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Proceedings of the
27th Annual Military
Librarians' Workshop

Space Planning and Today's Technologies

Sheraton International
Conference Center
Reston, Virginia
12 - 14 October 1983

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The twenty-seventh military Librarians' Workshop was hosted by the Defense Nuclear Agency from 11-14 October 1983, at the Sheraton International Conference Center, Reston, Virginia. The theme was Space Planning and Today's Technologies. More than 170 military librarians participated in the various sessions. The workshop emphasized methods of reallocating present space to meet the changing demands of information technology.					
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SUMMARY

This was the twenty-seventh Military Librarians' Workshop since its beginning in 1957. These workshops play an important role in bringing together Department of Defense librarians and provide a forum for exposure to new developments of librarianship.

The objective of the workshop was to improve the effectiveness of librarians, and to explore new ways to better utilize space and improve services to the defense community. The attendees were able to take part in the various presentations and discuss new technologies and information available from industry.

These proceedings provide a useful record of the workshop and can be used by the participants in planning for the future.

INTRODUCTION

27th MILITARY LIBRARIANS' WORKSHOP
12-14 October 1983

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DEFENSE NUCLEAR AGENCY

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AGENDA

27th MLW MEETING LOCATIONS

TUESDAY - AFTERNOON - 11 OCT 1983

1630 - 2030	Registration - Lobby
1800 - 2000	Current Space Problem/Solution Exchange - Suite 420-2
2000	Executive Board Meeting - Suite 420-2

WEDNESDAY - 12 OCT 1983

0800 - 0900	Coffee and Registration - Lobby
0900 - 0930	Welcome - Room 1
0930 - 1030	Planning for Resource Allocation - Room 1
1030 - 1130	Managing the Physical Environment through Technology - Room 1
1130 - 1300	Lunch - Room A
1300 - 1430	Work Enhancers: Furniture for Today's Technology - Room C
1300 - 1430	Word Processing for Library Application - Room 3
1430 - 1500	Break
1500 - 1630	Word Processing for Library Application - Room C
1500 - 1630	Electronic Mail - Room 3
1800	Mid-Workshop Critique - Suite 420-2

THURSDAY - 13 OCT 1983

0800 - 0930	Intelligent Gateway for International Exchange of Information - Room 3
0800 - 0930	Presentation of GSA Requirements for Space Design and Planning - Room 1
0930 - 1000	Break
1000 - 1130	Local Area Networks - Room 3
1000 - 1130	Intelligent Workstations - Room 1
1130 - 1300	Lunch - Buffet in Main Dining Room
1300 - 1430	Intelligent Gateway for International Exchange of Information - Room 3
1300 - 1430	Presentation of GSA Requirements for Space Design and Planning - Room 1
1430 - 1500	Break
1500 - 1630	Local Area Networks - Room 3
1500 - 1630	Productivity Enhancement Project - Room 6
1800 - 1900	Reception - Poolside (weather permitting)
1900 - 2300	Banquet/Dinner and Dancing - Room A

FRIDAY - 14 OCT 1983

0800 - 1000	ADP Equipment Acquisition and Federal Requirements Room 1
1000 - 1030	Break
1030 - 1130	Federal Library Committee Report - Room 1 Service Wrap-ups Conference Wrap-ups
1130 - 1300	Lunch - Buffet in Main Dining Room

WELCOMING ADDRESS

by

MG Grayson D. Tate, Jr., USA
Deputy Director, Operations and Administration
Defense Nuclear Agency



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Greetings (Thank you Betsy . . . Good morning ladies and gentlemen.)

I appreciate this opportunity to welcome you to the 27th Military Librarians' Workshop.

We live in an increasingly complex society and we continue to develop means to explore and manage that society. Abundant resources - time, material, money, labor - have made the United States one of the most powerful countries in the world. Just recently, we have come to terms with the limits of our resources, and therefore our capacity. Bold and creative technological advances in this decade are changing the way we live, work and play.

The situation we are in reminds me of a story I once heard about an airline captain's announcement on one of those transatlantic flights. His voice suddenly came over the PA system. "Ladies and gentlemen," the pilot said, "I have some good news and some bad news. First, the bad news: we're lost. We don't have any idea where we are. Now, the good news: we have a two-hundred-mile-an-hour tail wind. IN OTHER WORDS, WE DON'T KNOW WHERE WE'RE GOING, BUT WE'RE GETTING THERE AWFULLY FAST."

In the information-handling business, it's becoming more difficult to stay on course . . . the information-handling job isn't getting any easier. Immediate retrieval and rapid communication of critical scientific and technical information to selected sources is essential. Evolving sophisticated communication technology continues to change the way we gather, disseminate, store and evaluate critical scientific and technical information.

Thanks to the establishment of libraries, the development of simple catalogs, sophisticated information storage and retrieval systems, the most modern text searching, word processing, and electronic systems, we can now respond to the never-ending evolving need to store and disseminate technical, scientific and strategic information.

There's always a small degree of comfort in being able to respond to those demands - reminds me of what the famous American, Satchel Paige, said. "Don't look back," he said. "Someone might be gaining on you."

I'd like to take a few minutes to explain the information-handling business at the Defense Nuclear Agency and tell you why we're in that kind of business.

I think it was Oliver Wendell Holmes who said, "When I want to understand what is happening today or try to decide what will happen tomorrow, I look back." DNA is the oldest Defense Agency - we've been in business ever since World War II when the Manhattan Project was created to oversee development of an atomic bomb. On July 16, 1945 the first atomic explosion occurred at Alamogordo, New Mexico. I remember that day well.

Afterwards, Dr. J. Robert Oppenheimer said, "We knew the world would not be the same." Almost three weeks later, atomic bombs were dropped on Hiroshima and Nagasaka, ending World War II.

After the war, the Atomic Energy Act of 1946 placed the responsibility of nuclear energy under civilian control. This resulted in two organizations concentrating on nuclear research and development. The first organization became the Atomic Energy Commission - they inherited the research, production and control functions from the Manhattan Project. The second organization became the Armed Forces Special Weapons Project and inherited the military personnel who had served in the Manhattan Project. Basically their mission was to support the Army, Navy and Air Force on atomic weapons issues by providing technical, logistical and training services.

In 1958, President Eisenhower's Reorganization Act redesignated the Armed Forces Special Weapons Project as the new Defense Atomic Support Agency. During the Kennedy Administration the internal structure and external relationships of the agency were reoriented and clarified. The last major change for DNA occurred twelve years ago during Johnson's administration - the Defense Atomic Support Agency was redesignated as the Defense Nuclear Agency, and again our mission was reoriented and streamlined.

The Defense Nuclear Agency today functions as a hub of nuclear effects and nuclear weapons activity. As the national focal point for all nuclear weapons effects research, it is not surprising that we produce and manage a vast amount of information.

DNA tends to be a mixture of both scientific research and management of scientific research performed by others. We gather weapons effects information both from field testing, from theoretical studies, from laboratory experiments, and from simulation. Reports and analysis of test and research results are compiled, analyzed and disseminated to appropriate agencies.

For example, sophisticated and complicated subjects such as superhard targets and satellite vulnerability are researched and studied and resultant technology is transferred to appropriate DOD developers and users. The survivability and credibility of our strategic and non-strategic forces depend upon this critical technology transfer. Obviously, effective storage, rapid retrieval and dissemination of information is essential.

We do not build bombs, but we're deeply involved in the entire life cycle process. While our primary concern is to determine the products of a nuclear explosion and effects of those products on systems and materials, we're also responsible for the worldwide protection of U. S. nuclear weapons, nuclear weapons safety rules, and management of the nuclear weapons stockpile. Also high on our list of priorities are nuclear weapons accident procedures and training doctrine, exercises simulating nuclear weapons accidents and even arms control negotiations.

DNA is staffed by members of each of the Military Services and a complement of civilian personnel. We maintain close liaison with all the Services, DOD components, the Department of Energy - the national scientific laboratories - and other Government agencies.

Our field and laboratory activities are conducted through two subordinate commands:

- o DNA's largest subordinate element is the Field Command at Kirtland Air Force Base, Albuquerque, New Mexico. As the agency's operational command, the Field Command constructs tunnels for underground nuclear weapons tests and test beds for high explosive tests. Using sophisticated computers, they keep track of all nuclear weapons, including the nuclear weapons stockpile, and operate a Joint Nuclear Accident Coordinating Center.

- o The second subordinate element of DNA is AFRRI - the Armed Forces Radiobiology Research Institute in Bethesda, Maryland. AFRRI functions as the sole DOD facility conducting scientific research in the field of radiobiology . . . in our case, we're concerned with the effects of ionizing radiation and how it affects the ability of military personnel to operate in a variety of combat situations. Over 90% of the Western world's radiobiology research can be attributed to AFRRI. This research is conducted through experiments that depend upon the use of radiation sources including a small, scientific TRIGA reactor . . . a standard research-type reactor similar to those used in many large medical centers.

DNA employs many of today's technologies that you will discuss during this workshop - things like sophisticated computers and networks, word processors, and efficient storage methods.

These new technologies enable us to perform research, record data and disseminate information to the nuclear weapons effects community.

For example, the DNA Scientific Computational System includes a nationwide telecommunications network with computer facilities at Los Alamos Scientific Laboratory and, at Headquarters. Contractors and government organizations who work for us and with us use these highly sophisticated computers to analyze data and simulate weapons effects. Research results are then published and distributed in DNA technical reports. These reports are both classified and unclassified.

DNA's Technical Library is indeed unique . . . it comprises one of the most comprehensive collections of nuclear weapons effects information. This collection is both the result of DNA research as well as the result of research performed by other organizations involved in nuclear effects research - organizations like the Air Force Weapons Laboratory and the Naval Research Laboratory. The Library Staff at DNA uses computers to store, retrieve and disseminate information in the collection. Access to commercial on-line data bases such as DIALOG, NEXIS, and DROLS is available . . . word processing equipment allows for efficient and timely responses to requests for information . . . mobile shelving systems provide for the most efficient use of space. The staff is highly motivated and service-oriented.

The Technical Library plays a vital role in DNA's research efforts . . . the staff provides services not only to DNA and other authorized government organizations but also to our contractors. By providing information to support the research efforts of our contractors, we believe that the Technical Library enhances our final product - the DNA technical reports.

The DNA Technical Library staff has been heavily involved since the beginning of the NTPR, not only in the research part, but also in the effort of declassifying and making as much information as possible available to the public. Also, the library has been instrumental in developing a special computerized data base in order to provide a program status to congress.

Now - six years later, we have an extensive data base . . . or library of information . . . that is available to veterans, historians, the press, the Veterans Administration, the Services and the American public.

Other activities of the DNA Technical Library include compilation of DNA historical reports and research for responses to Freedom of Information Act requests. I suspect that all of you have experienced the surge in the number of FOIA requests that we at DNA have experienced.

Some of you may have heard about one of our more recent information-gathering programs called the NTPR - or Nuclear Test Personnel Review Program. This careful and extensive study into the atmospheric nuclear testing program began in 1977 after the Centers for Disease Control became interested in the adverse health effects related to radiation exposure of former test participants. DNA, who was appointed as the DOD NTPR Executive Agent, was tasked with implementing the program in order to assist the veterans that were exposed to radiation during the atmospheric testing era. The scope of the program includes:

- o developing a personnel history of the 235 atmospheric tests;

- o compiling a roster of DOD personnel involved in the tests;

- o declassifying all possible nuclear test related documents which pertain to the tests; and

- o providing radiation exposure data or reconstructed exposure data where data is either missing or incomplete to the veterans.

DNA also maintains an information and analysis center known as DASIAC in Santa Barbara, California. DASIAC was established in 1961 as a DOD focal point for information and data on nuclear detonation phenomenology and nuclear weapons effects on tactical and strategic military systems. DASIAC maintains a large collection of nuclear effects documentation and data, analyses and reviews of weapon effects theories and models, state-of-the-art surveys, and environmental impact studies related to DNA/DOD actions.

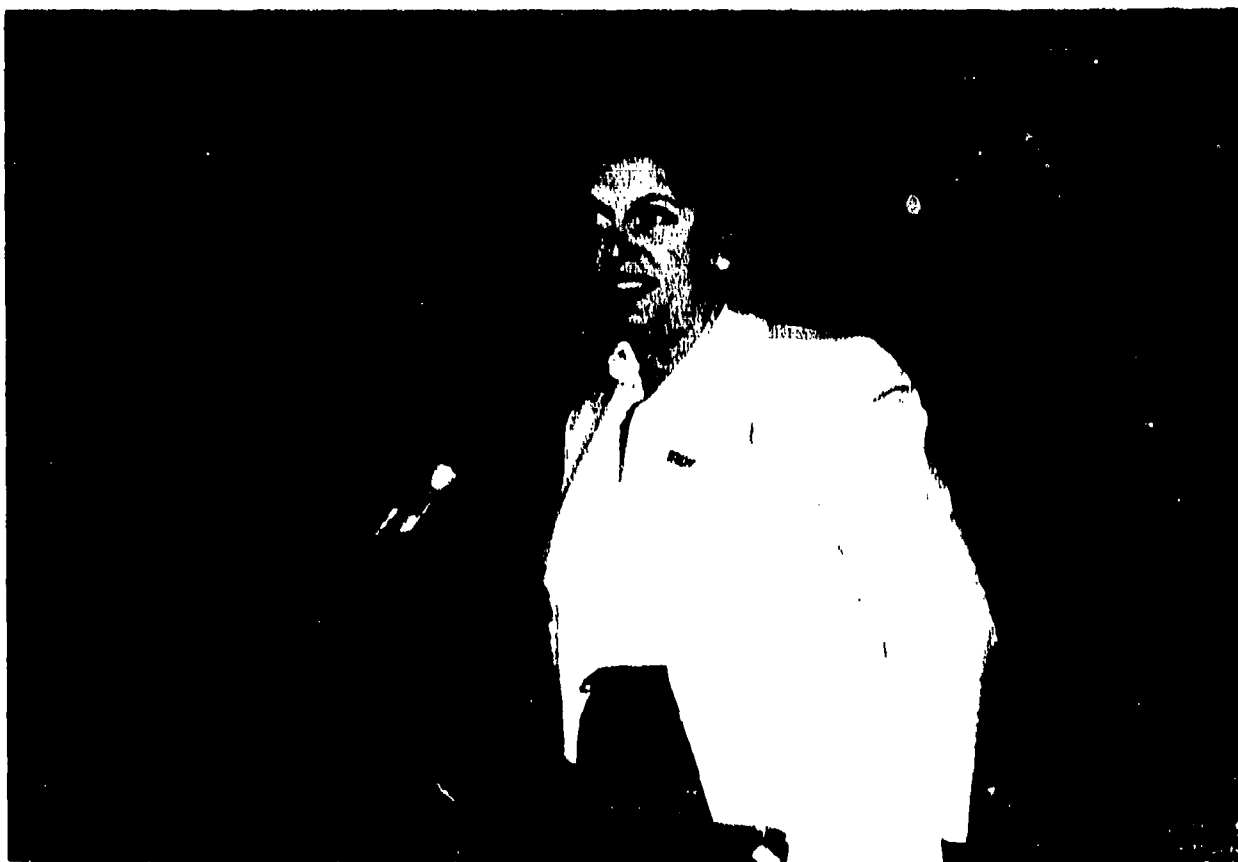
As you can see, information is a vital part of DNA's business. I am pleased that DNA has the opportunity to host the Military Librarians' Workshop. I am confident that the Program will provide a stimulating learning environment and that technical information activities at your own organizations will be enhanced by your participation here.

I leave you with a simple story - the great French scientist, Louis Pasteur, reached the height of his career when at the young age of thirty-two, he became a professor and dean of the newly formed Faculty of Science in the then-established University of Lille. At his inaugural lecture a mass assemblage of students, scientists, and professors were waiting. At the close of his speech, he mentioned that a new era of prosperity was about to blossom for the Faculty of Science in chemistry, electricity, and physics. He called on the young people to answer this call to the service of mankind and spoke of the challenge and contributions that awaited their enlistment. He said that training must be afforded to match this idealism of the French youth. To them he said, "Chance favors only those minds which are prepared."

AUTOMATION AND SPACE

(SYNOPSIS OF SPEECH FOR
MILITARY LIBRARIAN'S WORKSHOP)

PRESENTED BY
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The population is aging and the change in our nation's demographics is substantially impacting library facility planning. As people age they become more knowledgeable and more demanding. One effect is that librarians find themselves constantly defending their facility planning decisions. Patrons and staff rarely accept anyone's plans without question. The result is to lengthen the planning process and, in many organizations, constantly question layouts even after they are implemented. Second guessing has become a library industry pastime.

An aging population also implies more library staff members who are psychologically geared to take the next step up the management ladder. Unfortunately, the next step is blocked. Too many co-workers are already standing on it. Besides, the top is packed by those who refuse to retire. In the affluent, intellectual sections of our society "meaningful" work is now considered one of the keys to emotional success. This fairly recent phenomenon has caused many library managers and executives to choose work over retirement which in turn results in dissatisfaction in the ranks. Methods, therefore, have to be taken to recognize achievement by the rank and file; certain perks have to be handed out. Among those perks are better working conditions. Indeed, over the last few years or so, the conditions in the staff work areas have gotten better. Even the lounge areas have gotten better. The whole place is much more "human."

Of course, better working conditions can also be related to the fact that as a whole, the entire nation has gotten richer, and everyone is better educated. Today's average American worker

has attended school for approximately 11.5 years. The overwhelming majority of professional librarians have their MLS. Quite a few have a second masters in another subject.

Indeed, a good educational background and a willingness to constantly retrain increasingly appears to be another one of the essentials for achieving success in our society. Because of the many new things that must be learned, today's successful people are always attending school, or workshops, or conventions loaded with seminars. Not only do the vast majority of citizens recognize the worth of education, but a case can be made that America's educated mindset is the root cause to the steady loss of its smokestack and sweatshop industries. Educated people do not want to be exploited.

Of course, until the robots become more available, cost effective, and simple to install and use, our nation's smokestack and sweatshop industries will continue to utilize masses of unskilled and semi-skilled workers. These workers must use their backs and their hands to earn their pay; the work is hard and dirty. But the education -- at least in the United States (and other western industrialized nations) -- emphasizes intellectual pursuits over brute force. The result is to train people so that they want to work in such places as offices and libraries, and not in mills or sewing industries. Americans, on the average, want white collar jobs. To entice them to take the blue collar ones, we have to pay them more money. That is why journeymen painters make \$18/hour in certain cities in the U.S.A. Add to

that wage the cost of benefits and equipment operation and the hourly rate comes up to \$30! Because such wage scales are so out of kilter with that offered by the Third World, low level blue collar jobs are migrating to Southeast Asia, Africa and India -- wherever the wage scale tends to be relatively cheap.

But what does the migration of blue collar jobs to the Third World have to do with library facility planning in the United States? First, the educated mindset is causing the routine and dreary tasks to be phased out of library work processes. This means that facilities have to be designed for people who work creatively together and, at the same time, need privacy to concentrate. Second, an increasingly educated library workforce is very knowledgeable about its rights. Librarians read the facility planning literature available to them. They are quick to pipe up about the possibility of danger from radiation created by common office equipment, or the poisonous gases that may be broadcasting from the ventilation system, or human factors engineering necessary in the design of their own workstations.

Today's rank and file librarians want a piece of the decision-making pie. They refuse to sit idly by and let other people make the decisions as to how and where they should work. That explains why our library management styles have slowly but surely been changing from rigid hierarchical trees to more free form clustered groupings (often known as matrix management). This has caused chaos in many organizations. In some of our larger libraries people no longer know to whom they report and have not known for at least six months. Their organization's reporting

system has been revamped so many times in the preceeding two or three years that they have simply lost track of their boss.

Every facility planner knows that this situation adversely affects layout and design. After all, facilities are nothing more than reflections of management decisions and style. Each time a new boss arrives, the place is redesigned. It may take a while, but sooner or latter it happens; the new manager must make his or her mark on the working environment. Furthermore, a hierarchical management tree demands one type of design, while a matrix management grouping demands another.

For example, a hierarchical tree tends to require carefully regulated space and furnishing standards. At our huge governmental libraries standards are often such that the clerk on the lowest grade level receives, say, 37 square feet, which amounts to one metal desk and one secretarial chair; while the next level clerk receives 45 square feet, one metal desk, one run off and a secretarial chair; and so forth and so on.

But matrix management does away with so many standards; it is much more democratic. You see this more often in corporate American than in governmental America. Today, some corporations have facilities with only four or five space standards to house everyone from the lowest grade level library clerk to the division president. And the space layout is clustered. No longer do all the senior people have their workstation on the penthouse floor of the building and the junior ones down in the dungeons, but instead they are intermixing according to related functions.

Of course, there is yet another major trend affecting library facility planning and design, and for the majority of the patrons and staff, it is the most noticeable. This trend revolves around automation. Because of automation libraries are changing from relatively passive facilities to very active ones. Where once the cataloging function was considered the heart of the library, reference service is now moving into that central locus. Libraries are emphasizing information delivery rather than information access.

In the information access mode, librarians collect the books, journals and documents they think their patrons need or should need now or sometime in the future. The patrons are then welcome to come into the facility and find the materials by themselves. Yes, they can ask the reference librarian for help, but a surprising number don't even know a reference librarian exists. In fact, they don't even know technical processing exists; they think the stacks get filled by themselves.

Information delivery is geared to the marketplace. Patrons get what they need when they need it at the place they want it (at their desks or in their homes, for example). Information delivery centers around a staff of specialists who make deliveries happen -- and who enjoys dealing with patrons who constantly ask questions! It implies a substantial increase in the operating budget. There's so much more expensive equipment and the people working in the library are also expensive -- that's why they are called information specialists rather than just plain

librarians.

Here it has to be noted that automation is not a trend unto itself. Although it can be directly attributeable to advances made in the electronic industries, it can also be linked back to those changes spoken about before -- the changes in national demographics and the requirements of an increasingly educated workforce. The changes in demographics promise zero population growth by the year 2000. This implies fewer entry-level library clerks and technicians. They are just not being born. Fortunately automation does away with the need for so many clerks and technicians; that's because it does away with the routine, mindless and dirty jobs nobody wants or likes.

Of course, the clerical job shed does not just affect libraries. It affects every working environment. In fact, this change to an automated society is setting up a very serious situation for our nation. In this age of transition, the nation is being divided into the winners, losers and the superfluous. The winners are those who are educated, are constantly being retrained and can step into new white collar jobs as automated equipment takes over. The losers are those who had the skilled or semi-skilled jobs in blue collar fields which migrated to Third World countries. These people will continue to work, but they will no longer have the same pay or even status that they once had. The problems of the superfluous are the most frightening. This last group consists of the unskilled (once considered the exploited masses), who now make up the hardcore

unemployed. They don't have a job and have no hope of ever getting one.

Indeed, changes in our society can be likened to two caricatures of work depicted in two famous movies: MODERN TIMES, starring Charlie Chaplin, and SLEEPER, starring Woody Allen. In the first, the poor worker becomes nothing but a cog in a giant wheel. In the second, the masses are kept stupid and happy by a small coterie of people who do real work and run the world. Of course, it will not get as bad as that, but the second is a probable future in light of current events. This brings us to another point.

Since the end of World War II, organizational America has been on a hiring rampage. It could absorb the increased number of workers brought about by the baby boom and women entering the workforce. But now that ability to hire so many people is about to end and zero population growth in tandem with automation are the reasons. The huge numbers of people are no longer available, nor are they needed. One New York based high tech corporation, for example, had 126,000 workers in 1972 and has only 86,000 today, even though it added an entirely new marketing and sales force in the interim!

If the above figures are accurate, it implies that more organizations will soon be doing the same. In fact, there has been an effort to limit the head count by many of them. In segments of corporate and bureaucratic America it is far easier to add new equipment than new workers. Furthermore, many

organizations are sub-contracting out work; they hire small firms to hire temporary workers for certain jobs to be accomplished on site. To the casual visitor walking around these sites, the sub-contractors look and act the same as the regular corporate employees, but there is a very big difference. Corporate accountants do not have to worry about the sub-contractor's pay scales and benefits while corporate facility planners do have to make sure the workstations are to standard. Both tactics save the organization a great deal of money.

This move to hire temporary workers in some ways impacts the accommodations of regular corporate employees. Permanent employees are adjusting to the fact that there are more people working part time. Part-time workers are usually assigned to smaller workstations and are assigned a different location each time they come to work. Consequently the permanent employees become accustomed to smaller workstations and even accept them for themselves.

But another situation has developed. Upper level people "float," especially executive level library workers. Most of them have at least four workstations: their regular desk and chair in the office (where they do their regular work); a reserved workstation in the conference or executive dining room (to hold special meetings); at least one "serendipitous" workstation in the corridor, cafeteria, library, company gym, or at a convention (where they find out what's happening or ask important questions); and last, but not least, a workstation at home.

Middle level library workers also have four workstations: their regular one in the office, the shared one in the patron area, the serendipitous one in the corridor, cafeteria, convention, etc. and their shared one at home. The lowest level library people tend to have just one workstation: an assigned desk and chair. In fact, in libraries today, while the executive and middle level workers are running around like crazy, the lowest level ones are desk bound.

The fact that so many of the important people have more than one workstation has caused many libraries to spend more money on the amenities. In the last five to ten years library buildings have been constructed which feature attractive atriums, lush gardens, and the like. The implication of the discussion is that they are doing this not only for their patrons, but for their staff as well.

Of course, the needs of the patron should always be paramount. In fact, the switch from information access to information delivery emphasizes just that. Information delivery is obviously changing the work to be done. This is causing libraries to change service patterns substantially, but facility planners are only told about this reorganization after the fact. They are rarely part of the planning process. Since facilities are reflections of the work to be done in an organization -- and at the same time modify the work -- the fact that facility planners are not part of this planning process is counter-productive. Libraries are very equipment intensive; in this day and age the choice and layout of equipment modifies the work to be done. If

equipment is placed so that the flow of work is illogical, the work is seriously affected. Furthermore, the equipment is always being changed. If the library facility is designed so that it is not flexible enough to take constant change into consideration, hard to get funds may be spent wastefully.

The management planning process and the facility planning process ought to be integrated. Facility planners should be aware that a floor with a thousand microfiche filing cabinets will be replaced in the long run by a computer room housing a main frame, the requisite disk drives, telecommunications equipment, terminals and cables linking terminals and optical disk readers throughout the building. For that matter the facility planners should also be aware that the two filing cabinets in a particular staff office contain material that is already up and running on a microcomputer and, therefore, can be immediately removed.

Second, facility planners must recognize that in an era in which automation is new, people complain about their working conditions and with good reason. A workstation designed for automation is substantially different from one that is designed for paper tasks.

Paper is light and easily manipulated to accommodate the individual worker and his or her working preferences. But machines are very different. Most automated equipment is bulky. Some computer terminals -- those with built-in high speed modems -- are 2-1/2' wide by 2-1/2' deep. Furthermore, computer terminals come with screens, keyboards and other peripheral de-

vices. The individual worker must now accommodate his or her body to the equipment instead of vice versa.

For example, a typical word processing operator works with a dictaphone in tandem with a computer terminal. In the normal working situation the word processing operator's ears are plugged up by the dictaphone earphones, eyes are glued to the video display screen, hands are keystroking on the keyboard, backside is situated on the chair, and one leg is manipulating the dictaphone treadle (while the other leg is free). In a situation such as this, no wonder the word processing operator complains about burning eyes, a headache and a sore back! If that operator is to be made more productive, he or she must be made comfortable.

Comfort can be achieved by purchasing ergonomic furniture that has been designed to take these tasks into consideration. Here it must be noted that in a transitional time such as this, the advent of electronic equipment does not mean the banishment of hard copy. Electronic equipment is usually installed in addition to the hard copy storage units. Indeed, one head of records management noted a 15% increase in the amount of paper to be filed because of all the additional computer print-outs.

Another fact that should be noted is the sudden plethora of electronic equipment. Gadgets beget gadgets. The number of electronic pencil sharpeners in the white collar sector has grown substantially these last few years. A good planner designs for the addition of electronic gadgets. An information manager, for example, may have on the desk one or more video display screens, a

microform machine, task light, and a four line electronic memory telephone. At the very least 6 outlets per mid-level librarian may be required; in some facilities 8 outlets are necessary.

Here it should be noted that people often require two or more video display screens on their desks. They need more than one because: a) an information service to which they subscribe requires the lease of specific equipment, or b) they may have to check large chunks of information from two or three sources and it's simply easier to display that information simultaneously.

But let us return to the subject of comfort. The office furniture industry has been concentrating on this area. Quite a few companies offer ergonomic office furniture lines, some of which sport all the bells and whistles. In the past year or two, the computer manufacturers have been designing ergonomic machines. The CPUs are becoming smaller and lighter in weight. Indeed, there are several microcomputers on the market that can handle up to 100 terminals! The display units are also becoming thinner. Soon the information on an entire 8-1/2" x 11" page will be displayed on a screen thin enough to hang on the wall, or take and hold in one's lap. A few of the smaller liquid crystal display screens can already handle one third of a page, although their visual display resolution is not up to standard. Many video display screens on the market today have exceedingly good resolution and have gone a long way toward removing the worst problems of glare. Others swivel, tilt and telescope so that operators make them much more comfortable to use. Keyboards

are also becoming thinner and are designed better. Some key-boards are attached by long electrical tethers or are completely unattached. They communicate with their CPUs using infrared rays. Operators have been known to keyboard in their laps!

The point is, then, that although the facility planners are taking the tact that the furniture industry will solve the problems, these same problems may be solved by the computer manufacturers themselves. Many of the situations that are considered difficulties today may simply go away.

Then, too, although keyboarding is becoming easier, in the future in a variety of situations it promises to be phased out. Within the next ten years substantial amounts of information will be inputted directly utilizing optical readers or voice recognition systems of one sort or another. If there are problems with noise in today's library environments, what will happen in years hence when people are expected to talk to their machines?

The library of the future may be very different than it is today. We are just entering into a video revolution. Like Captain Kirk of the Enterprise we may not only converse with our computers, but their answers may encompass giant pictorial displays. Indeed, optical disks which contain a substantial amount of important equipment accessible by computer technology are already on the market. They are being vended in a variety of technical and medical fields.

Which brings us to a final point: facility planners must understand the difference between how information is transmitted

in a paper-based society and an automated society. In a paper-based society, information is transmitted on a one to one basis: you send me a letter and I read it or you write a book and I read it. In an automated society, information can be transmitted to a variety of people simultaneously: you transmit information to me and I and my co-workers look at it at the same time. The reason is simple. It is hard for two people to read one letter simultaneously, unless two copies are made. It is simple, however, for two or more people to read a video display at one time. Furthermore, because of the nature of the electronic technologies, print or pictorial copies can be flashed simultaneously on any number of screens. Thus, more and more people can have access to the same information. This means that integrated planning efforts between management and facility planning groups promise to become the norm rather than the exception.

**Managing the Physical Environment
Through Technology**

Presented By

**Mr. John White
Vycor Corporation**

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MANAGING THE PHYSICAL ENVIRONMENT THROUGH TECHNOLOGY

SUMMARY OF PRESENTATION: JOHN WHITE, VICE PRESIDENT VYCOR

NEW TECHNOLOGIES HAVE EVOLVED WHICH CAN BE APPLIED TO FACILITIES MANAGEMENT AND SPACE PLANNING. THESE SYSTEMS ARE A STEP BEYOND COMPUTER PROGRAMS THAT CREATE SPREADSHEETS AND CHARTS OR DO COMPUTER-ASSISTED DESIGN (CAD), THEY COMBINE BOTH OF THESE FUNCTIONS WITH POWERFUL INTEGRATED DATABASES. THUS, THE SYSTEMS DELIVER COMPLETE FORECASTING, PLANNING MANAGEMENT AND COMMUNICATIONS INFORMATION IN GRAPHIC AND TABULAR FORMATS, ON VIDEO MONITORS OR IN HARD COPIES, WITH AS MUCH DETAIL OR SUMMARIZED DATA AS YOU REQUIRE. THEY PRODUCE SCALE DRAWINGS WITH NUMEROUS LEVELS OF DETAIL IN FAR LESS TIME THAN A SKILLED DRAFTSMAN.

THESE SYSTEMS INTEGRATE FACILITY MANAGEMENT WITH OVERALL CORPORATE OR ORGANIZATIONAL PLANNING INFORMATION FROM PERSONNEL, PURCHASING, DEVELOPMENT AND ANY OTHER DEPARTMENTS TO PRODUCE EASY-TO-USE, EASILY UPDATED INFORMATIONAL TOOLS.

USING POWERFUL RELATIONAL DATABASES AND ADVANCED COMPUTER GRAPHICS, THESE SYSTEMS GIVE USERS THE ABILITY TO:

- O PROGRAM IMMEDIATE SPACE REQUIREMENTS FOR SPACE PLANNING
- O ESTIMATE FUTURE SPACE REQUIREMENTS BASED ON DEPARTMENTAL PERSONNEL PROJECTIONS
- O TRACK CURRENT SPACE UTILIZATION

- O ESTABLISH A RECORD OF SPACE UTILIZATION FOR USE IN REFINING CURRENT AND PROJECTED SPACE ALLOCATION PROGRAMS
- O PREPARE COMPUTER-GENERATED BUILDING STACK DIAGRAMS IN FULL COLOR
- O CREATE AND UPDATE BLOCK-TYPE FLOOR PLANS IN FULL COLOR
- O PREPARE COMPUTER-GENERATED COLOR BUSINESS GRAPHIC (E.G., LINE GRAPHS, BAR GRAPHS AND PIE CHARTS) THAT RELATE TO NEEDS OF BOTH THE FACILITIES MANAGER AND MANAGEMENT IN GENERAL
- O MANIPULATE INPUTTED DATA TO MEET SPECIFIC NEEDS BY UTILIZING THE RELATIONAL DATABASE MANAGEMENT SYSTEM AND A STATE-OF-THE-ART REPORT WRITER.

ONE SUCH SYSTEM THAT I WILL ADDRESS TODAY HAS FOUR MODULES WHICH TOGETHER BUILD A DATABASE THAT INTEGRATES INFORMATION FROM MANY DIFFERENT SOURCES. IT PRODUCES VALUABLE REPORTS OF REAL AND POTENTIAL SITUATIONS FOR PLANNING AND CONTROL. THESE MODULES AND THE REPORTS THEY ARE ABLE TO DELIVER ARE DESCRIBED BELOW:

FORECAST.

THE FORECAST MODULE DEALS WITH EXISTING FUNCTIONAL WORK FLOW AND ORGANIZATION AS WELL AS THE ANTICIPATION AND ANALYSIS OF FUTURE REQUIREMENTS. THE DATA IT CONTAINS REFLECTS THE ORGANIZATIONAL CHART OF A COMPANY OR AGENCY, AS WELL AS DETAIL ON WHERE PEOPLE ARE, WHAT SPACE AND EQUIPMENT THEY USE, WHAT SPATIAL RELATIONSHIPS THEY HAVE TO EACH OTHER, AND WHAT ALTERNATIVES FOR THEIR PLACEMENT AND USE YOU WILL HAVE FOR THE FUTURE.

THE INFORMATION ON WHICH FORECAST PROCESSES AND PRODUCES REPORTS MAY INCLUDE:

- 0 DEPARTMENTAL NAMES AND TABLE OF ORGANIZATION
- 0 PERSONNEL JOB TITLES AND CODES
- 0 EQUIPMENT TYPES AND CODES
- 0 CORPORATE OR GSA SPACE STANDARDS FOR PEOPLE, EQUIPMENT AND SUPPORT
- 0 PROJECTION YEARS (TO NEAREST MONTH)
- 0 SPACE REQUIREMENT PROJECTIONS
- 0 MODIFIERS (CIRCULATION OR ACCESS, USABLE TO RENTABLE, RENTABLE TO GROSS PLANNING CONCEPTS)
- 0 ALTERNATIVE GENERATION.

SPACE PLANNING.

THE SPACE PLANNING MODULE ALLOWS FOR THE CREATION OF DRAWINGS WHICH DISPLAY INFORMATION ON CURRENT CONDITIONS AND FUTURE FACILITY AND SPACE REQUIREMENTS. THE MODULE KEEPS TRACK OF REAL AND ALTERNATIVE SITUATIONS THROUGH FULL COLOR, HIGH-IMPACT GRAPHICS THAT CAN BE PRODUCED EASILY AND QUICKLY.

REPORTS THAT MAY BE GENERATED INCLUDE:

- 0 BUILDING PLANS
- 0 GRAPHIC BLOCK ALLOCATIONS OF RENTAL/OCCUPANCY PLANS BY ORGANIZATIONAL UNIT
- 0 FURNITURE AND OFFICE LAYOUTS
- 0 MECHANICAL, ELECTRICAL AND TELEPHONE LAYOUTS

FACILITIES MANAGER.

USING A POWERFUL RELATIONAL DATA BASE AND REPORT WRITER, THIS MODULE PRODUCES COMPREHENSIVE INVENTORIES OF SPACE, PEOPLE, EQUIPMENT, FURNITURE AND REAL ESTATE, AND PROVIDES HISTORICAL SUMMARIES OF CHANGES TO CURRENT CONDITIONS AS THEY ARE MADE. THE DATA CONTAINED IN IT IS ALSO MADE AVAILABLE TO THE SPACE PLANNING AND FORECAST MODULES FOR THEIR COMPUTATIONS AND REPORTS.

THE INFORMATION HANDLED BY THE FACILITIES MANAGER MODULE INCLUDES:

- O BUILDING ALLOCATIONS
- O FLOOR ALLOCATIONS
- O DEPARTMENT ALLOCATIONS WITH ORGANIZATIONAL MATRIX
- O PERSONNEL LISTINGS AND ALLOCATIONS
- O FURNITURE AND EQUIPMENT INVENTORIES AND LOCATIONS
- O SHARED, COMMON OR SPECIAL SPACES
- O REAL ESTATE COSTS (RENT, AMORTIZATION, CHARGEBACKS)
- O HISTORICAL SUMMARIES OF TRENDS
- O BUILDING CONDITIONS
- O WORKPLACE DISTRIBUTIONS
- O FUNCTIONAL ADJACENCIES DISPLAYED IN STACK, BLOCK AND FLOOR
PLANNING
- O CROSS SECTION (BUILDING STACK) PLANS
- O GRAPHIC SYMBOLS FOR ARCHITECTURAL AND FURNITURE COMPONENTS
- O ECONOMIC ANALYSIS OF GRAPHIC SYMBOLS AND SPACE STANDARDS ATTRIBUTE
DATA

- O EQUIPMENT CATALOG ITEMS AND IDENTIFICATIONS
- O GROSS, RENTABLE, USABLE, ALLOCATIONS AND BLOCK CALCULATIONS
- O MULTIPLE DRAWING LAYING IN
- O DEPARTMENTAL SPACE ALLOCATION REPORTS IN STACK AND BLOCK PLANNING

BUSINESS GRAPHICS.

THIS MODULE TRANSLATES THE DATA FROM THE OTHER THREE MODULES INTO COLOR CHARTS AND GRAPHS. THESE ARE THEN DISPLAYED ON VIDEO COLOR GRAPHICS SCREEN, OR PRODUCED AS COMPUTER-GENERATED HARD COPY IN 35MM SLIDES, 8"x10" TRANSPARENCIES OR POLAROID, 8 1/2"x11" FULL COLOR DRAWINGS OR XEROGRAPHIC COLOR COPIES.

THE CAPABILITIES OF THIS MODULE INCLUDE:

- O PIE CHARTS
- O BAR CHARTS
- O LINE CHARTS
- O RATIO (SEMI-LOG OR FULL-LOG) CHARTS
- O GENERAL ACCOUNTING-TYPE LIST CHARTS
- O ORGANIZATIONAL CHARTS
- O GENERAL NON-FORMATTED CHARTS AND GRAPHICS

INFORMATION IS ENTERED INTO THE SYSTEM, WHICH THEN COMPUTES AND CREATES THE ACTUAL GRAPHIC FORMATS. NO DRAWINGS ARE DONE BY HAND; DETAILED SCALE FLOOR PLANS, CHARTS AND GRAPHICS ARE PRODUCED FROM DOT MATRIX PRINTERS AND PEN PLOTTERS.

AS YOU CAN SEE, THE USE OF SYSTEMS SUCH AS I HAVE DESCRIBED WILL ALLOW US TO BETTER UTILIZE AND MANAGE OUR SPACE.

**Work Enhancers: Furniture and Shelving for
Today's Technology**

Presented by

**Mr. Gary Stevenson
and
Mr. James Billings
Haworth System Furniture and Columbia Business Furniture
and
Mr. Karl Warner
Spacesaver Systems, Inc.**

(Presentation not available)

Summary

One of the problems facing libraries today is the choice of space saving equipment that will improve the efficiency of library operations and have expandable functional use for the future. This problem was addressed by those familiar with space utilization and the advantages of today's modular furniture and mobile shelving. Economical considerations were given.

Word Processors For Libraries

Presented By

Ms. Connie Baker
CPT Corporation

and

Mr. Robert Cheatham
IBM Corporation

and

Mr. Lee Power
Federal Library Committee

(Presentation not available)

Summary

The process of getting things done more quickly, economically, and accurately is now much easier with word processing. The benefits that can be attained through high productivity and the various ways of using word processing in libraries were discussed in detail.

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Electronic Mail

Presented By

LTC K. Griffin - HQ DA Administrative Systems
Directorate, Operational Management Information System (OPTIMIS)

(Entire presentation not available)

With the proliferation of electronic technology, we have the capability to put a message into a system to anyone who uses that system, send it to them, and have them receive it instantly. The message can also be stored in an electronic mailbox, so a person can sign on the system and retrieve it when they desire. It tells who it is from, when it was sent, the subject, and the entire message. When this is done, the person has the option of answering immediately or acknowledging receipt more quickly than the regular mail system. The OPTIMIS System makes this available along with many other features. The slides and the explanation of the mail module, that were handed out during the session, are provided.

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HEADQUARTERS, DEPARTMENT OF THE ARMY

OPERATIONS MANAGEMENT INFORMATION SYSTEM

OPTIMIS

THE HQ DA STAFF OFFICER'S FRIEND

OPTIMIS CAPABILITIES

- **RESEARCH**
- **REDBOOK**
- **ELECTRONIC MAIL**
- **DOCUMENT SUSPENSE CONTROL**
- **TEXT EDITING**
- **SPELL**
- **CALCULATOR**

OPTIMIS

TRAINING

- **MODULES AND UTILITIES**
- **INDIVIDUAL OR GROUPS**
- **TERMINALS**

ACCESS

- **TELEPHONIC**
- **USERNAME AND PASSWORD**
- **USER MANUALS**
- **TERMINALS OR COMMUNICATING WORD
PROCESSORS**

OPTIMIS

- **ASSISTS COMMUNICATION WITH COUNTERPARTS**
- **GIVES YOU MODERN OFFICE TOOLS**
- **HELPS YOUR TIME MANAGEMENT**
- **MAKES YOU SMARTER**
- **COSTS YOU NOTHING**

MAIL MODULE User's Manual

1. The user signs on (see SIGN ON GUIDE for assistance) and the system displays its welcome message. If user has received new mail, the system displays:

You have 1 new Mail message.

2. The system prompts you with a dollar sign:

\$

3. To enter the MAIL MODULE simply type MAIL and hit the "return" (CR) key. The system will respond with:

\$MAIL <CR>

You have 1 new message.

MAIL>

4. To receive a complete list of messages in your file, that has already been read, you type DIRECTORY or DIR.

MAIL>DIR<CR>

If the user wants to see only the new messages, he hits the return key after MAIL>. Example: \$MAIL> <CR>

To continue reading new messages, hit return until
\$MAIL-E-NOMOREMSG. no more messages appears.

5. After reading a message, the user can then choose any of the MAIL commands shown below.

SUMMARY OF MAIL COMMANDS

COMMAND	ABBREVIATION	FUNCTION
DIRECTORY	DIR	Lists a summary of your messages.
READ or READ 3	REA	Displays next page, next message (or hit carriage return to advance to the next page) To display a specific message.
EXIT	EX	Gets you out of the MAIL Module and returns you to the \$ prompt.
FORWARD	FO	Forwards current (last-read) message to user(s).#
REPLY	R	Pre-addresses a reply to sender of the current (last-read) message.#
REPLY/EDIT		See Editor User's Guide
FILE	F	Copies current (last-read) message into a specified file.#
SEARCH		Allows you to locate particular words or phrases within a MAIL file.

SEND	S	Sends a message to a username or usernames.
SEND/EDIT		See Editor User's Guide.
SEND/LAST		Gives mail user opportunity to retrieve a copy of last message (or reply) sent.
BACK	B	Backs up to the previous message.
DELETE	D	Deletes the current (last-read) message.#
HELP	H	Displays information on how to use MAIL.
HELP*	H*	Displays information on all MAIL commands.

NOTE: You MUST be reading a message before you can FILE, FORWARD, DELETE or REPLY to it.

EXPLANATION OF MAIL MODULE COMMANDS

When the user types the word MAIL after the \$ sign and hits the return key, the system responds with "You have new message(s)" if you have received any new mail, then prompts you "MAIL>". The user then types the desired command from the following list.

EXAMPLE: MAIL>DIRECTORY

BACK or B

Displays the previous message, the message before the current (last-read) message.

DELETE or D

Deletes the current (last-read) message from your list of mail messages. The system automatically rennumbers your messages when one has been deleted.

The message is not actually deleted from the file until you either EXIT mail or READ another message file. Therefore, if you accidentally delete a message, you can recover it by aborting MAIL with CTRL/Y. RESTATED: You MUST use the EXIT command to get out of MAIL to assure deletion of messages.

IMPORTANT: You MUST keep a minimum of 1 message in your MAIL directory at ALL times in order to access your other MAIL files.

DIRECTORY or DIR (filename.typ)--optional field

Lists a summary of your mail messages. It displays the message number, sender's name, date, and subject of each of your mail messages.

If no filename is specified, a directory of the current message file (MAIL.MAI) is displayed. A filename may have up to 9 alphanumeric characters, the filetype may have up to 3 alphanumeric characters.

If a filename is specified, a directory of the specified message file will be displayed. Example: DIR INFO.MAI

NOTE: The DIRECTORY command used after \$ sign (not in MAIL) gives a list of all files including mail files.

DISTRIBUTION LISTS

(see SIGN ON GUIDE, USEFUL SYSTEM COMMANDS, \$CREATE or \$EDIT)

EXIT or EX or E

Exits the MAIL module; returns user to \$ prompt.

FILE or F filename.typ

Adds a copy of the current (last-read) message to the end of the specified message file. If the filename does not exist, it must be named by the user. A filename may have up to 9 alphanumeric characters, a filetype may have up to 3 alphanumeric characters.

Any files created in this manner will have the same attributes as your active mail file (MAIL.MAI). You can access these additional mail files by specifying the filename used in the optional field of the mail commands listed in this module.

Example: MAIL>DIR INFO.MAI

NOTE: The FILE command does not automatically delete the message from the current file. This allows you to retain it in the current file or file it in another message file.

FORWARD or FO

Sends a copy of the current (last-read) message to another user or users. You will be prompted, just as in the SEND command, for the names of the user(s) to whom you wish to forward the message and for the subject of the message.

After typing the subject, hit the "RETURN" key <CR>. This forwards a copy of the message, maintains the original in the current file, and returns you to: MAIL> .

HELP or H

Provides general information about MAIL commands.

Example: MAIL>HELP<CR>

HELP*

Provides a detailed narrative on all the MAIL commands similar to what is contained in this MAIL guide.

Example: MAIL>HELP*<CR>

READ or R

Performs two functions: READ a message or READ a file.

Each message in your mail directory of mail messages has a number. To READ a specific message enter the command READ followed by the desired message number. By entering a number known to be greater than the number of messages, ie 99, the newest message in your message file will be displayed.

Hitting the "return" key after each message will cause an advance to the next message, or page, in the file.

To READ a file while still in the mail module, type:

READ filename.typ<CR>

Example: MAIL>READ INFO.MAI<CR>

READ (continued)

While you are already in the MAIL module, the computer may send you a message saying, "New mail from USERNAME." To read this new message, enter the command READ MAIL.

Example: MAIL>READ MAIL<CR>
The new message will be displayed.

REPLY or R

Sends a reply to the sender of the current (last-read) message, automatically readdressing and inserting the subject. You will be prompted for the text of your reply.

Example: MAIL>REPLY
TO: SMITH
SUBJECT: RE: CONFERENCE ATTENDANCE

When you have finished entering the text and wish to send the message, press control key <CTRL> and Z key simultaneously.

The user knows the message was sent when the system responds:
MAIL>

REPLY/EDIT or R/EDIT

SEARCH word or phrase

Allows you to locate particular words or phrases within a MAIL file.
Example: MAIL>SEARCH CONFERENCE

This command will display the first message containing the word "CONFERENCE". Type "SEARCH" to continue searching additional messages for the same word or phrase. MAIL>SEARCH

SEND or S

Sends mail to another user or users. You will be prompted for the names of the user(s) to send to and the subject of the message. Example: MAIL>SEND<CR>
To: Username
Subj: My Topic

When you have finished entering the text of the message and wish to send it, press control key <CTRL> and Z key simultaneously. While typing the TEXT of a message you have the ability to abort sending the message by pressing <CTRL> and C keys simultaneously.

Example: \$MAIL
MAIL>SEND
To: HERBIG
Subj: TEST OF CTRL C
Enter your message below. Press CTRL/Z when complete,
CTRL/C to quit:
I REALLY DON'T WANT TO SEND THIS MESSAGE <CTRL/C>
^C

%MAIL-E-SENDABORT, no message sent

MAIL>

SEND (continued)

Hitting CTRL/C prior to typing any of the body of the text, ie in the TO: or SUBJ: lines, will cause you to abort out of the MAIL module entirely.

CTRL/C will NOT abort when using SEND/EDIT.

If a filename is specified on the SEND command, that file will be sent to the user(s). If no filename is specified, you will be prompted for the text of the message.

Example: MAIL>SEND filename typ<CR>

NOTE: You can send a message to multiple users by typing in the usernames separated by commas, no spaces or by using a distribution list as shown in the second example (see SIGN-ON GUIDE, USEFUL SYSTEM COMMANDS, \$CREATE)

Example: To: SMITH,JONES,JOHNSON

Example: To: @NEWSYS.DIS

SEND/EDIT

Gives the user the capability to edit a message/file before sending it to another user or users.

See EDITOR User's Guide for instructions.

SEND/LAST

Allows mail users to retrieve a copy of last message (or REPLY) sent. This command is helpful if you have forgotten to include someone on the "To:" line or wanted to send yourself a copy for record.

Example: MAIL>SEND/LAST
To: USERNAME

NOTE: You must have just finished sending a message, with NO intervening commands, in order to use the SEND/LAST command.

An Intelligent Gateway for the
Department of Defense: The Technology Information System (TIS)

Presented by

Gladys Cotter
Defense Technical Information Center
and
Rich Klawin
Control Data Corporation

AN INTELLIGENT GATEWAY FOR THE DEPARTMENT OF DEFENSE:
THE TECHNOLOGY INFORMATION SYSTEM (TIS)

Gladys Cotter
Defense Technical Information Center, Alexandria, VA

BACKGROUND

The Defense Technical Information Center (DTIC) is participating in an joint agency effort with the Department of Energy (DOE) and the National Aeronautics and Space Administration (NASA) to develop an intelligent gateway computer system. We have similar and often mutual users who need access to a wide variety of information resources, many of which are available online. Unfortunately, incompatible computer resources, complex and different access procedures and command languages, and the absence of the ability to aggregate, post-process and analyze data online limit the usage and usefulness of these resources. Our goal is to maximize online availability of these resources through the use of an intelligent gateway computer.

Each participating agency is responsible for developing a directory of the online information resources under its control. DTIC has surveyed the DoD community to identify existing DoD databases, their scope and availability for sharing. Survey results are being used to develop the DoD resource directory and determine which databases should be accessible through the gateway. This information will provide the basis for establishing a DoD gateway which, in turn, will be a node in an intergovernmental gateway network with NASA and DOE. This network is depicted in Figure 1.

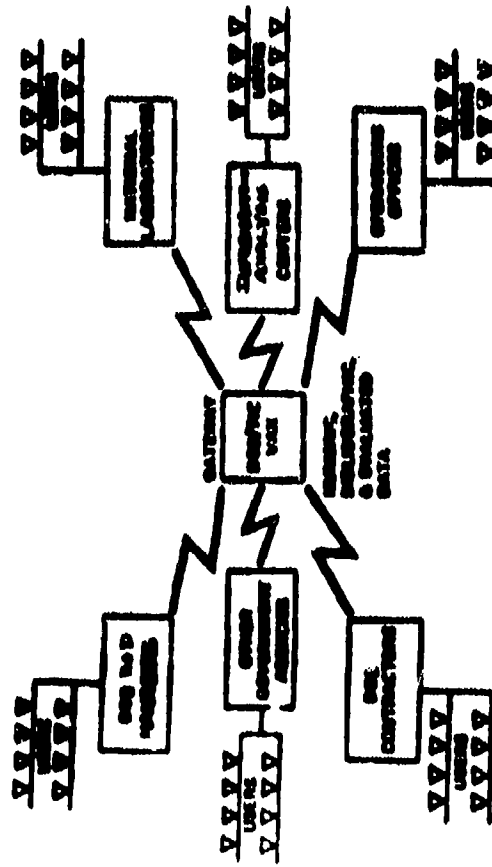
THE TECHNOLOGY INFORMATION SYSTEM (TIS)

The Technology Information System (TIS), currently under development at the Lawrence Livermore National Laboratory (LLNL), is the prototype system for the network. TIS is an intelligent gateway computer system which provides for distributed networking, electronic communication,

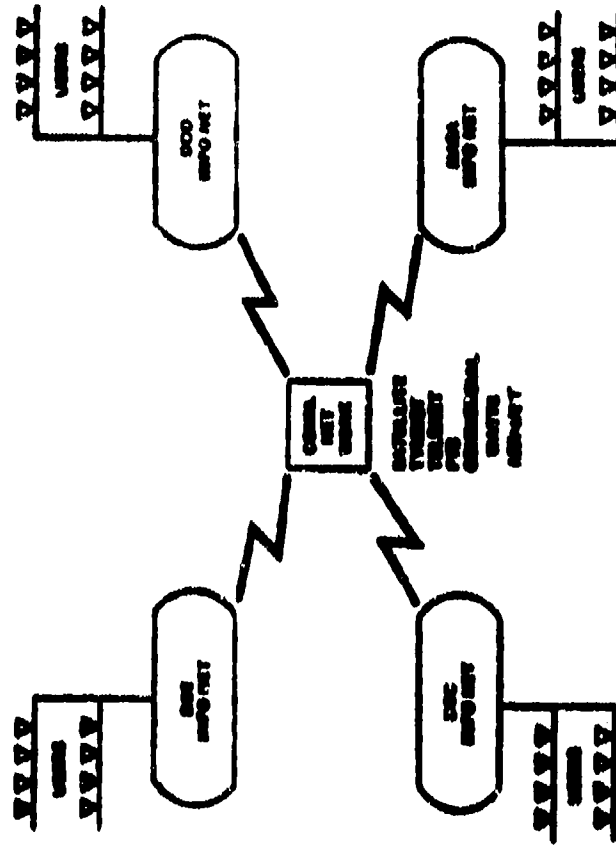
Figure 1. DOD INTELLIGENT GATEWAY COMPUTER SYSTEM

INTE' RATED NETWORK

DOD INTEGRATED INFORMATION NETWORK



CONCEPTUAL MODEL FOR AGENCY NETWORKING



interactive modeling, data management, and graphics.

The current method for searching a database by use of a remote terminal requires that the researcher identify and access an appropriate distant computer and follow the unique search practices that have been programmed into it. The normal search requires that several databases be accessed, probably more than once each, and the researcher is burdened with interpreting and following a different instruction manual for each system. The product of the search is a volume of printed matter that must be culled for the relevant material that is to be retained for use. For the infrequent user, most of the time and effort expended in a search are non-productive; they are given over to identifying appropriate databases, accessing them, reading instruction manuals, and cutting and pasting printouts. The need is for the resulting information product, which takes relatively little time to assemble. The rest of the search process is expensive overhead.

The Technology Information System links people, information centers and computers. To accomplish this TIS functions as an electronic switch, a translator, a super-intelligent terminal, a communications interface and a transaction controller. TIS streamlines, speeds-up, and modernizes the search process by providing a fast, smart robot to do the drudge work. The researcher need only access one computer -- TIS -- and learn one set of access protocols. TIS can locate appropriate databases, converse with them on the researcher's behalf, and provide a single, final, relevant printout. In the language of the technology, TIS provides a directory of resources which can be accessed through the gateway and automatically switches authorized users to the information utility of their choice. TIS provides a protocol translator for connecting to and disconnecting from these resources. Users are provided online instructions, sample search sessions, and contact

points with phone numbers for each of the resources. In addition, data analysis can be performed through the extensive TIS library of post-processing routines. As a result, TIS eliminates much of the non-productive overhead of database searching.

COMMUNICATIONS CAPABILITIES

Communications capabilities are the backbone of any gateway system and TIS has many outstanding features here. Users can access TIS via TYMNET, ARPANET, FTS, WATS and commercial phone lines. After login, many communications options are available. I will focus on electronic mail, write, link, connect, dial, and download.

Electronic Mail

Electronic mail service is available to all TIS users twenty four hours a day. Standard electronic mail features, such as send, receive, answer, and forward, are incorporated. Mail messages can be sent simultaneously to multiple addresses, with lengthy documents attached if needed. Users recognize the benefits of being able to communicate with numbers of people at the same time and of avoiding the call-back routine. Messages can be filed for future reference or deleted from the system upon command.

Write

WRITE is another communications option, which allows users online to communicate with each other via their terminals. You first enter the command XWHO, to get a display list of who is currently online. You then enter the command XWRITE, followed by the name of the user you wish to communicate with, which notifies that user who then has the option of responding. The

WRITE command is only useful when parties who want to communicate are at their terminals, by chance or arrangement, at the same time.

Link

The LINK command is unique to TIS and allows users at different and various locations to link their terminals so that they are viewing the same data display. All users have control over the display and can issue commands at will. Of course, linking necessitates a cooperative spirit and some coordination.

The LINK command has proven advantageous in numerous situations. For example, an instructor can provide on-line tutorials to a student or a class at a different location. This technique was used by Dr. Sullivan of the Chemical Information System (CIS), in Washington, D.C., to provide a demonstration of CIS to a class in Brazil. The use of a speaker phone enhanced this demonstration by providing simultaneous voice communication.

The LINK command is also useful for joint online editing of reports. This practice eliminates mail delays and allows users to discuss changes while viewing the data together.

Through the LINK command information specialists and end-users can perform interactive database searches. The end-user benefits from the specialist's expertise while the specialist benefits from the end-user's immediate feedback. This communications capability can be used to facilitate technology transfer from the government to industry.

Connect

The CONNECT command provides users with automatic access to information resources. Users do not have to know telephone numbers, ARPANET locations, passwords, access protocol or logout protocol. The user issues the CONNECT command and a data resource name. TIS then attempts to establish a

connection to the resource and logs the user in. The user is provided feedback during this process with a display such as:

Attempting TYMNET connection to DoD/DROLS

Connection made

Attempting login to DoD/DROLS

Login complete

DoD/DROLS is ready. Please enter your request.

TIS uses TYMNET, TELENET, ARPANET, COMMERCIAL TELEPHONE and FTS to establish connections.

The CONNECT command can be used to access information centers worldwide. Systems such as DoD/DROLS, DOE/RECON, NASA/RECON and DIALOG are currently available. In order to be eligible to use the CONNECT command for access to a resource, a TIS user establishes an account with that resource and obtains the required access identification information, such as passwords, to be programmed into the gateway by the TIS Data Base Administrator. The billing process is unaffected by gateway access. Vendors maintain the same billing structure and users maintain the same reimbursement structure, regardless of the TIS access procedures. TIS has several levels of security to ensure that password integrity is not violated.

Dial

Users who wish to access a resource other than those listed in the TIS resource directory take advantage of the DIAL command, rather than the CONNECT command. DIAL allows users to call any information center, computer, or terminal, no matter where the location. Using DIAL implies that the user knows the necessary passwords and telephone numbers. DIAL allows the user to

access an off-network facility while retaining TIS capabilities such as downloading and file transfer.

Downloading

Once you are connected to a resource through TIS, you can download data from that resource. Downloading data opens many options to you. For example, you can review it at your own pace, merge it with other data, and share it with other users by allowing them to access your file. You can also transfer your file to other users so that they can manipulate the data to suit their own needs. You can share your data selectively on a worldwide basis.

POST PROCESSING

TIS offers a library of post-processing routines for numeric and bibliographic data. In order to execute post-processing routines, users must download the data into a TIS file. Post-processing routines, as with the CONNECT command, are available for selected resources. The routines currently available are REVIEW, DISPLAY, PERMUTE, CROSS-CORRELATE, and CONCORD.

REVIEW allows users to process citations and determine relevance at their convenience. Users are presented with the author, title, date and several lines of an abstract. Based on this information they may choose to continue to work with the citation or discard it and move on to the next. If they continue to work with the citation they may add local options, which include assigning relevancy values and index categories that are searchable. Users also can flag citations for which they wish to order the full text, plus add their own comments to a citation.

The DISPLAY routine allows users to generate bar charts representing the yearly publication rate for a subject area, personal author, or corporate author. This type of graphic representation makes growth trends immediately apparent.

PERMUTE provides statistics on the frequency of occurrence for descriptive terms in the citations. Single and compound expressions containing up to four terms are analyzed. These terms are presented in alphabetic order, preceded by the number of occurrences.

The CROSS-CORRELATION and CONCORD routines analyze the relationships among data elements chosen by the user. These routines provide intelligence that is very tedious to extract manually from standard bibliographies.

A goal which is shared by DTIC, NASA, and DOE is to provide our users with the capability to merge search results from our databases, eliminate duplicate citations, and produce one relevant information product in the desired format. We want our users to be able to work with our databases and get more value from them. We are convinced that TIS is a major step toward achieving this goal.

Output from TIS can be transferred to wordprocessors and merged with reports, sent to typesetters as camera ready copy or routed to high speed printers. TIS simplifies all phases of technical reporting. Information processing, report generation, review and release and publication can all be accomplished through TIS with this printing interface capability.

TIS is linking the electronic office, on-line information centers, computer centers and home computers. Through the integrated information system, it provides unified access to numerous, dissimilar data files. Some of the ways in which TIS currently is being used are:

- . To find, aggregate, organize, evaluate, and report technical

information/data.

- . To do comparative, interactive modeling and performance prediction.
- . To provide communications among administrators and project staff, nationwide.
- . To access any national or international information center, or domestic or foreign-based computer.

TIS brings high efficiency to the database searching process because:

- . It integrates all of the procedural and mechanistic functions of the process in one automated system that is search-logic specific.
- . It automatically provides connections between and among information systems.
- . It provides routines to extract, aggregate, disaggregate, and post-process data collected during a search.
- . It provides routines for generating conventional graphics.
- . It is friendly with - even compassionate of - computers, terminals, word processors, typesetting equipment, and other hardware.
- . It is indifferent to the communications path - trunk line, FTS, WATS, TYMNET, ARPANET - as long as someone pays the bill.
- . It loves users, with or without computer training, and offers them a guiding menu, HELP options, and reasonable levels of forgiveness.

TIS is running on a VAX-11/780, uses the UNIX operating system, and includes INGRES as the database management system.

DEVELOPMENT GOALS

A Steering Committee comprised of representatives from DoD, NASA and DOE meets on a regular basis to establish mutual goals for TIS and evaluate our progress toward achieving those goals. Our FY 83 goals are to extend the TIS post-processing routines to all of our databases and to provide automatic multi-file processing. As mentioned earlier, multi-file post-processing involves the elimination of duplicate citations. We are also supporting a feasibility study regarding a standard command language. We hope to have this feature available on TIS in FY 84.

DTIC is sponsoring a number of DoD user entities who have agreed to test TIS in their operations and make recommendations regarding its evolution into a DoD Intelligent Gateway System. Users can choose the applications they wish to test. TIS orientations are provided at DTIC, or at the user's location through TIS linking technology. We also provide demonstrations of the system for interested members of the DoD community. If you would like further information on this topic you can contact me at:

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Space Management and Planning Issues

Presented by

Lawrence W. Vanderburgh, Architect
General Services Administration
Washington, D.C.

(Presentation not available)

An outline of the presentation, along with some floor plans that were used as handouts, is included.

MILITARY LIBRARIAN WORKSHOP
Reston, Virginia
October 13-14, 1983

SPACE MANAGEMENT AND PLANNING ISSUES

Lawrence W. Vanderburgh, Architect
General Services Administration
Washington, DC 202-523-5444

1. SYMPTOMS

- Insufficient space for books, seating, people, terminals
- Faster book pile-up than microform conversion
- Inappropriate space configuration/location
- Unresponsive repair and maintenance
- No room/plans for growth and change
- Shared space with other functions

2. UNDERLYING PROBLEMS

- Insufficient understanding of facility management by your own management
- The tail-wagging-dog syndrome
- Inability to justify/support requirements
- Inadequate strategy
- Too specialized for routine treatment, too small for special attention

3. BASIC PRINCIPLES

- The value of facility management
- The true meaning of managed facilities
- Facility performance
- The importance of good groundwork
- The basics of programming space needs
- The typical space request process -- GSA or other

4. PARTICULAR CONCERNS FOR LIBRARIES

- Space use vs. space type
- Office-type is part of the GSA utilization rate
- Libraries are NOT in the space reduction limelight
- Typical space standards do not address library needs
- Projecting use: the new-highway syndrome
- Separating user traffic, bookflow and staff patterns
- Avoiding being the home-away-from-home for packrats
- The technology/information/knowledge explosions
- Balance of information-sharing between libraries and user-clientele offices
- Building support: acoustics, lighting, dedicated lines, floor loading
- Location in the building -- how to enjoy being a political bon-bon
- The unique agony of moving libraries

5. SUGGESTIONS FOR FUTURE PLANNING

- Development of common library planning standards
- Strengthen your data on projected use; get your clientele to provide it
- Nurture your relationship with your friendly neighborhood advocate
- Network information exchange among libraries, esp. specialized collections

LIBRARIES—1

School libraries

By CHARLES R. McCURDY, *Art Reference Librarian, Pratt Institute*

Since there are several types of libraries, i.e., public, academic (including school, college, and university), and special libraries, only the salient features are noted here. The following design recommendations have been adapted from the sources listed under References which specifically deal with the programs and planning of different types of libraries.

In large public and university libraries where the number of books exceeds 200,000, it is generally necessary to concentrate book storage in a multilevel stack area. In such areas the book stacks are usually designed to be self-supporting and the floors (called "decks") are supported by them, as shown in the isometric drawing following. The data on the following pages pertain to this type of installation.

In smaller libraries, however, most librarians prefer to have the normal floor construction of the building designed to carry bookshelves in any location on the floor. This scheme permits complete flexibility in the arrangement of bookshelves and reading space, and facilitates future alterations and expansion.

NOTE: See further discussion and illustrations in section on "Schools."

Reading rooms for academic libraries

Space should be provided to accommodate at least one-tenth of the student body. An allowance of 30 to 35 sq ft per reader is recommended; this provides space for bookshelves, tables, chairs, charge desk, and comfortable circulation.

Shelving should be provided in the reading room for a suitable portion of the book collection. Detailed recommendations for shelving are given elsewhere in this section.

Vertical filing cabinets (legal size) are used for storing miscellaneous material, such as clippings, pictures, and pamphlets. Each cabinet occupies a floor area 18 in. wide by 29 in. deep.

Card catalog: Each unit of 15 drawers provides filing space for cards for 3,000 volumes; a unit is 33 in. wide by 17 in. deep.

Special reading rooms

Large school libraries often provide separate rooms for one or more of the functions listed below. Smaller libraries may use alcoves off the main reading room for these functions.

Reference books
Reserve books
Periodicals
Faculty reading room

Conference rooms

One conference room (120 sq ft mini-

mum) is recommended for every 1,000 students. It should be located adjacent to the main reading room and separated from it by glass partitions, so that it can be supervised from the circulation desk. Conference rooms should be acoustically treated and provided with shelving for books and records.

Audio-visual center

If the audio-visual center is located in the library it should provide the following facilities:

Equipment room (300 to 400 sq ft) provided with locked cupboards for storing the following equipment:

16-mm sound movie projector
2 by 2-in. slide projector
3½ by 4-in. slide projector
Opaque projector
Overhead projector
Projection screens
Record player
Tape recorder
Radio receiver
Television receiver
Spare parts and supplies; portable stands

It should also provide workbenches or tables for servicing the equipment.

Materials room (300 to 400 sq ft) provided with storage facilities for slides, filmstrips, movie film, tapes, records; also card catalog, workbenches, tables, desks, and chairs.

Viewing and auditioning room (800 to 1,000 sq ft).

Office (150 to 200 sq ft).

Offices and workrooms

Librarian's office—private, receptionist or secretary located in outer office.

Cataloging office—accessible to the public catalog area of at least 125 sq ft per staff member is required.

Preparation room—adjacent to cataloging office, with connecting door; shelving, storage for supplies, and washbasins should be provided; minimum area, 125 sq ft per staff member.

Other areas

Checkroom and security area in lobby near entrance; turnstiles and guard.

Student toilets; staff toilets.

Student lounge; staff lounge (optional).

Exhibition gallery; small auditorium (optional).

Public libraries contain many features of an academic library. However, they also provide special departments for work with children and young adults, music rooms, and browsing areas. They frequently must provide space for administrative work with

bookmobiles and branch and extension centers.

Shelving

All shelving should be freestanding and all shelves should be adjustable in height. Dimensions of shelving are as follows:

Width of section: 3 ft
Height of section: Elementary school—5 to 6 ft
Junior high school—6 ft
Senior high school, college, and public libraries—6 to 7 ft
Height of parts: Base—4 to 6 in.
Cornice, if used—2 in.
Shelf thickness—13/16 in.
Usual distance between shelves—10 to 10½ in.
Depth of shelves: Standard—8 to 10 in.
Oversize—10 to 12 in.
For bound periodicals—12 to 15 in.
For phonograph records and picture books—16 in.
For mounted art reproductions—30 in., with many vertical dividers
For current periodicals—sloping display shelves—16 in. measured along the slope, 12 in. measured from front straight back

Miscellaneous equipment

The following equipment is standard in most types of libraries and space should be provided for it:

Bulletin boards and display cases
Book trucks
Step ladders and stools
Microfilm reader and storage cabinets
Dictionary stands
Index tables for periodical indexes
World globe for reference section
Rapid photocopying equipment

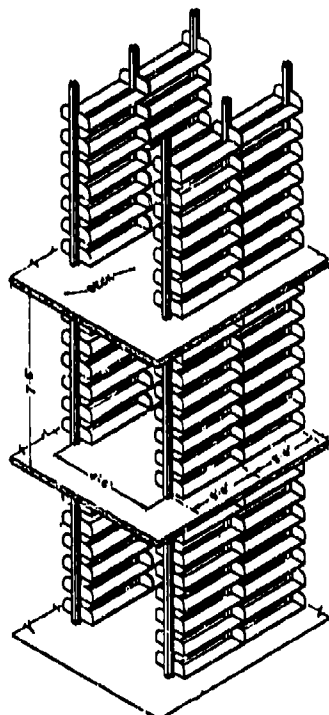
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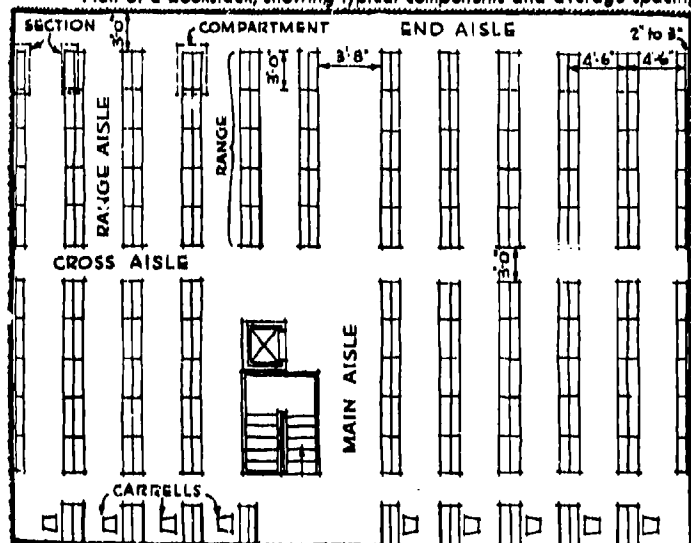
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The Small Public Library Building. UNESCO, Paris (1959). 133 pp.
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Diagrammatic section of a multi-tier bookstack. The columns of successive tiers are joined to form a continuous column which supports both the deck and the shelving



Plan of a bookstack, showing typical components and average spacing



Data courtesy of W. R. Ames Co., Breeze Corps., Inc., and Sneed & Co.

GLOSSARY OF TRADE TERMS

Section	Shelving between two shelf supports
Compartment	Two sections back to back
Stack Columns	Members which act as shelf supports and vertical uprights, dividing compartments and carrying stack loads
Range	A group of sections (single-faced range) or compartments (double-faced range) with shelf supports common to adjacent sections
Tier	One level in a bookstack
Deck	A stack room floor — usually one of the intermediate floors of a multi-tier stack
Carrell	A space or cubicle provided in a stack for individual study — usually equipped with desk and shelves
Aisles	
Main Aisle	The "Main Street" of a bookstack
Cross Aisle	Secondary aisle branching off main aisle
End Aisle	Aisle along the wall of a bookstack
Range Aisle	Aisle between two ranges
Booklift	Dumbwaiter adapted to library use
Book Conveyor	Power-operated device for mechanical delivery of books from stacks to users in a multi-tier installation

SHELF AND STACK DATA

Height of Bookstack	Generally 7 ft. 6 in. measuring from top surface of deck floor to top surface of deck floor above, in multi-tier installations; 7 ft. 2½ in. overall for one-tier stacks
Shelf Sections	Normally 3 ft long between shelf supports; 8, 9, 10, or 12 in. wide for books, and 18, 20, or 22 in. wide for bound newspapers
Ranges	Length, as required, preferably not over 30 ft., in even multiples of shelf length. Parallel ranges generally spaced on centers 4 ft. 6 in. apart
Aisles	Main, 3 to 4 ft. wide; range, 2 ft. 6 in. to 3 ft.
Stairs	Straight runs: well length, 8 to 9 ft., 12 risers; width, 2 ft. 6 in. or slightly more. Return runs: well length, 6 ft. 8 in., 12 risers; width, 5 ft. or slightly more
Deck Floor	Three general types: (1) reinforced concrete, usually 3½ in. thick; (2) flanged or formed steel plates, ½ in. to ¾ in. thick (to bottom of flanges — about 2¾ in.); and (3) steel framework with 1¼-in. marble, slate, or stone (4¾ in. from top of slab to bottom of supporting steel frame). Resilient floor covering adds only approximately ¼ in. thickness to slabs or plates

LIBRARIES—3

Bookstack data

UNIT STACK WEIGHTS

BOOKS

25 to 30 lb. per cu. ft. of ranges

STACK CONSTRUCTION

Quoted as 5, 8, and 8 to 10 lb. per cu. ft., depending upon the manufacturer

DECK FRAMING

2 to 4 lb. per sq. ft. of gross deck area

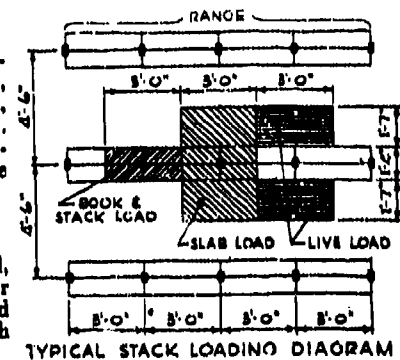
DECK FLOORING

3-in. reinforced concrete slab, 38

lb. per sq. ft.; 3½-in. reinforced concrete slab, 44 lb. per sq. ft. gross area, with ½ in. tile or linoleum covering, 45 lb.; flanged steel plate floor, 12 lb. per sq. ft. of gross area; 1¼-in. marble or slate, 18 lb. per sq. ft., aisle area

LIVE LOADS

Building codes vary, but in general, for column loads, assume 40 lb. per sq. ft. of aisle area for live load and reduce this figure 5 per cent for each deck below the top deck



STACK LOADS. The following tables illustrate the general variation of stack loads for from one to twelve tiers.

8" SHELVING												10" SHELVING											
Including stacks, books, live load, and 3½-in. concrete deck floor (A=typical aisle and support, B=typical intermediate support, C=typical wall and support).																							
TIER	1	2	3	4	5	6	7	8	9	10	11	TIER	1	2	3	4	5	6	7	8	9	10	11
A	495	2,320	4,120	5,390	7,230	9,340	11,820	14,770	18,290	21,490	24,370	A	620	2,370	4,190	5,360	7,140	9,270	11,770	14,740	17,990	21,520	24,420
B	990	3,640	6,240	8,580	11,560	15,280	19,740	24,960	30,980	36,980	42,940	B	1,240	4,740	8,380	10,720	14,280	18,540	23,540	29,480	35,980	42,940	49,840
C	495	1,540	2,600	3,540	4,370	5,140	5,860	6,530	7,160	7,750	8,310	C	620	1,750	2,970	3,900	4,690	5,360	5,920	6,480	7,040	7,600	8,160

BOOKSTACK CAPACITIES

Among formulas suggested for use in computing the size of stacks necessary to house a given number of books is the "Cubook" method, devised by R. W. Henderson of the New York Public Library.* The "cubook" is a measurement of stack capacity, defined as the "volume of space required to shelve the average book in the typical library." According to this formula, a single-faced section of stack, 3 ft. long and 7 ft. 6 in. high, has the following capacities:

- 100 "cubooks" (85 per cent octavos, 13 per cent quartos, and 2 per cent folios) †
- 117 volumes (87 per cent octavos and 13 per cent quartos)
- 132 volumes (octavos only)
- 67 volumes (quartos only)
- 12 volumes (folios only)

The "cubook" method makes provision for 10 per cent of each shelf to remain unoccupied since it often is impractical to load shelves to their full visible capacity.

To determine the number of sections required when the number of volumes to be shelved is known, the following formulas are used:

Let N = number of single-faced sections required (1 section = 100 "cubooks")

- (1) For a typical library, when the "cubook" is considered directly applicable: $N = \text{Vols.} + 100$
- (2) For a library made up of octavos and quartos only:

$$N = \text{Vols.} + 117$$

* Library Journal, Nov. 15, 1934, and Jan. 15, 1936.
† According to American Library Association, an octavo is about 8 to 10 in. high; a quarto, 10 to 12 in.; and a folio, over 12 in.

- (3) For a library made up of octavos only: $N = \text{Vols.} + 132.3$
- (4) For a library made up of quartos only: $N = \text{Vols.} + 67.5$
- (5) For a library made up of folios only: $N = \text{Vols.} + 11.7$
- (6) For a library made up of various size groups when the ratios are known:

$$N = (\text{Octavos} + (\text{quartos} \times 1.96) + (\text{folios} \times 11.3)) + 132.3$$

Shelf Size

The foregoing formulas indicate the number of sections required but do not cover the number of shelves or the proportion of shelves of each width (8 in., 10 in., or 12 in.). In general, the following shelf data applies:

For folios — 13 12-in. shelves per section

For octavos and quartos — usually 7 shelves per section, divided as follows:

- 85 per cent 8-in. shelves
- 10 per cent 10-in. shelves
- 5 per cent 12-in. shelves

Area and Volume Requirements

The "cubook" can be reduced to approximate terms of area and volume requirements for bookstacks, as follows:

11.08 "cubooks" require 1 sq. ft. of stack floor area

1.48 "cubooks" require 1 cu. ft. of space in a stack

These values can be used as follows:

Required stack floor area = No. "cubooks" $\times .090$

Required space (cu. ft.) = No. "cubooks" $\times .676$

SHELVING DATA FOR SPECIAL COLLECTIONS (To be consistent with "Cubook" method, figures shown should be reduced by 10 per cent, to avoid overcrowding shelves.)						
TYPE OF BOOK	Vols. per Foot of Shelf	Vols. per Foot of Single-Faced Range	Vols. per Shelf	Maximum Vols. per Single-Faced Section	Shelf Depth	Shelves per Section
Circulating (Non-Fiction)	8	56	24	168	8"	7
Fiction	8	56	24	168	8"	7
Economics	8	56	24	168	8"	7
General Literature	7	49	21	147	8" & 10"	7
Reference	7	49	21	147	8"	7
History	7	49	21	147	8"	7
Technical and Scientific	6	42	18	126	8", 10" & 12"	7
Medical	8	56	24	168	8" & 10"	7
Law	6	36	12	84	8"	7
Public Documents	8	56	24	168	8"	7
Bound Periodicals	8	56	24	168	10" & 12"	7
U. S. Patent Specifications	2	14	6	42	8"	7
Art	7	42	21	126	10" & 12"	7
Braille	4	24	12	72	12"	7

**The Scientific/Engineering Workstation
Experiment: Plans and Progress**

Presented By

**R. T. Van Esiltine
David W. Taylor Naval Ship Research and
Development Center
Bethesda, MD**

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THE SCIENTIFIC/ENGINEERING WORKSTATION EXPERIMENT:
PLANS AND PROGRESS

By

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To improve the productivity of government agencies, office automation technology must address the diverse needs of the employees at every level of the organizations. Most office automation systems provide managerial, administrative, and clerical services such as electronic mail, bulletin boards, calendars, ticklers, word processing, and report generation. However, these systems do not address the scientists' and engineers' fundamental needs which include computations and graphics. Office automation systems must provide for these needs in research and engineering organizations such as the Naval laboratories. To offer central guidance and to coordinate the individual Naval laboratories in developing their office automation systems, the Naval Laboratories Office Automation and Communication System (NALTOACS) was established in 1981. As part of the NALTOACS effort, the Technical Office Automation and Communication System (TOFACS) at the David W. Taylor Naval Ship Research and Development Center (DTNSRDC) has been tasked to assess the needs of Naval laboratory scientists and engineers in an office automation system.

To accomplish this task, TOFACS is conducting the Scientific/Engineering Workstation (SEW) Experiment. It is assumed that individual workstations which communicate with each other can be tailored to meet the requirements of scientists and engineers. Thus, the experiment's objective is to determine those hardware, software, and communication characteristics of scientific/engineering workstations that would meet their requirements. Furthermore, the experiment shall determine which characteristics of the workstations are necessary to significantly improve the productivity of scientists and engineers. Through development of a prototype network of SEWs, the experiment will test and validate our assumptions about the viability of SEWs and the concepts of distributed processing.

To achieve the objective of the SEW experiment, twelve major milestones must be completed. Work accomplished to date under the first three milestones includes the preliminary user and system requirements analysis, the productivity analysis, the systems evaluation of high performance SEWs, and the configuration analysis for the prototype network. Structured personal interviews with 24 technical people at DTNSRDC were conducted to determine the preliminary user and system requirements for the SEWs. Additionally, these interviews were used to develop a productivity model and its baseline measurements. Two high performance SEWs, the Apollo DOMAIN and the PERQ, were selected after a survey of possible SEW vendors. Visits to sites using either the Apollo DOMAIN or the PERQ were made in order to perform a systems evaluation of these SEWs. Based upon the results of the interviews and site visits, a configuration for the prototype network was developed. This presentation will present the results and conclusions of the work accomplished under the first three milestones.

An Overview of Local Area Network Technology and
a Case Study of the NSWC LAN

Presented By

Eugene P. Stemple
Naval Surface Weapons Center

AN OVERVIEW OF LOCAL AREA NETWORK TECHNOLOGY
and
A CASE STUDY OF THE NSWC LAN.

E. Stemple, 13 October 1983

OVERVIEW

Introduction

In order to understand Local Area Networks it is necessary to briefly review some concepts of networks in general. In many cases the reasons for using a network, and the benefits to be obtained, are no different whether the network extends around a room or around the world; it is simply a matter of scale. At the larger extreme one may cite the DDN (Defense Data Network) as an example, or in the broadest sense one may consider the telephone "system" as a network. The DDN provides connectivity among some 300 individual computer systems and thousands of users. At the other extreme is the simplest of all networks, i.e. two computers at arm's length serving just two users. Lest one think this case is too trivial to ever be of any value it can be pointed out that the 1983 BYTE magazine game contest first prize was awarded for just such an application. Obviously the domain of the Local Area Network is somewhere between these two extremes and I will return to this point shortly.

Network objectives

First, let us look at the major objectives for the use of networks. Broadly stated the objective is to provide efficient data communications but this can be divided into the following categories: interactive processing, inquiry response, and information transfer. The techniques for interactive access were among the earliest applications of data communications and are now well developed. As soon as computers were able to support multiple terminals it was obvious that the connection between the two could be made by telephone, thus broadening the potential user population tremendously. A data communication network must provide this service. The distinction between interactive access and inquiry response is not great. In the latter case the user does not enter any new data into the system but merely selects from data already stored. The "information bank" type of service is rapidly growing in popularity and it is presumed that it will be a commonly found resource on any large network. The techniques for information transfer between any two arbitrary points in a network have been developed more recently. In most cases such a transfer is controlled, or at least initiated, explicitly by the user. However, once such a capability exists in a network there is no good reason why such transfers should not take place automatically as an indirect (implicit) result of a user's action. This capability should be supported by a modern data communications network. The use of a network to provide the necessary data communications offers significant cost benefits. The cost savings result from a sharing of operational expenses by many users and a similar distribution of fixed (overhead) expenses. The airlines have demonstrated that many more passengers can be transported by the use of much larger aircraft and slightly larger crews; the higher fixed expenses being

fully justified. Similarly, it is indeed expensive to establish a large network but will be fully justified if any reasonable fraction of the network's capacity is utilized.

Definition

If a "network" is defined as: a system comprised of multiple communications links and control computers organized for the efficient transmission of data between any two points then the definition of a Local Area Network follows easily from an agreement on the scope of a "local area." The present use of this term encompasses a range of sizes from a single room up to base-size facilities.

Network benefits

The underlying, or perhaps overriding, benefit of a network therefore is economics. Keeping that always in mind let us look at the more abstract goals that are achieved through the use of networks. A community of interest develops among the users of network resources and, in a less formal way, among the users of the network itself. The availability of a specialized data base, for instance, may foster an exchange of information among the users of that data base in addition to their access to information in the data base. To the extent that this exchange reduces duplication of effort it produces an indirect economic benefit. Specialized services may be justified if the accessible population is large enough. A network provides the mechanism for access by a larger population and thus makes it economically feasible to provide special services of limited demand. Reliability has been a high priority objective in most network designs and in the larger systems it is common to have redundant components and multiple paths. A reasonable trade off must be made between increased reliability and increased costs but a great deal of improvement can be obtained at a modest cost. A network removes some constraints on the physical location of computer systems and the users of those systems. The greater flexibility results in lower costs and more rapid change. Resource sharing can be looked upon as more users accessing a single system (making more effective use of the system) or as more systems being accessed by the same set of users (making the system users more effective). In either case, a network can provide the mechanism for effective resource sharing. These advantages of networks in general will also apply, on a smaller scale, to Local Area Networks. Next I will home in on the characteristics of Local Area Networks.

LOCAL AREA NETWORKS

Characteristics

A typical local area network provides access to 1 or 2 large computer systems and a dozen small systems. A characteristic size of a local area network would provide several hundred service (access) points, the majority of which are represented by individual user terminals, distributed over a geographical area of a few neighboring buildings. Certainly there are many instances both larger and smaller than this typical size, as alluded to in the

definition given previously. Almost always in the larger networks, and likely to evolve in local area networks, the structure is a hierarchical one. Sub-nets are interconnected forming networks and higher level interconnections may form super-nets. The obvious illustration of this principle is the telephone system: central office exchanges (and PBXs) within a local calling area within an area code within a country code. Note that it is not necessary that all components be supplied or even operated by one company as long as standards can be devised. In the present network environment the interconnection between different (incompatible) networks is implemented by a "gateway" computer that does the necessary data format translations. It is not clear whether the gateway concept is a temporary one, while network and internetwork standards are evolving, or whether a gateway serves some useful purpose unrelated to the compatibility issue.

Objectives

Why implement a local area network? Economics, of course. The installation of a local area network in a given instance is a secondary issue in the sense that it simply provides the data communications necessary for some other, usually unrelated, purpose. Note the synergistic aspects of the situation: an application of computer technology is proposed which offers significant benefits; the application depends heavily upon data communication capabilities; the installation of a local area network can only be justified by an extensive data communications requirement; without a local area network the cost is prohibitive for any communication-intensive application. Perhaps this is more aptly described as a Catch-22.

Requirements

Since a local area network provides low-cost data communications the rationale for installing a LAN rests on the aggregate data communication requirement. The diversity of requirements makes it difficult to accurately project the real needs but, fortunately, a few large requirements will force the issue and the smaller requirements can then ride along for free. The largest single requirements, typically, result from a general purpose computer facility serving hundreds of users or from automated office systems distributed among hundreds of users. The emphasis on one or the other depends upon the nature of the work being done in a particular facility. In recent years the trend toward more powerful minicomputer systems has led to a proliferation of medium- and small-size systems meeting more specialized requirements. This distribution of processing power away from the single giant all-purpose facility has significantly increased the need for efficient data communications capability. This trend is continuing with the advent of microprocessor systems and intelligent terminals. At first, the tendency is for such smaller systems to be used "alone" but sooner or later the need arises to access data or transfer data from another system to avoid the duplication of effort involved in creating a local copy of that data. The same argument might apply to software except for the restrictions imposed by copyright and software licensing agreements. It is clear that more and more individual workers are going to use computers, in one way or another, in performing their routine daily tasks. Of course, each user wants this process to go faster. A decade ago it was common to communicate at speeds of 10 to 30 characters per second. Nowadays 120 characters per second is considered slow

and 960 characters per second is quite common. These speeds refer to users' terminals; the speeds between computers are one or two orders of magnitude faster. The aggregate need for data communication capability is, therefore, increasing rapidly.

IMPLEMENTATIONS

PBX Alternative

Before comparing some of the current technical implementations of local area networks it is worth looking at the competition, keeping in mind that the end objective is to provide a system capable of establishing many simultaneous connections suitable for the transmission of data at moderate speeds among hundreds of devices. Prior to the advent of local area networks this type of function was performed by telephone equipment. A combination of modems, data access arrangements, dedicated phone circuits, and the facilities of the regular switched phone network was used to provide the necessary communication paths. It is only natural, therefore, that the telephone companies (and equipment suppliers) should seek to serve this growing market. The technology for electronic switching and digital PBXs is developing to support data and voice requirements. The obvious advantage of this approach is in the high capital investment in wiring, maintenance equipment, personnel training, and physical plant already in place. If an existing telephone system must be completely renovated in order to provide this new capability then this advantage may no longer apply. It appears now that the interface equipment attached to the network (no matter what the transmission medium may be) will represent, by far, the major cost of the system. Thus it is of relatively little importance whether existing facilities can be used, particularly if any limitations to future growth are imposed by the decision. The two major disadvantages to the digital PBX approach are: (1) very high speeds, above 200,000 bits per second, not possible; and (2) transmission of television (video) information not possible.

Twisted pair

The simplest local area network to implement, and the one providing the lowest level of performance, is built around a pair of wires (twisted together for consistent electrical characteristics) routed to all the devices to be interconnected. At each device an electrical connection is made for transmitting and receiving data. Over short distances the potential transmission speed is quite high. Obviously the transmission medium is cheap and the electrical interfaces to each device can be relatively simple. This is the quick-and-dirty system and in keeping with a minimum cost approach the burden of network access control is assumed by the software running in each and every device on the network. A great idea for "very local" networks but not likely to be effective in sizes encountered in large systems or office automation implementations.

Baseband coaxial cable

The next two LAN implementations I will describe are based on the use of a

coaxial cable as the transmission medium. One of the most widely advertised systems, a baseband system, is known by the trademarked name of Ethernet. It is difficult to make a clear distinction between the baseband and broadband concepts without resorting to a deeply technical discussion; however, let me try to "oversimplify" the situation somewhat and give an analogy. In a baseband system the information is conveyed by the polarity and/or magnitude of a voltage applied to the coaxial cable; in a broadband system the information is conveyed by changing the fundamental character of a continuous "carrier" signal, i.e. altering the frequency or amplitude of the carrier. It is almost the same as the difference between the telegraph and the telephone! The apparent complexity of generating a carrier and then modulating it, as the process is called, is worthwhile because of the fact that many carriers may be transmitted simultaneously on the same medium and easily separated by the appropriate receivers. The electronics for sending and receiving baseband information is less complex but the constraint of one transmission at a time is a disadvantage. In a moment we will examine the need for and the means for sharing any network medium, whether twisted pair or coaxial cable, and see that the constraint of one transmission at a time is not a serious one. It should also be understood that all types of local area networks require some kind of special interface (electronics) for the attachment of a device to the network. Baseband systems are viable for distances of a few thousand feet and have a typical capacity of 1 million characters per second. There are several suppliers of this type of network in addition to the Ethernet developers (Intel-DEC-Xerox).

Broadband coaxial cable

A single coaxial cable may be used as the medium for a broadband system also. The technology for the broadband systems is based on the development of CATV equipment. As originally engineered such systems provide for the distribution of many (60) television program channels from a centralized studio facility to a community of many (thousands) subscribers. Even in this environment it is becoming evident that it is very useful for the subscribers to be able to "talk back" to the program originating facility. Carrying this concept to its logical extreme, i.e. allowing every subscriber to originate as well as receive programs, is of little real value in the CATV business but is exactly the capability required for a data communications network. Of course, I do not mean network users are interested in TV transmissions but that the capability for transmitting and receiving huge quantities of information from any point within the network is the desired goal. Various schemes are employed for doing this efficiently. One of the most attractive is to use two distinct ranges of frequencies for data coming from or going to particular device and to do the necessary frequency conversion at the "headend" of the cable. This arrangement requires only a single coaxial cable to provide all services. The distance limitations of this type of network are measured in the tens of miles and are well in excess of the needs of local networks. The data transmission capacity of this type of broadband system is somewhat difficult to relate to the baseband case but, roughly speaking, 20 simultaneous TV channels each of which carries the equivalent of 30 pages of text each second translates into (conservatively) 1.2 million characters per second or more realistically 5 million characters per second. In any kind of network there arises the need to extend service to the maximum distance possible; in the case of broadband systems it is relatively convenient to

insert amplifiers in the cable trunk lines to boost the signal strength as needed, in the case of baseband systems this technique is not quite so straightforward and early systems did not have repeaters to allow network extension. This limitation is being addressed in current system designs.

ISSUES AND RISKS

Contention

To take full advantage of the resource sharing nature of a network it will be necessary to handle the contention situation smoothly. By contention we mean the resolution of conflict when more than one device needs to transmit data on the network at a particular instant in time. In the case of broadband systems there may be many independent "channels" for data transmission and in this context contention applies to each channel independently. The extremely high capacity of the systems being discussed here might lead one to conclude that all users can be served simultaneously and indeed that could be done. But remember that economics is the driving force behind networks and thus it is required to obtain the greatest possible sharing of the transmission medium even at the expense of added complexity. Eventually, of course, the extra complexity and the degradation in service of an extremely loaded network negates the economies of resource sharing.

There are several approaches to contention resolution. Briefly, the most often used mechanisms are: reservation, priority, and first-come-first-served. In a reservation system, as the name implies, no transmission is permitted unless the device has been given an explicit "slot" for its private use. An advantage of a reservation system is that it can guarantee a transmission rate to any and all devices until the system capacity is reached. A disadvantage is that reserved capacity may be unused. In a priority system any transmission may be interrupted by a higher priority device. An advantage is that high priority data can be assured of transmission without delay while allowing low priority data to use up the otherwise idle periods. A disadvantage is that a required transmission rate cannot be guaranteed, except to the very highest priority devices. In a system based on first-come-first-served (equivalent to a priority system where all devices are equal) an attempt is made to transmit data in the order in which it is received and if system capacity is reached all transmissions are slowed proportionately. The advantage is maximum utilization of the transmission medium and equitable impact on all users when contention arises. The disadvantage, in addition to no guarantee of transmission rate for any user, is what I might call the principle of most patience: i.e. under heavy load conditions the most patient users will remain on the network, struggling with slow transmission rates, while the impatient user will disconnect, hoping to come back later when the network is not so busy, thereby improving the network performance for those who remain.

Flow control

At the individual user, or device, level the manifestation of contention in receiving data is in intermittent and erratic flow of data. When sending data the effect is that the device cannot send unless permitted to send by the

network. The term "flow control" is applied to any situation in which a mismatch of speed or capacity exists and in which transmission of data is suspended until explicit permission is granted. This interaction of a device wishing to transmit data with another device intended to receive that data (and by extension, with a network that is interposed between the two devices) is extremely important in a local area network environment. Unfortunately all three players in this process must cooperate and that is sometimes difficult to arrange. Nevertheless, many of the benefits of a local area network can only be achieved if an efficient mechanism for flow control is supported by the network and if that mechanism is compatible with the capabilities of the devices to be interconnected.

Technology risks

No new technology, such as local area networking, can be implemented without some risk. One consequence of rapid growth and development of new products is a divergence by the various vendors in an attempt to secure a market share. This fight for market penetration using various proprietary techniques temporarily discourages standardization. The LAN state of the art is just entering the phase when manufacturers are willing to consider standards and interconnectivity of their respective products. Until a higher degree of stability has developed in this area there is some risk of committing to a network that ultimately will become "non-standard". Another hazard of the rapid pace of development is that of early obsolescence. With new and better products becoming available every month it is difficult, and risky, to commit to a particular product while expecting an improved version to be "just around the corner". A third risk is one of long term vendor support. Success in the local area network business is attracting many competitors, both established companies and total newcomers. Not all of them will survive the long haul, thus there is a risk of committing to a network implementation for which maintenance and/or expansion is impossible. Indeed, total replacement is the usual course in these circumstances. These comments should not be taken as a rejection of the movement into local area networks but rather as recognition that risks do exist and prudent decision makers must take them into account.

The 64 dollar question is: What is the best local area network? Everyone is hoping I have the answer to this question but nobody will be surprised when I tell you there is no single answer. An unambiguous choice can be made for trivial cases; unfortunately in real life there are too many circumstances unique to a particular case and the scope of the requirements will be too broad for simple solutions to be effective. Some of these aspects should come out in the case study of NSWC's network which will be described shortly.

Data vs meaning

One last point deserves some mention before going into the case study details. For a network to be useful it is necessary but not sufficient that the data transmission be accomplished without error. (To achieve error free transmission it is permitted to have multiple tries.) An example of this phenomenon in the library business might be the delivery of a book in Japanese to an English speaking reader. The delivery is perfectly error free yet the result is "zero transfer of information"! All networks, at some level, are merely mechanisms for reliable transmission of binary digital data but the

meaning and context of the data thus transferred is entirely beyond the responsibility of the network. This situation is of some concern to the "providers" and the "users" of a local area network so that no misunderstanding results when the "system" does not work as it should. Again the need for standards arises. In network terminology a protocol is the standard to be applied in interpreting data transmitted in a particular case. As a working definition of a protocol let us assume it is defined as: a prior agreement on the context and meaning of the digital representation of the data to be transmitted. Efforts to standardize the protocols for network communication and inter-network links are moving forward both at the national and international level. The ISO (International Standards Organization) has developed a "reference model" of the network communication process which is proving very useful in discussions of network protocols. In this model the process is broken into 7 layers which can be discussed, at least, in relative isolation even though the actual implementation in hardware and software may cause the boundaries to be obscure.

NSWC LAN CASE STUDY

Requirements

The rest of this presentation will deal with a case study of the NSWC (Naval Surface Weapons Center) LAN implementation. We are not suggesting that this is the best approach for everyone as there were some unique circumstances driving our decisions which may not apply to other installations. However, it should be interesting to see how one network evolved through the concept, planning, and implementation stages. Here is the situation as it existed in the summer of 1980: The computer division at NSWC had a procurement action underway for acquisition of a large-scale general purpose computer system (as a replacement and upgrade of existing systems) that would support 150 interactive ports initially and be expandable to 400 ports. At the same time a project was initiated to establish an office automation system on a pilot scale with the long range intent of supporting 400 users (ports) for office automation applications, primarily word processing and electronic mail but with a significant effort in application of ADP techniques to office procedures. Other systems of much smaller scope were already installed within the Center and the provision of data communications facilities for these systems constituted a small, but rapidly growing, requirement. All together, then, the need was to provide a data communication system with a capability of 1000 simultaneous users connected to any of a variety of host computers scattered throughout two major laboratory facilities separated by 70 miles. And that was just for starters! What additional needs might materialize in the next ten years would be very difficult to predict.

Options

The first clear decision was to obtain a high-speed link capability over the 70 mile span between laboratories. Consideration was given to common carrier leased lines and to satellite links. In our case it was more economical to obtain a high-speed leased line and this solution also presented the least risk in terms of the inherent delay in satellite transmissions.

This was a long lead-time item. There were further constraints within the Dahlgren laboratory environment (namely that all utilities were underground and that all conduits compatible with coaxial cable were "oversubscribed") which led us to a decision to use fiber optic trunk lines to interconnect physical areas that could not be reached with coaxial cables. The only available conduit space was occupied by high voltage power distribution wiring which prevented the use of any electrical conducting materials, hence the selection of glass fibers. The general topology of our network was now emerging - i.e. several coaxial cable systems would provide the transmission medium in localized areas and these "sub-systems" would be interconnected by high-speed serial links whether they be supplied by the common carriers or through fiber optic lines. It remained our intent from the earliest stages that any communication system to be implemented must present a homogeneous appearance to the users. For many of the reasons previously discussed as advantages or disadvantages of the various competing network technologies our situation favored a broadband system and that was the decision that was made.

A competitive procurement action was initiated in October 1981 for a broadband local area network system and a contract was awarded to Sytek, Inc. in December 1981. Delivery of equipment began in February 1982 and first operational use occurred on 10 July 1982, i.e. some two years after a serious effort began.

Present

To give just a few of the salient characteristics of the LAN system as it presently exists at NSWC. We are using Sytek System 20 components on a broadband cable system installed under separate contract. All usage is for asynchronous devices having RS-232C interfaces and at speeds up to, and including, 9600 bits per second. Four "channels" are in active use out of 20 channels available. Approximately 200 computer ports are accessible on a dozen different machines and approximately 400 user ports are connected to terminals and printers. The present traffic load on the network is over 30 million packets per day and we are still in the rapid growth phase of our installation. As expansion takes place during the next 12 months under contracts already in place it is expected that the total network utilization will double. Interconnectivity with the DDN (MILNET) is in an experimental stage and an internet gateway will be implemented and supported.

Support

Speaking of support, the implementation of a local area network on any large scale requires a commitment of either in-house or contract personnel to the operation, maintenance, monitoring, and administration of the system and this is no small level of effort. When any resource, such as a general purpose computer, a network, or a library is used daily by hundreds of employees it is essential for the managers of that resource to see to it that adequate service is available and that any deficiencies are corrected as quickly as possible. The funding arrangements for continuing operations present an interesting administrative dilemma. Is a local area network a "utility" service which should be charged against general overhead? Or is it a reimbursable service which must pay its own costs from user revenues? There are sound arguments for either approach but the technical difficulty of

collecting appropriate accounting information (actual usage) tilts the balance toward general overhead. And last, but not least, recent publicity regarding unauthorized access to government computers emphasizes the need for appropriate ADP security measures on any local area network.

MILITARY LIBRARIANS WORKSHOP

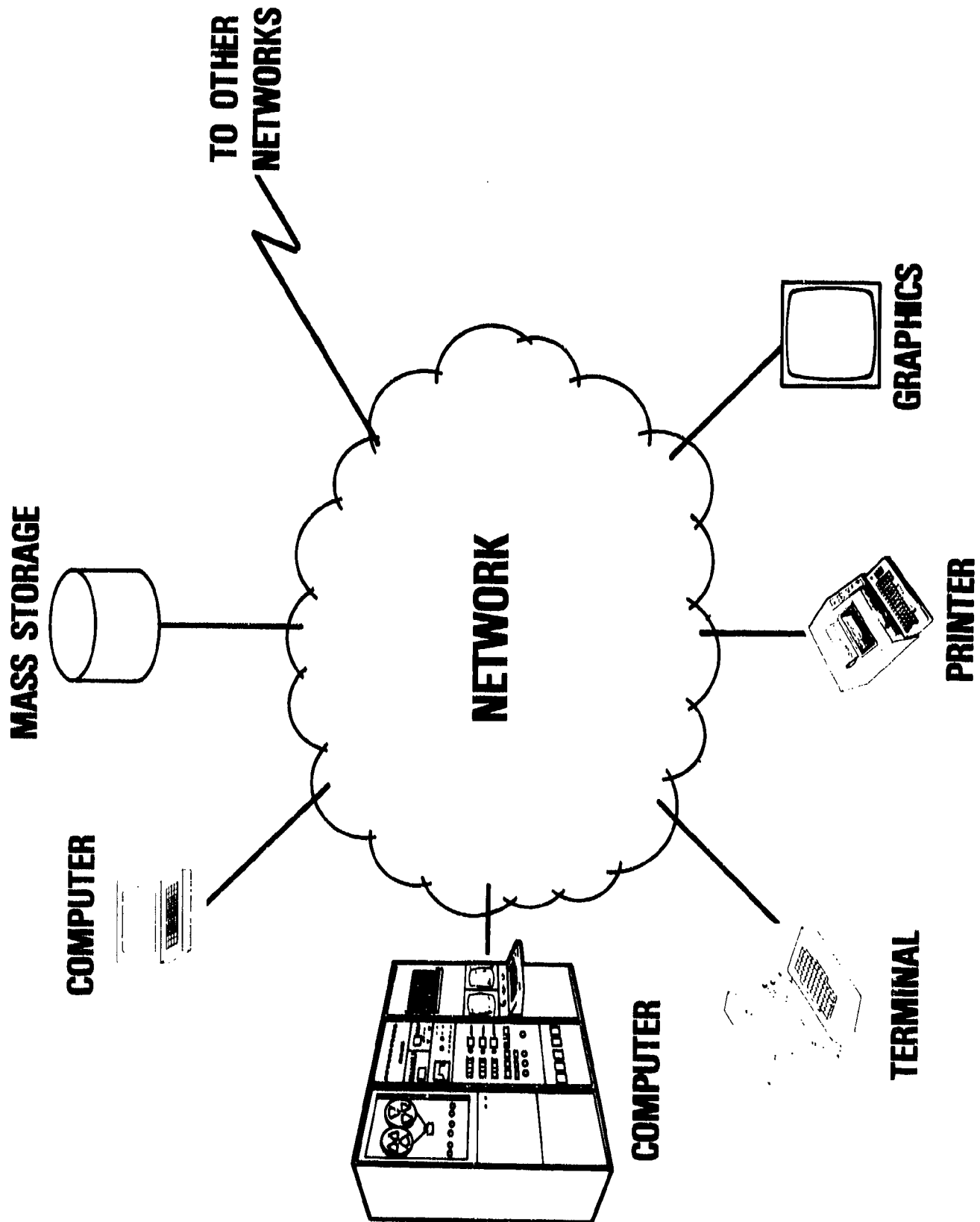


SESSION ON

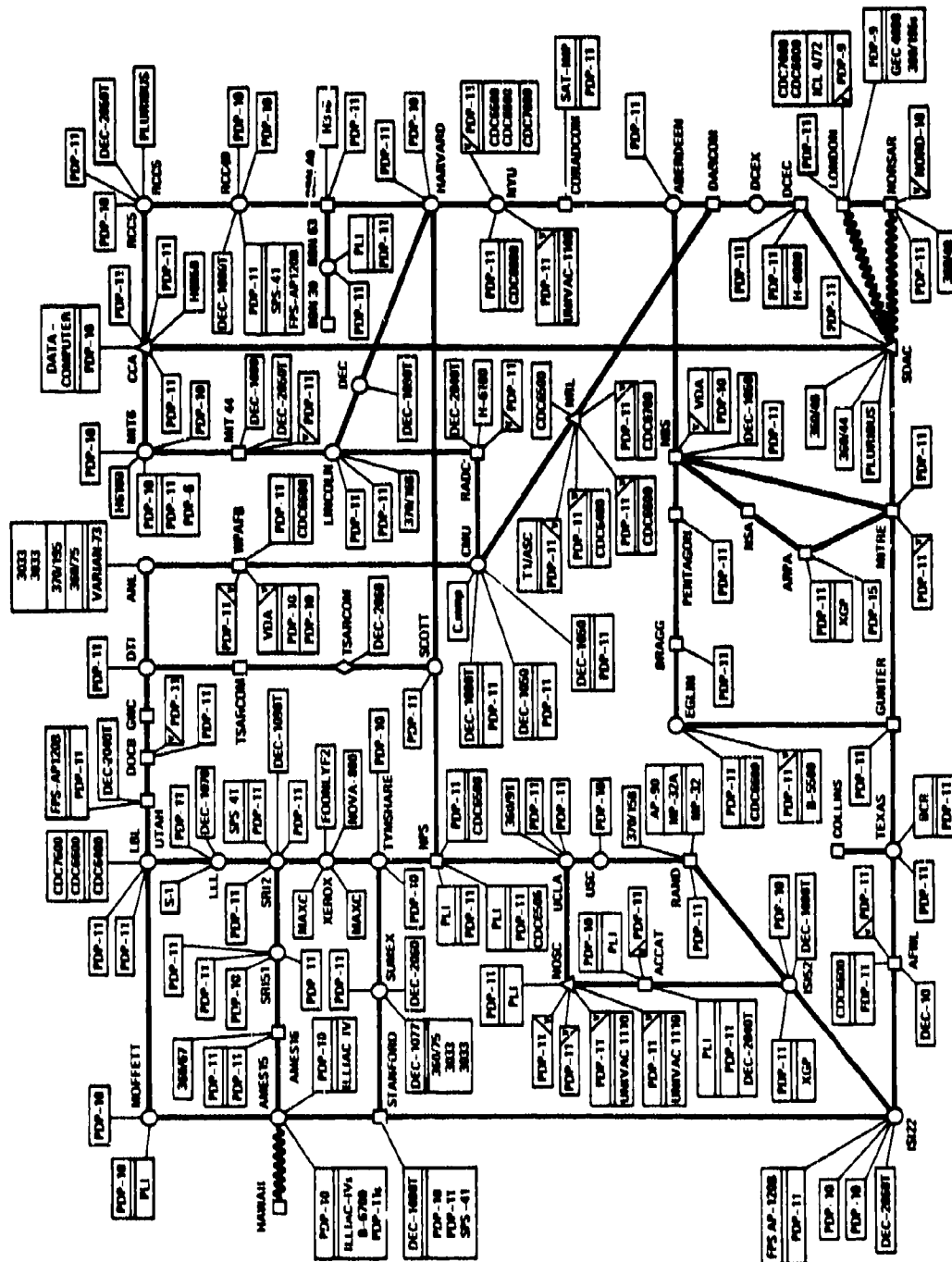
LOCAL AREA NETWORKS

OUTLINE

- **NETWORK BENEFITS**
- **ALTERNATIVE NETWORKS**
- **CHARACTERISTICS**
- **LIMITATIONS**
- **RISKS**
- **PROTOCOLS**
- **CASE STUDY**



ARPANET LOGICAL MAP, JUNE 1979



PLEASE NOTE THAT WHILE THIS MAP SHOWS THE HOST POPULATION OF THE NETWORK ACCORDING TO THE BEST INFORMATION OBTAINABLE, NO CLAIM CAN BE MADE FOR ITS ACCURACY.
 HOST COMPUTER CONFIGURATION SUPPLIED BY THE RETROHIS INFORMATION CENTER
 NAMES SHOWN ARE IMP NAMES, NOT (NECESSARILY) HOST NAMES

- IMP
- TTP
- △ PLURIBUS IMP
- ◇ PLURIBUS TTP
- ▭ SATELLITE CIRCUIT
- ▲ VERY DISTANT HOST

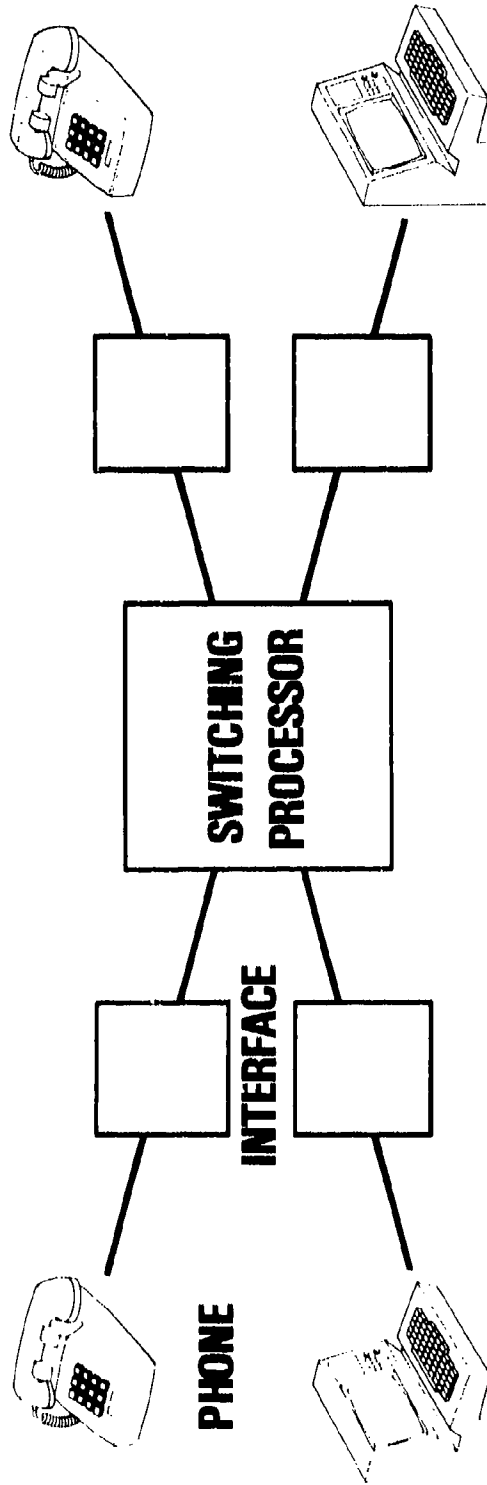
NETWORK BENEFITS

- **COMMUNITY OF INTEREST**
- **SPECIALIZATION**
- **RELIABILITY**
- **FLEXIBILITY**
- **RESOURCE SHARING**

LAN CHARACTERISTICS

- **FEW LARGE SYSTEMS**
- **MANY SMALL SYSTEMS**
- **20 TO 1000 USERS**
- **200 FEET TO 3 MILES**
- **COMMON ORGANIZATION**

DIGITAL PBX



TERMINAL

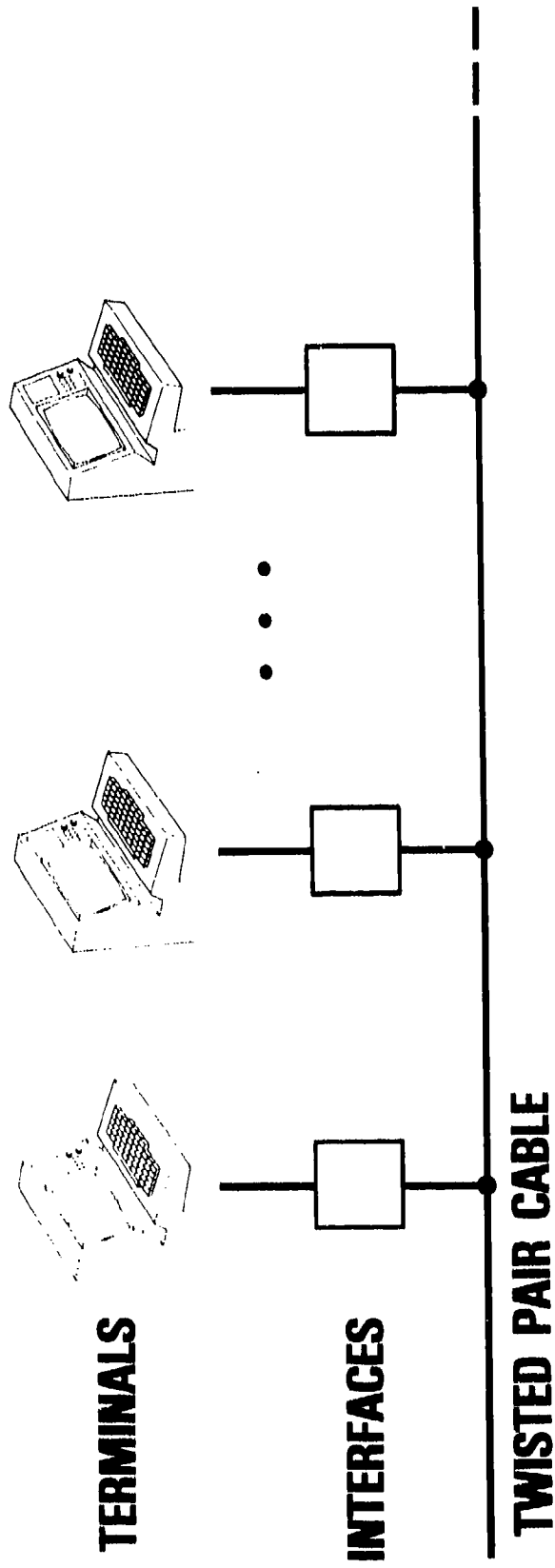
PLUS:

- USES EXISTING WIRING

MINUS:

- LIMITED SERVICE

TWISTED PAIR



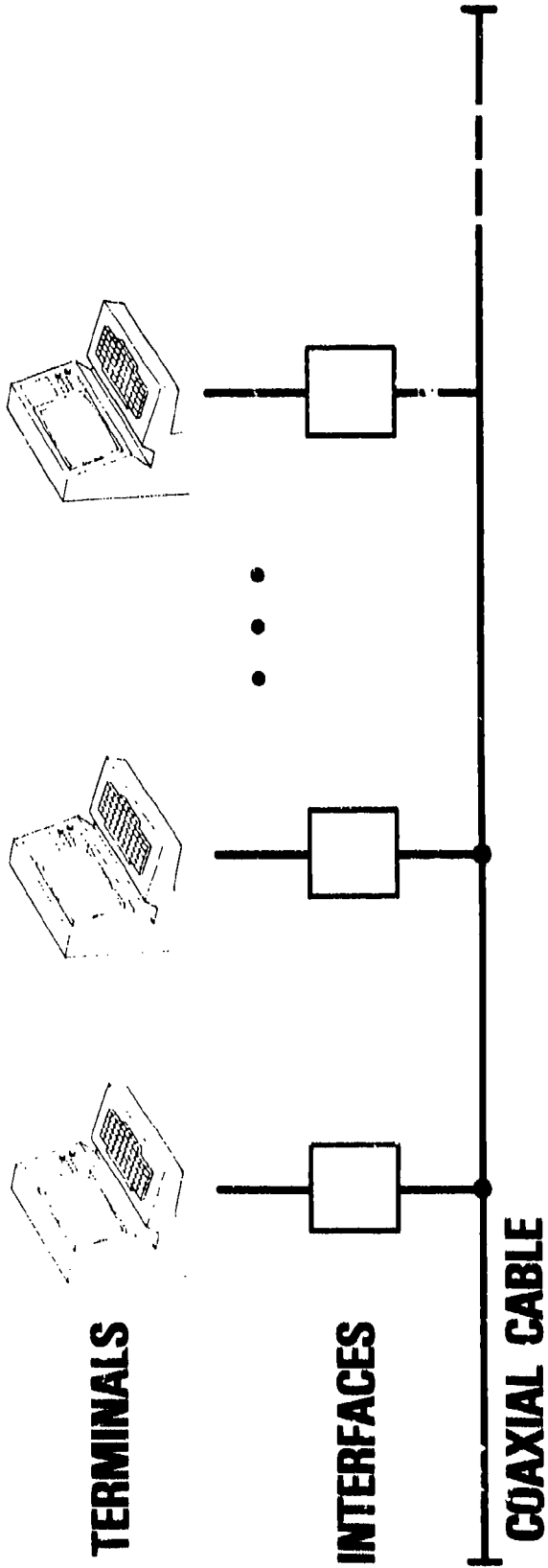
PLUS:

- COST

MINUS:

- DISTANCE
- E-M INTERFERENCE

BASEBAND



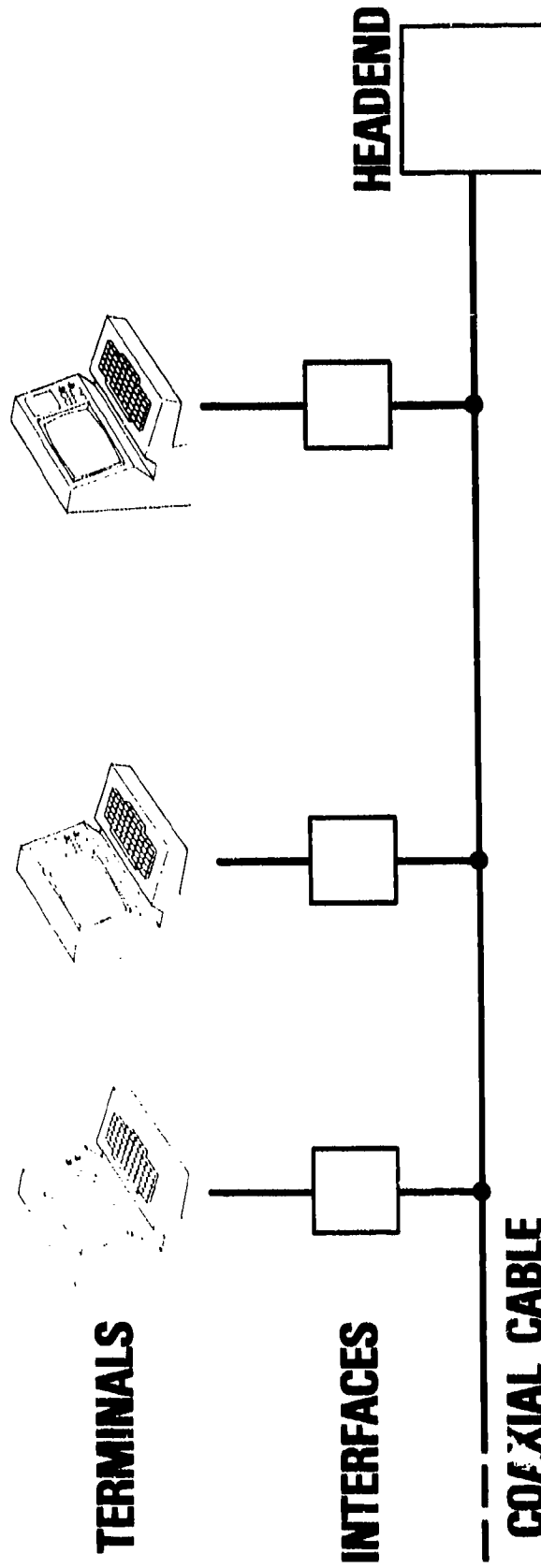
PLUS:

- SPEED
- VENDORS

MINUS:

- DIGITAL ONLY
- DISTANCE

BROADBAND



PLUS:

- SPEED
- MULTI-SERVICE
- DISTANCE

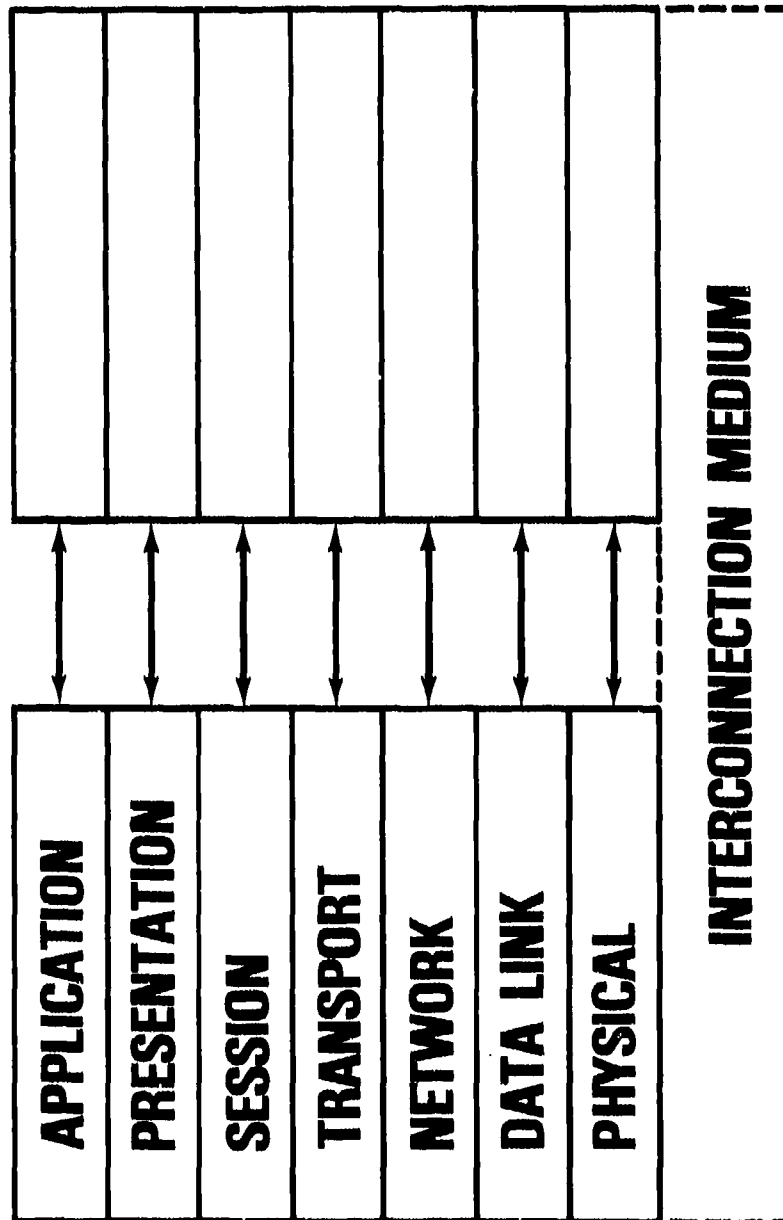
MINUS:

- COST

TECHNOLOGY RISK

- **STANDARDS NOT SET**
- **PRODUCT OBSOLESCENCE**
- **VENDOR STABILITY**

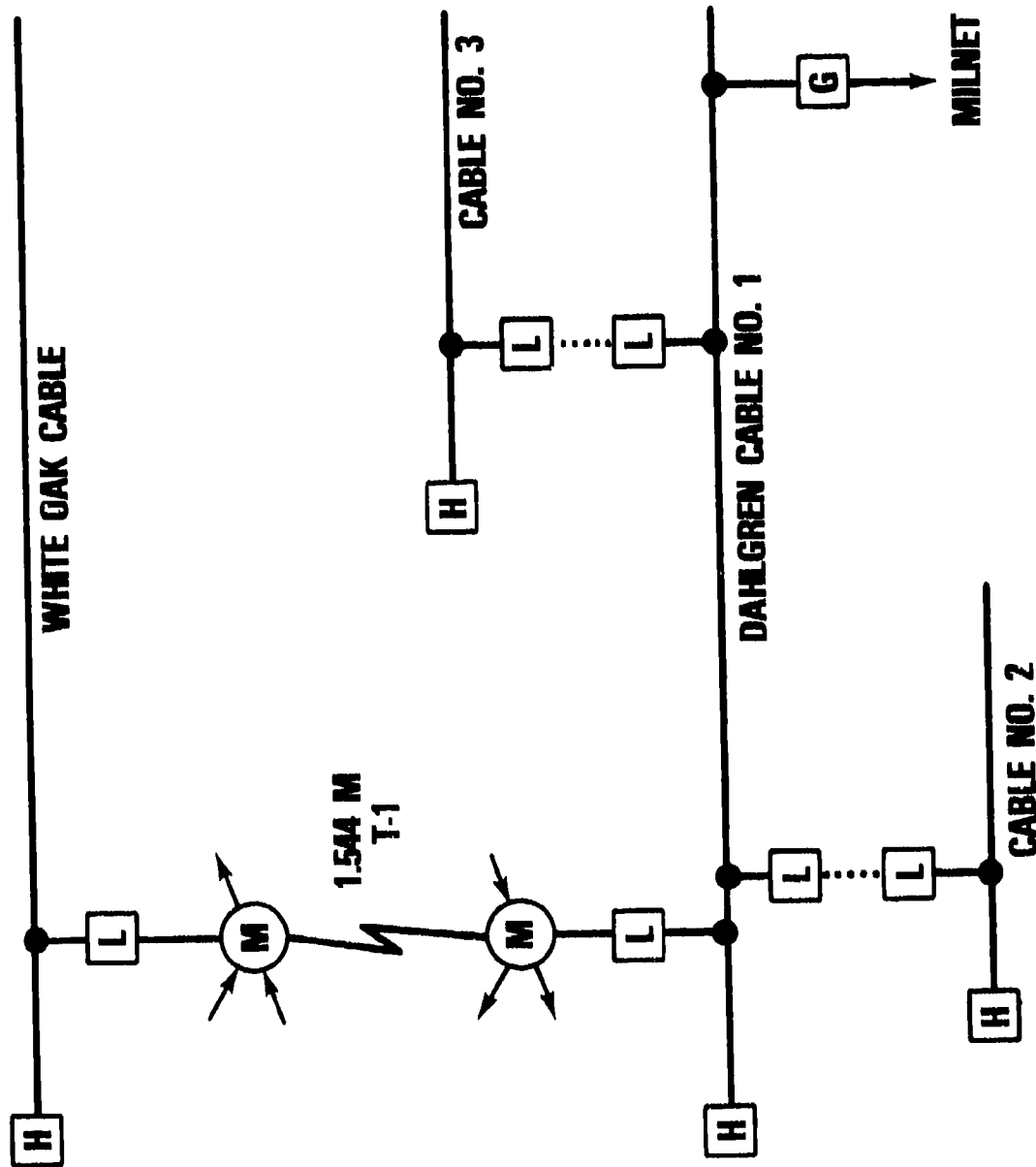
ISO MODEL



REQUIREMENTS OF COMMUNICATION SYSTEM

- **INTERCONNECTIVITY**
- **SUPPORT VARIED AND GROWING COMPUTING RESOURCES**
- **SUPPORT VARIETY OF TERMINAL DEVICES**
- **SUPPORT MANY USERS**
- **BE RELIABLE, ROBUST, AND POTENTIALLY SECURE**

NSWC TOPOLOGY



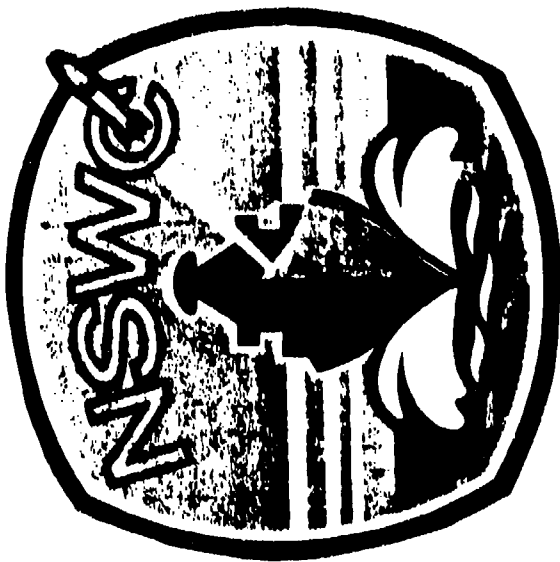
ISSUES

- **LONG TERM SUPPORT**
- **FUNDING ARRANGEMENTS**
- **ADP SECURITY**

Productivity Enhancement Project

Presented By

**Ms. Georgene Burton
Naval Surface Weapons Center**



PRODUCTIVITY ENHANCEMENT PROJECT (PEP)

SPEAKER:

GEORGENE B. BURTON

AGENDA

- **BACKGROUND**
- **APPROACH**
- **BASELINE SYSTEM PROCUREMENT**
- **EXPANSION STRATEGY**
- **MANAGEMENT CHALLENGES**

PRODUCTIVITY ENHANCEMENT PROJECT

PHASED DEVELOPMENT APPROACH

1981-82	PHASE I	PROTOTYPE 100 TERMINALS ● INVESTIGATE OAS STATE-OF-THE-ART ● ESTABLISH PRODUCTIVITY MEASUREMENT METHODOLOGY ● DEMONSTRATE PRODUCTIVITY IMPROVEMENT WITH SELECTED APPLICATIONS ● APPLY, "LESSONS LEARNED" TO NEXT PHASE ● DEVELOP TRANSITION STRATEGY
1983-85	PHASE II	INITIAL PRODUCTION 200-250 TERMINALS ● IMPLEMENT BASELINE OAS AT CENTER ● INTEGRATE WITH CENTER ADP RESOURCES ● DEVELOP EXPANSION STRATEGY ● DEVELOP LIFE CYCLE SUPPORT STRATEGY
1985 →		FULL PRODUCTION 1000+ TERMINALS ● EXPAND BASELINE OAS ● ESTABLISH LIFE CYCLE SUPPORT

BACKGROUND

- **WHY PEP?**
- **PERSONNEL CEILINGS**
- **INCREASING WORKLOAD**
- **DUPLICATIVE EFFORT**
- **CORPORATE MEMORY**

LESSONS LEARNED

- **USER FRIENDLINESS**
- **SYSTEM RELIABILITY**
- **SYSTEM INTEGRATION**
- **FULL NETWORKING**
- **VENDOR INDEPENDENCE**

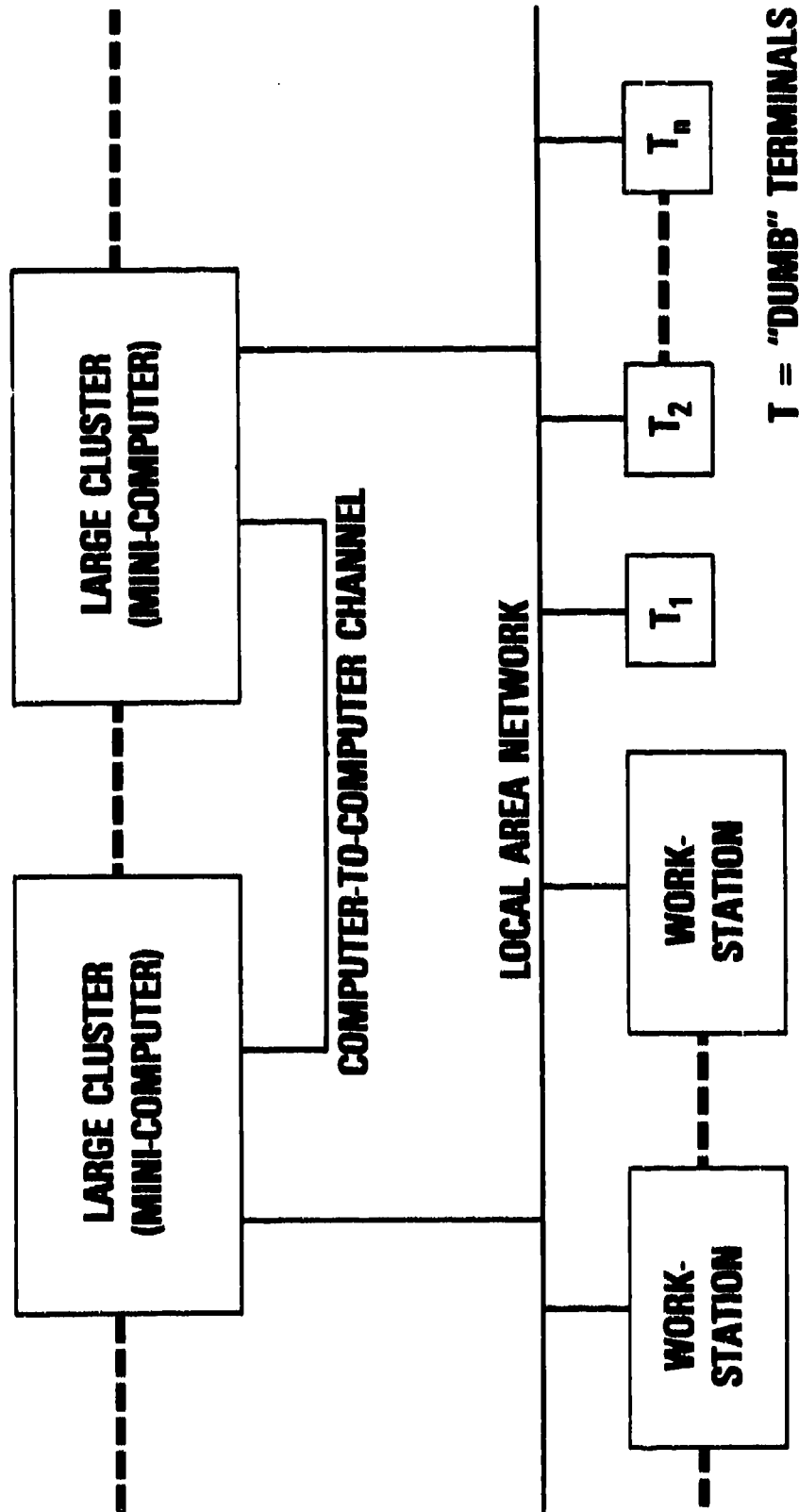
USER FRIENDLINES

- **USER ACCEPTABILITY AS PART OF TECHNICAL EVALUATION**
- **MENU AND COMMAND MODES**
- **HELP FACILITY**
- **ON-LINE DOCUMENTATION**
- **COMPUTER ASSISTED INSTRUCTION**

NOVEMBER 1982

PHASE II SYSTEM

• ARCHITECTURE



RELIABILITY

- **CENTRALIZATION OF LARGE CLUSTERS**
- **QUALIFICATIONS OF VENDOR SUPPORT PERSONNEL**
- **ONE VENDOR SOLUTION**
- **SOFTWARE AND HARDWARE FIX TIMES**
- **OPERATIONAL AND PERFORMANCE DEMONSTRATIONS**
- **ON-SITE ANALYSTS AND ENGINEERS**

NOVEMBER 1982

INTEGRATION

- **STAGGERED DELIVERY**
- **QUALITY ASSURANCE BASELINE**
- **GRADUAL INTRODUCTION OF WORKSTATION CAPABILITIES**
- **VT100 COMPATIBLE TERMINALS**
- **NEC SPINWRITER PRINTERS**

NOVEMBER 1982

NETWORKING

- **MAIL**
- **SCHEDULER**
- **SYTEK LOCALNET 20**
- **WORKSTATION SERVER**
- **COMMUNICATIONS INTERFACE**

NOVEMBER 1982

UNIX BASED OAS SOLUTION

- **MINIMIZE VENDOR DEPENDENCE**
- **MINIMIZE SUPPORT EFFORT**
- **PROVIDE DEFINED EVOLUTION PATH**
- **COMPUTER CENTER POLICY FOR ADP PROCUREMENTS**

NOVEMBER 1982

PHASE II SYSTEM

- **SPECIFICATIONS**

- **MANDATORIES**

- 4 LARGE CLUSTERS

- 100 WORKSTATIONS

- 1 WORKSTATION/COMMUNICATION SERVER

- 1 HIGH SPEED PRINT SERVER

- UNIX OPERATING SYSTEM

- OAS

- COMMUNICATION PROTOCOLS
 - AUDIT TRAILS

- **DESIRABLES**

- LASER PRINT SERVER

- OCR SUPPORT

- VOICE FILE PROCESSING

- COLOR GRAPHICS

- FULL PAGE DISPLAY

- OAS ENHANCEMENTS
 - SCIENTIFIC NOTATION
 - INTERFACE WITH OTHER WPs
 - FORMS SUPPORT
 - COMPREHENSIVE DBMS

- **OPTIONS**

- 2 LARGE CLUSTERS

- 50 WORKSTATIONS

- LARGE CLUSTER EXPANSIONS

- WORKSTATION EXPANSIONS
 - DISK DRIVE EXPANSIONS

BASELINE OFFICE AUTOMATION SYSTEM

- **FOUR DEC 11/780 VAX MINI-COMPUTERS**
- **FIFTY CCI POWER 5/10 WORKSTATIONS**
- **COMPUSCAN ALPHA WORD III OCR**
- **ALTERTEXT WORD PROCESSING CONVERSION AID**
- **UNIX OPERATING SYSTEM**
- **CCI'S OFFICEPOWER**
- **CCI'S USER DEFINED APPLICATIONS PACKAGE**

INITIAL CAPABILITIES

- **INTEGRATED WORD PROCESSING AND DATA MANAGEMENT SYSTEM**
- **NETWORKED ELECTRONIC MAIL**
- **NETWORKED APPOINTMENT SCHEDULING**
- **CALENDAR MANAGEMENT**
- **TABLE ARITHMETIC**
- **MILNET ACCESS**

FUTURE INITIATIVES

- **ELECTRONIC SPREAD SHEET**
- **BASIC LANGUAGE**
- **DATA BASE MANAGEMENT SYSTEM**
- **GRAPHICS**
- **NEW WORKSTATIONS**
- **INTERFACE TO OTHER SYSTEMS (STAFS, NACMIS,
BEST, ETC.)**
- **APPLICATION DEVELOPMENT**

PHASE II SYSTEM

• SCHEDULE

DPA APPROVED	3 FEB 83
RFP RELEASED	7 FEB 83
BIDS CLOSED	11 APR 83
CONTRACT AWARD	30 JUN 83
FIRST DELIVERY	30 AUG 83
INTEGRATION/TESTING	SEP 83-FEB 84
RELEASE TO USERS	MAR 84
ADDITIONAL DELIVERIES, INTEGRATION/ TESTING, RELEASE TO USERS	NOV 83-NOV 84

PHASE II SYSTEM

- **EVOLUTION/EXPANSION STRATEGY**
- **ESTABLISH COMPATIBILITY MECHANISMS**
- **EXERCISE CONTRACT OPTIONS**
- **EXPAND TO FULL CAPABILITY**
- **UNIX BASED UPGRADES**

MANAGEMENT CHALLENGES

- **AUTOMATING INEFFICIENCY**
- **SYSTEM ABUSE**
- **INFORMATION EXPLOSION**
- **SLOW EVOLUTION TO PAPERLESS OFFICE**
- **CHANGING ROLES**
- **CHANGING WORK PATTERNS**
- **LIFE CYCLE COST**

GENERAL SESSION
ADP EQUIPMENT ACQUISITION AND FEDERAL REQUIREMENTS

Presented by

Donald Page, Director
Policy and Regulations
Government Services Administration

(Entire presentation not available)

In lieu of a presentation outline, Mr. Page has submitted a GSA bulletin and several regulations to assist in understanding federal procurement requirements.

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DONALD J. PAGE

DONALD J. PAGE is Director, Policy and Regulations Division, Office of Information Management Resources (OIRM), General Services Administration. He has been assigned to Government-wide IRM activities since joining GSA, particularly in the areas of data processing, communications and teleprocessing services. He presently heads an office responsible for the development of policy and regulations to support GSA responsibilities in ADP and telecommunications procurement and management. He also supervises the OIRM Standards Branch which coordinates and represents GSA's Government-wide positions on the development and implementation of Federal Information Processing and Telecommunications Standards. Previously, Mr. Page managed the GSA program which issues delegations and approvals to Federal agencies for computer hardware and support and communications equipment and services. He also played a major role in the establishment of the GSA Office of Software Development and was responsible for implementing the Teleprocessing Services Program.

EVOLUTION OF GSA'S ADP PROCUREMENT REGULATIONS

Mr. Page's presentation traced the evolution of GSA's regulatory actions in the implementation of procurement procedures for ADP equipment under the authority of Public Law 89-306, the Brooks Act. He related this evolution and the general direction of granting greater authority and responsibility in ADPE procurement to the growing-up process of his family over the time period since the Brooks Act has been in effect (October 1965). Issues such as the following were discussed briefly:

Whether GSA should procure equipment for agencies or delegate authority to procure

Effect of limited ADP staff in GSA

Reorganization efforts

Strictness of GSA reviews

Timeliness of GSA actions

Dollar level thresholds for GSA intervention

More flexible procedures in granting ADP delegations

The principle of "maximum practicable competition"

Assigning agencies the responsibility for performing their computer hardware and services procurements

Recent significant increases in dollar thresholds for ADP procurements

Satisfaction of agency requirements (want vs. need)

The overall presentation was designed to illustrate the pattern of rewarding proper actions and responsible behavior with increased levels of authority and responsibility and to demonstrate that these factors apply to on-the-job performance of Federal activities engaged in ADP acquisition, as well as to raising children in line with the expectations of present day society.

August 19, 1983

GSA BULLETIN FPR 61
FEDERAL PROCUREMENT

TO: Heads of Federal agencies

SUBJECT: Office Technology Plus (GSA's Computer Store)

1. Purpose. This bulletin describes GSA's new computer store, Office Technology Plus, and its relationship to other procurement vehicles available to Federal agencies for buying small computers and related software, training, and maintenance.

2. Expiration date. This bulletin contains information of a continuing nature and will remain in effect until superseded or canceled.

3. Background. GSA recently awarded a contract for the operation of a computer store called Office Technology Plus. The store will be located in the General Services Building, room 1220, 18th and F Sts., NW, Washington, DC 20405. It is a nonmandatory source of supply by which Federal employees in the Washington, DC area may become acquainted with, purchase, and be trained on the latest end user computing equipment and related products and services. Federal employees may buy products from the store for agency use only. The store is intended to provide the Government with:

a. Special service and assistance, to help Government employees in the Washington area determine how products sold at the store can improve agency efficiency/productivity and at what cost.

b. A Government focal point that will sell the latest end user computing equipment and software.

c. Low cost service and maintenance for all products sold in the store.

d. Seminars and forums on the use of products available at the store.

Note.--The information in this bulletin is identical to information contained in GSA Bulletin FPMR F-156.

e. Information on how microcomputers and related software packages can be used for specific functions in Government offices.

f. Low cost training for Government employees on equipment and software sold by the store.

g. Reduced costs for end user computer related items, including maintenance and training.

h. "Side-by-side" comparisons, sales, maintenance, technical support and expertise, and training for the same type of product from multiple manufacturers.

4. Acquisition alternatives. After an agency has determined its needs and justified its requirements in accordance with applicable Government- and agency-wide regulations,* the agency should determine which procurement approach is most likely to meet its requirements at the lowest overall cost, price and other factors considered. To do so, an agency must know the approximate size and dollar value of its requirement and the technical service and training required. Depending on the nature of an agency's requirements, the best alternatives for acquiring small computers are normally (a) using small purchase procedures, (b) issuing a formal solicitation document, (c) placing an order under an ADP schedule contract, or (d) placing an order with the computer store. These alternatives are discussed below.

a. Small purchases. Agencies may use small purchase procedures when the value of the procurement is less than \$10,000 (\$25,000 in the Department of Defense) and small purchase procedures are determined to be in the best interest of the Government. This would be the case when an item is obtainable at a lower cost from a manufacturer or dealer in the open market than from a schedule contractor or the store. This situation might result from a special marketing promotion. Small purchase procedures are described in FPR Subpart 1-3.6 (or, if applicable, Defense Acquisition Regulation Section 3-6).

b. Formal solicitation document. Issuing a solicitation document and conducting negotiations are more time consuming and expensive than issuing an order under an existing contract (such as

* Note.-- Government-wide guidance regarding the determination of need and justification process for ADPE and software is contained in FPMR Subpart 101-35.2. GSA Bulletin FPMR F-153 contains guidance on end user computing. GSA is developing regulatory changes and further guidance regarding small computers, which is scheduled to be issued in 1983.

the store or a schedule contract). For relatively large requirements, a competitive solicitation will normally result in lower prices than either an order from a schedule contract or a purchase from the store. The determining factor should be whether the expected price reduction will justify the added cost of conducting the procurement. A competitive solicitation is also appropriate when:

(1) The expected value of the procurement exceeds the maximum order limitation of the store or an applicable schedule contract; or

(2) The requirements cannot be satisfied reasonably by an ADP schedule contract or the store. (This might be the case when the agency's requirements call for a customized package with features not offered commercially.)

c. GSA nonmandatory ADP schedule contracts.

(1) GSA annually awards ADP schedule contracts to hundreds of vendors (including both dealers and manufacturers) for hardware, software, and related products and services. Each schedule vendor negotiates discounts from its commercial prices. These discounts are based on a number of factors, including the amount of business the vendor expects to receive from its schedule contract, the prices listed in the vendor's commercial catalog, and the discounts it offers its other customers. In over 95 % of the cases, GSA receives discounts that are equal to or better than those which vendors offer their most favored end user customers. These schedule contracts are nonmandatory sources of supply. The procedures governing the use of ADP schedule contracts are set forth in FPR § 1-4.1109-6. (See FPR Temporary Regulation 71, which contains the effective version of § 1-4.1109-6.)

(2) The ADP Schedule Contract Program consists of the following three sections.

(i) Section A. Schedule A contractors offer their full lines of commercially available equipment and software, such as central processing units (CPU's), on-line peripherals, software packages, hardware maintenance services, and microcomputers. These contracts contain relatively strict terms and conditions, such as liquidated damages for late installation or delivery, a 30-day acceptance period, and short response times for remedial maintenance. Under Schedule A, agencies issue orders directly to the contractors and pay the contractors upon receipt of invoice after acceptance. Schedule A also has provisions for mandatory training and several types of maintenance.

(ii) Section B. Schedule B contracts offer attachments and peripheral devices that are not channel connected to the CPU. This equipment is used primarily off line or in a stand-alone mode. Schedule B contracts generally have no provision for liquidated damages, permit longer response times for remedial maintenance, and have a less stringent acceptance test period.

(iii) Section C. Schedule C is a pilot multiple award schedule program for microcomputers (purchase only) and related software and peripherals. This program is now available to all Federal agencies. Purchasing agencies, after selecting equipment and ensuring that the purchase complies with ADP procurement regulations, forward their orders to GSA. GSA consolidates the orders and issues orders to the vendors each week. Vendors then ship equipment to stipulated destinations and send invoices to GSA for payment. GSA then bills the purchasing agencies. Schedule C prices are generally better than those obtained under Schedule A or B. Terms and conditions in Schedule C contracts are similar to those used in the commercial marketplace. For example, there is no 30-day acceptance test period.

(3) Schedule contracts are intended primarily for relatively small requirements. FPR § 1-4.1109-6(b)(2) requires an agency to obtain a delegation of procurement authority from GSA before placing an order in excess of \$300,000 under a schedule contract. In addition, each schedule contract contains maximum order limitations that limit the size of individual orders.

(4) If an agency determines that a competitive solicitation approach is not likely to be the most cost effective method of procurement, and the agency has defined its requirements sufficiently to know which schedule and computer store offering(s) would meet its requirements, the agency should review the offerings of the store and the various schedule vendors and select the item(s) and the procurement vehicle that will meet its requirements at the lowest overall cost. All of the factors, in addition to the price of the computer (e.g., required services, the costs of conducting the procurement, etc.), that will influence the overall cost of acquiring and implementing the system, should be considered and documented in the procurement file. The services offered by the computer store that might influence the overall cost are discussed in paragraph 4d.

(5) If the agency decides to place an order under a schedule contract and the total purchase price of the item(s) being ordered is \$50,000 or less, the agency may place the order without further notice. If the purchase price exceeds \$50,000, the intent to place the order must be synopsisized in the Commerce Business Daily at least 15 calendar days before placing the order. This synopsis gives nonschedule vendors and other schedule vendors an opportunity to notify the agency of other items that might satisfy the agency's

requirement at a lower overall cost. The contracting officer must evaluate responses to the synopsis to decide whether the proposed items meet the requirement. If they do, the contracting officer must determine whether a solicitation or a schedule order will be more advantageous to the Government. The procurement file should be documented with the basis for this determination.

d. Office Technology Plus (GSA's Computer Store).

(1) Like the schedule contracts, Office Technology Plus is a nonmandatory source of supply. However, whereas many vendors are awarded schedule contracts, operation of the store was awarded to a single contractor, as an indefinite quantity contract, under a fully competitive procurement. The store will offer training, maintenance, and a variety of brands and types of microcomputers, peripherals, and software. It will also be allowed to change the items sold in the store as demand or technology changes.

(2) The net prices for items in the store are also based on negotiated discounts from the manufacturer's list price (for equipment) and the contractor's commercial prices (for services). The contract for the store contains a maximum order limitation of \$100,000. Therefore, no individual order can exceed \$100,000. There is no requirement to synopsise these orders or to obtain a delegation of procurement authority from GSA (see FPR § 1-1.1003-2(a)(5) and FPR Temp. Reg. 71). Instructions on how to process delivery orders at the store may be obtained at the store or by contacting the GSA office listed in paragraph 6.

(3) The equipment and software sold by the store may be priced higher or lower than items available under schedule contracts. However, even when the price is higher an agency may still find the store to be the lowest overall cost alternative when:

(i) The agency does not have sufficient expertise or information to identify the schedule offerings that would meet its requirements, or

(ii) The agency determines that the value of the services offered by the store will offset the price differential between equipment available at the store and under schedule contracts.

(4) Some of the services offered by the store that may influence the overall cost of acquiring and implementing a system are discussed below.

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(i) Systems integration. Store personnel will advise potential users on the technical characteristics of various processors and software packages to assist the user in determining the best system for the user's requirement. The store's on-line software shopping service will contain purchase descriptions and evaluations and will assist users in determining which types of specialized software packages are available.

(ii) Training. Six free seminars will be available to store customers. These seminars are designed to acquaint customers with the basic capabilities of end user computers for specific applications, such as general office management and micros in laboratories. Additional seminars will be held to introduce new products or technological advances. The store will provide space and personnel to coordinate the establishment of users' groups. Training in the use of 21 specific software packages, including operating systems, will be available on a cost-per-student basis.

(iii) Maintenance. A 2-hour system checkout will be conducted before delivery. Warranties will run for 90 days from delivery. Maintenance after warranty can be provided on an annual basis, on a per-hour basis, or on a flat charge (based on the problem) basis. Annual maintenance agreements will provide for pick-up and delivery. Other maintenance will require the customer to deliver the component to the store or pay an extra charge. If repair time is estimated to exceed 16 working hours, the store will loan compatible equipment to the user.

(iv) Delivery. Delivery will be within one day for standard models and quantities of one. For nonstandard models or quantities greater than one, delivery will be based on mutual agreement, not to exceed 30 days.

(v) Single vendor responsibility. The store has the capability to be a "one-stop shop" for systems integration (hardware and software), training, and maintenance, which will allow the agency to deal with only one vendor for all these services.

5. File Documentation. Federal agencies are required to satisfy their ADP needs at the lowest overall cost, price and other factors considered (see FPR Temp. Reg. 71 at § 1-4.1102-10 for definition). Therefore, when an agency decides to order an item(s) whether from the computer store, under a schedule contract, or from another source, the agency should document its file with the reasons that the item(s) selected will satisfy its requirements at the lowest overall cost. All factors other than price that will influence the overall cost should be quantified to the extent practicable.

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6. Assistance to agencies. Further information regarding the computer store may be obtained by contacting the computer store, telephone (202) 371-2150, or by contacting GSA's Office of Information Resources Procurement, Systems and Services Division (KEC), Washington, DC 20405, telephone 202, or FTS, 535-7521 or 535-7522.



ALLAN W. BERES
Assistant Administrator for
Acquisition Policy

1. FEDERAL ACQUISITION REGULATION (FAR). WHAT CHANGES CAN WE EXPECT TO SEE IN ADP ACQUISITION AS A RESULT OF THE FAR WHICH WAS PUBLISHED IN THE 19 SEPTEMBER 1983 FEDERAL REGISTER?

Contact: Mr. Roger Walker
(202) 566-0194

2. GSA SOLE SOURCE WAIVERS.

- A. WHAT ARE THE CONDITIONS REQUIRING A GSA WAIVER FOR SOLE SOURCE SELECTION OF COMPUTERIZED SERVICES?
- B. WHAT IS THE BACKGROUND AND PRESENT STATUS OF USING THE FEDLINK CONTRACTS FOR ACQUIRING ACCESS TO LIBRARY SUPPORT SYSTEMS SUCH AS ONLINE COMPUTER LIBRARY CENTER, INC., LOCKHEED DIALOG INFORMATION SERVICES, INC., INFORMATICS TAPE PROCESSING, ETC.? ADVANTAGES AND DISADVANTAGES OF 'RIDING' FEDLINK CONTRACTS?

Contact: 2.A - Mr. David Mullins
(202) 566-0194

2.B - Mr. John Ray
(202) 566-0646

3. ACQUISITION OF LOCAL SYSTEMS.

- A. WHAT ARE THE DOLLAR VALUES BREAKPOINTS FOR APPROVAL REQUIREMENTS FOR AUTOMATED SYSTEMS? WHO APPROVES AT EACH LEVEL?
- B. WHAT IS THE DIFFERENCE IN APPROVAL REQUIREMENTS FOR SYSTEMS TO BE DEVELOPED IN-HOUSE, BY CONTRACTOR AND TURN-KEY SYSTEMS?
- C. SINCE THESE REGULATIONS ARE SUBJECT TO FREQUENT CHANGE, WHAT GSA OFFICE CAN BE CONTACTED FOR LATEST REQUIREMENTS?

Contacts: Mr. Roger Walker
Mr. David Mullins
Mr. Phil Patton
(202) 566-0194

4. PROVIDE A BASIC SCHEDULE AND TIMETABLE FOR ACQUISITION AND IMPLEMENTATION OF AN
AUTOMATED LIBRARY SYSTEM, ESPECIALLY THE SEQUENCE OF ACTIONS AND TIME ESTIMATE
FOR DEVELOPING MILESTONES.

Contact: Mr. David Mullins
Mr. Phil Patton
(202) 566-0194

NOTE: There is no standard
timetable for procurements.
Each acquisition depends
on its individual and
unique requirements.

SCHEDULE FOR ACQUISITION OF
AN AUTOMATED LIBRARY SYSTEM

DEVELOP SPECIFICATION AND BENCHMARK (IF ANY)	6 MONTHS - 1 YEAR
DEVELOP SOLICITATION DOCUMENT	30 - 60 DAYS
ISSUE SOLICITATION	
RECEIVE PROPOSALS	
EVALUATE PROPOSALS	60 - 120 DAYS
CONDUCT BENCHMARK TEST	
AWARD	
DELIVERY (IF OFF-THE-SHELF)	90 - 120 DAYS
DELIVERY (IF CUSTOMIZED)	LONGER
ACCEPTANCE TEST PERIOD	AT LEAST 30 DAYS

5. SOFTWARE.

- A. WHO OWNS ADP SOFTWARE WRITTEN FOR GOVERNMENT USE WHEN RETENTION OF TITLE IS NOT ADDRESSED IN THE CONTRACT? HOW CAN SUCH SOFTWARE BE KEPT IN THE PUBLIC DOMAIN SO OTHER GOVERNMENT AGENCIES CAN USE OR MODIFY IT WITHOUT ADDITIONAL PAYMENT TO THE CONTRACTOR?
- B. BRIEF DISCUSSION OF SOFTWARE CONVERSION STUDIES, ESPECIALLY AS THEY RELATE TO ACQUIRING COMMERCIAL, TURN-KEY SOFTWARE WHICH WILL NOT BE ALTERED IN LOCAL PROGRAMMING EFFORTS.

Contacts: 5.A - Mr. David Mullins
(202) 566-0194
5.B - Mr. John Caron
(703) 756-6156

6. GSA COMPUTER STORE.

A. HOW CAN LIBRARIANS MAKE THE BEST USE OF THE GSA COMPUTER STORE?

WHO CAN WE CONTACT FOR MORE INFORMATION?

B. WHAT IS THE PROCEDURE FOR ACQUIRING EQUIPMENT THROUGH THE STORE RATHER THAN THROUGH THE FEDERAL SCHEDULES? HOW CAN A LIBRARIAN ENSURE THAT THE LEAST COST PROCEDURE WILL BE USED FOR MINI AND MICRO COMPUTER ACQUISITION?

Contact: Mr. Barry Petroff
(202) 371-2150

GENERAL SERVICES ADMINISTRATION
WASHINGTON, D. C. 20405

July 22, 1983

FEDERAL PROCUREMENT REGULATIONS
TEMPORARY REGULATION 71

TO: Heads of Federal agencies

SUBJECT: Changes to Federal Procurement Regulations Subparts
1-4.11 and 1-4.12

1. Purpose. This temporary regulation:

a. Raises the dollar thresholds for blanket delegations of procurement authority (DPA) for Federal agencies to acquire ADP resources;

b. Grants authority to GSA's Assistant Administrator of Information Resources Management to issue letters establishing thresholds and conditions for the acquisition of ADP resources by individual Government agencies;

c. Changes the definition of ADPE to reflect equipment classification changes agreed to by a Joint GSA/DoD Classification Review Group in 1981 and reflected in GSA Bulletin FPMR A-79, dated October 23, 1981;

d. Adds conditions under which the award decision for low cost computers can be based on the lowest offered purchase price;

e. Removes the requirement to submit copies of solicitations and contracts to GSA; and

f. Makes other clarifying changes regarding the use of ADP schedule contracts.

2. Effective date. The provisions of this regulation are effective September 1, 1983, but may be observed earlier.

3. Expiration date. This regulation expires September 30, 1984.

4. Background.

a. The DPA thresholds are being raised to reduce paperwork, to extend greater autonomy to Federal agencies in meeting their ADP resources needs, and to reflect GSA's shift in emphasis from precontract to postcontract review of agency ADP procurements.

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b. In April 1981, a GSA/DoD Joint Classification Review Board agreed that special purpose minicomputer and micro-computer controlled systems designed to process only the office information application would be classified as Federal Supply Classification (FSC) 7435, Office Information Systems Equipment. General purpose ADPE capable of being programmed to process a variety of applications was excluded from FSC 7435 and remained in FSC Group 70. These changes were explained in FPMR Bulletin A-79 and are reflected in the Cataloging Handbook H2-1, dated May 1982. This regulation changes the definition of ADPE in Subpart 1-4.11 to conform to this classification change.

c. A subsequent GSA/DoD Joint Classification Review Board has recommended that the special purpose equipment classified as FSC 7435 be designated as 7435 "A" and that general purpose ADPE capable of being programmed to process a variety of applications, but used primarily as a word processor, be designated as 7435 "B" in nonmandatory ADP schedule contracts negotiated by GSA's Office of Information Resources Management (OIRM). This approach has been adopted as a temporary measure to help ease management, jurisdictional, and funding problems in some agencies and departments regarding these equipment types. The "A" and "B" designations do not affect basic equipment classifications or regulatory definitions. Equipment designated as 7435 "B" remains general purpose ADPE governed by all applicable ADP procurement and management regulations.

d. A common general criticism of the ADP regulations has been that they are oriented toward large, centralized equipment systems and are therefore too cumbersome and complex to be used when acquiring small, low cost end user computers. Specific criticisms center on the requirements to apply life cycle costing to small requirements, to obtain a DPA from GSA for requirements above the blanket regulatory thresholds, and to report low cost items to the ADP Management Information System (ADP/MIS). A number of changes are being made in this temporary regulation to address these perceptions, including:

(1) Adding recognition that the administrative costs of conducting a life cycle cost analysis to determine the lowest overall cost alternative should be commensurate with the cost or price of the item being acquired;

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(2) Adding conditions under which ADPE priced at \$25,000 or less may be acquired on the basis of lowest offered purchase price;

(3) Excluding special purpose office information system equipment designated in ADP schedule contracts as 7435 "A" equipment, from the definition of ADPE, thereby generally exempting such equipment from the ADP procurement regulations; and

(4) Raising the blanket DPA thresholds.

d. Related changes are being made in an FPMR Temporary Regulation that will exempt ADP equipment systems costing \$50,000 or less from the ADP/MIS reporting requirements; and will merge the existing regulations governing word processing into the ADP management regulations.

e. An FPMR Bulletin is also planned that will announce the availability of a recently completed report titled "Managing End User Computing in the Federal Government" and that will include recommended agency policies and procedures regarding information resources management.

5. Explanation of Changes.

a. The following changes are made in Subpart 1-4.11.

(1) Section 1-4.1100 is amended to recognize that use of GSA nonmandatory schedule contracts covers certain office automation equipment related to ADP equipment, as follows:

§ 1-4.1100 Scope of subpart.

This subpart sets forth policies and procedures relating to the procurement of all automatic data processing equipment (ADPE), commercially available software, maintenance services, and related supplies by Federal agencies (see also § 1-4.1109-1) and by Government contractors as directed by agencies. Use of GSA nonmandatory ADP schedules for certain office automation equipment not defined as ADP equipment is also included.

(2) Section 1-4.1102-1 is amended to clarify office automation and telecommunications equipment definitions regarding automatic data processing equipment in paragraphs (a) and (b) as follows:

§ 1-4.1102-1 Automatic data processing equipment.

* * * * *

(a) Included are:

(1) Main-frame, mini, and micro digital, analog, or hybrid computers;

(2) Auxiliary or accessorial equipment, such as plotters, tape cleaners, tape testers, data conversion equipment, source data automation recording equipment (optical character recognition devices, computer input/output microfilm and other data acquisition devices), or computer performance evaluation equipment; etc., designed for use with digital, analog, or hybrid computer equipment, either cable or modem connected, wire connected, or stand alone, and whether selected or acquired with a computer or separately;

(3) Punched card accounting machines that can be used in conjunction with or independently of digital, analog, or hybrid computers;

(4) Devices used to control and transfer data and/or instructions to and from a central processing unit (CPU), including data transmission terminals, batch terminals, display terminals, modems, sensors, multiplexors, and concentrators;

(5) Storage devices that are designed to be cable connected for use on line in which data can be inserted, retained, and retrieved for later use;

(6) General purpose mini or micro computers used as control mechanisms where computer technology is essential in controlling, monitoring, measuring; and directing processes, devices, instruments, or other equipment (see also FPR § 1-4.1109-18 and FPMR § 101-35.207-1); and

(7) Equipment used in office automation applications that is designed to be controlled by a general purpose data processing language primarily to be applied through the internal execution of a series of instructions, not limited to specific key stroke functions, and designed to process a variety of applications.

(b) Excluded are:

(1) ADPE systems and components specially designed (as opposed to configured) and produced to perform computational, data manipulation, or control functions, but which have no general purpose applicability;

(2) ADPE that is modified at the time of production to the extent that:

(i) It no longer has a commercial ADP market; or

(ii) It cannot be used to process a variety of applications; or

(iii) It can be used only as an integral part of a non-ADP system.

(3) Section 1-4.1102-10 is revised to reflect that the cost to the agency of determining the lowest overall cost alternative should be commensurate with the cost or price of the item being acquired, as follows:

§ 1-4.1102-10 Lowest overall cost.

"Lowest overall cost" means the least expenditure of funds over the system/item life, price and other factors considered. Lowest overall costs shall include purchase price, lease or rental prices, or service prices of the contract actions involved, other factors, and other identifiable and quantifiable costs that are directly related to the acquisition and use of the system/item; e.g., personnel, maintenance and operation, site preparation, energy consumption, installation, conversion, system start-up, contractor support, and the present value discount factor (see also FPMR § 101-35.210). However, the administrative costs of conducting an analysis to determine the lowest overall cost alternative shall be commensurate with the cost or price of the item being acquired and with the benefits expected to be derived from conducting the analysis. (Also see § 1-4.1103-6 regarding ADPE priced at \$25,000 or less.)

(4) Section 1-4.1103-6 is added to allow award based on lowest offered purchase price for ADPE priced at \$25,000 or less, as follows:

§ 1-4.1103-6 Award criteria for low cost purchases.

Agencies may acquire ADPE on the basis of lowest offered purchase price when all of the following conditions are met:

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(a) The purchase price of each system or item of equipment (including associated software) being acquired does not exceed \$25,000;

(b) The total purchase price of all of the equipment and software being acquired under the procurement is \$300,000 or less;

(c) The requirements are not fragmented to circumvent the thresholds in § 1-4.1103-6(a) and (b);

(d) The purchase method is likely to be the lowest overall cost acquisition alternative (see FPMR §§ 101-35.209 and 101-35.210); and

(e) The agency determines, based on the requirements analysis, determination of system/item life, and comparative cost analysis, that award based on lowest offered purchase price is consistent with the lowest overall cost policy objective. (See FPMR §§ 101-35.207, 208 and 209.)

(5) Section 1-4.1104 is revised to provide the following changes: (1) To restate the provisions now in paragraph (a); (2) to broaden the provisions now in paragraph (b) to encompass the entire subpart in new paragraph (c)(2); (3) to delete the requirements now in paragraphs (c) and (d) for agencies to furnish copies of solicitations and contracts to GSA; (4) to change paragraph (a) to add a provision authorizing GSA's Assistant Administrator for Information Resources Management to change the blanket thresholds (up or down) or change other specific conditions regarding the exercise of procurement authority by an agency or component thereof upon written notice; (5) to repeat the changes made as paragraphs (a)(2) and (a)(3) in Temporary Regulation 64 in regard to responsibilities and accountability of agency senior designated officials in new paragraphs (b)(1) and (b)(2); (6) to place the requirement now in paragraph (a) for compliance with FPMR Subchapter F in new paragraph (c)(1); and (7) to delete paragraph (d), as follows:

§ 1-4.1104 Procurement authority.

(a)(1) To allow for the orderly implementation of a program for the economical and efficient acquisition of ADPE, commercially available software, maintenance services, and related supplies, agencies are authorized to acquire by contracting for these items --

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(1) In accordance with the provisions of this § 1-4.1104, or

(1i) When a specific delegation of procurement authority has been provided by GSA in accordance with the provisions of §§ 1-4.1105 and 1-4.1106.

(2) Specific changes in thresholds or conditions regarding the exercise of procurement authority by a particular agency or component thereof may be authorized by the GSA Assistant Administrator for Information Resources (K). The changes will be in writing, will cite this paragraph (a)(2) of § 1-4.1104, will state effectivity and scope of applicability, and will be directed to the designated senior official of the applicable agency.

(3) Requirements shall not be fragmented in order to circumvent the established blanket delegation of procurement authority thresholds.

(b)(1) The provisions of Public Law 96-511 (the Paperwork Reduction Act of 1980) direct each executive agency head to designate a senior official (officials in DOD) reporting to the agency head to be responsible for implementing the Act. This designated senior official is assigned responsibility for the conduct of and accountability for any acquisitions made under a delegation of authority under section 111 of the Federal Property and Administrative Services Act of 1949 (40 U.S.C. 759) (see 44 U.S.C. 3506 (c)(4)).

(2) The designated senior official in each agency shall advise GSA in writing of the position title and organizational identity of those officials who have been authorized to submit agency procurement requests to GSA (see also §§ 1-4.1105 and 1-4.1107). The designated senior official shall keep the listings current. (A change of incumbent in an unchanged position and organizational assignment does not require notification.) Listings shall be submitted to GSA (KMA), Washington, DC 20405.

(c)(1) Agencies shall comply with the applicable provisions of FPMR Subchapter F before initiating procurement action on an approved requirement.

(2) Agencies shall accomplish procurement actions in accordance with the provisions of this Subpart 1-4.11.

(6) Section 1-4.1104-1 is revised to provide the following changes: (1) To remove the phrase "unless procurement authority has been specifically withdrawn" in the opening paragraph (but see new paragraph (a)(2) of § 1-4.1104); (2) to revise upward the blanket thresholds for competitive ADPE procurements made by "normal solicitation procedures" from \$500,000 purchase price or \$150,000 annual rental charges to \$2,500,000 purchase price or \$1,000,000 annual rental charges; and (3) to revise upward the blanket threshold for sole source or specific make or model ADPE procurements made by "normal solicitation procedures" from \$50,000 purchase price or \$18,000 annual rental charges to \$250,000 purchase price or \$100,000 annual rental charges, as follows:

§ 1-4.1104-1 Automatic data processing equipment.

Except as indicated in § 1-4.1104-5 regarding potential use of the ADP Fund, FPMR Subpart 101-36.2 regarding sharing, and FPMR Subpart 101-36.3 regarding the use of excess ADPE, agencies may procure ADPE without prior approval of GSA when either paragraphs (a), (b), or (c) applies.

(a) The procurement is to be made by placing a purchase/delivery order against an applicable GSA requirements-type contract.

(b) The procurement is to be made by placing a purchase/delivery order against a GSA schedule contract provided that the following three conditions are met:

(1) The order is within the maximum order limitation (MOL) of the applicable contract;

(2) The total purchase price (even though the item(s) are to be rented or leased) of the item(s) covered by the order does not exceed \$300,000;

(3) The requirements set forth in § 1-4.1109-6 on the use of GSA schedule contracts are met.

(c) The procurement is to be made by solicitation procedures other than use of GSA requirements-type or schedule contracts and the value of the procurement (including evaluated optional features) does not exceed:

(1) \$2,500,000 purchase price or basic monthly rental charges (including attendant maintenance costs) that do not exceed an annual rate of \$1,000,000 for competitive procurements; or

(2) \$250,000 purchase price or basic monthly rental charges (including attendant maintenance costs) that do not exceed an annual rate of \$100,000 for sole source or specific make and model procurements.

(7) Section 1-4.1104-2 is revised to provide the following changes to clarify that the blanket thresholds apply irrespective of method or time period (e.g., purchase, perpetual license, or annual services), and to revise upward the blanket thresholds for procurements made by "normal solicitation procedures" from \$100,000 competitive and \$50,000 sole source to \$1,000,000 for competitive procurements and \$100,000 for sole source procurements, as follows:

§ 1-4.1104-2 Software.

Except for software available through the Federal Software Exchange Center as covered by FPMR Subpart 101-36.16 and software provided with and not separately priced from the ADPE, agencies may procure commercially available software without prior approval of GSA when either (a), (b), or (c) applies.

(a) The procurement is to be made by placing a purchase/delivery order against an applicable GSA requirements-type contract.

(b) The procurement is to be made by placing a purchase/delivery order under the terms and conditions of an applicable GSA schedule contract [see § 1-4.1109-6].

(c) The procurement (regardless of method or time period) is to be made by solicitation procedures other than use of GSA requirements-type or schedule contracts and the value of the procurement (including evaluated optional features) does not exceed:

(1) \$1,000,000 for competitive procurements; or

(2) \$100,000 for sole source procurements.

(8) Section 1-4.1104-3 is revised to raise the blanket thresholds for procurements made by "normal solicitation procedures" from \$200,000 per year competitive and \$50,000 per year sole source, to \$1,000,000 per year competitive and \$100,000 per year sole source, as follows:

§ 1-4.1104-3 Maintenance services.

Agencies may procure maintenance services without prior approval of GSA when either paragraph (a) or (b) of this § 1-4.1104-3 applies.

(a) The procurement is to be made by placing a purchase/delivery order under the terms and conditions of an applicable GSA schedule contract [see § 1-4.1109-6].

(b) The procurement is to be made by solicitation procedures other than use of GSA requirements-type or schedule contracts and the monthly charges do not exceed:

(1) An annual rate of \$1,000,000 for competitive procurements; or

(2) An annual rate of \$100,000 for sole source procurements.

(9) Section 1-4.1109-6 is amended to provide the following changes: (1) Paragraph (a)(1) is revised to indicate that § 1-4.1109-6 is to be used in context with the regulations; (2) paragraph (a)(2) is revised to limit the use of "only new" and "all or none" requirements unless justified; (3) paragraph (a)(3) is revised to indicate that administrative costs in relation to the value of the requirement should be considered when determining the number of schedule offerings to be considered; (4) subparagraph (a)(3)(ii) is revised to indicate that "third party" suppliers should be considered when determining whether a requirement should be satisfied by a schedule order or by issuing a solicitation document; (5) paragraph (a)(4) is added to place the requirement to synopsise schedule orders in the Commerce Business Daily (CBD) in the opening paragraph; (6) paragraph (a)(5) is added to recognize that the nonmandatory ADP schedules offer special purpose (FSC 7435 "A") equipment as well as general purpose ADPE; (7) paragraphs (b), (c), and (d) are revised to remove the references to the CBD synopsis, which is now more fully explained in paragraphs (a) and (f); (8) subparagraphs (b)(3) and (4) are deleted; (9) paragraph (c) is rewritten to combine subparagraphs (c)(1) and (2) with the introductory paragraph; (10) paragraph (d) is rewritten to

combine subparagraphs (d)(1) and (2) with the introductory paragraph; (11) paragraph (e) is rewritten to combine subparagraphs (e)(1) and (2) with the introductory paragraph; (12) paragraph (f) is revised to redesignate paragraphs (f)(1) and (2) as (f)(2) and (3); to add a new paragraph (f)(1) to extend the CBD synopsis requirement to schedule orders for software and maintenance and to change the CBD synopsis thresholds to \$50,000 purchase price instead of \$50,000 per schedule order; and to state in new paragraph (f)(2) that the CBD synopsis shall reflect system life, net purchase price if converting from lease, any restrictive requirements, any requirements unique to software or maintenance, and that the notice is not to be considered a formal solicitation document; and (13) paragraph (g) is revised to clarify in (g)(2) that CBD responses are encouraged from both schedule vendors and nonschedule vendors, and to add guidance in (g)(2)(ii) regarding the analysis of CBD responses from schedule vendors offering schedule prices, and in (g)(2)(iii)(B) to clarify that a competitive procurement resulting from responses to a CBD synopsis must be publicized, as follows:

§ 1-4.1109-6 Use of GSA schedule contracts.

(a) General. (1) In addition to the requirements of Subpart 1-4.11 and FPMR Subchapter F, orders placed against GSA nonmandatory schedule contracts under § 1-4.1104 are subject to the provisions of this § 1-4.1109-6. When a schedule contract is used pursuant to a § 1-4.1104 blanket delegation of procurement authority, a specific delegation of procurement authority from GSA is not required even though the order is for a noncompetitive (sole source) requirement as defined in § 1-4.1102-8.

(2) The existence of nonmandatory ADP schedule contracts shall not preclude or waive the requirement for maximum practicable competition in obtaining ADP or related equipment, software, or maintenance services. In addition, the availability of those items under an ADP schedule contract shall not preclude or otherwise detract from procuring the items, including peripheral equipment or items for augmenting an existing system, from a number of different sources if this action will be in the best interest of the Government. Accordingly, an "all or none" requirement or a requirement for "only new" equipment shall not be used unless specifically justified.

(3) Suitable equipment must be considered whether or not this equipment is on an ADP schedule contract. Accordingly, when an agency is procuring under the blanket delegation of procurement authority provisions of § 1-4.1104, maximum practicable competition shall be sought. When using ADP schedules, the offerings of a sufficient number of schedule contractors that might satisfy the agency's requirements shall be considered. (See also § 1-1.302-1(b) for policy intent.) Alternatively, the agency may choose to prepare a solicitation package in an effort to secure appropriate products and related services at lower overall costs to the Government. Even though the solicitation process consumes time and resources, it may be in the best interest of the Government when:

(i) The expected cost reduction will exceed the added costs of acquisition; or

(ii) There is a reasonable expectation that better offers will be received from suppliers other than the schedule contractor (e.g., the "third party" suppliers) for suitable items; or

(iii) The agency requirements cannot be satisfied reasonably by any ADP schedule contractor; e.g., the agency's requirement calls for a customized package of equipment, training services, or other features not offered commercially.

(4) Agencies shall comply with the synopsis requirements of paragraphs (f) and (g) of this section before placing orders, as outlined in paragraphs (b), (c), (d), and (e) of this section, against GSA nonmandatory schedule contracts.

(5) Special purpose equipment is available under GSA nonmandatory ADP schedule contracts. These items are designated as FSC 7435 "A" equipment in the schedule contracts. This Subpart 1-4.11 does not apply to these special purpose items, except that agencies must follow the provisions of this § 1-4.1109-6 before ordering such equipment from a nonmandatory ADP schedule contract. However, in no case is a delegation of procurement authority from GSA required for equipment designated as 7435 "A". (Note that the 7435 "A" and "B" designations will not be used after FY 1984.)

(b) Initial acquisition of ADPE. Orders for the initial acquisition of ADPE, whether for purchase or rental, may be placed against the ADP schedule contracts provided that all of the following conditions are met.

(1) The order does not exceed the contract's maximum order limitation (MOL).

(2) When the purchase price of the items covered (even though the items are rented or leased) exceeds \$300,000, a specific delegation of procurement authority is obtained. (See §§ 1-4.1104-1(b)(2) and 1-4.1105.)

(c) Continued rental or lease of installed ADPE and software. ADP schedule contracts may be used for the continued lease or rental of installed equipment and software under the provisions of the schedule contract. However, when orders are for or include the continued lease of an installed central processing unit (CPU), a specific delegation of procurement authority under § 1-4.1105 shall be obtained before issuing the renewal order if the schedule purchase price exceeds \$300,000 and the results of the Commerce Business Daily (CBD) synopsis indicates that the equipment is available from a source other than the schedule contract.

(d) Conversion from lease to purchase of installed ADPE. A specific delegation of procurement authority shall be obtained before issuing an order to purchase previously leased ADPE with a net purchase order price of more than \$300,000 when identical (specific make and model) or suitable substitute equipment is available from a supplier other than the schedule contractor.

(e) Acquisition of software and maintenance services. Orders may be placed against ADP schedule contracts for software and maintenance services provided that the value of the order does not exceed the MOL of the applicable schedule contract.

(f) Synopsis requirements.

(1) The intent to place an order for ADPE, software, or maintenance services against a nonmandatory ADP schedule contract shall be synopsized in the CBD at least 15 calendar days before placing the order, when the purchase price of the equipment (whether purchased or leased) exceeds \$50,000, or when the software or maintenance charges exceed an annual rate of \$50,000. (Note.--This synopsis requirement is applicable to the conversion from lease to purchase of ADPE, but it is not applicable to the continued lease of installed ADPE that does not include a CPU.) This synopsis requirement applies notwithstanding the exemption in § 1-1.1003-2(a)(5) (or, if applicable, DAR 1-1003.1(c)(v)).

(2) These synopses should include sufficient information to permit the agency analyses required by § 1-4.1109-6(g). They shall be prepared and forwarded in accordance with Subpart 1-1.10 (or, if applicable, DAR Part 1-10). As a minimum, and as applicable, these synopses shall state:

(i) Quantities, dates required, any restrictive (e.g., bundled) requirements that have been justified, and a point of contact, including phone number, for further information;

(ii) Specific make and model, system/item life, and support requirements (e.g., hours of maintenance coverage, response times) of any equipment to be ordered or maintained;

(iii) The name, functional description, and operating environment of any software packages to be ordered;

(iv) A request for pricing data; and

(v) A statement that no contract award will be made on the basis of any response to the notice, because the synopsis of intent to place an order against a schedule contract shall not be considered a formal solicitation document.

(3) Publication of contract award information in the CBD is not required when an order is placed against an ADP schedule contract, whether or not it follows a competitive solicitation, since the schedule contract was publicized in accordance with § 1-1.1004.

(g) Actions after the CBD synopsis. The schedule order synopsis technique provides agencies with both the GSA negotiated schedule prices (derived from discounting prices in the competitive commercial marketplace) and such additional product and cost information as might be submitted by potential nonschedule suppliers in response to the CBD notification. After consideration of the affirmative responses received in response to the CBD notice, the contracting officer must decide whether ordering from an ADP nonmandatory schedule, or conducting a competitive acquisition, is most advantageous to the Government. Accordingly, the contracting officer shall take one of the following actions:

(1) When no responses are received, the procurement file shall be documented with the results of the CBD synopsis and the order placed in accordance with the terms and conditions of the applicable schedule contract.

(2) When a response to the CBD notice is received from either a nonschedule vendor or a schedule vendor (expressing an interest either on or off schedule) for an item(s) that meets the user's requirement, the contracting officer shall take one of the following actions:

(i) Document the procurement file with an analysis that indicates that the respondent's item(s) would not meet the requirement, or that the synopsized schedule item(s) provides the lowest overall cost alternative, and place the order against the synopsized schedule contract; or

(ii) Document the procurement file with an analysis that indicates that a responding vendor's schedule offering will meet the requirement at the lowest overall cost and place an order against that ADP schedule contract; or

(iii) Document the procurement file with an analysis that indicates that a competitive acquisition would be more advantageous to the Government. When this is the case, the contracting officer normally should issue a formal solicitation. In this event:

(A) The solicitation should contain terms and conditions substantially the same as those contained in the schedule contract in which the order was to be placed. The addressees of the solicitation shall include the schedule vendor for the purpose of ascertaining the vendor's interest in furnishing the item(s) off the schedule. This procedure will permit the schedule vendor to discount the schedule item(s) price since a discount under a separate proposal would not be a "price reduction" as provided in the schedule contracts.

(B) The agency shall publicize the procurement in accordance with the provisions of FPR § 1-1.1003-2 (or, if applicable, DAR 1-1003).

(C) The contracting officer shall evaluate the offers received. It should be noted that some vendors may not agree to the solicitation terms and conditions that schedule vendors have accepted and that have been incorporated in their schedule contracts. The contracting officer shall act in a manner most advantageous to the Government by either awarding a contract based on the offers received in response to the

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solicitation or placing an order with a vendor under a schedule contract. The procurement file shall be documented to justify the action taken.

* * * *

b. The following change is made in Subpart 1-4.12. Section 1-4.1203 is amended to provide the following changes in paragraph (d): (1) Blanket thresholds now in subparagraphs (1) and (2) are revised upward in new subparagraph (1) from \$300,000 per year for competitive procurement and \$50,000 per year for a sole source procurement to \$2,000,000 per year for a competitive procurement and \$200,000 per year for a sole source procurement; (2) a new provision is added in paragraph (d)(2) authorizing GSA's Assistant Administrator for Information Resources to change the blanket thresholds (up or down) or change other specific conditions regarding the exercise of procurement authority by an agency or component thereof upon written notice; and (3) some provisions now in paragraphs (d)(1) and (d)(2) are restated in paragraphs (d)(3) and (d)(4), as follows:

§ 1-4.1203 Authorization for commercial ADP services contracting.

* * * *

(d)(1) Agencies may procure commercial ADP services without prior approval of GSA when the monthly charges (including evaluated optional features) do not exceed:

(i) An annual rate of \$2,000,000 for a competitive procurement; or

(ii) An annual rate of \$200,000 for a sole source procurement.

(2) Specific changes in thresholds or conditions regarding the exercise of procurement authority by a particular agency or component thereof may be authorized by the GSA Assistant Administrator for Information Resources Management. The changes will be in writing, will cite this paragraph (d)(2) of § 1-4.1203, will state effectivity and scope of applicability, and will be directed to the designated senior official of the applicable agency.

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FPR Temp. Reg. 71

(3) Agencies shall comply with the requirements regarding the sharing or use of existing Federal ADP resources and the use of GSA sources of supply before initiating procurement action under authority of this § 1-4.1203(d).

(4) Requirements shall not be fragmented in order to circumvent the established blanket delegation of procurement authority thresholds.

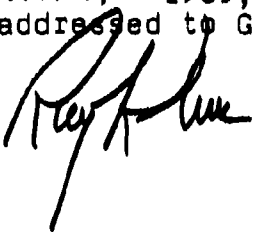
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6. Effect on other directives. This temporary regulation supersedes paragraph 5d of FPR Temporary Regulation 64, dated February 3, 1982.

7. Agency actions. Pending the issuance of a permanent amendment to the Federal Procurement Regulations, agencies shall follow the policies and procedures in this temporary regulation.

8. Information and assistance. Inquiries should be directed to Mr. David R. Mullins or Phillip R. Patton, Policy Branch (KMPP), Office of Information Resources Management, Telephone 202, or FTS, 566-0194.

9. Submission of comments. The views of agencies and other interested parties are invited regarding the effect or impact of this regulation and the policy and procedures that should be adopted in the future. All comments received before Oct. 1, 1983, will be considered. Comments should be addressed to GSA (KMPP), Washington, DC 20405.



RAY KLINE
Acting Administrator of General Services

GENERAL SERVICES ADMINISTRATION
WASHINGTON, D. C. 20405

June 13, 1983

GSA BULLETIN FPMR F-153
ADP AND TELECOMMUNICATIONS

TO: Heads of Federal agencies

SUBJECT: Management and use of information processing resources

1. Purpose. This bulletin discusses recent GSA actions regarding information resources management, provides recommended agency policies and procedures regarding information processing resources, and announces the availability of a GSA publication titled "Managing End User Computing in the Federal Government."

2. Expiration date. This bulletin contains information of a continuing nature and will remain in effect until superseded or canceled.

3. Terms used.

a. The following terms are used in this bulletin as defined in a concurrently issued FPMR temporary regulation titled Management of information processing resources:

(1) An "information processing resource" includes software and both general purpose and special purpose automatic data processing equipment (ADPE).

(2) An "end user computer" is a small general purpose computer (usually a microcomputer) that is normally operated by the ultimate user of the processed data rather than by a computer specialist in a central computer facility.

b. "Word processing" and "text editing" are used interchangeably in this bulletin to mean the manipulation of textual material through the use of a keyboarding device capable of controlled storage, retrieval, and automatic typing.

4. Background.

a. Information processing technology has traditionally been managed and used by diverse organizational elements, and separate rules have applied to specific areas of the technology. This has led to fragmented and ineffective management of information resources in agencies. General awareness of this situation and its potential costliness in terms of excessive paperwork, waste, and reduced effectiveness contributed to the passage of the Paperwork Reduction Act of 1980 (Pub. L. 96-511).

b. One of the principal goals of the Paperwork Reduction Act is to have agencies manage their information resources in an integrated fashion. Many agencies, including GSA, have already centralized policy making and have established "information resources management" organizations. GSA is also publishing revisions to the Government-wide procurement and management regulations governing ADP and word processing to encourage a more integrated approach to the acquisition and management of information processing resources.

5. GSA actions.

a. Some studies and inspections by GSA over the past several years have shown that information processing resources are not always acquired and used cost effectively in office environments, and that agencies do not always realize the full potential of the technology. From November 1980 to March 1981, GSA studied five operating office automation systems to determine what benefits these agencies had realized from the equipment and whether it was being used cost effectively. The study revealed the following:

(1) Agencies maintained little or no data showing how their systems performed either before or after the new equipment was installed, so productivity gains were difficult to identify.

(2) Agencies often failed to identify a specific mission-oriented need before installing the equipment, and the concept, scope, and potential value of the application of the technology were poorly defined.

(3) No guidelines existed on how to conduct a feasibility study or maintain system performance data.

(4) Incompatibility of equipment resulted in its underuse, creating potentially costly problems in future installations.

b. In May 1981, GSA published a handbook titled Word Processing: Determining the Cost Effectiveness of WPE for Text Editing. This handbook provides guidance regarding the determination and justification of need for equipment to be used solely for text editing. The handbook should not be used when other applications in addition to text editing are required. GSA is rewriting both the handbook and a related publication, titled Self Inspection Guide: Evaluating Word Processing Management, to provide more comprehensive coverage and simpler analysis methodology that will de-emphasize the counting of lines and keystrokes.

c. In mid-1982, GSA initiated a series of discussions regarding "end user computing." Various ADP, personal computer, personnel, and management experts from Government and industry participated. The result of these discussions was a report titled Managing End User Computing in the Federal Government. This

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report provides an overview of end user computing technology, including emerging management problems and possible solutions. It outlines a "managed innovation" program that GSA is implementing in the area of end user computing and recommends a series of actions for agency consideration. Agency policy officials are encouraged to obtain a copy of this report and to consider the management approaches and philosophies discussed in it when developing agency policies and procedures governing information processing resources. A limited number of copies of the report have been distributed to agencies. Additional copies may be obtained from GSA, Deputy Assistant Administrator for Information Resources Management (KA), Washington, DC 20405, telephone: FTS or area code 202, 566-0291.

d. GSA is concurrently publishing an FPMR temporary regulation intended to consolidate Government-wide management guidance regarding office automation technologies. The temporary regulation will:

- (1) Cancel FPMR Subpart 101-11.9 regarding word processing;

- (2) Cancel FPMR Bulletin A-79, which explained the 1981 GSA/DoD classification agreements and their effect on the ADP and word processing regulations;

- (3) Broaden the scope of FPMR Subpart 101-35.2 to include guidance regarding general and special purpose ADPE and to incorporate some of the management guidance previously contained in Subpart 101-11.9 and Bulletin A-79;

- (4) Change the definition of ADPE to reflect equipment classification changes agreed to by GSA and DoD as reflected in the A-79 bulletin;

- (5) Encourage requirements analysis based on aggregated agency requirements, rather than on an item-by-item basis; and

- (6) Rename the ADP Management Information System (ADP/MIS) the ADPE Data System (ADPE/DS) and change the reporting requirements so that only general purpose ADP equipment systems costing more than \$50,000 need be reported.

e. GSA has recently published a Federal Procurement Regulation (FPR) Temporary Regulation that:

- (1) Changes the definition of ADPE to reflect equipment classification changes agreed to by GSA and DoD as reflected in the A-79 bulletin;

- (2) Allows the award decision for purchased ADPE priced at \$25,000 or less to be based on lowest offered price; and

(3) Increases the blanket regulatory dollar thresholds for obtaining a GSA delegation of procurement authority for ADPE.

f. GSA has established a pilot multiple award schedule contract program for microcomputers. The pilot program was effective April 1, 1983 and consists of approximately 40 vendors. Under this program, agencies may submit orders for microcomputers to GSA, and GSA will forward the orders to the appropriate vendor. GSA will pay the vendor and bill the agency for the items. Effective June 1, 1983, this program was made available to all Federal agencies.

g. GSA plans to award a contract for the establishment of an Information Products and Training Center in the GSA central office building. This facility will be available for all Federal employees in the Washington, DC area to become familiar with, acquire, and be trained on the use of current end user computing equipment and software. If this pilot program is successful, similar centers will be established in the eleven GSA Regional Offices.

h. GSA has established a new service to offer information resources management (IRM) planning support to other agencies. The Federal IRM Planning Support Program brings to client agencies a methodology and planning structure that builds on GSA's internal planning success. On a reimbursable basis, program personnel help agencies to adapt the established planning process to their environment and to produce a baseline strategic IRM plan. The program also offers follow-on assistance to establish effective management systems and procedures for implementing the plan and institutionalizing the process. Additional information on this planning program is available from GSA, Federal IRM Planning Support Program (KFP), telephone: FTS or area code 202, 535-7515.

i. A number of other GSA initiatives are described in the report titled Managing End User Computing in the Federal Government discussed in paragraph 5c.

6. Recommended agency policies and procedures.

a. Information processing resources should be managed under a continuing agency program designed to improve delivery of services and products related to an agency's mission.

b. The designated senior agency official under the Paperwork Reduction Act should assign to specific individuals the responsibility for review and approval of all proposed information processing resources acquisitions. Approval actions should be subject to coordination of requests for information processing resources, including experimental or pilot systems, based on overall agency needs, in order to reduce duplication of effort, minimize equipment and software incompatibility, and maximize the sharing and use of resources.

c. Agencies should ensure that short term economies do not produce long term higher costs. For example, it might be less costly initially to let individual managers determine technical features and programming requirements of equipment. However, if later incompatibility with other systems results, agency costs may increase substantially over the long run.

d. To minimize the cost of requirements analysis, agencies should collect operating statistics routinely to identify problems such as increased workloads, longer processing times, and other indicators of possible problems. Agencies should also increase the use of automated recordkeeping to collect such statistics.

e. Agency procedures for justification, review, and approval of information processing resources should be consistent with the policies and procedures set forth in FPMR Subpart 101-35.2, particularly § 101-35.207 regarding determination of need and requirements analysis and § 101-35.209 regarding comparative cost analysis. Such procedures should at least include procedures for evaluating the productivity of installed systems and for ensuring conformance with established policies and procedures.

f. Agency management planning should make clear distinctions between pilot and research and development (R & D) projects so that investment of time and resources can be most effectively applied.

(1) Pilot projects. A pilot project is a small scale installation that represents a proposed large system. Pilot projects are often prudent and useful managerial tools to test new systems performance and refine systems design prior to full implementation. However, they must be properly managed or their value will be lost. Pilot projects should determine whether a system design is as cost effective in practice as it is in theory. Requirements analysis should precede pilot projects. Pilot projects should not be used for research. Agency procedures for pilot projects should include a requirement for documented evaluation of the project.

(2) Research and development projects. An R & D project is an experiment to determine the probable benefits of information processing technology. The rationale, expected costs, anticipated benefits, and post-installation evaluation of an R & D project should be documented, used in the planning process, and retained in agency files.

g. As discussed in paragraph 5d, agencies are required to report only ADPE systems costing more than \$50,000 to the ADPE/DS. However, agencies are required to maintain inventories and

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accountability systems for personal property. Agencies should ensure that such inventories are adequate to manage their information processing resources and that they are maintained at an organizational level sufficient to ensure cost effective use of the resources. The inventory should include such data elements as name of manufacturer, type (e.g., microcomputer, word processor), model or designation, location, purchase or lease cost, and date of acquisition.

7. Assistance to agencies.

a. GSA will act as a clearinghouse for disseminating R & D and pilot project information among Federal agencies. Agencies are encouraged to submit copies of documentation related to information processing technology projects to GSA (KL), Washington, DC 20405.

b. Additional guidance may be obtained by contacting the GSA Office of Office Information Systems (KL), telephone: FTS or area code 202, 535-7462.


FRANK J. CARR
Assistant Administrator
Office of Information
Resources Management

Annual Updates

Army Status

Ms. Dorothy Fisk

Navy Status

Ms. Bonnie Davis

Air Force Status

Mr. Tony Dakan

ARMY STATUS

MILITARY LIBRARIANS WORKSHOP

1983

Today I want to touch on several projects of interest to military librarians. The first is the Technician Training Package initiated by the Technicians Training Task Force Group of the Army Library Committee (ALC) and developed by Army librarians at Van Noy Library, Fort Belvoir, Virginia.

This is a self-paced instruction package using audiovisual cassettes accompanied by workbook and training exercises for each module. This package is now in its final production phase and will be made available to MACCM staff librarians in 1984.

The next project I want to mention is the Library Materials Acquisition Survey. This survey was developed by the Procurement Task Force Group of the ALC and sent to Army libraries in 1983. The purpose of the survey is to enable us to document problems in the acquisition of library materials and to analyze the effectiveness of current procurement procedures. The survey results are presently being analyzed by task force group members. A final report will be presented to the ALC at their November meeting.

Another item of interest, particularly to Army librarians, is the regulation of Army Audiovisual Production, Acquisition and Distribution of Audiovisual Products -- AR 108-XX. This regulation is being finalized and it is anticipated it will be distributed early next year. It includes an exemption for Army libraries from the procurement policies for AV materials as stated in the AR. Thus Army libraries may continue to purchase these materials under regular library materials procurement procedures. In the interim, the one year exception to policy for AV materials procurement granted by DA AV Production/Acquisition Office to Army libraries in September 1982 remains in effect. A message to the field regarding the extension of the procurement exemption will be forthcoming.

MILITARY LIBRARIANS WORKSHOP -- 1983 (continued)

As many of you know, ALMO is the DOD voting representative for the American National Standards Committee Z39. Library and Information Sciences, and Related Publishing Practices. In this capacity, we receive copies of all new or revised standards in the subject areas indicated by the title and cast the DOD ballot for acceptance or rejection of each. Input is requested from and coordinated with Air Force, Navy, Army and interested DOD organizations. Responses received are reviewed and consolidated into a DOD position. You will be interested to know that a new subcommittee is being formed to revise the ANSI Z39.18 standard, "Guidelines for Format and Production of Scientific and Technical Reports." Mr. Thomas Pinelli, NASA Langley Research Center, is the Chairperson. Mac Bonnett of ALMO will serve on the subcommittee.

As you are aware, the development and use of standards are very important within our arena because they provide the framework for interchange of information and facilitate the use of on-line services. Accepted standards for storing and retrieving information are mandatory for library automation.

In the past year the Army Automated Library and Information Support System (AALISS) was established. This is a system to provide coordination and support for the automation of Army libraries. It will achieve cost savings through joint acquisition of hardware and one-time acquisition of software for multiple installations.

Army has been a leader in implementation of the Integrated Library System (ILS) which was developed at the National Library of Medicine (NLM) and tested at The Pentagon Library. In consideration of this effort, NLM is making the ILS software available to DA libraries through an interagency agreement.

MILITARY LIBRARIANS WORKSHOP -- 1983 (continued)

Present automated Army library systems include: Redstone Scientific Information Center, Huntsville, Alabama,

- The Pentagon Library
- US Military Academy, West Point, NY
- Corps of Engineers Library Network

Proposed systems include networks at:

- Fort Bliss/White Sands Missile Range
- USAREUR
- Carlisle Barracks, PA, and

individual systems at the Combined Arms Research Library, Fort Leavenworth, and Walter Reed Army Institute of Research.

In conjunction with the ILS Support, ALMC is participating with other ILS users in the Integrated Library System Users Society (ILSUS) and FLC/FEDLINK ILS Users Group (FILSUG). The purpose of these organizations is to provide a mechanism for communication and cooperation among ILS users.

The next topic I want to cover is one of interest to all of us -- the Proposed Classification and Qualification Standards for the GS-1410 Library-Information Service Series. As many of you know in late 1982, GAO was asked to review these proposed standards by the Subcommittees on Civil Service, Compensation and Employee Benefits and Human Resources. In their report issued in August 1983, GAO states that OPM did not exceed its legal authority in developing the standards but failed to address the librarians criticism concerning reduction of the entry grade.

GAO recommended that OPM consider determining whether:

- Federal librarians hired at GS-9 with less than a two-year MLS degree and no experience have typically performed all of the duties and responsibilities of a GS-9 position successfully.

MILITARY LIBRARIANS WORKSHOP -- 1983 (continued)

Further GAO recommended that OPM consider determining whether:

-- Federal Librarians hired without an MLS degree typically performed all duties and responsibilities successfully and were able to progress through the career ladder. This should give an indication of the possible long-term impact of the proposed changes.

GAO also suggested that:

-- To further enhance the credibility of its surveys, OPM may wish to research the feasibility of:

- (1) Conducting statistically reliable occupational surveys and
- (2) Providing for clear documentation to enhance its credibility.

Five prominent Democrats immediately urged OPM to withdraw the standards until it established the credibility of its development process. "The proposals are short-sighted, unnecessary and unjustified attempts to save money at the expense of endangering the entire information network of the Federal government," charged Representative Patricia Schroeder. Representatives Geraldine Ferraro of New York, Mary Rose Oaker of Ohio and William D. Ford and Donald Albosta of Michigan joined Representative Schroeder in the withdrawal request.

Copies of the GAO report are available. Order information will be provided at the end of this presentation.

The Office of Personnel Management is required to report by mid-October to the House Government Operations Committee and the Senate Government Affairs Committee on the action it will take to comply with the GAO recommendations.

Their report was delivered to the committees on 12 October. In their response to the Committees, OPM points out that GAO concludes:

MILITARY LIBRARIANS WORKSHOP -- 1983 (continued)

(1) OPM did not exceed its legal authority to develop classification and qualification standards.

(2) OPM's actions were generally consistent with its actions affecting other recently developed standards.

(3) GAO did not require OPM to make changes in either its record keeping or sampling practices.

Specific comments on these points and both the classification and qualification standards are outlined in the subsequent 19 pages. Members of the ALA Steering Committee on the Standards are analyzing the report. We will be meeting Monday to work on a letter to the Committee. One final note, OPM states that it is still considering comments and suggestions for revision of the proposed standards. Copies of the OPM response to the GAO report will be provided to the ALC and the Navy and Air Force representatives.

For those interested in obtaining copies of the GAO report, it is available from the GAO Distribution Section, 441 G Street, NW, Washington, DC 20548 or call (202) 275-6241. The title of this report is "Classification and Qualification Standards for GS-1410 Library-Information Service Series. The date of this report is August 12, 1983 and the Report Number is GGD 83-97.

That concludes my prepared remarks. I would be glad to answer any questions.

NAVY STATUS

The Navy is involved in several activities at the moment (1) is a revision of a union list of serials held by the various Navy libraries (2) a cooperative effort between several of the Navy libraries to pool their periodical holdings allowing the libraries involved to handle their subscriptions more efficiently with a better return for their budget dollar. Anyone interested in the nuts and bolts of the program can contact either Pete Imhof of Naval Research Lab or Marshall Hughes of the Naval Surface Weapons Center. The other efforts in the Navy at the moment are concentrated in the A76 area - either defending against the initiation, penetration of, or halting the A76 process. In some cases, success had been achieved for a while - for example in August, Chief of Naval Operations issued a letter exempting eight Navy labs who had been in the A76 process. Others are still in the fight. I will not enumerate them here, but anyone wishing information may contact myself or Marshall Hughes.

In conclusion, the Navy's spring meeting will be in Boston, May 10-14, 1984.

AIR FORCE STATUS

THE AIR FORCE LIBRARY PROGRAM

A REPORT TO THE MILITARY LIBRARIANS WORKSHOP, 14 OCT 83

I. Personnel:

On Wednesday of this week the selection of the new Space Command Librarian was announced. The position is located at Hq Space Command, Peterson AFB, Colorado, and is responsible for the development and operation of a headquarters technical information center, and the development and direction of a command library program. Judy Hawthorne, currently Medical Librarian, Fitzsimmons Army Medical Center, becomes our newest Air Force Librarian.

The first phase of the Air Force librarians' career program, covering general or base librarians in grades GS-11 and GS-13, was implemented, and the first referral, selection, acceptance, and appointment has just been accomplished. Nova Maddox, the Base Librarian, Randolph AFB, Texas, and present at this workshop, becomes the Chief Librarian, Kadena AB, Okinawa, Japan.

The second phase of the career program will begin next month when a panel meets at Randolph AFB to do the necessary things to bring academic, technical, and special librarians in as yet undetermined grades into the system.

II. New Libraries:

Two academic and one special library were officially brought into the Air Force Library Program. They include the Survival Training library at Fairchild AFB, Washington, under the direction of John Milton, whom many of you may remember from other MLWs; the Air National Guard Professional Military Education Center library at McGhee-Tyson ANGB, Alcoa, Tennessee; and the Air Force Logistics Management Center library at Gunter AFS, Alabama. The ANG library is the responsibility of Captain Paul Coldman, and the Gunter library is directed by Regina Finney Atkins. They are both here with us today.

III. Construction:

Aside from two major construction projects that added wings to both the Air Force Academy library at Colorado Springs, and the Air University library at Maxwell AFB, Alabama, we have concentrated on facility up-grade through relocation, rehabilitation, renovation, and new interior furnishings and equipment.

The Pacific Air Forces Command has just approved the purchase of four pre-built libraries from Porta-Structures, Inc., Washington, D. C. Full size Porta-Structures, each with 1,600 square feet of floor space, and seating for 32 or more, and with a capacity of up to 12,000 bound volumes, will be erected at Clark AB,

The Philippines and at Hickam AFB, Hawaii, as branch libraries, and at Taegu AB, Korea, as a field library. A kiosk-type Porta-Structure with 170 square feet of floor space, and a 3,000 volume book capacity, will be used at Bellows AFB, Hawaii as a browsing library at that rest area.

We are hopeful that a Porta-Structure will replace the present inadequate base library at Bolling AFB, here in Washington area, and that one will also be purchased for the Langley AFB, Virginia library system, for use as a branch library. We see Porta-Structures as our most economically viable alternative to construction, and believe that acquisition of more of them will follow rapidly.

Finally, the Directorate of Morale, Welfare and Recreation (MWR), contracted with Arrowstreet, Inc., Boston, Massachusetts, to produce a design guide for Air Force libraries, as part of a larger project to publish design guides for all MWR facilities. The library design guide, which is specifically for general or base libraries, but applicable to any kind of a library or library work space, is completed, and is expected to be published and distributed by the first of the year. It will be given the widest possible distribution throughout the Air Force and the Department of Defense. My office worked closely with our directorate architects and engineers to incorporate suggestions from our librarians. The result is an outstanding guide that will be welcome and useful to all of the Department of Defense.

IV. Contracting Out:

While we have three technical, contractor-operated technical libraries, one contractor-operated base, including general library service, in our program, it was not until late 1980 that OMB Circular A-76 induced an over-zealous command to identify their base libraries at Elmendorf AFB and Eielson AFB, Alaska, for cost comparison studies. Presently, Elmendorf is off the hook for at least five years, since no commercial bid was received. The first lowest commercial bidder on the Eielson contract was disqualified during the financial analysis. The second lowest bidder is now undergoing the same kind of financial analysis. But he seems confident of success, since his representative has contacted the librarian and her staff with job offers. We are keeping our fingers crossed on the outcome.

V. Library Productivity:

The Air Force Library Productivity Survey Report for general libraries is now in its third year, and is gaining ever-widening acceptance as a valuable management tool for library self-evaluation. We hope to expand the report to include all Air Force libraries, when suitable indicators can be identified.

VI. Training:

We conducted a 2-day pre-ALA workshop for Air Force librarians at the New Otani Hotel, Los Angeles, California, in June. It was the most successful of the three such annual workshops, and was attended by more than 100 Air Force librarians from bases around the world. Next year in Dallas, Texas, we plan to offer the fourth workshop, but with an optional 1-day mini-workshop on microcomputers, conducted by Bob Walton, Automation Consultant, Texas State Library.

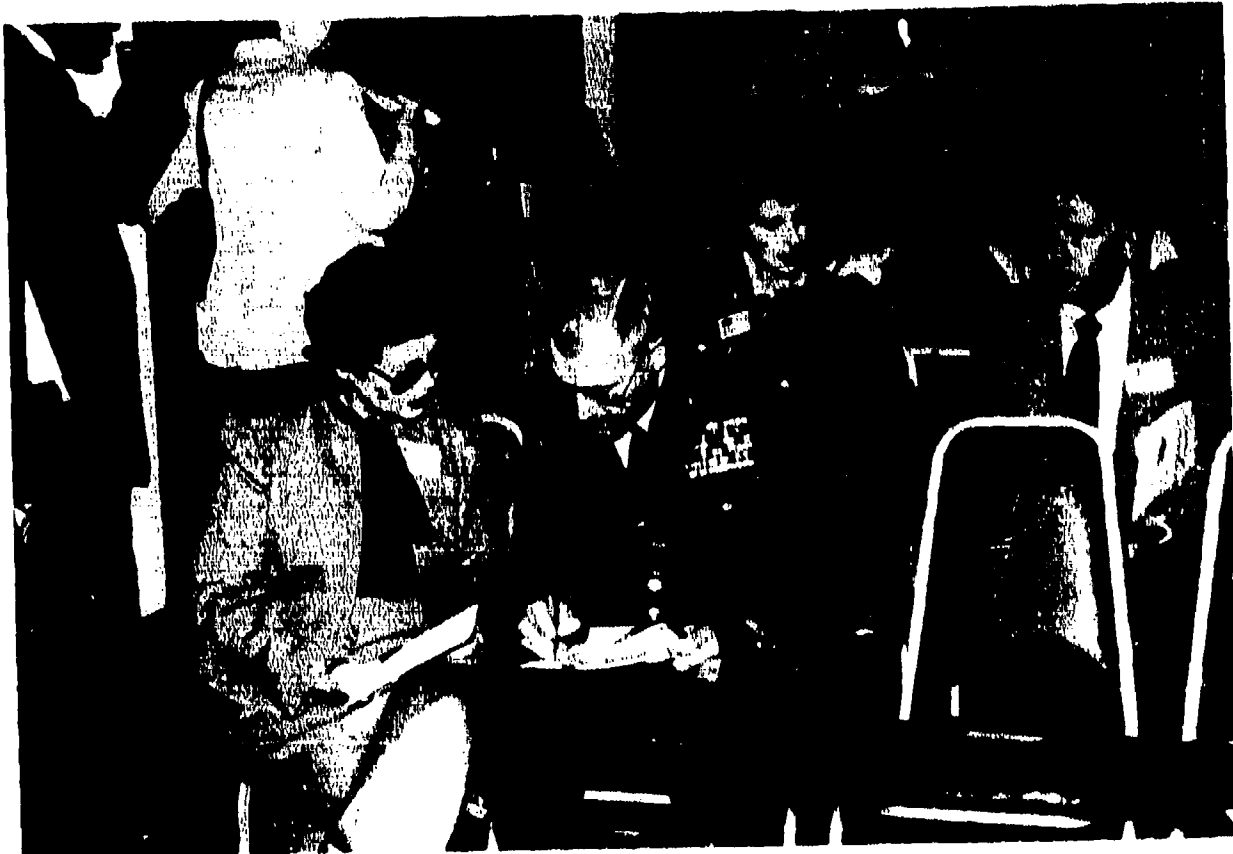
VII. Project Warrior:

No report of the Air Force Library Program's activities would be complete without mention of this phenomenally successful program. We are making money on it every single day, and public interest and enthusiasm builds continuously, thanks to the skill and innovation of our librarians. The Air Force Library Program is enjoying heightened visibility and credibility as a direct result of PROJECT WARRIOR.

VIII. Military Librarians Workshop:

And now, to wind up this report, I am please to introduce the 42 Air Force librarians who have gratefully and enthusiastically participated in this, the best Military Librarians Workshop to date! Our special thanks and recognition also to Air Force's Fran Quinn, for her part in the workshop's success.

TONY DAKAN, Director
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MG TATE AND BETTY FOX



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