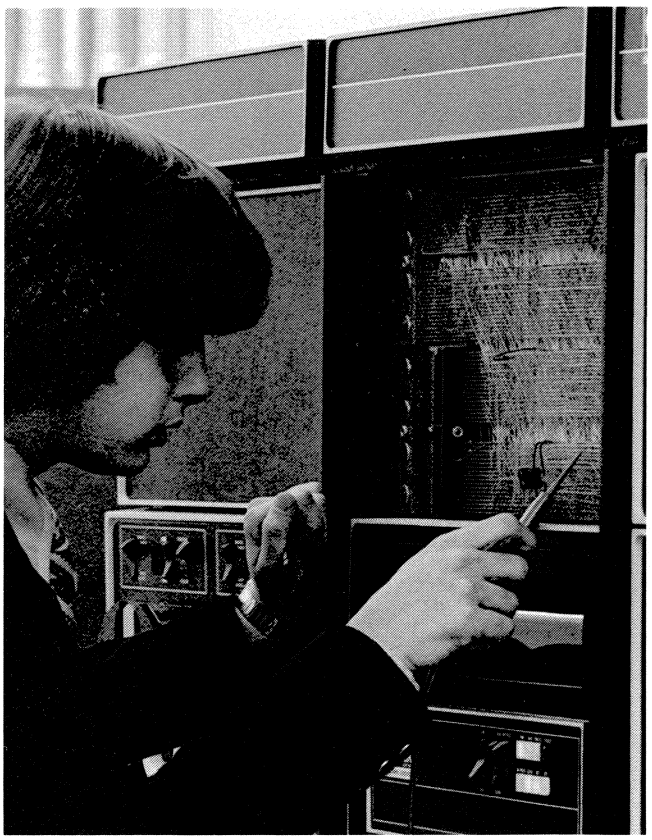
PDP-11
Hardware Maintenance Services

JULY 1976

Hardware Maintenance Services provide on-site and depot maintenance for all system hardware components, preventive maintenance and installation, and a number of contract arrangements to meet varying requirements.



FEATURES

- Field coverage
- Corporate support
- Logistics network
- Field inventories
- Critical applications service

DESCRIPTION

Field Coverage

Field Service meets its charter responsibility by equipping its in-field force with enough local manpower and material resources to provide customers with the best service cost/benefit comparison to be had in the industry. That word "local" denotes a key concept—DIGITAL has systems-trained service representatives and spare parts depots in 260 locations worldwide, 140 of these in North America. From these locations, 3000 service representatives provide warranty and 10,000 Service Agreement customers with the best computer maintenance service available anywhere, at any price. Combined with the high reliability hardware that has made DIGITAL the leader in the computer industry, that means systems that work—and keep on working.

Corporate Support

A great deal of maintenance service, however, is provided to DIGITAL users far from their computer room, perhaps before they even receive their computer system. In-field reliability monitoring for example, begins when the first device service call is made by a DIGITAL service representative anywhere in the world. Field Service call reports are completed and sent to corporate headquarters where they are correlated and stored on an in-house DECsystem-10. From this data, Corporate Field Service device support specialists are able to spot developing reliability problems and to generate, in co-ordination with design and manufacturing engineers, corrective Engineering Change Order's. These ECO's—priority coded from M-mandatory (must be installed immediately), to K-cosmetic (install at customer request)—are installed free of charge for Warranty and Service Agreement customers.

Logistics Network

Reliability enhancement through automatic ECO installation is only one of the service benefits enjoyed by Warranty and Service Agreement equipment owners. These DIGITAL customers benefit also from a worldwide logistics network which makes automatic distribution of recommended spares to Service offices receiving their first shipment of a new device. Service office inventories are computer-controlled by an inventory management system which correlates device reliability data with the Warranty and Service Agreement base being supported by a given field office. That adds up to high parts availability assurance levels and minimal material shortage downtime.

Field Inventories

But even the best inventory management system can't predict every failure. That's why DIGITAL backs up extensive field inventories with an emergency parts service in business 24 hours a day, 7 days a week to ship a customer system spare anywhere in the world by the fastest available means—part of the corporate commitment to keep customer systems working.

Critical Applications Service

DIGITAL's basic service agreement program includes priority response, scheduled preventive maintenance, unlimited parts and labor, and the administration and installation of Engineering Change Orders. This service is available from 8 hours, 5 days per week to 24 hours, 7 days per week. In addition DIGITAL Field Service is committed to the Critical Application customer—the user for whom uninterrupted system task performance is vital. For this class of customer, DIGITAL has developed the *Critical Applications Service Agreement.* This service plan guarantees response time within critical time frames and further guarantees that once on site, DIGITAL will work continuously until the system is returned to operating condition. If that commitment means working through and beyond the contract period, the customer sees no additional expense.

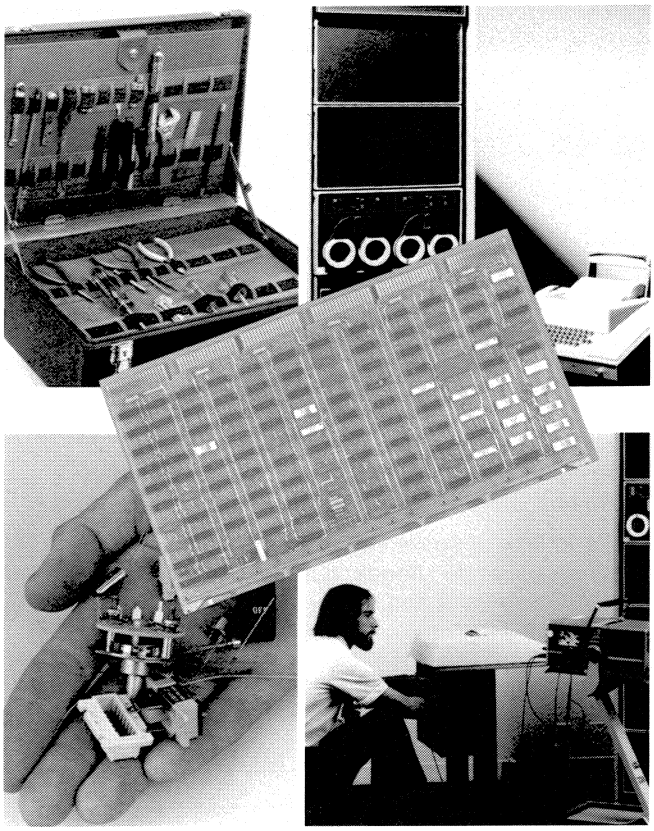
With a mature, worldwide service organization, DIGITAL has a wide variety of Service products which can be tailored to meet the system maintenance needs of any DIGITAL hardware owner. These products range from Critical Applications Agreements to OEM Agreements and Mini-System and Terminal Service plans, to in-field Product Repair Centers.

See your account representative for help in assuring maximum system availability with Digital Service Agreement—because no one can service it like the people who built it.

PDP-11
Customer Spares

JULY 1976

Customer Spares supports the total spare parts needs of all DIGITAL customers. This product line combines the previous business of Field Service Customer Spares and Logic Products module spares into one discrete business dedicated to serving the self-maintenance needs of our customers.



FEATURES:

- Loose-piece modules and power supplies
- Loose-piece components parts
- Pre-packaged module and component kits
- System-configured spare kits
- Teletype modification and spares kits
- Memory stacks and memory spares kits
- Tool kits
- ECO and PM kits
- Test equipment

DESCRIPTION

Processor Spares Kit

Spares kits are available for the maintenance of various PDP-11 minicomputers. Engineering expertise, failure-rate data and field experience is used to develop and update the kits for customer use.

Teletype Kits

Some DIGITAL customers prefer to buy Teletypes for use with their computers directly from Teletype Corporation.

Adaptation of these Teletypes to DIGITAL processors may be accomplished easily by using Teletype Modification Kits. In addition, we offer a Teletype Spares Kit for your convenience and a Teletype Tool Kit.

Spare Memory Stacks And Kits

DIGITAL provides memory stacks for your sparing needs. In most cases these items are available for off-the-shelf delivery.

Tool Kits

If you plan to maintain your own DIGITAL computer, you should consider the tool kits which our Field Engineers use. These kits have been designed and field-proven by DIGITAL's Field Service organization.

Maintenance Test Equipment

Many of DIGITAL's self-maintenance customers require such testors in their regular operations and are not aware of these product offerings through Customer Spares.

System-Configured Spares Kits

To assist you in your self-maintenance plans, DIGITAL will provide a *Recommended Spares List* for your particular system configuration.

- If you are planning to maintain a DIGITAL system, consider at the *front-end* the spares required to properly maintain your new equipment; order the necessary spares *with* the hardware.
- If you already have DIGITAL equipment in operation, use this *free service* as a verification of your present inventory of spare parts. This simple exercise may save you considerable expense and valuable time by giving you a checklist to optimize inventory.
- Recommended spares are developed from calculations of actual consumption areas.

Product Line Support

To provide our customers with the right kind of information and support, the following literature is available:

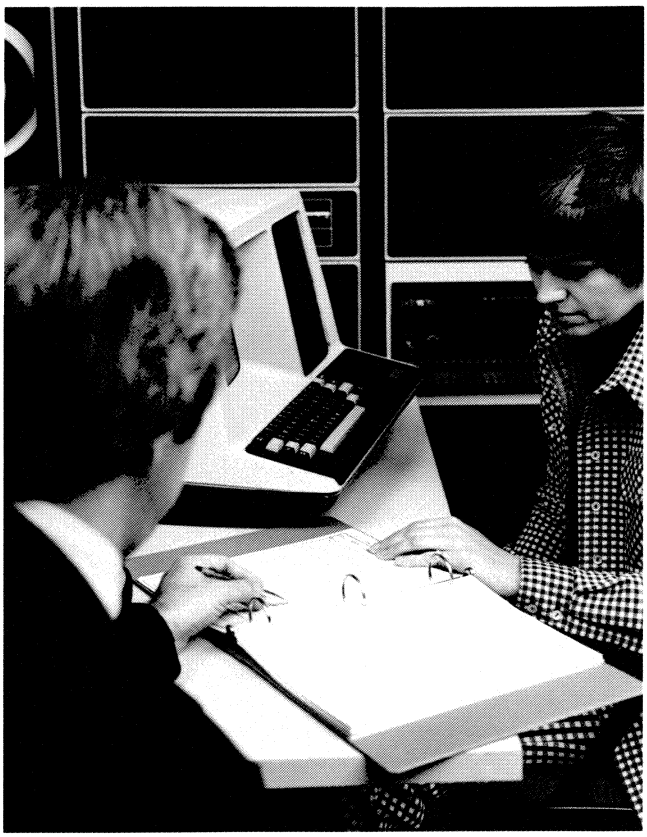
- Micro-Fiche of Spare Parts Price List
- "What spares do I need?" (Quoting Service)
- LA36 Spare Parts and Kits
- Emergency Service
- 11/70 Spares and Kits
- Test Equipment
- Option/Module Reference
- Tool Kits
- Illustrated Parts Breakdown
- DEC-ECO-LOG (Subscription Information)

PDP-11
Software Services

JULY 1976

The DIGITAL Software Services organization represents over 3,000 man-years of experience gained from the development and support of operating systems used in more than 40,000 computer installations. This expertise varies in complexity from real-time executives for minicomputers to complete software networks. Applications experience covers the spectrum from process control and monitoring scientific experiments to implementing reservation and inventory control systems.

This expertise reaches users through services that start from the personal attention of a skilled software consultant to the distribution of up-to-date software and software information. In this way, DIGITAL users can get the most out of DIGITAL computer systems and keep pace with the rapid advancements in software.



FEATURES:

- Consulting
  - systems design
  - systems programming
  - applications
- Home office specialists
- Software maintenance
- Software distribution

DESCRIPTION

Software Consulting Services

DIGITAL's consultants are software professionals specifically trained in DIGITAL products. They are experienced in designing, coding or modifying custom software as well as tailoring DIGITAL software to meet specific needs. Consultants are well versed in application areas such as communications, graphics, commercial data processing, process control and real-time systems. They are complemented by home office software support specialists, who provide additional technical back-up, often lowering your project cost.

DIGITAL software consultants can meet many different needs. For example, a highly sophisticated user may wish to temporarily supplement his staff to meet a critical project completion schedule. An OEM customer may require extra support and programming help during the development cycle of a product in order to make the end product more competitive or self-supportive in the market-place. New users may want a consultant to work hand-in-hand with their personnel in order to reduce their learning curve and expedite productivity.

Consulting services are available on a time-and-material basis for a short term (per-call), or a longer term (monthly or resident).

Software Maintenance Services

In order to provide customers with a continuing level of support for their software systems, DIGITAL provides Software Maintenance Services. Several levels of service are available as options ranging from a periodic software newsletter to automatic updates of software and manuals.

Periodic newsletters are mailed to all maintenance service subscribers. They contain information on system enhancements and new software products, general software information, software difficulties and their suggested solutions, and all in a timely manner. This "Software Dispatch" is distributed in loose-leaf binder format for easy reference and updating.

Subscribers to more comprehensive maintenance service plans receive the latest software updates on a suitable medium, as well as current issues of manuals and manual updates.

Software components, including documents and updates, can be purchased separately from DIGITAL's Software Distribution Center.

Software Distribution Center

Over 1,000 software items and documents are available from the Software Distribution Center (SDC). Included are source and binary software products on DECtape, paper tape, disks, magnetic tape, and cassette; paper and microfiche listing; textbooks, handbooks, and manuals. Customers are kept informed of current offerings through periodic issues of the SDC price list.

PDP-11
Educational Services

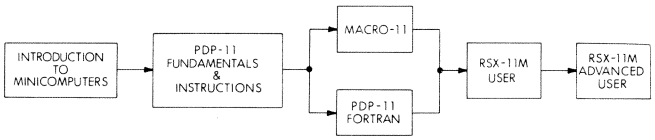
digital

JULY 1976

Like DIGITAL's computer systems, training facilities span the globe—Japan, Australia, Great Britain, Germany, France, the Netherlands, Sweden, Italy, and throughout the United States. Educational Services maintains fourteen fully-equipped Education Centers and a staff of experienced, full-time educators dedicated to providing all the timely education and training needed in support of all DIGITAL systems.

FEATURES

- Full curriculum of courses
- Custom courses to meet special needs
- On-site instruction
- Audio-visual self study courses



EXAMPLE: *RSX-11M TRAINING CURRICULUM*

DESCRIPTION

Curriculum Philosophy of System Training

Educational Services, through its Course Development Group in liaison with DIGITAL's Engineering and Software Development Groups, has taken a curriculum approach to customer training.

Educational Services can provide a curriculum of courses allowing a computer novice to progress from entry level to advanced level proficiency in software, hardware, or system management. Curricula for every CPU and operating system are graphically illustrated in flowcharts accompanying course descriptions in the *Educational Courses Catalog.*

These flowcharts make the analysis and planning of a training program a very straightforward procedure.

A full curriculum of PDP-11 training courses is available for each of these software and hardware products:

SOFTWARE	HARDWARE (CPU)
CAPS-11	
RT-11 F/B	LSI-11
RSTS/E	PDP-11/03
RSX-11D	PDP-11/04
RSX-11M	PDP-11/05, 10
IAS	PDP-11/35, 40
BASIC	PDP-11/45
FORTRAN IV-PLUS	PDP-11/70
COBOL	
DOS-11	

In addition, hardware familiarization or maintenance courses are offered on virtually all PDP-11 peripherals—disk and tape systems, printers, terminals and communications interfaces.

Facility Courses

Catalog courses are regularly scheduled classes offered at training centers. Presently, there are more than 100 scheduled classes that cover the range from first-time user to highly specialized training on theory of operation. Most catalog courses include extensive hands-on laboratory time, and all incorporate the use of a broad assembly of student workbooks, reference manuals, and other instructional materials.

On-Site Instruction

Customers with a group of individuals to train may find it more economical to have Educational Services conduct courses at the user's home site. On-site instruction of both catalog and custom courses eliminates travel and other expenses incurred by students attending classes at training centers. This method of instruction further enhances training by allowing DIGITAL instructors to emphasize points of particular value to the student's applications and operations.

Custom Courses

Specialized training is available for users with unique applications or training situations. This approach is designed to give the student the maximum relevant material for specific applications while minimizing extraneous information. The custom courses are tailored to the individual customer's schedule and typically comprise a series of courses. These can be modified from existing courses or be entirely new programs based on mutually agreed upon objectives.

Audio-Visual Courses

By taking advantage of the latest in audio-visual techniques, Educational Services has developed a series of courses that offers independent learning. Audio-visual courses are convenient, self-contained, and modular in topic. The self-instructional format allows students to progress at their own rates, study when and where they wish, and play back modules for review. Audio-visual course material is available in several forms —typically videocassette, or audio/filmstrip cassette— all supported by student workbooks. Of particular interest to PDP-11 users, is DIGITAL's self-paced audio-audio-visual course, *INTRODUCTION TO THE PDP-11.*

INTRODUCTION TO THE PDP-11 was developed with the customer in mind. The wide acceptance of the PDP-11 minicomputer has created the need for providing these users with a convenient, cost efficient means of system training. This course has been developed by technical training experts at DIGITAL to be the foundation for more advanced and specialized customer courses.

INTRODUCTION TO THE PDP-11 is divided, by topic, into nine study units. Each study unit consists of a student workbook and audio/visual media material. These workbooks contain lesson objectives, review material, study exercises and self-scoring tests that are designed to supplement and reinforce the audio/visual presentation.

The first five study units in this course present a system overview and teach basic PDP-11 hardware concepts. These study units are as follows:

- System Overview
- UNIBUS Concepts
- Priority Control
- Processor Organization
- Addressing & Memory

The remaining four study units cover PDP-11 programming concepts. These study units are as follows:

- Use of the Console
- Addressing Modes
- Instruction Set
- I/O Programming

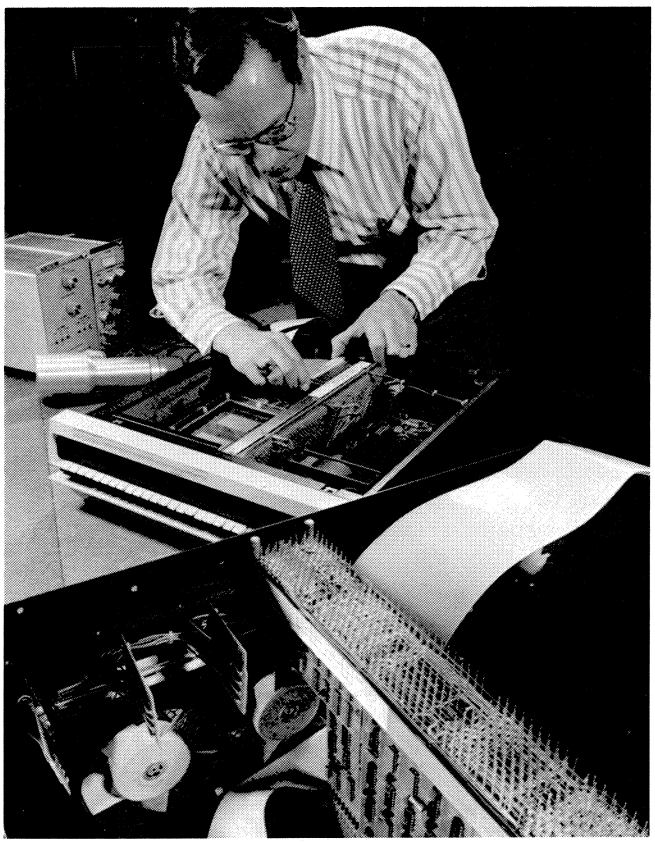
This self-study course also contains a student guide along with a set of reference books and a PDP-11 programming card. Answer sheets for the student workbooks are supplied in separate envelopes, and instructional materials (sets of workbooks) are supplied for ten students. In addition, a manager's package is included which contains instructions for properly administering the course.

PDP-11
Special Systems

digital

JULY 1976

Special Systems is a worldwide organization dedicated to serving the special needs of DIGITAL customers. It is comprised of more than 500 people—systems designers, hardware and software experts, a network of project managers, application specialists, technicians and production people. As a widely experienced systems organization, Special Systems provides a range of special solutions from processor interfaces and handlers to multiprocessors and complete turnkey systems. Fully staffed offices in the U.S., Canada, England, Germany, France, Japan and Australia offer global capability and regional support.



FEATURES

- Custom designed hardware
- Custom designed software
- Total system design

DESCRIPTION

Hardware

Special Systems has been demonstrating its capability for over fifteen years. Its worldwide engineering groups have developed special products such as unique peripherals, data collection systems, special interfaces, multiprocessors, and interactive graphics. Additionally, applications involving process supervisory and machine control have been successfully designed for particular customer needs.

Software

The Special Systems Programming staff offers a wealth of experience in designing and programming real-time and on-line systems. The staff has worked on a wide variety of real-time operating systems and executives with a special emphasis on DIGITAL's RT-11 and RSX-11 family of operating systems. Examples of the kinds of software developed by Special Systems include: industrial data acquisition and monitoring, information storage and retrieval systems, man-machine interface programs, industrial control systems, multi-processor systems, communication networks, communication concentrators, and an assortment of drivers and handlers integrating various special devices to a number of different operating systems.

Application Programming

A key ingredient in a successful computer system is tailoring the application software to meet specific needs. Application software may be designed and implemented by the computer system customer or Special Systems, or through an effort utilizing combined resources. Special Systems' broad base of experience in computer systems and engineering disciplines, coupled with a staff of application analysts, permits us to grasp unique requirements, rapidly prepare detailed system specifications, and provide application programming services, all on a "turn-key" basis if required. Special Systems personnel have worked on a wide range of applications including steam turbine power plants, batch mixing systems, communication networks, process control and monitoring, warehouse control (stacker cranes), factory automation and data acquisition, pipeline distribution systems, hospital systems, computerized baggage handling, and graphic display and plotter systems.

Systems

In addition to effective hardware and software, a total computer system is the culmination of many integrated functions. As an experienced systems organization, Special Systems offers the expertise necessary to build systems which answer the customer's needs, systems which Special Systems stands behind. They begin with problem analysis, followed by a clear and complete definition of the customer's requirements and goals. A functional and detailed system specification is generated, including solutions for best overall operation of the system and optimum cost effectiveness.

The preceding stages are combined in the preparation of a formal proposal. This document, which is based on a careful analysis of the requirements of the application, provides a detailed description of the goals, functions, hardware, software, schedule, and costs for the proposed computer-based system.

Project Management And Systems Engineering

To provide smooth and efficient progress from initial design to full implementation of computer systems, project management is of prime importance. Special Systems assigns a project manager to all projects requiring this function. It is this individual's responsibility to oversee and coordinate system specification and design, schedules, design approvals, documentation reviews, acceptance testing and final installation. The project manager also functions as the customer contact for all communication regarding progress reports, changes to system design, schedules, or any questions pertaining to the system.

As project management ensures that project activities are correctly performed, system engineering performs them. For system integration purposes, Special Systems maintains a high complement of capital equipment, enabling new designs to be tested quickly and effectively. The extensive experience of Special Systems in engineering and programming coupled with a strong background of project management, ensures a well planned and executed system development.

Special Systems Production

All Special Systems manufacturing operations provide a fast response manufacturing resource to support the prototype engineering of the special products that are unique to Special Systems business. Additionally, Special Systems production has the capability to manufacture an impressive spectrum of high quality products in volume, ranging from printed circuit board plotter controllers to highly complex bus switches for multi-processor systems.

The high quality of Special Systems products is maintained by an effective ongoing quality assurance program that is implemented by a staff of trained inspectors and skilled technicians. The Q.A. program includes inspection and test of incoming materials and finished goods, mandatory inspection procedures of manufacturing work in process and dynamic testing of finished products and systems prior to acceptance for shipment. Another feature of Special Systems production is a specially trained, highly skilled technical support service ready to provide site installation and post installation support of all Special Systems products and systems.

SERVICE

Documentation

With each product, Special Systems provides complete documentation. It includes topics such as specifications, operation and programming, and maintenance. All system or software documentation efforts involve complete documentation or specification before implementation begins. The resulting system or program is then capable of easy growth and modification.

Training

In addition to the standard training courses offered by Digital Equipment Corporation, Special Systems offers specialized training to cover all aspects of Special Systems, both in the hardware and software areas. These courses are offered at one of our facilities or at the customer location.

Field Service

In-field support of Special Systems products is structured to efficiently and quickly access the level of technical knowledge required for effective support. The product market support organization is the focal point for field problems, identifying and assigning the proper resource, and monitoring the solution process to assure satisfaction. Resources range from the technical support group, developed to provide in-field assistance to Field Service to the actual designers of the product.

PDP-11
DECUS

JULY 1976

Digital Equipment Computer Users Society (DECUS) is a voluntary, non-profit users group supported by DIGITAL. It is the largest and most active user group in the computer industry. Entirely controlled by users, the DECUS charter is to:

- advance the art of computation through mutual education and interchange of ideas and information,
- establish standards and provide channels to facilitate the free exchange of computer programs among members and
- provide feedback to the manufacturer on equipment and programming needs.

FEATURES:

- Extensive program library
- Users groups
- Special interest groups
- Workshops and symposia

The Society sponsors technical symposia twice a year (Spring and Fall) in the United States, and once a year in Europe, Canada and Australia. The Society also maintains the Program Library, publishes a library catalog, proceedings of symposia, and a periodic newsletter–DECUSCOPE.

DESCRIPTION

Membership

Membership in DECUS is voluntary and does not require payment of dues. Members are invited to take an active interest in the Society by contributing to or borrowing from the Program Library, contributing to DECUSCOPE, and participating in meetings and symposia. Membership is open to any installation that has purchased or has on order a DIGITAL computer or to any individual who uses a DIGITAL computer.

Program Library

The DECUS Program Library is one of the major activities of the users' group. It is maintained and operated separately and contains programs contributed by users.

The Library contains many types of programs, such as executive routines, editors, debuggers, special functions, games, maintenance and various other classes of programs.

Library Catalogs are issued which list all programs available from DECUS.

There are submission standards which programs must meet before they are accepted in the Library. Review procedures determine whether the program remains in the Library, is changed, or is removed. Library programs are available to all members on a request basis, for reproduction and handling charges only.

Activities

Two domestic symposia are held each year–one in the Spring and one in the Fall. Seminars are also held annually in Europe, Canada and Australia. The proceedings and papers presented at the symposia and seminars are published shortly after each meeting and are sent automatically to meeting attendees and upon request to others.

Joint Users' Group

The Society has been a member of the Joint Users' Group (JUG) of the Association in Computing Machinery since April 1964. DECUS sponsored the first JUG Executive Workshop in April 1966 and has participated in workshops held once a year ever since. Workshops consist of administrative personnel from several users' groups. The purpose of the meetings is to establish means for intercommunication among user groups.

Local Users' Group

DECUS encourages subgroupings of users with common interests. One of the most successful subgroupings has been Local User Groups. There are over 30 active Local User Groups, called LUGs, operating all over the world.

Special-Interest Groups

Special-Interest Groups (SIGs) are formed to promote the interchange of specialized information and have no geographic limitations. Specializations may be for application areas, subject areas, such as languages, or even specific computer lines. Examples of active SIGs are users in education, newspapers, clinical laboratories and interactive graphics.