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HYPERCARD DEVELOPMENT AND IMPLEMENTATION AT SRS*

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HyperCard
In Use At The
Savannah River Site

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HyperCard running on Apple Macintosh computers is being used in many different ways at WSRC. We currently have applications running within HyperCard that act as an expert system for new Macintosh users, we have a version of our card catalog for the 20,000+ volume technical library, as a personnel locator for our 14,000 + employee record file and as reference material for technical writers. We use HyperCard as a front end to our QA procedures and for a back end to our data acquisition systems. We often use HyperCard as a vehicle to move data from one computer platform to another because of its comprehensive file manipulation capabilities.

What is HyperCard?

HyperCard was written by Bill Atkinson of Apple Computer. HyperCard is a development tool that is capable of creating applications or operating as an applications itself. It is part of the system software delivered with every Apple Macintosh computer. It requires one megabyte of memory to run in its complete configuration but can operate in as little as 512k for "browsing" information. HyperCard comes with a fairly comprehensive tutorial, written in HyperCard, and the average user can be developing applications within hours.

The basic container of information in HyperCard is the field. The field can contain text or numeric data. Related groups of fields and other objects are diplayed on what is called a card. Hence the name HyperCard. These cards are directly analogous to index cards in a simple card catalog system. Groups of cards form a stack or HyperCard file. Even though individul cards are limited to the size of the original Macintosh screen (512 pixels x 342 pixels), stacks are only limited to the size of the mass storage device connected to the users computer. Cards can also contain other information in the form of Buttons and bit-mapped graphics. Buttons can be used to link cards or stacks. Buttons can also be used to launch a HyperTalk script. HyperTalk is HyperCards object oriented programming language.

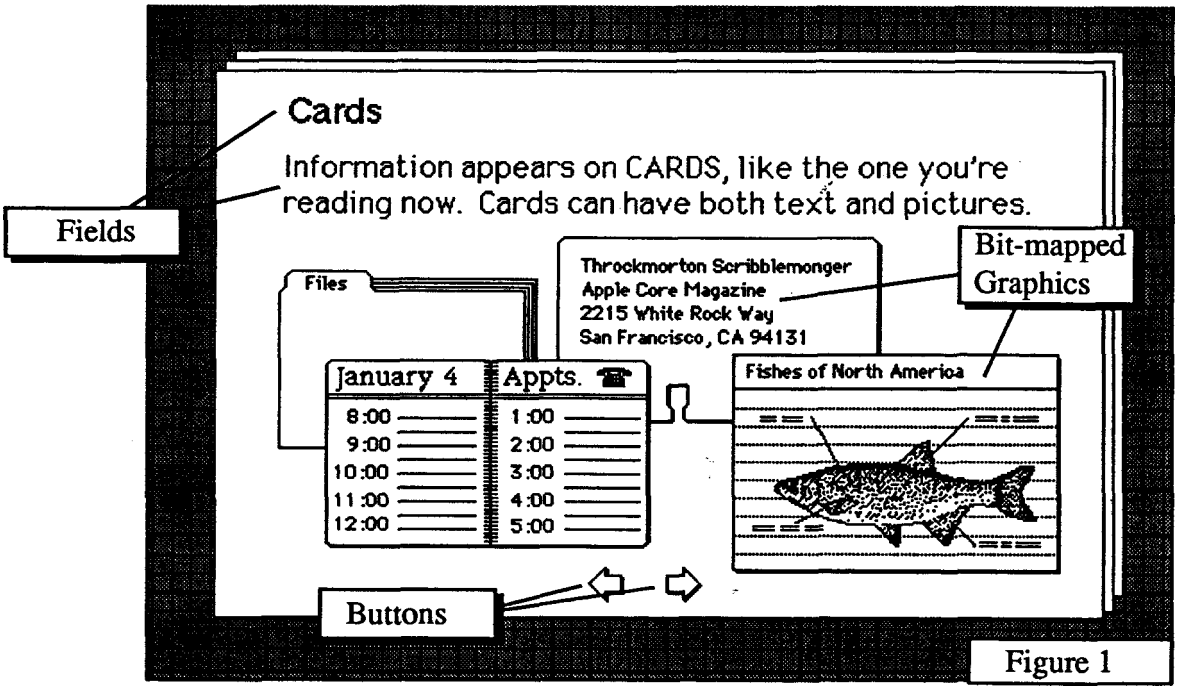


Figure 1

HyperTalk is a fourth generation, natural language interface to the Macintosh computer. It has its roots in languages like Lisp and SmallTalk. HyperTalk consists of over 100 English-like commands. The language has many of the features of Pascal; sophisticated control structures, user defined subroutines, and functions with parameter passing. To enhance the users interface it also has advanced graphics features, sound functions and disk file routines. HyperTalk programs, called scripts, can be attached to any HyperCard object; buttons, fields, backgrounds, cards or stacks. Message handlers capture actions of the user and the computer and then performs the scripts associated with these actions.

HyperCard features tear-off menus that can be placed anywhere on the Macintosh screen. Icons are an integral part of the Macintosh environment and HyperCard takes advantage of their use. The user has access to standard icons from within HyperCard or can build and design their own using HyperCards paint function or other programs such as ResEdit.

HyperCard contains the normal commands found in a database system to find and retrieve data. It can sort on any or all field and has limited printing capabilities. Data can be imported or exported via text files and HyperCard has a full range of field manipulation functions. This full range of text manipulation routines makes HyperCard extremely useful in moving data from one compter environment to another.

HyperCard can automatically create simple navigational scripts such as moving from one card to another or from one stack to another. It can also be used to select any pull-down menu item, including the Desk Accessories. Other applications can be launched using HyperCard and this has given rise to some basic operating systems based on HyperCard.

The MacDoctor ...

The MacDoctor was created to help new users solve basic problems with their Macintoshes and Macintosh networks. The MacDoctor consists of a series of cards, scripts and animation sequences that guides the user through some of the most common problems they will face. Only a very basic understanding of the Macintosh system and HyperCard are needed to operate the MacDoctor.

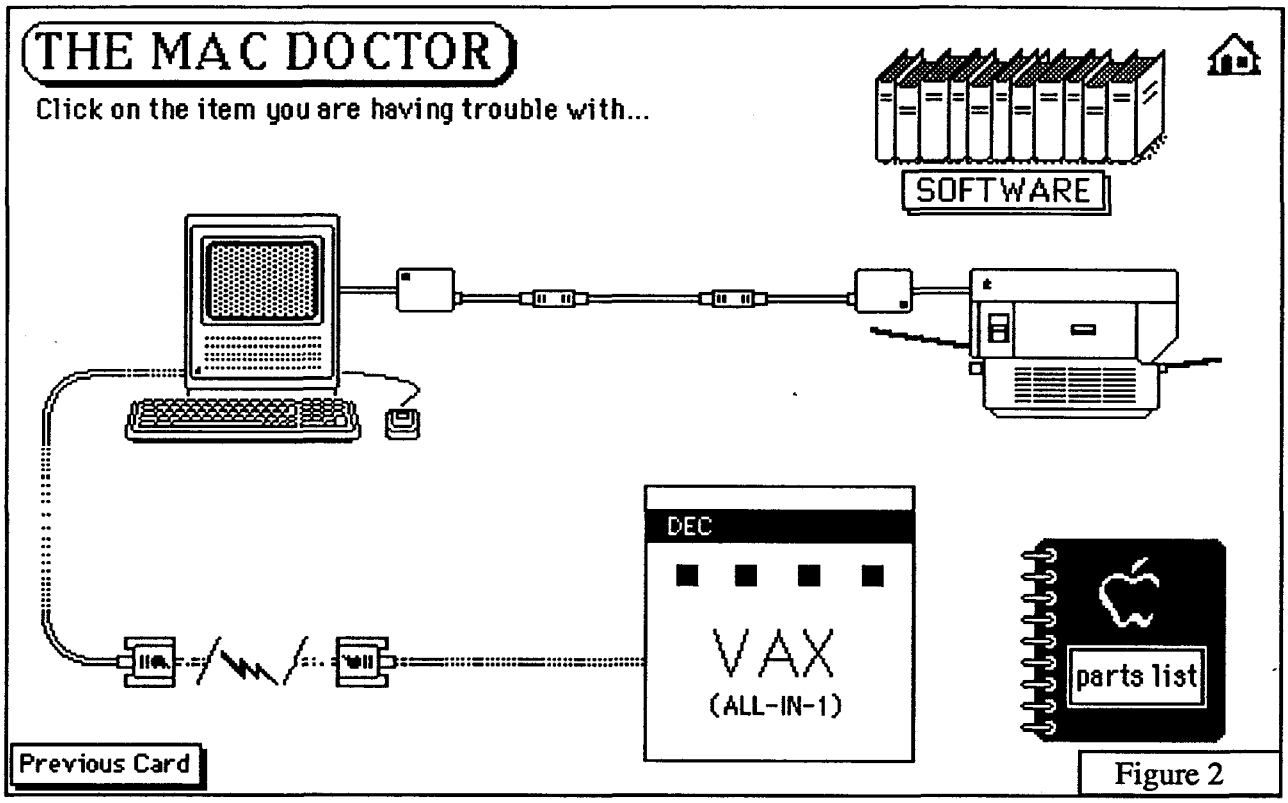


Figure 2

HyperCard was chosen for this task because of the short development time and the availability of the product to all Macintosh users. The graphic environment allowed scanned images of equipment to be used to illustrate troubleshooting procedures. The Macintosh pull-down menus could also be simulated so that the user would get the feel of actually performing the operation. Incorrect responses are processed and correct alternatives are returned by the MacDoctor.

Figures 3-4 are examples of screens the users would see as they navigate their way through the application.

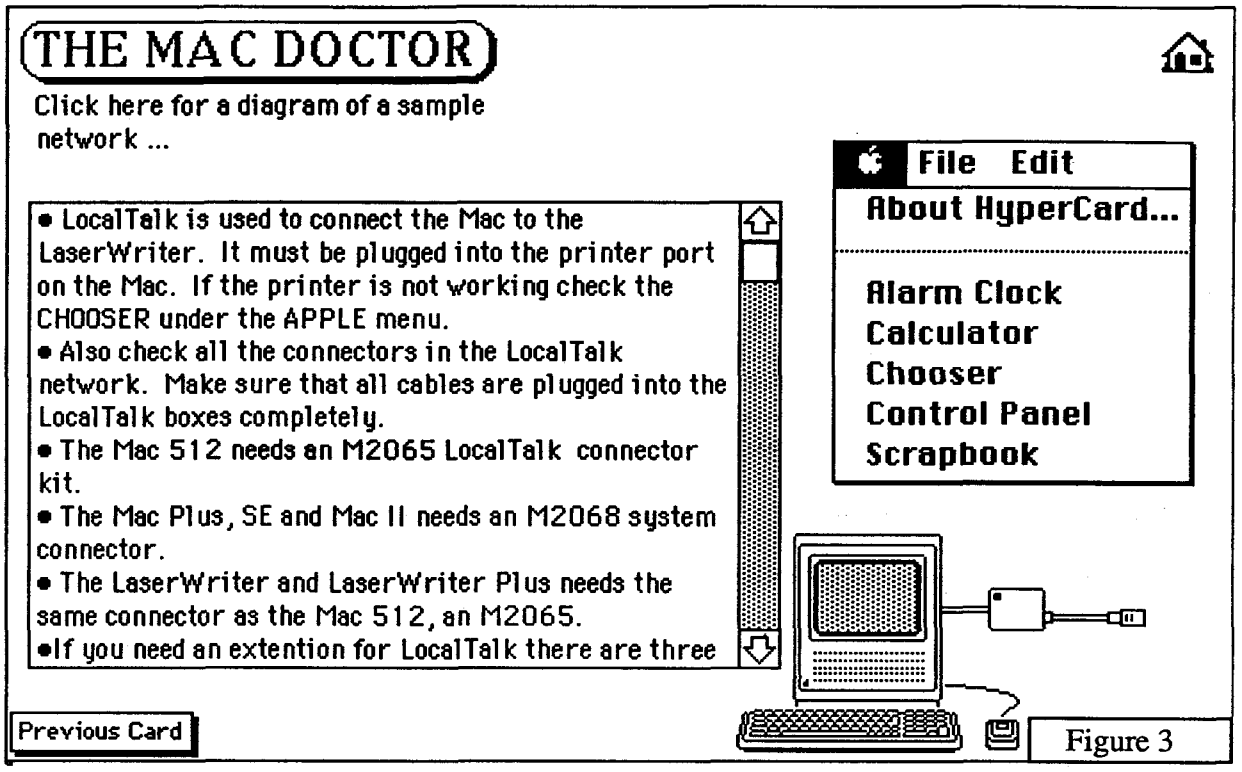


Figure 3

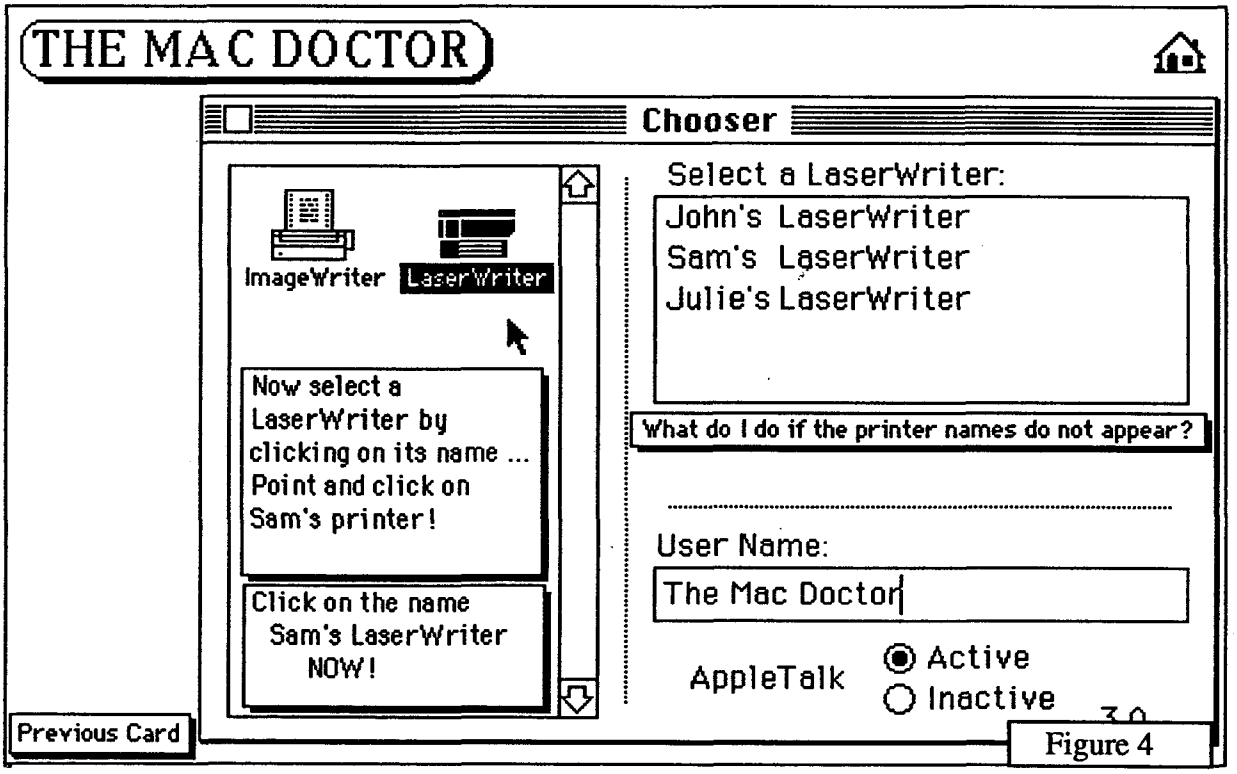


Figure 4

The product also contained a section on expanding and enhancing the Macintosh systems and peripherals. Upon completion the product theMacDoctor was distributed t new users in a variety of manners. The Scientific Computing Resource Center held a series of presentations on the product and the users were encouraged to pick up a copy upon leaving. For those users that had AppleTalk networks with Ethernet gateways the MacDoctor was available for downloading. The SCRC also encouraged users to come to the self-study area and get a copy. A copy of the MacDoctor is kept on all the Macintoshes in the SCRC self-study area.

The Personnel Locator ...

The Savannah River Site Personnel Locator System provides quick and easy access to site addresses and phone numbers of site personnel maintained on the Central Personnel Index. The system is designed to provide information to any person entering the site in search of someone. The system provides independence from the mainframe while functioning and ease of use and upkeep. This system was chosen after considering a number of possibilities including IBM and VAX mainframe applications and other personal computer applications. The HyperCard system was chosen because of the user-friendly interface and the flexible data manipulation functions.

The Central Personnel Index is maintained in an MVS data set on an IBM 3090. Before the data downloaded it is formatted and the pertinent data is extracted using Natural. The data set is then downloaded to the Macintosh running PacerLink via All-in-1 running on a VAX 8550. The data set which contains the first and last name, address, department and phone number of approximately 14,000 persons is then loaded into the HyperCard stack.

The user, which is presented with the screen in figure 5, can search by typing the last name of the person of intereste and the Personnel Locator will display the first occurrence of that last name, see figure 6.

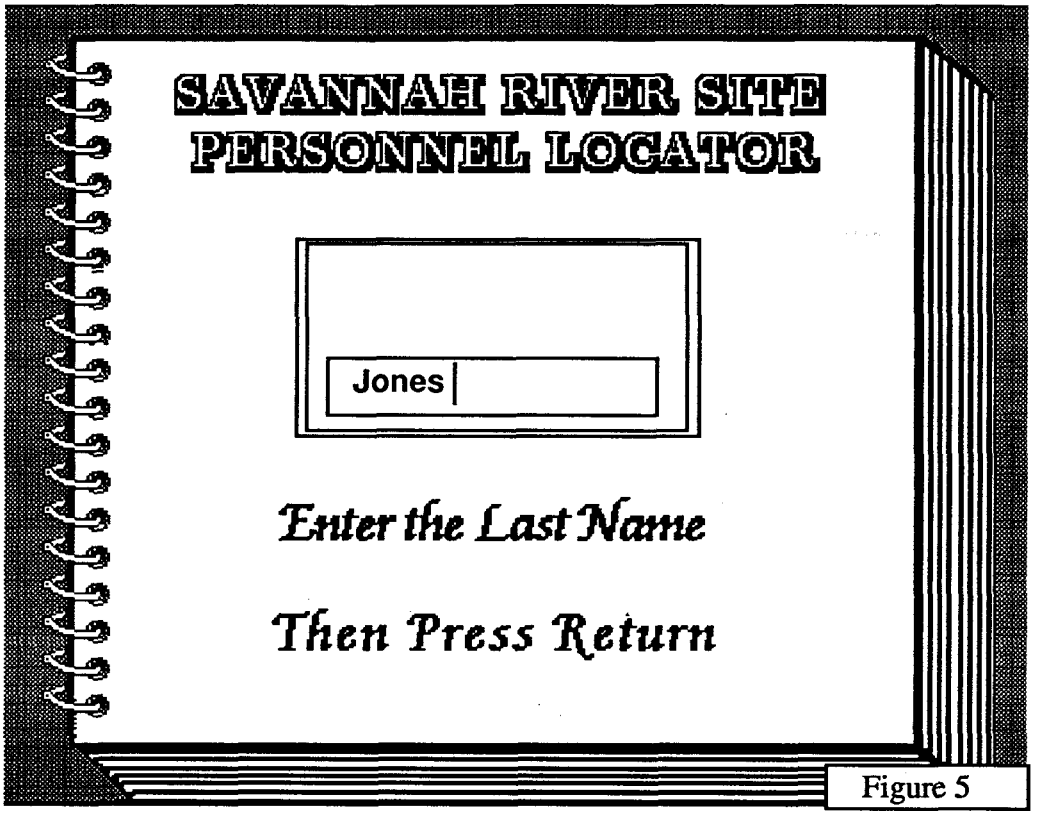


Figure 5

NAME			ADDRESS		PHONE
JONES	ALAN	B	730-M	137	01558
JONES	ALLEN	J	105-P		77391
JONES	AMOS	E			00000
JONES	AMOS	R			00000
JONES	AMY	S	703-A	E123	53560
JONES	ANDREW	R			00000
JONES	ANDREW	T	MDC 146		00000
JONES	ANGELA	D	773-A	C-041	53401
JONES	ANGELA	W	704-Z	2Z	00000
JONES	ANNIE	M			00000
JONES	ANTHONY	A	MDC 142		00000
JONES	ARNOLD	N			00000
JONES	ARTHUR	L	742-A	130	52728

PRESS RETURN TO FIND NEXT MATCH

PRESS THE ENTER KEY TO QUIT

Figure 6

The user can then press RETURN to view the next occurrence. If there is no other occurrence of the name or the system is left idle for sixty seconds then the system returns to the screen in figure 5.

When an update to the HyperCard stack need be done the old stack is simply discarded and the new version is installed in its place.

Technical Library Card Catalog ...

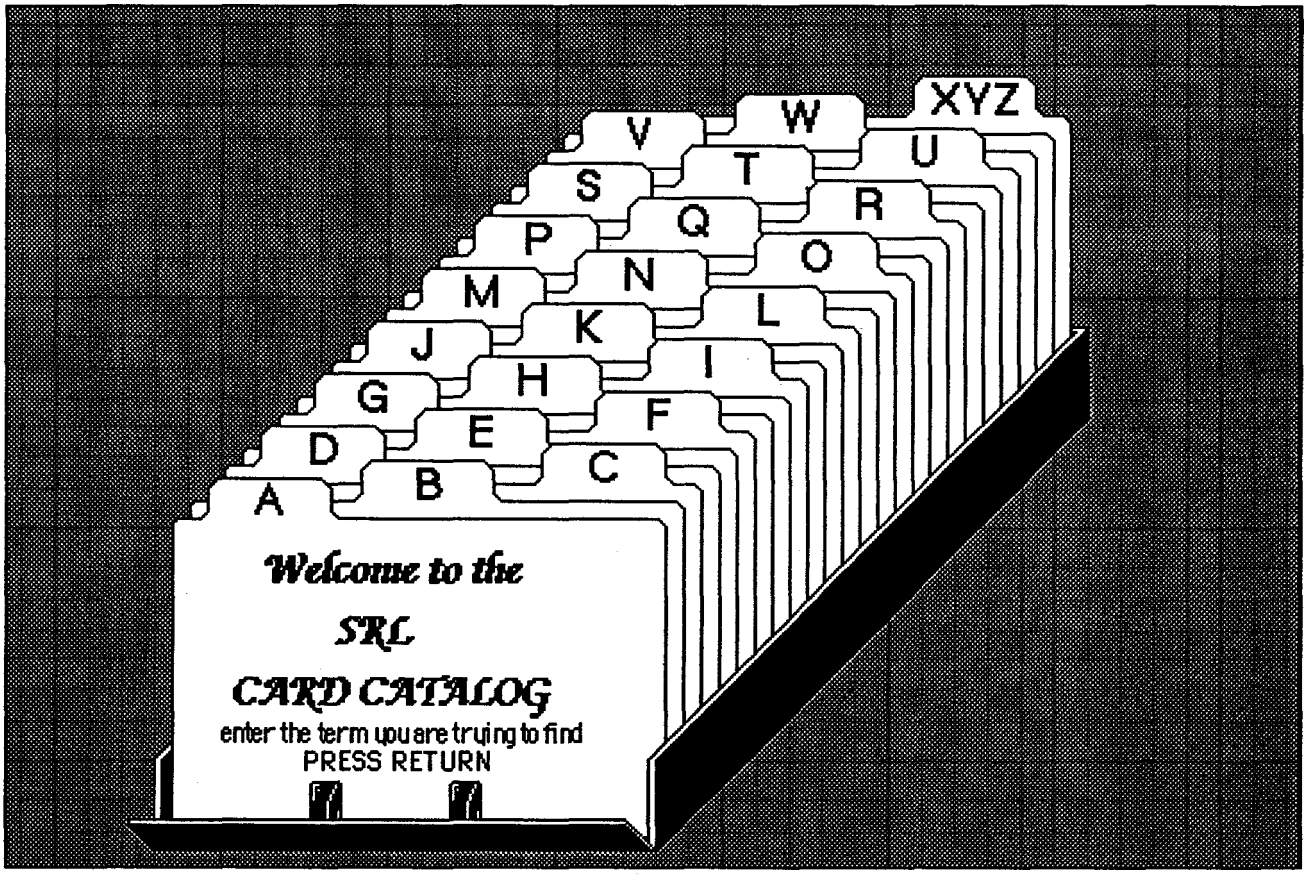
HyperCard was chosen as a backup system and as an alternative to the mainframe data base used to store the Library card catalog data. The HyperCard system allows library patrons that do not have mainframe accounts to access the primary card catalog information. An offshoot to this program has been a book labeling system for library acquisitions. When new library data is downloaded from the mainframe, in much the same manner as the Personnel Locator, adhesive labels for the new books are also created.

The primary data set that contains all of the card catalog information is a BASIS data base called TECHLIB. This data set resides on an IBM 3090 and as such can only be accessed by personnel that have active accounts on this computer. This posed a unique problem for the directors of the Technical Library because not all of the library patrons have mainframe accounts. Because of the secure nature of the mainframes on-site an on-line system was not practical. There were also times when the 3090 would be off-line for maintenance upgrades or network problems leaving the library patrons no means of referencing library data. The solution to both these problems was using a personal computer for the job. HyperCard was chosen.

The TECHLIB data base contains more information than is practical to put on a personal computer so pertinent information is first extracted, the call number, title, authors, publisher, subjects and series. This information is placed in a file on the IBM 3090. Because of the size of the file, 20,000 + records - about 5

megabytes, the standard data transfer method between the IBM 3090 and the Macintosh did not work. As a work-around, the TECHLIB file was fragmented and transferred in four parts. These downloaded with no problem. Once the data was moved to the Macintosh via All-in-1 on a VAX 8550 the file was recombined using HyperCard.

The Mac Backup, as the HyperCard stack is called by the Technical Library personnel, also allows the user to search by any string in the file, not just the index fields. Although no Boolean functions are allowed during the data search on the HyperCard stack, the search is accomplished quick enough to allow multiple searched within a few minutes.



Because of the size of the files involved, only new acquisitions are downloaded when updates to the file are needed. This update data is also used to create the book labels before it is added to the Mac Backup. The Technical Library personnel and the library patrons have been satisfied with the system and say that it is compares favorably in speed to the direct mainframe connection.

Technical Word List ...

The Technical word list was originally created to aid scientists and technicians at Savannah River Lab. It was published in a paperback reference manual and enjoyed favorable reviews. When the Macintosh became the personal computer of most commonly used by this group is was decided that the Technical Word list should be published electronically. The first publications was a simple word processing document. The end user would use the FIND function of their word processor and then COPY-PASTE the word or abbreviation that was needed. This worked well but was not as user-friendly as it might have been. It was decide that this might be a good application for HyperCard and the data was moved via a text file into HyperCard.

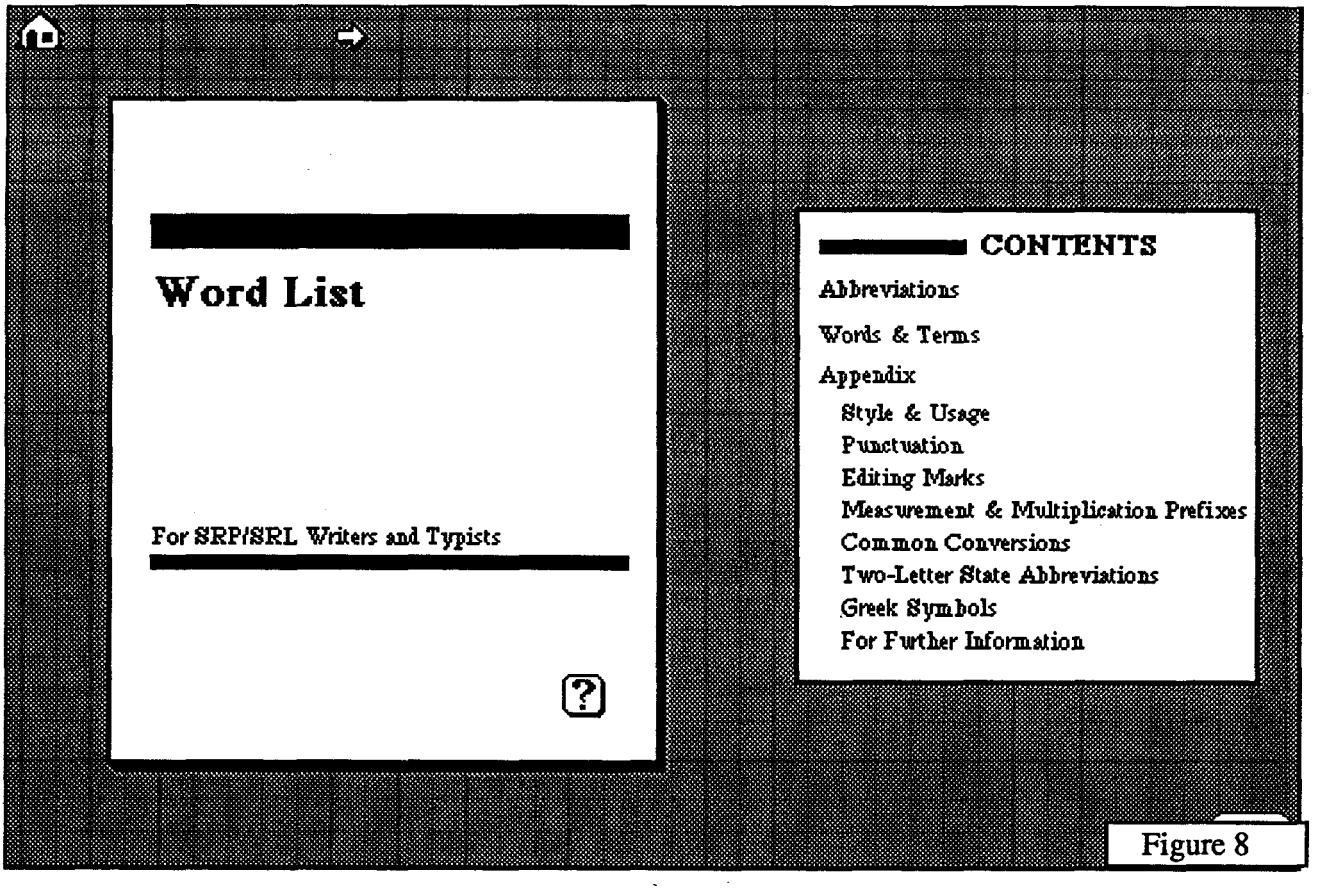


Figure 8

The word list contains information on abbreviations, technical words and terms, measurements, common unit conversions, and Greek symbols. The user would select the appropriate area from figure 7 with the Macintosh mouse and then use the HyperCard FIND function to locate specific information. Figure 8 is an example of a card containing abbreviations and their meaning. Once the user located the information of interest the data could be COPIED and PASTED in standard Macintosh fashion to other applications.

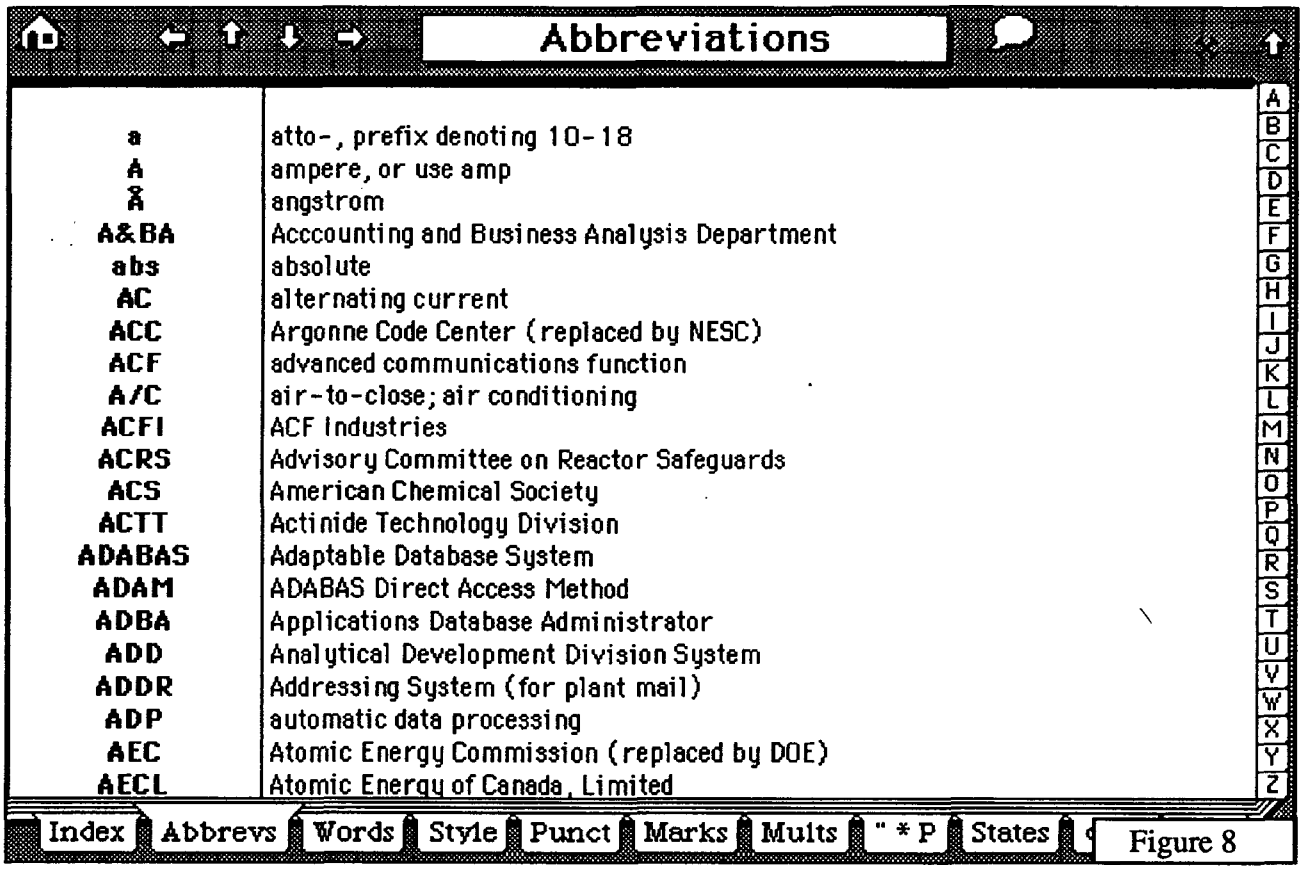


Figure 8

Conclusion ...

HyperCard has proven itself to be a very valuable tool in handling large amounts of data or when ease of use is of utmost imprtance. The system is very flexible and applications can be generated or modified with a minimum investment in manpower. When network and mainframe independence is a must, HyperCard on a Macintosh can be a very attractive and workable solution.

Acknowledgments ...

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C.T. Sutherland (T B&P) ... Mac Backup
Laura E. M. Flynn (Computer Systems Department) ... Personnel Locator
Philip L. Ames (Scientific Computations) ... Technical Word List