami Valley Hospital, 1 Wyoming Street, Dayton, OH 45409; (513)220-2590; •**C** •**Debug** •**EDT**

Slater, Gary A. Computer Systems Consultant, Aslan Business Systems, 246 Knollwood Drive, Newbury Park, CA 91320; (805)499-0931, (818)981-7000 339; [C, Cobol, Debug, PCA] •**Basic** •**EDT** •**EVE** •**Macro-32** •**Software Proj Mgr**

Smith, Kelvin Data Processing Manager Financial Computer Systems, One Strawberry Hill Court, Stamford, CT 06902; (203)357-0504; [EDT, Macro-11, Runoff&DSR] •**Basic** •**Basic Plus 2** •**TECO**

Soares, Bruce Naval Underwater Systems Center, Code 2211, Building 1171-1, Newport, RI 02841; (401)841-4236; •**Ada**

Stacks, Rick Sr. Programmer Analyst Arkansas Dept. of Pollution Control, 8001 National Drive, P.O. Box 9583 Little Rock, AR 72209; (501)562-7444; [Cobol, Debug, DECnet, EDT, TECO, Runoff&DSR] •**EVE** •**Fortran** •**TPU**

Stair, Patrick Systems Analyst Arkansas Dept. of Pollution Control, 8001 National Drive, P.O. Box 9583 Little Rock, AR 72209; (501)562-7444; •**Cobol** •**Runoff & DSR**

Tabor, William W.I. Tabor, Inc., P.O. Box 8078, Coral Springs, FL 33075; (305)528-9802, (305)755-7895; [BP2(RSTS), CMS, MMS, TPU] •**Basic** (VAX) •**Basic Plus 2** (RSX)

Thompson, Daniel P. Consultant, Ad Hoc Systems, 142 Argilla Road, Ipswich, MA 01938; (508)356-4667; •**APL**

Thompson, Marilee Princeton Plasma Physics Lab, P.O. Box 451, C-Site, Princeton, NJ 08544; (609)243-3422; [C, Debug, EDT, PCA] •**Fortran**

Tribble, Louis Lockheed Aeronautical Systems Co., P.O. Box 551, MS B6-360-7841, Burbank, CA 91520; (818)847-8186; •**Ada** •**EVE** •**Fortran** •**LSE** •**TPU**

Troy, William A. Systems Control, Inc., 1860 Jarvis Ave., Elk Grove Village, IL 60007; (312)437-4410; [EDT, TECO] •**Basic** •**Link** •**Macro-11,32** •**Pascal**

Tutterrow, Jesse Systems Programmer St. Louis University, Des Peres Hall, 3694 W. Pine St. Louis, MS 63108; (314)658-2560, (314)658-3052; JESSE@LUVCA.BITNET [Basic, Cobol, CMS, EDT, EVE, Fortran, LSE, MMS, Pascal, PCA, SCA, TPU] •**C** •**Debug** •**Fortran** •**Macro-32**

Weil, Garry A. Intel Corporation, 5200 NE Elam Young Parkway, MS HF2-80, Hillsboro, OR 97124; (503)696-2409; •**Ada; can help interface Intel cross-products.**

Wettersten, Phil Borden, Inc., 180 E. Broad St., BB #24, Columbus, OH 43215; (614)225-4603; •**TECO**

Williamson, Charles O. Jr (moved), (912)423-7389; •**RPG**

Wilson, John CAP Gemini America, 925 Tempo Drive, St. Louis, MO 63146; (314)235-6526; [CMS, Debug, Pascal, Fortran, MMS, LSE, SCA] •**Cobol** •**EVE** •**TPU**

Wyckoff, Kerry , 1117 E. 1000 S., Spanish Fork, UT 84660; (801)240-5948; [CMS, Cobol, EVE, FORTRAN, LSE, MMS, Pascal, SCA, TPU] •**Debug** •**Macro**

GLOBAL ACCESS

MUMPS SIG DECUS U.S. CHAPTER

"If you don't want it in the paper, don't let it happen."

DECUS

G L O B A L A C C E S S

Volume 3, No. 4 January, 1990

MUMPS means you never have to say you're sorting.

$VIEW(Editor)

The MUMPS SIG held an election in Anaheim. I am delighted to welcome Tom McIntyre (a DECUS "golden oldie," as he himself will tell you below) as our new Chair, and to welcome Chris Richardson, our outgoing Chair, as my new assistant.

I would like to take this opportunity to express the deep gratitude that the MUMPS SIG owes to Chris. He has been there, with unswerving dedication, to shepherd the SIG through crisis after crisis. At the Symposium where the previous Steering Committee simply failed to appear, he stepped up out of the audience and gave the sessions himself. He then proceeded to assemble a new Committee singlehandedly. And when the SIG Council eventually noticed that there had been a problem and put us on probation, he did the legwork to get us back to full SIG status. Chris, thank you for the endless time and limitless energy you put into the SIG. We can never thank you enough.

$VIEW(Chair)

At the Fall DECUS meeting in Anaheim, the MUMPS SIG unexpectedly elected me the new Chairman. Since it has been several years since I was last active in DECUS, it is appropriate that I give you a little background.

I began playing with DEC computers early in 1965 with a refurbished LINC computer loaned to UCLA by Digital. We eventually gave back the LINC and purchased the first LINC-8 that DEC shipped. I used the LINC-8 extensively in experiments on muscle mechanics. Several years later, I joined the faculty of West Virginia University and became the proud owner of one of the new PDP-12 computers. Since there were no other minicomputer or real-time computer users on the faculty at WVU, I ended up teaching courses in Computer Science as well as Physiology and Biophysics. It was at this time in 1970 that I first became aware of DECUS through my friend Larry Pearson.

Eventually, I became Chairman of the Biomedical SIG, and Symposium Coordinator for the PDP-8 and Biomedical SIGS. By 1977, I was DECUS Symposium Coordinator (at that time an elected Board position). I was Symposium Coordinator when the VAX was announced at the San Diego meeting in 1977.

In early 1978, I left the user community and went to work for DEC to manage software development for their new venture into the desk top, the PDT-11. Although the PDT-11 was relatively short lived, the software we developed for it (FMS, KED/EDT Keypad) has survived and had some impact. At one time or another at DEC I was responsible for Small Systems AD, GKS, LN01 fontware, Terminal Software Architecture (CTERM), and most of what eventually became Display Systems Software.

After 5 years, I left DEC to work for Raytheon and National Semiconductor, and eventually ended up with PRx, a small company that works extensively with MUMPS. In the meantime, my son Michael, who attended his first DECUS meeting at the age of 10, has grown up to become my Chief Engineer, and we have come back full circle to being actively involved in DECUS and especially in MUMPS.

In future issues, I will offer you my thoughts on just what MUMPS is and where it is going; what the credibility issues are around MUMPS as a major database product for DEC; what the redundancy issues are between the DECUS MUMPS SIG and the MUMPS Users Group (MUG); why there is more press coverage of PICK than there is of MUMPS; and other ramblings. For now, I will just say that I am glad to be back and I am looking forward to hearing from many of you as we prepare to take the first major Database language into the 21st century.

$DATA

MUMPS Development Committee (X11) Trip Report
October 2-4, 1989

The October meeting of the MUMPS Development Committee (MDC) was held in Andover, Massachusetts, and proved to be very fruitful, even though only a few items reached the point of being put to a vote. This report will note those documents of the MDC which changed status, the current status of the new ANSI standard, and the progress being made in adopting MUMPS as an international standard.

MDC Type A document X11/89-4 was replaced by document X11/89-14. X11/89-4 was the formal description of the standard way to interface to devices. X11/89-14 clarified this document by more explicitly explaining the use of colons in the USE parameter syntax, amd by amending the description of the $DEVICE special variable to be in compliance with what was actually voted on.

Subcommittee One document X11/SC1/88-42, SET $X and $Y, was edited to reflect the requirements the MDC has laid down for itself for Type A documents. This document is now in the proper form for elevation to MDC Type A, an event which is expected to take place at the next meeting in January.

Document X11/SC1/89-34 was accepted as a Type B replacement of document X11/SC1/89-27. This document details the precise format of the $DEVICE special variable and will eventually update document X11/89-14. This proposal provides for $DEVICE to have three comma-separated pieces. The first piece is an integer literal whose value is assigned by the MDC. Unless an error has occured, this piece will have a value of zero. For any error for which the MDC has made no code-number assignment, it will have a value of -1. The second piece contains the implementation-specific value for the relevant status. The third, and subsequent, pieces are left to the implementor and are expected to contain additional status information to help qualify the error.

Document X11/SC1/89-33A, the MERGE command, was accepted as a Type B document. MERGE is a new command for MUMPS and is introduced in this proposal to provide the means for copying entire sub-trees of data with a single command. Since the only standard way of doing this currently involves a series of nested FOR loops, with the attendant parsing of the global reference at each iteration, this command provides a far more efficient means of moving large amounts of data, especially in network or artificial intelligence applications.

Document X11/SC1/TG8/89-2, which talks about calling subroutines external to MUMPS, was discussed at length but failed to elevate due to concerns about binding, the use of the ampersand (&) in the syntax, how vectors would be exchanged between MUMPS and other languages, etc.

Document X11/SC1/TG9/89-2, which talks about large data structures, also received considerable discussion. The consensus seemed to be that the ability to store large amounts of data in a single entity was very much desired but some people felt hesitant over the idea of issuing read and write commands directly to globals. This proposal was revised at this meeting and will be on the agenda again at one of next year's meetings.

Document X11/SC1/89-37, which proposes changing the limits on subscripts within the portability requirements, was proposed and accepted as a Type C document. Currently, individual subscripts are limited to a maximum of 63 characters and the full global reference is limited to 127 characters. This proposal would remove the restriction on individual subscript length and extend the global reference size to be the same as the limit placed on string lengths (which is currently 255 characters). The fact that this proposal was adopted as a Type C shows that has strong support but most seemed to feel that extending the global reference length to be the same as the maximum string length was inviting trouble.

Document X11/SC1/89-38, which would increase the number of significant digits in numeric applications from 12 to 15, and document X11/SC1/89-39, which would increase the levels of nesting from 30 to 120, were both accepted as Type C documents.

Document X11/SC1/89-41 was accepted as a Type C document. This proposal would clarify the effect on the $IO special variable whenever the current device is closed and specifies that $IO would be given the empty value.

Two other proposals dealing with deficiencies in the current language were brought before the subcommittee. The first, X11/SC1/89-42, recognized that the QUIT command was the only command left that does not allow indirection of its arguments (with the exception of the FOR command where it would not be logical). This document proposed to rectify this situation and was accepted as a Type C. The second of these proposals will be discussed later.

To date, ISO has received only positive recommendations regarding accepting MUMPS as an international standard using the fast track ballot. However, it is my understanding that, in order for this to work, there can be no negative votes. Shortly before the October meeting, the MDC chairman received word from MDCC-J (the MDC counterpart in Japan) that they perceived a problem in the current draft standard which, if left uncorrected, would cause the Japanese representative to ISO to vote no on the fast track ballot. This problem dealt chiefly with wording in the current draft standard that restricted standard MUMPS to use of the ASCII character set. The MDC voted unanimously to alter this wording such that while any standard MUMPS implementation must include the ASCII character set, it is not prohibited from including others as well. The MDC also adopted document X11/SC1/89-43 as a Type C proposal to reserve the letter Y for other standards bodies to provide local standardized extensions to the MUMPS language.

Four objections to the ANSI canvass ballot currently in progress were received by the MDC secretariat. One of these was resolved, the other three submitted their protests to ANSI. To my knowledge, none of these protests changed anyone's votes but procedures required that these objections be submitted to ANSI and a new canvass ballot conducted. We should know the results from ANSI by the time this article goes to press.

The upcoming meeting schedule is as follows:

January 24-26	San Francisco, CA
June 6-9	Orlando, FL
October 6-8	Amsterdam, the Netherlands
February 4-6, 1991	San Diego, CA
May 31-June 2, 1991	New Orleans, LA

--Submitted by Mark Berryman,
DECUS MDC Representative

The MUMPS SIG at MUG-Europe

The DECUS-U.S. MUMPS SIG had the opportunity to confer with the European MUMPS community at the MUMPS Users' Group-Europe meeeting, held in Brighton, England, this past October 16-19. The SIG was represented by Chris Richardson and Mark Berryman. Total conference attendance numbered approximately 380, from 20 different countries. Nations represented for the first time included Brazil, Bulgaria, Kenya, and Malta.

The MUG-Europe conference format is identical to the U. S. MUG conference, and both are very similar to DECUS Symposia. There are technical sessions from both vendors and users, tutorial sessions, and user group meetings. There are also "roundtables," which are similar to DECUS panel discussions, but which provide even more audience participation. Finally, there is an exhibit floor, where the vendors get to flaunt their wares.

As in the U. S., the European MDC meets in conjunction with MUG-Europe, and the U. S. representatives attended as observers. The major discussions paralleled the Andover MDC meeting of two weeks previous. A special emphasis was given to MDC-Japan's need to find a means to support their Kanji character set (2048 characters) within the MUMPS Standard.

A primary purpose of this trip was to allow U. S. MUMPS SIG leaders to meet with their DECUS-U. K. counterparts. The U. K. SIG is suffering a period of diminished energy, similar to the U. S. SIG several years ago. Having successfully resolved the situation here, Chris and Mark felt that they could bring valuable experience to the British. They were assisted in this endeavor by Barry Herring, Digital's DSM Product Director. U. K. participants included Richard Rankin and Jackie Vincent, of the Hoskins Group, Ltd., and the British DEC Counterpart. The discussions produced several ideas for improvement, including widening the range of Symposium session topics, and increasing the population of available speakers. Mr. Herring indicated that Digital would support increased DECUS-U. K. MUMPS activity. The U. K. leaders appreciated U. S. efforts to assist them, and felt that the suggestions that resulted would be workable. As a final grace note, someone from DECUS-Switzerland inquired about starting a MUMPS SIG there.

Next year's MUG-Europe meeting will be in Amsterdam, and will feature the first U. S. MDC meeting outside of North America. The U. S. MUMPS SIG intends to be even more fully represented there than it was in Brighton.

--Reported by Chris Richardson,
DECUS-U. S. MUMPS SIG Past Chair

$HOROLOG

January 19	Submission deadline for March Newsletter
January 22-26	Canadian '90 Symposium; Toronto
May 7-11	Spring '90 Symposium; New Orleans, LA
June 11-15	MUG '90 Conference; Orlando, FL
June 26-28	DEXPO East '90; Boston, MA
December 10-14	Fall '90 Symposium; Las Vegas, NV

$ORDER("imply/infer")

It is time to return to the saga of the deadly pairs of twins. And, as in the last episode, there is a magic rule by which our hero can extricate himself from the swamp of sloppy usage. To wit:

- *Imply* means *to hint* or *to suggest.* The transmitter of information (writer or speaker) *implies.*
- *Infer* means *to guess* or *to surmise.* The receiver of information (reader or listener) *infers.*

Obviously, the astute reader will infer exactly what the subtle writer implied.

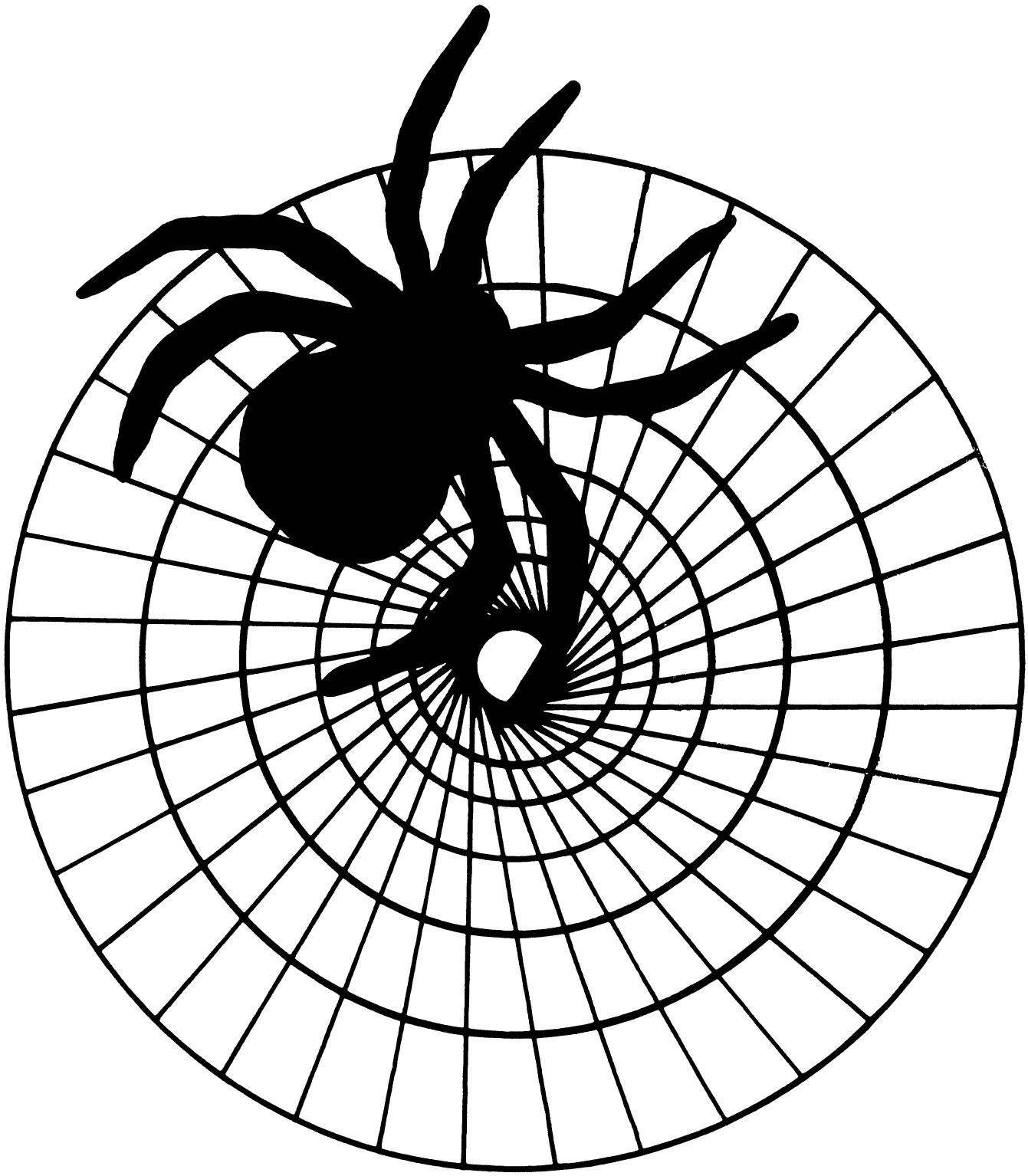
$NEXT

It appears that my notes about who has promised me what neglected follow me home from Anaheim. However, I seem to remember that the fickle finger of fate is pointing at Russ White, our DEC counterpart, for the next lead article. Just keep your hands inside the ride, and we'll both find out.

```
$NEXT($ORDER)="forbid"
```

$RANDOM

Time is Nature's way of preventing everything from happening all at once. --Tom Magliozzi



Networks SIG

TABLE OF CONTENTS

****

FROM THE EDITOR'S COBWEB

Happy New Year! I hope everyone had a wonderful holiday. On the note of new and wonderful, some exciting news. Judi Mandl, the Newsletter Editor informed me that, on October 22, 1989, nine-pound, six-ounce Michael Alexander joined the Network SIG, and the world at large. Judi, her husband Ed Faryniarz, and baby are all doing fine. Judi tells me she is being kept very busy, so I reckon you're stuck with me as the editor for at least a while longer.

This'll be a big issue. We have the first in a series of articles on TCP/IP brought to you by L. Stuart Vance. Also, we have the final installment of the Spring '89 DECUS Terminal Server Notes file. Al Bennett brings us a method of debugging complex DCL lines in command procedures (a VMS topic, but it's proved useful in some asynchronous DECnet command files I'm creating). Up front, we have another exciting installment in the Best Node Names contest.

Send any submissions to:
Rick Carter
Milcare
8500 Byron Rd., Loc. 0320
Zeeland, MI 49464

"BEST NODE NAMES": THE ADVENTURE CONTINUES...

The Best Node Names contest has one more entry this month, plus a non-eligible from our illustrious former Editor, which I forgot to put in, as well as one from her husband.

Cheryl Colburn, of Trans International, Milwaukee, Wisconsin submits HUEY and DUEY. (If they get another computer, I wonder what they'll name it?)

Judi Mandl sent me: SUN, MOON, EARTH, JUPITR, URANUS, MERCRY, SATURN.

Her husband, Ed Faryniarz has EARTH, WIND, FIRE, RAIN, HAIL.

For those of you new to this game, send your node names, as well as your name and address, and any further information, by March 1, 1990,
to:

Rick Carter
Milcare
Loc. 0320
8500 Byron Rd.
Zeeland, MI 49464

or to CARTER if you're on DCS.

TCP/IP AND THE INTERNET

L. Stuart Vance
DECUS Networks SIG TCP/IP Gadfly

With the ever increasing use of the Transmission Control Protocol/Internet Protocol (TCP/IP) family of protocols and the Internet under Digital Equipment Corporation computer platforms, the Networks SIG is pleased to present a series of articles on the TCP/IP protocol suite and its many uses.

The first several articles will be excerpts from a paper written by Ed Krol of the University of Illinois Urbana-Champaign entitled "The Hitchhikers Guide to the Internet." It was published this past September as Request For Comments (RFC) 1118 by the Defense Data Network (DDN) Network Information Center (NIC) at SRI International. Don't let the terms and acronyms scare you however; Ed does an excellent job explaining them in his paper. In this issue's excerpt, we'll present Ed's discussion of the Internet, the RFC process, the DDN NIC and the National Science Foundation Network's (NSFNET) Network Service Center (NNSC), mail reflectors, IP addressing, and current problems in the Internet.

If any of you have questions about TCP/IP or the Internet, please feel free to contact me at the following addresses:

US Postal Service

L. Stuart Vance
TGV, Incorporated
15139 Old Ranch Road
Los Gatos, CA 95030

Internet Electronic Mail

vance@tgv.com

```
==========================================================================
    Network Working Group                                        E. Krol
    Request for Comments: 1118                University of Illinois Urbana
                                                          September 1989
--------------------------------------------------------------------------
```

The Hitchhikers Guide to the Internet

Status of this Memo

This RFC is being distributed to members of the Internet community in order to make available some "hints" which will allow new network participants to understand how the direction of the Internet is set, how to acquire online information and how to be a good Internet neighbor. While the information discussed may not be relevant to the research problems of the Internet, it may be interesting to a number of researchers and implementors. No standards are defined or specified in this memo. Distribution of this memo is unlimited.

NOTICE:

The hitchhikers guide to the Internet is a very unevenly edited memo and contains many passages which simply seemed to its editors like a good idea at the time. It is an indispensable companion to all those who are keen to make sense of life in an infinitely complex and confusing Internet, for although it cannot hope to be useful or informative on all matters, it does make the reassuring claim that where it is inaccurate, it is at least definitively inaccurate. In cases of major discrepancy it is always reality that's got it wrong. And remember, DON'T PANIC. (Apologies to Douglas Adams.)

Purpose and Audience

This document assumes that one is familiar with the workings of a non-connected simple IP network (e.g., a few 4.3 BSD systems on an Ethernet not connected to anywhere else). Appendix A contains remedial information to get one to this point. Its purpose is to get that person, familiar with a simple net, versed in the "oral tradition" of the Internet to the point that that net can be connected to the Internet with little danger to either. It is not a tutorial, it consists of pointers to other places, literature, and hints which are not normally documented. Since the Internet is a dynamic environment, changes to this document will be made regularly. The author welcomes comments and suggestions. This is especially true of terms for the glossary (definitions are not necessary).

What is the Internet?

In the beginning there was the ARPANET, a wide area experimental network connecting hosts and terminal servers together. Procedures were set up to regulate the allocation of addresses and to create voluntary standards for the network. As local area networks became more pervasive, many hosts became gateways to local networks. A network layer to allow the interoperation of these networks was developed and called Internet Protocol (IP). Over time other groups created long haul IP based networks (NASA, NSF, states...). These nets, too, interoperate because of IP. The collection of all of these interoperating networks is the Internet.

A few groups provide much of the information services on the Internet. Information Sciences Institute (ISI) does much of the standardization and allocation work of the Internet acting as the Internet Assigned Numbers Authority (IANA). SRI International provides the principal information services for the Internet by operating the Network Information Center (NIC). In fact, after you are connected to the Internet most of the information in this document can be retrieved from the SRI-NIC. Bolt Beranek and Newman (BBN) provides information services for CSNET (the CIC) and NSFNET (the NNSC), and Merit provides information services for NSFNET (the NIS).

Operating the Internet

Each network, be it the ARPANET, NSFNET or a regional network, has its own operations center. The ARPANET is run by BBN, Inc. under contract from DCA (on behalf of DARPA). Their facility is called the Network Operations Center or NOC. Merit, Inc. operates NSFNET from yet another and completely seperate NOC. It goes on to the regionals having similar facilities to monitor and keep watch over the goings on of their portion of the Internet. In addition, they all should have some knowledge of what is happening to the Internet in total. If a problem comes up, it is suggested that a campus network liaison should contact the network operator to which he is directly connected. That is, if you are connected to a regional network (which is gatewayed to the NSFNET, which is connected to the ARPANET...) and have a problem, you should contact your regional network operations center.

RFCs

The internal workings of the Internet are defined by a set of documents called RFCs (Request for Comments). The general process for creating an RFC is for someone wanting something formalized to write a document describing the issue and mailing it to Jon Postel (Postel@ISI.EDU). He acts as a referee for the proposal. It is then commented upon by all those wishing to take part in the discussion (electronically of course). It may go through multiple revisions. Should it be generally accepted as a good idea, it will be assigned a number and filed with the RFCs.

There are two independent categorizations of protocols. The first is the state of standardization which is one of "standard", "draft standard", "proposed", "experimental", or "historic". The second is the status of this protocol which is one of "required", "recommended", "elective", or "not recommended". One could expect a particular protocol to move along the scale of status from elective to required at the same time as it moves along the scale of standardization from proposed to standard.

A Required Standard protocol (e.g., RFC-791, The Internet Protocol) must be implemented on any host connected to the Internet. Recommended Standard protocols are generally implemented by network hosts. Lack of them does not preclude access to the Internet, but may impact its usability. RFC-793 (Transmission Control Protocol) is a Recommended Standard protocol. Elective Proposed protocols were discussed and agreed to, but their application has never come into wide use. This may be due to the lack of wide need for

the specific application (RFC-937, The Post Office Protocol) or that, although technically superior, ran against other pervasive approaches. It is suggested that should the facility be required by a particular site, an implementation be done in accordance with the RFC. This insures that, should the idea be one whose time has come, the implementation will be in accordance with some standard and will be generally usable.

Informational RFCs contain factual information about the Internet and its operation (RFC-1010, Assigned Numbers). Finally, as the Internet and technology have grown, some RFCs have become unnecessary. These obsolete RFCs cannot be ignored, however. Frequently when a change is made to some RFC that causes a new one to be issued obsoleting others, the new RFC may only contains explanations and motivations for the change. Understanding the model on which the whole facility is based may involve reading the original and subsequent RFCs on the topic. (Appendix B contains a list of what are considered to be the major RFCs necessary for understanding the Internet).

Only a few RFCs actually specify standards, most RFCs are for information or discussion purposes. To find out what the current standards are see the RFC titled "IAB Official Protocol Standards" (most recently published as RFC-1100).

The Network Information Center (NIC)

The NIC is a facility available to all Internet users which provides information to the community. There are three means of NIC contact: network, telephone, and mail. The network accesses are the most prevalent. Interactive access is frequently used to do queries of NIC service overviews, look up user and host names, and scan lists of NIC documents. It is available by using

%telnet nic.ddn.mil on a BSD system, and following the directions provided by a user friendly prompter. From poking around in the databases provided, one might decide that a document named NETINFO:NUG.DOC (The Users Guide to the ARPANET) would be worth having. It could be retrieved via an anonymous FTP. An anonymous FTP would proceed something like the following. (The dialogue may vary slightly depending on the implementation of FTP you are using).

```
%ftp nic.ddn.mil
Connected to nic.ddn.mil
220 NIC.DDN.MIL FTP Server 5Z(47)-6 at Wed 17-Jun-87 12:00 PDT
Name (nic.ddn.mil:myname): anonymous
331 ANONYMOUS user ok, send real ident as password.
Password: myname
230 User ANONYMOUS logged in at Wed 17-Jun-87 12:01 PDT, job 15.
ftp> get netinfo:nug.doc
200 Port 18.144 at host 128.174.5.50 accepted.
150 ASCII retrieve of <NETINFO>NUG.DOC.11 started.
226 Transfer Completed 157675 (8) bytes transferred
local: netinfo:nug.doc remote:netinfo:nug.doc
157675 bytes in 4.5e+02 seconds (0.34 Kbytes/s)
ftp> quit
221 QUIT command received. Goodbye.
```

(Another good initial document to fetch is NETINFO:WHAT-THE-NIC-DOES.TXT).

Questions of the NIC or problems with services can be asked of or reported to using electronic mail. The following addresses can be used:

```
NIC@NIC.DDN.MIL             General user assistance, document requests
REGISTRAR@NIC.DDN.MIL       User registration and WHOIS updates
HOSTMASTER@NIC.DDN.MIL      Hostname and domain changes and updates
ACTION@NIC.DDN.MIL          SRI-NIC computer operations
SUGGESTIONS@NIC.DDN.MIL     Comments on NIC publications and services
```

For people without network access, or if the number of documents is large, many of the NIC documents are available in printed form for a small charge. One frequently ordered document for starting sites is a compendium of major RFCs. Telephone access is used primarily for questions or problems with network access. (See appendix B for mail/telephone contact numbers).

The NSFNET Network Service Center

The NSFNET Network Service Center (NNSC), located at BBN Systems and Technologies Corp., is a project of the University Corporation for Atmospheric Research under agreement with the National Science Foundation. The NNSC provides support to end-users of NSFNET should they have questions or encounter problems traversing the network.

The NNSC, which has information and documents online and in printed form, distributes news through network mailing lists, bulletins, and online reports. NNSC publications include a hardcopy newsletter, the NSF Network News, which contains articles of interest to network users and the Internet Resource Guide, which lists facilities (such as supercomputer centers and on-line library catalogues) accessible from the Internet. The Resource Guide can be obtained via anonymous ftp to nnsc.nsf.net in the directory resource-guide, or by joining the resource guide mailing list (send a subscription request to Resource-Guide-Request@NNSC.NSF.NET.)

Mail Reflectors

The way most people keep up to date on network news is through subscription to a number of mail reflectors (also known as mail exploders). Mail reflectors are special electronic mailboxes which, when they receive a message, resend it to a list of other mailboxes. This in effect creates a discussion group on a particular topic. Each subscriber sees all the mail forwarded by the reflector, and if one wants to put his "two cents" in sends a message with the comments to the reflector.

The general format to subscribe to a mail list is to find the address reflector and append the string -REQUEST to the mailbox name (not the host name). For example, if you wanted to take part in the mailing list for NSFNET reflected by NSFNET-INFO@MERIT.EDU, one sends a request to NSFNET-INFO-REQUEST@MERIT.EDU. This may be a wonderful scheme, but the problem is that you must know the list exists in the first place. It is suggested that, if you are interested, you read the mail from one list (like NSFNET-INFO) and you will probably become familiar with the existence of others. A registration service for mail reflectors is provided by the NIC in the files NETINFO:INTEREST-GROUPS-1.TXT, NETINFO:INTEREST-GROUPS-2.TXT, NETINFO:INTEREST-GROUPS-3.TXT, through NETINFO:INTEREST-GROUPS-9.TXT.

The NSFNET-INFO mail reflector is targeted at those people who have a day to day interest in the news of the NSFNET (the backbone, regional network, and Internet inter-connection site workers). The messages are reflected by a central location and are sent as separate messages to each subscriber. This creates hundreds of messages on the wide area networks where bandwidth is the scarcest.

There are two ways in which a campus could spread the news and not cause these messages to inundate the wide area networks. One is to re-reflect the message on the campus. That is, set up a reflector a local machine which forwards the message to a campus distribution list. The other is to create an alias on a campus machine which places the messages into a notesfile on the topic. Campus users who want the information could access the notesfile and see the messages that have been sent since their last access. One might also elect to have the campus wide area network liaison screen the messages in either case and only forward those which are considered of merit. Either of these schemes allows one message to be sent to the campus, while allowing wide distribution within.

Address Allocation

Before a local network can be connected to the Internet it must be allocated a unique IP address. These addresses are allocated by SRI-NIC. The allocation process consists of getting an application form. Send a message to Hostmaster@NIC.DDN.MIL and ask for the template for a connected address. This template is filled out and mailed back to the hostmaster. An address is allocated and e-mailed back to you. This can also be done by postal mail (Appendix B).

IP addresses are 32 bits long. It is usually written as four decimal numbers separated by periods (e.g., 192.17.5.100). Each number is the value of an octet of the 32 bits. Some networks might choose to organize themselves as very flat (one net with a lot of nodes) and some might organize hierarchically (many interconnected nets with fewer nodes each and a backbone). To provide for these cases, addresses were differentiated into class A, B, and C networks. This classification had to with the interpretation of the octets. Class A networks have the first octet as a network address and the remaining three as a host address on that network. Class C addresses have three octets of network address and one of host. Class B is split two and two. Therefore, there is an address space for a few large nets, a reasonable number of medium nets and a large number of small nets. The high order bits in the first octet are coded to tell the address format. There are very few unallocated class A nets, so a very good case must be made for them. So as a practical matter, one has to choose between Class B and Class C when placing an order. (There are also class D (Multicast) and E (Experimental) formats. Multicast addresses will likely come into greater use in the near future, but are not frequently used yet).

In the past, sites requiring multiple network addresses requested multiple discrete addresses (usually Class C). This was done because much of the software available (notably 4.2BSD) could not deal with subnetted addresses. Information on how to reach a particular network (routing information) must be stored in Internet gateways and packet switches. Some of these nodes have a limited capability to store and exchange routing information (limited to about 700 networks). Therefore, it is suggested that any campus announce (make known to the Internet) no more than two discrete network numbers.

If a campus expects to be constrained by this, it should consider subnetting. Subnetting (RFC-950) allows one to announce one address to the Internet and use a set of addresses on the campus. Basically, one defines a mask which allows the network to differentiate between the network portion and host portion of the address. By using a different mask on the Internet and the campus, the address can be interpreted in multiple ways. For example, if a campus requires two networks internally and has the 32,000 addresses beginning 128.174.X.X (a Class B address) allocated to it, the campus could allocate 128.174.5.X to one part of campus and 128.174.10.X to another. By advertising 128.174 to the Internet with a subnet mask of FF.FF.00.00, the Internet would treat these two addresses as one. Within the campus a mask of FF.FF.FF.00 would be used, allowing the campus to treat the addresses as separate entities. (In reality, you don't pass the subnet mask of FF.FF.00.00 to the Internet, the octet meaning is implicit in its being a class B address).

A word of warning is necessary. Not all systems know how to do subnetting. Some 4.2BSD systems require additional software. 4.3BSD systems subnet as released. Other devices and operating systems vary in the problems they have dealing with subnets. Frequently, these machines can be used as a leaf on a network but not as a gateway within the subnetted portion of the network. As time passes and more systems become 4.3BSD based, these problems should disappear.

There has been some confusion in the past over the format of an IP broadcast address. Some machines used an address of all zeros to mean broadcast and some all ones. This was confusing when machines of both type were connected to the same network. The broadcast address of all ones has been adopted to end the grief. Some systems (e.g., 4.3 BSD) allow one to choose the format of the broadcast address. If a system does allow this choice, care should be taken that the all ones format is chosen. (This is explained in RFC-1009 and RFC-1010).

Internet Problems

There are a number of problems with the Internet. Solutions to the problems range from software changes to long term research projects. Some of the major ones are detailed below:

Number of Networks

When the Internet was designed it was to have about 50 connected networks. With the explosion of networking, the number is now approaching 1000. The software in a group of critical gateways (called the core gateways) are not able to pass or store much more than that number. In the short term, core reallocation and recoding has raised the number slightly.

Routing Issues

Along with sheer mass of the data necessary to route packets to a large number of networks, there are many problems with the updating, stability, and optimality of the routing algorithms. Much research is being done in the area, but the optimal solution to these routing problems is still years away. In most cases, the the routing we have today works, but sub-optimally and sometimes unpredictably. The current best hope for a good routing protocol is something known as OSPFIGP which will be generally available from many router manufacturers within a year.

Trust Issues

Gateways exchange network routing information. Currently, most gateways accept on faith that the information provided about the state of the network is correct. In the past this was not a big problem since most of the gateways belonged to a single administrative entity (DARPA). Now, with multiple wide area networks under different administrations, a rogue gateway somewhere in the net could cripple the Internet. There is design work going on to solve both the problem of a gateway doing unreasonable things and providing enough information to reasonably route data between multiply connected networks (multi-homed networks).

Capacity & Congestion

Some portions of the Internet are very congested during the busy part of the day. Growth is dramatic with some networks experiencing growth in traffic in excess of 20% per month. Additional bandwidth is planned, but delivery and budgets might not allow supply to keep up.

TESTING DCL COMMAND LINES FOR COMMAND FILES

By Allen Jay Bennett, Steelcase

Having been a Softwaare Quality Assurance Manager in a previous life, I have always stressed the importance of testing code before releasing it.

The following has helped me test each line of code before including it in the released DCL command files to be used in the production environment in my current life in a very large Information Systems Department.

Include the following symbol definition in your LOGIN.COM file:

```
$ REM*EMBER :== "CRE REM.TMP !" ! to remember the previous line ^A
! recall and ^Z to exit
```

(note the exclamation point in the symbol definition).

Then after incrementally testing the DCL command line at your terminal in an interactive session, the exact DCL command line can be "remembered" into a file called REM.TMP with this REM command. The procedure is as follows:

1] When you have the DCL line tested to your satisfaction, use the up-arrow to recall the DCL line.

2] If you are not already in insert mode, toggle into insert mode
using CONTROL-A. Type CONTROL-H togo to the beginning of the line.

3] Type "REM" (or "REMEMBER" if you wish). This inserts the REM command at the beginning of the line. When DCL expands the symbol, your command will be a comment at the end of a CREATE command.

4] Hit RETURN. This creates a file called REM.TMP, which is now open for you to write to.

5] Hit UP-ARROW again. You now have the exact command line entered in your file, with the word "REM" in front of it. Hit CONTROL-Z to close the file. You can add a dollar sign and remove the "REM" word later within an editor.

The exact DCL command line tested can then be included in the target DCL command file to be used in the production environment knowing that the command line has already been tested. This helps to produce a higher quality for released DCL command files. I use the EDT editor command "INC REM.TMP" at the location in the target DCL command file that I need to include the tested line into. This probably seems clumsy for you EMACS folks, but it works. Also, you know the code has been tested at least incrementally before final testing and/or releasing.

Allen Jay Bennett
Steelcase, Inc.
Grand Rapids, MI 49501-1967
(616)247-2152

DECUS SPRING 1989 SYMPOSIUM TERMINAL SERVER NOTES FILE

PART 3: CONCLUSION

```
================================================================================
Note 11.0                        LATSYM? Fluke                        3 replies
VAXFAM::WBAKER "Baker, William / Ford Aerospace Cor"   17-MAY-1988 13:24
--------------------------------------------------------------------------------
```

Another problem we recently had with LATSYM, and I've seen it before but it went away and now its back. Here's the symptoms: The printer (in this case an LA100) attached to a DS200 is printing its job. I've defined a VMS form for that job with a length of 66 lines a 2 line top margin, and a 2 line bottom margin. Suddenly the printer decides to ignore the bottom margin and to print 64 lines per page instead of the 62 printable lines defined by the form. Under version 4.6 the solution involes clearing the print queue. Stopping the queue manager, then restarting the queue manager. Finally you delete the queue, re-define the forms, and re-init the queue. I may no all these steps, but these are what finally worked. Now for the kicker, When I finished fixing the bug on one system, I decided to look at my other systems. Guess what, they were all like this. I had to run through the above procedure on all my nodes. The symptoms were noticed on the primary node on a Wednesday, and I have proof from user printouts it had been working on Tuesday. Accounting show no work being done by any privileged accounts over-night. Back in VMS 4.5, I had this same problem, and the real solution was to re-link LAT, or at least that seemed to work the one time I had to fix the problem. Is there a possibility that this is a LATSYM problem, or it really a problem with the queue manager, SYSDEVCTL.TLB, and possibly the LTDRIVER. I know if I had not done of the fix work (from my previous experience) that the print job would have been perfect had I moved the printer to a direct DZ11 port. Any and all ideas of what caused the problem will help greatly.

```
================================================================================
Note 11.1                        LATSYM? Fluke                          1 of 3
VAXFAM::JCAHILL                                        18-MAY-1988 08:59
                              -< check port setup >-
--------------------------------------------------------------------------------
```

I haven't heard of any problems similar to yours that were traceable to LATSYM. I recently received a QAR on LATSYM from another group within Digital that reported exactly that same problem. In that case, I determined that the problem was with the physical page length characteristic on the port being used. Unless the LTA terminal port is set up correctly *and* the form length is correct, the terminal driver and symbiont won't insert the page break in the proper place.

Jim Cahill
VMS/LAT Engineering

```
================================================================================
Note 11.2                          LATSYM? Fluke                          2 of 3
VAXFAM::WBAKER "Baker, William / Ford Aerospace Cor"   18-MAY-1988 14:12
                              -< Let's try again... >-
--------------------------------------------------------------------------------
```

Before we went through the lengthy method of recovering from the problem, we cross verified all the settings in the forms, ltaxx devices, and the print queues. All were as they should have been. The only exception, was that one form was defined by the system as having a length of 66 with no margins. It was redefined to its proper setting. Somewhat of a side note is that the form that we reset, was still defined properly in the system startup, and we had no indication that any privileged user had ever manually modified the form. Anyway, once the form was reset, it did not fix the proplem. The form had only been modified on the primary system, and was not corrupted on any of the other remote systems. Yet the remote systems also exhibited the same characteristics.

The only thing I can think of is that somehow the SYSDEVCTL.TLB file or the symbiont data file somehow became corrupted on each of the systems. The only real question is which file would possibly have caused this problem. We had been working on updates for the SYSDEVCTL.TLB file the week before, but we had not yet installed that version as the primary version of that file. The timing is very strange, as nothing can be found to indicate any tampering with the queue's or associated files before the date the problem started.

```
================================================================================
Note 11.3                          LATSYM? Fluke                          3 of 3
29067::J_HASSENCAHL "John Hassencahl CSC/CS NSU"        19-MAY-1988 16:58
                    -< probably not sysdevctl.tlb ... >-
--------------------------------------------------------------------------------
```

The SYSDEVCTL.TLB file would only be suspect if you were using one or more set-up modules with the form that was printing. Even then, this modules should not have any affect on how the symbiont does its page breaks. Again the prime places to look is at the length of the form definition and the terminal set-up's on the lta device. Most if not all page formating is done either in the smbsrvshr routines that are common to both prtsmb and latsym or in the ttdriver based on the terminal definitions. Once the data reaches the ltdriver, it is not altered.

```
================================================================================
Note 12.0                  Can't connect to DECSA                    2 replies
VAXFAM::STANNENBAUM                                    17-MAY-1988 13:59
--------------------------------------------------------------------------------
```

I have a DECSA to which I can't CONNECT NODE. TSM can't connect to it either, failing with a timeout message. I've checked everything I can think of (service passwords, service enablement, etc.). All the NCP loopback tests seem to work, and I can connect to other servers on the Ethernet (I have only one DECSA).

Colorado support asserts that the problem must be that I installed the software without using VMSINSTAL, thus I do not have the account installed that I need to do this. My only response to that was, "Thank you for your insight."

Does anyone have any notion of what else I should check or how to go about diagnosing this further?

Thanks in advance.

Saul Tannenbaum
Manager, Scientific Computing
USDA HNRC at Tufts University

```
================================================================================
Note 12.1                    Can't connect to DECSA                      1 of 2
VAXFAM::JHEFFERNAN "John Heffernan - Terminal Serve"    17-MAY-1988 14:16
--------------------------------------------------------------------------------
```

Good to hear from a fellow Jumbo from Tufts!

It is probally a setup problem. You do need to install the DECSA software. There are some files called PLUTOWL and PLUTOCC that need to be the right directory (sys$system, I think). Also service must be enabled and the maintenance or service password must match from the one in the DECnet database and the one on the server.

This sounds familar. Were you speaking to Jane Ryer on this?

Stop by the booth or network suite tommorrow and we can discuss it further.

John

```
================================================================================
Note 12.2                    Can't connect to DECSA                      2 of 2
VAXFAM::STANNENBAUM                                      17-MAY-1988 16:28
                           -< Um, I've done all that >-
--------------------------------------------------------------------------------
```

> It is probally a setup problem. You do need to install the DECSA
> software. There are some files called PLUTOWL and PLUTOCC that
> need to be the right directory (sys$system, I think). Also service
> must be enabled and the maintenance or service password must match
> from the one in the DECnet database and the one on the server.

I did install the DECSA software, and from VMSINSTAL. We do have all the PLUTOwhatver files in sys$system. Maintenance and service passwords all appear to be correct. I'll try and get to the terminal room, dial into my system, and confirm all this, then drop by the booth.

Saul

```
================================================================================
Note 13.0                      Moving Sessions                    2 replies
VAXFAM::SLJACKSON "Simon L. Jackson"                     17-MAY-1988 14:43
--------------------------------------------------------------------------------
```

I am trying to find a method to "transfer" a session from one CPU node on an ethernet to another. This would be between two co-operating processes - one on each CPU.

The initial arrangement would be port N on server TS attached via a server initiated connect as LTAnnnn: to process L on CPU A. Process L is a standard JOB_CONTROL initiated LOGINOUT process. After logging in, the terminal is passed to process A on CPU A, which is a multi-threaded menu handler (eg. ACMS agent/ACMSCP), and process L is terminated.

A command entered on that terminal indicates that the terminal should be "transferred" to CPU B.

I anticipate that the sequence of actions would be something like:

1 Process A would send a mail message to process B on CPU B giving the port N and server TS names.
2 Process B would then establish a connection of LTAmmmm: (does not have to be the same as LTAnnnn:) through to port N of server TS.
3 Finally process B would notify process A of success and process A would read any remaining type-ahead from LTAnnnn:, terminate its connection through LTAnnnn:, and pass the type-ahead to process B.
4 Process B now has control of the terminal.

Hopefully the above makes sense.

The question is: Is it possible for process B to establish such a connection and have its session take over as soon as process A's session disconnects?

The aim of all the above is to create a menu-handling system which knows which node in a network (not cluster) one should run a given application on.

```
================================================================================
Note 13.1                       Moving Sessions                        1 of 2
VAXFAM::JHEFFERNAN "John Heffernan - Terminal Server    19-MAY-1988 08:52
--------------------------------------------------------------------------------
```

Are planning to use dedicated ports available with V5 or the connect QIO?
John

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

================================================================================
Note 13.2                       Moving Sessions                        2 of 2
19584::CAPPELLOF "Carl J. Appellof"                    19-MAY-1988 10:08
--------------------------------------------------------------------------------
```

re .0
I believe that what you want to do may be possible with non-modem controlled server lines, but not with modem-controlled ones.

We've thought of this sequence:

Set server port to be ACCESS DYNAMIC so that VAXes can initiate connections to it as well as allowing a server user to do a normal
CONNECT.

Server user connects to VAX A.
Menu process on VAX A decides that user needs to be on VAX B.
Menu process sends a DECnet message to process on VAX B.
VAX B $ASSIGNs a channel to a pre-setup LTA device which points to the desired server port.
VAX B does a LAT CONNECT $QIO function. This connection request will be queued on the server until VAX A drops its connection.
Finally, VAX A drops the connection, and VAX B's connection is made.
VAX B's $QIOW unblocks or it's AST fires, and you're connected to the right VAX.

The reason this won't work on modem lines right now is that VAX A's LAT disconnect also causes the modem to hang up, dropping the server user. We're thinking about a modification to that behavior in the future.

```
================================================================================
Note 14.0       SUM (Show Users with LAT Server Port Names)    No replies
VAXFAM::MKIMURA "Michael Kimura, Hughes Aircraft"       17-MAY-1988 16:15
--------------------------------------------------------------------------------
```

I'm not sure if this is the proper place to enter this information but I'm sure some of you maybe interested...

I have submitted a program to the VAX SIG Tape called SUM (Show Users More) which functions exactly the same as SHOW USERS except that for LAT terminals the LAT Server and Port names are appended to the right of the display. In order for this information to fit the physical device name (usually LTAxxxx:) has been moved slighty to the left and the server name is truncated to six characters unless /FULL is specified.

This program works on VAX/VMS V4.6 & V4.7 using $QIOW with function code IO$__TTY__PORT and modifier IO$M__LT__READPORT and therefore requires SHARE and SYSPRV privilege along with WORLD to get JPI information.

A version has also been submitted that runs on VAX/VMS V5.0 and uses $GET DVI(DVI$TT__ACCPORNAM) and ONLY requires WORLD privilege.

Michael Kimura
Hughes Aicrarft
P.O. Box 92426
Los Angeles, CA 90009
MS:R2/A159

(213) 615-9775

P.S. Also see reply 5.7

```
================================================================================
Note 15.0               Logging out of TS sessions                2 replies
VAXFAM::SBABER                                          17-MAY-1988 16:18
--------------------------------------------------------------------------------
```

We have a fairly naive user base who can't seem to get the hang of having to log off in each session before logging off of the terminal server. Is there a way to cause the terminal server to disallow a logout while sessions are still current? Or, alternatively, a way to keep the VAX from stopping processes which get abandoned in this manner.

```
================================================================================
Note 15.1               Logging out of TS sessions                    1 of 2
VAXFAM::JCAHILL                                         18-MAY-1988 11:30
                                  -< not today >-
--------------------------------------------------------------------------------
```

» .... Is there a way to cause the terminal server to disallow
» a logout while sessions are still current?

Currently, there's no way to do this with our current terminal server products. However, it is a request we've heard before.

Jim Cahill
VMS/LAT Engineering

```
================================================================================
Note 15.2               Logging out of TS sessions                    2 of 2
VAXFAM::JBOOTH                                          19-MAY-1988 09:48
                                -< Lie to them >-
--------------------------------------------------------------------------------
```

I never tell the users to log off at the Local> prompt. I don't even tell them it is a command. I explain the Local> prompt as the only prompt they should see unless the server crashes, in which case they must "remind" the server who they are. If your user group is really naive they will believe this.

Another solution which may not be applicable is using dedicated services.

If they logged out of the server why would you want to keep the process running? They would log out turn off and go home with your accounting system having a ball with connect time charge backs.

```
================================================================================
Note 16.0          Laser Writer on a Terminal Server 200?        15 replies
VAXFAM::RSWANSON                                        17-MAY-1988 17:33
--------------------------------------------------------------------------------
```

Has anyone out there connected an APPLE Laser writer up to a DECserver 200? and then used something like MAC240 to connect to the service then MACdraw to print to the terminal port as opposed to the printer port on the MAC?

We have a lot of MACs tied to our LAN and it would be neat stuff if they could share a LASERWRITER!

We tried the above (defined the printer as a service available). When we connected to it using MAC240 we could type on the keyboard and what we typed printed. However when we dropped out of MAC240 and went to MACDRAW (selected the terminal port) we just got garbage. Any ideas?

```
================================================================================
Note 16.1          Laser Writer on a Terminal Server 200?           1 of 15
VAXFAM::LKILGALLEN "Larry Kilgallen"                    18-MAY-1988 08:45
                    -< Hurry, Hurry to Wednesday sessions >-
--------------------------------------------------------------------------------
```

> < Note 16.0 by VAXFAM::RSWANSON >
>
> -< Laser Writer on a Terminal Server 200? >-
>
> Has anyone out there connected an APPLE Laser writer up to a DECserver
> 200?

Talk to the folks giving the sessions from 9-12 today on Mac-VAX connectivity. (I know, the LaserWriter is not a Macintosh, but the same third party vendors do those connections.) If you don't read this reply in time, Apple is giving a session at 4 pm.

```
================================================================================
Note 16.2          Laser Writer on a Terminal Server 200?           2 of 15
VAXFAM::ASTRIEGEL                                       18-MAY-1988 16:38
                    -< Problem with PostScript being eaten >-
--------------------------------------------------------------------------------
```

We ran into some problems with a Digital LN03R Scriptprinter connected as a service on the DECserver 200. Digital mentions that they don't support PostScript printers on queues from terminal server ports, but don't say why.

Our problem showed up when we sent perfectly good PostScript files to the print queue and the normal activity lights on the printer lit and all looked normal until nothing printed out. Some files work, some files don't. Seems like the DECserver swallows something every so often. These same files print out perfectly every time when we use a hard-wired port to the laser printer.

Alan Striegel
Pioneer-Standard Electronics

```
================================================================================
Note 16.3          Laser Writer on a Terminal Server 200?           3 of 15
NIS60::ASORRELL "Al Sorrell - Westinghouse Baltimore    19-MAY-1988 09:45
                          -< PostScript talks back? >-
--------------------------------------------------------------------------------
```

<Postscript printers not supported>

My suspicion is that PostScript printers like to send status messages BACK to the system. Most printers do not an I suspect that LATSYM doesn't handle the backtalk gracefully at times. Anybody have any confirmation on this?? We'd also like to have that capability.

Al

```
================================================================================
Note 16.4          Laser Writer on a Terminal Server 200?           4 of 15
VAXFAM::RGRAHAM "Bob Graham, Dow Chemical, 504/389-"    19-MAY-1988 10:05
                          -< use the LN03R symbiont >-
--------------------------------------------------------------------------------
```

It's practically impossible to get a DEC PostScript printer to work from a normal (PRTSMB or LATSYM) symbiont. That's why DEC offers a special symbiont for the LN03R as part of the support software for it. It's not bundled with the printer, you have to order it separately (sorry, I don't remember the product code).

Naturally, the LN03R symbiont is only supported for hardwired printers. However, we've been running it over reverse LAT circuits since last Oct
or so and it has worked just fine.

Bob Graham
Dow Chemical
PO Box 400 BLDG 2503
Plaquemine LA 70765

```
================================================================================
Note 16.5          Laser Writer on a Terminal Server 200?           5 of 15
19584::CAPPELLOF "Carl J. Appellof"                     19-MAY-1988 10:15
                       -< You NEED the special symbiont >-
--------------------------------------------------------------------------------
```

Yes, reply .-1 has it right. You MUST use the special LN03R symbiont to drive the ScriptPrinter. The reason is, as also pointed out earlier, that PostScript printers "talk back" to the host.

As .-1 points out, the LN03R symbiont will usually work with LTA application ports. There's an official version of this symbiont with LAT support due out soon (don't ask me what "soon" means).

One additional advantage of this symbiont is that it has built in translators so you can send you LN03, REGIS, or TEKtronix files to the printer, and they'll get translated to PostScript along the
way.

```
================================================================================
Note 16.6          Laser Writer on a Terminal Server 200?           6 of 15
VAXFAM::ASORRELL "Al Sorrell - Westinghouse Baltimor    19-MAY-1988 11:49
                            -< <getting closer> >-
--------------------------------------------------------------------------------
```

Chatting with the folks over at the printer area revealed that the LN03R symbiont is just finishing F/T and should be available *very* soon. This will work with the terminal server at that time.

Al

```
================================================================================
Note 16.7          Laser Writer on a Terminal Server 200?           7 of 15
VAXFAM::ASORRELL "Al Sorrell - Westinghouse Baltimor    19-MAY-1988 11:51
                    -< LN03R symbiont *ONLY* for LN03Rs! >-
--------------------------------------------------------------------------------
```

Note that the special LN03R symbiont is:

1) licensed to the LN03R and shipped with it , and
2) incompatible with *ALL* other (i.e. non-DEC) P/S printers since they added some special commands which talk to "implementation specific" P/S features in the LN03R — even better than "copy-protect"!

Al

```
================================================================================
Note 16.8          Laser Writer on a Terminal Server 200?           8 of 15
VAXFAM::JCAHILL                                          19-MAY-1988 11:52
                         -< clarification on support >-
--------------------------------------------------------------------------------
```

re < Note 16.4 by VAXFAM::RGRAHAM "Bob Graham, Dow Chemical, 504/389-1689">

» Naturally, the LN03R symbiont is only supported for hardwired printers.
» However, we've been running it over reverse LAT circuits since last Oct
» or so and it has worked just fine.

NOT TRUE! Digital *does* support the use of LN03R PostScript© printers on LAT terminal servers. I was just told by people who should know that the special symbiont required to support this has just gone to the SDC. It should be available soon. Sorry, but I don't have the order number either.

The printer doesn't actually use "reverse LAT" — it gets set up the same way as other LAT printers, using an LTAx: application port set up using LATCP.

Jim Cahill
VMS/LAT Engineering

```
================================================================================
Note 16.9          Laser Writer on a Terminal Server 200?           9 of 15
VAXFAM::JCAHILL                                          19-MAY-1988 11:58
--------------------------------------------------------------------------------
```

re last three messages:

Ah, the fun of multiple people accessing NOTES files at the same time!

(:>

```
================================================================================
Note 16.10         Laser Writer on a Terminal Server 200?          10 of 15
VAXFAM::GALTOBELLO "Gus Altobello, Reuters"              19-MAY-1988 12:08
                      -< PostScript printers *can* work! >-
--------------------------------------------------------------------------------
```

Re: Preceeding message on PostScript printers & servers.

At Reuters, we have two non-DEC PostScript printers hooked up to a DECserver 200 using the LATSYM print symbiont.

One of them (a Dataproducts) occasionally hangs, and can be made to hang by power-cycling it; a bit of fudging with the queues is then required to make everyone happy again.

The other (a TI) has given us not a bit of trouble.

We also have an LN03R, which is reverse-LAT'ed to our system. We ordered the equipment from DEC not knowing about the non-LAT limitation of the print symbiont. Our shop is run ENTIRELY on an Ethernet which connects to the main computer room in another building: there is *no* way to run wires from the printer to the system, hence the reverse-LAT solution (which works quite nicely, thank you).

PostScript printers *do* return a lot of information to the system. It appears, though, that the print symbiont ignores this chatter...

-gus

```
================================================================================
Note 16.11        Laser Writer on a Terminal Server 200?          11 of 15
29067::J_HASSENCAHL "John Hassencahl CSC/CS NSU"        19-MAY-1988 18:57
                    -< Check the pro's and con's first ... >-
--------------------------------------------------------------------------------
```

It may be true that the postscript symbiont works with a server, but it does so in much the same way as the standard vms print symbiont prtsmb does. The LN03R symbiont makes the connection to the server/ port combination via the old brute force method. It like the prtsmb do not have any idea that they are talking through the ltdriver to a server and are not prepared to handle any possible lat/ethernet related error conditions as latsym is prepared to do. The other short coming of the ln03r and vms print symbiont is that the server/port that the printer is attached to is tied exclusively to that system where as latsym will allow multiple cpu's on the ethernet to access/share the print device. The bottom lines is that you have to weigh the pro's and con's to see if it is worth it or not.

```
================================================================================
Note 16.12        Laser Writer on a Terminal Server 200?          12 of 15
4268::APPELLOF "Carl Appellof LAT/VMS Engineering"      20-MAY-1988 10:06
                    -< Single VAX will own the ScriptPrinter >-
--------------------------------------------------------------------------------
```

re .-1
One of the "con"s will be there with the real LN03R symbiont too: It will always grab the LN03R device on a SINGLE VAX, and keep it forever. This makes sense for a lot of reasons, mostly the complexity of the postscript interaction with the symbiont (e.g. if the printer wants to "talk back" to the symbiont, but the symbiont has already disconnected, then who's there to listen?).

The PrintServer folks will document this "single VAX" limitation, and recommend using DQS if other VAXes on your network need to access the ScriptPrinter.

```
================================================================================
Note 16.13          Laser Writer on a Terminal Server 200?          13 of 15
VAXFAM::RGRAHAM "Bob Graham, Dow Chemical, 504/389-1     20-MAY-1988 11:54
                          -< sometimes it's a feature >-
--------------------------------------------------------------------------------
```

Having a single VAX "own" the printer is not always a "con". At our site we have several printers where we control the media (paper, transparencies, letterhead) used through the FORM and STOCK mounted on a queue. This allows our users to declare what they want their output printed on and be reasonably assured that they won't get any surprises. If two or more VAXes can access the printer through separate queues, you can't control the output media this way.

```
================================================================================
Note 16.14          Laser Writer on a Terminal Server 200?          14 of 15
VAXFAM::TMORRIS "Tom Morris UNC-CH School of Public"     20-MAY-1988 12:27
                       -< Using PS PRinter over LATSYM >-
--------------------------------------------------------------------------------
```

We've currently got a NEC LC890+ PostScript laser printer hooked up through an LTAxx applications port created during system startup, using the standard LATSYM symbiont. I've not had any major problems with __any__ of our LAT symbiont queues (~10 of them), other than an occassional communications hangup where neither the symbiont nor the server nor the printer will talk to each other. This happens only 1x/month across any of our server-based queues.

The trick in getting things to work right for me was:

(1) use postscript batch mode server (almost __no__ chat back from PS)
(2) make damn sure that all baud, bits, parity, etc are 100% correct. (If not, the printer says it is "processing" the garbage characters—in reality it has entered its PS error mode => skip to EOF (^D).)
(3) set up the queue with a /library=xxxx/separate=reset=pseof where "pseof" is the name of a module in that library containing a ^D. This way, __if/when__ the printer enters PS error mode skip to EOF, only the offending job gets "munched". Subsequent jobs will come out okay.

Of course, the way I'm doing things, I cant do neat trick things like automatically download the correct fonts, automatically convert ASCII files to PostScript, etc. Since the DEC LN03R symbiont wont work with any other PS printer, and because DEC flat out refuses to sell or license said symbiont without purchase of the hardware, we've got on order the PacerPrint symbtiont from Pacer. It'll be +reaL+ interesting to see how well that really works.

Tom Morris TOM@UNCSPHVX.BITNET ...!mcnc!ecsvax!tpmsph
919 966 2694

```
================================================================================
 Note 16.15          Laser Writer on a Terminal Server 200?          15 of 15
 VAXFAM::TMORRIS "Tom Morris UNC-CH School of Public"     20-MAY-1988 12:31
--------------------------------------------------------------------------------
```

FYI, re .14, I'm not sure I've configured things exactly by the manual, so here's how that PS queue line is set up, if I can recall (syntax is guaranteed to be wrong below):

LATCP create port LTA1:/server=EARTH/PORT=port__8

init/queue/dev/on=ATHENA::LTA1:/PROC=LATSYM/LIBR=NECPS/SEP=RESET=PSEOF POST1

I've left out a few steps, like setting the terminal characteristics and the exact setup on the server port (9600 8N1, access remote, etc).THese are left as an exercise for the reader. If anyone is really desperate or bored, send mail over BITNET to me at TOM@UNCSPHVX, and I'll extract the appropriate info and send it out.

```
================================================================================
Note 17.0                          XOFF'ing                          2 replies
VAXFAM::AHUNT                                                19-MAY-1988 10:28
--------------------------------------------------------------------------------
```

Any solutions to the following problem:

Some of our servers are connected via RS232 lines to a SYTEK communications system. Occasionally the SYTEK sends a XOFF to a port but forgets the XON to go with it. When a SHOW PORT is done the port is seen to be in the XOFF state. No user is actually using the port.

The only way we have found to free the port is to have one the SYTEK tech's with privilege to send a XON to the port and restablish communications. (A reboot of the server will do it too obviously.) Any other ideas on how to free the port?

```
================================================================================
Note 17.1                          XOFF'ing                              1 of 2
4268::IZBICKI "Ken Izbicki, LAT Engineering (Mass.)"    19-MAY-1988 13:02
                            -< Try 2 LOGOUT commands >-
--------------------------------------------------------------------------------
```

It depends on what kind of terminal server you are using. With the DECserver 100 and 200, you can free up the line by issuing 2 consecutive LOGOUT PORT "n" commands. The reason that it takes 2 commands is because the server will normally attempt to print out the "logout" message before it actually performs the logout function. The second LOGOUT is an indication to the server to bypass flow control, ignore the logout message, and force the logout function to occur immediately.

This is a bit of trivia, I do not believe it is documented anywhere. But if you ever have trouble with a hung port, always try 2 LOGOUTs to see if it cleans up the line.

- Ken Izbicki
Terminal server software

```
================================================================================
Note 17.2                          XOFF'ing                              2 of 2
VAXFAM::AHUNT                                                19-MAY-1988 16:15
                                   -< Thanks. >-
--------------------------------------------------------------------------------
```

Will try. It is a DS200 with modem control. Appreciate the tidbit.

```
================================================================================
Note 19.0                 Modems on Decserver 200                      1 reply
VAXFAM::JHORAN                                               19-MAY-1988 15:07
--------------------------------------------------------------------------------
```

I'm trying at present to get a batch of Hayes modems to work with a DecServer 200. All goes fine on dialing out, but on dialing in the phone gets picked up, but no connection to the Decserver results.

Has anyone out there got this working? If so what did they do in terms of terminal cable connections, port setup etc?

Regards John Horan

```
================================================================================
Note 19.1                    Modems on Decserver 200                      1 of 1
VAXFAM::BROECKEL                                          19-MAY-1988 15:40
                         -< DEC's already figured it out >-
--------------------------------------------------------------------------------
```

>> I'm trying at present to get a batch of Hayes modems to work with a
>> DecServer 200. All goes fine on dialing out, but on dialing in the
>> phone gets picked up, but no connection to the Decserver results.

I'm not sure if this will help, but stop by the DEC booth for VAXPAC. VAXPAC is digital's communication package that allows a VMS user to utilize modems on the DECserver to dial out.

Dave Faulkner (DEC) is the guy to see. He has documentation on VAXPAC which shows you all of the settings for both the 1200 and 2400 Hayes modems. He also shows you how to set up the DECserver ports. If you made it to his presentation this morning, then you already know the detrails, otherwise ask him for one of the handouts.

```
================================================================================
Note 20.0           New logicals MOM$SYSTEM[no]SOFTID          No replies
VAXFAM::ASORRELL "Al Sorrell - Westinghouse Baltimo"    20-MAY-1988 09:49
--------------------------------------------------------------------------------
```

Noticed on the cluster that there are two MOM$ names I haven't seen before...

MOM$SYSTEM_NOSOFTID and MOM$SYSTEM_SOFTID

These both point to MOM$SYSTEM -> MOM$LOAD

Anybody know the significance of these new logicals??

AL

Office Automation

OA SIG NEWSLETTER

SUBMISSIONS:

We need LOTS of articles to fill an average of 10 pages per issue with worthwhile information. You are our most important resource! Please send articles, suggestions, questions, and topics of concern to:

Roger Bruner
Foreign Mission Board
Box 6767
Richmond, VA 23230
804/353-0151

Submissions must be received by the 15th of the month for use in the issue dated two months afterwards (e.g., by January 15 for the March issue).

EDITORIAL POLICY:

Editorials and articles are solely the opinions of the authors. Materials will be reproduced as accurately as possible, but are subject to editing as needed. Commercialism, pricing, and futures are strictly prohibited, as well as anything of an unprofessional or unethical nature.

BULLETIN BOARD:

The OA SIG moderates several on-line bulletin board conferences for discussion of OA problems and solutions. These conferences are available on the DECUServe system. Watch upcoming issues for further information.

CONTENTS OF JANUARY ISSUE

FROM THE EDITOR

It was really great seeing old OA SIG friends at Anaheim and sharing information with you. We really missed seeing some of you, but hope we'll catch you at New Orleans; it's not too early to start planning.

As promised, we do have some coverage of the Symposia in this month's issue. More will follow periodically.

You'll note an "Index of Articles" for 1989 both as an article AND as a tearout in the back of this book. Please make good use of it to refresh your memory on where to relocate that good information you knew you had seen somewhere!

Note the continuation of this column on the next page. There was just too much to say to have to limit myself! By the way, I'm running low on articles from people other than myself; this cannot and should not be MY newsletter. Please write in and help!

Roger B.

IMPORTANT TEAROUTS

In the tearout section in the back of this volume you will find several important pages. One is a SIR (Software Improvement Request) form for registering concerns and suggested improvements.

There is also a questionnaire for OA SIG members to use to tell us more about themselves and their sites. Originally designed for use by the Washington Office Automation LUG, this questionnaire revealed some really interesting things about WOALUG members. Cathy Hotka at the American Petroleum Institute, the originator of the questionnaire, was kind enough to adapt it for OA SIG use and to provide me with a beautiful copy. Please take a few moments now to complete it and send it to me (see 'SUBMISSIONS' on OA-1 for the address). In several months, we'll try to compile the results and see what we are like as a SIG!

CONGRATULATIONS

Congratulations to Dan Evans of B.C. Systems Corporation, who won the drawing at the Campground in Anaheim. Dan won a week's worth of DIGITAL training of his choice. Maybe his prize will provide him with some good information for a Newsletter article? Nice going, Dan!

Also, special best wishes to E-PUBS, which began as a working group under the sponsorship of the OA SIG just a short time back. At Anaheim, they received full SIG status!

OASIS

The OASIS bulletin board will be a thing of the past by the time you read this notice. We appreciate DIGITAL's help in creating and maintaining OASIS during its lifetime, and now we will turn to DECUServe for the kind of information sharing we enjoyed on OASIS. Special thanks to Dale Coy for his many hours spent as the administrator of OASIS!

INDEX OF ARTICLES FOR 1989 OA SIG NEWSLETTER*

Roger E. Bruner, Foreign Mission Board

*NOTE: A copy of this list is included in the tearout section at the back of the book to prevent you from having to mutilate this issue to have a loose copy.

WPSPLUS FORUM: WHAT'S THAT NUMBER AGAIN

Diana McLeod, Mustang Fuel Corporation

"I work in an environment where it is necessary to print the retention number of my document at the very bottom of each page. Is there any way I can have the system automatically put the document number at the bottom of each page?"

Yes, you can have the document number print on your document any place you want or you can have it appear on your screen but not print.

First of all, create a UDP (I named mine D0CNUM) with the following keystrokes:

{GOLD []}
B0TT0M{CR}
{CR}
.PROCESS 0A$CURDOC_DOCNUM
{GOLD []}
{SEL}
{DOWN}
{CUT}
{UP}
{PASTE}

This will enable you to print the number of your document as a footer. If you do not want the number to print but only want to see it, you can change the word BOTT0M (that will appear on your screen after you run the UDP) to COMMENT.

If this is to appear at the bottom in a footer, be sure to run this UDP at the top of your document (if you only want it to print on the last page of your document, put it at the top of the last page). If it is just a 'comment' it doesn't matter where you put it. Also, as with any footer (or header for that matter), be sure you allow enough room in your bottom/top margin to accomodate the number of lines of your footer/header.

EXAMPLES:

1. You want the document number to appear at the bottom of the printed page.

At the top of your document press the DO key. Type DOCNUM and press RETURN.

You will see the following appear at the top of your document.

```
————————————START CONTR0L————————————
BOTTOM

004673
————————————END C0NTR0L————————————
```

This is just a simple footer control block with your document number. If you need to have other things within this footer, go ahead and type them in. Example below.

```
————————————START CONTROL————————————
BOTTOM

004673
                                \-P-
————————————END C0NTROL————————————
```

The control block above will print the document number and page number at the bottom of each page.

2. You only want the document number to appear on your screen but not on the printed version? Then change the word BOTTOM to COMMENT.

```
————————————START C0NTR0L————————————
COMMENT

O04673
————————————END CONTROL————————————
```

The control block above tells the computer not to print the document number but only to show it on the screen. When you use a comment control block, it does N0T affect your pagination, top or bottom margins.

Note: The idea for the above procedures was copied from a note located on the OASIG bulletin board.

MEMORIES OF SYMPOSIA PAST & PRESENT

Roger E. Bruner, Foreign Mission Board

Having attended four of the last five symposia, I've found each to be outstanding in its own way.

Anaheim '87 was my first, and I remember it as my initiation into not just a series of meetings and presentations, but an active process [pun intended] designed to accomplish something worth accomplishing. I came away with an assurance that I was not trying to function in the ALL-IN-1 world by myself, and I brought home the friendship of many new friends — both "DECies" and non-"DECies" — who would help me over and over again in the time since then.

Cincinnati is most memorable for the introduction of a "working prototype of a possible new release of ALL-IN-1" which finally officially became version 2.3. Our ALL-IN-1 trainer was at DECUS for the first time, and she felt so fortunate to have that preview in anticipation of how it would affect her training needs and plans. It was at Cincinnati that I won a meal with the ALL-IN-1 developer of my choice; being able to spend an evening with Rick Warford seemed more of an honor than winning the actual contest.

Atlanta '89 was such an important followup on 2.3, since it had been received by all sites by then and had actually been installed in some of them. I remember some very strongly and clearly stated opinions about the "to do's" and "not to do's" of 2.3. It was in Atlanta that I became more conscious of my role as a member of the OA SIG Steering Committee, something that comes with responsibility rather than privilege. Along the lighter side, it was in Atlanta also that I realized I could better keep from losing my Steering Committee label if I trimmed it and stuck it inside my DECUS badge holder. One is never too old to learn!

And now — Anaheim '89. It's going on all about me as I sit in the Campground on this Friday, November 10, as attendees talk to developers about their specific needs and problems. I am extremely pleased at how everything has gone so far. I myself still have a full day of sessions to attend, followed by an OASIG Steering Committee "POST WRAPUP", and — finally — a "redeye" back to the East Coast early Saturday morning.

But what information I'll be taking back with me! If the October announcement by DIGITAL of the plans for ALL-IN-1 2.4 was a (pleasant) surprise, it was so great to be able to get the details here and to see a working prototype of 2.4 on the exhibit hall floor. For my site, the upcoming queue management functions may mean having to do less tailoring on 2.3; having VAXNOTES bundled with ALL-IN-1 is an extra special treat, since it is something I've wanted for so very long, but could not justify our purchasing. I've also been really impressed with DIGITAL's apparent determination to work more closely with third-party vendors, and the two sessions (a followup had to be scheduled when time ran out in the

first) for "DEC ASKS THE OA SIG" were among the very best; there is no question in my mind that DEC wants to get our input for use in their planning. Where but at DECUS can they find such a representative group of their customer base?

I also appreciated the opportunity to visit the VTX Working Group meeting. Videotex is certainly well thought of by its users, but it seems to be a product which especially needs the support of a user group. You may recall that we had several VTX related articles in the November issue, and I hope we can count on the VTX working group to keep the rest of us well informed on this subject.

It would be an injustice to call this article a summary of Anaheim '89 (or of the other symposia mentioned); there will be followup articles from different contributors during the next several months. But I did want to take a few minutes off during the "heat of battle" to say how much I wish the rest of you could have been here!

NAME THE NEWSLETTER, CONTINUED FROM NOVEMBER

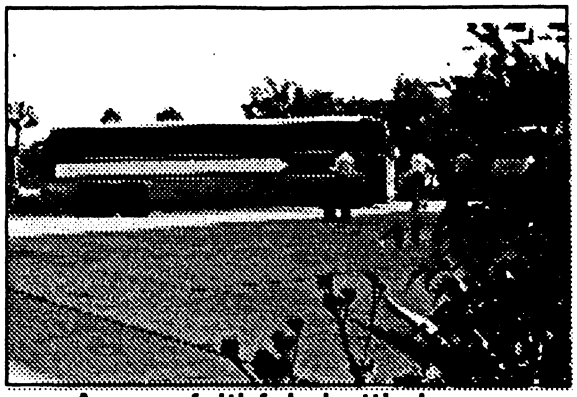
Roger E. Bruner, Foreign Mission Board

I mentioned a NAME THE NEWSLETTER contest in the November issue of the "OA SIG NEWSLETTER" which we need to name. I purposely omitted details because I wanted to check with other members of the OA SIG Steering Committee first. They have suggested that a prize be given, but I'm not sure if we decided on the prize yet. I did receive several suggestions at Anaheim which seem to be in keeping with our Eagle insignia; one of my favorites so far is — hey, wait! I can't tell you that yet! Please send your own ideas in as this contest closes upon receipt of a workable idea. The address is on page OA-1 under "SUBMISSIONS".

NOTE: The pictures on the next two pages are the best of one of two rolls of film. The other got "misplaced" by People's Drugs after being processed. Even if they find the pictures, it will be too late to do anything else for this issue. When I get them back, I may plan on a second pictorial report. Ed.

Pictures from Anaheim

Gatherings outside the DECUS Store



An everfaithful shuttle bus

Lynda Peach speaks out!

Illuminating Rick Warford

Attendee still alert on Thursday

Push & shove for morning break

The Land of Disney predominates

The VTX Working Group...working

DEC & the OASIG both listen

Packing up the Campground

The Q&A Session...or is it Wishlist?

Removing WELCOME DECUS sign

PERSONAL COMPUTER

SPECIAL INTEREST GROUP

PC

NEWSLETTER

TABLE OF CONTENTS

PRO Section

In the PRO Mailbag This Month
By Gary Rice

The following letter arrived just before press time. I thought that the information it contained would be useful to you.

November 11, 1989

Dear Gary,

I haven't been a very good correspondent, but I do read your columns in the DECUS PC SIG's Newsletter!

The PRO seems to be a thing of the past for most people, but I am getting a lot of mileage out of mine. I dedicated it to being a ham radio application engine. I write the software in BASIC Plus 2 and Datatrieve. I moved some sources to a VAX and re-compiled. They ran perfectly on the first try!

The COMM port on the PRO is connecterd to my ham radio set-up. If you ever want to use the COMM port from a language, it defaults to 1200 baud if you access it from BASIC, and you have to assign it to the logical "LP:" to get it to open successfully. FORTRAN may be different. If you have PRO/Comm, you can get it to whatever speed you want, but for those of us without PRO/Comm .....

I also discovered something new that might be interesting. If you set up a second terminal to log in via TT2: (the printer port) using the Multi-terminal Configuration Application from the Toolkit 3.x, you can disconnect the regular VR201 and keyboard, and the system will boot just fine. I thought for sure that it would get stuck on some error.

This means you can put the PRO in your closet, down in the cellar or where ever you want and connect a PC (Mac, Rainbow, Clone, whatever) to the printer port. When you want to use the PRO for something, just use Kermit or some other terminal emulator.

I didn't have my PRO hooked up for quite a while because it was such a hassle to have 2 monitors and 2 keyboards on the desk. Now I can have it connected to my Rainbow and have it default to my account and a "first application" of DCL. When I turn on the PRO and connect vai Rainbow Kermit, I get the "$" prompt.

I also found a place that has various systems (Rainbow, PRO, DECmate) and spare parts, if you should ever need them. Call Brian or Jennifer at (407)433-0846.

Last but not least, I would love to have a copy of the "Big Tape" that you just announced. There were quite a few disks in your collection that sounded interesting but I never got around to sending any blanks. This will hold me for quite a while! Thanks again for all your hard work and for being so generous.

Tom Cooper

Well, Tom, read on. The next article will be most interesting for you.

DEC Contributes Software to the Public Domain
By Gary Rice

At the DECUS Symposium this last November, DEC announced that the following products had been submitted to the DECUS Library and are now in the Public Domain:

Product	Library Order Number	Media Price	Docs. Price
P/OS V3.2	PRO177	$115	$65
PRO/BASIC V1.4	PRO174	$15	$25
SYNERGY V2.1	PRO180	$115	$55
SIGHT V1.1	PRO176	$25	$25
TOOLKIT V3.1	PRO178	$55	$240
INSTALLATION & MAINT V3.3	PRO179	$25	$10
PRO/DECNET V2.1	PRO175	$35	$25
Total		$385	$445

The following restrictions apply: First, Prose Plus (part of the Synergy package) does NOT contain the spell checker. It was licensed from a third party. Second, the docs are TEXT only. They contain no charts, graphs, pictures, or graphics of any kind. In addition, they only contain the PRO specific things in those cases where the docs crossed over into the RSX doc set. For example, the Toolkit Taskbuilder Manual will be almost completely missing since the bulk of the manual was written for RSX by the RSX product group.

Next month I will provide a more complete description of these products. In addition, I wil detail the plans we have to add them to the PRO PD Tape that I announced last month.

General Section

Mark Sebern Awarded Board Medal
By Lynn Jarrett

The PC SIG is very proud of one of its steering committee members, Dr. Mark Sebern, a long-time DECUS member. Mark was presented with a Board Medal at the Anaheim Symposium.

Mark's involvement with the PC SIG goes back several years and he has presented many technical sessions at symposiums over the years as well as a seminar in Anaheim in November. He has also been a contributor to the PC SIG Newsletter, submitting articles of which I'm sure many of you have benefitted in the past.

Mark, a former employee of DEC, and now president of Sebern Engineering, Inc., joined DECUS after grad school and has been a member ever since. He presented his first session at DECUS Chicago in April, 1980: "Running RSX-11M on the LSI-11 and LSI-11/2."

Other sessions he has presented include: Spring 1987 (Nashville) "Converting a User-Written Graphics Application To Run Under Synergy on the Pro."

Fall 1987 (Anaheim): "Converting a User-Written Graphics Application to Run Under Synergy on the Pro"; "Moving Pro Applications to a VAXstation'; and "My New PC is a VAXstation."

Spring 1988 (Cincinnati): "My New PC is a VAXstation"; "Moving PC Applications to a VAXstation"; and "A User's View of Interleaf's Electronic Publishing Software."

Spring 1989 (Atlanta): "Moving PC Applications to a VAXstation"; "A User's View of Interleaf's Electronic Publishing Software'; and "Writing a VAXstation (DECwindows) application."

At the Anaheim Symposium, Mark presented a popular seminar "Writing a DECwindows Application".

Members like this in DECUS who continually give of their time and technical expertise contribute greatly to its success. Thanks from all of us and congratulations to you, Mark.

Rainbow Section

DEC Licenses Rainbow News to Distribute (some) Rainbow Software
By Gary Rice

The following article is excerpted from an article that appeared in the September 1989 issue of Rainbow News. These excerpts are reprinted here with permission of Rainbow News, P.O. Box 567, O'Fallon, IL 62269

After much harranging by the Rainbow Community, DEC has agreed to allow for non-DEC distribution of certain Rainbow software and documentation. The arrangements were made through Beth Joseph, our newest PC SIG Digital Counterpart. Excerpts from the Rainbow News article follow:

After some deliberation, Digital has finally agreed to License RN to make available out-of-print Rainbow documentation and disks. If you are missing one or more manuals or disks, contact IRUG.

Disks	Original DEC part number
Winchester Utility/Diagnostic Disk (Formats and tests hard disks through 10 MB)	BL-W968A-M3
Rainbow 100 Diagnostic Disk RX50	BL-T309B-BV
PC100 Memory Utility Program RX50	BL-T905A-BV
Rainbow Diagnostic Disk	BL-Z628A-BV
Winchester Utility v.3.0 (Formats to 20 MB)	
Learning Rainbow Vol. 1 (CP/M)	BL-488A-BV
Learning Rainbow Vol. 2 (CP/M)	BL-Y889-BV
GSX86 v1 Bin RX50	BL-W965-RV

IRUG cannot supply copies of either the MS-DOS or CP/M operating disks as these are stil available, and are licensed by companies other than just Digital.

Manuals

Essential books, needed by most new Rainbow owners, and some old hands, as well, are available again. The documents are copied, not original. Because of the cost of making a few copies at a time, prices for some items (such as the Technical Documentation) may be prohibitive. Some items will be reduced slightly to fit on 8 1/2 x 11 paper (making your cost much lower).

Rainbow Owner's Manual
: Description of Rainbow components and their use. Use of Set-up key, printer connections, communications diagnostics tests. Well illustrated. A must for every Rainbow owner.

Read Me First
: Omissions and additions to the Rainbow 100 Installation Guide, Rainbow 100 Owner's Manual, Getting Started and Rainbow 100 User's Guide.

Rainbow Installation Guide
: Bare bones Basics: Unpacking, installation, testing.

Winchester Disk Option Notice and Change Notice to the Rainbow 100 Winchester Disk Option, Upgrade and Installation Guide

Getting Started - MS-DOS 2.05
: See description for CP/M

Getting Started - MS-DOS 2.11
: See description for

CP/M Getting Started - CP/M
: Seting up and turning on the Rainbow, how to format and copy diskettes, making working copies of the master system diskette. This is included with operating system documentation if you have it. Critical for beginners. Probably not necessary for more experienced users.

Rainbow 100 Memory Board Option and Adapter Installation Guide
: For use with Digital memory boards. Board assembly, removing system module, installation, adding chips, changing memory set up, testing memory, messages, failure code table.

Using the Hard Disk
: Using the hard disk with MS-DOS, setting up the hard disk, manual vs. automatic start, winchester disk messages, solving winchester disk problems, partitioning the hard disk, autoboot. Excellent explanation of how to install hard disk.

IRUG also has almost all of the documantation that has been made available for the Rainbow, including the first three volumes of Rainbow 100 Technical documentation (QV053-GZ, QV054-GZ, QV055-GZ; centered on the Rainbow A, CP/M, and DEC printer manuals) and two of the later volumes, Rainbow 100+/100B Technical documentation (QV069-GZ, 100+/100B docs, 100+/100B terminal emulation, Technical Manual Addendum for models 100A, 100B, and 100+, Rainbow 100 Technical Manual, Color Graphics Option Programmers Reference Guide, Intel Application Notes), and the MS-DOS v.2.05 Technical documantation (QV068-GZ, MS-DOS 2.05 Technical Documentation, 2.05 Programmer's Guide, 2.05 BIOS listings, MS-DOS Operating System Programmer's Reference Manual, MS-DOS Operating System Macro Assembler Manual, Rainbow Guidelines for

Producing Translatable Products). We also have BIOS Listings for MS-DOS 2.11. We do not have the newest CP/M Technical Documentation (QV067-GZ), and would welcome a donation of a complete set. Because these Technical Manuals run upwards of a thousand pages, we cannot, under ordinary circumstances, make copies of them. We suggest rather that those people who need them try to get them through the classified ad section of the Journal. We will make partial copies on an ad hoc basis. Members who absolutely must have this information should call or write for a price estimate.

That concludes the article from Rainbow News. Manuals range in price from $3.00 to $45.00. Disks are $20.00 each. Please note that NONE of these items are available through DECUS. Contact IRUG directly to obtain these items.

Rainbow Bibliography - Part 5: the Letter G

By Dr. Thomas Warren, PC SIG Session Notes Editor

The Bibliography that follows is reprinted here in serialized form with permission of:
Rainbow News, P.O. Box 567, O'Fallon, IL 62269, (618)632-1143

What follows is a selected bibliography of articles on the Rainbow. It is selective because it is not complete and not complete because I have not seen everything available. It is, however, complete enough to get the interested party started.

That is a small hint. Let me make a bigger one. IF YOU KNOW OF RAINBOW ARTICLES, PUBLICATIONS, BOOKS, ETC. THAT AREN'T LISTED HERE, PLEASE CONTACT ONE OF THE PC SIG STEERING COMMITTEE. Your input to this monumental effort on Tom Warren's part is VERY MUCH DESIRED! Our addresses and phone numbers appear at the back of these Newsletters. Ed. Each section is headed by a KEYWORD, a list of which are attached in an appendix. *This month, my quota of 25 pages allows me to include the letter "G" of the bibliography. Ed.*

GAMES

"Adventure", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 1, No. 4-5 (August-Sept., 1984), 4-5. (Games)

"Books", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 6 (June, 1985), 15-16. (Bibliography, Games)

"CodeBlue Reviews", RAINBOW NEWS, Vol. 4, No. 3-4 (March/April, 1987), 22. (Games, CB, HOOPS, Disk Optimizer, Wordprocessing, METHODS, SmallTalk, PC Scheme,PC-File, PC- Calc, BRIEF)

Fineman, Mark B. "Rainbow for Kids", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 12 (Dec. 1985), 5-6. (Games, Graphics, Dr.Logo, Software, Users)

Gavelis, Bill. "Software Review: Infocom's Deadline", WASHINGTON ARERA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 10 (Oct., 1985), 8. (Games)

Glossbrenner, Alfred. GOING ONLINE: COMMUNICATIONS ON THE DEC RAINBOW. Billerica, MA: Digital Press, 1984. (BBS, Bibliography, Modem, POLY-XFR, Games)

Gold, Bruce L. "INFOCOM Game Patch for Rainbows with 640K or More", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 3, No. 1 (Jan. 1986),16. (Games, ZORK)

McClinton, Rick. "Public Domain Game Review: HACK: Exploring the Dungeons of Doom", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 7 (July, 1985), 6. (Games, Software)

Reisler, Kurt L. "RCPM, RBBS, 'Freeware'--Public Domain Software for the Rainbow Personal Computer", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 3 (March, 1985), 6-7. (CP/M, BBS, Patch, Games, Accounting, KERMIT, XMODEM, Bibliography)

Shannon, Terry. "Public Domain Software Review: SCRAM: The China Syndrome on Your Rainbow", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 3, No. 2 (Feb. 1986), 6. (Games)

Shannon, Terry. "Wishbringer", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 3, No. 1 (Jan. 1986), 7. (Game)

GENEALOGY

"Letters to the Editor", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 8-9 (August-Sept., 1985), 13-14. (LISP, Communications, Modem, LA50, Hardware, Genealogy, Pascal)

"Letters to the Editor", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 10 (Oct., 1985), 15-16. (Memory, Genealogy, LA50, WordPerfect, WordStar, CP/M)

McClinton, Arthur, Sr. "Personal Ancestor File", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 3, No. 1 (Jan. 1986), 6-7. (Genealogy, Family History, Software, Patch)

"Ten Years of Personal Computers--A Partial Chronology", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 1, No. 7 (Nov., 1984), 4-5. (Genealogy, History)

GWBASIC (See also BASIC, MBASIC, BASICA)

"Application Software: New Languages for the Rainbow", PERSPECTIVE, Vol. 2, No. 3 (October 1984), 30-31. (MS-DOS, MBASIC, GWBASIC, PASCAL, FORTRAN)

"Digital Announces New Education Software Program", EDU, No. 38 (Spring, 1985), 44-45. (WordStar, PFS-File, MultiPlan, SuperCalc, GWBASIC, POLYCOM, Accounting, Spreadsheet, Communication)

Fitzgerald, Dennis K. "Report from Anaheim--The Fall 1984 DECUS Symposium", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 1 (January, 1985), 3-4. (8087, ReGIS, GWBASIC, MS-DOSv2.11, Lotus, DESQ, WordStar, Printers, Public Domain Software, AME86.EXE, MS-DOS, Bibliography)

Needleman, Theodore. "Rainbow Corner", HARDCOPY, Vol. 6, No. 4 (April 1986), 118-120. (Software, Public Domain, FIDO, Bulletinboards, I-Drive, GWBasic, BASIC, Switch-It)

Reid, Dave. "Fitting Dual Monitors to a Rainbow", RAINBOW NEWS, Vol. 4, No. 3-4 (March/April, 1987), 30-31. (Hardware, Modification, Graphics, Lotus, GWBasic)

"Software and Hardware", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 2 (February, 1985), 9-10. (Printers, Taxes, CP/M-86,MS-DOS,GWBASIC, MBASIC, POLYCOM, POLY-XFR)

"Software Available for the Rainbow", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 1, No. 4-5 (August-Sept., 1984), 10. (Sideways, GWBASIC, Accounting)

GRAFIX PARTNER

"Application Software: GraFIX Partner", PERSPECTIVE, Vol. 4, No. 2 (n.d.), 13. (Graphics)

Bassin, N. Jay. "Chairman's Corner: Caveat Emptor Grafix Partner", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 12 (Dec., 1985), 3. (Graphics, Software, Utilities, Norton)

GRAFTALK

"Application Software: GrafTalk, Business Graphics for the Rainbow and DECmate II", PERSPECTIVE, Vol. 3, No. 1 (January 1985), 30.

Heinz, Lisa. "Graftalk: A Few Comments", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 2 (February, 1985), 7. (Graphics)

"Q/A: GrafTALK", PERSPECTIVE, Vol. 2 No. 3 (October 1984), 44. (Graphics)

Saul, Bob. "Product Review: Graftalk", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 6, No. 3 (June 1986), 10-11. (Software, Graphics, Charts)

GRAMMATIK

Bassin, N. Jay. "Product Review: Writer's Pack (Part One)", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 2 (February, 1985), 3-5. WordStar, Wordprocessing, Utilities, Footnote, Bibliography, Grammatik, Proofreader)

Bassin, N. Jay. "Product Review: Writer's Pack (Part Two)", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 3 (March, 1985), 8-9. (WordStar, Gammatik, Proofreader, Footnote, Bibliography)

Bassin, N. Jay. "Product Review: Writer's Pack (Conclusion)", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 4 (April, 1985), 5-6. (Footnote, Bibliography, Grammatik, WordStar, Proofreader, Indexer)

GRAPHICS

"Announcing New Products: The Rainbow Personal Presentation System", PERSPECTIVE, Vol. 2, No. 3 (October 1984), 10-11. (Graphics, Slides)

"Announcing New Products: Rainbow ReGIS", PERSPECTIVE, Vol.4, No. 1 (January 1985), 9. (Graphics)

"Application Software: AutoCAD ADE3", PERSPECTIVE, Vol. 4, No. 2 (n.d.), 12-13. (Graphics)

"Application Software: Context MBA: An Integrated Softwear Package for the Rainbow 100", PERSPECTIVE, Vol. 2, No. 3 (October, 1984), 32-33. (Spreadsheet, Graphics, Wordprocessing, Data Management, Communications)

"Application Software: Daisy-Aids", PERSPECTIVE, Vol. 1, No. 2 (July 1983), 25-26. (Graphics)

"Application Software: DECmate II and Rainbow Hop Aborad the Overhead Express", PERSPECTIVE, Vol. 3, No. 2 (June 1985), 15-16. (Graphics)

"Application Software: GraFIX Partner", PERSPECTIVE, Vol. 4, No. 2 (n.d.), 13. (Graphics) "Application Software: GrafTalk, Business Graphics for the Rainbow and DECmate II", PERSPECTIVE, Vol. 3, No. 1 (January 1985), 30.

"Application Software: GraphPlan, Integrated Graphics and Spreadsheet for the Rainbow 100 and 100+", PERSPECTIVE, Vol. 3, No. 1 (January 1985), 30-31.

"Application Software: Lotus 1-2-3", PERSPECTIVE, Vol. 2, No. 1 (January 1984),36-37. (Spreadsheet, Graphics)

"Application Software: Matrix-Aids V3.1 Graphics Software for the Rainbow, DECmate II and DECmate III", PERSPECTIVE, Vol. 3, No. 1 (January 1985), 31-32.

"Application Software: SuperCalc3", PERSPECTIVE, Vol. 4, No. 1 (n.d.), 10. (Spreadsheet, Graphics)

"Application Software: 20/20 Integrated Spreadsheet Modeling Program", PERSPECTIVE, Vol. 4, No. 1 (n.d.), 11. (Data Management, Graphics)

"April Meeting Notes", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 5 (May, 1985), 2-4. (Software, Graphics, Overhead Express, dBaseIII, Integration, DESQ, Spreadsheets, MS-DOS, LNO3)

Bassin, N. Jay. "Chairman's Corner: Caveat Emptor Grafix Partner", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 12 (Dec. 1985), 3. (Graphics, Software, Utilities, Norton)

Bassin, N. Jay. "Lotus 1-2-3 Printgraph on the Rainbow", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 6 (June, 1985), 10. (Printing, Graphics)

Bassin, N. Jay. "Product Review: Overhead Express", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 6 (June, 1985), 4-5. (Graphics)

Bassin, N. Jay. "Screen Controls from CP/M Operating System", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 3, (March, 1985), 13. (Graphics, Printers)

"Books", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 1, No. 7 (Nov., 1984), 9. (Bibliography, Communications, MultiPlan, Lotus, Graphics, WordStar)

Bowman, Carl. "Software Review: Benchmark Composer", RAINBOW NEWS, Vol. 4, No. 5-6 (May-June, 1987), 16. (Fonts, Typefaces, Graphics, Wordprocessing)

Carzell, Marquetta. "Technical Perspectives: Plotting XY Graphs U Using LOTUS 1-2-3 on your Rainbow Personal Computer", PERSPECTIVE, Vol. 2, No. 2 (May 1984), 12. (Lotus, Graphics)

Chattaway, Alan. "Notes from Down Under", RAINBOW NEWS, Vol. 4, No. 3-4 (March/April, 1987), 40-41. (ASCII, WordStar, CP/M, ENSOFT, TEXTSOFT, PrintMAster, PrintShop, CP/M-80, Graphics)

Chorney, Victor J. "Look", THE DEC PROFESSIONAL, Vol. 5, No. 7 (July 1986), 72-73. (Graphics, Communications)

"Computer Graphics: An Emerging Technology", PERSPECTIVE, Vol. 3, No. 1 (January 1985) 20-23. "Computer Graphics: Spanning the Applications Spectrum", PERSPECTIVE, Vol. 3, No. 1 (January 1985), 24-29.

"DEC Rainbow 100 Interface: Taking Advantage of Powerful Video Capabilities", DATA BASED ADVISOR, December, 1984, no pp. (Graphics, dBaseII, Monitor)

"Dr. Logo: Beyond Turtle Graphics", EDU, No. 38 (Spring, 1985), 35-36. (Training, Languages, Programming)

Fineman, Mark B. "Rainbow for Kids", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 12 (Dec. 1985), 5-6. (Games, Graphics, Dr.Logo, Software, Users)

Fitzgerald, Dennis. "Dualing Monitors", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 3, No. 3 (March 1986), 10-11. (Hardware, Graphics, Monitor)

Fitzgerald, Dennis K. "Product Review: Graphwriter", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 6 (June, 1985), 3-4. (Graphics, Printers, LA50, LA100, Multiplan)

Fitzgerald, Dennis. "Software Review: 20/20", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 3, No. 4 (April 1986), 8-11. (Spreadsheet, Database, Graphics)

Geremia, Ken. "Software Review: In Search of a Sharper `Image'", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 8-9 (August-Sept., 1985), 5-6. (CP/M, Wordprocessing, Graphics)

"Grapevine, The", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 7 (July, 1985), 14. (dBaseII, Lotus, Pascal, Graphics)

Hall, Carl E. "A Short Primer for the Rainbow Graphics Interpreter", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 3, No. 2 (Feb. 1986), 9-13. (Training)

Hall, Carl E. "Software Review: look Version 1.1", RAINBOW NEWS, Vol. 4, No. 10-12 (Oct.-Dec.,1987), 12-13. (Graphics, CP/M)

"Hardware and Software Available", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 1, No. 7 (Nov., 1984), 8-9. (Terminal, E-Mail, Desktop, WordStar, LA100, CP/M, ADA, Graphics, Printer, MS-DOS, Accounting, Cables)

Heinz, Lisa. "Graftalk: A Few Comments", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 2 (February, 1985), 7. (Graphics)

Herzfeld, Val. "Simple BASIC PRogram to Create a Screen Pattern Generator", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 6 (June, 1985), 10-11. (Programming, Graphics)

"January Meeting Notes", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 2 (February, 1985), 1-2. (Communications, PolyCom, PolyTrm, Kermit, Terminal, Emulator, ReGIS, Graphics, MS-DOS, Knowledgeman, Multiplan, CP/M, FIDO)

McClinton, Arthur Jr. "Product Review: rainbow ReGIS", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 3 (March, 1985), 7-8 (Graphics, KERMIT, POLYCOM, MS-DOS, CP/M, CP/M-86)
McClinton, Art. "Rainbow ReGIS Update Available", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 3, Nos. 11-12 (Nov-Dec. 1986), 18-19. (Graphics)

McSweeny, Jim. "Rainbow Graphics--GSX/RGI", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 1, No. 6 (Oct., 1984), 5-6. (CP/M, RGI)

"Managing Information in Today's Office", PERSPECTIVE, Vol. 3, No. 2(June 1985), 24-29. (Data Management, Wordprocessing, Communication, Spreadsheet, Graphics)

Maroun, David P. "Using MBasic to Write Graphics Programs", RAINBOW NEWS, Vol. 4, Nos. 1-2 (Jan-Feb, 1987), 22-24. (Programming)

Mattson, Dick. "A Mystery Unravels", PERSPECTIVE, Vol.2, No. 2 (May 1984), 11. (Graphics, BASIC)

"May Meeting Notes", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 1, No. 2 (June, 1984), 1. (Lotus, Graphics,)

Miller, Jerry. "Project Transport", THE DEC MICROLETTER, Vol. 1, No. 3 (n.d. [1987]), 31-32. (Graphics, Monitor, Cards, EGA)

Needleman, Ted. "Rainbow Ramblings", THE DEC MICROLETTER, Vol. 1, No. 1 (Nov, 1986), 3. (Graphics, Desktop Publishing)

Needleman, Theodore. " Software Products That Enhance System Productivity", HARDCOPY, Vol. 7, No. 3 (March 1987), 123-130. (Accounting, Graphics, Switch-It)

Neiburger, Carl. "Probing the Mysteries of Video Memory", RAINBOW NEWS, Vol. 4, No. 5-6 (May, 1987), 27-28. (Graphics, Hardware)

"New Products for the Rainbow Personal Computer Line [Office Workstation]", EDU, No. 38 (Spring, 1985), 37-39. (Hardware, ReGIS, Graphics, WPS-PLUS, Communication, Networking, Lotus)

O'Neal, Tim. "Technical Perspectives: Using GSX-86 with Assembly Language on Your Rainbow", PERSPECTIVE, Vol. 2, No. 3 (October, 1984), 14-15. (Graphics, GSX)

Osborn, William R. and J. David Maupin. USING BUSINESS GRAPHICS: LOTUS 1-2-3 ON THE DEC RAINBOW. Billerica, MA: Digital Press, 1984. (Spreadsheet)

Osborn, William R. and J. David Maupin. USING BUSINESS GRAPHICS: LOTUS 1-2-3 ON THE DEC RAINBOW. New Bedford, MA: Digital Press, 1985.

Pappas, George. "Rainbow ReGIS", PERSPECTIVE, Vol. 4, No. 1 (n.d.), 22-23. (Graphics, Patch)

Poor, Hank. "Software Review: GMT-10 Tektronix 4010 Emulator", RAINBOW NEWS, Vol. 4, Nos. 1-2 (Jan-Feb, 1987), 5. (Graphics Terminal emulator)

"Product Announcement: STSC Announces APL*PLUS for DEC Rainbow", WASHINGTON AREA USERS GROUP NEWSLETTER, Vol.2, No. 2 (February, 1985), 2-3. APL, Langauges, BASIC, FORTRAN, COBOL, Pascal, Graphics)

"Q/A: DaisyAids", PERSPECTIVES, Vol. 2, No. 2 (May 1984), 44-45. (Graphics)

"Q/A: GRAPHPLAN-86", PERSPECTIVE, Vol. 3, No. 1 (January 1985), 44.(Graphics, Spreadsheet)

"Q/A: GrafTALK", PERSPECTIVE, Vol. 2 No. 3 (October 1984), 44. (Graphics)

"Q/A:GSX-86", PERSPECTIVE, Vol. 3, No. 2 (June 1985), 40-41. (Graphics, GSX)

"Questions and Answers", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No.1 (January, 1985), 14-15. (Graphics, Languages)

"Questions and Answers", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 5 (May, 1985), 9-10. (Diskdrives, Communications, WordStar, Multiplan, ASCII, Terminal, Lotus, CP/M-86, Graphics, ReGIS)

"Rainbow ReGIS--Software Patch for VT102, VT125, and VT240 Terminals", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 12 (Dec. 1985), 11-12. (Graphics, MS-DOS)

"Rainbow Questions and Answers", PC-SIG NEWSLETTER, Vol. 2, No. 4 (June, 1985), 43-45. (Terminal, Lotus, Spreadsheets, dBaseII, CP/M-86, Multiplan, MS-DOS, CP/M, LA50, LA100, MBASIC, Samna, Graphics)

Reid, Dave. "Fitting Dual Monitors to a Rainbow", RAINBOW NEWS, Vol. 4, No. 3-4 (March/April, 1987), 30-31. (Hardware, Modification, Graphics, Lotus, GWBasic)

Reid, Dave. "Improving GSX's Printer Output", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 3, No. 4 (April 1986), 14. (Graphics, Printers, LA100)

Rhodes, Bob. "Software Review: Is Condor an Endangered Species?:2" RAINBOW NEWS, Vol. 4, No. 10-12 (Oct.-Dec., 1987), 16. (Database, dBase, Graphics)

Saul, Bob. "Product Review: Graftalk", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 6, No. 3 (June 1986), 10-11. (Software, Graphics, Charts)

Shephard, Frank. "Create Fractals on a Rainbow", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 10 (Oct., 1985), 11-12. (ReGIS, BASIC, Programming, Graphics)

"Software and Hardware", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 1 (January, 1985), 14. (ChessWright, BASIC, Compiler, Graphics, Database)

"Software and Hardware", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 3 (March, 1985), 16. (Financial Planning, Real Estate, MArketing, Database, GRaphics)

"Software and Hardware", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 6 (June, 1985), 15. (Communications, Graphics, Modem, Autocad, Knowledgeman, Dr. Logo, Utilities, CP/M, Hardware)

"Use GSX Graphics with Turbo Pascal", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 6 (June, 1985), 12.

Worsh, Arthur J. "Software Review: Graph'n Sketch", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 3, No. 1 (Jan. 1986), 5-6. (Graphics)

Yin, Khin Maung. "GW-BASIC: A Color Graphics Language Tool for Your Rainbow", THE DEC PROFESSIONAL, Vol. 5, No. 5 (May 1986), 38-43. (Basic)

Yin, Khin Maung. "Rainbow ReGIS", THE DEC PROFESSIONAL, Vol. 5, No. 7 (July 1986), 30-34, 36-37. (Graphics)

Yin, Khin Maung. "Rainbow ReGIS: A Color Graphics Tool for the Rainbow", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 8-9 (August-Sept., 1985), 10-12. (ASCII, Terminal, MBASIC, LA50, Software)

GRAPHPLAN

"Application Software: GraphPlan, Integrated Graphics and Spreadsheet for the Rainbow 100 and 100+", PERSPECTIVE, Vol. 3, No. 1 (January 1985), 30-31.

"Q/A: GRAPHPLAN-86", PERSPECTIVE, Vol. 3, No. 1 (January 1985), 44.(Graphics, Spreadsheet)

"Software Available for DEC Rainbow", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 1, No. 2 (June, 1984), 3. (Indix, GraphPlan)

GRAPHWRITER

Fitzgerald, Dennis K. "Product Review: Graphwriter", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 6 (June, 1985), 3-4. (Graphics, Printers, LA50, LA100, Multiplan) "Software Available for the DEC Rainbow", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 1, No. 3 (July, 1984), 5. Investment Manager, Calc, Graphwriter, Communications, WordEase, Programming, C)

GSX

McSweeny, Jim. "Rainbow Graphics--GSX/RGI", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 1, No. 6 (Oct., 1984), 5-6. (CP/M, RGI)

O'Neal, Tim. "Technical Perspectives: Using GSX-86 with Assembly Language on Your Rainbow", PERSPECTIVE, Vol. 2, No. 3 (October, 1984), 14-15. (Graphics, GSX)

"Q/A:GSX-86", PERSPECTIVE, Vol. 3, No. 2 (June 1985), 40-41. (Graphics, GSX)

Reid, Dave. "Improving GSX's Printer Output", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 3, No. 4 (April 1986), 14. (Graphics, Printers, LA100)

"Use GSX Graphics with Turbo Pascal", WASHINGTON AREA RAINBOW USERS GROUP NEWSLETTER, Vol. 2, No. 6 (June, 1985), 12.

PCSA Section

DEC's Replies To PCSA Wish List Top 10
By Fran Garrett, PCSA Working Group Chair

Hi y'all, I have just returned from another successful DECUS and have some important information to share. I'm afraid that the deadline on this issue of the Newsletter is so close that I will have to scramble to even get the key item covered. I do want to tell you that the PCSA sessions were outstanding this Symposium and were very well attended.

As you may or may not know, as PCSA Working Group Chair, I gather System Improvement Requests (SIR's) from DECUS members and then ask you to vote on the top ten items to be considered by DEC engineering for future enhancements. These SIR's (or WISHES) are typically gathered during Symposia and are submitted to DEC to respond to at the next DECUS.

In an effort to get as much input as possible, I am trying something different this time. I would like to use this forum to request any additional SIR's. If you have any items that you think are worthy of DEC engineering efforts, then please mail them to me and I will include them in the "Wish List" to be voted on.

When I have gathered all the SIR's, I will publish them in this Newsletter as well as mail a copy to all those who have given me their mailing information. You can then vote on which items ar the most important to you.

I can be reached in the following manner:

Fran Garrett
Union-Tribune Publishing Co.
350 Camino de la Reina
San Diego, CA 92112
(619) 293-1676

For your information, DEC's responses to the PCSA top ten wish list items for Fall DECUS 1989 were as follows:

1) Provide an option to automatically disconnect from disk or file services after a user-definable period of inactivity.
* *This request conflicts with the automatic re-connect feature of the server.*

2) Need ability to fully remap keyboard to use with third party software such as WordPerfect.
* *We need more information on this one, please try to be more explicit.*

3) Common boot disk images--all PC's share that which is common instead of 360kb being used for each PC.
* *Good idea, we will consider for a future release.*

4) Documentation to include:
   a) Need a getting started section.
   * *Done in V3.0*
   b) Need streamlined section for installation procedures.
   * *Done in V3.0*
   c) Should include instructions for integration with ALL-IN-1.
   * *No current plans for this.*
   d) Better documentation on sequences of events/messages-- what's going on internally.
* *On going.*
   e) Small and inexpensive--users will not buy whole set. Example: MAIL could use reference card
   * *V3.0 doc set has been repackaged to solve this.*

f) Documentation is needed on CD-ROM.
* *Will consider for a future release.*

5) Disk services MUST have multiple read/write capabilities.
* *This is technically not feasible. But the solution is the faster file server in V3.0*

6) Resource accounting.
* *This will be phased in over time.*

7) Truly transparent failover including ability to connect to file server without specifying node name as is done with disk server.
* *Good idea, may be implemented as Digital develops naming services.*

8) Want to see the GRANT command support identifiers-- not to just allow GRANT to the GROUP/PUBLIC.
* *Good idea, will consider for a future release.*

9) File server to support resource identifiers.
* *We interpret this as a poart of resource accounting and will be phased-in over time.*

10) One password on normal boots (no additional passwords required--system remembers what service user can access).
* *Good idea, will consider implementing over time.*

PCSA System Administration
By Ronnie Cheng, Digital Equipment Corporation

Slides from the Fall DECUS Symposium session PC074 are reproduced here for the benefit of those people who could not obtain copies at the session. Ed.

Personal Computing
Systems Architecture
System Administration

Ronnie Cheng
Digital Equipment Corporation, U.S.A
Personal Computing Systems Group
Fall DECUS, Nov. 1989

PCSA System Administration

Topics

Differences
Installation
Configuration
PCSA Administration

Differences

PCSA V2.2 to V3.0 Server changes

- File Server provides Data and Open File Caching
- File Server includes support for Microsoft Basic LANMAN Redirector 1.0 protocol.
  - Read Raw
  - Write Raw
  - Lock and Read
  - Write and Unlock
- Provides remote boot configuration via the use of template disk.
- Enhanced PCDISK command set.
- PCSA manager includes a menu selection for setting up a HP Laserjet.

Differences

PCSA V2.2 to V3.0 Client changes

- Enhanced Client Configuration utilities
- PCSA network client software includes support for EMS/XMS
- Incoporates NETBIOS into DNP
- Included client broadcast facility
- Enhanced PC DECwindows
  - Enhanced Display facility
  - New Configuration utility
  - Extended memory support with virtual memory manager
  - Enhanced PC Session Manager to support suspend session
- Single-buffered datalinks are included but unsupported

Installation

Preparing to Install

- System Backup
- Checking SYSGEN parameters
  - CHANNELCNT
  - GBLPAGES
  - GBLSECITONS
  - MAXBUF
  - NPAGEDYN
  - SCSNODE
  - SCSSYSTEMID
  - SYSMWCNT
  - WSMAX

Installation

Preparing to Install

- Define logical names
  - SYSUAF
  - NETPROXY
  - RIGHTSLIST
- Start DECNET
- Planning Disk Usage

Installation

Planning Disk Usage

- Server software requires 4500 blocks of disk space on sys$sysdevice:
- Client software requires 26000 blocks of disk space
- Application software
- Personal accounts and common services area
- Remote boot disks

Note: For better server performance, try to distribute services to different spindles.

Installation

Installing the VMS Server

- PCSA V3.0 supports VMS 5.1 and 5.2
- PCSA V3.0 supports VMS media type TK50, RX33 and MagTape
- Use VMSINSTAL to load VMS Services for PCs to the server
- Modify the SYSTARTUP_V5.COM file to start LAD & PCFS
- Enable circuit service, if you planned to use remote boot.
- Modify DECnet EXECUTOR database
  - pipeline quota
  - maximum link

Installation

Installing the VMS Server

- Check/modify pcfs_startup.com to adjust run command qualifiers
  - AST_LIMIT
  - BUFFER_LIMIT
  - IO_BUFFERED
  - IO_DIRECT
  - MAXIMUM_WORKING_SET
  - PAGE_FILE
- Check/modify lad_startup.com to adjust
  - maximum number of disk services mounted simultaneously
  - maximum number of workstation connections
- Start the queue manager

Installation

Installing PCSA Client

- Use VMSINSTAL to load PCSA Client software
  - supported media includes TK50 and Magtape
- Also available in floppy media for
  - Asyn - DECnet-DOS
  - PC DECwindows on ULTRIX
- Automatic Upgrade Process includes
  - copying V2.2 remote boot TSK images to a subdirectory.
  - extracting MS-Windows files to create MSWINV21 service.
  - update logical pcsa$system_container to point to the V3.0 system container file.
- Configure the initial workstation
  - Use NETSETUP utility to create a key disk for the initial workstation.
  - This workstation can be either booted from a hard disk or a floppy.
- Installing DOS system files with DOSLOAD utility

Installation

Installing Applications

Choosing the type of Servers:

- LAD - Disk Service
  - Application that can be installed to a floppy device
  - Application that can be executed from a read-only area.
- PCFS - File Service
  - Application that can be installed as a network application.
  - Application that requires write access for temporary files in the service area.
  - Restrict access to the application needed to be enforced on a UIC basis.

** Note that the LAD server will offer better performance.

Installing Applications

Using the Disk Server

General steps used to install an application to a disk server:

- At the server, use the PCSA_MANAGER Create Disk command to create an application virtual disk for the application.
- Use the PCSA_MANAGER Mount Disk command to mount the disk for read/write access.
- At the workstation, connect to the application virtual disk just created with the NET USE command.
- Run the application installation procedure, specify the drive to which you connected the application virtual disk in the previous step when prompted.
- At the server, dismount the service and remount it read-only. You can specify a password if want to maintain control over who can access the service. Use /CONNECTION qualifier to limit the number of simultaneous users in compliance to application license agreement.

Installing Applications

Using the File Server

General steps used to install an application to a file service:

- At the server, use the PCSA_MANAGER Add Service/Dir command to create an application service for the application. Use /CONNECTION qualifier to limit the number of simultaneous users in compliance to application license agreement.
- Use the PCSA_MANAGER Grant command to offer the system administrator read/write access to the service, and the users, who require access, read-only access to the service.
- At the workstation, connect to the application service you just created with the NET USE command. Be sure to specify the system administrator access control string when you connect.
- Run the application installation procedure.

Configuring PCSA Clients

Choosing the Boot Media

PCSA supports three types of boot media :

- Hard disk
- Floppy Disk - 3.5" and 5.25"
- Network Key Disk - remote boot

Choose the type of boot media for the workstation prior to configuring the workstation. Your choice will depend on:

- Is another server available for system disk service ?
- Will the workstation need to be able to function as a standalone machine if the network is not available?
- Do you want centralized control of the workstations boot media.

Configuring PCSA Clients

Remote Boot

- a process in which a client workstation is booted with a virtual disk service.
- provides centralized control of the workstation's boot media.

** Note: Remote boot consumes additional memory 5K.

Configuring PCSA Clients

Choosing the Memory Option

PCSA V3.0 supports loading network components into XMS/EMS. Options:

- Conventional Memory
  - Conventional memory consumption = 182K
- EMS/XMS
  - Conventional memory consumption = 69K
  - Conventional memory consumption if remote booted = 87K
  - XMS/EMS must be configured before running the configuration utility.
  - Potential conflict between some XMS drivers and the redirector.

** Note: LAD and LAST cannot be loaded into EMS if workstation is remote booted.

Configuring PCSA Clients

Choosing the Memory Option

XMS/HMA supports for 80286 and 80386 machines - 64K

- Loading Redirector

EMS supports for 8086, 80286 and 80386 machines - 128K

- Loading LAD
- Loading LAST
- Loading RCV
- Loading LAT
- Loading DNP

Configuring PCSA Clients

Using the Configuration Utility

The NETSETUP utility supports the configuration of a

- LOCAL booted workstation
  - hard disk
  - floppy disk
- Remote booted workstation
  - virtual disk

In addition, it provides supports for upgrading V2.2 local and remote boot workstations.

Configuring PCSA Clients

Creating User profile

Use PCSA_MANAGER menu to tailor the user environment to

- automatically connect to application services
- automatically connect to print services

PCSA Administration

Starting/stopping the Servers

- Starting the Servers
  - Execute the command file PCFS_STARTUP to start/restart the PCFS server. Related files: PCFS_LOGICALS.COM and PCFS$SERVICE_DATABASE.DAT
  - Execute the command file LAD_STARTUP to start/restart the LAD server. Related files: LAD_LOGICALS.COM and LAD$SERVICE_DATABASE.DAT
- Stopping the Servers
  - Execute the PCSA STOP FILE CONNECTION/ALL command to stop all file server connections.
  - Execute the PCSA STOP DISK CONNECTION command to stop all disk server connections.

the Management Utilities

PCSA_MANAGER

PCSA_MANAGER utility offers two interfaces in managing the PCSA services:

- Command line style
  - quicker to use
  - can be executed from a command file
  - provides better controls
- Menu
  - easy to use
  - provides standard PCSA managements

the Management Utilities

PCDISK

PCDISK provides file management capabilities on a LAD container file from the VMS operating system. It supports:

- general purpose DOS functions, including new commands:
  - attribute
  - create
  - format
  - label
  - show
  - spawn
  - xcopy
- file manipulations to/from a virtual disk from/to VMS - export and import commands.
- virtual disk that emulates a DOS diskette.
- VMS accessible DOS-formatted devices, RX33 and RX24.
- access via the use of file name and service name.

the Management Utilities

PCDISK

PCDISK implements virtual disk access as follows:

- can connect to a virtual disk file that is mounted read only.
- cannot connect to a virtual disk file that is mounted read/write.
- can connect with shared read access to a virtual disk file with other PCDISK readers.
- can connect to read/write services as a client workstation.
- can connect to read-only services as a client workstation.

the Management Utilities

LASTCP

LASTCP is the management interface that allows you to control and diagnose LASTDRIVER. It includes the abilities to

- start and stop the LASTDRIVER
- display counters for circuits, lines, nodes and LASTDRIVER
- display node characteristics
- display known clients and servers
- display LAST status
- reset LAST counters

PCSA Administration

Managing PCSA services

Use PCSA_MANAGER to create and maintain

- System Services
  - PCSA$DOS_SYSTEM_V30 (LAD)
- Application Services
  - PCFS$UPDATE and PCFS$READ identifiers are added to provide access control to an application service via the use the default account.
  - It supports USER name base of protection via the use of PCSA GRANT command.
- Common Services
  - A common file storage for all users.
  - It implements UIC base of access control.

PCSA Administration

Managing PCSA services

- Personal Service - User Accounts
  - It allows access to a VMS user account.
  - It is not part of the service database.
  - It implements UIC base protection.
  - PCSA_MANAGER provides functionality to add, modify and remove a VMS user account.
  - A user profile is created, autouser.bat to automatically make connection to selected application/common services.
- Print Services

PCSA Administration

Print Services

Creating a VMS print queues for supported printers:

- Use PCSA menu - Print Queue option
- Provides supports on setting up a print queue for
  - LN03
  - LN03P
  - LA75
  - LA50
  - LJ250
  - HP Laserjet (unsupported)

Configuring PCSA Server

Print Services

Creating a VMS print queues for non-supported printers:

- Set terminal and device characteristics
- Create a device control library for the printer
- Define a form for the printer using the DEFINE/FORM command
- Create a generic queue associated with the queue
- Update the VMS startup file specific to your site to define the form and initialize the queue when you restart the system
- Add the service and grant user access to the service using PCSA_MANAGER menu interface.

Configuring PCSA Server

Print Services

Creating a Print Service for an existing queues

- Add the service and grant user access to the service using PCSA_MANAGER menu interface.

Managing Keydisks

NETSETUP

NETSETUP offers both local and remote keydisk management. In particular, it can

- create
- maintain
- upgrade

any PCSA keydisks.

Managing Keydisks

PCSA_MANAGER

PCSA_MANAGER provides command set to maintain network keydisk, including the ability to :

- create and delete a network keydisk template.
- create customized network keydisks with a template.
- display network keydisks.

Managing Keydisks

Maintaining V2.2 workstation keydisks

- Use PCSA_MANAGER to create a network keydisk and make the necessary NCP database definitions.
- Use V2.2 NETSETUP to create/modify and copy the necessary files from V2.2 system container file to the network keydisk.
- Copy bshell.exe from system service to the network keydisk
- Modify config.sys to include shell=bshell.exe /p:512

PCSA Administration

Managing PCFS Server Performance

PCSA V3.0 offers Open File and Data Caching in the file server.

- Performance Tuning Mechanism
  - PCFS$BUFFER_SIZE
  - PCFS$CACHE_OPEN_FILES
  - PCFS$CACHE_SIZE
- Monitoring Tools
  - PCSA show file counters

Managing PCFS Server Performance

Performance Tuning Mechanism

PCFS$CACHE_SIZE

- This logical defines the amount of non-paged memory that the file server allocates for the cache buffer.
- In all network environments, increasing this value will improve the file server's performance.
- The amount of performance gain by increasing this value depends on the file size and the locality of reference (spatial and temporal.)

Managing PCFS Server Performance

Performance Tuning Mechanism

PCFS$BUFFER_SIZE

- This logical defines the size of disk read/write buffers in bytes.
- Adjusting this logical will provide significant performance improvement when the server system does not have a MSCP disk controller (e.g. uVAX 2000.)

Managing PCFS Server Performance

Performance Tuning Mechanism

PCFS$CACHE_OPEN_FILES

- This logical enables or disables open file caching.
- Open file caching will improve the file server's performance in most cases.
- Exception: If the application creates a large number of small temporary files, open file caching will have negative effect on the file server's performance.

Managing PCFS Server Performance

Monitoring Tools

The PCSA SHOW FILE COUNTERS command displays caching statistics in :

- Open file caching
  - Cache hit rate
- Network efficiency
  - SMB requests
  - bytes read/written
- Data Caching
  - disk reads/writes
  - data not-in-cache
  - read waits & read tries
  - buffer waits
  - serial waits
  - file extents

Managing PCFS Server Performance

Tuning

Increase the cache size (PCFS$CACHE_SIZE) if

- the ratio of read waits to read tries is high
- the ratio of data not-in-cache to read tries is high
- a large value is displayed for buffer waits
- the ratio of disk reads to SMB read requests is high
- the ratio of disk writes to SMB write requests is high

Managing PCFS Server Performance

Tuning

Associate system parameter: WSMAX

- WSMAX >= PCFS$CACHE_SIZE + 1024 + (50 * #work-station)

Associate run command qualifiers:

- IO_DIRECT = PCFS$CACHE_SIZE * 512 / PCFS$BUFFER_SIZE
- AST_LIMIT = IO_DIRECT + IO_BUFFERED + QUEUE_LIMIT + ENQUEUE_LIMIT

PCSA Administration

Managing LAD Server Performance

- Performance Tuning Mechanism
  - PCSA Start Disk_Server Connection /CACHE=
  - Increase the cache size in increments of 256 pages.
- Monitoring Tool
  - PCSA Show Disk counters /cache
  - Monitor Cache hit rate - should achieve 80%

Managing LAD Server Performance

Tuning

If the cache hit rate is less than 80%, increasing the cache size can improve the LAD server performance. Associated system parameters:

- NPAGEDYN
  - The amount of NPAGEDYN consumed by LAD and LAST is the sum of
    - cache size * 525 (bytes)
    - 30,000 bytes for the driver images
    - (#server + #client) * 250 (bytes)
    - # mounted service * 100 (bytes)
    - # node connection * 100 (bytes)
    - # service connection * 350 (bytes)

Managing PCFS Server Performance

Performance Tuning Mechanism

- LRPCOUNT and IRPCOUNT
  - Increase the LRPCOUNT and IRPCOUNT when their current size is equals to the maximum size. Use Show MEM/full to display the values.
  - Increase the IRPCOUNT in increment of 100.
  - Increase the LRPCOUNT in increment of 10.

PCSA Administration

PCSA Security Mechanism

PCFS Server honors

- VMS break-in evasion security measure
- access according to the PCSA GRANT command
- ACL
- UIC - RMS protection mask

LAD Server provides password protection per service basis.

PCSA Administration

Managing PCSA in a Cluster

LAD services:

- PCSA_MANAGER provide cluster-wide service management via the use of one common database.

PCFS services:

- File server process must be started on all cluster members that will provide file services.
- File server implements cluster-wide locking to enable share access to file server processes.

PCSA System Administration

Summary

Differences

Installation

Configuration

PCSA Administration

Macintosh Section

Alisa Systems, Inc., Pacer Software, Inc. - A Comparitive Analysis

By Larry White

Slides from the Fall DECUS Symposium session PC048 are reproduced here for the benefit of those people who could not obtain copies at the session. Ed.

Alisa Systems, Inc.
Pacer Software, Inc.
A Comparative Analysis
PC048

DECUS
Fall 1989
Anaheim, CA

Larry White
Winthrop-Lawrence Corporation
South End Bridge Circle
Agawam, MA 01001
(413) 786-0041

Who, What, Why??

Who?
Anyone interested in MAC to VAX connectivity

What?
NON-technical discussion of Alisa and Pacer products using *AlisaTalk* and *PacerLink* as a base

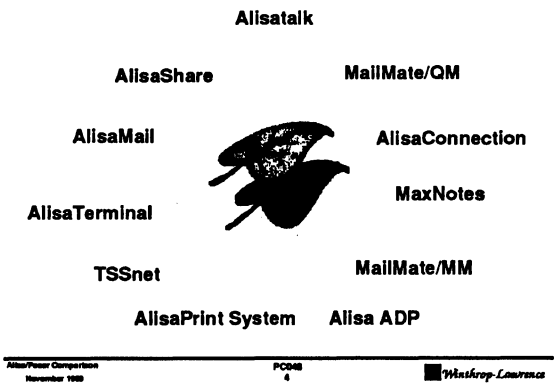
Why?
Integration of MACs and VAXs is a rapidly growing trend.

What it is not...
In-depth technical discussion
Detail product comparison
Forum to air Alisa or Pacer gripes

Who are they?

Alisa and Pacer are two of the leading suppliers of MAC-to-VAX connectivity products.

They both offer products other than their well known, VAX-based, AFP-compatible file servers.



PacerLink

PacerShare PacerTOPS

PacerGraph PacerPost

PacerPrint

What Are Your Requirements?

File Server - Appleshare (AFP), TOPS, Novell, PCSA

Virtual Disk Server

Terminal Emulation - VT100, VT220, VT240/241, 3270

File Transfer - VAX, IBM, UNIX

Network Connectivity - AppleTalk, DECnet, TCP/IP

Database Connectivity - SQL, CL/1

Mail Servers/Gateways - MS-Mail, QuickMail, VAXmail, PROFS, SNADS

Print Servers - VAX Queues, Appletalk, Postscript

Two Implementations of VAX-based AFP File Server

Alisa Systems, Inc.

Considerations

AFP Compatibility
Server Administration
Security
Accounting
Performance
Integration with VMS features
Printing
Terminal Emulation
Support for non-MAC clients (PC and compatibles)
Host platforms
Price

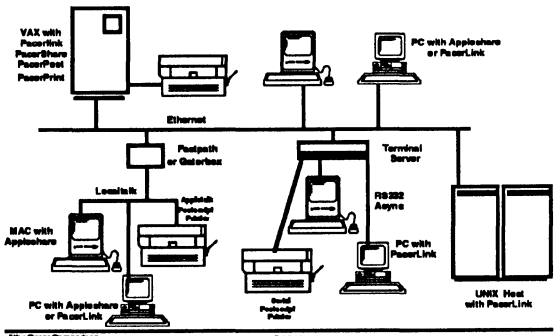
Differences

Pacer creates a VMS network process for each MAC file server client	Alisa uses one VMS process on the VAX.
Pacer users standard VMS login (clear text)	Alisa uses standard VMS and/or UAM with encrypted passwords
Pacer supports multiple groups for client	Alisa supports drop folders
Pacer uses a Pacer-developed bridging process for Appletalk	Alisa uses Apple's Appletalk to VMS bridge or communicates directly with the Ethernet controller
Pacer provides VMS-based tools for administration	Alisa provides VMS based tools and a Hypercard stack for administration
Pacer provides a VT100/220 compatible terminal emulation package running a Pacer-developed protocol and serial redirector for third-party TEs	Alisa provides a Cterm driver for White Pines TE and Versaterm Pro

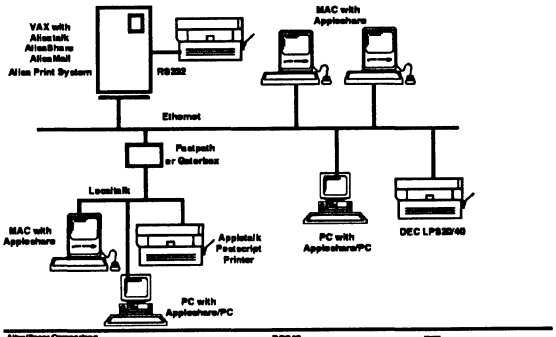
Differences (cont.)

For TE, PacerLink must be installed on each VAX. (or you must use "Set Host")	Only one VAX on the network is required to have DNGate
Pacer allows Async, Localtalk, and Ethertalk connections	Alisa allows Localtalk and Ethertalk connections
Pacer creates three files on the VAX for each MAC file (resource fork, data fork and desktop information)	Alisa creates two files on VAX for each MAC file (resource and data forks)
Pacer will run under ULTRIX	Alisa allows Guest access
Pacer will soon allow access from a TOPS client.	

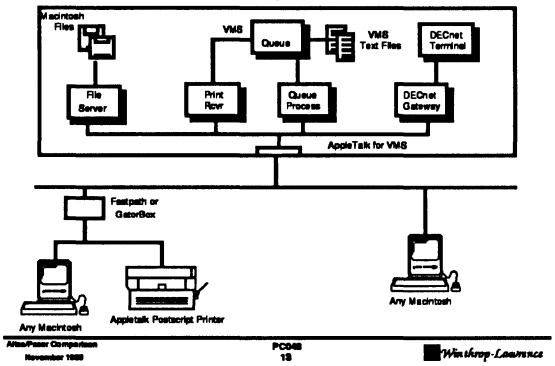
Typical Pacerlink Environment



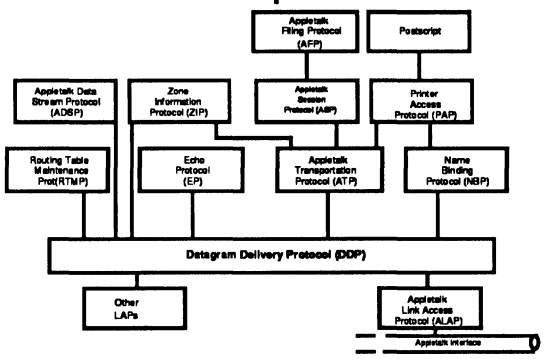
Typical Alisatalk Environment



Alisatalk Implementation



PacerLink Implementation



Products

	Alisa	Pacer
File Server	Alisashare	PacerLink PacerShare PacerTOPS
Virtual Disk		PacerLink
Terminal Emulation	Provides Cterm drivers for White Pines TE and Versa Term Pro	PacerLink and PacerGraph
File Transfer	TSSnet and 3party emulators, Alisashare	PacerLink PacerShare

Products (cont.)

	Alisa	Pacer
Mail Server/Gateways	AlisaMail, MailMate/QM Mailmate/MM	PacerPost
Printing	Alisa Print Services Alisa ADP	PacerPrint

Futures...

Pacer products migrating to use the Appletalk for VMS from Apple

Alisa plans to implement ACLs

AlisaShare and PacerShare differences will diminish

VMS Services for the Macintosh?

NetWare VMS for the Macintosh?

Product market and functionality will continue to grow

Appletalk for VMS V3.0

Appletalk Phase II

Summary

- AlisaShare and PacerShare have some differences but major functionality is the same
- There is no clear cut winner
- How about both products?

Other Products

The MAC to VAX connectivity market is constantly expanding. There are numerous vendors that provide a wide range of products.

There are other vendors that offer non-AFP compatible file storage on the VAX. For example, RAF and White Pines VMacs.

Want More?

Here's were to get more information:

Alisa Systems, Inc
221 East Walnut Street, Suite 175
Pasadena, CA 91101
(818) 792-9474

Pacer Software, Inc.
1900 West Park Drive, Suite 280
Westboro, MA 01581
(508) 898-3300

Apple Publication "Apple/Digital Integration Solutions Reference Guide" (M0049LL/A)

Digital Publication " Introduction to the Apple-Digital Network Environment" (EK-APDEC-OP-001)

Special Thanks To:

Bob Denny
President
Alisa System, Inc
Pasadena, CA

Dave Ryter
Vice President, Marketing
Pacer Software, Inc.
Westboro, MA

THE mini• tasker

DECUS
RT-11 SIG NEWSLETTER

RT-11 MINITASKER
January, 1990

Contents

****

From the Editor:

Happy New Year! By the time you read this, I'll probably be at my new job. (Of course, I don't know what that is or where it is yet!) For now though, the address for newsletter submissions remains:

John M. Crowell
RT-11 Newsletter Editor
P.O. Box 128
Davis, CA 95617

And the files are EMPTY! I need stuff to print. So those of you who went to the symposium in Anaheim, send me a page or two about what you learned there. For those of you who, like I, missed it, write me a letter asking about what you would have hoped to learn had you gone. We'll dig up answers. I'll certainly be digging for reports on the Wish List and Feedback sessions as well as the *im promptu* Internal Queueing Workshop that I'm told occurred.

Thanks to our SIG Chairman, Milton Campbell, for setting the good example. His trip report, minus the sections bracketed by "flame on" and "flame off" appears in this issue. I've started a running index of Minitasker articles, which I intend to publish each January. I've already found it useful. I hope you do. Finally, there is another addition to my series of "here's how I do it" articles. I know some of you out there also do kinky things with RT-11 and TSX-Plus. Write up a page or two, or just send me some code. I'll put the boiler plate around it.

RT-11 Minitasker
Cumulative Subject Index
September, 1985 - December, 1989

****

RT-11 Minitasker
Author/Contributor Index
September, 1985 - December, 1989

DeChellis, L.	August 89	RT-3
Doran, C.	June 87	RT-3
Dotzel, G.	May 86	RT-15
Dustman, T.	March 87	RT-14
Evans, D.	March 89	RT-2
Farley, S.	March 88	RT-3
	April 88	RT-2
Firestone, J.	October 88	RT-2
	December 89	RT-2
Fisk, C.	March 86	RT-2
G'rew, A.	December 89	RT-6
Gentry, M.	October 89	RT-29
Graham, D.	July 86	RT-3
Hamilton, R.	September 88	RT-2
	February 88	RT-9
	May 88	RT-10
	May 88	RT-12
	July 89	RT-22
	November 89	RT-13
Hamish, R.	April 87	RT-4
Hammond, I.	April 86	RT-14
	March 87	RT-17
	October 89	RT-4
Harrod, S.	March 87	RT-8
	January 88	RT-13
	July 88	RT-3
Heidebrecht, B.	March 87	RT-16
Heuer, P.	March 88	RT-21
Hoshiko, T.	April 86	RT-5
Judge, E.	February 87	RT-10
	March 89	RT-21
	August 89	RT-4
	November 89	RT-3
Leroy, B.	December 86	RT-5
LeRoy, M.	November 87	RT-21
Lethe, D.	September 86	RT-12
Lubell, B.	December 88	RT-11
Lucas, B.	March 87	RT-16
MacDonald, D.	March 87	RT-11
Marak, M.	June 89	RT-3
Meister, R.	October 89	RT-25
Nelson, B.	September 86	RT-13
Ostergaard, P.	November 87	RT-19
Pappas, G.	March 87	RT-5
Peterson, J.	September 85	RT-10
Piskura, D.	September 85	RT-10
Proulx, J.	September 87	RT-10
	December 87	RT-5
	March 88	RT-9
Radetsky, R.	March 88	RT-20
Rasted, J.	June 89	RT-2
Rhodes, N.	September 86	RT-8
Roddy, R.	January 89	RT-2
Sallee, G.	June 87	RT-4
	November 87	RT-20
	June 88	RT-2
	July 88	RT-7
	July 88	RT-8
Schor, R.	August 87	RT-28
	November 87	RT-18
	December 87	RT-15
Shinel, T.	September 86	RT-8
	April 87	RT-2
Sidlinger, B.	March 87	RT-9
Smith, T.	September 85	RT-10
Taylor, S.	September 89	RT-6
Unger, J.	December 86	RT-4
van Julst, J.	October 87	RT-17
Vibert, J.	October 87	RT-5
Walker, J.	March 87	RT-16
Walker, W.	March 86	RT-4
	December 87	RT-13
Walraven, R.	June 86	RT-7
	August 86	RT-2
	August 86	RT-3
	December 87	RT-2
	January 88	RT-7
	February 88	RT-7
	February 88	RT-14
	March 88	RT-5
	March 88	RT-24
	April 88	RT-3
	May 88	RT-3
	June 88	RT-13
Whitlock, J.	August 88	RT-12
	September 88	RT-6
Williams, R.	March 87	RT-26
Wilson, C.	December 86	RT-7
Youdelman, B.	March 89	RT-18
	October 89	RT-28

Fall 1989 Symposium at Anaheim

Milton Campbell
RT-11 SIG Chairman

NOTE: I normally write trip reports for my own use. This is an editted version of my full report. I have removed most of the personal opinions and private stuff. If I have missed something, I appologize to the victims in advance. I also appologize for any spelling or grammar problems, this is not intended to be a work of art, just a record for me to refer to later.

From Saturday, 4-Nov to Friday, 10-Nov I attended the Fall 1989 DECUS Symposium in Anaheim. The Symposium was held in a combination of the Anaheim Convention Center, the Anaheim Hilton, and the Anaheim Marriott. The hotels servered as the headquarters hotels. I stayed in the Marriott in a room adjoining the joint HMS and RT suite. The Convention Center was used for registration, DEC exhibit floor, campgrounds, and some session rooms. There were session rooms in both the Hilton and Marriott, with most of the Marriott rooms quite large. The Sunday evening reception was held in the Marriott. Weekend meetings were in both hotels. Symposium meal service was provided in the two large ballrooms of the Hilton. As is usual in Anaheim, the use of 3 buildings resulted in a somewhat spread out symposium. On the whole, this did not present any real problems, although the campgrounds and exhibit floor were sufficiently far from most meeting rooms that it was hard to drop by for just a few minutes. Compared to last year (1988), the lunch location was much better (more centrally located).

The DEXPO show was held at the Disneyland hotel. As in the past, the show was scattered in 3 parts of the hotel. One in a parking garage under the hotel, one in a large meeting hall above the parking lot, and the last in tents (now called the "platinum halls") on the complete other side of the hotel. This sounds worse than it is, the walks are not that far if you don't need to do them much.

General:

There were a number of "new" things from DEC around at the symposium, although none that I was interested in were not anticipated in the press. The one significant RT-11 related item was the acknowledgement that the support for RT-11 on the KXJ11-CA in a MicroVAX would not be released.

The RT-11 SIG put on a good show. No sessions we cancelled or replaced, although one session had a speaker replacement (but the topic did not change).

The RT-11 campground was less successful than in Atlanta. This was mostly due to the location. All the campgrounds were in part of the Convention Center, which was a fairly long walk from the session rooms. Still, it was a worthwhile effort and one we will try to repeat. Equipment this time was provided by, or arranged for, by Bob Roddy, John Bedel and Dan Gilbreath.

Saturday, 4-Nov

I drove down to Anaheim in the early afternoon and worked in the First Timer's booth for a while. The SIG Council met starting at 7:30p. Two controversial items came up, both as the result of board discussions that probably leaked prematurely.

The first has to do with what is called "compensation", which essentially means anything provided free to anybody. The draft proposal we saw (which may or may not have been the actual version) basically ruled out almost all things. Main points were that awards (I am not sure what these are) are limited to $50, unit "gifts" limited to $15, and removal of symposium fee waivers for SIG chairs, SIG symposium coordinators and anyone else whose symposium job is not full time. Additional rules would be:

- no one would get the newsletter for free
- one set of symposium tape would be provided to each SIG, no other tapes would be given out.
- no DECUServe subscriptions or phone expenses would be paid, except for conference moderators.
- no one would receive free session notes
- no one would receive free library items.

This suggestion caused considerable comment from the SIG Council, little of it favorable.

The second board idea was for some type of exhibit floor, similar to the DEC floor, for DEC-approved third party suppliers. The implementation details of this idea were hazy. The discussion of this idea elicited a large number of negative comments. Many feared the contamination of commercialism, others thought that allowing DEC to control participation in a DECUS sponsored activity was unfair.

Sunday, 5-Nov

Early Sunday morning, I worked in the first timer's booth in the Convention Center.

I spent most of the rest of the day getting ready and talking to people.

The RT-11 Steering Committee met at 5:00p in the Suite. This mostly dealt with setting up for the Symposium, although we did talk some about overall SIG business.

The opening reception, in the Marriott, started at 8:30p (for speakers and chairs) and was the usual success. This reception is one of the best events at symposia.

Monday, 6-Nov

9:00a RT SIG Roadmap & Business Meeting
(Milton Campbell, David Evans, et al : audience 20+)

The roadmap portion consisted of a presentation of general Symposium information, followed by a walk through of the week's RT-11 sponsored sessions. Finally, sessions sponsored by other SIGs that might be of interest were pointed out.

The business meeting portion of the session included reports fromthe various committee representatives, as well as the solicitationof ideas and input.

10:00a RT-11 Product Panel
(Bryan Cothran - RT-11 Product Manager)

- RT-11 Group is currently responsible for:

  - RT-11
  - DECNet/RT-11 (such as it is)
  - MACRO (for all PDP-11 operating systems)
  - RTEM (RSX and VAX versions)

- RT-11 on PROs has been retired as of 1-Jul-89
  - last supported release is 5.4G
  - Version 5.5 will "probably" run on the PRO

- DECNet/RT-11
  - current version is V2.1
  - DNA III implementation

- RTEM
  - current version is V2.3
  - retired 30-Jun-89
  - availability ended 18-Oct-89
  - support ends Jan 1991

-RT-11
  - current version is V5.4G
  - available March 1989
  - next version is V5.5
  - available December 1989

- Bryan took a survey of plans of the audience

  - number with support contracts ~12
  - will buy -H kit ~12
  - both (multiple systems) ~5

- RT-11 V5.5 Features

- enhanced disk support
  - more blocks on RA and RD drivers
  - will capture and display status

RT-11 Product Panel (cont'd)

- increased DMA support for Unibus
- more efficient use of low memory
- virtual-to-physical address translation
- utility enhancements
    - BUP
    - KED/KEX
        - journalling
        - define and save multiple macros
        - initialization file
- enhanced SYSLIB
    - more maintainable
    - error handling improved
    - directory processing support

- streamlined media kit
    - remove unsupported handlers
    - some removed items will be submitted to DECUS library
    - items that will not be submitted because they are somewhere else or may not work
        - GETSTR.FOR
        - PUTSTR.FOR
        - VTMAC.MAC
        - VTHDLR.OBJ

- Layered products

    - BASIC-Plus/RT: version V3.2 is next version (with RT-11 V5.5)
    - FORTRAN-IV: current version is V2.8
    - FORTRAN-77/RT: current version is V5.0A
    - CTS-300: current version is V8.2

- PDP-11 C
    - versions that exits (or will by end of year)
    - (host & target): RSX, uRSX, CPR/RSX
    - VAX native, RSX target
    - (host & target) VAX-11 RSX
    - (host & target) RSTS

    - RT-11 hosted version probably around June 1990
    - RT-11 version of compiler will probably only run under XM

- CoProcessor RT-11

    - will not be released
    - "demand and effort to produce product are not there"
    - "don't think it will be profitable"

11:00 MAKE: A Developer's Tool for RT-11
(Ross Berteig - Cheshire Engineering: audience 15-20)

I came a little late to this sessions, so I missed the "history" of this project. It is basically an implementation of the MAKE utility found on Unix for RT-11. It is subject to some limitations due to the RT-11 environment, but appears to be a useful tool.

- manages file relationships, commonly source, object and program images, but could be any kind of related files.

- depends on a "prerequisite" description to describe file relationships as well as the actions that form the relationships

- MAKE then uses the prerequisite file and the current file dates and times to perform all the actions necessary to ensure that the "latest" changes are included in the final output of the process.

3:00p PDP-11 C Field Test Panel
(Panel: audience ~30)

This session followed the PDP-11 C announcement session which I missed. This session consisted of a panel of 6 field testers, 3 RSTS and 3 RSX. They recounted some of their experiences and impressions.

Terry Kennedy (RSTS)
- had some students use it
- migrated some utilities
- compared to DECUS C
    - not 2 step (compile & assemble)
    - recovers from errors (such as missing ;) much better
    - in general has good error detection and reporting
    - "better" object code
    - some better RTL features
- PDP-11 C does not have some of the "common extensions" found in DECUS and VAX C.

Bob Fidelman (RSTS)
- benchmarked PDP-11 C against some BASIC+ programs
    - 48% improvement on integer
    - C floating point did not work
    - PDP-11 native compilation was slow
- good documentation and error messages

Wayne Basley (RSX)
Compared to Whitesmiths
- uses AUTOINSTAL (or VMSINSTAL)
- relatively portable
- faster
- code size not as size efficient
- lots of code in limitted address space, hard to handle bigger code
- expects size problem to get better

PDP-11 C Field Test Panel (cont'd)

Tony Scandora (RSX)
- liked product, easy to install
- produces listings
- PDP-11 C "fussy" and catches many problems that are routinely missed by other compilers
- has function prototypes

John Cooper (RSX)
- started with Whitesmiths
- used only VAX hosted version of PDP-11 C
- generated bigger code than Whitesmiths
- no way to call RSX, except to use FORTRAN calls
- converted an application from Whitesmiths to PDP-11 C
- substantial compatibility with VAX C.

Steve Jackson (RSTS)
- small site
- little experience

Then Dennis Jenson got up from the audience since he is an RT-11 field tester.

- Using VAX host, RT-11 target version
- no native RT-11 yet
- had some OTS problems, particularly with the program start address
- must specify the transfer address to LINK
- thought optimization was good

We then conducted a quick poll as to what peoples target system would be

- IAS 0 (it turns out that C will not be supported on IAS)
- RSX 10
- RSTS 5+
- RT-11 20+
- Other 5+

8:00p What Digital Users Want in a Q-Bus Data Acquisition Module
(Robert Roddy and audience: audience 20+)

This turned into a lively audience participation. There were a number of different ideas. Perhaps Bob will summarize the results for the newsletter.

9:00p Running 32-bit Applications Under RT-11
(Shal Farley, Cheshire Engineering: audience 15-20)

This session described the software structure developed to support a 32-bit coprocessor running under RT-11 or TSX-Plus.

10:00p RT-11 & TSX-Plus on a MicroVAX
(Milton Campbell, Talisman Systems: audience 10-15)

This was my talk.

Tuesday, 7-Nov

The morning SIG council breakfast meeting was a joint one with the Symposia Committee to solicit our feeling on the "third party" exhibit floor idea. Response was heavily negative. A formal resolution of objection passed, but with as many abstentions as ayes due to the wording of the resolution. An informal straw poll found a nearly unanimous discomfort with the idea.

10:00a Internal Queuing Workshop
(Megan Gentry, Digital Equipment and group)

This was an informal get together in the RT-11 Campground to discuss the "state of the art" of internal queuing for RT-11 handlers. About 8 people were there. This will be the subject of an expanded, separate, report.

1:00p Implementing A Manufacturing System On A PDP-11
(Laure DeChellis, Security Pacific Bank: audience ~15)

This session described a manufacturing data processing system developed for an electronics board company. The system is written in COBOL and is quite large.

2:00p RT-11 Application: High Speed Data Discrimination and Collection System
(Philip Jeuck, SRI International: audience ~20)

I missed the first few minutes of this session, which included the goal of the system, however, it appeared to be a system that sampled parts of the radio spectrum to find "clear" channels.

- digitizing and discriminating "interesting" waveforms
- 250 khz input rate
- saving to disk and displaying
- DMA to 11/73 memory, then to disk
- looking for clear holes in the HF spectrum (i.e. low noise spots)
- originally in MACRO (starting in 1980), converted to FORTRAN in 1989
- realtime as well as captured data display

2:30p CDROMs and RT-11
(Harold Bencowitz: audience 25-30)

Harold purchased an RRD50 at a DECUS sale and installed it on his PDP-11. Then decided to see what he could do with it.

- H/W installation fairly easy.
- RT-11 S/W easy
- TSX-Plus had problems until V6.2 with the JREAD routine

    - CDROM logical structure - 3 types
    - High Sierra ("May 28" version)
    - ANSI
    - ISO (similar to ANSI) 9660
    - no separate American Standard, use ISO

- Problem(s)
    - every CDROM he has (essentially most under $100) are in the May 28 High Sierra standard
    - May 28 standard is out of print - can't buy it
    - He is trying to figure it out by dumping blocks and looking at the ISO standard
    - He has figured out most High Sierra formad, except for about 4 bytes of the directory.

- There is one other disk format - the one DEC uses
    - DEC format is "Unifile"
    - basically VAX file structure, except that files are contiguous
    - directory structure much harder than other formats
    - "Unifile Documentation Standard" manual is VERY expensive, about $5/page

- Microsoft Bookshelf is in High Sierra format, but most data is encrypted and he is not yet interested enough to try to break it.

- CDROMs are available with lost of public domain stuff

3:00p New Features for Handlers in RT-11 V5.5
(Margaret Carleson, Digital Equipment: audience ~20)

This was a discussion of new things in V5.5 that affect, or are available for, handlers.

There was a handout for this session.

4:00p RT-11 SYSGEN: Whys and Wherefors
(Robert Walraven, Multiware standing in for John Crowell)
(audience ~18)

This session discussed a number of the reasons why a SYSGEN might be desired, followed by a more detailed discussion of many of the SYSGEN choices.

5:00p RT-11 New Features of Utilities and KMON
(Megan Gentry, Digital Equipment: audience ~20)

This session discussed new features for RT-11 V5.5. I had a meeting to go to and had to leave shortly after this session started.

Wednesday, 8-Nov

By design, there were no RT-11 SIG sessions scheduled on Wednesday (thanks to David Evans). The most interesting item I saw at DEXPO was a company that makes bus converters. They go between many buses, but I was most interested in the Q-bus to PC-AT and VME busses.

In the afternoon I went back to the "real world" (outside of DECUS) to run some errands.

Thursday, 9-Nov

3:00p Learning How To Use IND Control Files
(Laura DeChellis, Security Pacific Bank: audience 20-25)

This was a good, short introductory session on IND presented using a small application as an example. This is a good format, because it did not get bogged down in covering all the IND commands, it concentrated on the one most useful for getting started.

3:30p TSX-Plus Workshop (Formerly TSX-Plus Magic)
(Jim Crapuchettes, Shal Farley, Milton Campbell)
(audience 20+)

This is a "help" type session where the audience discusses various TSX-Plus problems and solutions.

- Bill Walker: TSX-Plus doesn't autobaud very well
  - remarkable sensitive to random stuff between carrier and answer
  - sometimes doesn't answer

- Jim Crapuchettes:
  - part of problem is trying to autobaud for 19.2.
  - control-C is a better autobaud character for 2400 baud than "return"
  - problem was observed by 5-10 members of the audience
  - most of others do not have modems
  - most with problem said they could live with a restriction that 19.2 would not autobaud if that would fix the problem.

- Jim Williams: asked if it is likely that PDP-11 C would work on TSX-Plus

  - some PLAS directives may not work, although standard ones seem to be compatible
  - show of hands indicated that about 15 were interested in C if priced under $500, about 5 if priced at $1000

TSX-Plus Workshop (cont'd)

- Ralston Barnard: Problems using IND from UCL+ under TSX.

    - No answer

- George Mancini: Sometimes "BOOT DU0:" doesn't work

    - long boot times (many seconds) have been observed
    - boot time is "not predictable"

- Gary Sallee: Problems with MT: handler

    - may be in RT-11 handler

- Bob Roddy: SETUP program on PRO doesn't work

    - suggestion was that it can not work and is dangerous to try

- Bob Peckham: Can "delete" a spooler entry by number, the device name given in the command does not matter.

- Bill Walker: Trick to minimize UCL command file (particularly useful if you are using UCL+ which has its own file)

    - must have TSXUCL.TSX so any UCL will work
    - minimum is 1 command per line
    - TSXUCL.TSX can be defined on NL:, so it takes no space

- Jim Williams: Any compatibility probablems between RT V5.5 and TSX-Plus V6.4?

    COPY/DEVICE/FILE dv: file.xxx
    gets a fatal error something like
    ?-DUP-F-Input Error ...

    Apparently DUP is looking on SY: for SY:dv.SYS (or maybe SY:dvX.SYS). In any case, the current handler is dv.TSX.

- Bob Roddy: Spooler problems

- Bob Peckham: How to tell if a (serial) printer is powered off

    Since there is no hardware "ready" line, suggestion was to use a program to send and ENQ to printer and see if anything comes back in a reasonable time.

6:30 MACRO-11 Style
(Milton Campbell, Talisman System: audience ~15)

This as a combination of a presentation of ideas (i.e. opinions) and audience ideas (and response). We filled up the hour so things must have been OK.

7:30p Do Wishes Come True In Realtime?
(Scott Harrod: audience 15-25)

This session discussed some of the various wishlist items from the past and looked to see if and how they had been implemented (or granted). As part of his presentation, Scott handed out a wishlist "request forms" so that the audience could re-request any good ideas that had not yet been implemented. The result was a record number (for recent symposia) of wishlist submissions.

8:30p RT-11 User Speakout
(RT-11 Special Interest Group: audience 20-25)

This was the usual "magic" session of ideas, stories and other presentations.

Friday, 10-Nov

11:30p RT-11 Feedback
(RT-11 Engineering: audience 15-20)

In this session, representatives from RT-11 Engineering responded to the wishlist items that had been submitted during the week. The results of this session should be in the newsletter sometime.

12:30p RT-11 Wrapup
(Milton Campbell & RT Steering Committee: audience 15-20)

This was the usual wrapup session. Various SIG business items were discussed. The most noteworthy item for discussion was a proposal to "compress" the RT-11 sessions in New Orleans into Thuresday and Friday (and maybe a little Wednesday). The three main "benefits" of this are hoped to be:

- the compression makes it possible to consider coming to the symposium for just the RT-11 content. Compressing the scheduled increases the "density", as well as reducing the costs. The symposium fee is somewhat lower, but the main reduction is in time away from work and in lodging and food.

- the current RT-11 symposia population comes for most than just the RT-11 sessions. Many of these sessions (such as product updates) are early in the week, which makes it harder to go to RT-11 sessions.

- people with "casual" RT-11 interest who already come to the symposium (there are many) would also find it easier to get to RT-11 sessions if they were not scheduled against the heavies early in the week.

2:00p An open RT-SIG steering committee meeting was held in the RT-11 SIG suite. The meeting lasted about 1.5 hours and covered a lot of ground. We laid plans for New Orleans, as well as discussing other SIG business ideas.

I drove home Friday evening.

Mounting Logical Disks from Within Your Program

John M. Crowell
(unattached)

If your mind is as twisted as mine, you may have wanted, from time to time, to have your application program mount or dismount logical disks. Mind you, this is a very rude thing to do in multi-user environments - or even single-user multi-job environments when jobs don't cooperate. Even so, I have found it handy to be able to juggle LD units on the fly.

On the following pages is the subroutine I use. It is callable from MACRO or FORTRAN. Version 0 of this subroutine was for V5.3 of RT-11. The way LD tables are accessed was changed in RT-11 V5.4, so Version 1 of MOUNT was changed to accomodate the mercurial nature of LD. (Version 0 of MOUNT has been lost, so if you're still running RT-11 V5.3, don't ask me for it.) Version 2 of MOUNT still works for V5.4 (I think), but also works for V5.5 which has a SYSGENable number of LD units up to 64 (although only 32 of them are generally accessible).

So the ground rules for using MOUNT are:

1. Run on RT-11 V5.4 or later

2. LD handler and device handler for logical disk file must be in memory, having been LOADed or FETCHed.

3. Mounts and dismounts done by MOUNT affect only the copy of LD that is in memory. Reloading LD or rebooting RT-11 will result in a reversion to the original configuration.

4. Mounting LDn: does an implicit dismount of it first (just like the KMON command). The enterprising hacker will have no trouble modifying the routine to return an error code if the unit is already mounted. The argument IFLAG could also be used to encompass values to report or override the error. (Personally, I like it the way it is.)

As he does with nearly everything strange I do to RT-11 (or at least everything I do strangely), the RT-11 architect will probably have three or four good reasons why this subroutine won't work or shouldn't be used. I have donned my armour, and am ready for slings and arrows.

Footnote: By the way, you'll notice some weirdness in the use of .DSTAT and .LOOKUP in this code. Next month I'll expound upon these.

```
.enabl  mcl
.module $MOUNT,version=02,comment=<LD mount/dismount routine>
;+
;*********************************************************************
;
; This routine mounts/dismounts logical disks.
;
; WARNING: This routine assumes RT-11 V5.4 or later.
;
;  Handlers for both LD: and the device for the logical disk file
;  must be in memory - having been either LOADed or FETCHed.
;
; Mount/DISMOUNT affects only the in-memory copy of LD.  If the
; calling program FETCHed the LD handler, the mount goes away when
; the program exits.  The mount is definitely not preserved across
; boots.
;
;*********************************************************************
;
; FORTRAN calling method:  J = MOUNT ( IUNIT , FILE [,IFLAG] )
;
;  where:
;       IUNIT    = LD unit number to be mounted/dismounted
;                  (See description of IFLAG)
;       FILE     = 4-word RAD50 descriptor of file
;       IFLAG    = (optional)     +1 => mount read-only
;                                  0 => ignored
;                                 -1 => dismount
;
;       J = value returned
;                +1 Invalid unit number
;                 0 Normal return - no errors
;                -1 Error reading/writing LD tables
;                -2 LD handler not in memory
;                -3 File not found
;                -4 Invalid device or device handler not in memory
;                -5 No I/O channel available
;
; (R1 & R5 not preserved when called at FORTRAN entry point.)
;*********************************************************************
;-
.psect  USER$I

mount:: clr     r0
        mov     (r5)+,-(sp)
        cmpb    (sp)+,#3        ; 3 parameters ?
        blt     1$
        cmp     4(r5),#-1       ; yes, is third actually there ?
        beq     1$
        mov     @4(r5),r0       ; yes, put it in high byte
        swab    r0
        clrb    r0
1$:     bisb    @(r5)+,r0       ; put LD unit number in low byte
        mov     (r5),r1         ; get address of file descriptor
        .br     $mount          ; fall through
```

```
.sbttl  $MOUNT
;*********************************************************************
;
; MACRO calling method:  JSR  PC,$MOUNT
;
; Entry conditions:      R0 = low-byte : unit number
;                             high-byte   +1 => mount readonly
;                                          0 => mount read/write
;                                         -1 => dismount
;                        R1 = address of .RAD50 file descriptor
;
; Exit conditions:       C-bit clear, R0 = 0 => normal return
;                        C-bit set, R0 <>0 error return. (See error
;                             values in FORTRAN description
;                        R1-R5 preserved
;*********************************************************************
;-
ldunit  =: 32.          ; set to maximum number of LD units
                        ; (8. for V5.4)
                        ; (My system has 32.)
; LD.FLG bits

ld.act  = 100000        ; If set, LD unit is allocated
ld.rdo  = 40000 ; If set, LD unit is read-only

$mount::jsr     r5,$savrg       ; save R3-R5
        mov     r1,-(sp)        ; save R1 and R2 also
        mov     r2,-(sp)
        mov     r1,r2
        mov     r0,r5
        mov     #-5,r3          ; initialize error code
        .serr                   ; Disable EMT error abort
        movb    #14.,r4         ; Find an available channel
5$:     .cstat  #area,r4,#status ; (Don't use 15.
        bcs     10$             ;    in case of overlays)
        decb    r4
        bge     5$
        br      25$             ; Oops, all channels in use

10$:    inc     r3              ; error code = -4
        tst     r5              ; Is this a mount?
        bpl     15$             ; Yes, go lookup the file
        inc     r3              ; No, set error code to -3
        br      20$             ; Bypass file lookup

15$:    .dstat  #status,r2      ; Does device exist?
        bcs     25$             ; no error = -4
        tst     status+4        ; yes, is it loaded?
        beq     25$             ; no, error = -4
        inc     r3              ; yes, set error code to -3
        .lookup #area,r4,r2     ; is file there?
        bcs     25$             ; no, error = -3
        .cstat  #area,r4,#status ; yes, get particulars on file
        .purge  r4              ; reclaim the channel
```

```
20$:    inc     r3              ; set error code to -2
        .dstat  #ldtbl+1,#lddev ; physical .DSTAT on LD
        bcs     25$             ; not available, error = -2
        tst     ldtbl+4         ; OK is it in memory?
        beq     25$             ; no, error = -2
        mov     #1,phy$lk       ; force physical LOOKUP
        .lookup #area,r4,#lddev+1 ; lookup physical LD
        bcs     25$             ; no handler; error = -2
        inc     r3              ; set error code to -1
        .spfun  #area,r4,#372,#ldtbl,#2  ; Read LD table header
        bcs     25$             ; Can't read table, error = -1
        movb    ld.num,r1       ; get number of LD units supported
        cmpb    r1,r5           ; Check unit number against LD
        bhi     30$             ;
        mov     #1,r3           ; LD doesn't support this many
25$:    br      69$             ; take error return

30$:    mul     #7,r1           ; compute actual size of LD tables
        add     #2,r1
        mov     r1,-(sp)        ; save size of tables
        .spfun  #area,r4,#372,#ldtbl,r1  ; Read LD tables
        bcs     69$             ; Can't read tables, error = -1
        asl     r5              ; shift sign bit into C-bit
        bcc     35$             ; branch if mount
        bic     #^c377,r5       ; dismount: isolate 2xunit number
        bic     #ld.act,ld.flg(r5) ; dismount this unit
        br      45$

35$:    movb    ld.num,r1       ; Mount:  get # units
        asl     r1              ; get size of each table
        mov     nunit,r0        ; put unit number of physical
        swab    r0              ;   device in high byte
        bisb    csw,r0          ; put offset into $PNAME table
        bicb    #^c76,r0        ;   in low byte
        bis     #ld.act,r0      ; mark it active
        bit     #^c377,r5       ; read-only ?
        beq     40$
        bis     #ld.rdo,r0      ; yes, set the bit
40$:    bic     #^c377,r5       ; isolate 2 x unit
        mov     r0,ld.flg(r5)   ; set flag word in table
        mov     r5,r0
        add     #ld.flg,r0      ; point to flag entry
        add     r1,r0           ; point to starting block entry
        mov     stblk,(r0)      ; set starting-block
        add     r1,r0           ; point to file-size entry
        mov     length,(r0)     ; set file size
        add     r1,r0           ; point into file-name table
        add     r5,r0           ; add another 6 x unit to get
        asl     r5              ;       file-name
        add     r5,r0           ;               entry
        mov     device,(r0)+    ; copy physical device anem
        tst     (r2)+           ; skip device name (we already got
it)
        mov     (r2)+,(r0)+     ; copy file name
        mov     (r2)+,(r0)+
        mov     (r2),(r0)
```

```
.sbttl  Rewrite LD tables

45$:    neg     (sp)            ; Change to write command
        .spfun  #area,r4,#372,#ldtbl,(sp)+ ; Write LD tables
        bcs     69$             ; Can't write tables; error=-1
        clr     r3              ; OK, error = 0 !

69$:    .purge  r4              ; forget this channel
        .herr                   ; Restore EMT error abort
        mov     r3,r0           ; return error code in R0
        bne     70$             ; if <>0, set C-bit
        tst     (pc)+           ; clear C-bit, skip SEC
70$:    sec
        mov     (sp)+,r2        ; restore registers
        mov     (sp)+,r1        ; (doesn't affect C-bit)
        return

.psect  USER$D

area:   .blkw   4               ; EMT parameter block
phy$lk: .word   1               ; set =1 for physical device LOOKUP
        .word   0               ; 6th word for SPFUN

lddev:  .word   ^RLD ,0,0,0

status:                         ; status block for .DSTAT and
.CSTAT
csw:    .word   0               ; CSW address
stblk:  .word   0               ; Starting block number
load:                           ; (.DSTAT - handler load address)
length: .word   0               ; File length
hiblok: .word   0               ; Highest block written
nunit:  .word   0               ; Device unit number
device: .word   0               ; Device name in RAD50

ldtbl:
ld.id:  .blkw   1               ; Filled with ^RLD
ld.num: .blkb   1               ; Number of LD units (8. in V5.4)
        .blkb   1               ; (reserved by Digital)
ld.flg: .blkw   ldunit
ld.ofs: .blkw   ldunit
ld.siz: .blkw   ldunit
ld.nam: .blkw   4*ldunit

        .end
```

For code shown in **BOLD** type, see my article on physical device I/O in next month's Newsletter.

UNISIG

From the Editor *by Sharon Gates-Fishman*

Happy New Year! As we start the decade of the '90s, the role of these Newsletters is being examined at a variety of levels. DECUS' Communications Committee is looking into combining more DECUS publications. In doing so, the function of each individual publication must be defined, in order that it continue to perform that function after any change in format. At the Unisig level, the role of our specific newsletter is being examined. Let me repeat some questions I asked you last month:

What do *you* want this newsletter to be? Do you want to see technical Unix and Ultrix information published here? Or do you prefer to get that sort of information from other sources? Are you interested in reading about SIG activities? What are you hoping to find when you read the Unisig newsletter?

There is a Unisig Woods Meeting scheduled for early March, and I would really like to take your input to the Steering Committee.

Even though this is a new year and a new decade, my old pet DECUS peeve is still alive and "well." Unisig Newsletter veterans will have read my tirades about this before, but the problem persists. The problem: misuse of *symposium* and *symposia*! DECUS (and especially the U.S. Chapter) is a group whose very lifeblood comes from symposia. One would think that such a group could use the term correctly. In case your Greek is rusty, *symposium* is **singular**, and *symposia* is **plural**. While it is OK to refer to the "Anaheim symposia,", is is absolutely **not** OK to refer to "last November's Anaheim symposia." One event : symposium. More than one event : symposia. Its quite simple. Join the growing movement to correct the usage of this much-misused DECUS word.

While we're being pedantic, here's something interesting: the *Americal Heritage Dictionary* indicates that *symposium* derives from the Greek *sumposion*, meaning drinking party. Some things never change.

This month we have the first installments of periodic excerpts from

- **Frequently Asked Questions about Unix - with Answers**

a monthly posting in the comp.unix.questions newsgroup on Usenet. Two questions this month, more to come once in a while.

We also have copies of slides from the Anaheim *symposium* that didn't make it into the Session Notes. First,

- **Kernel Debugging on ULTRIX/RISC**

This was UN053, if you want to get the audio tape. I apologize for the illegibility of the copies. In order to get them dark enough to decipher, I had to make the extra junk darker, too. That's one problem with analog copying. If there is something specific that you are unable to read, give me a call.

The second set of slides is

- **Configuring Virtual Memory**

which was UN045.

Are you interested in getting involved with the Unisig but aren't sure how to do it? There are plenty of opportunities for involvement both at symposia and in-between. Symposium activities include staffing the campground, chairing sessions, writing articles for Update.Daily, and many others. In Anaheim, Unisig volunteers were rewarded with *ultra-bitchin* caps and shirts. Who knows what cool stuff awaits volunteers in New Orleans? Between symposia, there are the myriad DECUS committees that would love to have your participation. The Unisig currently doesn't have formal "Working Groups," but we are thinking about setting up such a structure, and those groups need people to chair them. And, of course, there is always Newsletter work to be done. So drop me a line - let me know what you're interested in doing, and I'll try to get you started.

Questions, comments, or "I want to volunteer" notes, send hardcopy to:

Sharon Gates-Fishman
NDC Systems
730 E. Cypress Ave.
Monrovia CA 91016

or e-mail to:
amdahl!cit-vax!ndc!sgf

How do I remove a file whose name begins with a '-' ? *from Frequently Asked Questions about Unix - with Answers*

Figure out some way to name the file so that it doesn't begin with a dash. The simplest answer is to use

rm ./-filename

(assuming *-filename* is in the current directory, of course.) This method of avoiding the interpretation of the - works with other commands too.

Many commands, particularly those that have been written to use the *getopt(3)* argument parsing routine, accept a -- argument which means "this is the last option, anything after this is not an option", so your version of rm might handle

rm -- -filename

Some versions of rm that don't use *getopt()* treat a single - in the same way, so you can also try

rm - -filename

Kernel debugging on ULTRIX/RISC

by

Al Delorey

ULTRIX(tm) Engineering Group

decvax!afd

Address Space

The system is always in virtual address mode (no physical address mode)

Address spaces

KSEG0 - not mapped, cached; for kernel text
virtual: 8000 0000 -> 9fff ffff (512 MB)

KSEG1 - not mapped, not cached; for I/O space
virtual: a000 0000 -> bfff ffff (512 MB)

KSEG2 - mapped, cached; for stacks, kernel mallocs
virtual: c000 0000 -> ffff ffff (1 GB)

KUSEG - mapped, cached; for user space
virtual: 0 -> 7fff ffff (2 GB)

Stacks

No interrupt stack, only Kernel and User stacks

Startup Stack - at 0x8001f7ff (0x8002ffff in 3.0/RISC) - grows downward and is used during system startup, until a kernel stack is available.

Kernel Stack - starts at 0xfffe000 (kseg2 space)

User Struct - starts at 0xffffc000 (kseg2 space)

User Stack - starts at 0x7ffff000 (kuseg space) (one guard page 0x7ffff000 to 7fffffff)

How do I remove a file with funny characters in the filename ? *from Frequently Asked Questions about Unix - with Answers*

One classic answer is:

*rm -i some*pattern*that*matches*only*the*file*you*want*

which asks you whether you want to remove each file matching the indicated pattern. Depending on your shell, this may not work if the filename has a character with the 8th bit set (the shell may strip that off). Another is:

rm -ri

which asks you whether to remove each file in the directory. Answer **y** to the problem file and **n** to everything else. Unfortunately, this doesn't work with many versions of *rm*. (Always take a deep breath and think about what you're doing and double check what you typed when you use *rm*'s **-r** flag.) Also

find . -type f ... -ok rm '{}'

where **...** is a group of predicates that uniquely identify the file. One possibility is to figure out the inode number of the problem file (use *ls -i*) and then use

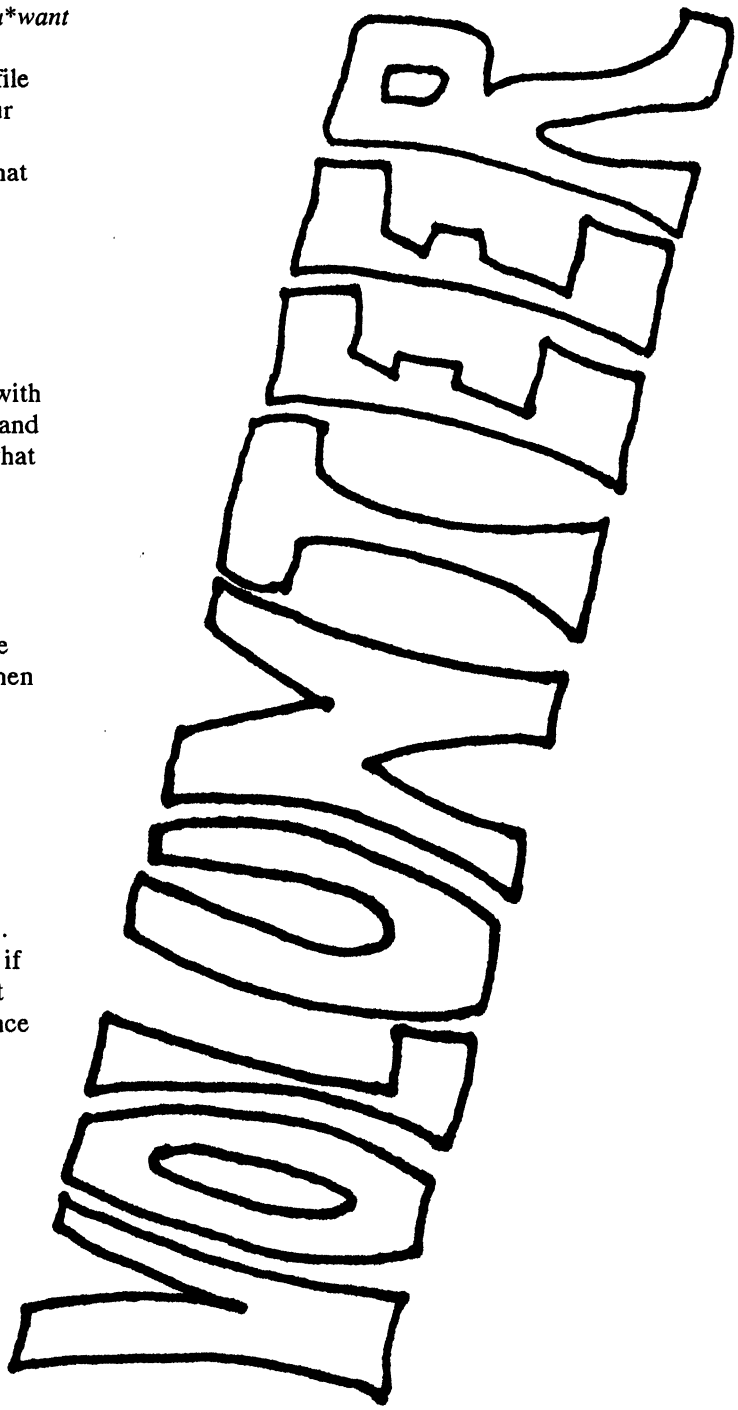
find . -inum 12345 -ok rm '{}'

or

find . -inum 12345 -ok mv '{}' new-file-name

-ok is a safety check - it will prompt you for confirmation of the command it's about to execute. You can use *-exec* instead to avoid the prompting, if you want to live dangerously, or if you suspect that the filename may contain a funny character sequence that will mess up your screen when printed.

If none of these work, find your system manager.



Using nm

For a system crash that gives an Exception PC (EPC) on the console, you can use nm(1) to determine what routine was executing.

```
nm -n /vmunix
```

This command will display the name list (symbol table), in numerical order, of the vmunix image. Find the address that is closest to (but less than) the given EPC from the crash. That address is the starting address of the routine that was executing.

You can then subtract the start address of the routine from the faulting PC, to determine the offset from the beginning of the routine where the error occurred. Then using dbx the offending instruction can be found.

Sample nm output

```
First Kernel text address: 8003,0000 (192k bytes above 8000,0000)
        80030000 T start
        80030000 T eprol
        800300ac T putstr
        80030148 T lputc
        8003018c T cn_reset

        ...

First Kernel data address: is approximately 8011,0000
        80112030 D Sysmap
        8011c830 D Usrptmap
        8011f920 D camap
        8011f930 D kmempt
        8011f930 D ecamap
        80123930 D Forkmap
```

3

Low memory usage

(in sys area see mips/entrypt.h)

physical	kseg1		use
0x00030000	0xa0030000	upward	Ultrix kernel text, data, and bss
0x0002ffff to 0x00020000	0xa002ffff to 0xa0020000		additional Prom Space (64K)
0x0001ffff to 0x0001fc00	0xa001ffff to 0xa001fc00		1K netblock (host/client net boot info)
0x0001f7ff	0xa001f7ff	downward	1K Ultrix temporary startup stack (at 0x2ffff in 3.0; here in 3.1)
0x0001f400	0xa001f400		
0x0001f3ff	0xa001f3ff	downward	dbgmon stack (a few K less than 64K)
0x00010000	0xa0010000	upward	dbgmon text, data, and bss
0x0000ffff	0xa000ffff	downward	prom monitor stack
0x00000500	0xa0000500	upward	prom monitor bss
0x000004ff to 0x00000400	0xa00004ff to 0xa0000400		restart block
0x000003ff to 0x00000080	0xa00003ff to 0xa0000080		general exception code (note cpu addresses as 0x80000080)
0x0000007f to 0x00000000	0xa000007f to 0xa0000000		utlbmiss exception code (note cpu addresses as 0x80000000)

4

Some Usefull dbx Commands

Command (alias)	
alias [name[(args)]cmd]	show all aliases or define an alias
assign (a) var=value	assign a value to a program variable
stop at (b)	set a breakpoint at a given line
cont (c)	continue after breakpint
delete (d)	delete the given item from the status list
down	move down an activation level in the stack
dump	print variable info for current routine
dump	print global variable info for all routines
file	what is the current file
file filename	set the current file to 'filename'
func (f)	set context to specified func name (selects the file)
history (h)	print history list
status (j)	show status list, shows breakpoints (journal)
list (l)	list the next 10 lines of source code
l line:range	list 'range' lines of code, starting at 'line'
next (n or S)	step specified # of lines (don't stop in calls)
nexti (ni)	step spec'fd # of as lines (don't stop in calls)
print (p)	print the value of the specified expr or var
pd	print value of the spec'fd expr/var in decimal
po	print value of the spec'fd expr or var in octal
px	print value of the specified expr or var in hex note: Can't print register variables.
pr	print values of all registers
quit (q)	exit dbx
run [args]	run the program with specified cmd line args
rerun (r)	rerun the program with same arguments
return	finish executing the func & stop back in caller
set	show setting of dbx variables
set $var=value	set a dbx var (can define a new variable)
step (s)	step specified # of lines (stopping in calls)
stepi (si)	step specified # of as lines (stop in calls)
stop at (b)	set a breakpoint at a given line
stopi at <addr>	set breakpoint at given as instruction addr
u	list the previous 10 lines
unset $var	unset a dbx variable
up	move up an activation level in the stack
w	list 5 lines before and after current line
W	list 10 lines before and after current line
where (t)	where are we & how we got here (stack trace) can also be done when stopped at a breakpoint (this will show where/how a system crashed)
whatis <var>	show the variable/symbol definition
whereis <var>	show all versions of the specified variable
which <var>	print default (current) version of the var
/<regex>	search ahead in source code for the reg expr
?<regex>	search back in source code for the reg expr
!<history-item>	specify a cmd from history list (by # or str)
line edit	emacs like line edit capability. To enable you must set the shell environment variable LINEEDIT (setenv LINEEDIT)
^A	Move cursor to start of line
^B	Move cursor back one char
^D	Delete char at the cursor
^E	Move cursor to end of line
^F	Move cursor ahead one char
^H,delete	Delete char preceding cursor
^N	Move ahead one cmd line in hist list
^P	Move back one cmd line in hist list

Using dbx to debug the kernel

```
dbx -k vmunix.n vmcore.n
```

t	get back trace (show where/how the system crashed)
routine-name/ni	dump out n instructions from given routine
&<symbol>/<fmt>	print address and contents of a symbol
<address>/<cnt><mode>	print the contents of image at the given address valid modes are: d,D short, long decimal o,O short, long octal x,X short, long hex c a byte as a char s a null-terminated string f single precision real g double precision real i machine instructions

example:
If the system crashes and reports an EPC of 0x8000dead, then dbx can be used to determine where in the kernel that PC is located.

0x8000dead/9i	decode 9 instructions (& show line #s) @ 0x8000dead Beware: that code that's ifdef'ed out will not count in dbx's line numbering
p gnode[n]	print the gnode struct n in the gnode table
p text[n]	print the text struct n in the text table
set $pid=n	set process context to given pid can then do trace, p *up, p *up.u_procp, etc. on proc
p *up	print the u_area (of current proc)
p *up.u_procp	print the proc struct of the current pid ("$pid")

Using dbx on running vmunix

```
dbx -k /vmunix
```

&<symbol>/<fmt>	print address and contents of symbol
a <symbol>=<value>	to change the value of a symbol (must be root)

Examining the Exception Frame

All error traps & interrupts (except cache parity errors) generate an "exception condition".

Exception conditions trap to VECTOR(exception) in locore.s.
Exception routine saves state in the exception frame (on stack).

For interrupts, VECTOR(VEC_int) is called, which saves additional state on the exception frame, & calls intr() (in trap.c).
intr() calls the specific interrupt handler thru "c0vec_tbl".

For traps, the individual trap routine is called thru the "causevec", these routines (VEC_addrerr, VEC_ibe, VEC_dbe) in turn call VECTOR(VEC_trap), which saves additional state on the exception frame, and calls trap() (in trap.c).

A pointer to the exception frame (ep) is passed as an argument to the following routines:

trap, intr, tlbmod, tlbmiss, syscall

Thus by using dbx to get a trace, you can find the address of the exception frame (the ep argument). You can then dump out the exception frame with a dbx command like:

```
dbx> 0xffffnnnn/41X
```

(cont on next page)

Examining the Exception Frame (cont)

The offsets within the exception frame are defined as follows (see file mips/reg.h):

```
#define     EF_ARGSAVE0     0       /* arg save for c calling seq */
#define     EF_ARGSAVE1     1       /* arg save for c calling seq */
#define     EF_ARGSAVE2     2       /* arg save for c calling seq */
#define     EF_ARGSAVE3     3       /* arg save for c calling seq */
#define     EF_AT           4       /* r1:  assembler temporary */
#define     EF_V0           5       /* r2:  return value 0 */
#define     EF_V1           6       /* r3:  return value 1 */
#define     EF_A0           7       /* r4:  argument 0 */
#define     EF_A1           8       /* r5:  argument 1 */
#define     EF_A2           9       /* r6:  argument 2 */
#define     EF_A3           10      /* r7:  argument 3 */
#define     EF_T0           11      /* r8:  caller saved 0 */
#define     EF_T1           12      /* r9:  caller saved 1 */
#define     EF_T2           13      /* r10: caller saved 2 */
#define     EF_T3           14      /* r11: caller saved 3 */
#define     EF_T4           15      /* r12: caller saved 4 */
#define     EF_T5           16      /* r13: caller saved 5 */
#define     EF_T6           17      /* r14: caller saved 6 */
#define     EF_T7           18      /* r15: caller saved 7 */
#define     EF_S0           19      /* r16: callee saved 0 */
#define     EF_S1           20      /* r17: callee saved 1 */
#define     EF_S2           21      /* r18: callee saved 2 */
#define     EF_S3           22      /* r19: callee saved 3 */
#define     EF_S4           23      /* r20: callee saved 4 */
#define     EF_S5           24      /* r21: callee saved 5 */
#define     EF_S6           25      /* r22: callee saved 6 */
#define     EF_S7           26      /* r23: callee saved 7 */
#define     EF_T8           27      /* r24: code generator 0 */
#define     EF_T9           28      /* r25: code generator 1 */
#define     EF_K0           29      /* r26: kernel temporary 0 */
#define     EF_K1           30      /* r27: kernel temporary 1 */
#define     EF_GP           31      /* r28: global pointer */
#define     EF_SP           32      /* r29: stack pointer */
#define     EF_S8           33      /* r30: callee saved 8 */
#define     EF_RA           34      /* r31: return address */
#define     EF_SR           35      /* status register */
#define     EF_MDLO         36      /* low mult result */
#define     EF_MDHI         37      /* high mult result */
#define     EF_BADVADDR     38      /* bad virtual address */
#define     EF_CAUSE        39      /* cause register */
#define     EF_EPC          40      /* program counter */
```


Examining any Process in the System

```
ps -axlk vmunix.n vmcore.n  - Flags (see ps(1))
                              -a All processes (not just your own)
                              -x Even processes w/ no tty
                              -l Long format (more info given)
                              -k Kernel files given
                            - get <pid> of process to examine

Back in dbx...
set $pid=n          set processs context to given pid (in dbx)
```

Can then do t (trace), p *up, p *up.u_procp, etc. on the process

The process' stored registers in the u_area are in "exception frame format" and can be obtained as follows:

```
px up.u_ar0[n]
```


Forcing a Panic

```
dbx -k /vmunix /dev/mem     - run as root to write

a ln_softc=0
                            - will panic on next network interrupt
                              (even works in single user mode)
                              (Don't do this if system is diskless or
                               it won't dump)

a gnodeops=0
                            - will also panic the system
```

Note: don't bash the proc struct, or then dbx can't work on the image
Note: don't bash the console structs or you won't see the panic messages

Forcing a Memory Dump on DS3100/2100

If you set the bootmode to 'r' (restart), then when the restart button (on a DS3100) is pressed, the system will do a memory dump, and then a reboot, as opposed to halting and clearing memory.

Note that the dump may be silent, so be patient.

To set the bootmode to restart use the console command:

```
>>> setenv bootmode r
```


Forcing a Memory Dump on DS5400

Set the break enable switch up (the dot in the circle).

Press the break key to get the console prompt.

The crash dump code can then be run by typing the "go" command with a special address (the kernel start address + 8) that will call the memory dump routine. In Ultrix V3.0/3.1 the kernel start address is 0x80030000, so the dump routine is started by:

```
>>> go 0x80030008
```


Debugging "hung" systems

(Finding the real kernel stack)

When you force a dump from a "hung" system, the standard back trace done by dbx will not be useful for the currently active process. Dbx will get the process context out of the u_area, which is old. That is, the u_area will have the process context for the last time that the process was context switched out.

The kernel stack for each process in the system is located at virtual address 0xffff,e000 in KSEG2 space. The system has an array of NPROC u_areas that are 8k bytes each. Even though each user process has its u_area and kernel stack at the same virtual address in KSEG2 address space, each uarea/kstack maps to a unique physical address.

On context switches the first 2 entries in the TLB ("safe entries") are set up to map the u_area and kernel stack for that user process.

Within dbx, you can dump out the kernel stack with a command such as:

```
0xffffd000/1028X
```

This will dump the kernel stack from low to high memory (most recent events to oldest events).

Examining stack frames with dbx

odump(1)

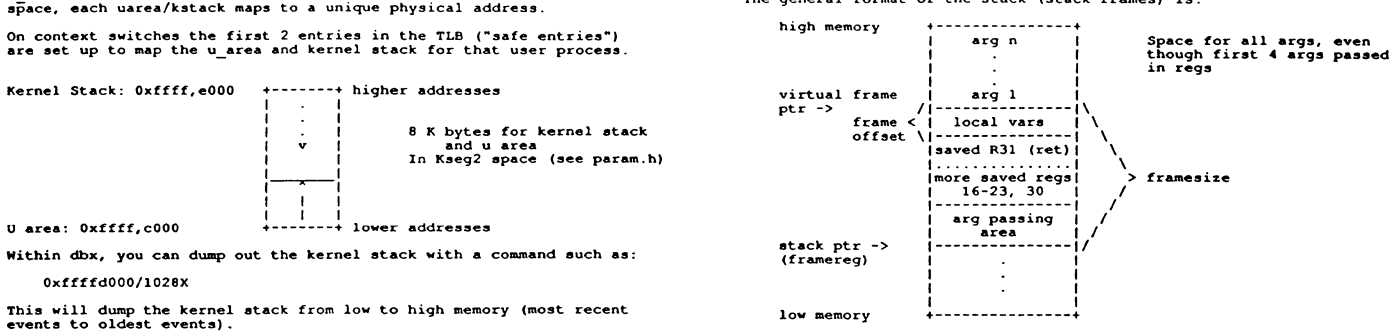
The utility odump(1) can be used to get a symbol table dump of vmunix.n

```
odump -P vmunix.n > vmunix.syms
```

See /usr/include/sym.h (struct runtime_pdr) for the format of the runtime procedure descriptor created by the loader.

The "fpoff" field as shown by odump is the frame size for the particular procedure entry.

The general format of the stack (stack frames) is:



Using this information, you should be able to work your way back up the call history on the stack.

Examples of usage are in libexc: unwind.c, exception.c, exception.h

More on Examining stack frames with dbx

You may find it equally productive to start at the top (high memory) end of the kernel stack and look for the return address of VEC_syscall on the stack. This is where VEC_syscall calls "syscall" and the stack frame for entry into "syscall" has the return address of VEC_syscall saved on the stack. Using the following dbx command will show the instructions in VEC_syscall, and in particular where "syscall" is called, thus you can see the return address that will be on the stack.

```
(dbx) VEC_syscall/30i
   [VEC_syscall, 0x800c3868]              ori     r5,r16,0x1
   [VEC_syscall:590, 0x800c386c]          mtc0    r5,sr
   [VEC_syscall:591, 0x800c3870]          sw      r2,20(sp)
   [VEC_syscall:592, 0x800c3874]          sw      r3,24(sp)
   [VEC_syscall:593, 0x800c3878]          move    r5,r2
   [VEC_syscall:594, 0x800c387c]          move    r6,r16
   [VEC_syscall:595, 0x800c3880]          jal     syscall
   [VEC_syscall:595, 0x800c3884]          nop
**>[VEC_syscall:596, 0x800c3888]          bne     r2,r0,0x800c3810
   [VEC_syscall:596, 0x800c388c]          nop
```

The return address will be: 0x800c3888

Using dbx in this way and the dump of the kernel stack, you can pick and guess your way down the stack to find where the system went.

Disassemble Utility

```
dis -p routine image-file    - will disassemble a routine in the image file
                               see dis(1)
```


Some Usefull Console Commands

```
Dump
    dump -w -x ADDR#CNT       - dump contents of memory, starting
                                at given ADDR & dumping CNT locs
                                (long words in hex format)

    dump -w -x ADDR:ADDR      - dump contents of memory, starting
                                and ending at given ADDRs
                                (long words in hex format)

    dump -w -x 0x8001f400:0x8001f800
                              - dump the startup stack

Examine
    e [-(b|h|w)] ADDR         - examine byte, halfword, word;
                                ADDR is a virt addr; to examine
                                physical loc 0 use 0x80000000

Go
    go [pc]                   - transfer control to given addr

Help
    help [cmd]
    ? [cmd]                   - if no cmd given, display cmd menu

Printenv
    printenv [evar]           - display current value of specified
                                environment variable
Setenv
    setenv EVAR STRING        - set the specified environment
                                variable to the given string
                                environment variable
Unsetenv
    unsetenv EVAR             - remove the environment variable
                                from the environment variable table
Test
    t a                       - test all components and subsystems

Booting
    auto                      - use environment variable "bootpath"
                                to boot multiuser: DS3100/2100 only

    boot                      - use environment variable "bootpath"
                                boots to single-user on DS3100/2100
                                boots to multi-user on other systems

    boot -s                   - boot to single user (this cmd option
                                not on DS3100/2100)

    boot -f rz(CTRL,UNIT,PART)vmunix
                              - boot the specified image to singleuser
    boot -f mop()             - boot from the network to single-user
                                not on DS5800

    boot ... memlimit=<#bytes of mem>
                              - to artificially reduce memory size
```


References For Further Info

Language Programmer's Guide, MIPS Computer Systems, Inc.

MIPS Assembly Language Programmer's Guide, MIPS Computer Systems, Inc.

MIPS R2000 RISC Architecture, Gerry Kane, Prentice Hall

Header files:

```
    /sys/h/
        proc.h
        user.h

    /sys/machine/mips
        entrypt.h
        frame.h
        pcb.h
        pte.h
        reg.h
```

Configuring Virtual Memory
ULTRIX Engineering Group

- Joseph Amato
  - decvax!amato

VM and System Administration

- System Structures
  - Process and Text Structures and Tables
  - System Page Table
- Segment Sizes
  - Text/Data/Stack/Shared memory
- Swap Space
- Paging/Swapping
- Tools

System Tables

- maxusers
  - Sizes proc and text tables
  - nproc = 20 + (8 * MAXUSERS)
  - ntext = 24 + MAXUSERS + NETSLOP
  - param.c
  - mbuf's now dynamically allocated
- maxuprc
  - Number of processes each user may have
  - Default 50

System Memory
physmem

- Sizes the buffer cache
  - 10% of physmem
  - Sets default size of user page table
  - Sets default of kernel memory allocator
  - Default minimum 4 meg

User Virtual Address Space
maxuva

- Controls aggregate user virtual address space
  - Sizes user page table in system page table
  - if(physmem is less than 64) then 256 meg uva
  - else 512 meg uva

Kernel Allocatable VAS
KMEMMAP

- Controls amount of memory allocatable by kernel
  - mbufs, HSC, text/shared memory swap maps
  - Sizes a portion of system page table
  - if(10% physmem less than 3 meg) then 3 meg
  - else if(10% physmem greater than 10 meg) then 10 meg
  - else 10% physmem
- machine/vmparam.h

Text Segment Size
maxtsiz

- Controls maximum size of text portion of a process
- Sizes swap map of text structure
- Default 12 meg

Data/Stack Segment Size
maxdsiz/maxssiz

- Maximum size of data/stack portions of a process
  - Default 21 meg
- Not configureable (see dmmin/dmmax)

Shared Memory Segment Size

Minimum/maximum size of shared memory segment

Stored in sminfo structure

- smmin
- smmax

Scale in 512 byte pages

- 0
- 256 (256 * 512 bytes = 128kb)

Kernel Allocation of Swap Space
dmmin/dmmax

- Minimum/maximum amount of swap allocated to data/stack
- Changes maximum data/stack size
- Swap fragmentation
- Scale in 512 byte disk blocks
  - 32 (32 * 512 bytes = 16 kb)
  - 1024 (1024 * 512 bytes = 512 kb)

Kernel Allocation of Swap Space
dmtext

- Maximum amount of swap allocated to text/shared memory
- Scale in 512 byte disk blocks
  - 1024 (1024 * 512 bytes = 512 kb)
- Cannot be greater than dmmax
- Not configureable

Shared Memory Segments
System wide

- smmni
  - Total number of shared memory segments allowed in the system
  - Sizes global shared memory table
  - Stored in sminfo structure
  - Default is 100 segments
- Changed in data/vm***data.c

Shared Memory Segments
Per Process

- smseg
  - Maximum number of shared memory segments per process
  - Dynamically allocated at smat()
  - Default is 6 segments per user process

Miscellaneous Shared Memory
smbrk

- Controls the number of pages between data segment and start of shared memory
- Stored in sminfo structure
- Default 64 (64 * 512 bytes = 32 kb)

Miscellaneous Shared Memory
smsmat

- Sets the highest attachable address for shared memory
- Stored in sminfo structure (in bytes)
- Default 22 mb
  - config'd in megabytes

Pagein Threshold
pgthresh

- Size of program before paging it in
  - if(text + data is less than pgthresh) bring complete image in
  - else it will be demand paged in
- Set on a filesystem basis
  - mount -o pgthresh=512
  - Default is 128 kb

aging and Swapping Out Thresholds
lotsfree

- Amount of free memory when pageing starts
  - 512 kb (was 1/4 memory)
- conf/param.c
  - Number of 512 byte pages

Paging and Swapping Out Thresholds
desfree

- Amount of free memory when swapping begins
  - 200kb (at most 1/8 of memory)
- If (desfree greater than 1/8 memory) then
  - desfree = 1/8 memory;
- conf/param.c
  - Number of 512 byte pages

Paging and Swapping Out Thresholds
minfree

- Minimum amount of free memory
  - 64 kb (but at most 1/2 of desfree)
- If (minfree greater than desfree / 2) then
  - minfree = desfree / 2;
- conf/param.c
  - Number of 512 byte pages

Tools

- ps
  - process specific information
- pstat
  - process and text table, u-area, and swap space usage
- vmstat
  - pageing, swapping, cpu, and fork stats
- ipcs
  - shared memory, semaphores and message queues
- ipcrm

NEWSLETTER OF THE VAX SYSTEMS SIG

Pageswapper

Our Mascot

VAX SYSTEMS SIG
DECUS U.S. CHAPTER

TABLE OF CONTENTS

VOLUME 10 NUMBER 15

CONTRIBUTIONS

Contributions and suggestions for this newsletter are constantly needed. Articles, letters, technical tips or anything of interest to our SIG are greatly appreciated.

Please do not submit program source. It is difficult to typeset and is better distributed on the VAX SIG tape. Please do not submit "slides" from DECUS Symposia presentations or other meetings. They are generally a very incomplete treatment for those readers of the *Pageswapper* who are not so fortunate as to be able to travel to Symposia. Please DO write articles based on such slides. Please do not embed "mark up language" (TeX, SCRIBE, RUNOFF) commands in your submission. Plain ASCII test is preferred.

Send your contributions to:

David K. Santistevan
Western Data Technologies
5270 Fox Street
P. O. Box 5542
Denver, CO 80217

Submissions may also be made electronically via DCS to KINGS.

EDITOR'S NOTE

David Santistevan
Pageswapper Editor

Well the exciting part of the season is over and we are faced with the more boring part of winter. But what a great season it's been. The Anahiem Symposia was one of the most successful I have ever attended and New Orleans is also looking great.

We have started our format changes with this issue, look through the issue and let us know what you think.
I would also like to encourage participation in our two new columns "Ask the Wiz" and "Ask Digital". You may submit questions as you would with any other submission or you can simply give us a call with your question.

In addition this month we are featuring an article called "BO KNOWS VAX?" which belive it or not is an article on the future of VMS". This article is a summary of Digital's position regarding the rumor that there is no new VMS operating system for the VAX, and their actual committment to VMS for the long term.

Ted Nieland the VAX SIG library coordinator will have a monthly section dedicated to reviewing library tape submissions. This input has been a great help to me when I've needed a second opinion in order to clarify particular submissions. I think you'll find it useful too. Remember, keep those comments and suggestions coming so we can continue to provide you with the best newsletter available throughout the new decade!

Have a Great New Year!

Dave

ASK THE WIZZARD

Marvin Abeyta, Staff Writer
Western Data Technologies

WE CAN GET YOUR QUESTIONS ANSWERED !!! As PAGESWAPPER editors, we have direct access to frontline VMS developers, managers and a worldwide network of computing professionals. Please phone or mail questions to:

Marvin J. Abeyta
WESTERN DATA TECHNOLOGIES
5270 Fox Street
P.O. Box 5542
Denver, CO 80217
(303)298-9192

QUESTION: WHY DOES THE COMMAND "ANALYZE/DISK/NOREPAIR/NOCONFIRM" ACTUALLY DO REPAIRS ?

ANSWER: With the new highwater file marking introduced in version 5.0 , in order to check the file highwater mark the operating system has to access the file. When the file system has the file opened it takes the opportunity to correct any errors it finds at that point. It's not an analyze/disk issue, rather, it's a disk consistency issue that the file system itself is maintaining. The file system must make sure that the file highwater mark is consistence with the file header.
NOTE: Look for a fix, that is , the file system won't make changes unless repair is explicitly asked for, in the next major release.

QUESTION: WHAT'S THE TRUTH ABOUT THE EXISTENCE OR NON-EXISTENCE OF A FILE ARCHIVE BIT ?

ANSWER:
There is a file archiving feature coming, however, there is no archive bit.

QUESTION: WHAT IS THE PRODUCT RELEASE DATE AND HOW IS IT USED ?

ANSWER: The PRODUCT RELEASE DATE is coded into the product and into the PRODUCT ACCESS KEY (PAK). A PAK will allow access to the product only if the PRODUCT RELEASE DATE of the product is earlier or equal to the PRODUCT RELEASE DATE of the PAK. Therefore, an H-kit of a product will work indefinitely but the PRODUCT RELEASE DATE will prevent you form using the next generation of the product. A PRODUCT TERMINATION DATE, on the other hand, specifies the last date on which you can use the PAK. Typically, PAKs do not contain PRODUCT TERMINATION DATES unless they are a demo PAK, or a loaner PAK, that sort of thing.

QUESTION: WHAT DOES THE WARNING MESSAGE IN VMS'S FILE SYSTEM THAT IT IS UNSAFE TO USE THIRD PARTY DISK DEFRAGMENTORS REALLY MEAN ?

ANSWER: No, there isn't a bug in the file system. Rather, the file system needs to be extended beyond is current limits to allow for a transaction processing type semantic across certain functions within the file system. Because of this short coming, the file system under VMS couldn't support a safe defragmentation utility.

QUESTION: WILL DEC EVERY DO ANYTHING TO PREVENT A CLUSTER NODE WITH VAX CLUSTER SET TO ZERO FROM BEING ABLE TO ACT AS A STAND ALONE SYSTEM USING ONE THE HSC DISKS ?

ANSWER: No, but DEC will not support it either. Systems physically connected to others systems with a CI, but with vax cluster set to zero can use and access an HSC disk as if it were a stand alone system. However, this breaks the rules of good vax clustering and can have serious ramifications if you're not

careful. DEC's position not to support this type of usage stems the fact that the integraty of the disk cannot be guarenteed since there is no guarentee of synchronization for access to the disks. There is nothing to prevent someone from mounting a disk, which is fully visible to the standalone system, and completely corrupting it because acccess are not synchronized between the standalone system and the cluster systems. Subsequently, DEC had no choice but to state publicly that the configuration is unsupported. DEC, however, does recognizes that people, for whatever reason, do in fact use their system in this manner and will not intentionally do something that will prevent it.

QUESTION: WHY DOES SWAPPER, UNDER SOME CONDITIONS, CONSUME SIGNIFICANT PORTIONS OF AVAILABLE CPU CYCLES?

ANSWER: This pacticuler behavior is highly dependent upon your workload and configuration. What swapper is doing when it devoures the cpu cycles is identifying pages it wants to write to backing store, but it is not trying to flush the entire modified page list. Rather, swapper is going through the modified page list identifying pages to write in a selective fashion to backing store. The problem occurs when the candidate page number, the count of pages to be included in the selective write, is GREATER than the sysgen parameter MPW_WRTCLUSTER, the number of pages swaper will write in a single I/O. The scan is restarted at the top of the modified page list after each I/O initiation and each I/O completion.

QUESTION: WHAT CAUSES SELECTIVE WRITING OF PAGES FROM THE MODIFIED PAGE LIST ?

ANSWER: There are three different situations that cause selective writes of the modified page list.

1. Dead page table scan happens when you want to throw a page out of a process(page table page). If a page table page references a page on the modified page list it's neccessary to severe the command with a page table entry, subsequently, it's neccessary to write these pages to backing store before the page table entry can be put on the modified page list.

2. Balanced Slot Cleanup happens when a process is deleted. The process will do most of the cleanup itself,however, the final dying gasps are done by swapper cleaning up the balance slot.

3. Global Section Deletion happens because the modified page list is selectively written when global sections are deleted.

QUESTION: WHAT CAN I DO TO WORK AROUND THIS PROBLEM ?

ANSWER: There are four things you

can do the prevent too many pages to be written out.

1. set MPW_IOLIMIT = 1 this will revert to pre 5.0 behavior ,in that, you'll have only one outstanding I/O at a time.

2. set MPW_LOWAITLIM=MPW_LOLIMIT this will control the number of I/Os swapper gets behind when the modified page list exceeds the MPW_HILIMIT

3. reduce MPW_HILIMIT this will control when you write pages out, therefore reduce time scanning

4. increase working set sizes addresses the case when your process is throwing out a page table page and invoking the dead page table scan. An increase in working set size reduce the number of page table scans.

BATCH / PRINT BUG FIXES

V5.0-1 - several print symbiont fixes

V5.0-2 - several job controller fixes

V5.1 - logical queue fix

V5.2 - generic target list fix deadlock (part1)

V5.2-1 - deadlock (part2)

OUTSTANDING PROBLEMS :

- changing stock type on form
  - . set queue/form_mounted
  - . define/form/stock with references
- stop/queue/manager after JOBCTL abort/restart with exec print jobs

BATCH / PRINT FEATURES

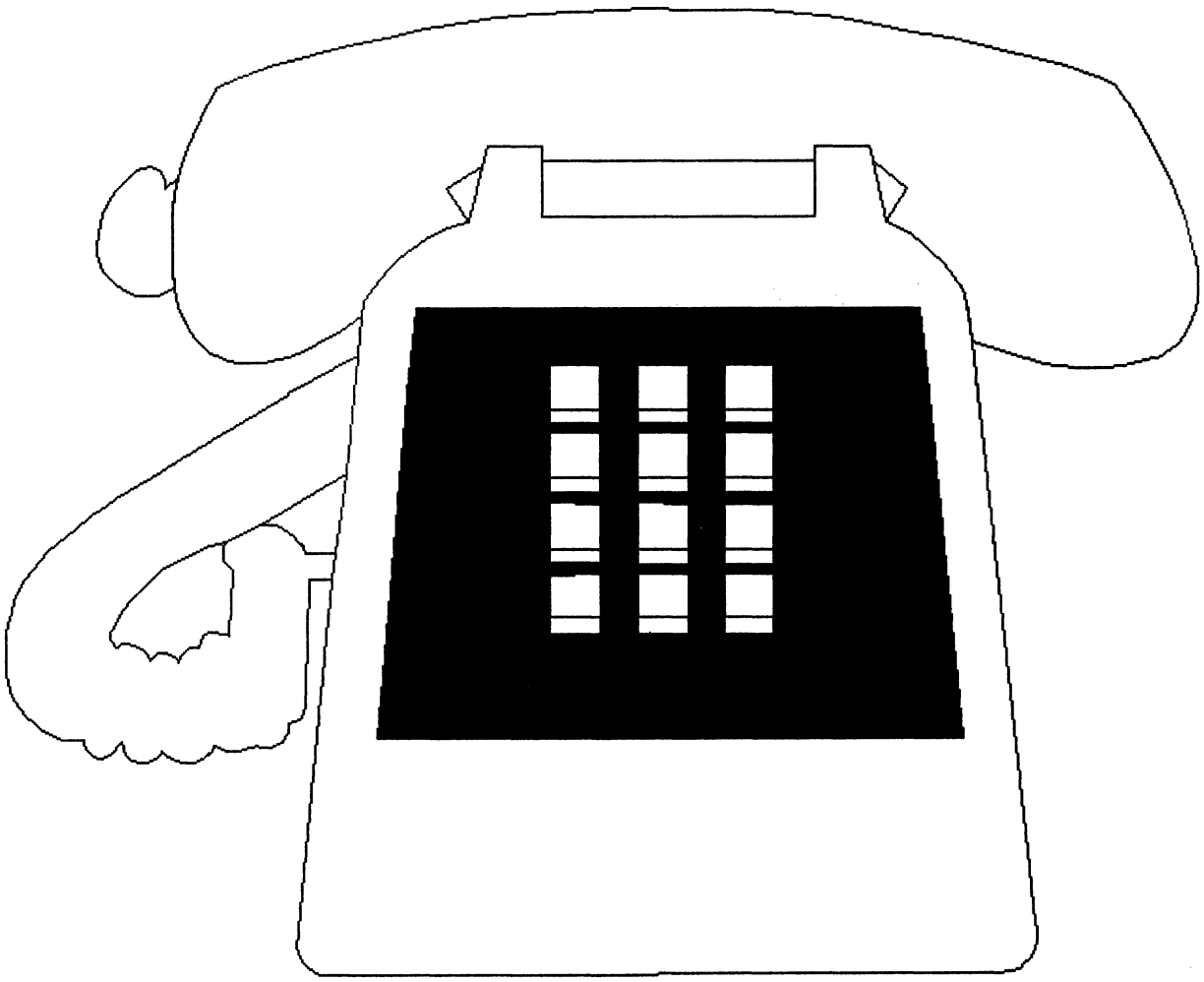
V5.0 - many peformance improvements
- . pending list per queue
- . Job entry index (show enrty)
- . better print job scheduling
- . faster recovery after node exit
- ACLs on queue
- F$GETQUI

V5.2 - $ENTRY local symbol after successful print in submit

V5.3 - performance inprovements
- . SUBMIT AND PRINT commands
- . process deletion overhead
- . job notification

ASK DIGITAL

Marvin Abeyta, Staff Writer
Western Data Technologies



WE CAN GET YOUR QUESTIONS ANSWERED !!! As PAGESWAPPER editors, we have direct access to frontline VMS developers, managers and a worldwide network of computing professionals. Please phone or mail questions to:

Marvin J. Abeyta
WESTERN DATA TECHNOLOGIES
5270 Fox Street
P.O. Box 5542
Denver, CO 80217
(303)298-9192

LISCENSE MANAGEMENT FACILITY

QUESTION: DO YOU ANTICAPATE EXTENDING LMF TO GENERALIZED THIRD PARTIES AS OPPOSED TO WHO HAPPEN TO BE COOPERATIVE AT THIS CURRENT TIME.

ANSWER: DEC has always intended to extend LMF to all third parties. Even those who don't have cooperative marketing agreements.

QUESTION: WILL THERE BE EFFORTS TO COORDINATE THE DISTRIBUTION OF CONSOLIDATED SOFTWARE AND THE ONLINE DOCUMENTATION ? (ie MEDIA AND DOCUMENTATION)

ANSWER: They are coordinated today in that both are shipped on the same day. However, the online documentation library doesn't contain documentation for all 120 products that are on the consolidated software distribution compact disc.

QUESTION: COULD YOU CLARIFY DEC's POLICY IN REGARDS TO COPING DOCUMENTATION ?

ANSWER: For hardcopy documentation, the standard copyright protection act is in play. You can copy part of a book for personal use only. For making multiple copies of parts or whole books you can purchase a right-to-copy liscense from DEC. For the online documentation, since it is sold as software and is therefore subject to the terms and conditions of copyrighted software and ,as such, you cannot legally copy it. At this time there is no right-to-copy liscense available for the compact disc media.

QUESTION: WHAT'S THE TIME TABLE FOR THIRD PARTY USE OF THE LISCENSE MANGEMENT FACILITY ?

ANSWER: DEC can't be sure. It's in field test now, but since there are business practice issues as well as techical issues to be resolved with the third parties the process is more complicated than normal field tests.

QUESTION: WILL PAKS BE GENERATED BY THIRD PARTIES ?

ANSWER: Yes, if/when third parties start distributing their products using LMFs they would have to generate their own paks. DEC would provide some sort of utility such as a pak generator.

QUESTION: HOW MANY USERS IN A VAX LOCAL AREA CLUSTER COULD ACCESS ONLINE DOCUMENTATION FROM A SINGLE CD READER AND UPDATE SERVICE ?

ANSWER: Although there is a lack of emphirical performance data, DEC experience has been that clusters of up to sixty users with 3 to 10 users access a single online documentaion compact disc reader at the same time suffered no performance problems. Of course, it really depends on your own cluster configuration size and usage.

QUESTION: COULD ALL THE USERS ON A WIDE AREA NETOWRK ACCESS THE SAME ONLINE DOCUMENTAION COMPACT DISC READER ?

ANSWER: DEC doubts that all users would be able. However, they (DEC) didn't venture forth a reason why not. If any readers could share some insight, please contact the page swapper editor.

QUESTION: HOW EXPENSIVE AND AVAILABLE ARE THE COMPACT DISC READERS ?

ANSWER: No, DEC didn't save enough money in not having to produce the 50 or 100 floppy disks to give away the readers. However, the compact disc readers are reasonably priced and DEC is considering packageing the readers with the CDs in terms of a subscription offering as well as offering some vaxstations with the reader embedded.

QUESTION: IS THE ULTRIX DISTRIBUTION FOR THE RISC BASED AND THE VAXSTATION BASED TECHNOLOGY THE SAME.

ANSWER: Currently, only the VAX based distribution is distributed using the compact disc technology.

QUESTION: IS IT POSSIBLE TO USE A VAX (SPECFICALLY AN UNTRIX SYSTEM WITH ETHERNET CONTOLLER PLACED IN PROMISCUOUS MODE) AS A EHTERNET TRAFFIC MONITOR ?

ANSWER: It is ineffective to use ETHERNET contollers for network traffic monitoring since the total ETHERNET controller bandwidth is sensitive to only 3.4 to 3.7 MB/SEC transmissions(ETHERNET can handle approximately 10MB/SEC). You would only see 1/3 of the traffic on the backbone. A LANBRIDGE 100 would be able to monitor the entire EHTERNET bandwidth since it can accomodate approximately 13000 transfers / SEC.

QUESTION: WHAT FUTURE DIRECTIONS WILL DEC BE CONCENTRATING ON ?

ANSWER: New vector processing technology implemented in the 9000 and 6400+ series VAX(processing speeds to compete with the CRAY XMP). A new FORTRAN complier to take advantage of vectorization. Will feature auto-optimization, auto-decompression and auto-parallelism. Future systems will push 100 vups but the VAX architecture will need to be redesigned to approach faster processing speeds.

QUESTION: WHAT HAS BEEN DONE TO IMPROVE PREFORMANCE TO THE LISCENSE MANAGEMENT FACILITY ?

ANSWER: Performance improvements have been made to the LICENSE LIST of the license management facility. The VMS$LICENSE.COM has been modified fot larger clusters. It is now prompt based, and prior license values are retained as defaults. BTACH mode entry if license information is supported in 5.2. The Cluster PAK is noew fully enforced in VMS 5.2. All product licenses are now enforced

SIG TAPE REVIEW 4 & 5

The Spring 1989 L&T/VAX SIG Tape Reviews
Part 4

Earle Ake
Science Applications Intl. Corp.

Todd Aven
Computer Associates International

Jack Davis
Phillips Consumer Electronics

Daniel Graham
Dynamics Research Corporation

Rand Hall
Merrimack College

David Hittner
Pioneer Standard Electronics

Ted Nieland
Control Data Corporation

Jon Pinkley
Westinghouse Electric Corporation

This is a review of the VAX89A2 section of Spring 1989 L&T/VAX SIG Tape. Due to the large amount of overlap between the L&T and VAX SIG tapes, the Tape editors decided to combine the tapes into one large tape with no overlap. This SIGs tape contains many useful items for people with VAX Computers and people interested in Languages and Tools.

The reviewers have scoured through most of the tape and have jotted down the following notes on the material that is on the tape. Not everything on the tape is reviewed due to the shear volume of material, but it is hoped that this review will help people in deciding what on the tape might be useful to them.

The SIG tapes are a project started by the SIGs a while back as a method of distributing free software that might be helpful to others. Not all of the material on the tapes are "finished" products.

The encapsulated reviews are rated on a 1-5 scale with 5 being excellent.

Submission Subdirectory:	[VAX89A2.Games.FCD]
Ease of Installation:	5
Documentation:	3
Intended Audience:	General
Ease of Use:	3
Usefulness:	1
Sources Included:	yes - Macro
Objects Supplied:	no

Description:
This is a five-card draw poker game implemented for VT-compatible terminals.

Observations:
Having violated the prime directive for using new software - DO NOT read the documentation, I found that the documentation is confusing - when it says "..keys 6 through 0..", it REALLY means it! - 6, 7, 8, 9, and 0!

Other than the confusing statement in the documentation file, the program seems to run just fine. Since I'm not exactly an avid gambler, (or even an occasional gambler), I'm not too well qualified to give an opinion of the game's playability or fairness.

Submission Subdirectory:	[VAX89A2.GHC]
Ease of Installation:	4
Documentation:	4
Intended Audience:	General
Ease of use:	5
Usefulness:	5
Sources included:	Yes, FORTRAN
Objects Supplied:	No

"I have modified the source modules PROTOCOL.FOR and XMODEM.FOR, along with the include file PARAMS.INC of Robin Miller's VAXNET program (version 12.1) to support the XMODEM-CRC protocol. When sending, CRC usage is automatic when it is noted that the receiver requests CRC. When receiving, an additional prompt is presented to the user after the RECEIVE command is issued; depending on the users response, VAXNET will expect CRC. "

This submission contains modifications to VAXNET as submitted by Robin Miller on the Fall 1987 VAX SIG tape. He has included XMODEM-CRC support to the XMODEM module. Previously VAXNET would only handle XMODEM-Checksum. To take advantage of these modifications, you need to get the previous VAXNET submission and replace the modules contained here.

Submission Subdirectory:	[VAX89A2.GUNTHER]
Ease of Installation:	
Documentation:	3
Intended Audience:	RS/1 users
Ease of Use:	
Usefulness:	
Sources/objects Included:	yes

Description:
This directory contains two RS/1 procedures for producing trilinear contourplots, contained in two subdirectories:

- o \TERNARY Contains a procedure to produce trilinear contourplots as RS/1 CONTOURPLOT objects.
- o \TRILIN Contains a procedure to produce trilinear contourplots as RS/1 GRAPH objects.

The first of these is newer and better than the last. However, the older procedure in the \TRILIN directory has the advantage of not requiring the RS/1 CONTOURPLOT option to work (if your site does not have the CONTOURPLOT option, you will have to use the older procedure) as well as not requiring a graphics terminal or plotter (it can produce usable output on a line printer.)

See the individual README.TXT files in each of the above subdirectories for more information.

Comments:
I'm afraid I don't know what on earth this submission is about. I have no knowledge of RS/1 or whatever trilinear contourplots are. I hope it is useful to SOMEONE.

Submission Subdirectory:	[VAX89A2.INFOVAX.BOSS]
Ease of Installation:	4
Documentation:	4
Intended Audience:	System Managers, General
Ease of use:	5
Usefulness:	5
Sources included:	Yes, C
Objects Supplied:	Yes

BOSS is an interactive job controller. It lets you run several interactive jobs simultaneously.

BOSS allows a user to have more than one interactive job attached to the terminal at the same time. It operates like a terminal server does. BOSS is handy if you want to run several processes at once from the same terminal but don't want to have subprocesses. Processes are identified by single letters and it is very easy to switch between processes. Handy for people that can operate more than one terminal at a time.

Submission Subdirectory: [VAX89A2.INFOVAX.CVTTIME]
Ease of Installation: 5
Documentation: 1
Intended Audience: General
Ease of use: 5
Usefulness: 2
Sources included: Yes, DCL
Objects Supplied: N/A

CVTIME.COM is a small command procedure that takes a given date string and based on a keyword such as LASTYEAR, NEXTMONTH, LASTMONTH, etc. returns into a global symbol the appropriate date string. If you pass it the string "23-JAN-1989" and the keyword "NEXTMONTH", you will get back the string "1-FEB-1989".

Submission Subdirectory: [VAX89A2.INFOVAX.EXEC_BATCH]
Ease of Installation: 5
Documentation: 5
Intended Audience: General
Ease of use: 5
Usefulness: 5
Sources included: Yes, C
Objects Supplied: Yes

Someone recently posted a BATCH.COM command procedure which inputs commands interactively and submits it to a batch queue. I have a utility called EXECUTE, written in C, which does this. It's advantage is, of course, being an executable, it runs faster than a command procedure. It also has the following added features: If there is only one command to be executed, that command can be entered on the EXECUTE command. The prompting for input lines is done using SMG$ routines, so that line recall is possible. Specifying /EDIT invokes an editor for inputting the commands, rather than prompting line by line. The qualifier /QUEUE can be used to specify the batch queue. Lastly, there is a /NOBATCH qualifier, so that the commands are executed immediately. I find this useful for executing a series of commands without having to create a command procedure (or alternatively typing the commands ahead and hoping that I've spelled them properly.)

This is a neat way to submit something to batch. There have been command procedures written that submit a one line command to batch, but this is more than that. This is written in C so it is fast. It also uses SMG$ routines which makes for easy command recall. It is much easier than editing a file to submit to batch. This is worth looking at.

Submission Subdirectory: [VAX89A2.INFOVAX.HAYES_DTE]
Ease of Installation: 5
Documentation: 3
Intended Audience: General
Ease of use: 5

Usefulness: 4
Sources included: Yes, MACRO
Objects Supplied: Yes

Here's a modification of Jake VanNoy modification to the examples DF03 driver. I changed it for a MT224 (Multitech) modem which i think is functionally equivalent to a Hayes.

This is a macro program for use with the SET HOST/DTE/DIAL command in VMS. It provides support for the MT224 (Multitech) modem.

Submission Subdirectory: [VAX89A2.INFOVAX.KEPT_SUBPRC]
Ease of Installation: 3
Documentation: 2
Intended Audience: Programmers
Ease of use: 3
Usefulness: 4
Sources included: Yes, C
Objects Supplied: Yes

An implementation of subprocess caching.

This is an example of how to start a subprocess and communicate with it using mailboxes. The subprocesses waits until something has been written to it's mailbox. The subprocess reads the command, executes it, and returns the status back to the main program. Not very useful by itself, but it does provide a good example of how to use this in other programs.

Submission Subdirectory: [VAX89A2.INFOVAX.MAIL_ALIAS]
Ease of Installation: 5
Documentation: 5
Intended Audience: General
Ease of use: 5
Usefulness: 5
Sources included: Yes, DCL
Objects Supplied: N/A

Mail_Alias allows users to have Mail Aliases defined for them via use of a configuration file and a logical name table that is connected only within the scope of this program. This scheme allows the logicals to be defined at all times, but not to be processed all the time.

This is a command procedure that will define mail aliases for you. It allows you to have the alias file in your SYS$LOGIN: directory or you can reference a logical name MAIL_ALIASES. You can define a mail alias such as:

Stupid: System

Every time that you send mail to stupid, it will actually go to SYSTEM.

This is a very handy utility if you are on a network and don't want to go through typing in a destination string such as: User%Node1.Node2.Node3@Edu every time you want to send that user a mail message.

Submission Subdirectory:	[VAX89A2.INFOVAX.MT_BOT]
Ease of Installation:	5
Documentation:	1
Intended Audience:	Programmers
Ease of use:	5
Usefulness:	3
Sources included:	Yes, C
Objects Supplied:	Yes

I believe batch is the best way to deal with running backup and receiving "next volume" mount requests, however, there is a way we have used back in the olden days (pre-VHS tape drives) which you might find handy. Its a program that is SPAWN/NOWAIT'd from whatever terminal you are using and it wakes up every 30 seconds and checks the mag tape device status watching for the MT$_BOT bit to pop up (which usually means the tape has been rewound and dismounted) causing it to send a bell code to the terminal. I didn't write it, but here it is if you want it.

Well that just about sums it up. You can start this up as a subprocess and when the tape drive wants another tape, it rings the bell at the users terminal.

Submission Subdirectory:	[VAX89A2.INFOVAX.PASSWORD_SWAP]
Ease of Installation:	5
Documentation:	4 (Comments in code)
Intended Audience:	System Managers
Ease of use:	5
Usefulness:	5
Sources included:	Yes, FORTRAN
Objects Supplied:	No

There are two FORTRAN files in this directory: PUSH_PASSWORD.FOR and POP_PASSWORD.FOR. The purpose of PUSH_PASSWORD.FOR is to extract the hashed (encrypted) password of a specified VMS username, save it in a file in SYS$MANAGER:username.PUSHED, and insert a new, known hashed password using AUTHORIZE. POP_PASSWORD reverses the process.

These two programs would be good for the system manager that wants to do some work for a person and charge it to their account but doesn't know their password. The system manager saves the old hashed password, changes the password to allow him access, then restores the old password for the user. Would also be handy for the system manager in debugging a problem for a user that only occurs under one account. Rather than having the user give the password over the phone, the password is changed long enough to allow access and the password it not compromised. For security reasons, I

would not suggest leaving this out in the open.

Submission Subdirectory: [VAX89A2.INFOVAX.PGFLQUO_SIZER]
Ease of Installation: 5
Documentation: 4
Intended Audience: System Managers
Ease of use: 5
Usefulness: 5
Sources included: Yes, DCL
Objects Supplied: N/A

[Someone] had asked me about some method to help in determining what PGFLQUOTA would be needed to run programs being created on his system. He kept bumping into the quota problem as simple program(s) were 'enhanced' into complex programs then into HUGE programs.

To this end, I have enclosed a command procedure which will examine the .EXE file for the amount of page file usage which MIGHT be used.

This directory contains a command procedure which looks at an .EXE file to determine how much PAGEFILE space the program may need when running. The command procedure reports number of writable pages in the image such as:

Total number of writable pages for image is: 2240

From this information, the system manager could be able to size the PAGEFILE and set PGFLQUOTA to a proper amount.

Submission Subdirectory: [VAX89A2.INFOVAX.POKE_BOOTTIME]
Ease of Installation: 5
Documentation: 4
Intended Audience: System Managers, System Hackers
Ease of use: 5
Usefulness: 4
Sources included: Yes, FORTRAN, MACRO
Objects Supplied: Yes

Here is a SHELL archive containing a program to allow anyone with CMKRNL privilege to POKE the system BOOTTIME. This address in system, space (EXE$GQ_BOOTTIME) can sometimes be wrong. This causes programs that use the SYS$GETSYI item SYI$_BOOTTIME or the lexical function F$GETSYI item BOOTTIME) to be wrong.

The program will ask for a standard VMS time, convert it to binary time and call a kernel mode routine to poke the cell in system space.

This program also serves as a nice template for writing other system space poking routines.

How useful it would be to change the system boottime may be questionable, but some good examples of how to write system space poking code is provided here. There is a good example of how to recover from an access violation when running in kernel mode. Code was linked under V5.x so relink to run under V4.x.

Submission Subdirectory:	[VAX89A2.INFOVAX.PROFILE]
Ease of Installation:	5
Documentation:	3
Intended Audience:	Programmers
Ease of use:	5
Usefulness:	4
Sources included:	Yes, C
Objects Supplied:	No

A poorman's PCA.

Simply call ProfStart when you want profiling to start, ProfPrint to stop profiling and print results. If you don't call ProfPrint, it will be called automatically when the program exits.

I wrote this for use with a particular piece of code I was working on so it may not be completely general. I've included one .h file it uses (vms.h, which provides handy definitions for dealing with VMS), but not a .h file that is specific to the larger piece of code. Among other things, it #include's vms.h, and defines a FILE * named Logger to which output is written (and a symbol name LOGGER to indicate that the debug code is enabled). So, view this as a sketch of how to write this kind of code.

Note that, because the timer AST's are requested in user mode, you will get distorted readings around system calls. Still, this will give you some picture of where your code is spending your time. (In VMS V5, you can request that $SETIMR measure CPU time, not elapsed time. This could give you more useful information; it's left as an exercise to the reader....)

DEC has a product called PCA (Performance and Coverage Analyzer) that takes this basic idea and expands it into something much more generally usable - this profiler requires some wizardry to use. You might want to look into it.

This is a way to monitor the amount of CPU time a program is taking. It is not extremely general and may take some modifications for your particular application. It does give a good example on how to monitor program CPU consumption.

Submission Subdirectory:	[VAX89A2.INFOVAX.PTYPE]
Ease of Installation:	5
Documentation:	2
Intended Audience:	General

Ease of use: 5
Usefulness: 2
Sources included: Yes, DCL
Objects Supplied: N/A

PTYPE is a command procedure that aids in the typing of files to remote printers. It has the escape characters to put the printer in 132 column mode or other modes. This would be handy to use if you wanted to type a file to a printer but didn't want to take the time to setup a queue and use DECs queue forms.

Submission Subdirectory: [VAX89A2.INFOVAX.SETPORTNAME]
Ease of Installation: 5
Documentation: 3
Intended Audience: System Managers
Ease of use: 5
Usefulness: 4
Sources included: Yes, MACRO
Objects Supplied: Yes

Here's a little toy I wrote yesterday which lets a suitably privileged (CMKRNL) user manipulate the Access Port Name (DVI$_TT_ACCPORNAM) field for terminal devices, e.g.

```
$ Run ACCPORNAM
ACCP> Show TXA0
%ACCP-I-ACCP, Access port name of _TXA0: is set to Operator's room
ACCP> Set TXA0 On the moon
ACCP> Show TXA0
%ACCP-I-ACCP, Access port name of _TXA0: is set to On the moon
ACCP> Exit
$
```

VMS V5.x only; use it carefully (it doesn't crash my systems, but ...).

This is a nice little hack for setting the Access port name of a terminal device such as TXA7:. Normally, access port names are only associated with terminal server ports. You may want to use this to assign names to ports associated with say a Tektronix workstation or a direct connect PC to more rapidly identify what that port is or what it's function is.

Submission Subdirectory: [VAX89A2.INFOVAX.SETUSER]
Ease of Installation: 5
Documentation: 3
Intended Audience: System Managers, System Hackers
Ease of use: 5
Usefulness: 5
Sources included: Yes, MACRO
Objects Supplied: Yes

SETUSER a Utility to allow a privileged user to become another user.

This program allows a privileged user (CMKRNL, PSWAPM, privs plus read access to sysuaf) to change his username. It also changes the users Account name, UIC, Process name, and Default Directory to that of the specified user.

It now changes the group logical name table and changes the owner of the JOB table. (14-Oct-1986).

NOTE: READ WARNING in SETUSER.MAR!!!!!!!

Modified to run under VMS V5.0, 5.0-1, 5.0-2 and 5.1 only!

This is another utility to change your process to that of another user. This one differs in that it also changes the group logical name table and the owner of the job table. This is important when spawning a subprocess. Because the author hardcoded some of the addresses into the program, be sure to read the warning in SET_USER.MAR first before you run this. Note the versions of VMS that the author says it will work with.

Submission Subdirectory:	[VAX89A2.INFOVAX.SHOWDEF]
Ease of Installation:	5
Documentation:	1
Intended Audience:	System Managers
Ease of use:	5
Usefulness:	3
Sources included:	Yes, MACRO
Objects Supplied:	Yes

Here is a program to find the default directory specification for any process (i.e., SHOW DEFAULT/ID=pid).

The program is written in macro and will show the default directory for any process in the system.

Submission Subdirectory:	[VAX89A2.INFOVAX.SHOW_DEV]
Ease of Installation:	5
Documentation:	5
Intended Audience:	General
Ease of use:	5
Usefulness:	4
Sources included:	Yes, DCL
Objects Supplied:	N/A

ShowDev - A command file to show all information about a device.

SHOWDEV is a command procedure that shows you everything there is to know

about a device, plus some that you forgot about. Whether all this information is useful or not is up to you. If you should ever need it, it is here.

Submission Subdirectory:	[VAX89A2.INFOVAX.SMP_PHOTO]
Ease of Installation:	4
Documentation:	5
Intended Audience:	General
Ease of use:	5
Usefulness:	5
Sources included:	Yes, C
Objects Supplied:	Yes

For those of you who don't know about PHOTO, PHOTO copies all of the Input/Output (IO) that appears on the terminal to a file. It is useful for turning in homework assignments, which do most of their IO to the terminal. PHOTO requires that you have installed the latest version of the PY/TW drivers maintained by Kevin Carosso of NRC (kvc@nrc.com or kvc@ymir.bitnet, found in the directory [VAX89A2.KVC]; if you are running DECWindows, the PY/TW drivers are already installed).

This is a modification to the photo program enhanced to run on SMP type processors. PHOTO copies all the Input/Output to a file for review later. This is a lot handier than submitting a job to BATCH to capture the output since you are still running interactively.

Submission Subdirectory:	[VAX89A2.INFOVAX.STRIP]
Ease of Installation:	5
Documentation:	2
Intended Audience:	General
Ease of use:	5
Usefulness:	5
Sources included:	Yes, C
Objects Supplied:	Yes

STRIP performs functions on text files such as removing embedded <CR><LF>, leading and trailing spaces, conversion to 7 bit ASCII, convert to uppercase or lowercase, expand tabs, convert spaces to tabs, and so on. It is one of those multipurpose utilities that everyone needs every once in a while and usually just codes up a quick program to take care of it. Written in C, STRIP takes it's arguments in a UNIX like fashion so a foreign command must be defined for it to work. STRIP is a good utility to keep around.

Submission Subdirectory:	[VAX89A2.INFOVAX.UAF_PROFILE]
Ease of Installation:	5
Documentation:	3
Intended Audience:	System Managers
Ease of use:	5
Usefulness:	5

Sources included: Yes, FORTRAN
Objects Supplied: Yes

PROFILE is a FORTRAN utility which adds new accounts or modifies existing accounts by using a screen-oriented interface that allows changes to be made by moving the cursor to the desired field and entering the changes. Four different screens can be displayed: main user profile, login flags, primary and secondary days, access restrictions, and privileges. Cursor movement is accomplished by using the arrow keys or the Unix 'hjkl' keys. Fields can be changed in the main user profile screen by typing the "Insert Here" or "Enter" keys to toggle edit mode. After the text has been entered, Carriage Return or any of the arrow keys will terminate the input. Login flags, Primary days, and Privileges can be changed with the "Select" or keypad "Period" keys. Normal or full privileges can be enabled with the "N" or "A" keys. Access modes can be changed by: hitting "-" or "Remove" keys to deny total access to an access type; hitting "+" or "Insert Here" to allow total access to an access type; hitting "Select" or keypad "Period" keys to selectively allow or deny access on an hourly basis. The user's top level directory will be created, diskquota will be enabled, and a sample login procedure will be copied to the user's directory.

PROFILE is a very nice utility that DEC should have designed a long time ago. It is a way to manipulate the SYSUAF file without having to remember all that syntax and be able to always see the complete user record after you make any changes. I tested this on a V4.x and a V5.x system. The program worked well on a V4.x system, but I had to make some minor changes to allow it to work under V5.x. The only thing I find a little irritating is the fact that whenever you make any change to the SYSUAF record, PROFILE updates the entire record. If you have AUTHORIZATION FILE audit turned on, any changes to a record will result in an operator message that indicates the entire record was changed, not just the one field that was modified. Other than that, it is a very useful program.

Submission Subdirectory: [VAX89A2.INFOVAX.UNDEL]
Ease of Installation: 5
Documentation: 3 (In source code)
Intended Audience: System Managers
Ease of use: 3
Usefulness: 5
Sources included: Yes, FORTRAN, MACRO
Objects Supplied: Yes

Undelete a file on a FILES-11 disk

Handles disks with any cluster size, and files with any number of extension headers. Use with caution only when you REALLY need it; a backup copy is always preferable if you have one. If the file is really vital, back the disk up before using UNDEL on it.

For those files that were accidently deleted and it was just before a backup was done. As the author points out, use this with extreme caution and make sure to do a full backup on the disk before the program is run. If there has not been any disk activity since the file was deleted, you have a good chance to UNDEL it. As always with a program such as this, use at your own risk.

Submission Subdirectory:	[VAX89A2.INFOVAX.VMS_SHARE]
Ease of Installation:	5
Documentation:	5
Intended Audience:	General
Ease of use:	5
Usefulness:	5
Sources included:	Yes, DCL
Objects Supplied:	N/A

Packages a series of files into a format suitable for transmission over electronic mail networks which may mangle the text.

This directory contains VMS_SHARE V06.10 and PAKMAIL V1.2. Both packages are written in DCL and are very useful for sending a series of text files across electronic mail networks in pieces and then re-assembling the pieces into the original files. VMS_SHARE is used to make up the mail files and then PAKMAIL is used to send all the files out to their destination. VMS_SHARE uses VAX-TPU and therefore you must be running at least VMS V4.4.

Submission Subdirectory:	[VAX89A2.INFOVAX.WHAT]
Ease of Installation:	4
Documentation:	5
Intended Audience:	System Managers
Ease of use:	5
Usefulness:	5
Sources included:	Yes, C, MACRO, PASCAL
Objects Supplied:	Yes

A FAST Cluster and network-wide SHOW USERS (and Much more) type command.

This is a routine to SHOW USERS and other commands on many nodes of a network. This is very much like the FINGER routine that has been submitted on previous DECUS tapes. You can show users, show system, and much more. WHAT uses non-transparent DECnet communications.

Submission Subdirectory:	[VAX89A2.INFOVAX.ZOO]
Ease of Installation:	5
Documentation:	5
Intended Audience:	General
Ease of use:	5
Usefulness:	5
Sources included:	Yes, C
Objects Supplied:	Yes

This directory contains ZOO V2.01, BILF V1.0, and FIZ V2.0 ZOO archive repair utility for VMS. ZOO is the VMS port of the popular ZOO archive utility which is in use on personal computers. ZOO allows the user to compress and store many files in a single archive. ZOO is different than

Submission Subdirectory: [VAX89A2.IVANOV.CURSES]
Ease of installation: 3
Documentation: 3
Intended Audience: C Programmers
Ease of use: 3
Usefulness: 4
Sources included: No
Objects supplied: Yes

This is an implementation of UNIX Curses for VMS. This version of CURSES is compatible with that of BSD 4.2 Unix.

Submission Subdirectory: [VAX89A2.IVANOV.MAKE]
Ease of installation: 3
Documentation: 3
Intended Audience: C Programmers
Ease of use: 3
Usefulness: 4
Sources included: Yes, C
Objects supplied: Yes

This is an implementation of UNIX MAKE for various operating systems, including VMS. This version make also supports MS-DOS and TOPS-20.

Submission Subdirectory: [VAX89A2.IVANOV.MISC]
Ease of installation: 3
Documentation: 3
Intended Audience: C Programmers
Ease of use: 3
Usefulness: 3
Sources included: Yes, C
Objects supplied: Yes

This directory contains copies of ASCTOBIN and BINTOASC. These programs are used to transfer items from Binary to Ascii and visa-versa.

Submission Subdirectory: [VAX89A2.IVANOV.VAXCIO]
Ease of installation: 3
Documentation: 2
Intended Audience: C Programmers
Ease of use: 3
Usefulness: 4

Sources included: Yes, C
Objects supplied: Yes

This is an implementation of UNIX system V "termio" for VMS.

Submission Subdirectory: [VAX89A2.JSCLUG]
Ease of installation: 2
Documentation: 3
Intended Audience: Programmers, System Managers
Ease of use: 3
Usefulness: 3
Sources included: Yes FORTRAN, Macro
Objects supplied: Yes

This submission is a conglomeration of utility programs written at NASA/JSC. There are three main subdirectories, each addressing a different need. Although these programs may be usable in their present form, I did not try using them because they are quite site dependent in their help, installation environment, etc. Because they will require customization, I feel programmers and system managers will get the most from this offering.

The source code is provided and some of the utilities have very good documentation of the program design and flow. The CALENDAR program in LIFENET subdirectory has a whole directory devoted to program documentation. A lot of good ideas can be pulled from the code.

Overview:

[.LIFENET] This subdirectory has a CALENDAR utility and an RMAIL program. The calendar program is meant to provide a "bulletin board" of events. The RMAIL program is a multi-network mailing system, however it will not work with VMS V5.x due to changes in the VMS mail interface.

[.TELEMAIL] This is a set of command procedures and programs that will allow a batch job to retrieve and post GTE/Telenet mail. It uses modified VAXNET code to "dial" out to Telenet, check for new mail, and post and mail sent by users on the local system. This has a lot of potential if your company currently has everyone dialing up for themselves. I didn't try this out, I don't have a GTE/Telenet account.

[.LABSTAR] This is targeted toward a very narrow audience. If you are using DEC's LABStar system, you will be interested. The Labstar system is evidently a VAX based data aquisition system that includes A/D converters, etc. I didn't have the

necessary equipment to try this out. There are some sample programs providing a screen based user interface to the Labstar system.

Submission Subdirectory:	[VAX89A2.KVC.PTY]
Ease of installation:	5
Documentation:	3
Intended Audience:	System Managers, General
Ease of use:	5
Usefulness:	4
Sources Included:	Y (Macro, C)
Objects Supplied:	Some, not all

This is Kevin Carosso's current version of the PTY drivers. This code will work on both VMS 4 and 5. The PTY drivers are required for some of the other submissions on this tape (BOSS and PHOTO, for example). This version of the PTY drivers is compatible with the DECWindows version, but should not be used to replace the DECWindows version.

Submission Subdirectory:	[VAX89A2.KVC.DECWINDOWS]
Ease of installation:	2
Documentation:	3
Intended Audience:	System Managers, DECWindows users
Ease of use:	3
Usefulness:	4
Sources Included:	N/A
Objects Supplied:	N/A

These are the instructions on how to set up a VAXStation with DECWindows to run the DECWindows locally, but to log into another host. It is basically the instructions on how to set up a VAXStation to be a DECWindows terminal (which is a good use for old VAXStations).

Submission Subdirectory:	[VAX89A2.LBGS89.BECOME]
Ease of installation:	5
Documentation:	3
Intended Audience:	System Managers
Ease of use:	5
Usefulness:	4
Sources Included:	Y (Macro, Pascal)
Objects Supplied:	Y

This program when used as a foreign command allows a suitably privileged user to "BECOME" another user. This program sets the following process parameters: UIC, DEFAULT DEVICE & DIRECTORY, PROCESS NAME, USERNAME, ACCOUNT NAME, PROCESS PRIVS, GROUP LOGICAL NAME TABLE LNM$GROUP, RIGHTS from RIGHTSLIST.DAT

Works as advertised with V5. It doesn't execute the user's LOGIN.COM but is useful nonetheless.

Submission Subdirectory:	[VAX89A2.LBGS89.MISC]
Ease of installation:	3
Documentation:	2
Intended Audience:	System Managers
Ease of use:	3
Usefulness:	5
Sources Included:	Y (Bliss)
Objects Supplied:	Y

This directory contains a group of system programming utilities and routines. DISKQUOTA-Routine which will allow an application program to check a user's disk quota before creating a large file. FINDUIC, FINDACL, FINDLBN-Utilities to search volumes by UIC, ACL, and LBN. SHOQUOTA- Utility program to provide a real time display of a process's quotas and limits.

Everything works fine. Shoquota is the gem of the lot. I prefer Joe Meadows' FIND program to the three separate find utilities here.

Submission Subdirectory:	[VAX89A2.LILUG.closeup]
Ease of installation:	4
Documentation:	4
Intended Audience:	System Managers
Ease of use:	4
Usefulness:	3
Sources Included:	Y (DCL)
Objects Supplied:	N

These are two command procedures for protecting a networked vax from attacks directed at the default decnet account. Both of the schemes embodied in these procedures have been tested and proven successful against a variety of scenarios. The first procedure selectively allows access from default DECNET processes only to the objects MAIL, $MOM, NML, PHONE and if present, FINGER and SEND. The second procedure turns off all access to FAL and takes the additional step of redirecting all requests for access to the object TASK, to a different account with a different default directory.

This subdirectory serves as a good introduction to DECnet security for the novice system manager.

Submission Subdirectory:	[VAX89A2.MINT]
Ease of Installation:	2
Documentation:	3
Intended Audience:	system managers

Ease of Use:
Usefulness:
Sources/objects Included: yes, MACRO, TPU, PASCAL

MINT is a Mail INTerface program that emulates the MM mail interface from the TOPS-20 operating system. MINT requires PMDF (Pascal Memo Distribution Facility). This submission also has a copy of the VASSAR Spell program as part of it.

Submission Subdirectory: [VAX89A2.MONLATV]
Ease of Installation: 4
Documentation: 4
Intended Audience: system/network managers
Ease of Use: 3
Usefulness: 3
Sources/objects Included: yes, VAX MACRO

Description:
The programs in this directory were submitted by DEC. The programs allow you to monitor three different ethernet protocols: LAVC, LAT, and Hardware ID.

NOTE: MONLAT cannot be run on a machine using LAT
NOTE: MONLAV cannot be run on a machine that is part of a LAVC.

Comments:
These procedures work as described. There are rather severe limitations, however, that make it difficult to test this software in case your machines are all on a LAVC and all use LAT terminal servers.

Submission Subdirectory: [VAX89A2.NIELAND.bulletin]
Ease of installation: 4
Documentation: 5
Intended Audience: General Users
Ease of use: 5
Usefulness: 5
Sources Included: Y (Fortran, Macro)
Objects Supplied: Y

Bulletin is a bulletin board-type utility with an interface much like VMS MAIL's. Privileged users can create messages which are displayed in full at login. Folders can be created so that messages pertaining to a single topic can be placed together. Folders can be made private so that reading and writing is limited to only users or groups who are granted access. Alternatively, folders can be made semi-private in that everyone is allowed to read them but write access is limited.

```
Bulletin is very well-documented and is easy to install. It works
enough like VMS MAIL that novice users should be able to learn it
without any problems. This is a very good alternative to ANU-NEWS.

Submission Subdirectory:        [VAX89A2.NIELAND.checkpass]
Ease of installation:           3
Documentation:                  2
Intended Audience:              System Managers
Ease of use:                    3
Usefulness:
Sources Included:               Partial (Fortran)
Objects Supplied:               Y

[Submittor's Note:  The CHECK_PASS broke under later versions of
FORTRAN. The following are the diffs needed to fix the program:

************
File DUA6:[VAX89A2.NIELAND.CHECKPASS]CHECK_PASS.FOR;1
   78         INTEGER*2  U , P
******
File DECUS$:[SOURCE.CHECK_PASS]CHECK_PASS.FOR;52
   78         IMPLICIT NONE
   79         INTEGER*2  U , P
************
************
File DUA6:[VAX89A2.NIELAND.CHECKPASS]CHECK_PASS.FOR;1
   82         INTEGER LENSTR, MIN_PASS, I, MAX, STAT
   83   C
******
File DECUS$:[SOURCE.CHECK_PASS]CHECK_PASS.FOR;52
   83         INTEGER LENSTR, MIN_PASS, I, MAX, STAT, SYS$GETUAI, LEN
   84   C
************
************
File DUA6:[VAX89A2.NIELAND.CHECKPASS]CHECK_PASS.FOR;1
  382         INTEGER*2 U, P, T, STAT
  383         CHARACTER PASS*32
  384         DIMENSION CPASS1(2) , CPASS2(2) , ECN(2)
  385         INCLUDE '($UAIDEF)'
******
File DECUS$:[SOURCE.CHECK_PASS]CHECK_PASS.FOR;52
  382         IMPLICIT NONE
  383         INTEGER*2 U, P, T, STAT
  384         CHARACTER PASS*32
  385         INTEGER CPASS1(2) , CPASS2(2) , ECN(2), LGI$HPWD
  386         INCLUDE '($UAIDEF)'
************

Sorry about the problems.]
```

The Check_Pass utility checks a list of users' passwords against a large dictionary, flagging usernames with passwords that are in the dictionary. You supply the list of usernames, it does the checking.

I could not get this to work. This program is a nice idea but it needs a lot of work. If a password match is found at the beginning of the dictionary Check_Pass doesn't quit--it checks the rest of the dictionary. Sources for HPWD are not included even though there are legal copies available.

Submission Subdirectory:	[VAX89A2.NIELAND.crypt]
Ease of installation:	3
Documentation:	2
Intended Audience:	General Users
Ease of use:	3
Usefulness:	4
Sources Included:	Y (C)
Objects Supplied:	Y

Crypt encrypts/decrypts files. Crypt's distinguishing feature is that the encrypted file is in hex so it can be mailed. Versions, although not compatible, are included for VMS, UNIX, and DOS.

Submission Subdirectory:	[VAX89A2.NIELAND.TAPES]
Ease of installation:	varied
Documentation:	varied
Intended Audience:	System Managers, Tape users
Ease of use:	varied
Usefulness:	5
Sources Included:	Y (C, Fortran, Macro)
Objects Supplied:	Y

This subdirectory branch includes several tape reading utilities. Utilities are included to deal with the following tape formats: Tar, EBCDIC, Honeywell GCOS BCD, BRU, RT-11, PIP-10, ANSID, VB. Several tape copy programs are included as well.

Some of these utilities are amazing. Quality and documentations are varied but these are must-haves for most shops.

Submission Subdirectory:	[VAX89A2.NIELAND.term_lock]
Ease of installation:	4
Documentation:	2
Intended Audience:	General Users
Ease of use:	5
Usefulness:	4
Sources Included:	Partial (Fortran)
Objects Supplied:	Y

Termlock is a terminal locking program. I.E., one that prevents use of your terminal until you supply it with a valid password.

Termlock is one of the nicest programs I've seen of its kind. It doesn't need to prompt you for an initial password because it uses your normal password(s) from the UAF.

Submission Subdirectory:	[VAX89A2.NIELAND.uuencode]
Ease of installation:	3
Documentation:	2
Intended Audience:	General Users
Ease of use:	3
Usefulness:	2
Sources Included:	Y (C)
Objects Supplied:	Y

This is an implementation of UUENCODE/UUDECODE for VMS.

This can be used to transfer binary files suing MAIL. It does not save file attributes. It is a direct port of the UNIX code and is compatible with the UNIX versions.

Submission Subdirectory:	[VAX89A2.NSWC]Modify
Ease of Installation:	2
Documentation:	4
Intended Audience:	Programmers
Ease of Use:	3
Usefulness:	5
Sources Included:	yes - Fortran
Objects Supplied:	no

Description:

A program that will process a wildcarded list of files, performing string substitutions.

Observations:

Unfortunately, this was linked under VMS V5.1 - I'm running V4.7 (it's a long story...), and so had to rebuild it so I could try it out... and I don't happen to have the Fall 87 VAX sig tape to get the library NSWC1LIB.OLB which it links with.

From the Help file, this looks like a great little program - how often have you had to change a variable name in a bunch of related files? - or modify control sequences in a print file (see my comments about [VAX89A.NSWC.RNO...]), I just wish I could have tried it out!

Submission Subdirectory: [VAX89A2.NSWC]Reformat
Ease of Installation: 2
Documentation: 4
Intended Audience: Programmers
Ease of Use: 3
Usefulness: 5
Sources Included: yes - Fortran
Objects Supplied: no

Description:
A program to copy a file, changing its attributes.

Observations:
Unfortunately, this was linked under VMS V5.1 - I'm running V4.7 (it's a long story...), and so had to rebuild it so I could try it out... and I don't happen to have the Fall 87 VAX sig tape to get the library NSWC1LIB.OLB which it links with.

This is another one that I could (will when I get a runnable version) use frequently - I seem to constantly be playing the fun little game of 'the file contents are right, why won't the program read it?', where the program turns out to be bigoted against the file attributes of the file in question.

Submission Subdirectory: [VAX89A2.NSWC.RNO...]
Ease of Installation: 1..5
Documentation: 1..5
Intended Audience: General,Programmers,System Managers, etc
Ease of Use: 1..5
Usefulness: 1..5
Sources Included: yes - Macro and Fortran
Objects Supplied: for Fortran files, not for Macro files

Description:
A much-extended derivative of Bonner Labs Runoff.

Observations:
The positive side:
1) Comes with .CLD and .HLP files for the DCL interface.
2) It contains many capabilities that DSR does not - the ability to reference DCL symbols to obtain values, the ability to do symbolic references to chapter, page, and other numbers (including forward references), macro capability, and the ability to define and incorporate escape sequences to control your printer.
3) There are two utilities supplied with it to support two-column indexes, and the use of change bars.

The negatives:
1) A quick trial showed that it is not compatible with DSR - there are commands defined in DSR that NSWC RNO fails to understand.

2) Only partial documentation is supplied.
3) The documentation supplied is RNO output files - for an unknown printer with embedded escape sequences. It is not printable on a conventional line printer, and would take a massive effort to edit so that it could be.

Submission Subdirectory:	[VAX89A2.PAVLIN]
Ease Of Installation:	4
Documentation:	3
Intended Audience:	System Programmer
Ease of Use:	3
Usefulness:	5
Sources Included:	Yes, FORTRAN & MACRO
Objects Supplied:	Yes

The [.PAVLIN] submission includes two utilities, DISM32 and ETHERMON. DISM32 is a disassembler of native VMS images. It has a large table of symbolic addresses, and disassembled most of the images I fed it. Macro-32 code produced is fairly readable, although occasionally it reconstituted .ASCxx strings as multiple .BYTE instructions, making reading difficult. Documentation is good. Utility of the code depends on your needs. Good for system hackers. ETHERMON appears to be a good utility from the description. Documentation is missing, although help files are provided. The purpose of ethermon is to log traffic that appears on the ethernet. Most ethernet protocols are understood, and it appears that there is a filtering mechanism so that the user need not pore over page after page of unwanted ethernet packets. I was not able to get ethermon running due to insufficient resources. Should be a good utility to track ethernet [non-]performance.

Submission Subdirectory:	[VAX89A2.qmaster]
Ease of installation:	4
Documentation:	4
Intended Audience:	Operators
Ease of use:	4
Usefulness:	4
Sources Included:	Y (BASIC)
Objects Supplied:	Y

Qmaster is a screen-oriented program to manipulate VMS print and batch queues. You can do the following: find out information about an entry, release an entry, hold an entry, delete an entry, change the form type of an entry, change the queue priority of an entry.

Qmaster, with a little work, could become a SIG Tape classic. It is very easy to use, especially with an LK201 keyboard (Select, Do, etc.) Select a queue and its entries pop up. Select an entry and a list of options pop up. Select your option and presto. There are a few small bugs but they should be easy to get rid of.

Submission Subdirectory:	[VAX89A2.RPI]
Ease Of Installation:	4
Documentation:	4
Intended Audience:	System Manager
Ease of Use:	4
Usefulness:	3
Sources Included:	Yes, BLISS, MACRO, PL/I
Objects Supplied:	Yes

The [.RPI] submission contains eight subdirectories, containing CHECKALLOC, CLAIM, MPMGR, NSQUERY, SDFILTER, SETUP, and WATCHER. CHECKALLOC compares disk quotas against available space, and lists largest users. CLAIM allows users to become the owner of files in their directories that they do not own. MPMGR builds MODPARAMS.DAT files for the entire cluster. NSQUERY interrogates Internet domain name servers. SDFILTER gives more control over VWS screen dumps. SETUP centralizes the login setup of applications software. WATCHER is a flexible idle job killer. Documentation is good.

Submission Subdirectory:	[VAX89A2.SCHAFFRATH]
Ease Of Installation:	3
Documentation:	2
Intended Audience:	System Manager
Ease of Use:	3
Usefulness:	2
Sources Included:	Yes, BASIC, MACRO-32
Objects Supplied:	No

The [.SCHAFFRATH] submission contains eight subdirectories, containing various odds and ends written as system management aids. There are various .COM procedures for checking system status, an idle job killer, some macro that pokes into system security space, a PAK formatter, a screen-oriented mail facility, routines to allow one to bash PCB's, and stuff to control and format UAF records. An interesting collection of odds and ends. Would be excellent for a beginning system manager to learn about various management functions and abilities. WARNING: This submission does not contain executables or objects. Most items require a BASIC compiler.

Submission Subdirectory:	[VAX89A2.SHAPIRO]
Ease of Installation:	5
Documentation:	5
Intended Audience:	General
Ease of use:	5
Usefulness:	5
Sources included:	Yes, TPU
Objects Supplied:	N/A

Extensible VAX Editor - EDT Extension
[EVEDT]

(EVEDT Version V4.0-110188)
(For use with VMS 5.x and TPU 2.x and above)

The NEW EVEDT Editor. More than just an enhanced EVE editor.

All major EDT keypad functions are IDENTICAL !

EVEDT ADVANTAGES over EDT include:

1) No more waiting for the cursor to catch up with you
2) Split Screens
3) Insert AND Overstrike modes
4) Rectangular cut & paste
5) Keystroke Learning
6) Command Repeat
7) Spawn to a subprocess from within the editor
8) Execute a DCL command from within the editor
9) Context sensitive constructs inserted with a single key sequence
10) Print a selected range from within a buffer being edited
11) Translate non-printable or multinational characters for printing
12) Automatically set matching characters for (),<>,[], etc.
13) And much, much more!

This is a real nice EDT-like editor with a lot of handy extensions. It combines the features of EDT along with some of the better features of EVE. Included are good command repeat, rectangular cut & paste, DCL spawn, and more. The only catch is that you have to be running VMS V5.0 and TPU V2.0 which is included with VMS V5.0. All you V4.x users are out of luck on this one.

Submission Subdirectory:	[VAX89A2.SPC.COOKIE]
Ease of Installation:	5
Documentation:	2
Intended Audience:	General
Ease of use:	5
Usefulness:	2
Sources included:	Yes, C
Objects Supplied:	Yes

A version of the Cookie program which runs on VAXen under VMS, PDP-11's under RSTS/E and RT-11 (with DECUS C) and IBM PC's (with either Microsoft's C or Borland's Turbo C compilers).

A favorite of mine with little or no redeeming social value. At login or logout time have COOKIE type out a fortune for you. Sources included for a number of operating systems.

Submission Subdirectory: [VAX89A2.SPC.FINGER]
Ease of Installation: 4
Documentation: 5
Intended Audience: System Managers, General
Ease of use: 5
Usefulness: 5
Sources included: Yes, FORTRAN, MACRO
Objects Supplied: Yes, object library

An update to the VMS FINGER utility. This is version V51_1_13 of FINGER. (Version 51_1_17 is on the final tape.)

I have been using the FINGER program at this site for some time now. FINGER allows a user on one node to look at (FINGER) a user on an other node. A user may also FINGER the system to find out such things as what users are logged on, operating system version, how long it has been up, and so on. When a user sends a mail file to an other user, the first user may FINGER the second to see if he has read the mail message. Very handy utility to look at other systems without being logged on.

Submission subdirectory: [VAX89A2.SPCTELE]
Ease of Installation: 3
Documentation: 4
Intended Audience: General
Ease of Use: 3
Usefulness: 3
Sources/objects Included: yes, various languages

Description:

MAILUAF.COM: modified sys$examples:mailuaf.com to change users mail counters and personal name, VMS 4.x only.

Uptime Logger makes a log of system uptime, reason for crash. At the end of the month, a report is produced showing number of crashes and shutdowns, average time to reboot on both and amount of business downtime.

MON_REPORT: Works off DEC software in sys$examples MONITOR.COM, MONSUM.COM and SUBMON.COM to create monitor stats for your machine. Data is then automatically plotted weekly using DISPLAA. (if you don't have DISPLAA, this will at least gather and massage the raw data into form.)

SUBSCRIB: Creates listing of who has how many blocks on each disk to see if disk is over-subscribed and why.

VWS_GRAPHICS: Neat graphic tricks for Vax Workstations.

Comments:
These programs do work as described. A couple are somewhat ho-hum, but useful in the right circumstances. The VWS graphics are nice.

The Spring 1989 L&T/VAX SIG Tape Reviews

Part 5

Submission Subdirectory:	[VAX89A3.DBAG]
Ease of Installation:	4
Documentation:	2 (note: I rated this low because I did not receive the English version of the manual with the review copy of the tape. An english translation is on the final tape.)
Intended Audience:	Database users and programmers.
Ease of Use:	3
Usefulness:	3
Sources included:	Yes Fortran, Bliss (one module)
Objects supplied:	Yes

DBAG is a simple database system simular in some ways to the DBASE III product. It is not a DBASE clone, so don't expect to move DBASE code off a PC without significant changes. An object library is supplied that allows a programmer to call the DBAG routines to access database records.

DBAG commands are styled after a mix of DBASE and VMS DCL. Online help provides the syntax of commands but not many examples. The manual that I received was in Portuguese, the English translation will be on the tape that you receive. I was able to create a simple database using only the online help. Having a user's manual in English will make the package more useful.

Submission Subdirectory:	[VAX89A3.NEWS58]
Ease of installation:	3
Documentation:	5
Intended Audience:	General
Ease of use:	4
Usefulness:	5
Sources included:	Yes, VAX C
Objects supplied:	Yes

Introduction:

ANU NEWS is computer based conferencing system. In that respect it is simular to the VAX Notes layered product. It

can be used for local only conferences, or can be part of a distributed conferencing system. News implements the Standard for Interchange of USENET Messages (RFC1036). It can therefore be used to read Netnews distributed by the usenet sites. ANU NEWS can also be used as a local bulletin board system, but that is not what it is best suited for.

The version of NEWS that I tried out was actually the version that was shipped with the [.UUCP] distribution. It was NEWS 5.7 with bug fixes that were distributed over the network. I am not sure exactly what changed in version 5.8, the documentation was essentially the same. (Print the documentation from the [.NEWS58] tree, it has some typos fixed, at least in the .TEX version of the manual.)

Installation:

First time installation is not trivial, because you need to read a lot of documentation first. I recommend reading "Installing NEWS" (Chapter 10 of the News User's Guide) and "Installing and Integrating NEWS" (Chapter 11 of the DECUS UUCP System Manager's Guide) several times before doing the actual installation. Read the chapter in the UUCP manual even if you aren't going to install DECUS UUCP, it provides some hints that aren't covered in the NEWS User's Guide.

Note: I only have news running in local mode at this point, so I don't know all the details about Netnews.

After I got it installed, I was able to create several local newsgroups and I posted some articles as a test. The user interface seemed quite natural, and the is VMS style online help available. Compared to VAX Notes, I found NEWS easier to use. My only experience using VAX Notes has been on Larry Kilgallen's PAGESWAPPER MicroVAX and at DECUS symposia.

Summary:

This is an free alternative to VAX Notes. More importantly, it provides a mechanism for VMS systems to easily participate in a Netnews (usenet) conference. As distributed, it uses DECnet or TCP/IP and the NNTP (Network News Transfer Protocol) to exchange news article with other systems. If you want to receive news via uucp, definitely look at DECUS UUCP which integrates ANU NEWS with uucp.

Submission Subdirectory:	[VAX89A3.UALR.ALOCWAIT]
Ease Of Installation:	3
Documentation:	2

Intended Audience: System management,general
Ease of Use: 4
Usefulness: 4
Sources Included: Yes, FORTRAN
Objects Supplied: No

This submission is an ALLOCATE/WAIT command to supplement the ALLOCATE command. There isn't a lot of documentation supplied on the program, but it speaks for itself. It requires additional privileges (CMEXEC) to run. It is assumed that the system manager knows enough about VMS to install it . The installation requires adding to the DCL command tables and installing the image using INSTALL.

Submission Subdirectory: [VAX89A3.UALR.BBS]
Ease Of Installation: 2
Documentation: 1
Intended Audience: PC users, SYSOPs
Ease of Use: 4
Usefulness: 4
Sources Included: Yes, FORTRAN
Objects Supplied: No

This submission is an update to the UALR BBS system. It has been on many previous SIG Tapes. It is a very good VAX-based BBS. This updates makes it easier to customize the program using DCL symbols in the startup command procedure. It is a little tricky to install, but not too bad. If you want to start of BB of your own, this is an excellent package to use.

Submission Subdirectory: [VAX89A3.UALR.CB]
Ease Of Installation: 2
Documentation: 1
Intended Audience: PC users, SYSOPs
Ease of Use: 4
Usefulness: 4
Sources Included: Yes, FORTRAN
Objects Supplied: No

This submission is an a citizen's band radio simulator for the VAX. It has been included to go along with the BBS submission.

Submission Subdirectory: [VAX89A3.UALR.ETAPE]
Ease Of Installation: 4
Documentation: 1
Intended Audience: General
Ease of Use: 4
Usefulness: 4
Sources Included: Yes, FORTRAN
Objects Supplied: Yes

This is program to handle EBCDIC, ASCII, and GCOS BCD tapes. It can read and

write tapes. The submission includes a .HLP file. Requires LOG_IO and PHY_IO to run the program.

Submission Subdirectory:	[VAX89A3.UALR.READBACK]
Ease Of Installation:	2
Documentation:	1
Intended Audience:	System managers
Ease of Use:	3
Usefulness:	2
Sources Included:	Yes, FORTRAN
Objects Supplied:	No

This submission is a program that will read a BACKUP saveset and create a new BACKUP saveset with only those files specified. The usefulness of this submission is in the eye of the beholder. I don't think I would have a use for it, but other sites might find it very useful. The executable isn't supplied, so you need the FORTRAN compiler to build it.

It is currently very limited as it does not process CRC information, it doesn't accept wildcards, and the files must be specified in the order they appear in the saveset.

Submission Subdirectory:	[VAX89A3.WATCHDOG]
Ease of Installation:	4
Documentation:	5
Intended Audience:	System Managers
Ease of use:	5
Usefulness:	5
Sources included:	Yes, FORTRAN, MACRO
Objects Supplied:	No

This directory contains the WATCHDOG program. The original was taken from a DECUS tape (unknown authors) and was rewritten. The purpose of this program is to monitor interactive processes and log processes off that have been inactive for a specified period of time. A interactive process is a process that is attached to a terminal. The process can be network process, a spawned process, or an interactive process. WATCHDOG does not care as long as it is connected to a terminal.

This version contains some bug fixes to previous versions as well as support for SMP systems. This is very handy for users that leave their terminals logged on unattended and you have warned them for the last time. Let WATCHDOG loose on the system and it will take care of unattended terminals. WATCHDOG issues a few warnings to the user and then stops his process. A record
s kept to indicate warnings given and when a user was logged off. An option is also available to have WATCHDOG ignore processes such as SYSTEM or others that should never be logged off.

VMS Intercept Driver Technology -

and its application to Virtual Disks, Shadow Disks, Memory Disks, Striping Disks, Encrypting Disks and more.

by

John P Yardley, Keith A Pegler and Paul F Kennedy

JPY Associates Limited
5 Surbiton Hill Road,
Surbiton, Surrey
England KT6 4TW.
Tel: 44-1-390-8487

Abstract

Intercept Device Drivers were developed initially to implement transparent encryption under VAX/VMS. The Intercept technology, however, has some extremely useful applications to other, more general fields of data processing. This paper describes Intercept technology, and some of the uses it may be put to.

1 Intercept Technology

VMS device drivers normally provide the software interface between a user process and a hardware device such as a disk, terminal or magnetic tape. The purpose of the driver is twofold:

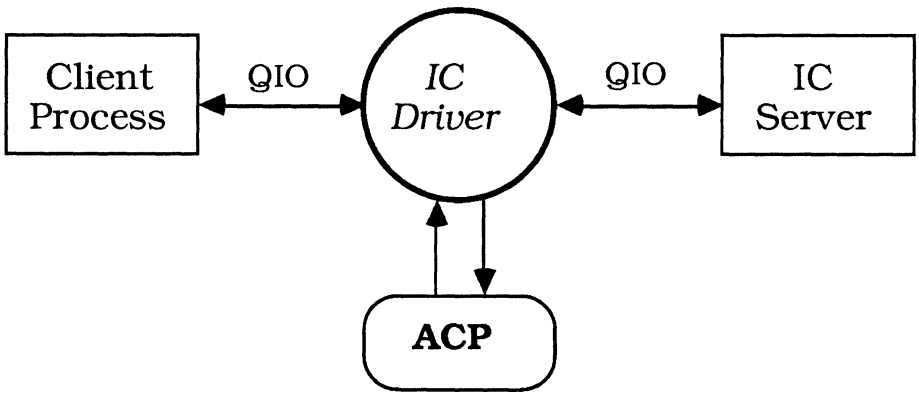
- To release the application developer of the need to intimately understand the device.
- To present a consistent software interface to a number of devices in the same general class (eg random-access disks) so that an application can operate unchanged with any of the devices.

For storage devices such as disks and magnetic tapes, the driver must be able to perform certain primitive operations such as reading and writing a given logical block. However, most disks need to go further by maintaining some sort of file structure, most usually the VMS Files-11 level-2 file structure. For each driver to contain dedicated code for operations like creating and deleting files say, would be a heavy burden on the programmer and system.

To overcome this, VMS permits drivers to call back the operating system to perform file operations and synchronise file access requests from many users. The part of the VMS operating system responsible for file handling is known as an Ancillary Control Process or ACP (in the case of files-11level-2 this is implemented with an eXtended Queue Processor or XQP). The ACP in turn calls back the driver to execute the primitive block reads and writes. Many of the characteristics of a device, so far as the user is concerned, are determined by the associated ACP rather than the device itself.

Device drivers do not necessarily have to service real hardware devices and indeed, there are several VMS drivers that do not (two examples are the MAILBOX driver and the NET driver). However, there is little that can be accomplished within such a pseudo device driver since, aside from providing the ACP, operating system support within drivers is very limited. In particular, drivers cannot make use of system services. An intercept driver overcomes the lack of system services available to a driver by passing I/O requests to a regular VMS process for interpretation. This process is known as an intercept device **server** and it has full access to all VMS services which it may use on the driver's behalf. Figure 3-1 illustrates how the client, the driver, the server and the ACP relate to each other.

Figure 1 The Intercept Driver Concept



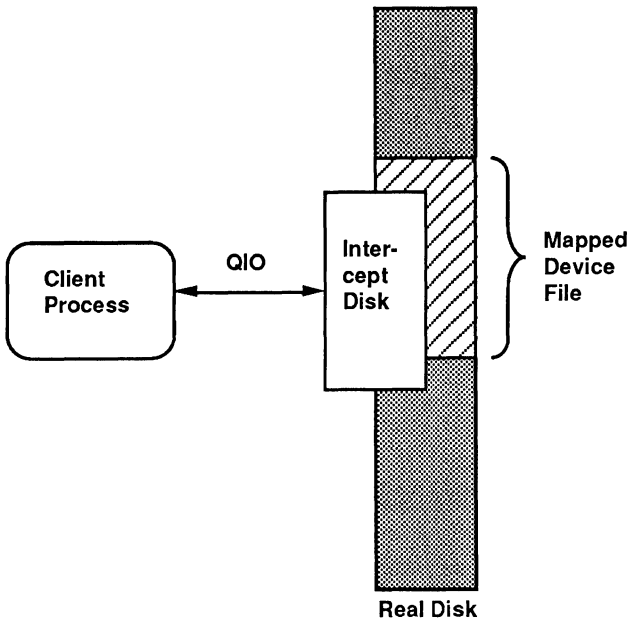
The primary characteristics of the device are determined by the ACP used with an intercept driver. The selection of ACP and interpretation of the QIO arguments are usually "hard-wired" into the driver. The choice of server, on the other hand, is completely dynamic and may be changed as required.

Intercept drivers are named according to the class of device they emulate or equivalently the ACP they use. By convention, disk type drivers (using the Files-11B ACP) are named **ID** and magnetic tape drivers are named **IM**. Drivers using no ACP and relying on the server to execute all functions are generally named **IC**.

The technique of separating driver and server is a major departure from the more pedestrian approach of executing all "server" functions within the driver. Although there is slight performance penalty in doubling-up on QIO requests, this is minimal because the client and server QIO requests are effectively overlapped. The server technology gives the following benefits:

- The server has full access to system services (including network-wide RMS services)
- The server may execute entirely in user mode
- The server can be written in any VMS supported language
- The server may be debugged with a symbolic debugger
- The server uses memory only when running

Figure 2 Mapped Device File Concept



2 ID Servers

There are any number of different servers that may be written for an ID (disk-type) device. We confine our interest here to servers in the same general class of ID server which map the device to a Mapped Device File or MDF. These types of server all treat a regular Files-11 file as though it were a device in its own right. The concept is illustrated in Figure 2.

Four specific types of ID server result in four particular types of disk:

- Virtual disks
- Encrypting disks
- Shadow disks
- Striping disks

Virtual disks are the vanilla flavour of an ID server, they simply map the logical blocks of the device onto the virtual blocks of the mapped device file. A subset of the virtual disk is a **memory disk** in which memory is used instead of the mapped device file.

Encrypting disks go a stage further by encrypting data written to the mapped device file and decrypting data read from the file.

Shadow disks are a variant of virtual disks. Instead of maintaining a single mapped device file, they maintain two (or more) files. Normally, the two mapped device files are on separate physical disks so that in the event of a catastrophic disk failure, file operations may be switched to the shadowing file. The control logic associated with bringing mapped device files in and out of a shadow set and maintaining transparent non-stop file access across a drive failure is ideally suited to a server process. Furthermore, unlike its hardware counterpart, software shadow disks maybe restricted to part of a real disk.

Striping disks can be implemented with an MDF server as a trivial extension to virtual disks. Striping (not stripping) is a technique of spreading disk blocks over a number of physical drives by interleaving groups (or clumps) of blocks. It has the effect improving transfer rates for large files to and from memory. The degree of improvement is a function of the number of disk heads involved.

Since all of these techniques are a variant of the basic virtual disk technique, we shall use the virtual disk server and associated DCL commands to illustrate various aspects of intercept technology.

3 Starting and Stopping Servers

Once an intercept driver has been loaded by the system, it can perform no useful work until a server process has been started up to serve the client requests. Each unit with no associated server is said to be **free**. It appears "offline" to VMS, as illustrated by the following "SHOW/DEVICE" command on a freshly connected ID unit:

```
$ SHOW DEVICE IDA0/FULL

Disk IDA0:, device type RM05, is offline, file-oriented device, shareable,
   available to cluster.

   Error count                    0    Operations completed                0
   Owner process                 ""    Owner UIC                         [0,0]
   Owner process ID        00000000    Dev Prot    S:RWED,O:RWED,G:RWED,W:RWED
   Reference count                0    Default buffer size                 512
```

Normally, there is a separate server process for each unit on the device, but there is no reason why a single server should not serve all units. The advantages of having a separate server for each unit are firstly that such servers are easier to write (no context switching) and secondly that different clients may run different servers on different units.

A server is started by the DCL command SERVE. Since there may be a choice of servers, the SERVE command always takes a qualifier specifying the name of the server to be run. The "/DATALOCK" qualifier, for example, is used to run the encrypting disk server. This qualifier also determines the syntax for the SERVE command.

All SERVE commands take the general form:

```
SERVE/SERVER_NAME ic-unit [parameters...]
```

The syntax of the parameters depends entirely on the server, so the server name is an unambiguous way of specifying this syntax to the VMS DCL interpreter. SERVER_NAME is usually the generic name of the facility (such as VIRTUAL or SHADOWDISK) and not necessarily the filename of the server image.Given that the SERVE command is syntactically correct, VMS activates the image SERVE.EXE which then proceeds in six logical steps to run the server and return control to DCL:

1. Check the command for semantic correctness, once again depending on the server chosen.

2. Check all possible conditions that might cause the server to fail on start up. For example, checking that the intercept unit exists and is free; that the mapped device file exists or can be created (if applicable), etc.

3. Perform any services it can on behalf of the server. This might include creating files, setting up network connections, locating encryption keys,etc.

4. Establish channels to communicate with the server.

5. Activate the server image as a detached job.

6. Wait for the server to run successfully, or otherwise inform client of reason for failure and exit.

Once the server is successfully running, the served intercept unit becomes "online" and the server appears in the active job table.

In order to distinguish between servers serving different ID units, SERVE.EXE identifies each server with a process name chosen according to the facility and the ID unit being served. Server process names take the form:

```
id-unit_facility-name
```

This VMS terminal log illustrates two DataLock (Encrypting) servers (indicated «) running for "IDA0" and "IDA6":

```
$ show system
VAX/VMS V5.0-2  on node  19-JAN-1989 17:56:51.05   Uptime    0 00:18:28
  Pid    Process Name    State  Pri      I/O       CPU       Page flts Ph.Mem
20200021 SWAPPER         HIB     16        0    0 00:00:02.34         0       0
20200042 IDA0_DLK        LEF      2       14    0 00:00:00.35       122     178 «
20200027 CACHE_SERVER    HIB     16        6    0 00:00:00.17        63      91
20200028 CLUSTER_SERVER  HIB      8       10    0 00:00:00.46       117     202
2020002A JOB_CONTROL     HIB      9      159    0 00:00:01.45       129     293
2020002B CONFIGURE       HIB      8        6    0 00:00:00.33        92     126
2020002C SMISERVER       HIB      9       68    0 00:00:02.22       456     281
2020002D SYMBIONT_0001   HIB      4       17    0 00:00:00.63       158      37
2020002E JPY11           CUR      4     1813    0 00:00:44.87     16995     186
20200032 PFK11           LEF      7     2735    0 00:02:15.69     15723     208
20200036 IDA6_DLK        COM      2       11    0 00:02:13.88       122     178 «
```

The general syntax of the SERVE command for a virtual disk is:

```
SERVE/VIRTUAL id-spec mapped_device_file [/qualifiers]
```

The "id-spec" and "mapped_device_file" parameters are always necessary and specify the ID unit and filename of the MDF to be mapped to that unit.

The MDF file specification may be any valid VMS file specification, including where appropriate, the name of another DECnet node or cluster member. If an encrypting server is used then in either case, any implied network traffic between the encrypting server and the MDF host system is implicitly encrypted.

The following DCL log illustrates the appearance of an ID unit to VMS after a virtual disk server has been successfully activated:

```
$ SERVE/VIRTUAL IDA0 MY_FILE/CREATE/ALLOCATION=500
$ SHOW DEVICE IDA0/FULL

Disk IDA0:, device type RM05, is online, file-oriented device, shareable,
    available to cluster.

    Error count                    0    Operations completed                1
    Owner process                  ""   Owner UIC                       [0,0]
    Owner process ID        00000000    Dev Prot    S:RWED,O:RWED,G:RWED,W:RWED
    Reference count                0    Default buffer size               512
    Total blocks                 500    Sectors per track                   1
    Total cylinders              500    Tracks per cylinder                 1
```

3.1 Creating Mapped Device Files

If the MDF does not exist, it may be created by including the "/CREATE" qualifier with the "SERVE" command. The size of the MDF defaults to 494 blocks unless specified by the "/ALLOCATION=" qualifier. The created MDF is normally non-contiguous but may be made contiguous by use of the "/CONTIGUOUS" qualifier. Mapping to contiguous MDFs can improve the performance of served IDs.

MDFs created by SERVE.EXE are RMS sequential files with fixed-length records. Such files have two associated parameters recording the number of blocks **allocated**, and the number of the highest block used. When certain VMS operations such as backing-up and copying occur, only the actual number of blocks "used" are transferred. This can lead to an improvement in the speed and efficiency of these operations. In the specific case of MDF where it not uncommon to allocate file sizes of thousands of blocks, mini-

mising the highest block used is advantageous. Clearly, the more files written to the MDF the greater the number of blocks are in use, but more conveniently, files are generally allocated space from the beginning of the disk (ie the low numbered blocks of the disk). One "fly in the ointment" is that the process of initialisation on large disks (or equivalently large MDFs) causes the INDEX file for the disk to be placed at or about the middle block. This means that for a 20,000 block MDF, 10,000 blocks are immediately written-off of the host disk without the storage of a single file. Moreover, whenever the MDF is backed-up or copied, 10,000 blocks are transferred when perhaps no more than a few hundred may be used.

Fortunately, VMS comes to the rescue by allowing the user to specify the position of the INDEX file. This is achieved with the "/INDEX=" qualifier to the INITIALIZE command. The "/INDEX" qualifier may take values of "BEGINNING", "MIDDLE" or "END". Obviously, the "/INDEX=BEGINNING" is most appropriate when initialising MDFs.

3.2 Stopping a Server

ID servers are all stopped in the same general way, that is by the "SERVE/FREE" command. The general form of this command is:

```
SERVE/FREE id-spec
```

where "id-spec" specifies the ID unit to be freed.

4 Using Served ID Units

The same procedures are undertaken to initialise and mount an ID unit as would be with a real disk unit. For example, the following sequence of DCL commands would create a new MDF, initialise it as a files-11 volume, then mount it:

```
$ SERVE/VIRTUAL IDA0 MY_FILE/CREATE/ALLOCATION=500
$ INITIALIZE IDA0:  JPY
$ MOUNT IDA0 JPY
%MOUNT-I-MOUNTED, JPY          mounted on _IDA0:
$ DIR ICA0:[000000]

Directory IDA0:[000000]

000000.DIR;1        BACKUP.SYS;1        BADBLK.SYS;1        BADLOG.SYS;1
BITMAP.SYS;1        CONTIN.SYS;1        CORIMG.SYS;1        INDEXF.SYS;1
VOLSET.SYS;1

Total of 9 files.
```

A subsequent "SHOW DEVICE" command indicates how the system views the served ID unit:

```
$ SHOW DEVICE IDA0/FULL

Disk IDA0:, device type RM05, is online, allocated, deallocate on dismount,
    mounted, file-oriented device, shareable.

    Error count                    0    Operations completed                60
    Owner process           " TXB0:"    Owner UIC                      [SYSTEM]
    Owner process ID        00000048    Dev Prot    S:RWED,O:RWED,G:RWED,W:RWED
    Reference count                2    Default buffer size                512
    Total blocks                 500    Sectors per track                    1
    Total cylinders              500    Tracks per cylinder                  1

    Volume label               "JPY"    Relative volume number               0
    Cluster size                   1    Transaction count                    1
    Free blocks                  476    Maximum files allowed              125
    Extend quantity                5    Mount count                          1
    Mount status             Process    Cache name             "_DUB0:XQPCACHE"
    Extent cache size             64    Maximum blocks in extent cache      47
    File ID cache size            64    Blocks currently in extent cache     0
    Quota cache size               0    Maximum buffers in FCP cache       156

  Volume status:  subject to mount verification, file high-water marking, write-
      through caching enabled.
```

While an ID unit may not be used as the VMS boot device, there are very few other restrictions. Together, the ID driver and server permit:

1 Sharing of ID units
2 Execution of images from ID units.
3 Storage of Section Files on ID units.
4 Mapped Device Files to be non-contiguous and to "use" only the highest block written.
5 Unlimited fragmentation of files within an MDF.
6 ID units to be coupled as Volume Sets.
7 ID units to be nested.

5 Useful Applications of Served ID Units

The following are some suggestions for using the Virtul Disk and Encrypting Disk server :

5.1 Reducing Disk Fragmentation

ID offers a partial solution to the problem of disk fragmentation. Fragmentation may impact all users, and may be minimised by restricting those users who fragment the disk most to a single ID unit. Once their MDF has been created, any fragmentation that occurs is contained within the MDF and has no effect on other users.

5.2 Simplifying Backups

ID is a useful device on which to store files that require special attention for backing up. Such files may be backed up more or less frequently than the normal system backup procedure, as required. Also, it is often much faster to backup the MDF - as a file - rather than the individual files it contains.

5.3 Group Quota Allocations

Allocating disk quotas for groups of users is not currently possible under VMS. System Managers may give individuals quotas but in order to ensure that a group of users do not exceed a given disk quota, the Manager must divide the quota among individuals. Using ID, the group can be allocated the whole MDF.

5.4 Pre-allocation of Disk Space

Applications which have predictable peak loading of disk space can guarantee the space is available by creating an MDF of the appropriate size for its output files. Program crashes can hence be avoided when available disk space fluctuates wildly.

5.5 Software Development

An ID device provides a safe environment for developing software which could leave the file structure vulnerable, such as programs which perform physical or logical I/O. Data files for untested third-party products may be located on ID, to isolate them from main system areas.

5.6 Mopping Up Available Disk Space

Sometimes it is useful to obtain as much free space on a single device as possible. Perhaps for applications requiring a very large scratch file. Often the space required is available across a number of different devices, but not on a set of devices serviced by a single driver.

By serving several IDs, each mapping to an MDF consuming the total free space on each device, then BINDING these IDs into a single VOLUME SET, it is possible to present the user with a single ID whose size is equivalent to all the available free space.

As an example, suppose disks "DUB0" and "DLA1" are available, with 18,446 and 6,959 free blocks respectively. The following DCL log shows the execution of a DCL command procedure designed to mop up all available disk space into a single ID unit, IDA0, of 25,405 (or 25,148 free) blocks:

```
$ @mopup
$ set verify
$ free1 = f$getdvi("dub0:","freeblocks")
$ free2 = f$getdvi("dla1:","freeblocks")
$ serve/datalock/noencrypt/system/create/allocation=18446 volset1/find dub0:x
%SERVE-I-UNINUMALL, IC unit IDA0:
$ serve/datalock/noencrypt/system/create/allocation=6759 volset2/find dla1:x
%SERVE-I-UNINUMALL, IC unit IDA1:
$ initialise/index=beginning volset1 volset1
%INIT-W-NOBADDATA, bad block data not found on volume
$ initialise/index=beginning volset2 volset2
%INIT-W-NOBADDATA, bad block data not found on volume
$ mount volset1,volset2 volset1,volset2/bind=mopup
%MOUNT-I-MOUNTED, VOLSET1     mounted on _$255$IDA0: (GAZEBO)
%MOUNT-I-MOUNTED, VOLSET2     mounted on _$255$IDA1: (GAZEBO)
$ show device disk$mopup
Device                 Device           Error    Volume         Free  Trans Mnt
 Name                  Status           Count     Label        Blocks Count Cnt
$255$IDA0:    (GAZEBO)  Mounted alloc        0  VOLSET1         18415     1   1
$255$IDA1:    (GAZEBO)  Mounted alloc        0  VOLSET2          6733     1   1
```

The procedure commences by finding the free space available on each disk, "DUB0" and "DLA1", which it assigns to the symbols "free1" and "free2". These symbols are used as values in the "/ALLOCATION" qualifiers in the succeeding "SERVE/DATALOCK" commands. Hence, two files are created, "DUB0:X.MDF" and "DLA1:X.MDF", each of which consume the remaining free space on each disk.

The "/FIND" qualifier is used to search for free ID units (in fact, "IDA0" and "IDA1") and assign them to the logical names "VOLSET1" and "VOLSET2". These units are then INITIALISED using the "/INDEX=BEGINNING" qualifier to keep the index files near the front of the MDF files (this can minimise data transfer on MDF backups).

Finally, the ID units are bound together and MOUNTED as a volume set with a size equivalent to the sum of the free space on each disk.

6 Summary

The foregoing illustrates a novel technique developed by the authors to solve a number of difficult data processing problems in a way entirely consistent with VMS. Unlike other traditional technologies employing totally driver-resident code, InterCept devices elegantly avoid restrictions like contiguous Mapped Device Files. Furthermore, intercept device servers can be developed and debugged extremely quickly and safely. This contrasts with the normal driver development cycle requiring assembler code, kernel mode privilege, XDELTA and single use of the processor.

This paper describes only disk-type applications of intercept devices. In fact, intercept devices may be combined with appropriate servers to mimic almost any type of device driver - including, for example, communications device drivers for Ethernet. The authors will, in due course make available the programming interface and tools for a user to design and implement his own servers for ID, IC and IM. In so doing, we hope to encourage the development of Intercept technology as an industry standard.

BO KNOWS VAX?

Chuck Green
Western Data Technologies

BO KNOWS VAX?.....
C.E. (Chuck) Green
Western Data Technologies

It's doubtful that NFL star player Bo Jackson knows or even cares about VAX or VMS. However, a couple of years ago it appeared to many of us that no one in the DEC community had a grip on these products either. New products were released at a staggering pace, it seemed that other products were rendered obsolete before being unpacked, multiple versions of VMS were out and your specific version was being updated almost monthly. More recently, DEC has announced new architecture VAX systems to compete with the guys in the workstation to mainframe markets. This in turn has raised many legitimate questions regarding the direction DEC is going and the longevity of the VMS Operating System.

Fortunately we may now rejoice. DEC has shown us the future, and it is good. In a session titled "VMS Long Range Directions" presented at the Fall DECUS Symposium in Anaheim, several representatives from Digital spoke regarding the next five to ten year planning for DEC as well as the VAX and VMS products.

According to Rick Spitz, Group Manager of VMS Engineering, collective customer input has allowed DEC to develop a "high level model" of what they perceive as customer needs. In addition, DEC plans to increase the quantity of interactive sessions such as this one in order to continuously expand on this model. The attributes currently contained in this model are as follows:

* Customers make a significant investment in their computer operations and they want this investment protected.

* Systems must be reliable. More and more companies depend on their systems 24 hours a day, 7 days a week.

* Customers want the freedom to pursue the correct solution for their needs. An open standard not limited to DEC.

* The typical customer site is focused on their specific application.

* Availability and ease of use are of great importance to the users, system managers and the operation.

From this model DEC has established a new focus for VMS which is to become the best

distributed operating system available for production environments. Points of concentration within this focus will be on interoperability, reliability, availability, integration and overall ease of use. Rick also stressed that Digital is rededicated to developing a system based on an open standard in order to allow maximum connectivity to the global networks of the future while enhancing both ease of use and fault tolerance.

The vision for the VAX VMS systems in the coming decade are "computers with processor performance 100 to 1000 times that of the original 780 shipped 10 years ago." These systems will exploit the latest in both computer architecture and hardware technologies in order to minimize the dependence of software on specific hardware or hardware attributes. This in turn will give future versions of VMS a greater level of flexibility. Thus, the ultimate goal is to create a VMS based, leadership computer environment which will carry well into the 21st century.

Larry Kenah, Digital's VMS Technical Director further stressed this vision by stating that DEC "wants VMS to be the best distributed production environment in the world." An aggressive and complicated goal which brings up two obvious questions. The first being: What is a distributed system? The second being: What is a production system?

According to Digital the distributed systems of the future will actually provide customers with the best of both worlds by combining traits of the centralized systems of today with the distributed systems of today, where some limited type of system distribution exists. This will provide users with coherence in allowing them to become accustomed to specific features which will be usable across the distributed network. Concurrently these systems will operate at a larger extent in terms of quantity of users and physical geography. In addition, there will be much more flexibility with respect to growth as additional systems can be added throughout the network in order to accomplish such.

Distributed systems allow for more efficient sharing of both functions and resources such as data, hardware and even personnel. They offer greater opportunities for the creation of high availability systems which are not subject to point failure problems and in turn allow applications and data needed to be available at all times. Thus, in DEC's opinion, the distributed system of the future will consist of a set of hardware, software and data components which are heterogenous (a combination of multi-vendor units). The size of the system will be global and will be capable of supporting users in the magnitude of several hundred thousand. The system will be globally connected by a network consisting of multiple underlying network technologies. And finally, the system will provide a uniform set of services with certain properties that are uniform throughout the system. In order to accomplish this these systems will possess global properties consisting of Global Names, Global Access,

Global Security, Global Management and Global Availability.

Where VMS fits into this system of the future is in Digital's belief that VAX Clusters are the best example of distributed systems today. And since VAX Clusters are all VAX VMS systems, this automatically provides many of the necessary global properties. VAX Clusters provide excellent availability of features as well as ease of growth which is the basis for DEC's desire to make VAX Clusters the distributed system of the future and the provider of distributed service. Unfortunately, today's VAX Cluster does have its drawbacks. First, they are homogenous which doesn't fit the general user/open standard model. Second, they are constrained in size of both the cluster members and geographical extent. Therefore,the plan of the future is to build on the strengths of the VAX Cluster, move into the heterogenous distributed computer environments and use distributed systems with VAX Clusters as the backbone to move into the production system environment.

Larry defined a production system with the simple statement "you bet your business" which in short means that if your production system fails, your business stands a good chance of failing or at least suffering from a severe setback. The two most important aspects of this type system is the availability of data and applications, and the management requirements demanded by the system. Because of this, the new VMS based production systems will be developed to provide more consistent performance and more controlled reliability (even on non-controlled components). The goal here is to reduce any type of system failure as much as possible while introducing services into the system that will allow applications to continue their existence across other failures. Such application failover services will become simpler on production systems with the planning of global distributed systems. In addition, the present property of some subsystems in VMS to degrade poorly when resources are at their maximum will be addressed such that if resources are depleted, applications will experience only a small amount of degradation and a simultaneous warning will be issued to the operator and/or management. With respect to the availability of data, the plan here is to automate the storage process of data and introduce intelligence such that neither the user or application will need to know the physical volume that contains the specific data element.

System management of future production systems will also be made much simpler and in essence "the system will manage itself". This being a grand goal is still far from possible however, Digital does intend to eliminate intervention where possible and provide well-integrated, easy to use interfaces for those functions that require manual operation. There are also plans to create a management model such that system management techniques used will be the same with respect to all nodes within the distributed network.

Of course with all of the

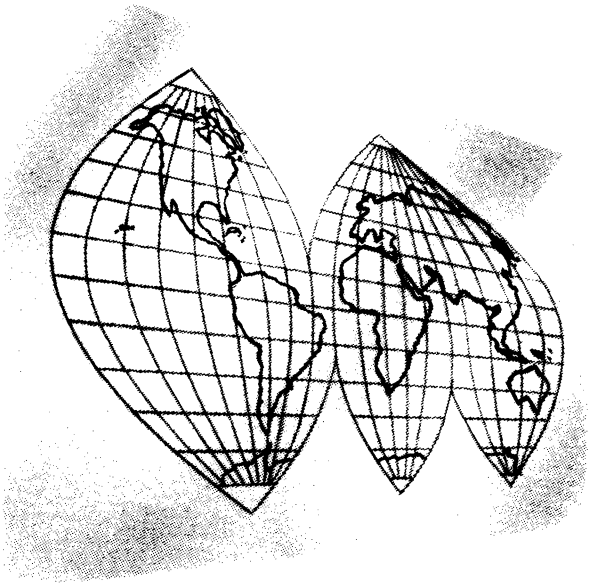
discussion stressing the needs for the future being global networks of systems servicing hundreds of thousands of users, the obvious question now becomes one of security. Fortunately it seems that DEC has given this issue more attention than can be outlined here which was described in detail by Andy Goldstein, VMS Senior Consultant. To briefly describe the depth to which DEC appears to have gone in order to optimize security on a distributed system, imagine the following. Picture yourself strapped in front of a 48 inch television screen approximately six feet back with a tape of HP's advertisement for computing solutions stuck on the part where they say "What If", and running for 24 hours a day. Digital intends to acquire above the previous NCSC C2 rating for security in future systems and are therefore asking "what if" to their what if's.

Andy also discussed VMS Sponsored Advanced Development projects now underway which include Auto-Tuning or system automatic on-line tuning for optimum performance. Fast Boot to reverse the trend of an ever growing boot delay with every new release of VMS. Transaction Processing (TP) Data Storage in which a simple database system will be developed with a performance target of 1000 times RMS for TP applications. Research into getting VMS out of macro code and translating it to a high level language. And a project just getting underway at the University of Massachusetts to implement the UNIX MIT Athena services in a heterogeneous environment including VAX/VMS and integrate Athena services with Digital distributed services to produce a complete distributed system.

In conclusion, Digital states that VMS is in it for the very long haul for both production and distributed system environments. Based on this session it certainly appears that VAX/VMS lives and will continue to develop into a part of the global information and communications network that is rapidly approaching reality. Thus to Digital, those committing to VMS can say thanks and take a deep breath of relief that your systems need not be replaced next month. However, to Digital the emphasis must still be on leading the way so to borrow another phrase from BO.....Just do it.

DECUS

The DECUS LIBRARY



LIB

Software News

U.S. Chapter Edition

"Solving Your Everyday Problems"

The DECUS U.S. Chapter Library Committee has begun a process by which items in the DECUS Library are reviewed by DECUS members with the resulting written review published in the DECUS U.S. Chapter SIGS Newsletter publication.

The items reviewed are available from the DECUS Library for a minimal charge. If you wish to order the item in this review, contact the DECUS Library and request the item by the reference number in the review title.

The DECUS Library can be contacted within the United States at:

The DECUS Library
219 Boston Post Road BP02
Marlboro, MA 01752-1850

Phone: 508 480-3418

People who would like to volunteer to help with the DECUS Library review project should contact the Review Coordinator, Ted Nieland. Mr. Nieland can be contacted on DCS at NIELAND.

DECUS Library Reviews
LASERS, QUEUES and Other Fun Things - V00425

Robert G. Schaffrath
General Foods Corporation

Encapsulated Review

Rated on a scale of 1 to 5 with 5 being excellent	
Ease of Installation:	3
Documentation:	4
Intended Audience:	System Managers
Ease of use:	4
Usefulness:	4
Sources:	Supplied, VAX C
Objects Supplied:	Yes

Introduction

LASERS, QUEUES and Other Fun Things is a collection of VMS utilities for performing various disk, laser printer, and queue operations. It was submitted by Bob Armstrong at Algonquin College. The submission includes all source code as well as documentation. The documentation states that VMS version V5.1 is required for the package. The software has been successfully executed on VMS V5.2 without problems.

Intended Audience

LASERS, QUEUE, and Other Fun Things is intended for the VMS System Manager. Most of the utilities require privileges above the normal TMPMBX and NETMBX that most users have.

Test Configuration

LASERS, QUEUE and Other Fun Things was tested on a VAX 6330 running VMS V5.2 and a MicroVAX 3600 running V5.1-1. Disk drives used in testing are RA82's and RA90's.

Installation

The installation is somewhat involved. This is to be expected since many of the tools in the package require the user to customize them for his/her environment. The initial installation involves restoring one saveset. This saveset will create it's own directory structure containing the various tools in the package.

Documentation

LASERS, QUEUE and Other Fun things comes with an 18 page manual. It explains the UNDELETE, LASER, and Queue across DECnet utilities as well as a description of the special printer Symbionts. Additional documentation is provided with the utilities in the form of RUNOFF source and .MEM files. The documentation is somewhat technical but should not be any problem for an experienced system manager.

Ease of Use

The various utilities are relatively easy to use. Each utility comes with its own .COM file for compilation and linkage. Utilities such as PATCH_HEADER, which allows you to change characteristics of files, should be used only by people who understand the underlying file system. It would be very easy to corrupt a file as well as the disk if not used carefully. However, as with any powerful utility, a competent user should have no problems.

The following notes where made while reviewing the package:

- The LIST_HEADER utility is essentially an equivalent to the DCL DUMP/HEADER command. However, it accesses files by FID rather than filename and also provides several additional pieces of information. One minor enhancement for it would be to parse out

V00425 LASERS, QUEUES and Other Fun Things Version: June 1989

Submitted by: Bob Armstrong, Algonquin College, Nepean, Ontario, Canada

Operating System: VAX/VMS V5.1 Source Language: C Memory Required: 300 Pages Software Required: VAX C Compiler Keywords: File Management, Utilities - VMS

Abstract: LASERS, QUEUES and Other Fun Things is a collection of useful utilities. Following is a brief summary of these utilities:

FileHeader	A real UNDELETE utility, if the file can be recovered it will remark the blocks as allocated, fix the header and place the file within the directory. A list header utility, list all headers associated with an fid and shows whether the extents are allocated, or free. A patch header utility, not complete but will allow you to flip flags or patch fid's. A real MOVEFILE utility, something like MV under UNIX, will move files (without deletion) to new directories on the same disk (works with wildcards as well).
Drawtree	A super fast drawtree utility, uses RMS routines and written in C. Handles roots, and extra long directory names.
Laser	As well as all other qualifiers on the PRINT command LASER supports /FONT. You define what fonts are available for what printers/lasers. LASER sets up the appropriate text modules from SYSDEVCTL.TLB file when the file is printed.
Operations	Use SYSDEVCTL.TLB to program your printers, reduces operations setup time.
Symbionts	A collection of single stream symbionts, to do character translation from Digital Equipment Corporation multinational to specific sequences for third party printers. Easily modifiable for other printers/lasers.
QUEUES across DECNET	Link queues across a normal DECNET link. This will allow users to print on a remote machine without having NETMBX, everything appears as a local queue.

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

Figure 1: DECUS Library Abstract for *LASERS, QUEUES and Other Fun Things*

the file protection field. Currently, a hex value is returned for the protection.

- A utility called MOVE_FILE is provided which is supposed to by identical to the UNIX MV command. I am at a loss to figure out what is special about it since you can move a file in VMS using the RENAME command.
- The PATCH_HEADER utility is a fascinating utility for modify the header of a file. It is also dangerous if used by an inexperienced user. One enhancement which would be nice is the ability to access the file by filename as well as FID which is used currently.
- The UNDELETE utility works as promised. A useful enhancement would be the ability to specify the directory to scan and the name of the output file. Currently, you must SET DEFAULT to the target directory. Also, it may be desirable to give the restored file a name different than its original. One bug did crop up while testing this program. I discovered that when I set my default to the physical device name (ie. DUA1:), the program returned an RMS error. When I set default to the disk's logical name (ie. DISK$LABEL), it worked. No mention is made of this restriction in the documentation.
- The DRAWTREE utility draws a map of the directory tree using VT100 graphics. One enhancement would be desirable. The utility should check to see if the directory entry being examined is an alias entry. This can be accomplished by checking the backlink identification as well as the filename in the header. If you have VAX-11 RSX installed on your system, the utility will dump both [SYSEXE] as well as [001004]. It should only dump [SYSEXE]. One other note was that on some directories, a small 'x' was appended to the name. I found nothing in the documentation to tell me what this means.
- The OPERATIONS, LASER, and SYMBIONTS tools are used with various printers. I did not have the hardware necessary to test the SYMBIONTS package.
- QUEUES ACROSS DECNET took a bit of hack-

ing but finally worked. The documentation is a bit skimpy as to what should be modified and how. Also, the .COM files for running the software required quite a bit of modification. Once running, the software did function. If found two changes which could improve the functionality of the package. First, the LINK_BUSINESS.COM file should be modified to check queue status using the F$GETQUI lexical rather than a SHOW QUEUE into a file. Secondly, the MANAGE_BUSINESS,COM file checks to see if a node is available by doing a SHOW NETWORK into a file and reading back that status. This assumes you have Full Function DECnet up and running.

Some Final Thoughts

Overall, I was impressed with the software in this package. Due to the fact that this is the first release of this package, some rough edges are to be expected. I look forward to seeing further enhancements to this package.

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

DECUS NO: V00444 **TITLE:** FIBA – File Batch Generator **Version:** 1.0, September 1989

Author: W. Hammerschmid, Isperpasse 16, Austria A-1210 Wien

Operating System: MicroVMS V4.6 through V5.1, VAX/VMS V4.6 through V5.1 **Source Language:** PASCAL **Keywords:** Utilities – VMS

Abstract: Depending upon what the date (backup, created, expires or revised date) is on two or more files, there will be generated one or more command lines in the batch file.

The output file includes the setting of the default directory, which contains the input file, all command lines with leading $ (if they are not continuing command lines) and three remark lines with a down counter in front of every new command block and the name of the file, which starts the command line block.

Media (Service Charge Code): 600' Magnetic Tape (MA) **Format:** VAX/ANSI

NEW LIBRARY PROGRAMS AVAILABLE FOR THE PROFESSIONAL 300 SERIES

DECUS NO: PRO179 **TITLE:** Professional Installation and Maintenance **Version:** 3.2, October 1989

Submitted by: Digital Equipment Corporation

Operating System: P/OS V3.2 **Memory Required:** 512KB **Keywords:** Professional 300 Series – P/OS

Abstract: Professional Installation and Maintenance is a set of diskettes for the Professional 300 series personal computers which provides an additional level of testing above the Self-test.

The MAINTENANCE APPLICATION diskette is run as a Professional application program. For the hard disk based systems, the software on the diskette can be installed onto the hard disk or run directly from the diskette. For systems without a hard disk, the software always runs directly from the diskette. The programs available on this diskette are:

System Unit Test	Tests the system module and optional hardware.
Keyboard Key Test	Allows most keyboard keys to be tested.
Printer Test	Sends data to a printer.
Configuration Display	Displays the hardware contained in the system unit.
Bar Patterns	Displays color bars (or gray shaded bars) on the video monitor for systems that have an extended Bit Map option.

Notes: Some options like the DECNA and TMS will only run in Standalone mode that is not installed on the hard disk as an application. Version 3.2 of P/OS is required, which is available from the DECUS Library as DECUS No. PRO177.

Documentation available in hardcopy only. Sources not included.

Media (Service Charge Code): User's Manual (EB), Three RX50 Diskettes (JC) **Format:** P/OS

DECUS NO: PRO178 **TITLE:** PRO/Tool Kit **Version:** 3.2, October 1989

Submitted by: Digital Equipment Corporation

Operating System: P/OS V3.2 **Memory Required:** 512KB **Keywords:** Tools – Software Development, Professional 300 Series – P/OS

Abstract: The PRO/Tool Kit contains all the RSX programming tools, libraries and utilities you need for writing new applications or for modifying existing RSX or VMS programs to take advantage of the Professional's special features.

The PRO/Tool Kit along with one or more PRO/Tool Kit Languages can be installed on any Professional with 10MB or larger hard disk P/OS system, 20MB is recommended however. After selecting the PRO/Tool Kit from the P/OS menu, you can write, compile, task build, execute and debug programs directly on your personal PDP-11. The Digital Command Language is the interface to the Tool Kit utilities and languages. The PRO/Tool Kit includes software that lets you develop fully distributed applications for the PRO/DECnet environment. With this facility you can create P/OS applications that access files on remote DECnet systems, perform task-to-task communications and even bypass the higher-level DECnet protocol to gain direct access to the Ethernet circuit.

Some features include:

. RMS, FMS, SORT, GRAPHICS, PRO/GIDIS, FRAME DEVELOPMENT TOOL, P/OS Services and EDT.

DCL commands include:

. APPEND, COPY, CREATE, DELETE, DIRECTORY, RENAME, SUBMIT/REMOTE, SET HOST, SET PROTECTION, TYPE, BROADCAST, SHOW USERS

Following is a list of the manuals that you will receive when you order Media Service Charge Code (EK):

"Volume 1,	Introduction"
"Volume 2A,	Terminal Subsystem and Graphics"
"Volume 2B,	Terminal Subsystem and Graphics"
"Volume 3,	Task Building and Macro Programming"
"Volume 4,	Operating System"
"Volume 5,	PRO/RMS-11"
"Volume 6,	Debugging, Drivers, and Advanced Programming"
"Volume 7,	PRO/DECnet"
"Volume 8,	PRO/Tool Kit"

Notes: Version 3.2 of P/OS is required, which is available from the DECUS Library as DECUS No. PRO177. The MACRO language is included; no other Digital Equipment Corporation developed language for the PRO is available through DECUS.

Documentation available in hardcopy only. Sources not included.

Media (Service Charge Code): User's Manual (EK), Nine RX50 Diskettes (JI) **Format:** P/OS

DECUS NO: PRO177 **TITLE:** P/OS Hard Disk **Version:** 3.2, October 1989

Submitted by: Digital Equipment Corporation

Operating System: P/OS V3.2 **Memory Required:** 512KB **Hardware Required:** PC350 or PC380 with minimum 10 meg hard disk and floating point adapter. **Keywords:** Operating System, Professional 300 Series -P/OS

Abstract: P/OS Hard Disk is a disk-based, multi-programming, priority-structured, event-driven operating system, which includes:

. P/OS Hard Disk User interface
. P/OS Hard Disk Record Management System
. CORE Graphics Library
. PRO/GIDIS Graphics Tools
. DECnet Support
. DECtouch Driver
. PROSE Editor
. EDT Editor
. Backup and Restore Capabilities - Backup and Restore Application and Backup and Restore Utility (BRU)
. Disk Maintenance Utility
. System Installation and Customization Utility
. Digital Command Language (DCL) user interface; can be used in many cases as an alternative to the menu-based user interface.

Both the Professional 300 and P/OS support the Digital Multinational Character set. By using eight rather than seven bits to represent a character, the character may be used to define both the ASCII characters and other characters including most Western European Characters. The compose key allows typing of composite characters not represented on the keyboard legend.

The P/OS Hard Disk User Interface is a hierachy of menus and forms through which the user interacts with the operating system, utilities and applications. A menu may be a list of applications, a list of files or directories, or a list of other menus. Included are File Services, Print Services and Environment Services.

Following is a list of the manuals you will receive when you order Media Service Charge Code (EG):
"P/OS Server User's Guide"
"PROSE User's Guide"
"PRO/EDT User's Guide"
"Command Language User's Guide"
"Hard Disk System User's Guide"
"Hard Disk System for Beginners"
"Hard Disk System Error Guide"
"P/OS Hard Disk System Release Notes"

Documentation available in hardcopy only. Sources not included.

Media (Service Charge Code): User's Manual (EG), Twenty-One RX50 Diskettes (JP) **Format:** P/OS

DECUS NO: PRO176 **TITLE:** PRO/SIGHT **Version:** 1.1, October 1989

Submitted by: Digital Equipment Corporation

Operating System: P/OS V3.2 **Memory Required:** 512KB **Keywords:** Graphics, Professional 300 Series – P/OS

Abstract: PRO/SIGHT is an object-oriented, interactive graphics editor that allows the user to create a variety of pictures ranging from simple organization charts to complex graphics arts images.

Users can draw with cursor keys, a mouse or digitizing tablet. A set of menus appear at the bottom of the screen that allow the user to select colors, fill patterns, brush styles, text fonts, and standard shapes to include in the picture. They also allow the user to choose any eight of 256 possible colors (4,096 colors with a Professional 380).

PRO/SIGHT has a variety of editing functions which allow the user to move, copy, delete or change the color or fill pattern of objects.

Once created, the picture can be output on a variety of plotters or dot-matrix printers. The picture can also be stored in a GIDIS file to be recalled for future use or sent to another Professional.

Notes: Version 3.2 of P/OS is required, which is available from the DECUS Library as DECUS No. PRO177. Documentation is included on the media. It was created using RUNOFF and the .MEM files are included on the media. The documentation does not include graphics tables, charts, or figures, but does include all of the text found in the hardcopy version. If you wish to purchase the documentation in hardcopy, specify the media service charge code (ED) on your order form. Optional hardware for this package is the extended bit map option.

Sources not included.

Media (Service Charge Code): User's Manual (ED), Three RX50 Diskettes (JC) **Format:** P/OS

DECUS NO: PRO175 **TITLE:** PRO/DECnet **Version:** 2.1, October 1989

Submitted by: Digital Equipment Corporation

Operating System: P/OS V3.2 **Memory Required:** 512KB **Keywords:** Networking, Professional 300 Series – P/OS

Abstract: PRO/DECnet enables a Professional 300 Series System to participate as a non-routing (end) node in DECnet computer networks. The Professional node can communicate with other DECnet nodes using either the Communications Port (COMM1) for Asynchronous or Synchronous DDCMP Wide Area Network communications, or the NET1 Port for Ethernet Local Area Network communications, but not both at the same time. The optional PRO/Tool Kit, see DECUS No. PRO178 for a description of this package, contains libraries which allow developers to write applications which communicate in a DECnet network.

PRO/DECnet Phase IV networks can contain up to sixty-three network areas, with a maximum of 1023 nodes per network area, given proper network planning. Phase III nodes participating in Phase III/IV networks are limited to the Phase III routing capability of 255 nodes. Phase II nodes are not supported. Phase IV end nodes not directly connected to an Ethernet Local Area Network must connect to a Phase IV full function (routing) node, and can only communicate with Phase III nodes through such a router.

The functions available to the PRO/DECnet user depend largely upon the configuration of the rest of the network. Each DECnet product offers its own level of capability and its own set of features to the user. Functions available with PRO/DECnet include Remote DECnet Terminal Utility, Remote File Access and File Transfer, Mail, Phone, Modem Support and Task-to-Task Communication and Network Management.

Following is a list of the manuals you will receive when you order Media Service Charge Code (ED):
"PRO/DECnet User's Guide"
"PRO/DECnet Problem Determination Guide"

Notes: A DECNA module is required to use the NET1 port on the rear of the system unit. Version 3.2 of P/OS is required, which is available from the DECUS Library as DECUS No. PRO177.

Documentation available in hardcopy only. Sources not included.

Media (Service Charge Code): User's Manual (ED), Five RX50 Diskettes (JE) **Format:** P/OS

DECUS NO: PRO174 **TITLE:** PRO/BASIC **Version:** 1.4, October 1989

Submitted by: Digital Equipment Corporation

Operating System: P/OS V3.2 **Memory Required:** 512KB **Keywords:** Language Interpreters, Professional 300 Series – P/OS

Abstract: BASIC is a conversational programming language developed at Dartmouth College that uses simple English language-like statements and familiar mathematical notations to perform operations.

PRO/BASIC is an interactive BASIC for the Professional 300 system. It is comparable in function to most personal computer BASIC implementations, and yet maintains a high degree of compatibility with the BASIC available on Digital Equipment Corporation's larger PDP-11 and VAX systems.

PRO/BASIC contains the following features:
. Long variable names (up to thirty-one characters)
. Sequential files (terminal format)
. Random access files (virtual arrays)
. Chaining from one program to another with parameters
. Video terminal line editing
. Immediate syntax checking on input
. Debuffing facilities such as program trace and step capabilities
. Single and double precision that results in six digits and sixteen digits of accuracy respectively
. Multiple dimensional arrays (up to seven)
. Extended IF-THEN-ELSE statements
. Multiple statements on a line capability
. Calculator PRINT mode (implied PRINT)
. Print formatting with PRINT USING statement
. Programmable error handling (ON ERROR GO TO)
. User defined single line functions
. Extensive support for graphics (over twenty statements)
. String support, complete with string arrays and functions
. Meaningful, English error messages, e.g. "Expected a comma" rather than "Syntax Error"
. On-line Help
. Limited access to the communications port

PRO/BASIC offers a total of 41.9K bytes of user memory in the workspace. Of this total memory, a maximum of 32K bytes can be used for code and a maximum of 9.6K bytes can be used for data. The addition of an extended memory board will not increase the amount of memory available to the PRO/BASIC user.

Notes: Version 3.2 of P/OS is required, which is available from the DECUS Library as DECUS No. PRO177.

Documentation available in hardcopy only. Sources not included.

Media (Service Charge Code): User's Manual (ED), One RX50 Diskette (JA) **Format:** P/OS

REVISIONS TO LIBRARY PROGRAMS

DECUS NO: V00387 **TITLE:** TPUPlus **Version:** October 1989

Submitted by: Rick Stacks, Ark Dept of Pollution Control, Little Rock, AR

Operating System: VAX/VMS V5.2 **Source Language:** VAX FORTRAN **Software Required:** VAX FORTRAN **Hardware Required:** VT100, VT200, VT300 or compatible terminal **Keywords:** Editors, Tools – Applications Development, Utilities – VMS, EVE, TPU

Abstract: The TPUPlus editing package is similar to a previous submission DECUS No. V00272, "Extended_EVEPlus", in that the package is layered upon TPU, but that is where the similarity ends. TPUPlus has been built to aid programmers, word processing people, and anyone else that might need to edit files on the VAX. With Version 5.0 of VMS came many changes to TPU and this made a complete rewrite of my previous editor necessary; thus was born TPUPlus. TPUPlus is very easy to build and install

TPUPlus has an EDT keypad, an EVE keypad (greatly enhanced from Digital Equipment Corporation's), WPS keypad, and numeric keypad easily accessible by using the SET KEYPAD command. Also built into the editor is a Spelling Checker, a sorting utility, rectangular cut/paste, and many other additions and enhancements to the TPU-based editors.

There are certain EDIT (EDT) line mode commands that are available by using GOLD {KP7} that are not available otherwise. These commands are SET SEARCH EXACT, SET SEARCH GENERAL, SET SEARCH OFF, line, SET WRAP, SET NOWRAP, CONTINUE, DELETE BEFORE, DELETE REST, DELETE WHOLE, SUBSTITUTE, _&TYPE. These commands function the same as their EDIT counterparts.

The EDT portion of this editor is an emulation of Digital Equipment Corporation's EDT editor with many special added features that increases the productivity of the user once the user becomes familiar with the editor commands. The user can become aquainted with these special functions and how to use them in the span of a couple hours. Most of the special functions share key definitions with the EVE version of the editor, increasing ease of use through similar key definitions.

Notes: Several new EVE/EDT commands have been added and this version is compatible with VMS V5.2 (DECWindows version).

Changes and Improvements: New commands and bug fixes for the Spell Checker.

Media (Service Charge Code): 600' Magnetic Tape (MA) **Format:** VMS/BACKUP, or order VL0010

DECUS NO: 110919 **TITLE:** A UNIX-Like File System for RSX **Version:** August 1989

Submitted by: Sanjay Dasgupta, Gas Authority of India Ltd., Chanakyapuri. New Delhi, India 110029

Operating System: RSX-11M V2.06, V3.2, RSX-11M-PLUS V2.1 **Source Language:** C, MACRO-11 **Memory Required:** 64KB **Software Required:** C Language System, Second Master Release, DECUS No. 11S018 **Keywords:** Utilities – RSX-11

Abstract: One of the useful things in UNIX is the hierachic file directory system. Hierarchic directory systems are found in all modern operating systems. But RSX seems to be an exception.

The RSX file system is restricted to a two-level, flat structure because of the design of routines (like '.PARSE' in SYSLIB) which access and manipulate the directory data structure. This implementation uses new routines that can parse multi-level, structured file-names. These new routines have been cast in a UNIX framework to provide the following functionality:

. A utility that emulates a UNIX-like command environment, enabling the user to create sub-directories and work with files and sub-directories within them. The following commands are provided:mkdir, cd, cat, chmod, mv, ls, pwd and rm. This utility is supplied in source and task form. No other software is needed to use it.

. A package of functions (callable from C) which enable C programs to manipulate files in a sub-directory environment. The following functions are provided: fopen(), getenv(), and chdir(). These functions are designed for use with the DECUS C-language system.

The principles used in this implementation are consistent with RSX conventions. This software can be used by non-privileged users, and entities created by it can exist side-by-side with normal RSX files and directories without conflict.

Notes: The user is assumed to be familiar with UNIX and RSX file structures.

Changes and Improvements: Added features and improved documentation.

edia (Service Charge Code): One RX02 Diskette (LA) **Format:** FILES-11, 600' Magnetic Tape (MA) **Format:** FILES-11

STEERING COMMITTEE LISTS

ARTIFICIAL INTELLIGENCE SIG

CHAIR
Cheryl Jalbert
JCC
128 West Broadway
Granville, OH 43023
(614) 587-0157

VICE-CHAIR
OPS5 WORKING GROUP CHAIR
Don Rosenthal
Space Telescope Science Inst.
Homewood Campus
Baltimore, MD 21218
(301) 338-4844

NEWSLETTER TASK FORCE CHAIR
ADMINISTRATIVE ASSISTANCE
Becky Wise
Amdalh CSD
2200 North Greenville Ave.
Richardson, TX 75081
(214) 699-9500 x 272

NEWSLETTER EDITOR
Curt Snyder
Allegan
2525 Dupont Drive
Irvine, CA 92715-1599
(714) 752-4760

SYMPOSIA COORDINATOR
Pam Vavra
Hughes Aircraft EDSG
P.O. Box 902 E52/D220
El Segundo, CA 90245-0902
(213) 616-7071

MEMBERSHIP COORDINATOR
SUITE COORDINATOR
Chris Goddard
Simpact Associates
9210 Skypark Court
San Diego, CA 92123
(619) 565-1865

SESSION NOTE EDITOR
George Humfeld
Naval Sea Systems Command
PMS 350 ED Dept of the Navy
Washington, DC 20362-5101
(202) 692-0137

ASS'T SESSION NOTES EDITOR
David Frydenlund

Terman Frydenlund Applied Tech.
10839 Broadwater Drive
Fairfax, VA 22032

STORE REPRESENTATIVE
Sally Townsend
Inst. Defense Analysis
1801 N. Beauregard St.
Alexandria, VA 22311
(703) 845-2122

PUBLIC DOMAIN SOFTWARE TF CHAIR
LIBRARY REPRESENTATIVE
Jim Sims

Space Telescope Science Ins.
3700 San Martin Drive
Baltimore, MD 21218
(301) 338-4949

COMMUNICATIONS COMMITTEE
John Shephard
El. Lilly Research Labs.
Lilly Corporate Center
MC625, Bldg. 98C/2321
Indianapolis, IN 46285
(317) 276-7947

AI LUG COORDINATOR
ASSISTANT STORE REP.
Dennis Clark

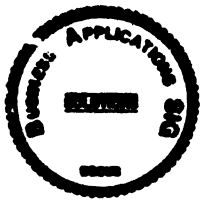
RT2 Box 264
Kingston, TN 37763
(615) 576-7384

REPORTER TO THE UPDATE.DAILY
Bill Lennon

SEMINAR UNIT REP.
CAMPGROUND COORDINATOR
Leona Fluck
Educational Testing Service
Rosedale Road
Princeton, NJ 08540
(609) 734-1243

DEC COUNTERPART
Marcia Roland
Marlboro, MA

MEMBERS-AT-LARGE
David Slater
George Winkler
Jeff Fox
John Williamson
Wayne Graves
Matt Mathews
Dave Campbell
Shirley Bockstahler-Brandt
Barry Breen
Tom Viana



BUSINESS APPLICATIONS SIG

CHAIRMAN
George Dyer
Gallaudet University
800 Florida Ave, NE-EMG Bldg
Washington, DC 20002
(202) 651-5300

COMMUNICATIONS COORDINATOR
Bob Sr. DOC H
Pioneer Standard Elect.
4800 East 131st St.
Data Prfocessing
Cleveland, OH 44105
(216) 587-3600-389

SYMPOSIA COORDINATOR
Mark Hults
USSA Administrative Systems
USSA Bldg. B01E
San Antonio, TX 78288
(512) 498-8725

LUG COORDINATOR
Patrick LeSesne
U.S. Coast Guard
Room 1416E 2100 2nd St. SW
Washington, DC 20593
(202) 267-0354

MARKETING COORDINATOR
Tom Byrne
L. Karp & Sons
1301 Estes
Elk Grove Village, IL 60007
(312) 593-5706

PROGRAM PLANNING COORDINATOR
Stuart Lewis
Douglas Furniture Corp.
P.O. Box 97
Bedford Park, IL 60499
(312) 458-1505

SEMINARS COORDINATOR
Daniel Esbensen
Touch Technologies, Inc.
9990 Mesa Rm , Rd. #220
San Diego, CA 92121
(619) 455-7404

LRP COORDINATOR
Arnold I. Epstein
D-M Computer Consultants
Rolling Meadows, IL 60008
(312) 394-8889

NEWSLETTER EDITOR
Dave Levenberg
Credit Suisse
Dept OA1 15th floor
100 Wall Street
New York, NY 10005
(212) 612-8372

SESSION NOTE EDITOR
Richard Kemp
Softport
99 Madison Avenue
New York, NY 10016
(212) 889-6575

LIBRARY REPRESENTATIVE
David Hittner
Projects Unlimited
3680 Wyse Road
Dayton, OH 45414
(513) 890-1800

CL SIG LIAISON
Becky Burkes-Ham

DMS SIG LIAISON Joe Sciuto MEMBERS-AT-LARGE
Robert D. Lazenby
Dixie Beer Dist., Inc.
Louisville, KY

Robert Kayne
Gallaudet College
Washington, DC

Ray Evanson
Paragon Data Systems
Winona, MN

DEC COUNTERPARTS
Paula Daley
Digital Equipment Corporation
Merrimack, NH 03054-0430

Pam Kukla
Digital Equipment Corporation
Maynard, MA 01754

DATATRIEVE/4GL SIG

CHAIRMAN
Donald E. Stern Jr.
Warner Lambert Company
10 Webster Road
Milford, CT 06460
(203) 783-0238

SYMPOSIA COORDINATOR
Bernadette Reynolds
City of Ontario Police
200 N. Cherry Ave.
Ontario, CA 91764
(714) 988-6481

ASS'T SYMPOSIA REPRESENTATIVES
T. Chris Wool
E.I. duPont DeNemours & Co.
Engineering Dept.
P.O. BOX 6090.
Newark, DE 19714-6090
(302) 366-4610

Janet G. Banks
Weyerhaeuser Info. Sys.
Mail Stop CCB-2E
Tacoma, WA 98477
(206) 924-4082

John Babiarz
System Support Services
15 Aircraft Road
Southington, CT 06489
(203) 628-5674

NEWSLETTER EDITOR
Joe H. Gallagher
Research Medical Center
2316 East Meyer Blvd.
Kansas City, MO 64132
(816) 276-4235

COMMUNICATION REPRESENTATIVE
PRODUCTION EDITOR
Steve Cordiviola
Kentucky Geological Survey
228 Mining & Mineral Resources Bldg.
Lexington, KY 40506-0107
(606) 257-5863

ASSOCIATE NEWSLETTER EDITOR
Pasquale (Pat) F. Scopelliti
Corning Glass Works
Mail Stop MP-RO-01-1
Corning, New York 14831
(607) 974-4496

Herbert G. Reines
Reznick Feddder & Silverman
4520 East West Highway
Suite 300
Bethesda, MD 20814
(301) 652-9100

Richard Copeland
Corning Inc.
Mail Stop HP-CB-06
Corning, NY 14831
(607) 974-8020

Lorey B Kimmel
6707 Whitestone Road
Baltimore, MD 21207
(301) 298-1500

VOLUNTEER COORDINATOR
Harry Miller
City of Ontario Police
200 N. Cherry Avenue
Ontario, CA 91754
(714) 988-06481

ASSISTANT VOLUNTEER COORD.
Judy Cutuli
Warner Lambert Company
10 Webster Road
Milford, CT 06460
(203) 783-0247

SEMINARS COMMITTEE REP.
Dana Schwartz
9325 Creekview Drive
Laurel, MD 20708
(301) 859-6277

SESSION NOTES EDITOR
Mary E. Roberts
City of Ontario Police Dept.
200 N. Cherry Avenue
Ontario, CA 91764
(714) 988-6481

SUITE COORDINATOR
Bert Roseberry
Commandant (G-APA-1)
2100 2nd Street, S.W.
Washington, DC 20593-0001
(202) 267-2629

FEATURE EDITOR
Philip A. Naecker
Consulting Engineer
3011 N. Mount Curve Ave.
Altadena, CA 91001
(818) 791-0945

DIGITAL COUNTERPARTS
John L. Henning
Digital Equipment Corporation
110 Spit Brook Road, ZK02-3/K06
Nashua, NH 03062-2698
(603) 881-2705

ARTIST & LIBRARY REP.
Bart Z. Lederman
System Resources Corporation
DOT Transportation System Center
Kendall Square DTS-66
Cambridge, MA 02142
(617) 494-2792

WORKING GROUP COORDINATOR
Larry Jasmann
U.S. Coast Guard
10067 Marshal Pond Road
Burke, VA 22015
(202) 267-2624

RALLY WORKING GROUP CHAIR
Steven G. Fredrickson
Fredrickson Consulting Service
2722 37th Avenue SW
Seattle, WA 98126
(206) 938-0482

RALLY WORKING GROUP VICE CHAIR
B. Paul Bushueff
DOT Transportation System Center
Kendall Square DTS-66
Cambridge, MA 02142
(617) 494-2090

POWERHOUSE W/G CHAIR
David Hatfield
Merrimack County Telephone Co.
P.O. Box 337
Contoocook, NH 03229
(603) 746-9911

SMARTSTAR WORKING GROUP CHAIR
Charles B. Gross
Eagle Technology
P.O. Box 1196
Dumfries, VA 22026
(703) 690-2155

ACCENT-R USER GROUP LIAISON
Winston Tellis
Fairfield University
North Benson Road
Fairfield, CT 06430
(203) 254-4000

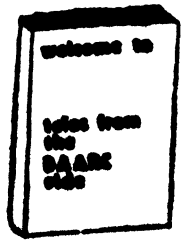
FOCUS WORKING GROUP CHAIR
Les Hulse
The Gillette Company
Prudential Tower Bldg.
Boston, MA 02199
(617) 421-7910

ORACLE WORKING GROUP CHAIR
Jay-Michael Baslow
Chemical Bank
277 Park Avenue
New York, NY 10172
(212) 310-5465

ORACLE WORKING GROUP VICE CHAIR
Shaul Ganel
Georgeson & Company Inc.
Wall Street Plaza
New York, NY 10005
(212) 440-9933

INGRES WORKING GROUP CHAIR
Larry W. Hicks
Turn Key Solutions, Inc.
1914 Fox Sterling Drive
Raleigh, NC 27606
(919) 460-9896

CORTEX WORKING GROUP CHAIR
Eric S. Dubiner
duPont IEA
Nemours Building Suite 9418
Wilmington, DE 19898
(302) 773-6780



DAARC SIG

CHAIRMAN
James Deck
Inland Steel Research Lab.
3001 East Columbus Drive
East Chicago, IL 46312
(219) 392-5613

SESSION NOTE EDITOR
Tracy K. Mixon
Science Applications Int'l. Corp.
P.O. Box 2501
800 Oak Ridge Tpke.
Oak Ridge, Tennessee 37831
H/(615) 966-3053
W/(615) 576-2262

COMMUNICATIONS REPRESENTATIVE
NEWSLETTER EDITOR
Dale Hutchison
Cummins Engine
500 Jackson Street
Columbus, Indiana 47201

SYMPOSIUM REPRESENTATIVE
Mike Gallant
Cummins Engine
4720 Baker Street Ext.
Lakewood, NY 14750

HARDWARE & INTERFACING
Peter Clout
Los Alamos National Lab
Los Alamos, NM

MATH STATISTICS & ANALYSIS
Herbert J. Gould
C.C.F.A. Univ. of Ill. Medical Ctr.
Chicago, IL

RS-1
George Winkler
CPC International
Argo, IL

CIM WORKING GROUP
Randall S. Gamby
McDonnell Aircraft Co.
M/S 0801480
P.O. Box 516
St. Louis, MO

DIGITAL COUNTERPART
Bill Forbes
Marlboro, MA

Drew Comstock
Maynard, MA

Laura Startzenbach
Marlboro, MA

DATA MANAGEMENT SYSTEMS SIG

CHAIRMAN
Tim Mueller
Silutions, Inc.
19m E. Central Ave., Suite 223
Paoli, PA 19301
(215) 640-4344

MEMBER AT LARGE
Past SIG Chairman
Doug Dickey
GTE Government Systems
1700 Research Blvd.
Rockville, MD 20805
(301) 294-8462

SESSION NOTES EDITOR
Alan Schultz
Southwestern Bell Yellow Pages
12800 Publications Dr., Suite 108
St. Louis, MO 63131
(314) 957-2029

SYMPOSIA COORDINATOR
SQL Standards Rep.
Keith Hare
JCC
P.O. Box 463
Granville, OH 43023
(614) 587-0157

COMMUNICATIONS REP.
Debbie Kennedy Coleman
Shane Co.
2 W Washington St., Suite 600
Indianapolis, IN 46204
(317) 635-9100

NEWSLETTER EDITOR
Jodi Austin
Sharpe Microelectronics Tech.
312 SE Stonemill Dr.
Vancouver, WA 98684
(206) 253-3789

MEMBERSHIP COORDINATOR
MEMBER AT LARGE
Rocky Hayden
Userware Intl.
2235 Meyer Avenue
Escondido, CA
(619) 745-6006

SEMINAR REP
Steve Gomez
Signal Technology, Inc.
1750 Montgomery St.
San Francisco, CA 94111
(415) 954-8532

CAMPGROUND COORDINATOR
OLTP WORKING GROUP COORDINATOR
Rosemary O'Mahony
Arthur Anderson & Co.
33 West Monroe St.
Chicago, IL 60603
(312) 507-6510

OLTP WORKING GROUP COORD.
Larry Goodhind
Sharp Microelectronics Tech.
312 SE Stonemill Dr.
Vancouver, WA 98684

SESSION CHAIR COORDINATOR
Andy Menezes
AD & E
29-B Montvale Avenue
Woburn, MA 01801
(617) 938-1979

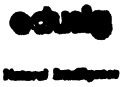
Rdb WORKING GROUP Coordinator
Howard Cheng
Bechtel Western Power Corp.
12440 East Imperial Highway
Norwalk, CA 90650
(203) 807-4077

STORE REPRESENTATIVE
FIMS STANDARDS REP.
Paul W. Plum, Jr
Lukens Steel Company
Coatesville, PA 19320
(215) 383-2024

SOFTWARE AG WORKING GROUP COORDINATOR
Ron Kaminski
Inland Steel Company
3120 Watling Street, MS 5-000
East Chicago, IN 46312
(219) 853-7668

DIGITAL COUNTERPART
Dan Frantz
Charles Kelley
Nashua, NH

Reed Powell
Marlboro, MA



EDUSIG

CHAIRMAN
Robert A.Shive, Jr.
Associate Dean of the College
Millsaps College
Jackson, MS 39210-0001
(601) 354-5201

VICE CHAIR AND UNIV. COORD.
Ardoth A. Hassler
Assistant Director
for Academic Services
Computer Center
Catholic University of America
Washington, DC 20064
(202) 635-5373
HASSLER@CUA.BITNET

SYMPOSIUM COORDINATOR
Mary Jac Reed
VAX Project Manager
Office of Instructional Tech.
University of Delaware
Newark, DE 19716
(302) 451-8161

COMMUNICATIONS COORDINATOR
Paula Barnes
Computer Center Operations Manager
North Carolina School of Science & Math.
1219 Broad Street
P.O. Box 2418
Durham NC 27705
(919) 286-3366
plb@ecsvax.bitnet

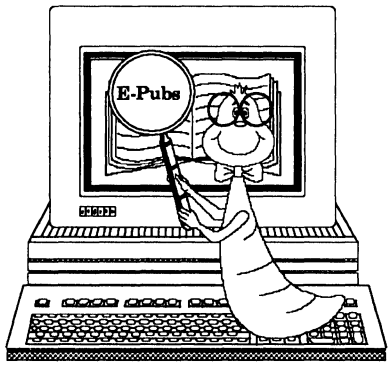
SEMINARS COORDINATOR
Donald C. Fuhr
Director of Computer Services
Tuskegee University
Tuskegee, AL 36088
(205) 727-8242

NEWSLETTER EDITOR
Jim Gerland
Suny at Buffalo
University Computing Services
Computer Center
Buffalo, New York 14260
(716) 636-3557

SESSION NOTES EDITOR
Claude Watson
Lansing Community College
P.O. Box 40010, Code 13
419 North Washington Sq.
Lansing, MI 48901-7210
(517) 374-1750

ADMINISTRATIVE APPLICATIONS COORD.
David Cothrun
President
Taft College
29 Emmons Park Drive
P.O. Box 1437
Taft, CA 93268
(805) 763-4282

DIGITAL COUNTERPART
C. Michael Greene, Jr.
Networking Consultant
Education Industry Marketing Group
Digital Equipment Corporation
Three Results Way, MR03-2/E7, Box 1003
Marlboro, MA 01752-9103
(508) 467-2149
GREENE%SANTEE.DEC@DECWRL
GREENE%SANTEE.DEC@DECWRL.DEC.COM
GREENE@SANTEE.DEC.COM



Electronic Publishing UIG

CHAIR (*)
Kevin J. Kindschuh
Northlake Software
812 SW Washington, Suite 1100
Portland, OR 97205
(503) 228-3383
(503) 228-5662 (FAX)

VICE CHAIR (*), WORKING GROUP COORDINATOR
William H. (Bill) Koppelman
Moody's Investors Service
99 Church St.
New York, NY 10007
(212) 553-0474
(212) 553-4737 (FAX)

SIG COUNCIL UIG COORDINATOR
Katherine (Kitt) Trimm
Pivotal, Inc.
6892 Dorado Ct.
Tucson, AZ 85715
(602) 886-5563

SYMPOSIA COMMITTEE REP. (*)
John L. Holland
J C Penney Co.
613 Rawhide Court
Plano, TX 75023
(214) 591-3393

ASST. SYMPOSIA REP.
Mary Margaret McCormick
McDonnell Douglas
P.O. Box 516 MS:1064664
St. Louis, MO 63166-0516
(314) 595-7070

COMM COMM REP (*), SESSION NOTES EDITOR
Kimberly White
Interleaf, Inc.
1646 N. California Blvd. #440
Walnut Creek, CA. 94596
(415) 946-9500
(415) 947-1375 (FAX)

NEWSLETTER EDITOR, UPDATE.DAILY REPORTER
Richard R Wolff
Bonneville Power Administration
Routing SWHP
PO Box 3621
Portland, OR 97208
(503) 230-5069
(503) 230-5316 (FAX)

SIR/WISHLIST COORDINATOR
Patty English
Signal Technology
5951 Encina Road
Goleta, CA 93117
(805) 683-3771
(805) 967-0871 (FAX)

TAPE LIBRARIAN
David Warren
Boeing Aerospace
PO Box 3999
MS: 6J-39
Seattle, WA 98119
(206) 237-8515

VOLUNTEER COORDINATOR
Ann P Jackson
Interleaf, Inc.
10 Canal Park
Cambridge, MA 02141
(617) 577-9813 x 4486

SEMINARS COORDINATOR
(Open)

STORE REP
(Open)

INTERLEAF WG CO-CHAIRS
Janet E Bressan
Boeing Computer Services
PO Box 3999 6J-39
Seattle, WA 98124
(206) 237-8418

Lisa M. Pratt
Boeing Aerospace
PO Box 3999,MS 6J-39
Seattle, WA 98124-2499
(206) 237-8603

TEX/LaTEX/WEB WG CHAIR
Donald E. Ambyh
Delco Electronics Corp.
PO Box 471, MS 1A21
Milwaukie, WI 53201
(414) 768-2682

DECwrite WG CHAIR
(Open)

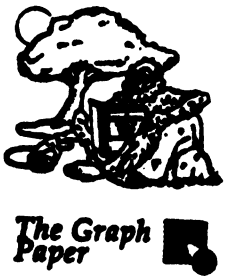
MEMBER-AT-LARGE
John W. Shepherd
Eli Lilly Research Labs
Lilly Corporate Center
MC625 Bldg. 98C/2321
Indianapolis, IN 46285
(317) 276-7947

DEC COUNTERPARTS (*)
Cathy St Martin
Digital Equipment Corporation
10 Tara Blvd
Nashua, NH 03052

Don Hedman
Digital Equipment Corporation
110 Spit Brook Road ZKO3-4/T61
Nashua, NH 03063

DEC CONTACTS
Marian Weisenfeld
Digital Equipment Corporation
110 Spit Brook Road ZKO3-4/T61
Nashua, NH 03063

Rick Landau
Digital Equipment Corporation
4 Technology Park Drive DSG1-2/C7
Westford, MA 01886



GRAPHICS APPLICATIONS SIG

CHAIRPERSON
Bijoy Misra
Harvard Smithsonian Center for Astrophysics
60 Garden Street, MS39
Cambridge, MA 02138
(617) 495-7393
bijoy@cfa3.bitnet

SYMPOSIUM COORDINATOR
DECWINDOWS WORKING GROUP CHAIR
Laura Vangas
Fermi National Laboratory
MS: 306
P.O. Box 500
Batavia, IL 60510
(708) 840-3049

STORE REPRESENTATIVE
Geriann T. Goeransson
Fermi National Accelerator Lab.
P.O. Box 500
Batavia, IL 60510
(708) 840-3986

SESSION NOTES EDITOR
Robert Krieg
Uphjohn Company
MS: 7266-267-1
301 Henrietta Street
Kalamazoo, MI 49001
(616) 385-7563

COMMUNICATIONS REPRESENTATIVE
NEWSLETTER EDITOR
HARDCOPY WORKING GROUP CHAIR
Robert Hays
P.O. Box 1567
700 KMS Place
Ann Arbor, MI 48106
(313) 769-8500 x458

STANDARDS REPRESENTATIVE
ANIMATION/VISUALIZATION WORKING GROUP
Steve Hankin
NOAA/PMEL/ Bldg No. 3
7600 Sand Point Way NE
Seattle, WA 98115
(206) 526-6080

INFORMATION OFFICER
Bill Kramer
NASA Ames Research Center
NAS Systems Division MS 258-6
Moffett Field, CA 94035
(415) 694-4418

SEMINARS REPRESENTATIVE
ENGINEERING WORKING GROUP CHAIR
Daniel Land
John Fluke Mfg. Co., Inc.
Mail Stop 221B
P.O. Box C9090
Everett, WA 98206

CAMPGROUND COORDINATOR
IMAGING WORKING GROUP CHAIR
Howell Dell
Network Business Solutions
2838 Old Welsh Road
Willow Grove, PA 19090
(215) 657-1884

WORKSTATION WORKING GROUP CHAIR
Bob Walraven
Multiware, Inc.
2121 Second Street
Building B, Suite 107
Davis, CA 95616
(916) 756-3291

LIBRARY REPRESENTATIVE
GKS/PHIGS/STANDARDS WORKING GROUI
Warren S. Yogi
NOAA NOS Ocean Applications Group
NPS FNOC Bldg. 4
Airport Road
Monterry, CA 93943
(408) 646-1649

MEMBERS-AT-LARGE
Bob Goldstein
Eye Research Institute
20 Staniford Street
Boston, MA 02114
(617) 742-3140
GOLDSTEIN%CDV.DECNET@MGHCCC.HARVARD.EDU

Pam Vavra
Lysander Solutions
P.O. Box 3368
Manhattan Beach, CA 90266

Paul Waterstraat
multiware, Inc.
2121 Second Street, Bldg. B, Suite 107
Davis, CA 95616
(916) 756-3291

Jim Sims
6712 Bonnie Ridge Drive
Apt. T-1
Baltimore, MD 21209
(301) 484-7566
sims@aplcen.apl.jhu.edu[128.220.101.4]

DIGITAL COUNTERPARTS
Jim Flatten
Spit Brook, NH

Rick Landau
Marlboro, MA

Irene McCartney
Hudson, NH

HARDWARE MICRO SIG

CHAIRMAN
Willian K. Walker
Monsanto Research Corp.
Miamisburg, OH

PRODUCT PLANNING COORDINATOR
George Hamma
Synergistic Technology
Cupertino, CA

PRE-SYMPOSIUM SEMINAR COORDINATOR
James R. Lindesmith
Monsanto Research Corp.
Miamisburg, OH

COMMUNICATIONS COORDINATOR
John G. Hayes
Information Systems
South Central Bell
Birmingham, AL

NEWSLETTER EDITOR
Neil Krandall
University of Cincinnati
Pharmacology & Cell Biophysics
Cincinnati, OH

DAARC SIG LIAISON
Bill Tippie
Kinetic Systems Corp.
Lockport, IL

STANDARDS COORDINATOR
CAMAC WORKING GROUP COORDINATOR
Peter Clout
Los Alamos National Lab
los Alamos, NM

LUG COORDINATOR
Gregg Giesler
Los Alamos Science Lab
Los Alamos, NM

TOEM (CHIPS & BOARDS)
Jack J. Peterson
Horizon Data Systems
Richmond, VA

HHK (HARDWARE HINTS & KINKS)
Wayne Kesling
Monsanto Research Cor.
Miamisburg. OH

UNIBUS HARDWARE
Ron Bogue
LIV Aerospace & Defense Co.
Dallas, TX

PERFORMANCE MEASUREMENT COORD.
William Wallace
600 W. Washington Street
Peoria, IL

CSS COORDINATOR
Pratap Gohel
E.I. duPont
Ingleside, TX

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
Emily Kitchen
A.H. Robins Co.
Richmond, VA

RT-11 SIG LIAISON
Gary Sallee
Sallee Software Consulting
yorba Linda, CA

RSX SIG LIAISON
Hans Jung
Associated Press
New York, NY

MEMBERS-AT-LARGE
Mike Rembis
American Dade
Costa Mesa, CA

Hans Dahlke
Richland, WA

Jim Cutler
EDS Tower
16533 Evergreen
Southfield, MI

DIGITAL COUNTERPARTS TERMINALS
Gail Jamison-Barnes
William Andrus
Marilyn Fedel
Frank Orlando
Maynard, MA

Art Bigler
Marlboro, MA

TOEM (Chips & Boards)
Art Bigler
Marlboro, MA

DIAGNOSTIC
George D. Cooke
Maynard, MA

STORAGE
Marilyn Fedele
Maynard, MA

MSD (Micro Systems Develp.)
Roy Rodgers
Maynard, MA

PRINTER PRODUCTS
Frank Orlando
Maynard, MA

DECUS EUROPE LIAISON
Hans Zoller

LANGUAGES AND TOOLS SIG

CHAIR, Tex/LaTeX/WEB W/G
FOLDER EDITOR
Donald E. Ambyh
Delco Electronics Corp.
P.O. Box 471, MS1A21
Milwaukee, WI 53201
(414)768-2682

VOLUNTEERS COORDINATOR
Shirley Bockstahler-Brandt
Applied Physics Laboratory
Johns Hopkins Road
Laurel, MD 20707
(301)953-6585

SEMINAR COMMITTEE REP.
Barry C. Breen
Sundstrand Data Control, Inc.
15001 N.E. 36th Street
P.O. Box 97001
Redmond, Washington 98073-9701
(206)885-8436

AUSTRALIAN L&T INTERFACE
Gordon Brimble
Bldg 180 Labs Area
Defence Research Centre
Box 2151 GPO
Adelaide, S.A. Australia 5001
(61)(8)259-6119

VICE CHAIR, UNITS
SYMPOSIUM COORDINATOR
Earl Cory
Contel
31717 La Tienda Drive
Westlake Village, CA 91359
(818) 706-5385

MEMBER ANSI PL/I X3J1 STDS. COMM.
Arthur Coston
Applied Information Systems, Inc.
500 Eastowne Dr.
Chapel Hill, NC 27514
(800)334-5510

DIBOL WORKING GROUP
Mark Derrick
WAAY Television
P.O. Box 2555
Huntsville, AL 35804
(205)535-3131

NEWSLETTER EDITOR
ALT. COMMUNICATIONS COMM. REP.
Alan Folsom, Jr.
Fischer & Porter Co.
E. County Line Rd.
Warminster, PA 18974
(215)674-7154

MEMBER ANSI COBOL X3J4 STDS. COMM.
Bruce Gaarder
Donahue Enterprises, Inc.
2441 26th Avenue. S.
Minneapolis, MN 55406
(612)721-2418

INTERSIG COORDINATOR
Dorothy Geiger
Wollongong Logistics Group
49 Showers Drive #451
Mountain View, CA 94040
(415)962-7160
(415)948-1003

EUROPEAN METHODS, L&T INTERFACE
Bernd Gliss
Max-Planck-Institute
Heisenbergstrasse 1
7000 Stuttgart 80, W. Germany
(711)686-0251

CHAIR, SECURITY WORKING GROUP
Rich Harris
General Research Corp.
5383 Hollister Avenue
P.O. Box 6770
Santa Barbara, CA 93160-6770
(805)964-7724

OBJECT-ORIENTED LANGUAGES WORKING GROUP
Robert Harwood
The Torrington Company
59 Field Street
Torrington, CT 06790
(203)482-9511 x2406

STORE REPRESENTATIVE
CHAIR, TECH. PROD. OF DOC. W/G
Howard Holcombe
RCA
Front & Cooper St.
Camden, NJ 08055
(609)338-4946

PAST SIG CHAIR
PRODUCTIVITY TOOLS COORDINATOR
Kathy Hornbach
Digital Equipment Corporation
ZK03-3/Y25
110 Spit Brook Road
Nashua, NH 03062

CHAIR, TECO WORKING GROUP
Mark J. Hyde
Advanced Computing Services
209 Ardsley Drive
DeWitt, NY 13214
(315)446-7223

CASE & TOOLS INTEGRATION W/G
John Ivler
System Development Engineering
De La Rue Printrak Inc.
1250 North Tustin Avenue
Anaheim, CA 92807
(714)666-2700

ACTING SYMPOSIUM COORDINATOR
MEMBER, ANSI BASIC X2J2 STDS. COMM.
PDP-11 REPRESENTATIVE
CHAIR, PDP-11 LAYERED PRODUCTS W/G
Stephen C. Jackson
SCJ Consulting, Inc.
Suite 105
7260 University Avenue N.E.
Minneapolis, MN 55432
(612)571-8430

SESSION NOTES EDITOR
Mark Katz
GTE Gov't Systems
100 First Avenue
Waltham, MA 02154
(617)466-3437

CHAIR, ADA WORKING GROUP
Lisa Kerby-Rodgers
ESL
495 Java Drive
Sunnyvale, CA 94088
Mailstop: 505
(408)738-2888

SIG SECRETARY
CHAIR, CONFIG. MGMT. WORKING GROUP
Mark Alan Kidwell
Texas Instruments Incorporated
P.O. Box 801 M/S 8006
McKinney, TX 75069
(214)952-2058

MEMB. ANSI FORTRAN X3J8 STDS, COMM.
Dr. Joseph King
Biotechnology Center
University of Wisconsin
1710 University Avenue
Madison, WI 53705
(608)263-8970

DEVEL. COUNTERPART, TECH. LANG.
Leslie J. Klein
Digital Equipment Corporation
ZK02-3/N30
110 Spit Brook Road
Nashua, NH 03062

CHAIR, FORTRAN WORKING GROUP
Scott Krusemark
Systemation, Inc.
8473 Daisywood Ave. NW
North Canton, OH 44720
(216)499-6251

DIGITAL COUNTERPART
Joe Mulvey
Linda Ziman
Nashua, NH 03062

MEMB. ANSI FORTRAN X3J8 STDS. COMM.
Rochelle Lauer
Physics Department
Yale University
P.O. Box 6666
New Haven, CT 06511-8167
(203)432-3366

SESSION QUALITY COORDINATOR
Gary C. Lelvis
IMSL
2500 Park West Tower One
2500 City West Boulevard
Houston, TX 77042-3020
(713)782-6060

CHAIR, LOW LEVEL LANGUAGES W/G
Gerald Lester
Computerized Processes Unlimited
4200 South I-10 Service Rd., Suite #205
Metairie, LA 70001
(504)889-2784

CHAIR, PROJECT MANAGEMENT W/G
Lynn C. Lewis
Lawrence Livermore National Laboratory
University of California
P.O. Box 808
Livermore, CA 94550
(415)422-8949

ASST. CAMPGROUND COORD.
CROSS DEV. & IMBEDDED SYS. W/G
Theresa (Teri) J. McNamara
Data Card Corp.
11111 Bren Road West
Minneapolis, MN 55343
(612)931-1792

ALT. ANSI X3J4 COBOL STDS. COMM.
Dale Marriott
El Paso County Office Bldg.
27 E. Vermijo Street
Colorado Springs, CO 80903
(719)520-6435

ASST. SESSIONS QUALITY COORD.
Raymond E. Marshall
Northern Telecom, Inc.
Network Support Systems Div.
54 Regional Drive
P.O. Box 649
Concord, NH 03301-0649
(603)224-6511

CHAIR, C WORKING GROUP
James Maves
Contel
Box 5009
31717 La Tienda Dr.
Westlake Village, CA 91359
(818)706-5395

ASSOC. W/G COORD. UNSCHEDULED TOPICS
CHAIR, COBOL WORKING GROUP
ALT. SEMINAR COMM. REP.
Bruce Mebust
Burlington Northern Railroad
176 East Fifth Street
P.O. Box 64962
St. Paul, MN 55164
(612)298-2382

STEERING COMM. MEMBER-AT-LARGE
Terry Medlin
Survey Sampling, Inc.
1 Post Road
Fairfield, CT 06432
(203)255-4200

BOF CHAIRS COORDINATOR
SESSION CHAIRS COORDINATOR
Antonino N. Mione
Rutgers University
Center for Computer & Information Services
Hill Center
P.O. Box 879
Piscataway, NJ 08855-0879
(201)932-4784

DEVEL. COUNTERPART, PDP-11 SOFTWARE
Joe Mulvey
Digital Equipment Corporation
ZK01-3/J10
110 Spit Brook Road
Nashua, NH 03062-2642
(603)881-1218

CHAIR, PUBLIC DOMAIN SFTWR. W/G
Edward (Ted) Nieland
System Research Laboratories, Inc.
2800 Indian Ripple Road
Dayton, OH 45440-3696
(513)255-5156
tnieland@wbafb-aamrl.arpa

SIG CHAIR
Joseph Pollizzi, III
Space Telescope Science Institute
3700 San Martin Drive
Homewood Campus
Baltimore, MD 21218
(301)338-4901
pollizzi@stsci.edu

CHAIR, VAXset W/G
ASST. WORKING GROUP COORD.
David J. Powell
The Upjohn Company
7294-25-7
301 Henrietta Street
Kalamazoo, MI 49007
(616)385-7214

VICE CHAIR, TECHNICAL
WORKING GROUPS COORD.
CHAIR, SCAN WORKING GROUP
David K. Ream
Lexi-Comp., Inc.
26173 Tallwood Dr.
N. Olmsted, OH 44070
(216)777-0095
(216)468-0744

LISP/AI COORDINATOR
Don Rosenthal
Space Telescope Science Institute
Homewood Campus
Baltimore, MD 21218
(301)338-4844

SIG TAPE LIBRARIAN
LIBRARY COMMITTEE REP.
Tony Scandora
Argonne National Laboratory
CMT 205
Argonne, IL 60439
(312)972-7541

MEMB. ANSI DIBOL X3J12 STDS. COMM.
Kenneth Schilling
2314 Mira Vista Avenue
Montrose, CA 91020
(818)249-0795

CLINIC DIRECTOR
MASTERS COORDINATOR
SESSION EVALUATION CARDS TABULATOR
George Scott
Computer Sciences Corporation
304 West Route #38, P.O. Box N
Moorestown, NJ 08057
(609)234-1100

STANDARDS COORDINATOR
CHAIR, PASCAL WORKING GROUP
CHAIR, MODULA-2 WORKING GROUP
MEMB. ANSI PASCAL X3J9 STDSD COMM.
E. Wayne Sewell
E-Systems, Garland Division
Box 660023, MS 53700
Dallas, TX 75266-0023
(214)272-0515 x3553

UPDATE.DAILY REPORTER
PUBLIC RELATIONS COORD.
Terry Shannon
Computer Information Systems
165 Bay State Drive
Braintree, MA 02184
(617)848-7515

CHAIR, APL WORKING GROUP
Chet Small
MIT Lincoln Laboratory
244 Wood Street
Lexington, MA 02173
(617)981-4172
(617)863-5500 x4172

CHAIR, PL/I WORKING GROUP
Jack Straub
13102 Borgman
Huntington Woods, MI 48070
(313)358-6338
(313)541-1941

VICE CHAIR, LOGISTICS
CAMPGROUND COORDINATOR
MEMB. ANSI C X3J11 STDS. COMM.
Michael S. Terrazas
LDS Church
50 E. North Temple, 27th Floor
Salt Lake City, UT 84150
(801)240-3246

DEVEL. COUNTERPART, COMMERC. LANG.
Jim Totton
Digital Equipment Corporation
ZK02-3/K06
110 Spit Brook Road
Nashua, NH 03062

CHAIR, BASIC WORKING GROUP
WISHLIST COORDINATOR
Bob Van Keuren
4087 Chamoune Avenue
San Diego, CA 92105
(619)283-5285

SUITE & RECEPTION COORD.
Matt Variot
Contel
Box 5009
31717 La Tienda Drive
Westlake Village, CA 91359
(818)706-5388

PAST SIG CHAIR
Sam Whidden
American Mathematical Society
201 Charles St.
P.O. Box 6248
Providence, RI 02940
(401)272-9500

STEERING COMM. MEMBER-AT-LARGE
Jay Wiley
Bechtel Power Corp.
12400 East Imperial Highway
Norwalk, CA 90650
(213)807-4016

ASST. NEWSLETTER EDITOR
Jim Wilson
Pfizer Inc.
QC Division
P.O. Box 88
Terre Haute, IN 47808
(812)299-2121 x271

CHAIR, TPU/EVE/LSE W/G
John Wilson
Knight Programming Support
724 Oak Brook Blvd.
Battle Creek, MI 49015
(616)961-3515

ALT. ANSI X3J9 PASCAL STDS. COMM
Phil Wirth
E-Systems, Garland Division
Box 660023, MS 53730
Dallas, TX 75266-0023
(214)272-0515 x4319

SOFTWARE METRICS WORKING GROUP
Allan F. Witt
Monsanto Company
Mail Zone 02J
800 N. Lindbergh Blvd.
St. Louis, MO 63167
(314)694-3997

COMMUNICATIONS COMMITTEE REP.
Kerry Wyckoff
1117 E. 1000 Street
Spanish Fork, UT 84660
(801)240-5948

MUMPS SIG

CHAIRMAN
Thomas W. McIntyre
PRx, Inc.
43 Bradford Street
Concord, MA 01742
(508) 369-3566

NEWSLETTER EDITOR
VICE-CHAIR
COMMCOMM REP.
Mark J. Hyde
Advanced Computing Services
209 Ardsley Drive
DeWitt, NY 13214
BITNET: MJHYDE@SUNRISE
INTERNET: MJHYDE@SUNRISE.ACS.SYR.EDU
(315) 446-7223

SYMPOSIUM SCHEDULER
Brad Hanson
Group Health, Inc.
2829 University Ave., S.E.
Minneapolis, MN 55414
(612) 623-8427

LIBRARY REPRESENTATIVE
PDP-11 WORKING GROUP REP.
Michael McIntyre
PRx, Inc.
43 Bradford Street
Concord, MA 01742
(508) 369-3566

SEMINARS REPRESENTATIVE
Edward Woodward
Science Applications Intl. Corp.
10260 Campus Point Drive MS42
San Diego, CA 92121
(619) 535-7210

CAMPGROUND COORDINATOR
ASSIST. SYMPOSIUM SCHEDULER
Mitchell Bell
Citibank
200 Rector Place #9P
New York, NY 10280-1101
(212) 559-3321

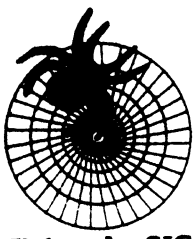
SESSION NOTES EDITOR
Paul A. Price
SciCor, Inc.
2643 Rand Road
Indianapolis, IN 46241
(317)244-8811

ASSISTANT NEWSLETTER EDITOR
Chris Richardson
Richardson Computer Research
P.O. Box 8744
La Jolla, CA 92038
(619) 488-6193

PAST CHAIR
MUMPS DEV. COMMITTEE REP.
Mark Berryman
Science Applications Int'l. Corp.
10260 Campus Point Drive MS 45
San Diego, CA 92121
(619) 535-7603
Internet: BERRYMAN@FWVC.SAIC.COM

DIGITAL COUNTERPART
Russ White
Marlboro, MA 01752
(617) 467-2397

ALTERNATE DEC COUNTERPART
Denise Simon
Digital Equipment Corp.
129 Parker Street (PK02-1/M23)
Maynard, MA 01754
(617) 493-9077



NETWORKS SIG

CHAIRMAN
Stuart Lewis
Douglas Furn. of California, Inc.
5020 W. 73rd St., Box 97
South Suburban, IL 60499-0097
(312) 458-1505

SYMPOSIUM COMMITTEE REP
L. Stuart Vance
University of Texas System
Office to Telecomm. Services
Balcones Research Center
10100 Burnet Road
Austin, TX 78758-4497
(512) 471-2416

SYMPOSIA REP
John Ceisel
100 S. Wacker #634
Chicago, IL 60606
(312) 507-6410

LIBRARY COMMITTEE REP
Mike West
Network Manager
USAF Avionics Laboratory
WRDC/AATC
WPAFB, OH 45433-6543
(513) 255-1953

SEMINARS COMMITTEE REP
Jeffrey Snover
47 Walden Pond Dr.
Nashua, NH 03060
(508) 256-6600

STANDARDS REP
Jim Ebright
Software Results Corp.
2887 Silver Drive
Columbus, OH 43211
(614) 267-2203

COMMCOMM REP
Allen Jay Bennett
Steelcase Inc.
(616) 247-2152

NEWSLETTER EDITOR
Judi Mandl
University of Conn. Health Center
263 Farmington Ave.
Farmington, CT 06032
(203) 679-3912

ASSISTANT NEWSLETTER EDITOR
Rick Carter
Systems Programmer/Analyst
Milcare
8500 Byron Road, Loc. 0320
Zeeland, MI 49464
(616) 772-8350

SESSION NOTES EDITOR
Mary Marvel-Nelson
General Motors Research Lab.
Warren, MI 48090
(313) 986-1382

WISH LIST COORDINATOR
Lt.Stuart L. Labovitz
USAF WDRC/ELMT
Bldg 620 Area B
WPAAFB, OH 45433-6523
(513) 255-7680
(513) 255-2062 Sec.
DCS: LABOVITZ
INTERNET: LABOVITZ%ETD1.DNET@WPAFB-ABLAB.ARPA

PAST CHAIRMAN
Bill Brindley
HDQ Naval Security Group Cmd.
(202) 282-0527

TECHNOLOGY COORDINATOR
Bill Hancock
ERI Training
P.O. Box 13557
Arlington, TX 76017
(817) 467-7031
(212) 334-1240
DCS: TOPAZ::HANCOCK
DECUServe: EISNER::HANCOCK
CompuServe: 76324,1303
Internet: HANCOCK@AMB2.LARC.NASA.GOV

MEMBER-AT-LARGE
Sandy Traylor
Target Systems
21063 Carlos Rd.
Yorba Linda, CA 92686

DIGITAL COUNTERPART
Monica Bradlee
Digital Equipment Corporation
550 King St. LKG2-1/U2
Littleton, MA 01460-1289
(508) 486-7341

STORE REPRESENTATIVE
Lesley C. Gray
United Airlines Flight Center
Stapleton International Airport
Denver, CO 80207
(303) 398-4035

NETWORKS SEMINARS REPRESENTATIVE
Michael C. Hutton
Eastman Kodak
901 Elmgrove Road
D-645 2-9A-EP
Rochester, NY 14653-5819
(716) 726-1941

Office Automation

OFFICE AUTOMATION SIG

(*) CHAIR
Joseph W. Whatley
Information Service & Technology
Nielsen Plaza
Northbrook, IL 60062-6288
(312) 480-6104

(*) VICE CHAIR
Ralph Bradshaw
Johnson and Johnson
Route 202
Raritan, NJ 08869-1489
(201) 685-3434

SIR PROGRAM ADMINISTRATOR
Edward L. Bowen
Bell South Services
1876 Data Drive, Room B204
Birmingham, AL 35244
(205) 998-6800

LIBRARY REPRESENTATIVE
Bob Hassinger
Liberty Mutual Research Ctr.
71 Frankland Road
Hopkinton, MA 01748
(508) 435-9061

(*)COMMUNICATIONS COMMITTEE REP.
Therese LeBlanc
LeBlanc & Associates, Ltd.
522 S. Northwest Highway
Suite # L3
Barrington, IL 60010
(312) 304-6800

NEWSLETTER EDITOR
Roger Bruner
Foreign Mission Board
3806 Monument Avenue
Richmond, VA 23230
(804) 353-0151

SUITE COORDINATOR
TAPE COORDINATOR
Tom Byrne
L. Karp & Sons, Inc.
1301 Estes Avenue
Elk Grove Village, IL 60007
(312) 593-5700

(*)SYMPOSIUM COORDINATOR
Lynda L.Peach
Mustang Fuel Corp.
2000 Classen Center, 800 East
Oklahoma City, OK 73106
(405) 557-9513

ROADMAP/PUBLICATIONS COORDINATOR
Scott McClure
3M/Industrial Tape Division
220-8E-01 3M Center
St. Paul, MN 55144-1000
(612) 736-4297

SESSION CHAIR COORDINATOR (East Coast)
Kae Sobczyk
Cooper Tire & Rubber Co.
P.O. Box 550
Findlay, OH 458040
(419) 424-4283

SESSION CHAIR COORDINATOR (West Coast)
Terry Griggs
OAS
661 W. Germantown Pike
Plymouth Meeting, PA 19462
(215) 834-1010

ASSISTANT SYMPOSIUM COORDINATOR
George Bone
Mare Island Naval Shipyard
Vallejo, CA 94590
(707) 646-2531 (Work)

CAMPGROUND COORDINATOR
Tony Ioele
OAS
661 W. Germantown Pike
Plymouth Meeting, PA 19462
(215) 834-1010

STORE COORDINATOR
Scott McClure
3M/Industrial Tape Div.
220-8E-01 3M Center
St. Paul, MN 55144-1000
(612) 736-4297

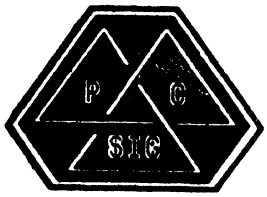
SESSION NOTES EDITOR
George Bone
Mare Island Naval Shipyard
Vallejo, CA 94590
(707) 646-2531 (Work)

(*) SPECIAL PROJECTS COORDINATOR
Katherine Trimm
PIVOTAL, Inc.
6892 Dorado Ct.
Tucson, AZ 85715
(602) 886-5563

PSS COORDINATOR
Terry Griggs
OAS
661 W. Germantown Pike
Plymouth Meeting, PA 19462
(215) 834-1010

SECURITY WORKING GROUP CHAIR
Ray Kaplan
P.O. Box 32647
Tucson, AZ 85751
(602) 323-4606

DIGITAL COUNTERPARTS
Judy Jurgens
Bob Malay
Digital Equipment Corporation
Nashua, NH



PERSONAL COMPUTER SIG

CHAIR
Jim Hobbs
Adolf Stop BC380
Golden, CO 80401-1295
(303) 277-2855

SYMPOSIA COORDINATOR
Jimbo Wilson
Nat'l Tech. Inst. for Deaf
Rochester Inst. of Tech.
P.O. Box 9887
Rochester, NY 14623
(716) 475-6241

ASSISTANT SYMPOSIA COORDINATOR
Conrad Bell IV
Fairchild Space Company
6404 Ivy Lane, Suite 600
Greenbelt, MD 20770
(301) 220-5631

CAMPGROUND COORDINATOR TBD
Jim Hobbs
Coors Brewing Co.
Mail Stop BC380
Golden, CO 80401-1295
(303) 277-2855

WORK SYSTEMS WORKING GROUP CHAIR
Thomas R. Hintz
University of Florida
IFAS Computer Network
Bldg. 120
Gainesville, FL 32611
(904) 392-5180

MACINTOSH WORKING GROUP CHAIR
Kent A. Behrends
Consultant
17309 Mapes
Cerritos, CA 90701
(213) 860-4750

LIBRARIAN/RAINBOW WORKING GROUP CHAIR
Brian Zubak
437 Old Peachtree Road
Suanee, GA
(404) 995-9800 ext. 1403

PCSA WORKING GROUP CHAIR
Fran Garrett
San Diego Union-Tribune Pub. Co.
350 Camino de la Reina
San Diego, CA 92108
(619) 293-1676

COMM COMM REP/SESSION NOTES EDITOR
Dr. Thomas Warren
Oklahoma State University
Department of English
Dir. Tech. Writing Program
Stillwater, OK 74078
(405) 744-6218

NEWSLETTER EDITOR
Gary Rice
McDonnell Douglas
5555 Garden Grove Blvd.
MS: K200 77/200
Westminster, CA 92683
(714) 952-6582

SEMINARS COORDINATOR
Tim Bundrick
2081 CS/SDB
Goodfellow AFB, TX 76908-5000
(915) 654-5336/5337

ART COORDINATOR
Ken Stricker
Martin Marietta Aerospace
P.O. Box 5837 MP-1270
Orlando, FL 32855
(407) 356-1794/7725

STORE REP
TBD

VOLUNTEER COORDINATOR
Scott Warren
920 W. Cantwell
Stillwater, OK 74075
(405) 624-0070

MEMBERS-AT-LARGE
Mark Sebern
Sebern Engineering Inc.
P.O. Box 268
Cedarburg, WI 53012
(414) 375-2200

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

DEC COUNTERPARTS
Beth Joseph
Digital Equipment Corporation
30 Porter Road LJ02-B10
Littleton, MA 01460
(508) 486-2391

Charles Giorgetti
Digital Equipment Corporation
146 Main Street ML01-2/C30
Maynard, MA 01754
(508) 493-3156

RSTS SIG

CHAIRMAN
Charles Mustain
Stark County School system
Data Services Division
7800 Columbus Rd. N.E.
Louisville, OH 44641
(216) 875-1431

COMMUNICATIONS REPRESENTATIVE
STORE REPRESENTATIVE
Ed Beadel
Instructional Computer Center
S.U.N.Y. College at Oswego
Oswego, N.Y. 13126
(315) 341-3055

SYMPOSIA COORDINATOR
Glenn Dollar
Digital Computer Consultants Inc.
21363 Lassen St., Suite 205
Chatsworth, CA 91311
(818) 341-9171

ASS'T SYMPOSIA COORDINATOR
Dan Stoller
Natural Country Farms
P.O. Box 758
58 West Road
Rockville, CT 06066
(203) 872-8346

NEWSLETTER EDITOR
Jodi Austin
Sharp Microelectronics Tech. Inc.
312 S.E. Stonemill Drive
Vancouver, WA 98684
(206) 253-3789

LIBRARY REPRESENTATIVE
R.R. Patel (PAT)
Medstone Int'l Inc.
(714) 646-8211

SEMINAR UNIT REP.
Scott Castleberry
1750 North Collins
Suite 108
Richardson, TX 75080
(214) 437-3477

VICE CHAIRMAN
WISH LISTS COORDINATOR
Lynnell Koehler
Campus America
POISE Prod. Ctr.
201 North Nevada Avenue
Roswell, NM 88201
(505)625-5500

RSTS PRODUCT PLANNING COORDINATOR
Errol E. Ethier
Information Design and Management, Inc.
23 Hunting Avenue
Shrewsbury, MA 01545
(508) 842-4220

DIGITAL COUNTERPART
Jeanne Davis
Digital Equipment Corporation
Merrimack, NH 03054

MEMBERS-AT-LARGE
Mark Hartman
2404 E. Nutwood E23
Fullerton, CA 92631
(714) 738-8300

Jeff J. Killeen
Information Design & Management, Inc.
31 Hopedale Street
Hopedale, MA 01747

Bruce L. Gaarder
Donahue Enterprises, Inc.
2441 26th Avenue South
Minneapolis, MN 55406
(612) 721-2418 x105

TAPE COPY COORDINATOR
W. Franklin Mitchell, Jr.
Erskine College
1 Washington Street
Due West, SC 29639
(803) 379-2131

RSX/IAS SIG

CHAIRMAN
Jim Bostwick
Cargill Research
Minneapolis, MN

CHAIRMAN EMERITUS
Dan Eisner

SYMPOSIA COORDINATOR
Rick Sharpe
Toledo Edison
Toledo OH

PRE-SYMPOSIUM SEMINAR COORDINATOR
Jim McGlinchey
Warrenton, PA

MULTI-TASKER EDITOR
James McGlinchey
Software Engineering Consultant
427-3 Amherst St. Suite 303
Nashua, NH 03063
(603) 884-7378

COMMCOMM REPRESENTATIVE
DeVIAS LETTER EDITOR
Frank R. Borger
Michael Reese Medical Center
Chicago, IL

STORE COORDINATOR
Steve L. Coffman
R. R. Donnelley & Sons
Lisle, IL

SESSION NOTE EDITOR
Burt Janz
BHJ Associates
Nashua, NH

TAPE COPY COORDINATOR
Glen Everhart
GE
Glen Mills, PA

LIBRARY REPRESENTATIVE
Ted Smith
The University of PA
Philadelphia, PA

RSX/IAS HISTORIAN
IAS WORKING GROUP CHAIR
Alan Frisbie
Flying Disk Systems
Los Angeles, California

CAMPGROUND COORDINATOR
James E. Berg
Department of Defense
Ft. Meade, MD

DIGITAL COUNTERPART
Pat Cherny
Nashua, NH

WORKING GROUP COORDINATOR
Charlotte Allen
Electronic Data Systems Corp.
Detroit, MI

VICE CHAIRMAN
BUDGET & FINANCE COORDINATOR
Gary Maxwell
U.S. Geological Survey
Menlo Park, CA

SRD WORKING GROUP COORDINATOR
Bob Turkelson
Goddar Space Flight Center
Greenbelt, MD

MENU COORDINATOR
Jerry Ethington
Prolifix Inc.
Frankfort, KY

MEMBERT-AT-LARGE
Bob Curley
The University of PA
Philadelphia, PA

Arnold De Larisch
Florida Atlantic University
Boca Raton, FL

Jim Neeland
Hughes Research Labs.
Malibu, CA

Anthony Scandora Jr.
Argonne National Laboratory
Argonne, IL

Ralph Stamerjohn
Creve Coeur, MO

RT-11 SIG

CHAIRMAN(*)
Milton Campbell
Talisman Systems
1142 Manhattan Avenue #255
Manhattan Beach, CA 90266
(213) 318-2206

SYMPOSIA COORDINATOR (*)
David P. Evans
Division 1152
Sandia National Labs
Albuquerque, NM 87185
(916) 756-3291

COMMCOMM REP (acting)(*)
DECUS STORE REP
Laura DeChellis
MDB Systems Inc.
1110 W. Taft Avenue
Orange, CA 92613
(714) 998-6900

NEWSLETTER EDITOR(*)
PRODUCT PLANNING CONTACT(*)
TECO CONTACT
John M. Crowell
Multiware, Inc.
P.O. Box 128
Davis, CA 95617
(916) 756-3291

SEMINARS (*)
STANDARDS COORDINATOR
Robert Roddy
David Taylor Research Center
Code 1564E
Bethesda, MD 20084-5000
(301) 227-1724

TAPE COPY GENERATION
John Bedel
David Taylor Research Center
Code 1564E
Bethesda, MD 20084-5000
(301) 227-1724

LUG CONTACT
Ned Rhodes
Software Systems Group
2001 North Kenilworth St.
Arlington, VA 22205
(703) 534-2297

FORTRAN CONTACT
Robert Walraven
Multiware, Inc.
2121-B 2nd St. Suite 107
Davis, CA 95616

MACRO CONTACT
Nick Bourgeois
NAB Software Services, Inc.
P.O. Box 20009
Albuquerque, NM 87154
(505) 821-1453

DECUS LIBRARY CONTACT (*)
NETWORKING CONTACT
Jim Crapuchettes
Omnex Corporation
2483 Old Middlefield Way
Mountain View, CA 94043
(415) 966-8400

RUNOFF CONTACT
John Davies, III
David Taylor Research Center
Code 1450
Bethesda, MD 20084-5000
(301) 227-1592

PERSONAL COMPUTERS
Dennis V. Jensen
AMES Laboratory ISU/USDO
310 Metallurgy
Ames, Iowa 50011
(515) 294-4823

NETWORKING CONTACT
Jim Crapuchettes
Omnex Corporation
2483 Old Middlefield Way
Mountain View, CA 94043
(415) 966-8400

OTHER LANGUAGES
Gary Sallee
19912 Fernglen Drive
Yorba Linda, CA 92686
(714) 970-2864

TSX CONTACT
C CONTACT
Jack Peterson
Horizon Data Systems
P.O. Box 29028
Richmond, VA 23229
(804) 740-9244

WISH LIST CONTACT
UNIX/ULTRIX CONTACT
Bradford Lubell
L.A. Heart Lab, UCLA
10833 Le Conte Avenue
Los Angeles, CA 90024
(213) 206-6119

PRO RT-11 & HARDWARE
William Walker
EG&G Mound Applied Tech.
P.O. Box 3000, A-152
Miamisburg, OH 45343
(513) 865-3557

RT-11 SUITE MANAGER
David R. Billing
EG&G Mound Applied Tech.
P.O. Box 3000
Miamisburg, OH 45343
(513) 865-3086

DIGITAL COUNTERPART
Connie Pawelczak
Maynard, MA

SITE SIG

NEWSLETTER EDITOR
Gregory N. Brooks
Washington University
School of Medicine
Department of Pediatrics
400 South Kingshighway
St. Louis, MO 63110
(314) 454-2237
brooks@kids.wustl.edu

COMMUNICATIONS COMMITTEE REP.
Terry C. Shannon
Int'l Data Corporation
DEC Advisory Service
Five Speen Street
Farmingham, MA 01701
(508) 935-4541

10th ANNIVERSARY CHAIR
Larry W. Hicks
Turn Key Solutions, Inc.
875 Walnut Street, Ste 275-170
Cary, NC 27511
(919) 460-9896

SIG CHAIR
Susan M. Abercrombie
Fitch Enterprises
48 Malilly Road
Portland, ME 04103
(207) 772-2837

SYMPOSIUM COMMITTEE REPRESENTATIVE
Marc Lippmann
Jamesbury Corporation
P.O. Box 15004
640 Lincoln Street
Worcester, MA 01615
(508) 852-0200 x2804

SESSION NOTE EDITOR
Gary Bremer
Emerson Electric Co.
MS 4448
8100 W. Florissant Avenue
St. Louis, MO 63136
(314) 553-4448

BUSINESS PRACTICES W/G
Dominick G. Darkangelo
General Electric Co.
Bldg. KW RM D160
P.O. Box 8
Schenectady, NY 12301
(518) 387-5478

WORKING GROUPS COORD
Peter E. Cregger
SAS Institute Inc.
Box 8000 SAS Circle
Cary, NC 27512-8000
(919) 467-8000

MATURE PRODUCTS WORKING GROUP CHAIR
Richard Alderson
Stanford University
Sweet Hall 4th Floor
Stanford, CA 94305-3090
415-723-4159
alderson@jessica.stanford.edu

CAMPGROUND COORDINATOR
Keith S. Crumpton
Bank of Boston
MS: 03-02-04
2 Morrissey Blvd.
Boston, MA 02125
(617) 929-6647

SEMINARS COMMITTEE REPRESENTATIVE
Mary Anne Feerick
1914 Fox Sterling Drive
Raleigh, NC 27606
(919) 460-9896

ASSISTANT SEMINAR COMMITTEE REPRESENTATIVE
Monica M C Tombers
23121 Lahser Road
Southfield, MI 48034

LIBRARY COMMITTEE REPRESENTATIVE
Simeon Wright
Douglas Computer International
331 West 2700 South
Salt Lake City, UT 84115
(801) 487-5811

DIGITAL ALTERNATE
James Eastham
Digital Equipment Corporation
150 Flanders Road, WFR1-2/B9
Westboro, MA 01581
(508) 366-3284

MEMBER-AT-LARGE
Gary Siftar
9006 So. 199th E. Avenue
Broken Arrow, OK 74014
(918) 455-6627 (home)

Dave Hunt
Lawrence Livermore Nat'l Lab
MS L-54 P.O. Box 808
Livermore, CA 94550
(415) 422-0434

Emily Kitchen
A.H. Robins Co.
1211 Sherwood Avenue R2SY
Richmond, VA 23220
(804) 257-2925

Timothy S. Frazer
7180 N.W. 179th Street #311
Miami, FL 33015
(305) 637-6884

Adam Zavitski
1001 Harvest Mill Court
Raleigh, NC 27610
(919) 266-5086

DIGITAL COUNTERPART
Joe Allan
Digital Equipment Corporation
150 Flanders Road
WFR1-2/G10
Westboro, MA 01581
(508) 870-3284

Rosemary Good
Digital Equipment Corporation
12 Crosby Drive
BUO/E55
Bedford, MA 01730
(617) 276-4877

UNISIG

CHAIRMAN
Kurt L. Reisler
Hadron Incorporated
9990 Lee Highway
Fairfax, VA 22030
(703) 359-6100
...uunet!hadron!klr

SYMPOSIA COORDINATOR
Michael Angelo
Compac Computer Corporation
20555 SH 249
Houston, TX 77070
713/374-8141
fax: 713/374-7305
uunet!cpqhou!michaela

SESSION NOTES EDITOR
William Cheswick
AT&T Bell Labs
600 Mountain Avenue
Murray Hill, NJ 07974
...research!ches

NEWSLETTER EDITOR
Sharon Gates-Fishman
NDC Corporation
730 E Cypress Avenue
Monrovia, CA 91016
(818) 358-1871
!amdahl!cit-vax!ndc!sgf

VICE-CHAIR
Dorothy A. Geiger
225 St. Pauls Avenue
#12-T
Jersey City, NJ 07306
201/792-0263
...decwrl!dgeiger

TAPE LIBRARIAN
Carl Lowenstein
Marine Physical Laboratory
Scripps Institute of Oc'graphy, P-004
La Jolla, CA 92093
619/534-1805
...{decvax,ucbvax}!ucsd!mplvax!cdl

STANDARDS COORDINATOR & USENET LIAISON
Ed Gould
Mt. Xinu
2910 7th St.
Suite 120
Berkley, CA 94710
(415) 644-0146
ucbvax!mtxinu!ed

GHOST IN THE SIG
Norman Wilson
Bell Laboratories, 2C514
600 Mountain Avenue
Murray Hill, NJ 07974
(201) 582-2842
[decvax,ihnp4]!research!norman

COMMUNICATIONS COMMITTEE REP
Ron Jarrell
Computing Center, Virginia Tech
1700 Pratt Drive
Blacksburg, VA 24061-0214
(703) 231-9513
...JarrellRA@vtcc1,cc.vt.edu

SEMINARS COORDINATOR
Steven Stepanek
Computer Science Dept.
School of Eng. & Computer Science
California State University at Northridge
18111 Nordhoff St.
Northridge, CA 91330
(818) 885-2799 or 3398
...sgs@mx.csun.edu

OSF DELEGATE
Stephen M. Lazarus
Ford Aerospace
MS X-20
P.O. Box 49041
San Jose, CA 95161
408/473-4203
...sgi!sun!sd1!sml

CAMPGROUND COORDINATOR
Sophie Strauss-Duckett
NASA-Ames
MS 233-7
Moffett Field, CA 94035
415/654-4787

DIGITAL COUNTERPART
Sharon MacDonald
Ted Prindle
Digital Equipment Corporation
110 Spit Brook Road
Nahsua, NH 03062-2698

VAX SYSTEMS SIG

CHAIRMAN
Susan T. Rehse
Lockheed Missiles & Space Co.
0/19-50, B/531,
P.O. Box 3504
Sunnyvale, CA 94088-3504

VICE CHAIRMAN
David Wyse
Projects Unlimited
3680 Wyse Road
Dayton, OH 45414-2539

EXECUTIVE COMMITTEE
Margaret Drake
Univ. of Texas
Health Science Center
7703 Floyd Curl Drive
San Antonio, TX 78284

Jeffrey Jalbert
J C C
P.O. Box 381
Granville, OH 43023

Lowell LeFebvre
Sytek, Inc.
19 Church St.
P.O. Box 128
Berea, OH 44017

Robert McQueen
Knoll Pharmaceuticals
MIS Department
30 North Jefferson Road
Whippany, NJ 07981

Betsy Ramsey
Catholic University of America
Computer Center
Washington, DC 20064

David Schmidt
Management Science Associates
6565 Penn Avenue
Pittsburgh PA 15206-4490

E.F. Berkley Shands
Washington University
Dept. of Computer Science
Campus Box 1045, Bryan 509
St. Louis, MO 63130-4899

SYMPOSIA COORDINATOR
Betsy Ramsey
Catholic University of America
Computer Center
Washington, DC 20064

SYMPOSIA COORDINATOR. ASST.
Michael Carullo
Westinghouse Electric Corp.
P.O. Box 746
M/S 432
Baltimore, MD 21203

SESSION CHAIRMAN COORDINATOR
Elaine Hall
Westinghouse
P.O. Box 746
M/S 432
Baltimore, MD 21203

SEMINAR COORDINATOR
Robert McQueen
Knoll Pharmaceuticals
MIS Department
30 North Jefferson Road
Whippany, NJ 07981

LIBRARY COORDINATOR
Glenn Everhart
25 Sleigh Ride Road
Glen Mills, PA 19342

COMMUNICATIONS COORDINATOR
G Beau Williamson
Rockwell International
1200 N. Alma Road
M/S 406-280
Richardson, TX 75081

NEWSLETTER EDITOR
David Santisteven
Western Technologies
P.O. Box 5542 TA
Denver, CO 80217

VAX NOTES SYSTEM MANAGER
Lawrence J. Kilgallen
Box 81, MIT Station
Cambridge, MA 02139-0901

SESSION NOTES EDITOR
Ken Johnson
Meridien Technology
15965 Manchester Road
Suite 102
St. Louis, MO 63011

BOOTBLOCK EDITOR
John L. Prather
Technicon Instruments Corp.
511 Benedict Avenue
Tarrytown, NY 10591

BOOTBLOCK STAFF
Richard DeJordy
American Mathematical Society
201 Charles Street
Providence, RI 02904

STORE COORDINATOR
Len M. Struttmann
Rockwell International
Collins Govt. Avionics Div.
M/S 153-100
400 Collins Road, N.E.
Cedar Rapids, IA 52498

MASTER'S LIST COORDINATOR
Anthony Abbattista
Anderson Consulting
100 South Wacker Drive
Chicago, IL 60657

SYSTEM IMPROVEMENT REQUEST
David Schmidt
Management Science Associates
6565 Penn Avenue
Pittsburgh, PA 15206-4490

VOLUNTEER COORDINATOR (fall)
Ron Tencati
Science Application Research
3847 Water Drop Court
Burtonsville, MD 20866

VOLUNTEER COORDINATOR (spring)
Glen S. Johnston
General Dynamics
10225 Long Rifle Drive
Fort Worth, TX 76108

CAMPGROUND COORDINATOR
Elizabeth Bailey
Tennessee Valley Authority
213 CEB
Muscle Shoals, AL 35661

CAMPGROUND COORDINATOR, ASSISTANT
Thomas Linscomb
Computation Center
University of Texas
Austin, TX 78712

WORKING GROUP COORD.
Lowell LeFebvre
Sytek, Inc.
19 Church St.
P.O. Box 128
Berea, OH 44017

CONFIGURATION METRICS W/G, CHAIR
Todd J. Young
Artec Distributing
Pine Haven Shore Road
Shelburne, VT 05482

PRODUCTION SYSTEMS W/G CHAIR
E.F. Berkley Shands
Washington University
Department of Computer Science
Campus Box 1045, Bryan 509
St. Louis, MO 63130-4899

DECNET SECURITY W/G CHAIR
Ron Tencati
Science Application Research
3847 Water Drop Court
Burtonsville, MD 20866

INTERNALS W/G CHAIR
VMS USER'S NETWORK W/G CHAIR
Jamie Hanrahan
Simpact Associate
9210 Sky Park Court
San Diego, CA 92123

INTERNALS W/G CO-CHAIR
Allen Watson
Watson Consulting Inc.
3 River Street Ext., Apt. 30
Little Ferry, NJ 07643

SMALL VAX W/G CHAIR
David Mehren
Integra Systems Corporation
P.O. Box 40341
Tucson, AZ 85717-0341

MIGRATION AND HOST DEV.
VAXINTOSH W/G CHAIR
Jim Downward
KMS Fusion Inc.
P.O. Box 1567
Ann Arbor, MI 48106

MULTIPROCESSOR W/G CHAIR
Eugene Pal
U.S. Army
CAORA (ATORCATC)
Fort Leavenworth, KA

PERFORMANCE W/G CHAIR
John T. Peterson
Systems Growth Planning Corp.
42 Great Brook Road
Milford, NH 03055

SECURITY W/G CHAIR
C. Douglas Brown
Sandia National Labs
Organization 2645
P.O. Box 5800
Alburquerque, NM 87185-5800

SYSTEM MANAGEMENT W/G CHAIR
Steve Tihor
251 Mercer Street
New York, NY 10012
BITnet: TIHOR@NYUACF
Internet:TIHOR@Acfcluster.NYU.EDU
TIHOR@NYU.EDU
UUCPnet:cmc12!tihor

VAXCLUSTER W/G CHAIR
Thomas Linscomb
Computation Center
University of Texas
Austin, TX 78712

ADVISORS
Joseph Angelico
Examco, Inc.
1600 20th Street
Kenner, LA 70062

Ken A L Coar
Digital Equipment Corp.
295 Foster St., LTN1-1/G08
P.O. Box 1123
Littleton, MA 01460-1123

Jack Cundiff
Horry-Georgetown Tech. College
P.O. Box 1966
Conway, SC 29526

Marg Knox
Computation Center
University of Texas
Austin, TX 78712

Art McClinton
Mitre Corporation
7525 Colshire Dr. M/S W386
McLean, VA 22102-3481

Ross Miller
Online Data Processing
N 637 Hamilton
Spokane, WA 99202

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

Al Siegel
Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201-2693

DATATRIEVE / Fourth Generation Languages SIG

1990 Product Improvement Request Submission Form

Submission Deadline - January 29, 1990

Submittor: DECUS Membership Number:

Firm:

Address:

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.)

QU

Mail submission to:

T. Chris Wool, PIR Editor
E. I. duPont DeNemours & Co.
Engineering Department
P. O. Box 6090
Newark, DE 19714-6090

Electronic Publishing (E-Pubs)
Software Improvement Request and Wishlist Form

Name: ..... Company: .....

Address: ..... Phone: .....

.....

The E-Pubs UIG is concerned with Digital and third party hardware/software products in the electronic publishing arena. What product does your request or suggestion concern? Please include the software version number where appropriate. Please reference only one product per form.

.....

If your request or suggestion does not relate to a product, please check which of the following E-Pubs UIG topics it does concern:

Newsletter . . . . . ☐ Symposium Sessions . . . ☐ UIG Tape Submission . . ☐ Session Notes . . . . . ☐

Information Folder . . . . . ☐ Working Group Activities . . . . . ☐ Pre-symposium Seminars . . . . . ☐ DECUS Store Items . . . ☐

Other . . . . . ☐ .....

How to write a request:
Please explain your request thoroughly. Don't assume that we know how something is done in "XYZ" product or in another SIG. Justify why the capability would be useful and give examples.

Brief description: .....

.....

Complete description with examples: .....

.....

.....

.....

.....

.....

.....

.....

At Symposia, return this form to the E-Pubs campground or submit at a Wishlist session. To mail, send to:

Patty English-Zemke, 87 Deerhurst Dr., Goleta, CA 93117

H M S S I G

HARDWARE SUBMISSION FORM -- A SIG INFORMATION INTERCHANGE

Message

Contact
Name

Address

Telephone

Type of equipment

SUBMIT ANY TYPE OF HARDWARE PROBLEMS AND/OR FIXES.

SEND TO:

William K. Walker
Monsanto Research Corp.
P.O. Box 32 A-152
Miamisburg, OH 45342

OR

Neil Krandall
Univ. of Cincinnati
Pharamacology & Cell
Biophysics
231 Bethesda Ave MC575
Cincinnati, OH 45267
(513)872-4788

DATAGRAM

DATAGRAMs are short messages, comments, requests, or answers that are published in NETwords. Please fill in the sections below and send the DATAGRAM to:

JUDI MANDL
UCONN HEALTH CENTER
263 FARMINGTON AVENUE, BLDG. #19
FARMINGTON, CT 06032

Title: _____

Message: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Your Name: _____

Address: _____

_____

Telephone: _____

If this is a reply to a previous DATAGRAM, what #? ___

Signature: _____ **Date:** _____

Place
Stamp
Here

JUDI MANDL
UCONN HEALTH CENTER
263 FARMINGTON AVENUE, BLDG. #19
FARMINGTON, CT 06032

Fold Here

System Improvement Request Form

DECUS Number: _____
Name: _____
Address: _____
_____
_____
_____
_____
Phone: _____
Product: _____
Product Installed Version: _____
Hardware: _____
_____
_____
_____
_____

Please give a detailed explanation of your concern or improvement:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Please send to:

Ed Bowen
Bell Services South
1876 Data Drive, Room B204
Birmingham, AL 35244
(205) 998-6800

OA SIG QUESTIONNAIRE

Tell Us About You

Name _____

Company _____

Street _____

City, State, Zip _____

What best describes your job function? Check all that apply.
- ☐ Information Systems management
- ☐ Technical/Programming
- ☐ Training and/or User Support
- ☐ User
- ☐ Vendor/Consultant
- ☐ Other (please specify) _____

What are the major applications at your site?

_____

_____

_____

What applications does your site do best?

_____

_____

_____

How many end-users does your site have? _____

What applications has your site not attempted that you would like to start? _____

_____

_____

PCs and Workstations

Does your site have IBM-PCs or compatibles? ☐ yes ☐ no

Does your site have Macintoshes? ☐ yes ☐ no

What % of the staff use a personal computer? _____

Do you anticipate the arrival of (more) PCs or Macintoshes during the next year? ☐ yes ☐ no

Networks and larger computers

What % of your PCs or Macintoshes are networked? _____

Are your networks local area, wide area, or both? _____

Are wide area networks via dialin line or X.25 pad?
☐ dialin line ☐ X.25 pad

What kind of network(s) do you have? _____

_____

What kind of VAXs do you have? _____

_____

Are your VAXs clustered? ☐ yes ☐ no ☐ doesn't apply

Will you add or remove VAXs in the coming year?
☐ add ☐ remove ☐ doesn't apply

User Support and Training

Does your site offer telephone hotline support? ☐ yes ☐ no

Does your site have an in-house training staff? ☐ yes ☐ no

Does your site have an electronic bulletin board? ☐ yes ☐ no

Communications

Are telephones part of your Information Systems department's responsibilities? ☐ yes ☐ no

Do you have broadcast fax capability? ☐ yes ☐ no

Are telexes integrated with your system? ☐ yes ☐ no

Do you use electronic mail? ☐ yes ☐ no

If you answered "yes" to the above question, do you use a third-party vendor?
☐ MCI Mail? ☐ Telenet ☐ other _____

If third-party, what is your mailbox address? _____

_____

Does your site have an X.400 link to allow electronic mail with other companies? ☐ yes ☐ no

Office Automation

Does your site use All-in-1? ☐ yes ☐ no

Do you have another kind of integrated office automation product (Target, OATmail, etc.)? If so, please specify:

_____

What kind of word processing software do you use?
☐ DEC ☐ Third-party (specify) _____

Is most of your site's word processing done on the:
☐ VAX ☐ PC ☐ Mac

Do you need to convert documents from one format to another? ☐ yes ☐ no

If your site uses spreadsheets, please specify which product:

_____

Database Applications

Check any databases that your site has:

Relational models _____

Hierarchical/networked models _____

Text and graphics _____

Text only _____

4GL's _____

Other (please specify) _____

_____

Roger Bruner
3806 Monument Avenue
Richmond, VA 23230

INDEX OF ARTICLES FOR 1989 OA SIG NEWSLETTER

VTX WORKING GROUP

VOLUNTEER APPLICATION

Name:_____ Title:_____

Company:_____

Address:_____

_____

_____

Phone : ( )_____Date:_____

1. When do you attend symposia?

___ Always ___ East coast only ___West coast only ___Irregular

2. a) Would you like to see the working group do something in particular? Please specify on the back of this form.

b) Would you be willing to coordinate the activity you have listed? ___ Yes ___ No

3. Please check if you are interested in any of the following activities:

___ Submit Newsletter article ___ Session chair

___ Present a session ___ Hold a campground clinic

If you would like to volunteer please fill out this form and send to:

Albert DeBlieck

70 Quentin Rd.

Rochester, New York 14609

VTX WORKING GROUP

WISHLIST QUESTIONAIRE

Name:_____ Title:_____

Company:_____

Address:_____

_____

_____

Network Address:_____

Phone : ( )_____Date:_____

Wishlist Request - brief description:_____

_____

_____

Wishlist Request - please explain you request thoroughly; don't assume that the details are known of other products or services; give examples:_____

_____

_____

_____

_____

_____

_____

_____

_____

Return this form to:

Albert DeBlieck
70 Quentin Rd.
Rochester, New York 14609

VAX Systems SIG

System Imporvement 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 (uese additional pages if required):

Tear out or photocopy reverse to submit an SIR.

Dave Schmidt
Management Science Associates
6565 Penn Avenue
Pittsburgh, PA 15206-4490
USA

VTX WORKING GROUP
MASTERS APPLICATION

Name:_____ Title:_____

Company:_____

Address:_____

_____

_____

Network Address:_____

Phone : ( )_____Date:_____

A VTX Masters list is being assembled and will be mailed out to the VTX Working Group members. It will also be available to interested parties at the Symposia in Anaheim. A Master is a person who is knowledgeable enough in VTX to be comfortable to answer questions about it. The qualifications are: expertise in VTX, a willingness to have his/her name published as a Master. If you would like to serve as a Master please fill out this form and send it to:

Albert DeBlieck
70 Quentin Rd.
Rochester, New York 14609

DECUS U.S. CHAPTER
SUBSCRIPTION SERVICE SIGS NEWSLETTERS ORDER FORM
(U.S. Members Only)

As a member of DECUS U.S. Chapter, you are entitled to contribute and subscribe to the DECUS monthly publication, **SIGs Newsletters.** You also have the opportunity to subscribe to the Symposia Proceedings which are a compilation of the reports from various speakers at the U.S. National DECUS Symposia.

- **No Purchase Orders will be accepted.**
- The order form below must be used as an invoice.
- All checks must be made payable to DECUS.
- All orders **MUST** be paid in full.
- Minimum of **$25.00** for orders placed via a credit card.
- No refunds will be made.
- The address provided below will be used for all DECUS mailings; i.e. Membership, Subscription Service and Symposia.
- SIGs Newsletters Price is for a one-year subscription beginning the month following receipt of payment.

Name _____ DECUS Member # _____

Company _____

Address _____

_____

City _____ State _____ Zip _____

Telephone # _(_____)_____

Subscription Service Offering		Unit Price	Quantity	Total
SIGs Newsletters	Note price increase	$40.00	_____	_____
Spring '89 Proceedings (SP9)		15.00	_____	_____
Fall '89 Proceedings (FA9)		15.00	_____	_____
Spring '90 Proceedings (SP0)		15.00	_____	_____
Fall '90 Proceedings (FA0)		15.00	_____	_____
			Total Amount	$ _____

☐ MASTERCARD ☐ VISA ☐ DINERS CLUB/CARTE BLANCHE® ☐ AMERICAN EXPRESS

Credit Card # __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ Expiration Date _____

I understand that there will be no refunds even if I decide to cancel my subscription.

Signature _____

S&M

FOR DIGITAL EMPLOYEES ONLY

Badge # _____ Cost Center _____

Cost Center Mgr. Name _____ Cost Center Mgr. Signature _____

MAIL TO: Subscription Service, DECUS (BP02), 219 Boston Post Road, Marlboro, MA 01752-4605, (508) 480-3446.

FOR DECUS OFFICE ONLY

Check Number _____ Bank Number _____

Amount $ _____

DECUS U. S. Chapter Application For Membership

IMPORTANT! Please provide a complete mailing address, include zip code in accordance with postal regulations for your locality.

☐ New Membership ☐ Update to Current Membership Profile

Current DECUS Membership Number _____

Do you wish to be included in mailings conducted by Digital (for marketing purposes etc.?) ☐ Permission ☐ Refusal

Please print clearly or type!

Name _____

Company _____

Address _____

_____

_____

City **State** **Zip**

Phone: Home ( ) **Business** ( )

Are you an employee of Digital Equipment Corporation?

☐ **Yes** ☐ **No**

1. How did you learn about DECUS? (check applicable item)

1☐ Another DECUS Member
13☐ Local Users Group
5☐ Hardware Pkg.
8☐ DECUS Chapter Office
12☐ Advertising
7☐ Software Dispatch (Digital Newsletter)
4☐ Digital Sales
2☐ Symposia
14☐ Special Interest Group
6☐ Software Pkg.
10☐ Digital Store

2. Primary business activity at your location: (check one)

Non-Computer Related
31☐ Manufacturing (other)
32☐ Agriculture, Construction
33☐ Energy, Mining, Oil
34☐ Engineering, Architecture
47☐ Transportation
35☐ Utilities
36☐ Government-Local, State
37☐ Government-Non-Military
38☐ Government-Military
41☐ Education
40☐ Medical or Legal Services
39☐ Finance, Banking, Insurance
42☐ Trade (wholesale, retail)
43☐ Research & Development
44☐ Leisure
45☐ Media
46☐ Other_____

Computer or DP related
25☐ Manufacturing (DP Equip.)
26☐ Software Development
27☐ Communications & Networking
28☐ Systems House, VAR/OEM
29☐ Consultant
30☐ Other DP Services

3. I wish to participate in the following DECUS U.S. Chapter Special Interest Group(s):

3☐ Artificial Intelligence
7☐ Business Applications
6☐ Data Management Systems
5☐ DATATRIEVE/4GL
8☐ Education
9☐ Electronic Publishing
10☐ Graphics Applications
11☐ Hardware and Micro
16☐ Languages and Tools
14☐ MUMPS
15☐ Networks
34☐ Office Automation
36☐ Personal Computer
18☐ RSTS
17☐ RSX/IAS
19☐ RT-11
21☐ UNIX
26☐ VAX Systems
32☐ Site, Mgmt. & Training
31☐ DAARC (Data Acquisition, Analysis, Research, and Control)

4. Using the classification numbers from question 3, please indicate which SIG would be the primary focus for your interests? #_____

5. Using the classification numbers from question 3, please indicate which SIG would be of secondary focus for your interests? #_____

6. Total employees in entire company/institution/government department: (check one)

2☐ 10,000 or More
3☐ 5,000 to 9,999
4☐ 1,000 to 4,999
5☐ 500 to 999
6☐ 250 to 499
7☐ 100 to 249
8☐ 6 to 99
9☐ Fewer than 6

7. Primary job function: (check one)

Organization Management
11☐ General & Corporate
12☐ Financial
13☐ Administrative Services
14☐ Marketing

Computer/Systems Operations
20☐ Management
21☐ Supervisory
22☐ Staff

Engineering/Manufacturing
30☐ Management
31☐ Staff

Science/Research/Development
40☐ Management
41☐ Staff

Other
50☐ Consultant
51☐ Educator
52☐ Other _____

8. Citizen of the United States? ___**Yes** ___ **No**

If no: Country _____

Forward to: Digital Equipment Computer Users Society
Membership Group
219 Boston Post Road, BP02
Marlboro, MA, 01752-4605
Phone: (508) 480-3635

Signature _____

rev: 07/89

DECUS Subscription Service
Digital Equipment Computer Users Society
219 Boston Post Road, (BP02)
Marlboro, MA 01752-4605

Affix mailing label here. If label is not available, print old address here. Include name of installation, company, university, etc.

STATUS CHANGE

Please notify us immediately to guarantee continuing receipt of DECUS literature. Allow up to six weeks for change to take effect.

( ) Change of address
( ) Please delete my membership record
(I do not wish to remain a member)

DECUS Membership No: _____

Name: _____

Company: _____

Address: _____

_____

State/Country: _____

Zip/Postal Code: _____

_____

Mail to: DECUS - Attn: Subscription Service
219 Boston Post Road, BP02
Marlboro, Massachusetts 01752-4605

USA