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December 1976

U. S. DEPARTMENT OF COMMERCE

NATIONAL BUREAU OF STANDARDS

THE WORLD OF EDP STANDARDS

Marjorie F. Hill
  Control Data Corporation *

        and

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  National Bureau of Standards

Institute for Computer Sciences and Technology
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Marjorie F. Hill and Josephine L. Walkowicz

ABSTRACT

This publication describes the activities
and relationships of the many organizations
and individuals involved at the national,
regional, and international levels in the
development of standards for computers and
information processing. A generalized
description of the standardization process
is presented first and then used as a basis
for describing the activities of the
principal organizations that comprise the
WORLD OF EDP STANDARDS. The Second Edition
of the WORLD brings up-to-date the
information contained in the First Edition
and retains the format used therein. The
description of each organization is
structured in a uniform manner and includes
the history of each organization, its
objectives, membership, organization,
finance, relationship to other
organizations, and its technical work.

PREFACE TO SECOND EDITION

Despite three printings, copies are no longer available of the First Edition of the WORLD OF EDP STANDARDS written by Marjorie F. Hill and printed by the Control Data Corporation. The National Bureau of Standards considered the work to be of significant importance and requested Control Data Corporation to revise and update the material for publication by NBS. Control Data Corporation agreed, and submitted a revision which was used as the basis for this Second Edition of the WORLD. At NBS, Miss Josephine L. Walkowicz of the Institute for Computer Sciences and Technology was assigned the responsibility for editing, updating, and preparing the WORLD for publication as a National Bureau of Standards document. NBS is pleased to provide this updated version of the WORLD OF EDP STANDARDS.

In preparing the Second Edition, NBS decided to retain the original structure and organization of the WORLD insofar as possible in incorporating the information necessary to reflect the changes that have taken place in the recent past. The NBS editor made an intensive effort within a very short time frame to obtain current information on the activities of all of the organizations chosen for inclusion in the WORLD. Though this effort was not completely successful, NBS chose to defer further research to a future revision of the WORLD, rather than to delay publication of the Second Edition at this time. The reader is cautioned, therefore, that a lack of change in the text does not always indicate that no change has occurred in the relevant organization or activity. The reader is further cautioned that the book was not intended to be an exhaustive catalogue of EDP standards activities, but rather a history and description of the EDP standardization process as it developed and as it actually takes place in selective countries and their respective organizations.

A Bibliography of source material is provided with this Second Edition. References were added to both paraphrased and quoted material, with full awareness of the fact that the author of the First Edition may have used source material other than that identified by NBS. Since much of the value of source material depends on its currentness, we welcome this opportunity to solicit updating information and other comments from the readers as well as from the organizations described herein.

Kindly send all such material to:

Miss Josephine L. Walkowicz
Institute for Computer Sciences and Technology
National Bureau of Standards
Washington, DC 20234

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PREFACE TO FIRST EDITION

This volume is intended for a large class of individuals now participating in standards committees or those other individuals who wish to acquire an appreciation for the subject.

The topics reflect what are felt to be necessary for a broad-based understanding of the standards development process. The text material covers the organizations which form the standards environment and the process used to ensure that a consensus has been reached. The treatment of the standardization process uses an anonymous description which can be particularized for either national or international standardization.

The material was, for the most part, selected from official year books, operating procedures, directives and bylaws of the organizations. The objective was to make the discussions sufficiently complete to be satisfying and to provide a structure which would facilitate later referral to the material. Each topic has been treated as an independent subject to minimize the need for cross references. This structure led to some redundancies which may be undesirable but appeared unavoidable.

A list of acronyms has been included to avoid endless repetition of lengthy names and permit the reader to become acquainted with the language of the subject.

The material is not intended for use as a legal or operating procedures document. In most cases, concepts have been stated in preference to official wording.

Every effort has been made to present the most current information in accurate form. Material which would tend to date the volume has been omitted. An effort was made to give the reader an understanding of the detail of the subject, but at the same time present a simplistic overview of the total process. In some cases this may have resulted in an oversimplication which will be displeasing to some.

Each organization is structured in identical format to include: history, objectives, membership, organization, relation to other organizations, finance, technical work and technical committees.

It is hoped that this volume will bring to everyone who uses it a better understanding of the process of standardization, of the standards organizations involved in the process and of the part each plays in the formulation of EDP standards for the world.

M.F.H.

ACKNOWLEDGMENTS

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CHAPTER 1
THE STANDARDS ENVIRONMENT

An introduction to the standards environment is an introduction to an environment which exists outside of and, to a large degree, independently of the organizations or company members that contribute to or actively participate in standards activities.

The development of standards is a vast worldwide activity which could almost be classified as an industry in itself. Thousands of individuals are involved in standardization for the EDP industry. In American National Standards Committee (ANSC) X3 alone there are about 1,000 individuals engaged in some phase of developing standards. It is reported that, on the average, eight ISO technical meetings take place somewhere in the world every working day of the year. (a) (b)

The realization of the importance of standards is not a product of our modern times; recognition of the value of standards has been accepted for centuries. The Magna Carta contained a chapter on standards and our own Constitution authorized Congress to "fix the standards of weights and measures."

As our civilization has grown more complex, the need for standards has grown at an unbelievable rate. Without thinking in terms of standards, we are accustomed to ask for a specific weight of oil for our car, film of varying speeds for our cameras, tires of a certain size, electric light bulbs, electric sockets, extension cords, etc. As consumers we look upon standards as vital to our daily life; we have become dependent upon standards; and we would not tolerate the inconvenience incurred by a lack of standards.

As professionals, standards are such an integral part of our daily life that we are often oblivious to their existence, and therefore, do not always appreciate their value. However, our history is rich in examples of how standards have aided technological advancement, industrial expansion, and consumer reception of goods and services.

The early growth of the railroads was aided by standards for track width, which made it possible for all railroads to share tracks and expand routes and services.

(a) Reference 8, page 11; (b) Reference 30, page 8.

The specification of wavebands for radio and television transmission made possible the vast radio and television industry. The walk on the moon which required the interaction of many organizations, would not have been possible without standardization within the project. We, as viewers, would not have been able to witness the moon walk without conformity between the project and existing broadcast standards.

For those who travel, the airlines have developed standards so that reservations may be made by one airline for a continuing flight on another airline. Standards both within the airline industry and within the computing industry have made this possible.

As we understand the role played by standards in our daily life, it becomes easier to understand why a need for standards is recognized by an industry. When this need in a particular area has been acknowledged, the next logical step is to convene a group interested in the subject to develop a standard.

Look again at the oil purchased and note that it is designated as SAE 30; film speeds are designated as ASA 64, ASA 160, etc., and cameras bear the same or similar notations. Note that an organization has now been identified with the subject to furnish stature to the standard.

The reason then for a standards organization to exist is to provide a framework so that standards which represent a consensus can be developed and approved. It is interesting to note that the history of each of the organizations described in this document illustrates that the need for standards was recognized, a meeting of interested parties was convened, and an organization was formed or designated through which standards could be developed and approved.

HISTORY

In the early part of our century, the general need for standards was fairly widespread and, as a result, several organizations were founded. Figure 1 shows the dates of origin of some of the prime organizations which, in more recent years, became concerned with standardization within the computer industry, and those organizations which were originated specifically for the development of computer-related standards.

When the first suggestions were made that standards should be established in the field of computers and information processing, there were mature and well-established organizations available to accept the responsibility for development of the needed standards. On the international scene ISO authorized the formation of Technical Committee 97 (Computers and Information Processing) and Technical Committee 95 (Office Machines), while at home the United States of America Standards Institute (now the American National Standards Institute) assigned to the Business Equipment Manufacturers Association (now the Computers and Business ...) the responsibility for forming USA Standards Committees X3 (Computers and Information Processing) and X4 (Office Machines and Supplies).

Meanwhile in Europe the European Computer Manufacturers Association was being formed and by mid-1961 the standardization effort for computers and information processing was well underway. Two years earlier CODASYL had been formed and COBOL already existed as a language, so ANSC X3 and ECMA immediately chose COBOL as one of the first products for standardization.

Figure 2 shows an exploded view of the founding dates of organizations involved solely in the development of standards for the computing industry. It is interesting to note that once the need for standards was recognized, appropriate organizations were quickly formed.

OBJECTIVES

The objectives of all the international and national standards bodies are so similar that they can be thought of as carbon copies of each other. Basically these objectives are:

    development of standards;
    promulgation of standards;
    coordination of standards development;
    establishment of standards;
    exchange of information.

At the technical level the objective is the development of a standard for a specific product or process. In this case the objective takes the form of a scope or boundary for the technical committee activity required for the development of the standard.

MEMBERSHIP

The membership base of standards-making bodies varies somewhat, but in general at the international level, the members represent nations. At the national level, individual members represent interests of consumers, producers, and general interest groups.

Membership in standards organizations is restricted in the sense that each organization establishes categories and balance for membership but is open-ended in respect to number of members. In the International Organization for Standardization (ISO) membership is restricted to the standards organization most representative of each nation. The American National Standards Institute (ANSI) represents the United States in ISO and therefore no other standards organization based in the United States can hold membership. Other standards organizations are subtly restrictive on the basis of technical interest, product produced, or similar categories. As an example, although the International Commission on Rules for the Approval of Electrical Equipment (CEE) has the word international in its name, membership is entirely European. The United States has only Observer status.

ORGANIZATION

Most of the standards organizations of nations (other than the United States) while usually not officially linked to their native governments, do have some semi-official status. Administratively, this accounts for the main difference among the organizations. Where standards development and processing are involved, the organizations offer similar series of procedures for evaluation, review, development, and balloting.

The reader will discover that all organizations are structured to accommodate a high level board for policy direction, a board for approval of standards, one or more technical advisory boards, an administrative board, and one or more standards development committees.

Some organizations consider their work complete when a standard is approved; others carry their work further into the areas of popularizing the standard, training in the use of the standard, educating for quality control, and testing and certification services.

The most common way for a standards organization to promulgate its standards is to authorize a company to affix the organization's label to a manufactured product. In this case vigilance is required to ascertain that conformance to the standard is being maintained, and also generally requires some form of testing laboratory as part of the organizational structure of the standards organization. Another common method is to place national standards in university libraries, or establish libraries for standards in conjunction with some other organization. Announcements in trade journals are also common.

Japan appears to have the most inclusive system of industrial standardization of any country examined, including the United States. Japan's standardization activities include involving professional societies in the standardization process and delegating the publication function to another organization. This latter organization also provides training and orientation courses and makes standards available at several locations throughout Japan.

Japan also has a certification program that is very similar to that of the Underwriters' Laboratories in the United States, as it links standards to testing, inspection of premises, and training for quality assurance. In addition, their work also includes the normal work of evaluating proposed standards and developing positions on ISO and IEC issues.

It should be noted that all technical standards development work is accomplished in technical committees, whether national or international standards are involved.

The similarities and variances among organizations for technical work are most obvious at the national level. In the international organizations, the technical committees are part of the parent organization; at the national level the technical committees may, or may not, belong to the parent organization.

For example, ANSI does not "own" any standards committees; the Canadian Standards Association lists as part of its organization committees whose scope parallels that of TC 97 and TC 95 committees. These committees for the most part review and evaluate international standards with a view to approving them as CSA standards.

RELATIONSHIP OF ORGANIZATIONS

Complicating factors in the development of standards are the inextricably interwoven relationships at the international level and the increasing complexity of relationships at the local or national technical committee level.

At the international level member bodies of the ISO Council are also member bodies of the Council of the International Electrotechnical Commission (IEC). Members of CCITT working groups are members of ISO technical committees; and ANSI technical committees may meet in joint sessions with an ECMA technical committee to develop an international standard.

The International Federation for Information Processing which is not a standards development body moved to Geneva so as to be closer to ISO and IEC headquarters. The Japanese Standards Association has an office in Geneva, located near the ECMA headquarters. The European Free Trade Association and the European Economic Community maintain close liaison with ISO, IEC, and ITU.

Complex as are the relations and the interactions between and among the standards making bodies, all activity comes to focus at ISO, IEC, and ITU. These organizations are recognized by the United Nations as the responsible bodies for standards development for both the developed and developing countries of the world.

The ANSI/ISO relationship is that of a national standards organization (ANSI) serving as a member of an international standards organization (ISO). When ANSI is asked to serve as the Secretariat for a technical subcommittee, ANSI is merely fulfilling its responsibility as a member of ISO in much the same way as an individual member of a task group or technical committee serves as secretary. The work is more complicated because of its scope and the international protocol involved, but the function is much the same.

The relationship between the technical committees of the European Computer Manufacturers Association and those of ANSC X3 are of prime importance to the expeditious development of international standards. ECMA has a different impact on the standards industry than does ANSC X3, as ECMA's standards committees are composed of representatives from many nations of Europe and membership is limited to producers only. By contrast, the membership of ANSC X3 is composed of producers, consumers and general interests who represent only the United States viewpoint.

It is becoming increasingly important to hold joint technical meetings so that ECMA and ANSI standards may develop in parallel, and technical issues may be resolved prior to an international meeting. The beneficial effects of this coordination can be seen in COBOL where the ANSI, ECMA, and ISO standards are identical.

FINANCE

Although many international and national organizations derive their operating revenue from membership dues and the sale of standards, others are wholly or partially supported by their governments. The Japanese Industrial Standards Committee is unique in that the publication of standards is the responsibility of the Japanese Standards Association which is independent of JISC.

Several national standards organizations have extended their activities to include a certification program which contributes to their income.

Most of the organizations included in this document are self-sustaining non-profit organizations.

TECHNICAL COMMITTEES

Most technical committees have an organizational structure similar to that of the parent organization and have an appropriate quota of administrative and advisory groups to supervise the progress of the technical work.

Each technical committee is chartered to develop standards within its assigned range of interest. Since this charter or scope generally covers a broad technical area, a technical committee may work simultaneously on several overlapping or independent technical areas within its assigned responsibility. Still other technical committees may need to establish liaison with technical committees of other standards organizations.

TECHNICAL WORK

Most of the developed countries take an active part in the development of the contents of standards. However, some elect to monitor the international development work which is then evaluated in terms of their national requirements. Australia and Canada are examples of this type of participation.

It is also common practice for some international organizations to adopt the International Standards developed by the ISO Technical Committees.

CHAPTER 2
DEVELOPMENT AND PROCESSING OF A STANDARD

The development of standards is based upon the premise that the project must be cooperative in nature and the technical content must represent a consensus of the parties involved. The theory of consensus applies to Federal standards as well as to national and international standards. Federal standards are subjected to review within the Federal Government and when a consensus has been reached the proposed standard is published in the Federal Register. Standards of the Electronic Industries Association as well as those of other organizations are developed in much the same manner.

The standards development phase may require many changes in wording to effect a compromise, as well as many material additions or deletions. The ultimate objective is to produce a standard for which consensus can be achieved.

The philosophy of consensus imposes a responsibility upon the organizations which form the framework within which standards can be initiated, developed, and approved. It naturally follows then that the organizations must develop a process, methods, and operating procedures that will guarantee that this consensus has been reached.

In the United States, ANSI recognizes only three methods for the development of evidence of consensus for approval as American National Standards. These are the Accredited Organization Method, the Canvass Method and the American National Standards Committee Method. All methods have the same objective, i.e., to develop evidence of consensus of interested parties for approval of a proposed standard.

Any individual or any organization may propose a standard for approval, and in so doing may specify any one of three methods. If the proponent elects either the Accredited Organization Method or the Standards Committee Method, the Standards Management Board refers the proposed standard to the appropriate body. The receiving organization then becomes responsilbe for the development of evidence of consensus and for reporting the results to the proponent within six months. If the Canvass Method is selected, the proponent is responsible for preparing the canvass list, collecting the responses, and documenting the results.

ACCREDITED ORGANIZATION METHOD

Any organization involved in standards work may seek accreditation from ANSI. An accredited organization may, through its own procedures for developing evidence of consensus, submit proposed American National Standards to ANSI for approval.

The criterion of accreditation for the organization requires a procedure for development of consensus comparable to that required under the American National Standards Committee method. Unscheduled audits may be performed by ANSI in order to ensure compliance with all accreditation criteria.

When the proposed standard has been approved within the accredited organization it is transmitted to ANSI for approval as an American National Standard. The transmittal must include a statement that the following requirements (plus other criteria) have been met:

All substantially concerned parties have had an opportunity
    to express their views and these views have been
    considered.
Significant conflicts with other American National Standards
    have been resolved.
Consideration has been given to existing national and
    international standards.
Evidence of compliance with ANSI procedures must be shown.

When a standard developed under this method is transmitted to ANSI it is treated in the same way as one developed by the American National Standards Committee Method.

CANVASS METHOD

The Canvass Method may be used when a standards-making organization or any other responsible organization has existing or draft standards it wants to have considered as American National Standards. In this event a canvass or mail poll is taken of all organizations which are known to have concern and competence in the subject.

The organization which proposed the standard becomes the sponsor and is responsible for preparing the canvass list, which is reviewed by the cognizant Standards Management Board. Generally, a six months' time limit is placed upon responses to the poll.

When the canvass ballot period closes the sponsoring organization must submit all pertinent documentation to the standards- approving organization. This documentation includes the standard being proposed, the canvass list, the comments received, and the sponsor's responses to adverse comments.

A standard submitted under this method is processed within the standards-approving organization in the same manner as one submitted under the standards committee method.

The Canvass Method is used when there is an organization which specializes in one field and is willing to accept the responsibility for the canvass. If the proposed standard is judged to be in the province of responsibility of an existing standards committee, that standards committee is included in the list of organizations canvassed.

If an accelerated procedure is indicated, a public meeting of the canvassees may be called by the sponsor to consider and discuss the proposed American National Standard. The meeting may be held within thirty to forty-five days of the date of the canvass letter, at which time all those present are expected to cast their vote.

The results and other relevant documentation are transmitted to ANSI and further procesing as an American National Standard proceeds in the normal manner.

STANDARDS COMMITTEE METHOD

The Standards Committee Method is the method best known to the computing industry. It is used when one or more organizations have developed or are developing standards on the same or related subjects.

The method described here is based upon the American National Standards Institute version. However, the fundamental principles, the decision base, and the decision points are identical to those at the international and local levels. As an example, the factors applied to the decision to form a standards committee are the same in ANSI as in ISO and as in ANSC X3.

The ANSI responsibilities in establishing a Standards Committee, watching its progress and acting upon its output are identical to those of the comparable ISO councils. The duties and responsibilities of an ANSI secretariat are identical to those of an ISO or IEC secretariat.

At the national and local levels the ingredients of a standards management board appear, but this function is not as visible in the international organizations. There the councils receive technical advice from special advisory committees reporting to the council, not from standing committees.

The Standards Committee Method consists of a secretariat and a standards committee embodying a balanced representation of consumers, producers, and general interests. Such a committee assures in advance that a consensus will be self-evident when the members have completed their assignment.

SECRETARIAT. One of the most important functions in the standardization process is that of the secretariat. It is also probably the least understood. The terms secretariat and sponsor are often used synonymously, but each has a distinct place in the standardization process.

A sponsor, as defined by ANSI, is "an organization or group which assumes responsibility for development and publication of its standard and subsequently submits it to the Institute for approval under any of the methods covered in these procedures." As an example, the American Society for Testing and Materials acts as a sponsor of ASTM standards when these are proposed as American National Standards. By this definition the Computer and Business Equipment Manufacturers Association (CBEMA) cannot be a sponsor, since the Association does not develop its own standards. (a)

A secretariat is "an organization or group authorized by a standards management board to assume the responsibilities defined in 4.5 [of the Procedures (Reference 2)] for an American National Standards Committee." A secretariat is always associated with a standards committee, a sponsor need not be. As an example, CBEMA was authorized by ANSI to act as the Secretariat for American National Standards Committees X3 and X4, while ANSI itself holds several ISO secretariats, among which is that for ISO/TC 97.

An important fact to remember is that where a standards committee exists all standards proposed in the technical area assigned to the committee are referred to that standards committee. For example, if an organization were to propose a standard that is within the scope of X3, the proposal would be transmitted to the Board of Standards Review of ANSI, then to the X3 Secretariat, which would handle the proposal through the X3 organization.

The secretariat plays an important role in the efficient functioning of the standards committee. A national secretariat must interact with its counterpart international secretariat and with all organizations which have an interest in its work.

The typical duties of a national secretariat as listed here may be equally applicable to international secretariats and parallel those established by other national bodies. The list below is based essentially on the duties defined by ANSI for a Secretariat of an American National Standards Committee.

    Organize the standards committee in cooperation with and
        under the operating procedures of the authorizing
        organization.
    Submit the list of committee members to the authorizing
        organization for approval.
    Determine that the representatives on the standards committee
        participate actively, and that all those having a substantial
        concern with and competence in standards within the
        committee's scope have the opportunity to participate.
    Submit proposed revisions of the scope of the standards
        committee for standards management board approval, when
        recommended by the standards committee.
    Appoint the officers of the standards committee or arrange
        for their election by the standards committee.
    Propose programs of work, together with proposed completion
        dates, and give direction and guidance to the standards
        committee.

(a) Reference 2, Foreword.

Assume responsibility for the administrative work, including
   secretarial services, arrangements for meetings, preparation
   and distribution of draft standards, letter ballots,
   minutes of meetings, etc.
Assume responsibility for processing letter ballots in
   accordance with the procedures of the organization.
Report results of voting according to the procedures of
   the organization.
Maintain standards within the scope of the standards
   committee in an up-to-date condition, and arrange for the
   publication and distribution of approved standards.
Keep the cognizant standards management board informed of
   committee activities by sending information copies
   of all material distributed to the standards committee.
Submit status reports of the work in progress to the cognizant
   standards management board, as required by established
   policy.

No organizational structure is imposed or required of the
secretariat by the approving agency as it is recognized that the
secretarial duties must be absorbed within the existing organizational
framework of the designated secretariat.

STANDARDS COMMITTEE ORGANIZATION. Standards committees are
organized with a chairmman, vice chairman and secretary as officers.
The chairman and vice chairman are appointed by the parent body for a
specified period of time; the chairman appoints a recording
secretary.

In addition to the normal duties of the chairmanship, typically a
chairman is held responsible to:

Act impartially, permitting all viewpoints relative to each
   specific issue to be presented.
Represent his committee to the parent body, to advisory and
   administrative bodies, and to other subcommittees and
   standing committees.
Acknowledge receipt of directives or recommendations from
   the parent body and indicate the intent of the committee
   to carry out such directives.
Set up short-term ad hoc groups to explore a particular
   subject in depth.
Maintain a balanced participation within the interests of
   the general topic.
Submit evidence that the users will be able to conform to,
   comply with, and benefit from general acceptance of proposed
   standards.
Ensure that a standards project is responsive to new
   technologies and that proposed standards have been
   designed to assure an orderly incorporation of new
   technologies where feasible.
Supervise preparation of expository remarks when necessary
   ensure that these are published as appendices to
   proposed standards.

In addition to acting for the chairman in his absence, the vice chairman is held responsible to:

Establish and maintain a document control system.
Prepare and maintain all necessary records of the committee.
Prepare, record and distribute notices, meeting agendas, and
   technical documents.
Prepare, distribute, record, and tally committee letter
   ballots.
Advise subcommittee chairmen of all actions taken by the
   standards committee or other organizations which affect
   the work of the subcommittees.
Review all documents to be published relative to their
   accuracy, clarity, apropriateness, and legal implications.
Publish a quarterly status report on the work of the
   committee and the work of other national and international
   organizations whose interests and output affect the work
   of the committee.
Issue a master plan containing schedules for completion,
   priorities, and relevant national and international
   interfaces.

The lists of typical duties of chairman and vice chairman are based essentially on the responsibilities defined for those offices in the ANSC X3 Manual for Objectives, Organization and Operating Procedures published in 1969. (b)

STANDARDIZATION PROCESS

The objective of the process which leads to approval of a standard is to confirm that consensus has been reached. Such a process must be carefully designed so as to provide:

Several review cycles of adequate length to permit response.
Balanced representation of those interested in the subject.
Approval bodies at each level of development.
A document flow which guarantees that all interested parties
   are informed.
Announcement to the public at the completion of selected
   milestones.

The process which is almost universally employed consists of three phases:

Planning – A standard is proposed as a candidate and a judgment is made as to its value to the industry. A committee is authorized to accomplish the work and a public announcement is issued to that effect.

Development – A committee is formed to develop the standard or standards. When work is completed, the proposed standard is transmitted to the approving body.

Approval – Approval through the hierarchical structure of the approving body and final publication.

(b) Reference 7, pages A48-A51.

To satisfy the commitment to consensus, each phase includes requirements for balanced representation, distribution of information and approvals. Entwined throughout this national effort are the liaison and joint participation required for the purpose of developing an international standard.

PLANNING PHASE. Any standardization organization may consider a request to establish a standards committee, when the need for a standard is perceived. Such requests are generally made in writing and include, but are not limited to the following:

Proposed scope of the committee.
Justification for proposal.
The functions which the committee will be expected to perform.
A list of organizations which are interested in and have
    competence in the proposed scope.
A proposed secretariat. (Not applicable where a
    secretariat exists.)

The request is forwarded to a technically-oriented advisory authority within the receiving organization. In ANSI this falls under the responsibility of the Executive Standards Council which assigns the subject to a Standards Management Board. The Executive Standards Council may take direct action if no such board exists in that particular field. In X3 this function is performed by the Standards Planning and Requirements Committee (SPARC).

In evaluating the request for initiation of a standards committee, the foremost consideration is that those concerned with the subject have an opportunity to express their views. For this purpose a general conference may be convened, a poll may be taken to determine interest in the subject, or a research study may be undertaken by an ad hoc study group.

The formation of a standards committee is based upon consideration of the following factors:

The need for such a committee.
Whether there is an acceptable, competent organization(s)
    already engaged in the work.
Whether there is unresolvable disagreement between two
    or more competent organizations which would hinder
    standardization in the area in question, if there were
    no national standards committee.
Whether there is sufficient indicated support from those
    substantially concerned and competent to ensure a
    reasonable chance of success.
Whether there is an acceptable, competent organization
    willing to serve as secretariat for the proposed
    committee. (c)

(c) Reference 2, page 10.

In ANSI a standards committee may be organized under the Institute's procedures only with the approval of the cognizant Standards Management Board, or the Executive Standards Council may act when no standards management board exists for that subject. In X3, SPARC (technical advisory) makes the recommendation, subject to final approval of X3.

When the decision has been made to form a standards committee, appropriate notices are issued to the press and interested parties are encouraged to participate. The completion of this phase results in the formation of a standards committee of the ISO/TC 97 class, the ANSC X3 class, or the X3 project class.

DEVELOPMENT PHASE. The administrative procedures during this phase are relatively uncomplicated, starting with the formation of the committee with a chairman, vice chairman and secretary as officers. These officers may be appointed by the secretariat or the secretariat may request election of them by the standards committee.

The first task of the new committee is to prepare a scope and program of work or work plan for the project. This must be approved by both of the relevant technical and the administrative bodies concerned.

Following the initial acceptance of the scope and program of work, the committee sets up its liaison with ISO and related organizations. During the life cycle of the standards development committee, the efficient and timely flow of information and the interactions with relevant technical committees are vital to the successful completion of the task.

The work of the standards committee culminates in the transmittal of a proposed standard to the cognizant authority. This is preceded by a ballot to verify that consensus has been reached. If only one subject was assigned to the standards committee, the committee ceases to hold meetings, but holds itself in readiness to process the comments generated during the approval phase of the proposed standard. It should be noted here that if any changes must be made in the technical content as a result of a ballot, the proposed standard is returned to the standards committee.

Figure 5 shows a typical hierarchical structure for the development of standards. The dotted lines at the right of the figure symbolize the technical relationships which may be formed (and most often are) to develop a standard. Many informal papers may pass between and among the organizations involved, but the formal papers such as country positions on issues, formal ballots, etc., are always transmitted by the national ISO member body, f.e., ANSI, to the secretariat of the ISO technical committee or subcommittee, whichever is appropriate. For this reason the secretariat function is shown as the link between the national and international environment.

APPROVAL PHASE. The approval phase begins with the receipt of the proposed standard at the secretariat with the request that it be processed as a national or international standard. The secretariat first determines that all the required documentation has been been submitted and then distributes the document for review prior to taking a formal ballot. If comments are received during the balloting process, these are forwarded to the development committee for resolution and the proposed standard may then be returned to the secretariat for review. The nature of the comments (substantive or editorial) determines whether the next step will be further changes or transmittal to the next higher level of authority.

The proposed standard now enters the stage where processing will be completed to make it a national or international standard. From this point on no decisions are made on the technical content; the total emphasis is on the evidence of consensus. When the existence of consensus has been validated, the life cycle of the development of a standard is complete. The proposed standard is then published in its entirety, or a notice is published indicating that the standard is available.

NATIONAL PARTICIPATION

An understanding of the operating procedures of various standards organizations provides one of the best avenues to an understanding of the total process of standardization. It is here that the reader can appreciate the checks and balances which constitute the development of a standard. It is here that the reader can appreciate and understand the slow, laborious, and frequently frustrating delays which, to an outsider, seem unwarranted but which are part of the process.

Basic to the process of standardization are the ballot procedures and member involvement. A ballot defines the development milestones and a vigorous member involvement is indispensable to achieving consensus.

Figure 6 shows the major ballot milestones and indicates the international activity which takes place concurrently with development efforts in the United States. Note that at any stage of development a standard may move forward as an international or as an ECMA standard before it moves forward in the United States. It should be noted that the project group and the technical committee are aided by advisory and administrative committees during the development process.

Figure 6 applies to both national and international standards activities as similar ballot milestones occur in both types of organizations.

VOTING RESPONSIBILITIES. All standards organizations establish requirements for membership and ballot responses in order to maintain the validity of the ballot process which is the technique used to determine that a consensus has been reached.

Most standards organizations base membership requirements on attendance at meetings and response to ballots. Each representative or alternate must exercise his voting privilege within a prescribed time limit. Failure to do so is considered lack of interest.

In ANSI any individual appointed to represent more than one member organization on a standards committee is entitled to cast a ballot for each. Any alternate member may return an executed ballot which is counted in the tally, if none is returned by the respective principal member. Proxy ballots are not permitted.

At the ISO level, the ballot is that of a member body representing a country; therefore, the question of the individual or his alternate does not apply.

BALLOTS AND BALLOT PROCEDURES. To understand the ballot procedure it is well to understand the milestones in the development of a standard. Basically the milestones which can be counted are the successful ballots executed at each level of the hierarchical committee structure. This is to say that only the ballot which receives enough affirmative votes to indicate consensus may be considered a milestone. Prior unsuccessful ballots do not constitute a milestone, neither does the act of transmitting a ballot to the next higher echelon of authority. The latter may be considered an event or a sub-milestone of the process.

Since much of the work is conducted in parallel, an ISO ballot may be conducted while a ballot on the same subject is underway in the United States. There is nothing to prevent the approval of a proposed standard as an International Standard or ECMA Standard prior to its approval as an American National Standard.

A letter ballot may be authorized by the standards committee chairman, the executive committee (if one exists), the secretariat, or a majority vote of those present in a standards committee meeting.

The final vote on a proposed standard or approved standard under revision must be a written ballot or some equally formal recorded method. The voting period for letter ballots varies with the organization but the elapsed time from submittal for the processing to the end of a ballot period usually exceeds the stated ballot period.

ISO Ballot Procedures. In ISO the ballot period for a Draft International Standard (DIS) is six months from the date of circulation of a proposed standard. In case of subsequent drafts, the period is ordinarily two months.

Both P (Participating) and O (Observer) ISO member bodies may vote and may respond in one of the following ways:

Approval of the draft as presented with editorial or
  other comments appended.
Disapproval of the draft for technical reasons appended.

P-members have an obligation to vote. A P-member may abstain if it has notified the technical committee secretariat and the Central Secretariat that, although it has an interest in the general scope of the technical committee, it has little interest or competence in one or more specific topics.

A Draft International Standard may be submitted for simultaneous voting by the P-members of a technical committee and by the Member Bodies under the Combined Voting Procedures.

In the case of the Combined Voting Procedure the Central Secretariat makes a two-part count of the ballots. First, the votes of P-members of the technical committee are counted and if a majority approves (with or without comments), the proposed draft is considered to have been adopted by the technical committee. A second count is taken of all votes (O- and P- members) and if 75 percent approve the draft, this constitutes approval by Member Bodies. If both counts are successful, the draft is said to be adopted by the majority of P-members and approved by 75 percent of the Member Bodies.

ANSI Voting Procedures. The voting period for letter ballots of a standards committee is six weeks from the date of issue. A follow-up letter requesting return of the ballot is sent to all those who do not respond within this time period. The results of the ballot remain confidential to the secretariat and the committee officers until the ballot period closes.

When the ballot period closes, the secretary of the standards committee forwards the ballot tally to the chairman of the standards committee who determines whether consideration of unresolved negative votes and comments shall be by correspondence or by a meeting of the standards committee or subcommittee involved.

If technical changes must be made to resolve negative votes, these changes must be submitted to the standards committee membership within the four-week period given for response. Those who voted in the affirmative must reaffirm their vote in the light of any substantive changes or may decide to cast a negative vote. If negative votes cannot be resolved, these must be reported to the membership of the standards committee, with the reasons given for the negative votes. Each voting member, on receipt of unresolved negative votes and comments from those balloted, must indicate whether or not this affects his original vote. The final result is recorded and reported to the secretariat and to the membership of the standards committee.

When this point is reached the secretariat may use its discretion as to whether the proposed standard is ready for submittal to the Institute. If at least two-thirds of the standards committee members voting have approved the standard, it is mandatory that the proposed standard together with the necessary exhibits be submitted to the Institute. If this is not done by the secretariat within one calendar month of the ballot closure, one or more of the members of the standards committee may offer the proposed standard for approval.

When the proposed standard reaches the Institute it is examined by the ANSI staff to determine that the documentation required has been forwarded and that evidence of consensus exists, just as was done when the proposed standard was submitted to the secretariat for a ballot by the standards committee.

The proposed standard is now submitted to the vote of the Board of Standards Review which requires an affirmative vote of not less than two-thirds of the full Board, taken by written ballot.

Approval of standards as American National Standards is delegated to the Board of Standards Review by the Board of Directors, but the Board of Directors retains the final authority on all matters pertaining to the approval process for standards as American National Standards.

DOCUMENTS. As the documents containing a proposed standard move through the standardization process, the changes in document names indicate the level of acceptance the standard has attained. The process involves some variation of the following general procedures:

Working Draft or Preliminary Draft - the first papers prepared and circulated. These are strictly committee documents and generally not the subject of a ballot. At ISO the secretariat usually decides when a Working Draft is sufficiently complete to be called a Draft Proposal.

Draft Proposal - proposals for a national or international standard submitted for a technical committee ballot. If successive documents are prepared they may be categorized as second, third Draft Proposal, etc.

Draft Standard - a Draft Proposal which has received the the approval of the technical committee for publication as a national or international standard.

Standard - a Draft Standard which has received all the necessary approvals for adoption as a national or international standard.

Although these are the milestone documents that reflect the content of the standard, other documents may supply additional functional support. Most important are working papers and position papers, which may take the form of proposed draft standards or draft standards.

As an example, if the United States wishes to respond to a proposed Draft International Standard, it may do so with a rewrite of the subject standard that represents the United States position. There have been instances where such submittals were used as the base for another version of a proposed standard.

In other instances the United States may submit a proposed American National Standard as a working paper at an international meeting. This is generally done when a ballot period in the United States is not complete and therefore no known position exists on the subject.

working papers on new technical areas or subjects may be submitted for consideration or for use as the base document for the subject. Although a working paper may be re-formatted as a standard, no action may be taken on it as a working paper. It must be elevated to the status of a base document in order to be considered as a proposed standard.

Position papers may be an individual member contribution to a technical committee, or a member body comment on an international topic.

Conventions. In the United Sates certain shorthand notations are used when referencing standards:

dpANS - draft proposed American National Standard
pANS - proposed American National Standard

The use of ANS as a prefix for American National Standards is discouraged.

MEMBER RESPONSIBILITIES. The development of a standard requires long hours of debate which culminate in the preparation of the document that is moved forward as a standard.

All standards committee work is accomplished by volunteers selected from the ranks of the member organizations. At the technical committee level, the individual must be technically competent in the subject and function as an independent "expert." In addition, the participant must become cognizant with all facets of the subject other than his own specific area of expertise in order to understand the viewpoint of other members. There is a great deal of committee work to be accomplished and each member must shoulder some of the responsibility. For example, many technical committees choose to use a rotating secretary arrangement in order to spread the responsibility among the members.

There are position papers to write, editing to be done, portions of the standard to be written, and administrative tasks unique to the committee activity must be completed.

A basic knowledge of Robert's Rules of Order is essential for participation in ANSI projects and a working knowledge of the standardization process is helpful for the member. A detailed knowledge of international protocol is essential so that a technical committee can function properly in the international environment.

A participant should plan to spend a fixed portion of his time on standards committee work as well as allocate time to interface with his own organization.

INTERNATIONAL PARTICIPATION

A technical committee must be responsive at all times to its international obligations. Papers on technical issues, contributions in response to resolutions passed at previous meetings, and comments or positions on new issues to be brought before the committee must be prepared and submitted according to international protocol. All documents must be received by the international secretariat four months prior to the scheduled date of a meeting of an international technical committee. International protocol requires that the technical committee submit papers through its national standards organization, which in turn forwards them to the secretariat of the international technical committee.

DOCUMENTS. A typical sequence of submissions of documents on magnetic tape disk packs would be:

From   National standards committee on disk packs
       (ANSC X3B7)
To   Secretariat of the national standards committee
       (CBEMA)
To   National standards organization
       (ANSI)
To   Secretariat of the international technical committee
       (DIN)

This transfer of documents along well-established channels takes place continuously as a proposed standard moves through the many stages between a working draft and an approved standard. At many stages during this process a proposed standard requires the attention of the full international technical committee which usually meets annually just for this purpose. All documents concerned with action items for the full committee must have arrived at the international secretariat four months prior to the scheduled date of a meeting.

On the basis of papers received, the secretariat of the international technical committee then prepares a preliminary agenda, the program of work, the resolutions made at the previous meeting, and the issues which have emerged during the year. Similar distribution is made to all member bodies of the technical committee and to its liaison groups.

The national technical committee must now prepare responses to all issues on the agenda. It is their responsibility to detect any corrections which should be made to the agenda, request changes in the agenda, or note omissions. If new items appear on the agenda, it is usually too late for the national committees to submit a response. However, technical committees are urged to prepare papers in response to new agenda items since there is a provision that late documents may be included for discussion or consideration if no Member Body present objects.

Continuing the above example, the full committee papers are then distributed:

From   Secretariat of the international technical committee
         (DIN)
To   Member Bodies,liaison groups, etc.
         (ANSI)
To   Secretariat of the national standards committee
         (CBEMA)
To   National standards committee
         (ANSC X3B7)

INTERNATIONAL REPRESENTATIVE.   In general, each national technical committee has an International Representative who is responsible for monitoring the relevant international, regional, and special interest standardization projects.   The International Representative plays an important role in coordinating all topics dealing with the technical committee work.   His is a continuing function -- if a ballot is overlooked, or a request for comments ignored, the national standards body may be considered unresponsive and subject to criticism.

The international work of a technical committee may involve such topics as:

Commenting on the relevant portions of standards
   proposed by another technical committee.

Preparing a national position on an administrative subject.

Casting a ballot on a proposed international standard for
   the member body of the international technical committee.

Preparing a recommendation for a ballot response to a
   proposed international standard for the national
   national member body.

Preparing national positions on each of the agenda items of
   the international technical committee meetings.

The International Representative is responsible for keeping the members of the technical committee informed, scheduling the preparation of national positions so as to meet international deadlines, preparing lists of relevant document (including national substantiating documents), and similar matters.

TECHNICAL COMMITTEE RESPONSIBILITIES.   Each member of the technical committee must be familiar with the international documents and the issues to be discussed at a forthcoming international meeting. Ideally, each member of the technical committee should be equally informed in order to accept the role of delegate. Each topic on the agenda requires a member body position in the form of Instructions to the Delegates which are used as guidance at the international meeting.

The technical committee usually works as a committee of the whole to prepare these national positions. In some instances, an ad hoc group studies the subject and prepares a recommendation which is voted upon by the committee as a whole.

These instructions constitute the national position and are considered binding upon the delegation.

The Delegation. Several weeks prior to an international meeting, each member country choses a delegation which has as its primary task the support of that nation's position on the technical and administrative issues to come before the meeting. This delegation may consist of one or more members, depending upon the number of issues to be discussed, the variety of topics, and the number of specialists required.

The International Representative may, but need not, serve as the Chief Delegate. When the delegation has been selected, the names are submitted to the national standards body for certification and transmittal to the international secretariat. The primary responsibility of the delegation is to represent the national point of view, to understand the viewpoint of other nations, and, if possible, to convince others of the validity of the nation's own viewpoint. In some cases the delegates may be able to propose or effect a compromise solution.

From the practical standpoint, collecting the documents upon which the discussions will take place must be accomplished with great care, and the contents of all documents must be thoroughly understood. Most agendas carry a note to the effect that only those familiar with the contents of the documents should attend. Domestic documents which deal with issues but are not documents listed on the agenda should also be included in the delegation's documents.

International Meetings. International meetings may be held any place in the world, the one stipulation is that there must be a national organization to act as host for the meeting. Among the duties of the host, is that of providing an interpreter for the official international languages of French, English, and Russian. Normally, all discussions take place in French and English, i.e., if a statement is made in French, it is translated into English and vice versa. If Russian is used, an interpreter is provided to translate to either French or English. To aid the interpreter, speakers pause for translation after every two or three sentences. Although this appears cumbersome to Americans, attentive participants and a skillful chairman can easily overcome potential awkward circumstances.

International committee and subcommittee meetings are more formal than their counterparts in the United States. All country member comments are made by the Chief Delegate. Members of the delegation may serve on ad hoc committees as individuals, but may not speak in plenary sessions unless officially recognized to do so. The Chief Delegate presents the views of the delegation unless the Chief Delegate requests the meeting chairman to recognize a member of his delegation as the spokesman on a specific subject.

International meetings generally consist of an opening plenary session, ad hoc (working group) meetings, and a closing plenary session. There may also be brief international plenary sessions to report on progress, re-assign working groups, etc.

During the opening ceremonies a chairman is chosen for the session in the event that there is no permanent chairman. Greetings are extended from the host organization, and unofficial announcements are made.

After the preliminaries are completed the first task is to appoint an ad hoc Drafting Committee, which aids the Secretariat in the preparation of the brief minutes of each day's session and the editing of the resolutions adopted. Resolutions are normally limited to matters directly concerned with the progress of the work or the approval of documents. All resolutions adopted during the meeting are presented for approval by the plenary session before the close of the meeting.

The open plenary session consists of a brief discussion of the items on the agenda. Emphasis is directed toward the work required to effect definitive action. This could mean convening a working group to edit a document before balloting, and another to review negative ballots and prepare responses. It might be a working group to study a technical area and decide upon a course of action. When this is complete, the delegates are assigned to the ad hoc working groups and instructed to reconvene for the closing (or intermediate) plenary sessions.

At the closing plenary session the working groups present their findings, normally expressed as resolutions. As mentioned previously, all resolutions made at the meeting are presented and voted upon during this session. Before adjourning, the committee may prepare a statement of results which can serve as a basis for press releases prepared by the Central Secretariat.

After the meeting the international secretariat prepares a complete draft report of the meeting, including the complete text of the resolutions. This is distributed to the participants within six weeks for approval within a specified time. Participants not responding within this time are considered to be in agreement with the report.

CHAPTER 4
INTERNATIONAL STANDARDIZATION

International standards are becoming an increasingly significant factor in world trade. Multinational companies find that differing national technical requirements have joined trade tariffs as significant factors in world-wide marketing. Different national regulations and standards may require a company to produce costly and unnecessary variants of a product. Development of international standards helps resolve these technical barriers to trade.

International standards are assuming a new role in world trade where the absence of approved standards may lead to conflicting regulations in different countries. It is neither desirable nor intended that standards should be applied with the force of law. However, the policy of legislating by "reference to standards" is becoming more and more frequent as technology develops and trade expands. Both the ISO and IEC Councils have adopted a code of principles concerning appropriate action required on the part of ISO, IEC, and various governmental bodies for the effective implementation of the "reference to standards" technique. The technique requires that legislation and regulations be drafted in the form of general requirements which contain references to a standard or a group of standards which, in turn, provide more detailed explanations of the general requirements, as well as illustrations of the means of meeting the requirements. (a)

Development of standards in the modern technological environment requires a complex maze of organizations, areas of interest, operational procedures, and treaty agreements. Best known to the computing community are the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC), and the International Telegraph and Telephone Consultative Committee (CCITT) of the International Telecommunication Union (ITU).

If all standards originated at the national level and moved in an orderly fashion to the international level in one organizational structure, few complexities would exist. However, standards originate in many areas and from many organizations and thus involve liaison with many other organizations.

(a) Reference 34.

As an example, working together to develop data communications standards are:

International Organization for Standardization
    TC 97 Computers and Information Processing
        /SC6 Subcommittee on Data Communications
American National Standards Institute
    ANSC X3 Computers and Information Processing
        X3S3 Subcommittee on Data Communications
Electronic Industries Association
    EIA/TR29 Facsimile Systems and Equipment
    EIA/TR30 Data Transmission Systems and Equipment
    EIA/TR37 Communications Interfaces
International Telegraph and Telephone Consultative
    Committee
    Subcommittees: Data Transmission; New Data Networks;
      Alphabets
U.S. State Department
U.S. Federal Communications Commission
Federal Telecommunications Standards Committee
Office of Telecommunications Policy
International Civil Aviation Organization

Participating in the deliberations of these organizations are representatives of the telecommunications administrative bodies, the private telecommunications enterprises of each country, the standards bodies of each country, the Common Market countries, and many others.

It should be noted that with the increased emphasis on teleprocessing, two disciplines are involved, computers and data communication. Although the procedures for developing standards are well established in both technologies, the need to cooperate has required new procedures and liaison arrangements. Since the common objective is to establish standards, both technologies have worked together to establish the formal arrangements needed for coordination and review of standards.

International standardization provides the solution to the problems of diverse national standards, the protection of consumer interests, and the elimination of trade barriers.

INTERNATIONAL STANDARDS ORGANIZATIONS

THE INTERNATIONAL ELECTROTECHNICAL COMMISSION
(IEC)

HISTORY

The International Electrotechnical Commission was formed in 1906; this makes it one of the oldest international organizations of concern to this study.

A number of international congresses on the applications of electricity had been held around the turn of the century, thus the need to set up a permanent organization to carry out international standardization was evident then.

At the International Electrical Congress in 1904 in St. Louis a resolution was passed by the Chamber of Government delegates:

That steps should be taken to secure the cooperation
of the technical Societies of the world by
the appointment of a representative Commission to
consider the question of the standardization of the
nomenclature and Ratings of Electrical Apparatus
and Machinery.(b)

As a result of this resolution the International Electrotechnical Commission was formed in 1906.

In 1947, the IEC became affiliated with the International Organization for Standardization (ISO) as the latter's Electrical Division, but retained its technical and financial automony.

OBJECTIVES

The objective of the Commission is "to facilitate the coordination and unification of national electrotechnical standards and to coordinate the activities of other international organizations in this field." The IEC works through the National Committees of each country. (c)

The work of IEC can be divided into two categories:

That aimed at improving understanding between electrical
engineers of all countries by drawing up common means
of expression: nomenclature, agreement on quantities
and units, their symbols and abbreviations, and graphical
symbols for diagrams.

(b) Reference 48, page 64.
(c) Reference 61, page 153.

Standardization of electrical equipment proper, involving
the study of problems of the electrical properties of
materials used in electrical equipment, standardization
of guarantees to be given for certain equipment as to
the characteristics, methods of test, quality, safety,
and dimensions controlling interchangeability of
machines and electrical equipment. (d)

MEMBERSHIP

The members of the Commission are the national committees of each
country in the same way as the national standards bodies are members
of the International Organization for Standardization.

The members are required to be as representative as possible of
all electrical interests in the country concerned: manufacturers,
users, governmental authorities, teaching and professional bodies.

Any self-governing country desiring to participate in the work of
IEC may form a committee for its own country and apply for membership
on the Commission. When it has been accepted as a member, the
committee is known as the National Committee. The National Committees
of the IEC are composed of representatives of the various technical
and scientific organizations which deal with questions of electrical
standardization at the national level. Most of the National
Committees are recognized and supported by their respective
governments. There is only one National Committee of the IEC for each
country.

The current list of IEC National Committees includes:

Argentina	Italy
Australia	Japan
Austria	Korea (People's Republic of)
Belgium	Korea (Republic)
Brazil	Netherlands
Bulgaria	Norway
Canada	Pakistan
China (People's Republic of)	Poland
Cuba	Portugal
Czechoslovakia	Romania
Denmark	South Africa
Finland	Spain
France	Sweden
Germany (East and West)	Switzerland
Greece	Turkey
Hungary	U.S.S.R.
India	United Arab Republic
Indonesia	United Kingdom
Iran	United States
Ireland	Venezuela
Israel	Yugoslavia

(d) Reference 27, page 5.

ORGANIZATION

The operations of the IEC are directed by a Council which meets annually. The Council consists of the President of the Commission, the Past Presidents (without vote), and the Presidents of the National Committees. The Treasurer and General Secretary of the Commission are ex officio members without vote.

The Committee of Action is composed of the Presidents of nine National Committees who are elected by the Council for a six year term. The President of the Commission is also a member, as are the Past Presidents, though the latter have no vote. The Treasurer and General Secretary of the Commission are ex officio members without vote. The Committee of Action deals with any problem submitted to it by the Council and acts to expedite the technical work of the Commission. It meets at least once a year.

The IEC also has advisory committees to the Committee of Action for special problems that cannot be handled within the technical committee structure. At present there are two advisory committees in IEC: the Advisory Committee on Electronics and Telecommunications and the Advisory Committee on Safety. The President of the Commission serves as Chairman of both. The other members of the Advisory Committee on Electronics and Telecommunications (ACET) are the Chairman and one representative of the Secretariat of all technical committees related to electronics or telecommunications. At present, there are seventeen such technical committees.

The technical work of the Commission is accomplished by over 78 technical committees which, in turn, form subcommittees to deal with individual and well-defined areas in the electrotechnical field. The scope of a technical committee is fixed at the time of its formation and must be approved by the Committee of Action.

All National Committees have the right to send delegations to the meetings of all technical committees and subcommittees and to receive the corresponding working documents. The technical committees and subcommittees can set up temporary working groups with a restricted membership to deal with a special task.

The United States National Committee holds technical secretariats for close to thirty technical committees and subcommittees.

RELATION TO OTHER ORGANIZATIONS

IEC has established close relations with bodies working in broadly similar fields. Some of these are inter-governmental, notably the regional organizations and other organs of the United Nations Economic and Social Council.

The individual National Committees maintain special liaison with the national standards bodies in each country through the technical committees. As an example, the U.S. National Committee has been affiliated with the American National Standards Institute and its predecessor organizations since 1931. The U.S. National Committee represents the United States in the IEC. Delegations to IEC technical committee meetings are authorized and certified by the American National Standards Institute.

FINANCE

The work of the Commission is financed by contributions from the National Committees and the sale of publications. The amount of the National Committee contributions is fixed by the Council.

TECHNICAL WORK

The work of the technical committees is restricted to electrotechnical standardization activities.

As of 1974 the following technical committees were engaged in activities of interest to the EDP industry.

TC 3 Graphical Symbols
TC 29 Electro-Acoustics
TC 39 Electronic Tubes
TC 40 Capacitors and Resistors for Electronic Equipment
TC 46 Cables, Wires and Waveguides for Telecommunication
        Equipment
TC 47 Semiconductor Devices and Integrated Circuits
TC 48 Electromechanical Components for Electronic Equipment
TC 56 Reliability and Maintainability
TC 51 Magnetic Components and Ferrite Materials
TC 52 Printed Circuits
TC 58 Methods of Measurement of Electrical Properties of
        Metallic Materials
TC 65 Industrial-Process Measurement and Control
TC 66 Electronic Measuring Equipment
TC 74 Safety of Electronic Data Processing Equipment and
        Office Machines
TC 75 Classification of Environmental Conditions
        (for Electrical and Electronic Equipment)
      and Electronic Equipment)
TC 77 Electromagnetic Compatibility between Electrical
        Equipment including Networks (e)

(e) Reference 26.

INTERNATIONAL FEDERATION FOR INFFORMATION PROCESSING
(IFIP)

NOTE: Although IFIP is not a standards development body it has been responsible for two studies which formed the base for international standards on ALGOL and on computer terminology.

HISTORY

The suggestion for the Federation was born during the preparation for the International Conference on Information Processing which was organized by UNESCO and held in Paris in June 1959.

The meeting of consultants convened by UNESCO for preparing the first International Conference on Information Processing provided an opportunity to discuss the aims and organization of the Federation and to prepare its statutes. These statutes were approved in January, 1960 by representatives of information processing societies from thirteen countries.

A Provisional Bureau was created with I.L. Auerbach of the USA as President and the statutes became effective in January 1960, after ratification by twelve national organizations.

For a short period a UNESCO staff member was responsible for the Secretariat of the Federation within the framework of the activities of the Provisional International Computation Centre in Rome. Some small financial assistance was provided by UNESCO.

OBJECTIVES

The International Federation for Information Processing is an international organization dedicated to all facets of the information processing sciences. These include theory, mathematics, equipment, and application techniques for the collection, transmission, computation, translation, storage, retrieval, reduction and display of information, usually by automatic means.

As stated in its statutes, the aims of IFIP are three-fold:

Sponsor international conferences and symposia on
    information processing, including mathematical,
    engineering, and business aspects.
Establish international committees to undertake
    special tasks falling within the spheres of
    action of its national member societies.
Advance the interests of member societies through
    international cooperation in the field of information
    processing. (f)

(f) Reference 62, page 9.

One of the unwritten goals of IFIP is to expose the people of the world (those who will be affected by information technology as well as those directly associated with it) to some idea of the progress that can be made through the intelligent use of the electronic digital computer.

MEMBERSHIP

IFIP is a multi-national federation of technical societies, or groups of societies, concerned with information processing. The American Federation of Information Processing Societies (AFIPS) is the member that represents the United States. The Association for Computing Machinery, the IEEE and other professional organizations are members of AFIPS.

At present there are 30 countries represented by technical societies or groups of societies that hold membership in IFIP. Among these are:

Argentina	Israel
Australia	Italy
Austria	Japan
Belgium	Mexico
Brazil	Netherlands
Bulgaria	Norway
Canada	Poland
Chile	South Africa
Cuba	Spain
Czechoslovakia	Sweden
Denmark	Switzerland
Finland	United Kingdom
France	United States
German Federal Republic	U.S.S.R.
Hungary	Yugoslavia

ORGANIZATION

The organization is headed by a council composed of an Executive Body and Trustees. The Executive Body consists of a President, a Past President, three Vice Presidents, a Secretary and Treasurer. There are six trustees elected to three-year terms on a staggered schedule.

The General Assembly meets annually to administer the affairs of the Federation, to review and approve progress and plans, and to provide a coordinating point to the Federation's activities. One country, one vote is the rule in the General Assembly, so that all constituent national groups have equal rights.

RELATION TO OTHER ORGANIZATIONS

The International Federation for Information Processing holds a unique position in the computing field. Unlike the ISO which is dedicated to the development of standards, IFIP does not develop standards, but concentrates on promoting better communications and understanding among scientists of all nations regarding the role of information processing in advancing scientific and technological progress.

IFIP'S activities in fulfillment of its perceived responsibilities are carried on at three levels:

(1) the triennial IFIP Congress patterned somewhat after the first UNESCO Conference on Information Processing;

(2) other international conferences organized and sponsored alone or jointly with international organizations such as the International Federation of Automatic Control and the International Federation for Dcoumentation;

(3) the work of the IFIP Applied Information Processing Group (IAG) and the IFIP Technical Committees, each of which has a defined sphere of activity.

FINANCE

IFIP is a nonprofit organization supported by membership contributions, proceeds from symposia, and royalties from sale of publications.

TECHNICAL COMMITTEES

IFIP has two types of organizational structures established for carrying out its technical program--the Special Interest Group and the Technical Committee. As noted earlier, development of standards is not the primary function of the organization. However, IFIP'S technical program has been a significant factor in the development of several International Standards in the field of information processing.

Currently, IFIP has only one Special Interest Group, the IFIP Applied Information Processing Group (IAG). This is a new name (adopted at the VIIIth General Conference of IAG of June 1975) for the former IFIP Administrative Data Processing Group. The VIIIth General Conference decided further to add a subtitle to the new name of the Group, i.e., the IFIP Group for Applied Information Processing in Management and Administration, and to retain the "old" abbreviation of IAG for the new name. The membership of IAG consists of Partners that are national institutions of all countries concerned with the use of computers in public and business administration. One national organization in each country is designated as the member to act on behalf of that country's Partners of the Group. The defined scope of Group activity is "to coordinate research, education and the exchange of experience in the field of information processing as applied to organizational, economic, and administrative problems in public and business administration." (g)

(g) Reference 25, page 12.

IFIP has eight Technical Committees that are active in various aspects of information processing. These include:

TC 2 - Programming
TC 3 - Education
TC 4 - Information Processing in Medicine
TC 5 - Computer Applications in Technology
TC 6 - Data Communication
TC 7 - Optimization
TC 8 - Information Systems
TC 9 - Relationship Between Computers and Society

TC 1 - Terminology was dissolved at the 1974 General Assembly of IFIP which was held in Stockholm. TC 1 was established in May 1961 and then incorporated into the Joint Terminology Committee of IFIP and the International Computation Centre. In a report of September 1961 to IFIP Council the Joint Terminology Committee stated that "the eventual objective of standardizing terminology and symbols in the field of computers and data processing must be achieved through ISO and IEC." (h) (i)

Accordingly, working Group A of ISO Technical Committee 97 was invited to participate in the meetings and work of the Joint Terminology Committee. Shortly afterwards, working Group A became Subcommittee 1 (Vocabulary) of ISO/TC 97 where it has functioned ever since as the responsible international body in terminology for computers and information processing. Meanwhile, the Joint Terminology Committee published the IFIP-ICC Vocabulary of Information Processing in 1966 and devoted attention to translating the Vocabulary into other languages. In 1971 when a revision appeared to be in order, the 1966 document was published as a "new venture" rather than as a revision, and was entitled the IFIP Guide to Concepts and Terms in Data Processing. ISO/TC 97/SC 1 has continued to consult both versions of the IFIP work, and has augmented these source documents with contributions from other sources as required to produce ISO terminology standards.

(h) Reference 45, page 2; (i) Reference 53, page 6.

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION
(ISO)

HISTORY

Though electrical engineers were among the first to realize the importance of international standardization, other segments of the engineering community were becoming increasingly more aware of the need for international cooperation in other areas of standardization. In 1926 about 20 of the world's principal standards bodies organized a meeting in New York and decided to band together as the International Federation of the National Standardizing Associations (ISA). ISA's early activity emphasized mechanical engineering, but addressed itself also to a wide range of other subjects such as paper sizes, cinematography, and textiles.

As the threat of war increased in the late 1930's, several countries withdrew their membership, so that by 1942 ISA ceased to exist. Its successor, comprising the national organizations of 18 allied countries, was formed in 1944 and functioned temporarily as the United Nations Standards Coordinating Committee.

When the war ended, 25 countries sent 64 delegates to a meeting in London on October 14, 1946 to consider the establishment of a new international organization "whose object shall be to facilitate the international coordination and unification of industrial standards." The discussions of these delegates resulted in the establishment of ISO whose provisional General Assembly met, also in London, on October 24, 1946. (1)

The ISO Constitution and Rules of Procedure were unanimously adopted by the General Assembly. It was decided that ISO should begin to function on an official basis as soon as the constitution had been ratified by 15 national standardization bodies. The 15th ratification--from Denmark--was received by the provisional Central Secretariat on February 23, 1947.

The Constitution and Rules of Procedure were subsequently ratified by all the national standardization bodies which had participated in the London conference. These organizations were automatically admitted as member bodies of ISO and later other national standardization bodies applied for membership.

The first General Assembly met in Paris in 1949. Subsequent General Assemblies were held in New York (1952), Stockholm (1955), Harrogate, U.K., (1958), Helsinki (1961), New Delhi (1964), Moscow (1967), Ankara (1970), Washington, D.C. (1973), and Geneva (September 1976).

(1) Reference 48, page 65.

OBJECTIVES

The object of ISO is to promote the development of standards in the world with a view to facilitating the international exchange of goods and services, and to developing cooperation in the sphere of intellectual, scientific, technological and economic activity. (k)

As a means to these ends ISO may inter alia:

Take action to facilitate coordination and unification of national standards and issue necessary recommendations to Member Bodies for this purpose.

Set up International Standards.

Encourage and facilitate, as occasion demands, the development of new standards having common requirements for use in the national or international sphere.

Arrange for exchange of information regarding work of its Member Bodies and of its Technical Committees.

Cooperate with other International Organizations interested in related matters, particularly by undertaking at their request studies relating to standardization projects. (k)

MEMBERSHIP

The ISO membership is composed of Member Bodies most representative of standardization organizations in their respective countries. Only one such organization in each country may be admitted to membership in the ISO.

The admittance of any new Member Body requires the unanimous vote of the ISO Council, which determines whether the organization applying for membership may be considered to be the most representative of its country's standardization matters, also whether the country is already represented by another organization. Provision is made in the Rules of Procedure for an appeal to all ISO Member Bodies if a unanimous vote for admittance is not obtained.

In 1964, the Council decided to create a new category of membership, that of Correspondent Member. Such a member is normally an organization in a developing country which does not as yet have a national standards body. Correspondent Members do not participate in ISO activities and have no voting privileges. However, they are kept fully informed about ongoing technical work. A Correspondent Member usually becomes a member body after a few years. Nearly all of the current Correspondent Members are governmental organizations.

As of December 1975 ISO membership comprised 63 Member Bodies and 16 Correspondent Members. (l)

(k) Reference 28, Articles 2.1 and 2.2
(l) Reference 32.

ORGANIZATION

The Principal Officers of ISO are the President, the Vice President, the Treasurer, and the Secretary-General.

The General Assembly, which determines the policy of the organization, consists of delegates nominated by the Member Bodies and meets at least once every three years.

The Council is composed of the President and the representatives of fourteen Member Bodies elected by the membership for a three-year term. It meets once a year to fulfill its responsibility for the operation and administration of the organization.

The President is elected either in the General Assembly or by letter ballot of all Member Bodies. He presides over both the General Assembly and the Council.

The Vice President is elected by the Council from its own members and may retain his seat on the Council in a personal capacity when the term of office of his own Member Body expires. The Treasurer may serve on the Council as the representative of his Member Body if the Member Body of the Treasurer's country is a member of the Council. Otherwise, he serves in a personal capacity but is entitled to vote only on matters affecting the financial affairs of the organization.

The Council is also served by six special advisory committees, whose advisory responsibilities are more or less self-evident from their names. The committees include the Planning Committee, the Standing Committee for the Study of Principles of Standardization, the Committee on Certification, the Development Committee, the Standing Committee for the Study of Scientific and Technical Information on Standardization, and the International Standards Steering Committee for Consumer Affairs.

The Executive Committee (EXCO) is composed of the Vice President and from three to seven other representatives of Member Bodies. EXCO assists the Council with regard to matters of administration, organization and finance which may arise in the interval between Council meetings, and is empowered to act where necessary within the framework of previous policy decisions of Council. The Treasurer participates in the EXCO meetings whenever financial matters are discussed.

The Central Secretariat is directed by the Secretary-General who is appointed by the Council. He is the chief administrative officer who conducts the affairs of the organization under authority of and in accordance with rules defined by the Council. Under the direction of the Secretary-General, the Central Secretariat coordinates the work carried out by the ISO technical committees, convenes all meetings of technical committees and subcommittees, institutes the voting procedures, circulates documents to Member Bodies, and publishes the documents accepted by the Council as International Standards. The Central Secretariat keeps the Member Bodies and Council informed of the work of the technical committees and the technical committees informed of work undertaken by other international organizations in related fields. It is the task of the Central Secretariat to ensure full consultation of the membership on the work of the technical committees which are responsible for the development of international standards. Organizationally, technical committees report annually to the Council through their Secretariats. The work of the technical committees is coordinated by the Central Secretariat under the direction of the Secretary-General. Currently there are over 150 technical committees. Counting all technical committees, their subcommittees, and working groups, there are over 1250 technical working bodies. In order to form a technical committee, there should be at least five Member Bodies willing to take an active part in the work. The scope of each technical committee is strictly defined and can only be altered with the approval of the ISO Council. Within this scope, each technical committee determines its own program of work.

RELATION TO OTHER ORGANIZATIONS

ISO, which is an international non-governmental organization, has been granted consultative status with the United Nations and many of its agencies. In particular, ISO enjoys Category I consultative status with the Economic and Social Council (ECOSOC) granted to "organizations which are concerned with most of the activities" of ECOSOC and "have marked and sustained contributions to make to the achievement of the objectives of the United Nations." This upgrades the former (Category II) status which ISO had maintained since 1947.

At a meeting in April 1975 the United Nations Conference on Trade and Development (UNCTAD) upgraded ISO's consultative status from "special" to "general," i.e., the highest available. In addition to its consultative relations with ECOSOC and UNCTAD, ISO has consultative status with the Food and Agriculture Organization (FAO), the International Atomic Energy Agency (IAEA), the International Civil Aviation Organization (ICAO), the International Labor Organization (ILO), the Intergovernmental Maritime Consultative Organization (IMCO), the International Telecommunications Union (ITU), the United Nations Environmental Program (UNEP), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the United Nations Industrial Development Organization (UNIDO), the Universal Postal Union (UPU), the World Health Organization (WHO), and the World Meteorological Organization (WMO). The ISO also maintains working relations with the regional economic commissions of the United Nations, and with the International Monetary Fund (IMF), the United Nations Institute for Training and Research (UNITAR) and the United Nations International Childrens Emergency Fund (UNICEF).

through these reciprocal relationships, a total of more than 300 international organizations can contribute to the preparation and implementation of ISO International Standards and can participate in ISO standardization work through liaison with the technical committees of interest to them.

The ISO technical committees cover an extremely wide field, but all questions of an electrotechnical character are dealt with by the International Electrotechnical Commission which was affiliated with ISO in 1947. This Commission, while preserving its autonomy, functions as the Electrical Division of ISO. The affiliation between the two organizations is well coordinated. Member bodies of the ISO Council are also member bodies of the IEC Council and each organization is officially represented at the Council meetings of the other. The policy of both organizations is to cooperate effectively and without duplication in all matters of common interest.

The ISO/IEC Joint Committee for Coordination and Consultation which reports to both organizations, was established jointly by ISO and IEC as an authority for the resolution of questions of overlap and duplication that cannot be settled at lower levels.

FINANCE

ISO is maintained by dues and contributions of its members, the amount of which varies according to the circumstances of the country concerned. Additional revenue is gained from the sale of International Standards and other publications.

TECHNICAL COMMITTEES

The technical committees are composed of member bodies wishing to take part in the work assigned to each committee. Each technical committee has a secretariat which is a member body appointed by the Council. The Constitution enjoins the technical committee secretariat to strict neutrality and to careful differentiation between its interests as a member body and its capacity as secretariat. The secretariat is responsible for the satisfactory conduct of the work of the technical committee and reports annually to the Council on the results achieved.

A typical ISO technical committee meeting usually draws representatives from many member nations. In the United States, the American National Standards Institute is the recognized member body. In France, it is the Association Francaise de Normalisation; in the United Kingdom, it is the British Standards Institution. Figure 8 presents a list of current (1975) Member Bodies of ISO.

It should be noted that ISO is involved in many standardization activities and only one of its technical committees is concerned with EDP and that is TC 97, Computers and Information Processing. Other ISO Technical Committees whose work (or part thereof) is related to that of TC 97 include TC 46, Documentation, TC 68, Banking Procedures, and TC 95, Office Machines. The USA holds the Secretariats for TC 97 and TC 68, Germany for TC 46, and Italy for TC 95.

MEMBERSHIP. Each Member Body interested in a particular subject may be represented on the relevant technical committee. Member Bodies who decide to take an active part in the work of a technical committee are known as Participating (P) Members of that committee. They have the right to participate in meetings and to vote. Member Bodies who wish only to be kept informed of the work of a technical committee are called Observer (O) Members of that committee. They have the right to attend meetings as observers, but not to vote. Correspondent Member Bodies may register as (O) Members of technical committees.

Chairmen of technical committees and subcommittees are nominated by the committee membership for a period of three years or more upon request. The Council then appoints the technical committee chairman and the technical committees appoint the chairmen of their respective subcommittees.

SUBCOMMITTEES. This is the level at which most of the technical decisions are made and is also the level at which much of the technical liaison takes place. Subcommittees are charged with the study of one or several items within the program of work of the parent technical committee. For example, TC 97 is charged with the responsibility for standards for computers and information processing. Each of its subcommittees is responsible for a portion of that standardization effort.

A subcommittee should consist of at least five (P) Member Bodies. One of these Member Bodies is appointed by the parent technical committee to act as the secretariat. A Member Body may have (O) membership in a technical committee and (P) membership in a subcommittee.

WORKING GROUPS. Technical committees and subcommittees may set up working groups composed of a restricted number of individuals to deal with particular points or problems which might arise in the course of the work of a committee. There are two kinds of working groups:

Preparatory Working Groups that remain in
existence for as long as necessary to deal with a
particular problem. This type of Working Group may
function between meetings of the parent committee
but it is automatically disbanded upon completion
of its assignment.

Ad Hoc Working Groups may be formed to deal with a
matter on which it is required to report to the
parent committee at the same meeting as that at which the
working group is formed. These groups are
disbanded at the end of the meeting at which they
were formed.

PROCEDURES. Meetings of technical committees and subcommittees are convened by the Central Secretariat which collaborates with the ISO/TC Secretariats in setting the date and venue. Draft agendas and meeting notices are circulated at least three months prior to a technical committee or subcommittee meeting. Distribution of working documents for meetings of each technical committee, subcommittee, or working group, is the responsibility of the respective secretariats. In the case of working group meetings, notices may be sent out by the working group secretariat less than three months in advance provided that all members of the working group approve.

INTERNAL LIAISON. Responsibility for maintenance of liaison among committees with common interests is assigned to the secretariats of the technical committees involved. The technical committees involved may designate observers to follow the work of other technical committees, or of one or more of their own subcommittees.

EVOLUTION OF AN INTERNATIONAL STANDARD. Prior to July 1971, standards proposed and approved by ISO were known as ISO Recommendations. Although the ISO charter included provision for approval and publication as ISO Standards, the procedure was not invoked until mid-1971 when a decision was made to publish all ISO Draft Recommendations as Draft International Standards and subsequently as International Standards. At the same time, a new category of document to be known as a Technical Report was introduced. (m)

The seven successive stages in the evolution of an international standard may best be described in the terms used in the ISO Directives.

Stage 1: A subject or item has been included in ISO's program of work via a working draft, or initial document circulated by the secretariat of a technical committee, subcommittee, or working group, to its members with a view to the subsequent presentation of a draft proposal. The technical committee decides when a working draft is ready for the draft proposal stage.

Stage 2: A draft proposal is under study. A draft proposal is a proposal for an International Standard registered at the Central Secretariat and submitted to members of a technical committee or subcommittee for consideration.

Stage 3: The Central Secretariat has registered the Draft Proposal as a Draft International Standard. A Draft International Standard is a Draft Proposal which, having received substantial support from the (P) Members of a technical committee for publication as an International Standard, has been registered at the Central Secretariat for circulation to Member Bodies for approval.

Stage 4: The Draft International Standard has been approved by the Member Bodies voting.

Stage 5: The Draft International Standard has been returned to the Central Secretariat for submission to Council.

(m) Reference 29, Section 6.

Stage 6: The Draft International Standard has been accepted by the Council as an International Standard.

Stage 7: The International Standard has been published. An International Standard is a draft International Standard which has been adopted by a majority of the (P) members of a technical committee and has been approved by at least 75 percent of ISO member bodies voting and accepted by Council for publication as an International Standard.

The Technical Report is an exception to the principal activity of ISO Technical Committees, namely, the drafting of International Standards. Preparation of technical reports may be considered only when the necessary majority or substantial support cannot be obtained for submission of a Draft Proposal for registration as a Draft International Standard, or for approval of a Draft International Standard. When this happens the technical committee must decide whether to request publication in the form of a Technical Report of the draft as it stands (together with reasons for failure to obtain approval), or to request publication of an explanatory document, which is called a Technical Report. The first alternative would be appropriate if there was a possibility of approval at some future time which depended on factors beyond control of ISO Member Bodies, as for example, national legislation or regulation. The second alternative would be appropriate if the technical committee wanted to proceed with other aspects of its technical work. In this case, the committee would issue a Technical Report on the points of agreement, together with reasons for the failure to reach agreement on other points. Technical Reports are subject to review not later than three years after publication. The purpose of the review is to try to reach the agreement necessary for publication of a Technical Report as an International Standard.

ISO TECHNICAL COMMITTEE 97
(COMPUTERS AND INFORMATION PROCESSING)

At a Round Table Conference on international standardization which was organized by ISO and IEC in May 1961, the need for a technical committee for computers and information processing become evident. As a result of this, ISO Technical Committees 95 (Office Machines) and 97 (Computers and Information Processing) were formed. ANSI (then ASA) Technical Committees X4 and X3 had been organized earlier that year and were used as models for their international counterparts, and ANSI officially accepted the Secretariat for both ISO/TC 95 and ISO/TC 97.

In April 1960 an association was being formed in Europe whose name was to be the European Computer Manufacturers Association. ECMA officially came into being in May 1961, just prior to the Round Table Conference which resulted in the formation of TC 97. Shortly afterwards ECMA was invited to become a liaison member of TC 97.

TC 97 is responsible for standardization in the areas of computers, associated information processing systems, peripheral equipment, and devices and media related thereto. The United States still holds the Secretariat for TC 97. Liaison is maintained with other ISO technical committees and relevant IEC committees. Among these are:

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ISO/TC     6   Paper, Board and Pulps
ISO/TC    37   Terminology
ISO/TC    39   Machine Tools
ISO/TC    46   Documentation
ISO/TC    68   Banking Procedures
ISO/TC    95   Office Machines
ISO/TC   145   Graphic Symbols
ISO/TC   154   Documents and Data Elements in Administration,
               Commerce and Industry
IEC/TC     3   Graphic Symbols
IEC/TC    44   Electrical Equipment of Industrial Machines
IEC/TC    48   Electomechanical Components for Electronic Equipment
IEC/TC    60   Recording
IEC/TC    61   Safety of Household Electrical Appliances
IEC/TC    65   Industrial Process Measurement and Control
IEC/TC    74   Safety of Electronic Data Processing Equipment
               and Office Machines   (n)
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(n) Reference 33.

PARTICIPATION.

(P) Member Bodies

Australia	Hungary	Sweden
Brazil	Italy	Switzerland
Canada	Japan	United Kingdom
Czechoslovakia	Netherlands	United States
Finland	Poland	U.S.S.R.
France	Romania	
Germany	Spain	

(O) Member Bodies

Austria	India	Peru
Belgium	Iran	Portugal
Bulgaria	Ireland	South Africa
Chile	Israel	Turkey
Denmark	Norway	Yugoslavia
Greece	Pakistan	

LIAISON WITH INTERNATIONAL ORGANIZATIONS. TC 97 maintains external liaison with the following organizations.

Bank for International Settlements
Comite Permanent des Congres Internationaux d'Actuaires (CPCIA)
Council for Mutual Economic Assistance (CMEA)
European Association of Manufacturers of Business and Data
    Processing Equipment (EUROBIT)
European Computer Manufacturers Association (ECMA)
European Conference of Postal and Telecommunications
    Administrations (CEPT)
European Organization for Nuclear Research (CERN)
Federation Internationale de Documentation (FID)
International Air Transport Association (IATA)
International Federation for Automatic Control (IFAC)
International Federation for Information Processing (IFIP)
International Press Telecommunications Committee (IPTC)
International Radio Consultative Committee (CCIR)
International Union of Pure and Applied Chemistry (IUPAC)
Union Internationale des Chemins de Fer (UIC)
United Nations Conference on Trade and Development (UNCTAD)
United Nations Economic Commission for Europe (ECE)
United Nations Office for Electronic Data Processing and
    Information Systems
World Intellectual Property Organization (WIPO)   (o)

SUBCOMMITTEES. As of year end 1975, TC 97 had fourteen subcommittees each of which has an assigned program of work.

SC 1 Vocabulary.
SCOPE: The establishment of the ISO Vocabulary of Data Processing covering the scope of ISO/TC 97 and related subjects, and any related abbreviations.
SECRETARIAT: France (Association Francaise de Normalisation)

(o) Reference 33.

SC 2 Character Sets and Coding.
SCOPE: The standardization of coded character sets, code
extension, definitions of characters for representation
by single and multiple bytes, and coded representations of
characters recorded in media for the interchange of coded
information between devices, equipments, and systems.
SECRETARIAT: France (Association Francaise de Normalisation)

SC 3 Character and Mark Recognition.
SCOPE: The standardization of the shapes of characters and marks
for input and output of data, for exchange among data processing
systems and associated equipment using machine-legible characters
or marks printed by hand or by machine, and of the associated
print quality requirements.
SECRETARIAT: Switzerland (Association Suisse de Normalisation)

SC 5 Programming Languages.
SCOPE: The standardization of programming languages including
programming languages for the control of industrial processes
and other software of broad utility, with provision for revision,
expansion and strengthening, and for the definition and approval
of test problems as aids in assessing the conformity of compilers
to one or other of the standardized programming languages.
SECRETARIAT: USA (American National Standards Institute)

SC 6 Data Communications.
SCOPE: To define the system functions, procedures and
parameters necessary for the transfer of data between data
systems over communication networks. To effect liaison with
CCITT and CCIR and to prepare proposals for their consideration
and for inclusion in CCITT and CCIR Recommendations as appropriate.
To prepare International Standards and/or Technical Reports
relating to those aspects of data communications for which ISO
is responsible.
SECRETARIAT: USA (American National Standards Institute)

SC 7 Design and Documentation of Computer-based
Information systems.
SCOPE: The standardization of techniques and methods associated
with the design and documentation of information systems based on
the use of computers.
SECRETARIAT: Sweden (Sveriges Standardiser in gskommission)

SC 8 Numerical Control of Machines.
SCOPE: The standardization of those aspects of data processing,
excluding programming languages, that are associated with the
numerical control of machines.
SECRETARIAT: France (Association Francaise de Normalisation)

SC 9 Programming Languages for Numerical Control.
SCOPE: The standardization of programming languages for the
numerical control of machines.
SECRETARIAT: France (Association Francaise de Normalisation)

SC 10   Magnetic Disks.
SCOPE: Standardization in the field of magnetic disks and the
recording of digital data on them for the interchange of
information and media among data processing systems and associated
equipment. The track format characteristiccs shall be defined
for those disks involved in information interchange.
SECRETARIAT: Germany (Deutsches Institut fur Normung)

SC 11   Computer Magnetic Tape.
SCOPE: Standardization in the field of magnetic tape and the
recording of digital data on it for the interchange of
information and media among data processing systems and associated
equipment.
SECRETARIAT: USA (American National Standards Institute)

SC 12   Instrumentation Magnetic Tape.
SCOPE: Standardization in the field of magnetic tape and
the recording of data on it for the interchange of information
and media in reel-to-reel instrumentation applications.
SECRETARIAT: USA (American National Standards Institute)

SC 13   Interconnection of Equipment.
SCOPE: Standardization of input-output interfaces, but excluding
data transmission modem interfaces.
SECRETARIAT: Germany (Deutsches Institut fur Normung)

SC 14   Representation of Data Elements.
SCOPE: 1. Standardization of the representations of data
             elements that are commonly interchanged among data
             processing systems and are not specific to particular
             user groups.
         2. Standardization of the representations of data
             elements that are commonly interchanged among data
             processing systems and require special treatment in
             automatic data processing.
         3. Standardization of procedures for describing data
             interchanged among data processing systems.
         4. Standardization of guidelines to assist ISO committees
             concerned with specialized applications in the
             representations of data elements to be interchanged
             among data processing systems.
         Excluded are representations of data elements that are
         within the scope and program of work of other ISO
         committees unless they require special treatment in
         automatic data processing.
SECRETARIAT: USA (American National Standards Institute)

SC 15   Labelling and File Structure.
SCOPE: 1. Standardization of the structure and internal
             labelling of files to facilitate the interchange of
             data files among data processing systems.
         2. Standardization of those data formats that need to be
             specified in order that the data may be correctly
             interpreted by data processing systems.
SECRETARIAT: United Kingdom (British Standards Institution)   (p)

(b) Reference 33.

ISO TECHNICAL COMMITTEE 95
(OFFICE MACHINES)

TC 95 is responsible for standardization of terminology and
definitions of functions of office machines and of other fundamental
elements of interest to users and manufacturers of such machines.   To
aid TC 95 in its technical work it has ten subcommittees.   Italy holds
the Secretariat through the Italian National Standards Institute
(UNIPREA).

PARTICIPATION.

(P) Member Bodies

Canada	Iran	Switzerland
Czechoslovakia	Italy	United Kingdom
Finland	Japan	United States
France	Spain	U.S.S.R.
Germany	Sweden	

(O) Member Bodies

Australia	Hungary	Poland
Austria	India	Portugal
Belgium	Mexico	Romania
Bulgaria	Netherlands	South Africa
Denmark	Norway	Yugoslavia
Ethiopia	Pakistan	

SUBCOMMITTEES.   As of year end 1975, TC 95 had ten subcommittees,
each of which had an assigned program of work, as indicated below.

SC 4   Duplicating and Document Copying Machines.
SCOPE: To study the development of standards for duplicating
and copying machines.
SECRETARIAT: United Kingdom (British Standards Institution)

SC 5   Dictation Machines.
SCOPE: To study the development of standards for dictating
machines and equipment, including terminology and definitions.
SECRETARIAT: United Kingdom (British Standards Institution)

SC 6   Mail Processing Machines and Other Special Machines.
SCOPE: To standardize terminology and other elements of mail
processing machines and other special machines.
SECRETARIAT: Germany (Deutsches Institut fur Normung)

SC 7   Vocabulary, Classification and Identification of
Office Machines.
SCOPE: Prepare a vocabulary for all machines falling within
ISO/TC 95. To establish directives for the minimum inscriptions
to be marked on office machines and data processing machines
to indicate: the origin; the characteristics of use when the
machines are electric.
SECRETARIAT: France (Association Francaise de Normalisation)

SC 9   Interrelation between Office Machines and Forms.
SCOPE: To study questions regarding the interrelation between
office machines, and data processing machines, and forms.
SECRETARIAT: Sweden (Sveriges Standardiseringskommission)

SC 12   Printing Ribbons and their Accessories.
SCOPE: The international standardization of inked ribbons and
their accessories, such as spools and shanks, minimum indications
to be shown on packages, for office machines and printing
machines used in data processing.
SECRETARIAT: France (Association Francaise de Normalisation)

SC 14   Keyboard Arrangements.
SCOPE: To establish a minimum number of standard keyboard
arrangements which will satisfy the requirements of the
major world languages and applications in the areas of office
machines, data processing equipment and other related fields.
SECRETARIAT: Italy (Italian National Standards Institute)

SC 15   Numeric and Alphanumeric Office Machines.
SCOPE: To investigate the need for and develop user
oriented standards for typewriters, adding, calculating,
accounting and cash register machines in those areas which are
not within the field of other Subcommittees of ISO/TC 95 or
ISO/TC 97.   Consideration based on specific proposals will be
given to other types of numeric and alphanumeric office
machines for inclusion in the scope at a future date.
SECRETARIAT: U.S.A. (American National Standards Institute)

SC 16   Symbols Used on Office Machines.
SCOPE: To develop ISO International Standards on symbols to be
used on humanly operated machines and on similar machines that
may be used in conjunction with other equipment.
SECRETARIAT: Germany (Deutsches Institut fur Normung)

SC 17   Credit Cards and Identification Cards.
SCOPE: Develop recommendations for specifications of embossed
"Credit Cards" and identification Cards.   Develop a universal
numbering system to facilitate data interchange.
SECRETARIAT: U.S.A. (American National Standards Institute)

INTERNATIONAL TELECOMMUNICATION UNION
(ITU)

HISTORY

The ITU is a treaty-level inter-governmental organization established in 1865 in Paris as the Union Telegraphique Internationale. The title was changed to its present one in 1932, after the amalgamation of the International Telegraph Convention and the International Radiotelegraph Convention. The International Telecommunication Convention was signed in 1965 and entered into force on January 1, 1967.

OBJECTIVES

To promote international cooperation by establishing international agreements, treaties, and standards regarding telecommunication.

To coordinate the activity of national governments and private organizations by promoting the development of technical facilities and their efficient operation.

To improve the efficiency and increase the usefulness of telecommunication services and to make them as generally available as possible.

MEMBERSHIP

The membership of ITU is composed of two classes of organizations: (1) the telecommunication administrative bodies of each country and (2) the recognized private enterprises of each country.

The interests of the United States administration are held by the U.S. Department of State which has delegated responsibility to the International Division of the Federal Communications Commission.

ORGANIZATION

The Plenipotentiary Conference is the supreme organ of the Union; the Administrative Council facilitates the implementation of the provisions of the Convention by member organizations. In addition to Administrative Council, there are two Administrative Conferences: The Administrative Telegraph and Telephone Conference; and the Administrative Radio Conference. Each of these two bodies is empowered to revise regulations within their assigned spheres of responsibility.

Four permanent organs comprise the operating arm of the ITU: the General Secretariat; the International Frequency Registration Board; the International Radio Consultative Committee; and the International Telegraph and Telephone Consultative Committee.

The General Secretariat of the Union is responsible for the preparatory and subsequent work associated with the ITU conferences which are held approximately every six years. These Conferences are usually well attended by large U.S. Delegations headed by an ambassador-level representative of the U.S. State Department. The FCC and major U.S. domestic and international telecommunications carriers also participate. The Secretariat is responsible for publishing the recommendations and principal reports of all permanent organs of the ITS as well as texts of regional and international agreements on telecommunication matters.

The International Frequency Registration Board is responsible for the registration of frequencies and as such is also responsible for testing conformance to registered communication frequencies. The International Radio Consultative Committee studies and issues recommendations on technical and operational questions specific to radio communication. The International Telegraph and Telephone Consultative Committee is concerned with the development of technical standards and operation rules for international telephone and telegraphic communications.

RELATION TO OTHER ORGANIZATIONS

ITU relates to the International Organization for Standardization through the study groups of CCITT, and has a specialized agency status with the United Nations. It is recognized by the UN as the responsible agency for all international communication matters.

TECHNICAL WORK

The technical work of ITU most closely related to information processing is found in the International Telegraph and Telephone Consultative Committee.

INTERNATIONAL TELEGRAPH AND TELEPHONE CONSULTATIVE COMMITTEE
(CCITT)

OBJECTIVES

The CCITT was established by Article 14 of the International Telecommunication Convention to examine and make recommendations on questions related to technical, operational, and tariff matters regarding facsimile, telegraphy, and telephony.

MEMBERSHIP

Membership of CCITT is made up of five categories:

A Members - Administrations, e.g., U.S. State Department
B Members - Recognized Private Agencies, e.g., ATT
C Members - Scientific or Industrial Organizations, e.g.,
            Data Processing Manufacturers
D Members - International Organizations, e.g., ISO
E Members - Specialized Agencies, e.g., World
            Meteorological Organization

Only "A" members have any voting powers at the Plenary where the decisions are made. The United States is represented by the State Department which has delegated this responsibility to the International Division of the Federal Communications Commission.

ORGANIZATION

The Plenary Assembly meets, in principle, every three years, according to the state of the studies of the CCITT Study Groups. The CCITT also has a Director and its own Secretariat.

RELATION TO OTHER ORGANIZATIONS

CCITT has liaison status with the International Organization for Standardization. CCITT relations with ISO/TC 97/SC 6 (Data Communications) are governed by CCITT Recommendation A20, first approved in 1964 and revised at four-year intervals since then. The Recommendation fosters a spirit of cooperative activity that is complementary rather than competitive so that there is no duplication of effort on the part of these two groups. Though neither ANSI nor the EIA (as national standards bodies) are eligible for membership in CCITT, there is cooperative interaction among these three groups also. This is due largely to the work of the Industry Advisory Group which was established by the U.S. Department of State in order to provide for this cooperation and communication. Meetings of the Industry Advisory Group are held in Washington several times a year and are open to the public. The attendants at these meetings are well

representative of all U.S. domestic and international telecommunication carriers as well as of manufacturers of business and data communications equipment. The IAG develops USA positions on CCITT activities for which there is no ongoing counterpart in the US as, for example, modems. The Group also forwards to CCITT positions developed by ANSI or EIA. (q)

TECHNICAL WORK

The technical work of CCITT is done by its 16 numbered (I to XVI) Study Groups each of which is concerned with a specific aspect of international telegraphy or telephony problems. In addition to each of these Study Groups, there are Special Study Groups whose assigned sphere of responsibility spans the work of several "numbered" Study Groups. Of particular interest to the data processing community is the work of Special Study Group A, Data Transmission, the first of the CCITT Special Study Groups designated "special."

Since its formation in 1960, CCITT Special Study Group A has developed approximately 35 standards on various aspects of data transmission over public telecommunication networks. The standards provide for interfaces between data processing and data communication equipment, signalling rates, transmission codes, modems, error control procedures, acoustic coupling, use of digital facilities, data transmission over switched networks, etc. In CCITT terminology these standards are more correctly called recommendations and are rigidly observed in all signatory countries of the ITU Convention. (r)

(q) Reference 60, page 213.
(r) Reference 60, page 211.

INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE
(CISPR)

HISTORY

The International Special Committee on Radio Interference was formed in 1933 under the aegis of the IEC. New terms of reference were adopted in 1956.

OBJECTIVES

The aim of the organization is to:

Prepare specifications on the method of measurement and to stipulate limits of radio interference in order to avoid difficulties in the exchange of goods and services.

Promote international agreement in various aspects of radio interference in order to foster satisfactory reception of sound and television broadcasting services and to facilitate international trade.

MEMBERSHIP

The membership is comprised of each National Committee (IEC) as well as a number of representatives appointed by interested international organizations.

ORGANIZATION

The organization is structured with a Plenary Assembly, a Steering Committee which acts in an administrative and advisory capacity, and a number of subcommittees and working Groups.

RELATION TO OTHER ORGANIZATIONS

CISPR is closely aligned with the IEC liaison organizations and with the International Radio Consultation Committee (CCIR) of the International Telecommunications Union.

TECHNICAL WORK

The Subcommittees of CISPR are responsible for studies over a defined but broad aspect of radio interference and allocate detailed studies to working Groups. When it is considered that a sufficient measure of agreement has been reached on the draft documents prepared by the working Groups, the drafts are circulated to the National Committees of the IEC for approval and subsequently issued as CISPR specifications.

A working Group on data processing equipment was established in late 1975.

PAN AMERICAN STANDARDS COMMISSION
(COPANT)

HISTORY

COPANT was established in 1947 as the Pan American Standards Committee, largely as a result of the efforts of the Pan American Union. It was the first inter-American standards agency; and its constitution limited its membership to those countries having national standards bodies. In 1961 the Committee was reorganized to provide for the participation of the United States and for participation as Associate Members of Latin American countries that had no national standards institutes. The name of the Committee was changed in 1965 to the Pan American Standards Commission, and the Spanish name of the organization, Comission Panamericana de normas Technicas, was used as the basis of the acronym, COPANT, that is used for the name of the Commission.

OBJECTIVES

The objectives of the Commission are to develop regional standards in order to foster the economic development of the countries of Southern and Central America, and to provide the Latin American Free Trade Association with the standards required to facilitate trade in the Latin American common market.

MEMBERSHIP

The membership in 1968 consisted of the national standards bodies of Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Panama, Paraguay

CHAPTER 5
EUROPEAN ORGANIZATIONS

Member Bodies of both IEC and ISO are free to adopt all International Standards as national standards either in toto without any change or with whatever modifications may be required to fit local needs. The principal objective of international standardization is, of course, the maximum coordination and alignment of national standards possible within the framework of the sovereign rights of self-determination of individual countries. Though many countries can, and do, adopt International Standards as their own, many other countries are unable to do so for a variety of reasons. Thus, differences in national standards have persisted in Europe and were of relatively little consequence when European industry was concerned primarily with its domestic market. Increase in world trade and the consequent opportunities for export production brought to light the technical barriers to trade inherent in differing national standards. The problem became acute in the case of varying specifications for manufactured products which required a manufacturer to produce several variants of a product for the export market. The problem was even more complicated when enforcement required the presence of foreign inspectors on the premises of manufacturers in the exporting country. The formation of the European Economic Community (the Common Market) and the European Free Trade Association provided additional impetus to the necessity for removing all barriers to trade, and pointed up the additional danger of standards among rival groups.

One result of these developments was the convening of all Western European standards bodies in Zurich in June 1960. At this meeting it was generally agreed that the "Six and Seven should actively collaborate in unification of their standards within the wider ISO framework." The organization of CEN (the European Standards Committee) and CENEL (now CENELEC), its electrotechnical counterpart, was one practical outcome of the Zurich decision. The objectives of both organizations "was not to duplicate or by-pass ISO or IEC, but to secure identical implementation of ISO and IEC agreements and to make use of the work done on standards by European manufacturing organizations." (a)

Both CEN and CENEL worked towards aligning their parent organizations into closer association with standards activities so that the work could proceed for Western Europe as a whole and standards so developed could be used as the basis for countries in both market areas. By 1968 both areas adopted the policy of legislation by reference to standards. At the same time work was directed in CEN toward development of agreement among the governments concerned regarding certification, testing and associated controls relevant to statutory regulations of member countries. This work has culminated in the establishment of the CENCER mark, as described later in this Chapter. The Chapter concludes with a description of the activities of two additional organizations indicative of European standardization activities, one an international certification authority, the other an association of manufacturing organizations.

(a) Reference 63, page 63.

EUROPEAN COMMITTEE FOR STANDARDIZATION
(CEN)

HISTORY

CEN was formed in 1961 by the amalgamation of the standards committees of the European Economicc Community (EEC) and of the European Free Trade Association (EFTA) into the European Standards Coordinating Committee. The purpose of both standards committees as well as of the successor organization was the unification of standards of member countries. The present title of the Committee was adopted in 1971.

OBJECTIVES

CEN's activities are directed toward the elimination of technical barriers to world trade by the establishment of European Standards as national standards. Such standards then serve as unification documents to which reference can be made in national as well as EEC directives and thus serve to coordinate national standards of member countries.

MEMBERSHIP

The members of CEN are the national standardizing bodies of EEC and EFTA countries. The following countries are members: members as of 1974.

Austria	Greece	Portugal
Belgium	Iceland	Spain
Denmark	Italy	Sweden
Finland	Luxembourg	Switzerland
France	Netherlands	United Kingdom
Germany (Federal Republic)	Norway	

ORGANIZATION

At the CEN Steering Committee meeting in June 1975 documents were signed which constituted CEN as an international association with legal status in Brussels. The new legal statutes established the General Assembly as the governing body of CEN; the Assembly's first meeting took place in Madrid on May 12-14, 1976. Another change was the establishment of a management committee composed of the chief executives of each Member Body. Other organizational components remain as before: the Steering Committee; the Central Secretariat; and Technical Working Groups. (b)

RELATION TO OTHER ORGANIZATIONS

CEN activity is complementary to that of ISO and is directed toward the development of harmonized standards that are usually based on ISO standards.

(b). Reference 17.

TECHNICAL WORK

The technical work in CEN is carried on by its approximately 46 Working Groups that have been established to date (February 1976). To accelerate the harmonization process, "CENTRI" groups were organized in the late sixties for the purpose of preparing initial drafts on priority items. At the Government level a Tripartite Committee consisting of France, Germany, and the United Kingdom, was established as an advisory body on priority activity, particularly that related to statutory regulations and compulsory approval requirements. In late 1973 the Council of the European Economic Community adopted a timetable for the realization of the initial phase of the program to eliminate non-tariff barriers to trade. (c)

CEN has established a corporate body called CENCER to implement a European certification scheme. CENCER has adopted a certification mark to indicate that a product so marked meets specifications defined by an independent inspection authority. National licensing authorities of CEN member countries administer the scheme; CENCER exercises control in order to ensure that licensing procedures comparable across national boundaries prevail.

In 1975 CEN Working Group 42 which had been responsible for the study and formulation of CEN certification policies was disbanded and a new consultative group on certification (CONCERT) established to carry on WG 42 responsibilities. The new group will also be responsible for ensuring proper liaison with CENCER as well as with experts and authorities involved in certification activities. (d)

The technical activity of CEN's Working Groups is directed toward the production of harmonized standards and European Standards. A harmonized standard is usually based on an International Standard and represents agreement among a group of nations as to the contents and uniform application of the conditions and requirements set forth therein. Once such agreement is reached in CEN, member countries are expected to bring their national standards into alignment with the harmonized document. A European Standard, on the other hand, is prepared at the direction of CEN, usually because there is no existing standard. Once a European Standard is approved by CEN, member countries are expected to adopt it as their national standard.

(c) Reference 49, page 14.
(d) Reference 17.

EUROPEAN COMMITTEE FOR ELECTROTECHNICAL STANDARDIZATION
(CENELEC)

HISTORY

In January 1973 CENELEC was formed by the merger of CENEL and CENELCOM. CENEL was the electrotechnical counterpart of CEN, the European Committee for Standardization, while CENELCOM comprised the Common Market members of CENEL.

OBJECTIVES

The objectives of the organization are to: (1) harmonize the national electrotechnical standards of member countries; and (2) remove trade barriers which may result directly or indirectly from the operation of national marks of conformity to standards in member countries. (e)

MEMBERSHIP

The National Electrotechnical Committees of the fourteen countries listed below are members of CENELEC:

Austria	Germany (Federal Republic)	Portugal
Belgium	Ireland	Sweden
Denmark	Italy	Switzerland
Finland	Netherlands	United Kingdom
France	Norway	

RELATION TO OTHER ORGANIZATIONS

Through the National Committees of its member countries, CENELEC works directly with the IEC in handling standardization problems associated with the electrotechnical field.

TECHNICAL WORK

CENELEC activity usually begins with standards and documents promulgated by the IEC and by the International Committee on Rules for the Approval of Electrical Equipment (CEE). Technical Committees established by CENELEC work in their assigned areas of activity to minimize the effects of trade barriers due to differences in national standards and regulations. Questionnaires re difficulties with national differences are circulated to the National Committees of CENELEC member countries in order to determine the degree of conformity in each country. The help of the National Committees as well of ad hoc groups of experts is also enlisted to help achieve an effective alignment of particular standards. Harmonization is considered to be achieved when member countries publish national specifications with an agreed content but not necessarily with uniform wording. As of late 1974 CENELEC produced some 200 harmonization documents.

(e) Reference 58.

In 1969 the predecessor organization of CENELEC accepted the responsibility for the operation of a quality assurance program for electronic components. This responsibility is vested in an executive committee established for this purpose, and now known as the CENELEC Electronic Component Committee (CECC). CECC is responsible for all aspects of the program with the exception of the inspection function which is vested in a separate and independent committee, the Electronic Components Quality Assurance Committee (ECQAC). This Committee is composed of representatives of national inspection organizations. The principal objective of the system is the promotion of manufacture of electronic components to harmonized standards with similar inspection and sampling procedures so that components manufactured in one country may be purchased with confidence by users in other countries.

INTERNATIONAL COMMISSION ON RULES
FOR THE APPROVAL OF ELECTRICAL EQUIPMENT
(CEE)

HISTORY

The Commission was organized in 1926 as the Installations fragenkommission (IFK) which was concerned with the safety of electrical equipment in common use. The number of participating countries grew from the four that participated in the first meeting to thirteen in 1939. Activities interrupted by World War II were resumed immediately after the war ended, and the IFK was reorganized in 1947 under its present name.

OBJECTIVES

The objectives of CEE are to issue standards for safety in use of electrical equipment and to achieve as much uniformity as possible in the safety regulations for electrical equipment of the member countries of the organization.

MEMBERSHIP

CEE functions as a Federation of European approval agencies. Members are those organizations which in each of the member countries issue rules and regulations for safety of electrical equipment. Each country is represented by only one organization.

CEE is based in Europe and is international insofar as Europe is concerned, but its membership does not extend to other nations of the world. The membership is limited to Europe; the United States is one of six countries with observer status.

The membership includes the following countries:

Austria	Germany (Federal Republic)	Poland
Belgium	Greece	Portugal
Czechoslovakia	Hungary	Spain
Denmark	Italy	Sweden
Finland	Netherlands	Switzerland
France	Norway	United Kingdom
		Yugoslavia

ORGANIZATION

Control is vested in the Plenary Assembly. The Assembly sets up technical committees to undertake particular tasks with the assigned objective of developing draft CEE Specifications. The Plenary Assembly approves the Specifications before publication.

TECHNICAL WORK

The CEE issues specifications that reflect international consensus but are not formally binding on member countries. CEE specifications are recommended to the membership in the development of national regulations regarding safety of electrical equipment. The CEE has established a certification program for the mutual recognition of test certificates for approval of electrical equipment. The program is open only to those CEE members who have accepted the rules established for the program.

In order to provide users with a simple means of identifying equipment which complies with CEE specifications, the "E" mark of conformity was adopted by the organization and brought to use at the end of 1973. (f)

(f) Reference 64, page 8.

EUROPEAN COMPUTER MANUFACTURERS ASSOCIATION
(ECMA)

HISTORY ·

At the turn of the decade of the 1960's three companies in the European computer manufacturing field sent a letter to all the known computer manufacturers in Europe inviting them to send representatives to a meeting to discuss the need for standards. At the meeting which was held in Brussels in April of 1960 work was delegated to a committee to prepare the formation of the Association and to draw up bylaws and rules.

By December of 1960 the form that the Association would take was well defined and in May 1961 the Association officially came into being with the companies in attendance at the first meeting becoming charter members. Just prior to the official registration of ECMA, the ISO/IEC Round Table Conference had been held which resulted in the formation of ISO TC 97 and its subcommittees. ECMA was asked to become a liaison member of TC 97.

OBJECTIVES

The purpose of the Association as stated in the bylaws is:

To study and develop, in cooperation with the appropriate national and international organizations, as a scientific endeavor and in the general interest, methods and procedures in order to facilitate and standardize the use of data processing systems.

To promulgate various standards applicable to the functional design and the use of data processing equipment.

The Association shall be a non-profit-making organization and shall devote itself to no commercial activity whatsoever. (g)

MEMBERSHIP

The Association consists of ordinary and associate members; other classes of membership may be created by a vote of the ordinary members at a General Assembly.

Ordinary members are companies which develop, manufacture and market in Europe data processing machines or groups of machines used to process digital information for business, scientific, control, or other similar purposes. Data processing machines used exclusively for military purposes are not included.

(g) Reference 21, page 6.

Further, the machines manufactured by ordinary members may not be basically copies of machines manufactured by any existing ordinary members. An ordinary member may not hold half of the capital of an existing member nor have half of its capital held by an existing ordinary member. If at least half of the capital of two or more companies is held by another company, both cannot be ordinary members; they must be represented by a single company only.

Associate members are those who have interest and experience in Europe in the technical work of ECMA. However, no company which qualifies for ordinary membership can be elected as an associate member. At the time a company applies for membership as an associate member, it must specify those technical committees in which it plans to participate. An associate member is bound by the bylaws of the Association and is entitled to the same rights and privileges as an ordinary member. Associate members may participate in any discussions at the General Assembly relevant to the technical committees in which they participate. However, associate members have no vote in the General Assembly.

ORGANIZATION

Organizationally ECMA is composed of the General Assembly, the Management, the Coordinating Committee, and the technical committees.

The General Assembly is the highest level of authority of the Association and its task is to control the Association and appoint its management officials. The General Assembly consists of representatives of the ordinary members and meets at least twice a year. Special General Assemblies may be called at the request of one-fifth of the ordinary members. A permanent Secretariat is maintained which reports to the General Assembly. The Secretariat is headed by the Secretary General, who is appointed by the General Assembly and who is responsible for the operation of the Secretariat.

The Management consists of a President and VicePresident elected for one year by the ordinary members at the General Assembly. Only representatives of ordinary members are eligible for these posts.

The Coordinating Committee consists of six members elected by the General Assembly who are responsible for making recommendations to the General Assembly regarding the formation, activities, reorganization, or dissolution of technical working committees. The Coordinating Committee reviews the work of the technical working committees semi-annually and nominates a provisional chairman and vice chairman for each new technical working committee.

FINANCE

The Association is financed by an equal levy on all ordinary members. The fees are set by the ordinary members in General Assembly. The Secretary General is responsible for all expenditures within the budget.

TECHNICAL WORK

Technical committees are formed by the Secretary General after being authorized by the General Assembly. For a new technical committee meeting, a provisional chairman and vice chairman are nominated by the Coordinating Committee. All ECMA members are entitled to send one or more representatives to any technical committee meeting, but only one vote per member company is permitted. Anyone else can attend a meeting only at the special invitation of the committee as a whole.

The use of the vote procedure is discouraged; however, if a vote is indicated to resolve issues, a simple majority of the member companies present at the meeting is required.

The work of all technical committees is reviewed every six months at a meeting of the chairmen of the technical committees with the Coordinating Committee and the Secretary General. A semi-annual report is submitted to the General Assembly which contains a description of the work to be carried out during the next year.

The English Language, as used in Great Britain, is the official language of the Association, and the metric system is used for measurements.

Promulgation of standards developed by the technical committees requires approval by at least two-thirds of all the ordinary members. ECMA Standards are made available without restriction to all interested parties. ECMA Standards are intended to be draft proposals for consideration by the ISO where the final standards are approved and adopted. Members of the Association are not obligated to follow any standard.

TECHNICAL COMMITTEES

The following technical committees are presently in operation. A break in the sequence indicates that the committee completed its work and has been disbanded.

TC 1   Input and Output Codes Committee.
SCOPE: Definition of common character sets (including alphabets, numbers, punctuation marks, special symbols and controls) and their coded representation suitable for input/output media and data transmission in order to facilitate interchange of information between data processing equipment. To define the implementation of codes on media.

TC 4   Optical Character Recognition Committee.
SCOPE: Definition of a minimum number of character sets legible both to humans and to machines. Specification of fonts, parameters. measurements and tolerances. Definition of document specification (size limits, ink, position of printed lines, etc.).

TC 6   COBOL Committee.
SCOPE: To survey the implementation and usage of COBOL and
to participate in the development and standardization of COBOL
languages, taking into account the specific European needs.

TC 8   FORTRAN Committee.
SCOPE: To consider the ISO and ANSI working papers on FORTRAN
and subsequent documents to ensure that European requirements are
taken into account in order that ECMA members can realize in
practice the highest possible degree of interchange of FORTRAN
programs.

TC 9   Data Transmission Committee.
SCOPE: The definition of common parameters which will
facilitate communication within and between data processing
systems using transmission links.   The preparation of coordinated
viewpoints covering those requirements which are of common interest
to both the European computer manufacturers and the telecommunication
services.

TC 10   PL/1 Committee.
SCOPE: To study the PL/1 language and to proceed with
standardization of PL/1.

TC 12   Product Safety Committee.
SCOPE: To consider national and international safety regulations
with a view to establishing appropriate safety recommendations
for data processing machines or units so that they are intrinsically
safe and safe for operating and maintenance personnel.

TC 13   Keyboards Committee.
SCOPE: To define standard layouts for keyboards for the ECMA 7-bit
code to be used either locally or remotely with data processing
systems, having regard both to existing practices and equipment
and to propsective developments in technology and usage.

TC 14   Paper Sizes Committee.
SCOPE: To survey and report on form sizes and layouts in use
and proposed, and to recommend the fields ripe for standardization.

TC 15   Labelling Committee.
SCOPE: To secure a wide scope for the interchange of data,
to investigate alternative methods of organization of
data sets and to classify methods for identifying and structuring
of data with a view of defining a standard or standards for labelling
suitable structures.

TC 16   Disk Packs Committee.
SCOPE: To identify and standardize the minimum number of
parameters necessary to ensure exchangeability of both replaceable
disk packs and the information recorded thereon.

TC 18   I/O Interface Committee.
SCOPE: To investigate the feasibility of standardization of I/O
interface parameters excluding those covered by TC 9 and make
proposals.

TC 19   Magnetic Tape Cassette Committee.
SCOPE: To identify and standardize the physical properties and the
relevant data format of a magnetic tape cassette for digital
applications--below the performance range of existing magnetic
tape standards--in order to ensure interchangeability.

TC 20   Electromagnetic Compatibility Committee.
SCOPE: To explore the conditions necessary to guarantee
reciprocal electromagnetic compatibility between data processing
and/or data communication systems and with the outside environment;
to report on the practicability of defining standards.

CHAPTER 6
NATIONAL ORGANIZATIONS

Many references have already been made to national standards bodies and their roles in international standardization activities. These national organizations have an even more important role to play in their respective countries where they are responsible for the coordination and integration of all interests involved in the development of national standards. In addition to this, the national standards bodies are usually responsible for the promulgation of standards and for the services associated with testing and certification required for quality assurance and adherence to standards for products entering the marketplace, either domestic or international.

Though the basic responsibilities of national standards bodies vary little from country to country, their organizational structures are as varied as the countries themselves. The extent of government involvement as well as the pattern of participation by scientific, industrial, and consumer interests in national standardization activities also vary from country to country.

In the pages that follow the national organizations of the United States, Canada, Japan, and the United Kingdom are described, together with selected organizations from each country which participate with the national standards bodies in the standardization process for ADP.

AMERICAN NATIONAL STANDARDS INSTITUTE
(ANSI)

HISTORY

ANSI was originally organized in 1918 by five engineering societies as the American Engineering Standards Committee (AESC). The founding organizations were the American Institute of Electrical Engineers, the American Society of Mechanical Engineers, the American Society of Civil Engineers, the American Society of Mining and Metallurgical Engineers, and the American Society for Testing and Materials.

The AESC was formed to provide a national organization for coordinating the development of national standards. Three Federal Government Departments were invited to join as founding members: the War Department, the Navy Department, and the Department of Commerce, all of which accepted the invitation. In 1920, trade associations as well as several technical and professional societies were invited to join. The need for a more workable structure resulted in the organization of the American Standards Association (ASA) in 1928.

In 1966 the ASA became the United States of America Standards Institute (USASI) under a new constitution and bylaws. In 1969, the present name, American National Standards Institute, was adopted. At that time ANSI was reorganized and more recently has undergone several modifications to its structure. The effect was to broaden the membership base and encourage user involvement.

OBJECTIVES

Five of the major purposes of the American National Standards Institute are:

To serve as the national coordinating institution for the development of national standards so as to insure the development of needed standards.

To provide an independent mechanism for approval and promulgation of voluntary national standards.

To provide a focal point for industry and Government coordination in the field of standardization.

To provide the mechanism for managing and coordinating programs of national standards.

To represent the USA in international standardization organizations of a non-governmental nature.

MEMBERSHIP

The American National Standards Institute is a federation of approximately 180 organizations representing trade, professional, commercial, organized labor, and consumer interests. Membership is divided into six classes: organizational, governmental, company, sustaining, individual and honorary. All but the last two categories have voting privileges on Institute matters. An organizational member is a nonprofit technical, professional, scientific, labor, consumer, trade, or other organization whose scope, recognition, and organization are, in the opinion of the Board of Directors, such that the member can paticipate in the development of standards. A governmental member may be a Department or Agency of the United States Government, or of any of the States, or an interstate or regional authority or agency, or any subdivision of these. A company member may be a corporation, company, firm, partnership, or other organization engaged in industrial or commercial enterprise or professional, educational, research, testing, or trade activities. Any affiliate, or division of a company may, at the discretion of the Board of Directors, be eligible for membership as a company member. Sustaining members are organizations not otherwise eligible for membership but interested in development of standards or in certification. Individual members are persons interested in development of standards or in certification. Individual members may attend council or board meetings with permision of the chairman of the body involved. Honorary memberships are conferred upon individuals by action of the Board of Directors.

ORGANIZATION

The principal officers are the President, who serves as the Chairman of the Board of Directors and three Vice Presidents. The Board of Directors is the governing and policy-making body of ANSI. The Board of Directors designates a Managing Director who serves as Secretary of the Institute and is its chief administrative officer.

The Board of Directors is comprised of the President, the immediate past President, three Vice Presidents, the Director of the National Bureau of Standards, the Chairman of the Organizational Member Council, the Chairman of the Company Member Council, the Chairman of the Consumer Council, the Chairman of the International Standards Council, the Chairman of the Executive Standards Council, the Chairman of the Board of Standards Review, the Chairman of the Certification Committee, and the Chairman of the Government Liaison and Support Committee. In addition to the above elected or ex officio members, twelve directors are nominated by organizational members, twelve by the company members, nine by the Government Liaison and Support Committee (from Federal Government members and other representatives of Government organizations qualified for membership), three by the Consumer Council, and three directors-at-large are nominated by the Nominating Committee of the Board.

The Board of Directors has three Standing Committees: Executive, Finance, and Government Liaison and Support. The Executive Committee is empowered to act for the Board of Directors between meetings of that body; the Finance Committee is responsible for a continuing review of the financial affairs of the Institute, and for making appropriate recommendations to the Board; the Government Liaison and Support Committee has the responsibility for developing policies and programs designed to improve and strengthen liaison with Government agencies at Federal, state, and local levels, and to guide the Institute in implementing such policies and programs. (a)

Five Councils, the Board of Standards Review, and the Certification Committee make up the operating arms of ANSI. The Councils are: Organizational Member Council, Company Member Council, Executive Standards Council, Consumer Council, and International Standards Council.

BOARD OF STANDARDS REVIEW. Approval of ANSI standards is delegated to the Board of Standards Review (BSR) by the Board of Directors. Essentially the BSR's function is a judicial one of determining that a consensus exists among those substantially concerned with the scope and provisions of a proposed standard.

The Board consists of nine to eighteen members appointed by the President of the Institute with the approval of the Board of Directors. Members of the Board of Standards Review serve as individuals, and not as members or representatives of any organization.

The primary responsibilities of the Board are to:

Implement procedures for the approval and withdrawal of
standards as American National Standards and adjudicate
questions or conflicts that develop in the approval
procedure.

Determine whether standards submitted to the Institute
for approval or withdrawal as American National Standards
meet the requirements of the Institute, and act on all
requests for approval, reaffirmation, revision, and
withdrawal of American National Standards.

Be watchful of the interests of those who may be affected
by a particular standard so that their views are given full
and adequate consideration.

Scrutinize evidence of the technical quality of the
proposed American National Standard. (b)

(a) Reference 4, pages 11-12. (b) Reference 4, page 15.

CERTIFICATION COMMITTEE. The Certification Committee has a voting membership of not less than six nor more than fifteen appointed by the President with the approval of the Board of Directors. The Committee is responsible for advising the Board of Directors and administering all national activities of the Institute in the field of certification.

ORGANIZATIONAL MEMBER COUNCIL. The Organizational Member Council is comprised of one representative from each organizational member of the Institute. The Council collaborates with the Executive Standards Council in identifying the need for new standards and the re-examination of existing standards in the light of changing conditions. The Council also represents the interests of the organizational members to the Board of Directors on the policies and programs of the Institute.

COMPANY MEMBER COUNCIL. The Company Member Council represents the interests of commerce and industry in the activities of the Institute. The Council is composed of one representative from each company member.

EXECUTIVE STANDARDS COUNCIL. The Executive Standards Council is composed of six representatives of organizational members, six representatives of company members, four representatives of governmental members, two members of the Consumer Council, and three members-at-large. Members are appointed by the President of the Institute with the approval of the Board of Directors and with guidance of the membership categories represented. The Executive Standards Council is responsible for the standards activities of the Institute, except for approval or withdrawal of standards as American National Standards.

CONSUMER COUNCIL. The Comsumer Council is responsible for the representation and protection of consumer interests in ANSI's work. The Council is composed of ANSI members who choose to be represented in the Council. In addition, five persons experienced in the consumer field are designated by the President with the approval of the Board of Directors. The Council also accepts applications for membership from other sources; ·these are subject to its approval and that of the Board of Directors. The Executive Committee of the Consumer Council handles the administrative work of the Council.

INTERNATIONAL STANDARDS COUNCIL. The International Standards Council consists of not less than fifteen nor more than thirty members who represent the broad interests of the Institute. Members are appointed by the President with approval of the Board of Directors.

The ISC is primarily an advisory body which counsels the Board of Directors on ANSI membership in international standardization organizations, on ANSI budget requirements for international standardization, and on basic policies and procedures for ANSI participation in international standardization and certification activities. The ISC acts in liaison with the Certification Committee on matters dealing with international certification programs.

The ISC responsibility includes technical and administrative policy for the Institute's activities involving the International Electrotechnical Commission, the International Organization for Standardization, the Pan American Standards Commission and other international standardization organizations with which the Institute is or may become affiliated.

STANDARDS MANAGEMENT BOARDS. To aid in administration and management, ANSI has established Standards Management Boards each of which is responsible for a particular discipline or homogeneous technical area. Each Board assists the Executive Standards Council in the management and coordination of standards under development in a given technical area.

For EDP, the Information Systems Standards Management Board is responsible for the supervision and coordination of the activities of seven ANSI Technical Committees: X3 (Computers and Information Processing); X4 (Office Machines and Supplies); Z39 (Standardization in the Field of Library Work, Documentation, and Related Publishing Practices); and Z85 (Standardization of Library Supplies and Equipment). The ISSMB is also responsible for three additional Technical Committees each of which has a computer application as the assigned scope of activity. These Committees are: D19 (Model Vehicle Registration and Certification of Ownership Procedures; D20 (The States' Model Motorist Data Base; and X9 (Banking). The scope of the Board includes all aspects of systems that transmit, store, or process analog symbols or encoded representations of information, including satellite or control systems, peripheral equipment, and auxiliary devices that significantly influence the effective utilization of composite information processing systems. (c)

RELATION TO OTHER ORGANIZATIONS

ANSI is the official Member Body of ISO, and through its afiliate, the U.S. National Committee, is recognized as the official U.S. member of the IEC. The Pacific Area Standards Congress, as noted earlier, was formed by ANSI for the purpose of strengthening the ability of the nations on the Pacific Rim to participate in international standardization activities.

ANSI provides management, leadership, coordination, and financial as well as administrative support for effective U.S. participation in the international standardization effort. The Institute pays the total dues to ISO and IEC and helps in governing the ISO through the Institute's membership on the ISO Council and on the Executive and Planning Committees. In its capacity as Secretariat, ANSI directs the work of many ISO Technical Committees and Subcommittees. (d)

FINANCE

ANSI derives its income from the sale of published standards and from membership dues.

TECHNICAL WORK

ANSI does not, in itself, develop standards; its only function is to provide the organization through which standards can be developed and approved. The Institute has Standards Management Boards to foster development of standards, a review board to determine that consensus has been reached, and a board for accepting and approving proposed standards.

ANSC X3
COMPUTERS AND INFORMATION PROCESSING

HISTORY

At an ISO meeting in early 1960, Sweden recommended that a new ISO Technical Committee be formed for standards for information processing. Additionally, it was suggested that the United States accept the Secretariat.

Upon return from the ISO meeting, the heads of manufacturing concerns in the United States and officials of CBEMA (then the Business Equipment Manufacturers Institute) were invited to a meeting. At this special meeting it was recommended that an organization be formed to develop standards in the computing field. As a result of this recommendation the X3, X4 and X6 Sectional Committees were formed. In 1965 the X6 Committee was disbanded and its work was taken over by an EIA group.

The announcement of the formation of X3 was made in September of 1960 and at that time COBOL and codes were emphasized as the standards to be developed. At the first organizational meeting of X3 which was held in February 1961, seven major topics were identified as: OCR, MICR, data transmission, programming languages, terminology, problem definition and analysis, and codes. The activities on standards for keyboards and office machines became a separate committee known as X4. CBEMA accepted the Secretariat (at that time this function was called a sponsorship) of both Committees.

In 1968, X3 was reorganized so that the administrative and technical review responsibilities were absorbed by two standing committees. In addition to this, the technical committees were realigned under the categories of hardware, software, and systems.

OBJECTIVES

ANSC X3 operates under the general objectives of the American National Standards Institute and is responsible for fulfilling the responsibilities of ANSI for the domestic standards within its stated scope: standardization in the areas of computers and information processing and peripheral equipment, devices and media related thereto.

MEMBERSHIP

Members are organizations with substantial interests in developing standards in the assigned scope of the Committee. Members are classified into three categories: Producers, Consumers, or General interest; no one of these categories is allowed to have a majority of members. Membership is divided into three categories as (1) Regular Member, (2) Ex-officio Member, and (3) Liaison Member and Observer.

A regular member (principal and alternate) is one who seeks membership and demonstrates a valid and continuing interest in the work of ANSC X3. A regular member or his alternate has full voting privileges. Ex-officio members are the chairmen of the technical committees, who may attend X3 meetings and who have the right of full participation except for voting privileges. Liaison members and observers are classified as those individuals, organizations or representatives of other standards committees who have an interest in the work of X3. Liaison members and observers do not have a vote.

ORGANIZATION

The Computer and Business Equipment Manufacturers Association (CBEMA) is designated by ANSI as the Secretariat for ANSC X3. As the X3 Secretariat, CBEMA provides the essential administrative support.

The Chairman and the Vice Chairman are appointed by the Secretariat for a period of three years. The Chairman appoints a Recording Secretary and may appoint such other officers as are required for the conduct of ANSC X3 business.

STANDING COMMITTEES. Assisting X3 in discharging its responsibilities are three standing committees which advise X3 relative to the administration, evaluation, allocation and scheduling of standards projects. Two of the standing committees have staff responsibilities and one is a line committee. The staff responsibilities are vested in the Standards Planning and Requirements Committee (SPARC) and the International Advisory Committee (IAC). The line responsibilities are vested in the Standards Steering Committee (SSC).

International Advisory Committee. The International Advisory Committee (IAC) is responsible for coordinating the work of ANSC X3 with respect to international affairs so as to assist ANSI in executing the responsibilities associated with its participation in ISO, IEC and other national, regional, and international standards bodies. The IAC is responsible for policy statements on issues rather than for technical positions.

Standards Planning and Requirements Committee. SPARC is an advisory committee responsible for the evaluation of the need for new standards and for review of proposed standards. SPARC audits the progress of standards development from the point of view of functional and economic, as opposed to technical, requirements. The Committee is also responsible for the review of proposed standards in regard to their conformance to their original objectives. SPARC may organize study groups, as required, to assist it in its responsibilities for the evaluation of the potential of proposed standardization activities.

SPARC consists of not more than 16 members, including the Chairman. Both the Chairman and the Vice Chairman must be from the consumer group and total membership must be equally divided between consumers and producers. Candidates for membership may be proposed by SPARC or by any member of ANSC X3; all officers and members are appointed by the Chairman of ANSC X3.

Standards Steering Committee. The Standards Steering Committee is the technical management committee of ANSC X3. As such the SSC is responsible for the management activities required in the initiation, development, monitoring, and validation of proposed standards. SSC determines the technical feasibility of proposed new standards, assigns standards projects to Technical Committees (existing or new area), and determines the program of work for each committee. The SSC is responsible for monitoring and coordinating the activities of all Technical Committees. To fulfill these responsibilities effectively, the SSC is organized into three groups: the Hardware Group, the Software Group, and the Systems Group. Each of the Groups has assigned areas of responsibility, as indicated in Figure 15. The officers of SSC include the Chairman, a Vice Chairman, each of the Chairmen (or Vice Chairmen of the Technical Committees), and a Secretary.

RELATION TO OTHER ORGANIZATIONS

ANSC X3 relates to ISO through the American National Standards Institute on matters pertaining to ISO issues and the international aspects of developing standards for computers and information processing. All United States comments on international topics, administrative or technical, are forwarded to ANSI for transmittal to the proper Secretariats.

X3 reports to ANSI through the Information Systems Standards Management Board. X3 Technical Committees maintain liaison with their ECMA, IFIP, CCITT, and ISO counterparts on both formal and informal bases with the approval of ANSI and the X3 Secretariat.

FINANCE

X3 members pay no dues, but the producer category of membership is drawn from the member companies of the CBEMA Data Processing Group. The cost of supporting X3 is largely borne by the producer group through dues to CBEMA.

All technical and administrative committee work is accomplished on a volunteer basis and as such is supported by the organizations represented by the volunteers.

TECHNICAL COMMITTEES

To provide an orderly method for developing standards, Technical Committees are organized along the same general lines as X3. The one major difference is that members of a Technical Committee function as individual experts, while X3 members represent an organization.

The Chairman of a Technical Committee is appointed by the Secretariat for a period of two years and is eligible for reappointment.

The Vice Chairman is also appointed by the Secretariat for a term of two years and is eligible for reappointment. His term is to be out of phase with the term of the Chairman by one year.

Each Technical Committee may have an international representative who is appointed by the Secretariat for a term of three years. It is his job to be cognizant of the work of the corresponding international, regional, and national standards organizations and report this work to the Technical Committee. The international representative is a member of the International Advisory Committee.

Membership on Technical Committees is open to any qualified individual who has an interest in a specific topic. Each committee member maintains his membership by attendance at meetings and responding to ballots.

The following Technical Committees were active (as of November 1975) in the American National Standards Institute.

X3A1 Optical Character Recognition.
Standardization of printed input and output used by optical scanning equipment. The work includes font design, hand-printed characters, print quality, etc.

X3A7 Magnetic Ink Character Recognition.
Responsible for the development and maintenance of MICR standards. Also acts as consultant to the American Bankers Association.

X3B1 Magnetic Tape.
Standardization of the physical and coding characteristics of digital magnetic tape. Typical projects include revisions to existing standards, development of standards for different recording techniques.

X3B5 Magnetic Tape Cassettes.
Standardization of the physical properties of magnetic tape cassettes/cartridges for digital applications to ensure interchangeability.

X3B6 Instrumentation Tapes.
Standardization of magnetic tape for interchange of information in reel-to-reel instrumentation applications.

   X3B7   Magnetic Disks.
Standardization of the physical and magnetic characteristics and
control formats of removable magnetic disk media. Specifications
included are: magnetic surface characteristics, track width,
recording mode, track quality characteristics, etc.
Considerations for control formats include record structure,
gap structure, checking techniques, address structure, etc.

   X3B8   FlexiblBisks.
Develop standards for the physical, mechanical and magnetic
requirements and for measurement of unrecorded flexible disks.

   X3J1   PL/I.
Develop a standard for PL/I in cooperation with ECMA TC 10 and
with technical cognizance of IFIP TC 2.

   X3J2   BASIC.
Develop a standard for the BASIC language.

   X3J3   FORTRAN.
Maintenance, updating, and clarification and interpretation of
the American National Standard FORTRAN.

   X3J4   COBOL.
Maintenance, updating, and clarification and interpretation of
the American National Standard COBOL.

   X3J7   APT.
Maintenance standard for APT programming language.

   X3J8   ALGOL.
Monitor and participate in the preparation of a draft
International Standard on ALGOL.

   X3K1   Project Documentation.
Standards for documentation of project functions including
introduction of project, definition, design, implementation,
operation and evaluation.

   X3K2   Flowcharts.
Develop standards for the techniques of flowcharting and the
design and use of flowcharts.

   X3K5   Vocabulary.
Prepare and maintain a Master Working Vocabulary which is
cognizant of the definitions required by all the subcommittees
of ANSC X3.

   X3K6   Network Oriented Project Management.
Formulate and propose standard characteristics and properties
of network management systems including fields of network
applications such as PERT and CPM.

   X3K7   Program Abstracts.
Develop a national standard for computer program abstracts.

X3L2   Character Sets and Codes.
Standardization of coded character sets including code
representation, recording formats and format indicators.
Projects include: code extension, code registration, control
character sets and graphic character sets.

X3L5   Labels and File Structure.
Standardization of labels and file formats for information
interchange on magnetic tape, including tape cassettes.

X3L8   Representation of Data Elements.
Develop standards for representing data elements of common
interest such as time, location, organizations and materials.

X3S3   Data Communications.
Define and develop standards for the operational characteristics
governing the performance of digital data generating and
receiving systems combined with communication systems. Areas of
interest include data communication control procedures, formats,
transmission speeds and system performance.

X3T9   I/O Interface.
Develop standards for the logical, physical and electrical
interface parameters which could be interconnected, such as
central data processing equipment, control units and I/O
devices. Areas of interest are vested in monitoring ISO
proposals.

TECHNICAL WORK

The technical work of X3 is accomplished under both SPARC and SSC
as described previously. The Technical Committees under the SSC are
responsible for the technical development of draft standards on
assigned topics identified as desired American National Standards.

ANSC X4
OFFICE MACHINES AND SUPPLIES

HISTORY

When the subject of the need for standards for the data processing industry was raised, it was recognized that business machines would interact with this burgeoning industry. However, it was decided that office machines and supplies should be established as an entity independent of X3. As a result, ANSC X4 was established and became the United States counterpart of ISO/TC 95.

OBJECTIVES

Standardization of the functional characteristics of office machines, plus accessories for such machines, particularly in those areas that influence the operations of such machines. Excluded are "data processing media" such as punched paper tape, punched cards and magnetic tape, but not the otherwise usual office machines that generate and/or sense such media.

TECHNICAL COMMITTEES

Four Technical Committees carry on the responsibilities of ANSC X4. These include:

    X4A7 - Paper Forms and Layout
    X4A8 - Electrical Characteristics and Safety of Office
            Machines
    X4A11 - Credit and Identification Cards
    X4A12 - Word Processing

There are also two Task Groups: X4KB which is concerned with Combined Keyboard Arrangments; and X4DSK concerned with Combined Keyboard Arrangements on the Reformed Keyboard. Monitor Committees complete X4's technical staff expertise. In 1975 there were eight Monitor Committees engaged in developing USA positions and providing USA delegations to the meetings of the various Subcommittees of ISO/TC 95, the international counterpart of ANSC X4.

ANSC Z39
LIBRARY WORK, DOCUMENTATION AND RELATED PUBLISHING PRACTICES

HISTORY

The history of ANSC Z39 dates back to June 1939. At that time the American Standards Association, acting on a request from the American Association of Law Libraries, the Medical Library Association and the Special Libraries Association approved a Committee on Library Standards.

The American Library Association served as the original sponsor of Z39; in 1951, however, the sponsorship was assumed by the Council of National Library Associations.

The first meeting of Z39 was held in New York in March 1940 but progress was hampered by suspension of the work of the International Standards Organization during World War II. Several efforts were made to revitalize the committee but these efforts failed for lack of adequate financial support. Despite the difficulties, however, several standards were published.

It was not until 1961 when adequate financial support became available that Z39 was able to expand both nationally and internationally.

OBJECTIVES

The objectives of ANSC Z39 are best expressed in the scope of its work as:

To develop standards for concepts, definitions, terminology, letters and signs, practices, and methods in the fields of library work, in the preparation and utilization of documents, and in those aspects of publishing that affect library methods and use. (e)

MEMBERSHIP

Membership is available to any association or organization concerned with the scope of the committee or with interest or activity in library work, documentation or related publishing practices. A total of 46 members includes libraries, professional, technical and educational institutes or associations, abstracting and indexing services, publishers, government agencies and commercial and industrial organizations.

(e) Reference 5, page 29.

ORGANIZATION

The officers consist of a Chairman, Vice Chairman and Secretary who serve for three years. It is the responsibility of the Chairman to give guidance for the formation of subcommittees, and with the advice of subcommittee chairmen, to invite participants to serve on subcommittees. The Chairman also assumes responsibility for funding activities of the Standards Committee and subcommittees. The Vice Chairman performs the usual duties of that office and, in addition, serves as the Chairman of the program committee. Subcommittees are formed to fulfill the technical objectives of Z39 and are dissolved upon completion of their tasks.

RELATION TO OTHER ORGANIZATIONS

Z39 relates to ISO by participating in the activities of its international counterpart, ISO/TC 46 (Documentation).

FINANCE

ANSC Z39 has been funded since 1961 by matching grants from the Council on Library Resources and the National Science Foundation.

TECHNICAL WORK

The technical work of Z39 is vested in its subcommittees.

SC/1 Program
SC/2 Machine Input Records
SC/4 Bibliographic References
SC/5 Transliteration
SC/7 Library Statistics
SC/10 Periodicals: Format and Arrangement
SC/12 Indexing
SC/18 Book Publishing Statistics
SC/27 Identification Codes for Countries
SC/29 Publicity and Promotion
SC/30 Standard Account Numbers
SC/33 Bibliographic Entries for Microfiche Headers
      and Roll Microfilm Containers
SC/34 Journal Articles Citations
SC/36 Standard Order Form
SC/37 Microform Publishing Statistics
SC/38 Scientific and Technical Translations
SC/39 Synoptics
SC/40 Reporting Serial Holdings
SC/41 Book Spine Layout
SC/42 Serial Claim Forms
SC/43 Bibliographic Code Design
SC/44 Newspaper and Journal Publishing Statistics

RELATED NATIONAL STANDARDS COMMITTEES

The work of ANSI Section Y, Drawings, Symbols, and Abbreviations, is closely related to that of ANSC X3. Each of the five Subcommittees which comprise Section Y has an assigned responsibility for one or more aspects of standardization in engineering drafting practice and procedures. These Subcommittees are:

        Y 1:   Abbreviations
        Y10:   Letter Symbols
        Y14:   Standards for Drawings and Drafting Practice
                    (Exclusive of Architectural Drawings)
        Y15:   Preferred Practice for the Preparation of Graphs,
                    Charts, and Other Technical Illustrations
        Y32:   Graphic Symbols and Designations

Standards developed by this group encompass the specification, definition, and graphic representation of terms, symbols, shapes, etc., used in engineering as well as in the physical sciences.

U.S. NATIONAL COMMITTEE
OF THE
INTERNATIONAL ELECTROTECHNICAL COMMISSION

HISTORY

The U.S. National Committee was founded in 1907. Since 1931 it has been affiliated with the American National Standards Institute and its predecessor organizations.

OBJECTIVES

The objective of the National Committee is to facilitate the coordination and unification of national electrotechnical standards and to provide the channel for U.S. participation in the international electrical standardization work of IEC and in other nontreaty activities.

MEMBERSHIP

Membership consists of the Chairman of the USNC/CEE (International Commission on Rules for the Approval of Electrical Equipment), the Technical Advisors and their Deputies of all IEC Technical Committees and Subcommittees for which the USNC holds a Secretariat, and individuals representing designated trade associations, testing laboratories, professional societies, and government organizations. There is also a honorary life membership granted to individuals for long or valuable service to the USNC.

ORGANIZATION

As an affiliate organization of the American National Standards Institute, the U.S. National Committee of IEC operates under a special set of bylaws. An Executive Committee administers the affairs of the USNC between the annual meetings of the full Committee. Members of the Executive Committee include the officers of the USNC (a President, three or more VicePresidents, a Treasurer, and a Secretary), the Chairman of the USNC/CEE, and individuals elected from the USNC, to a total Executive Committee membership of thirteen members.

The Treasurer and Secretary of the USNC are appointed by the President with the concurrence of the Executive Committee of the USNC. The Secretary is assigned by the Managing Director of ANSI for appointment by the President.

The U.S. National Committee for participation in CEE activities is responsible for the supervision of the U.S. observer(s) to the CEE and for the development of U.S. positions on CEE matters. The Chairman of the USNC/CEE is nominated and elected in the same manner as the officers of the USNC. Other members of the USNC/CEE are selected or appointed in the same way as advisory group members.

RELATION TO OTHER ORGANIZATIONS

The USNC is the United States member organization of IEC and represents the United States in the IEC. Since the organization is primarily concerned with coordinating and unifying national and international standards, USNC relates to other groups such as the Institute of Electrical and Electronics Engineers and the National Electrical Manufacturers Association in their technical work. The USNC does not, of itself, develop standards.

FINANCE

USNC gets its financial support from various sources. Some professional societies such as IEEE provide special budgets for support of delegates. Several secretariats are underwritten in full by organizations and private companies most interested in the work.

The staff expenses and headquarters operating costs are provided by ANSI. ANSI also pays the USNC dues to IEC. Industry associations, professional societies, and other groups pledge the funds needed to host international meetings.

TECHNICAL WORK

The U.S. National Committee manages its technical participation in IEC work by appointing a Technical Advisor and an Advisory Group for each IEC Technical Committee and Subcommittee. The Technical Advisor is chosen for his expertise in a given field. Most of the advisory groups are American National Standards Institute committees, but some are committees of other national organizations. When there is no parallel committee in the United States, the USNC selects a special group of experts to form an advisory group. More than 2000 individuals make up the membership of these advisory groups.

The technical advisor is responsible for developing a U.S. position on all matters relevant to the scope of his Technical Committee and for presenting the U.S. position to the IEC technical committee concerned. If attendance at international meetings is required, he is also responsible for selecting the delegates and securing financial support. At the present time, the USNC holds the international secretariats of twelve technical committees, and seventeen subcommittees. The USNC usually entrusts the operation of each secretariat to one of its member organizaitons but is responsible to the IEC Committee of Action for the operation of all secretariats accepted.

NATIONAL BUREAU OF STANDARDS
(NBS)

HISTORY

The National Bureau of Standards was established in 1901 when the Office of Weights and Measures located within the Treasury Department was redesignated the National Bureau of Standards. When the Department of Commerce and Labor was established in 1903, NBS was transferred to the new Department. When a separate Department of Labor was established by Congressional action in 1913, the National Bureau of Standards remained with the Department of Commerce where it continues to the present. NBS involvement in electronic computing machines began as part of the Bureau's program of technical assistance to other agencies. In 1946 two agencies asked NBS to provide scientific and advisory services and to act as contracting officer in the procurement of electronic computing machines. During the years that followed, NBS designed and developed the SEAC, SWAC, DYSEAC, MIDAC, and FLAC for its own use or for various governmental agencies.

The decade between 1950 and 1960 at NBS was rich in the development of pattern recognition techniques, optical scanning devices, time-sharing, multi-programming and multi-processing capabilities, and numerous computer applications. In 1964, under a major reorganization of Department of Commerce scientific activities, the Secretary of Commerce designated the Bureau "a principal focal point in Federal Government for assuring maximum application of the physical and engineering sciences to the advancement of technology in industry and commerce." (f)

In 1965 Congress passed the Brooks Act which extended explicitly to computers NBS basic responsibilities specified by the NBS Organic Act. Responsibilities for implementation of the Brooks Act were assigned to three agencies. The Office of Management and Budget was assigned responsibility for exercising fiscal control and providing policy guidance in the ADP area; the General Services Administration was made responsible for ADP equipment procurement and maintenance functions; and the Department of Commerce was authorized: (1) to provide scientific and technological advisory services to other agencies with regard to automatic data processing and related systems; (2) to make appropriate recommendations to the President concerning the establishment of uniform Federal automatic data processing standards; and (3) to undertake research in computer science and technology as needed to fulfill the above responsibilities. The Secretary of Commerce delegated these responsibilities to NBS. In response to the new responsibilities given it under this legislation, NBS brought together several units in 1966 to form the nucleus of the Center (now Institute) for Computer Sciences and Technology.

(f) Reference 40, page 26.

OBJECTIVES

The objectives of NBS as related to standards for computers and information processing are basically those expressed in the Brooks Act and assigned as the responsibility of the Institute for Computer Sciences and Technology.

ORGANIZATION

The National Bureau of Standards reports to the Assistant Secretary of Commerce for Science and Technology. NBS is composed of four organizational components or Institutes, each of which covers broad program areas of research and services. These are the Institute for Computer Sciences and Technology, the Institute for Basic Standards, the Institute for Materials Research, and the Institute for Applied Technology.

INSTITUTE FOR COMPUTER SCIENCES AND TECHNOLOGY. This Institute provides scientific and technical guidance to the effective use of computers and automation technology in the Federal Government. ICST develops Federal Information Processing Standards and is responsible for managing the Federal Standards program for ADP equipment. The Institute works with special interest communities in the development of voluntary standards for computer usage. ICST provides technical support in the formulation of international policy involving computers. ICST conducts research in computer sciences as required to fulfill its role of technical advisory to the Federal Government in effective utilization of computers; the Institute also operates the NBS central computer facility.

INSTITUTE FOR BASIC STANDARDS. This Institute provides the central basis within the United States for a complete and consistent system of physical measurements, and coordinates that system with measurement systems of other nations. IBS furnishes the research and essential services leading to accurate and uniform physical measurements and reliable data throughout the nation's scientific, industrial, and commercial communities, on properties of matter for their use. The Center for Radiation Research is located in the Institute for Basic Standards. The Center constitutes a prime resource within NBS for the measurement and standards work and basic research in radiation for NBS and other agencies and institutions. IBS is responsible for the operation of NBS Boulder Laboratories and is cosponsor of the Joint Institute for Laboratory Astrophysics with the University of Colorado.

INSTITUTE FOR MATERIALS RESEARCH. This Institute conducts research to provide a better understanding of the basic properties of materials and develops standards for measuring their properties to help ensure proper utilization of technologically important materials by the nation's scientific, commercial and industrial communities. IMR develops, produces, and distributes Standard Reference Materials which provide a basis for calibration of instruments and equipment and comparison of measurements on materials and aids in the control of production processes in industry. IMR also conducts research on the fundamental properties of matter and materials; and develops techniques for the preparation and characterization of special research materials.

INSTITUTE FOR APPLIED TECHNOLOGY. The Institute is responsible for facilitating the more effective use of technological standards and developments by Government and industry. IAT represents the public interest in the voluntary engineering standards system of the country. The Institute serves as a national resource in the development of standards, tests, or specialized services required by law for the protection of the public from special hazards. IAT also promotes the use of the performance concept in standards-making, whereby user requirements are the basis for evaluating products, components, or technological processes. (g)

RELATION TO OTHER ORGANIZATIONS

NBS is primarily concerned with Federal standards, but it takes an active part in all national and international standardization efforts. The Federal Government is a major contributor to the work of the American National Standards Institute (ANSI). The Director of the National Bureau of Standards is a member of the ANSI Board of Directors. Representatives from various Government departments and agencies participate through the councils, boards, committees, subcommittees, and task groups of ANSI, IEC, and ISO.

FINANCE

The National Bureau of Standards is an operating unit of an Executive Agency (the Department of Commerce) of the Federal Government and, as such, is supported by public funds.

TECHNICAL WORK

The Federal Information Processing Standards (FIPS) program is responsible for the technical work related to standardization in computers and information processing. The responsibility for the operation of the program is vested in the Institute for Computer Sciences and Technology of NBS.

The Federal Information Processing Standards Coordinating and Advisory Committee (FIPSCAC) was chartered to advise the Secretary of Commerce on matters relating to the nation's needs with respect to Federal information processing (automatic data processing) standards. The Committee functions as an advisory body and serves as a vehicle for coordinating the work assignments of a series of FIPS Tasks Groups and as a general advisory group to the Department of Commerce on information processing standards. The Committee's activities include providing advice on specific draft proposals in the automatic data processing (ADP) standards area, making recommendations on specific ADP standards problems, reviewing draft proposals developed by FIPS Task Groups, and advising on current and emerging issues related to ADP standards.

(g) Reference 42.

The members and Chairman of FIPSCAC are appointed by the Assistant Secretary of Commerce for Science and Technology. The Committee consists of at least fifteen, but not more than thirty, qualified experts on ADP selected from U.S. Government agencies and other public as well as private organizations. The Associate Director for ADP Standards, NBS, is the Chairman of FIPSCAC. The Chairman of the Interagency Committee on ADP (IAC/ADP) is also a member, as are the Chairmen of all Task Groups. Members are appointed to serve for a period of two years.

The Secretary of Commerce, or the Committee with his concurrence, may establish task groups as may be deemed appropriate to assist the Secretary or the Committee in the performance of their responsibilities. New task groups are formed, as required, by NBS when the need for such action is perceived by the Committee. NBS informs the Interagency Committee for ADP of the intent to form a new Task Group and its proposed scope of work, and thereby invites the participation of technically qualified personnel from all Federal agencies. The proposed work statement for each Task Group is reviewed by FIPSCAC and approved by NBS. Each Task Group is requested to develop a detailed work plan and to submit target dates for completion of the work assigned. The work that is assigned to a Task Group may be the review of a proposed recommendation or directive concerned with Federal Information Processing Standards, or the task may consist of the development of a draft proposed standard in a particular area. In either event, the final product of the Task Group is a recommendation to NBS which is transmitted via FIPSCAC and considered to be advice to the National Bureau of Standards in matters relating to the development, adoption, and implementation of Federal ADP Standards. (h) (i)

As of September 1976, there were thirteen FIPS Task Groups active. These include:

Task Group No.	Task Assignment
5	Federal Information Processing Vocabulary
9	COBOL Standard
10	Computer Performance Management
11	Optical Character Recognition
13	Workload Definition and Benchmarks
14	Documentation for Information Processing Systems
15	Computer Systems Security
16	BASIC Standard Programming Language
17	Data Element Directories
18	Computer Output Microfilm
19	APT Programming Language
20	User-Terminal Protocols
21	Multi-Vendor ADP Systems

(h) Reference 59. (i) Reference 23, pages 46-48.

Members of FIPS Task Groups participate as qualified experts having knowledge of their agencies' interests in the areas assigned to each Task Group. However, an agency is not bound by the individual views of its task group representative. Upon completion of the assigned task, a Task Group is dissolved by NBS with the advice of the FIPS Coordinating and Advisory Committee.

FIPS REGISTER. The Federal Information Processing Standards Register serves as the official source of information throughout the Federal Government pertaining to the approval, implementation, and maintenance of Federal Information Processing Standards resulting from the provisions of Public Law 89-306 (the Brooks Act). The intended use of the Register is to provide a single source of timely information concerning standards for use by agency managers. The Register contains information on standards classified by five categories: Hardware, software, applications, data, and ADP operations. Figure 17 provides a list of the 44 documents currently (end of FY 1975) listed in the Register and classified by type of document, i.e., standards, guidelines (recommended practices), or program management (information) documents.

FEDERAL TELECOMMUNICATION STANDARDS PROGRAM. In addition to its responsibility for uniform Federal automatic data processing standards relating to equipment, techniques, and computer languages, NBS has a mutual responsibility with the National Communications System (NCS) for the development and coordination of technical and procedural standards for data transmission and the computer telecommunications interface. The program is coordinated by the Federal Telecommunication Standards Committee, an interagency body established for that purpose. Membership in the Federal Telecommunication Standards Committee consists of representatives of each major operating agency of the NCS, representatives of the National Bureau of Standards, the General Services Administration, the National Security Agency, the Federal Communications Commission, and representatives of such other Federal agencies as a majority of the FTSC may consider appropriate. The Assistant Manager of NCS Technology and Standards of the Office of the Manager, NCS, is Chairman of the FTSC.

The technical work of the Federal Telecommunication Standards Committee is performed by Subcommittees that are established for the purpose of developing telecommunications standards, as the need for these is perceived. NBS and NCS jointly approve the scope and program of work for the development project for each proposed standard. Letters requesting Federal agency comments may be transmitted either by NBS or by NCS, depending on the assigned responsibility for a given standard. A fully coordinated standard is considered to be a joint recommendation from the two agencies and is forwarded simultaneously to the Administrator of General Services Administration through the Office of Telecommunication Policy for approval. An approved standard is issued as a single document that is clearly identified as belonging to both the Federal Information Processing Standards Series and the Federal Telecommunication Standards Series. (j)

(j) Reference 24, pages 45-52.

CONFERENCE ON DATA SYSTEMS LANGUAGES
(CODASYL)

HISTORY

Late in May of 1959 a meeting was held in the Pentagon to consider the desirability and the feasibility of establishing a common language for the programming of business-type applications. Present at the meeting were representatives of users, both those in the private sector and those in government, computer manufacturers, and other interested parties.

At this meeting the concept of three committees was agreed upon and the Short Range, Intermediate Range, and Long Range Committees were established. The Short Range Committee eventually became the official COBOL branch of CODASYL and the Intermediate and the Long Range Committees evolved into the Systems and Language Structures Committees respectively.

At the initial meeting "the Short Range Committee was given the task of developing an immediate language and was instructed to take the best of three existing language-compiler systems-- FLOWMATIC, AIMACO, and Commercial Translator--and to produce a language superior to any of these." (k)

By September 1959 this committee had specified wnat, in the Committee's opinion, was such a language. The specifications were modified further and by December 1959 COBOL existed as a language that was not identified with any manufacturer. The product of this phase of COBOL development was a report which was published in April 1960 and which has since become known as COBOL-60. Recognizing the evolving nature of the language, CODASYL, through its working committees, has published several editions of the COBOL language.

In 1961 a portion of the Intermediate Range Committee was combined with the Long Range Committee to form the Development Committee. Out of this group came a Decision Table Structured Language (Detab X) and a nonprocedural approach to problem statement identified as "Information Algebra."

OBJECTIVES

CODASYL is dedicated to the development of Data Systems Languages independent of any make or model of computer, and provides a forum for the exchange of ideas and knowledge related to those languages. Standardization is the responsibility of the appropriate groups of ANSC X3.

(k) Reference 41, page I-1-2.

MEMBERSHIP

Membership in CODASYL is through membership on a standing committee, each of which accords membership according to its individual rules. In the case of the Programming Languages Committee (PLC), there is a 25-member limit and the added stipulation that not more than two-thirds of the members can be from any one segment of the industry, i.e., users or implementors. Membership in one of the subcommittees does not constitute membership in the parent standing committee.

ORGANIZATION

CODASYL is organized as four standing committees reporting to the Executive Committee: the Systems Committee, the Programming Language Committee, the Data Description Language Committee, and the FORTRAN Data Manipulation Language Committee.

EXECUTIVE COMMITTEE. The Executive Committee is composed of not more than 15 members "who are accepted from written applications and nominations from individuals who have made significant contributions to the advancement of the goals of CODASYL." In addition, the chairman of each standing committee is a member of the Executive Committee. The Chairman is elected by the committee members at the first meeting of each calendar year. The Vice Chairman and secretary are appointed by the Chairman.

The Executive Committee provides policy guidance and direction to the standing committees, establishes publication policies, approves all formal publications of CODASYL, establishes membership policy, appoints chairmen of the standing committees and reviews membership in the standing committees periodically.

THE STANDING COMMITTEES. The Programming Language Committee is a development group responsible for the development of a language whose objective is directed to compatible, uniform source programs which require minimal changes for conversion or interchange. The committee concentrates its efforts on the tools and techniques needed by applications programmers. The principal products of the Programming Language Committee are the COBOL Language and the FORTRAN Data Manipulation Language.

The Systems Committee's purpose is to build up an expertise in, and to develop, advanced languages and techniques for data processing with the aim of automating as much as possible of the processes currently thought of as systems analysis, design and implementation.

The Data Description Language Committee is charged with furnishing and maintaining the specifications for a common data description language independent of any high-level programming language.

RELATION TO OTHER ORGANIZATIONS

CODASYL is recognized internationally as the language development body for COBOL. The ANSI standards body uses the CODASYL work as the base for the American National Standard for COBOL. All clarifications, changes or corrections are approved by the Programming Language Committee before incorporation into American National Standard COBOL.

FINANCE

CODASYL is completely supported by the contributed work of its members. There are no membership dues or other assessments.

TECHNICAL WORK

The technical development work is vested in three committees, i.e., Programming Language, Systems, and Data Description Language Committees.

The responsibility for the major portion of the development work for the COBOL language resides in the Programming Language Committee. The Programming Language Committee is responsible for the preparation of the COBOL Journal of Development. Extended capabilities are added to the language as they are developed by the task groups and approved by the Committee.

Task Groups are established as the need is recognized and become responsible for functional segments of the COBOL language. Each task group is responsible for the language extensions and the modifications required in the base Journal of Development for a particular project.

Task Group membership is by organization, but is not restricted to the same organizations as those of the parent committee. For example, a member of the Data Base Language Task Group may represent an organization which does not choose to be a member of the Programming Language Committee. As projects are completed, the task groups are disbanded, so that over any period of time the complement of task groups is continually changing.

ELECTRONIC INDUSTRIES ASSOCIATION
(EIA)

HISTORY

The Association was organized in 1924 under the name of Radio Manufacturers Association and went through two changes of name before its present name was adopted in 1957. In 1965 the EIA absorbed the Magnetic Recording Industry Association, and in 1975 the Eastern and Central Divisions of the Association of Electronic Manufacturers were merged with the Distributor Products Division of EIA. The Electronic Industries Association is a national trade organization representing the full spectrum of manufacturers of electronic products in the United States.(1)

OBJECTIVES

As a national organization EIA confines its activities to the area of legitimate public interest objectives under the policy direction of its Board of Governors. The following are some of the major objectives of EIA:

Advance the growth and technological progress of the industry.

Coordinate and convey the views of Association members to appropriate bodies on legislation regulations, and allied industry organizations.

Provide a forum for industry representatives to discuss matters affecting the interests of the industry and to implement the policies of the Association.

Assist the Department of Defense and the Armed Services in obtaining the most advanced and reliable products and scientific development from industry through an interchange of information and ideas.

MEMBERSHIP

The membership consists of companies engaged in the manufacture of electronic products. Company members may choose membership in one or more Divisions, depending on the products they manufacture or market. The Association has also another category of membership, that of Associate Member, which is open to certain other organizations.

(1) Reference 20.

ORGANIZATION

EIA is headed by a Board of Governors, with the management function vested in the President of the Association, several Vice Presidents, a Treasurer, and a General Counsel and Secretary. The Association fulfills its responsibilities to its membership through ten Divisions each of which is structured to serve the needs specific to the product lines manufactured by the member companies. Nine of these Divisions are product-oriented and include the Consumer Electronics Group which comprises three Divisions--Audio, Video, and Calculator, the Government Products Division, the Communications Division, the Industrial Electronics Division, the Solid State Products Division, the Parts Division, and the Tube Division. The tenth Division, Distributor Products, represents the manufacturers who market their products through distributors of electronic parts.

Two Departments, Marketing Services and Engineering, provide support services to the ten product-oriented Divisions. The Marketing Services Department publishes on a regular basis data on all facets of the electronics industry. The data is accumulated from information on sales and production voluntarily supplied to the Association by more than 500 companies. Indicative of the kinds of data published are a few selective titles such as the Electronic Market Data Book, Electronic Market Trends, and Sources of Electronic Market Information.

The engineering and technical activities of the Association are conducted through its Engineering Department. Over 4,000 industry and government representatives participate in approximately 225 of the Department's committees engaged in the development of EIA Standards and Engineering Bulletins. These committees prepare technical positions and recommendations on proposed government specifications and standards, as well as on revisions of existing specifications and standards. This Department also manages the public review and comment resolution phase in the standards development process. Through its Technical Advisory Groups, the Engineering Department is responsible for directing the Association's international standardization activities which interface with the IEC and ISO. During 1975 the EIA provided the Secretariat for 12 IEC Technical Committees, Subcommittees, and Working Groups, and served as the administrator of the U.S. National Committee for 29 of the 177 IEC Committees and Subcommittees.

For activities that cross Division lines and offer benefits to the entire EIA membership, the Board of Governors has established various Councils, Panels, and Committees. There are four Councils: Government Procurement Relations, Industrial Relations, Public Affairs, and International Business; and six Panels: Energy, Environmental, Government Technical Requirements, Patents and Proprietary Information, Metric Study and Traffic. The Association's eight Committees are: Annual Awards, Credit, Executive, Finance, Law, Membership and Scope, Salary Review, and Multipartite and Similar Accords. The last-named Committee serves as the Association's focal point for international product certification. Its principal activity over the immediate past years was (and continues to be) the emerging Quality Assessment System for Electronic Components (IECQ System) of the IEC. The EIA is participating together with the U.S. National Committee of the IEC in the formation of the system. This pilot scheme is a cooperative undertaking of western European countries, Russia, Japan, Canada, Australia, and the United States. (m)

RELATION TO OTHER ORGANIZATIONS

The EIA relates to other standards making bodies through the technical engineering committees of its Engineering Department, as noted above. The responsibility for the data communication standards program in the United States is shared by the Technical Committees of EIA and ANSC X3S3. These efforts are coordinated with those of CCITT, ISO, and IEC. Several EIA standards have been approved as ANSI standards.

FINANCE

Member companies pay dues that are assessed as a small percentage of the sales value for the preceding year of the electronic product lines served by the one or more Divisions to which each company may belong.

TECHNICAL WORK

To accomplish work in the data processing area, EIA's Engineering Department set up three committees and designated them as TR29, TR30, and TR37. TR30 holds joint metings with X3S3 on a regular basis with several individuals holding dual memberships.

TR29 Facsimile Systems and Equipment.
SCOPE: To develop and maintain standards for the interface between communication equipment and facsimile terminal equipment, and other standards that describe the characteristics of the facsimile terminal equipment.

(m) Reference 20, page 25.

TR30   Data Transmission and Equipment.
SCOPE: To develop and maintain standards for the interface
between data communication and data terminal equipment, including
work on data signaling speeds and on the interface between digital
data terminal equipment and signal converters, data sets, or
modems.   TR30 provides liaison and cooperation with ANSC on Data
Transmission and supports U.S. participation in international
standardization activity in this area.

TR37   Communications Interfaces.
SCOPE: To develop and maintain standards for the interface
between common carrier-provided communication equipment and
systems. This includes work on data, graphic, and voice
communication systems. The work program is oriented around the
existing common carrier tariffs which permit the connection of
customer provided equipment to the network through common
carrier provided connecting arrangements.

NATIONAL FIRE PROTECTION ASSOCIATION
(NFPA)

HISTORY

The National Fire Protection Association was organized in 1896 and was incorporated in 1930 in the State of Massachusetts.

Although the work of the Association has always been devoted to fire protection and prevention, the organization of the Electrical Section came as late as 1948. At the same time the NFPA Board of Directors organized a National Electrical Code Committee consisting of a correlating committee and a number of Code-making panels.

OBJECTIVES

As stated in the Articles of Organization the purposes of the Association are: "To promote the science and improve the methods of fire protection and prevention; to obtain and circulate information on these subjects and to secure the cooperation of its members and the public in establishing proper safeguards against loss of life and property by fire."(n)

MEMBERSHIP

There are four membership categories: Regular, Organization, Sustaining, and Honorary. The first two categories are most directly involved in NFPA activities. Regular membership is open to all individuals interested in the work of the Association. Each member has one vote at the regular NFPA meetings. Organizationn membership is available to institutes, societies, or associations concerned with the reduction of fire losses. Organization members have six votes at the meetings. Special interest groups of industrial, railroad, electrical, chief electrical inspector, fire marshal and fire service interests coordinate their activities within "Sections" of the membership. (o)

ORGANIZATION

The officers of the Association are the President, Treasurer, Secretary, Chairman, First Vice Chairman, and Second Vice Chairman of the Board of Directors. The Board of Directors which consists of eighteen Directors elected by the membership, has general charge of the affairs of the Association. The Standards Council administers the standards development activities of the NFPA in accordance with established bylaws.

The Association has an Annual Meeting and a Fall Meeting each year. Officers are elected at the Annual meeting. Action is taken on the recommendations of the technical committees and of the Board of Directors at both the Annual and Fall Meetings.

(n) Reference 43, page 3.
(o) Reference 43, page 4.

RELATION TO OTHER ORGANIZATIONS

The NFPA participates in the activities of the International Standards Organization and is a member of the Joint Council of National Fire Service Organizations. The Association is a Member Body of the American National Standards Institute and sponsors that organization's Technical Committee C1. The NFPA also participates in other capacities and activities of ANSI as well as in several consensus and testing organizations of the United States.

FINANCE

The NFPA is a non-profit organization supported by fixed annual fees for all classes of members.

TECHNICAL WORK

Technical Committees to handle problems of concern to the Association are created and operate under the authority of the Board of Directors. A statement containing the scope of work for a proposed Technical Committee, together with a list of interests to be represented thereon, is submitted for approval by the Standards Council prior to the establishment of a Technical Committee. Once formed, the Technical Committee functions until discharged by the Council, consolidated with another committee, or discontinued by other action of the Council.

Under the Association's five-year policy, standards that have been approved for five years without amendment are recommended for reconfirmation or withdrawal by the Technical Committee responsible for the Standard. The five-year time period may be extended by a request directed to and approved by the Council.

Through its National Electrical Code Committee the NFPA sponsors the National Electric Code (NFPA No. 70) and other standards in the field of safety in use of electricity. Each edition of NFPA No. 70 is submitted to the American National Standards Institute for approval as an ANSI Standard by Technical Committee C1. Article 645 of NFPA No. 70 (ANSI C1-1971), "Data Processing Systems," has as its scope "equipment, power supply wiring, equipment interconnecting wiring, and grounding of data processing systems, including data communications equipment used as a terminal unit." (p)

The formation of the Committee on Electronic Computers was approved by the NFPA in January 1970 in response to a request for standardization of fire protection recommended by the computer industry. The scope of this Technical Committee reads as follows: "To prepare standards for the protection of electronic computer equipment, components and associated records." This Committee is responsible for NFPA 75 (ANSI C128.1-1974), "Electronic Computer/Data Processing Equipment" which was approved by the Association in 1962 and revised in 1963, 1964, 1968, and 1973. (q)

(p) Reference 43, page 70-489.
(q) Reference 43, page 38.

UNDERWRITERS LABORATORIES, INC.
(UL)

HISTORY

The Underwriters Laboratories, Inc. was founded in 1894, chartered by the State of Illinois in 1901, and incorporated under the laws of Delaware in 1936. It is chartered as a non-profit corporation without capital stock, and dedicated to public safety.

The organization was established to provide services associated with the evaluation and testing of products, materials, devices, etc., for safety in use. Testing laboratories are maintained at five locations in the United States; equally important with UL's examination and testwork is its inspection and follow-up program in the factories where listed devices are manufactured. At the end of 1974, there were 150 inspection centers operating in the United States and 47 centers serving manufacturers in 38 foreign countries. (r)

An important part of the work of the Underwriters Laboratories is the development of standards which provide specifications and requirements for construction and performance under test and actual use of systems, materials and appliances of numerous types.

OBJECTIVES

As stated in the Certificate of Incorporation (Reference 57), the principal objectives are:

By scientific investigation, study, experiments, and tests, to determine the relation of various materials, devices, products, equipment, constructions, methods, and systems to hazards appurtenant thereto or to the use thereof, affecting life and property and to ascertain, define and publish standards, classifications and specifications for materials, devices, products, equipment, constructions, methods, and systems affecting such hazards, and other information tending to reduce and prevent loss of life and property from such hazards. (Article 3.1.1)

To contract with manufacturers, governmental agencies and others, for examination, classification, testing and inspection of materials, devices, products, equipment, constructions, methods, and systems with reference to hazards affecting life and property; and to report and circulate the results of such examination, test, inspection, and classification to insurance organizations, public safety authorities, governmental bodies or agencies, other interested parties and public by the publication of lists and descriptions of such examined, tested, inspected or classified materials, devices, products, equipment, constructions, methods and systems by the provision for the attachment of markings or labels thereto or issuance of certificates thereon, or in such other manner as from time to time may be deemed advisable. (Article 3.1.2)

(r) Reference 56, pages 10,11.

MEMBERSHIP

UL does not have member companies as do other standards making bodies but provides a broad base for public service by the requirement that all individual Members and Trustees be associated with one of the following categories: insurance industry, consumer interest, governmental body or agency, education, public safety body or agency, safety expert, standardization expert, public utility, or officer of the corporation. No more than one-third of the Board of Trustees may be from any one of these categories. (t)

ORGANIZATION

The business of Underwriters Laboratories is managed by a Board of Trustees whose officers consist of a Chairman, a President, one or more Vice Presidents, a Secretary, and Treasurer. In 1967 the Consumer Advisory Council was formed "to advise Underwriters Laboratories in establishing levels of safety for consumer products." The CAC reviews the UL Standards and Bulletins which concern consumer products, thus providing an informed consumer input to the evaluation process for safety standards. There are also eleven Commercial and Industrial Equipment Users Advisory Conferences that were established to provide user input to the development process of UL Standards for Safety for products that are not generally classed as consumer products. These Conferences are chaired by UL engineers who have major responsibility in the product areas of interest to each Conference. (u)

The Laboratories' five Engineering Councils: Burglary Protection, Casualty, Electrical, Fire, and Marines, act in both a technical and a judicial capacity to assure that safety requirements are based on realistic considerations of practical field experiences as well as on laboratory tests and sound engineering judgment. Membership on these Councils is restricted to individuals associated with enforcement authorities in the field of public safety of concern to each Council, government officials with responsibility for the establishment of safety standards, technically-qualified university personnel, and appropriate insurance interests.

(t) Reference 57, Article 5.1.
(u) Reference 56, page 17.

The operations of Underwriters Laboratories consist primarily of two types of services: New Work Engineering and Factory Followup Services. The six engineering departments that comprise New Work Engineering, perform the testing and evaluation of products submitted to UL and ascertain whether or not the products are in conformity with established requirements. Engineers of these departments are also actively involved in the standardization process itself. Factory Follow-up Services are responsible for the inspection of manufacturing plants and their production control methods in order to determine that production units meet safety requirements. These factory inspection services are performed in accordance with contractual agreements between the Laboratories and individual manufacturers.

RELATION TO OTHER ORGANIZATIONS

In its work in standardization, Underwriters Laboratories cooperates with many organizations including the American National Standards Institute, the American Society for Testing and Materials, and the National Fire Protection Association. The National Bureau of Standards acts as an arbitrator in the event of a disagreement between the Laboratories and a client.

FINANCE

Underwriters Laboratories, Inc. is supported by charges made to clients and subscribers for its services. These charges are on a time and material basis and are not affected by the nature of the report rendered, whether favorable or unfavorable.

TECHNICAL WORK

Published Standards for Safety are the basis of UL evaluation and testing of most products and materials. Consumers, users, manufacturers, government organizations, and insurance interests all provide input to the standards development process through the various UL Advisory Conferences and Engineering Councils.

All significant suggestions received by UL during the standards development process are submitted to the cognizant Engineering Councils for review and comment before official adoption action is taken by the Laboratories. As of 1974 there was a total of 355 published UL Standards for Safety. UL policy is to submit its Standards to the American National Standards Institute for approval as American National Standards.

In the field of safety standards, UL provides the Secretariat for three IEC Technical Committees, one of which is TC 74, Safety of Data Processing Equipment and Office Machines.

THE STANDARDS COUNCIL OF CANADA
(SCC)

HISTORY

The Standards Council of Canada is an independent agency that was created by an act of Parliament in October of 1970.

OBJECTIVES

The Council acts as a national coordinating body through which accredited organizations concerned with voluntary standardization may operate and cooperate to recognize, establish and improve standards in Canada and develop a comprehensive Canadian standards program to meet both national and international requirements and responsibilities.

The principal objects of the Council are to foster and promote voluntary standardization as a means of advancing the national economy, benefitting the health, safety and welfare of the public, assisting and protecting the consumer, facilitating domestic and international trade, and furthering international cooperation in the field of standards.

ORGANIZATION

The Standards Council of Canada is made up of 57 members: 41 members representing a national cross-section of private interests; six members from the Public Service of Canada; and ten members appointed to represent the Provinces. A nine-member Executive Committee appointed by and from the members of Council assumes responsibility for the conduct of Council affairs between meetings of the latter.

The Standards Council sponsors the National Standards System which is a national federation of established organizations involved in the preparation of voluntary standards for application in both the public and private sectors, as well as organizations and laboratories engaged in certification and testing activities.

RELATION TO OTHER ORGANIZATIONS

The SCC is the Member Body for Canada in the ISO, and the sponsor of Canada's National Committee, the Member Body of IEC. The Council has designated the Canadian National Committee of the International Organization for Standardization (CNC/ISO) and the Canadian National Committee of the International Electrotechnical Commission (CNC/IEC) as the responsible agencies for Canadian international standardization activity.

Both CNC/ISO and CNC/IEC have established Canadian Advisory Committees for each of the approximately 200 technical committees or subcommittees in which Canada has Participating or Observer status.

FINANCE

As a corporation established by Act of Parliament, the Council is financed by Parliamentary appropriation. The Council reports to Parliament via the Minister of Industry, Trade, and Commerce but is independent in its policies and operations.

TECHNICAL WORK

The Standards Council of Canada does not develop, publish, or sell standards. This prerogative belongs to Canada's standards-writing organizations which have been actively involved in standardization activity for many years. The SCC discharges its responsibilities by bringing together well established organizations into the National Standards System. Four independent elements comprise the System: accredited standards-writing organizations; accredited certification organizations; accredited testing laboratories; and the Canadian National Committees that represent Canada in the ISO and IEC.

The Council has developed criteria for: the preparation and approval of National Standards of Canada; and the accreditation of standards-writing organizations to the National Standards System. It is now in the process of developing criteria for the accreditation of certification organizations and testing laboratories. To rationalize the work of the accredited organizations, the Council approves the division of subject areas among standards-writing organizations on the basis of the principle of primary interest. This principle does not preclude other organizations from preparing standards in which aspects of the primary interest area exist, provided that the primary interest aspects are adequately covered by reference to relevant existing standards and provided further that there is consultation with the organization responsible for the primary interest area.

Currently (1976) there are six accredited standards-writing organizations in the National Standards System of Canada. These organizations include the Canadian Gas Association, the Underwriters Laboratories of Canada, the Canadian Government Specifications Board, the Electronic Industries Association of Canada, the Bureau de Normalisation du Quebec, and the Canadian Standards Association. A brief description of the first five of these organizations is provided immediately below. The Canadian Standards Association is treated at length because of its assigned responsibility for the data processing field.

THE CANADIAN GAS ASSOCIATION is a nonprofit volunteer standards organization which was founded by industry in 1907. The primary interest area assigned to CGA includes gas-fired equipment and accessories. Under its program of equipment testing and certification which the Association began in 1956, CGA certifies and provides testing services for fuel-fired equipment of all types and sizes. The Association also writes standards for the fuel-firing and electrical features of fuel-firing equipment.

THE UNDERWRITERS LABORATORIES OF CANADA was incorporated in 1920 as a nonprofit organization. ULC is sponsored by the Canadian Underwriters Association and its services and activities include certification, testing, issuing of standards and specifications related to crime prevention and hazards to life, fire, and casualties. The broad subject area assigned to ULC by the Council includes fire hazard, fire protection, and associated life safety related to product use or application in a system.

THE CANADIAN GOVERNMENT SPECIFICATIONS BOARD was created in 1934 as the aftermath of a conference to establish the Canadian Government Purchasing Standards Committee for the purpose of preparing procurement specifications for the Federal Government, primarily for non-military materials and supplies. The Board's function is to write standards for areas other than engineering; it does not provide certification or testing services. The Council assigned to the Specification Board 56 subject areas as primary interest responsibilities.

THE ELECTRONIC INDUSTRIES ASSOCIATION OF CANADA was approved for accreditation by the Council on February 24, 1975. Subject areas for the purpose of preparing National Standards assigned to the Association comprise the broad area of electronic components intended for use in equipment for telecommunications and electronic devices employing similar techniques.

THE BUREAU DE NORMALISATION DU QUEBEC was approved for accreditation by the Council on June 3, 1974. Subject areas for assignment to the BNQ have not as yet been identified. (v)

(v) References 50, 51, 52.

CANADIAN STANDARDS ASSOCIATION
(CSA)

HISTORY

The Canadian Standards Association is a nonprofit volunteer standards organization which was incorporated in 1919 as the Canadian Engineering Standards Association. The present form of the name was adopted in 1944 when the Association broadened its scope of work to include many sectors of Canadian industry. In addition to issuing standards, the CSA provides testing, examination, and certification services. The primary interest area assigned to the Canadian Standards Association by the Council includes the broad subject area of electrical products, materials, and equipment.

A specification committee on Computers and Information Processing was established in 1965 to assume the functions of the Canadian Joint Advisory Committee on IEC/TC 53 and ISO/TC 97. This was replaced in 1969 by the Sectional Committee on Computers and Information Processing and Office Machines.

OBJECTIVES

CSA objectives are:

To promote the establishment of uniform, nationwide standards for products, processes and procedures.

To provide the organization, coordinating staff and facilities to receive requests for standards, investigate their desirability and arrange for the formation of a Committee to write the standards.

To provide testing, examination, and certification services. (w)

MEMBERSHIP

Members are drawn from producers, consumers, scientific and technical societies, inspection interests, government departments both Federal and Provincial, and educational institutions.

There are two categories of membership, i.e., sustaining member and individual member. Individual members are further classified as to co-opted, associate, and honorary.

A sustaining member may be an individual, a parternership, a company, a governmental or municipal department or agency, a public utility, an industrial or technical association, etc. To be eligible for membership, the applicant must be accepted by the CSA Board of Directors.

(w) Reference 14, page 2.

Individual membership applies to those individuals who participate in the work of the Association through their appointment to Standards or Section Committees. In all categories, individual membership is based on nomination by two members and election by the Board of Directors.

ORGANIZATION

The Association is governed by a Board of Directors, which may delegate its authority for the operation of such Divisions, Boards, Councils and Committees as may be deemed necessary to carry out its purpose. (x)

The officers of the Canadian Standards Association are elected every two years. Standards and certification activities are carried out by several departments under the Managing Director. These departments include National Standards, International Standards, Certification, Planning and Development, Finance and Administration departments.

The Board of Directors is responsible for investigating the need for and the practicality of a standard on a specific subject. If the board approves, a standards committee is established.

The Standards Review Board is responsible for the final approval and adoption of a CSA Standard.

The CSA Sectional Committee on Computers, Information Processing and Office Machines (CIPOM) plays about the same role in Canada as X3 does in the United States. The basic difference is that in Canada the Sectional Committee is considered a part of CSA, whereas in the United States American National Standards Committee X3 belongs to the organizations which comprise the Committee rather than to ANSI which is forbidden by its Constitution to formulate standards.

RELATION TO OTHER ORGANIZATIONS

CSA positions on technical and administrative issues are contributed to the Standards Council of Canada. The SCC represents Canada in the ISO and IEC.

In Canada, CSA is closely affiliated with the National Research Council, the Central Mortgage and Housing Corporation, the Canadian Government Specifications Board, the Standards Division of the Department of Trade and Commerce, as well as numerous Provincial Government Authorities.

CSA is not a government organization but enjoys the cooperation of those departments of Federal and provincial governments that are concerned with the preparation and use of voluntary standards. As an example, CSA, through the Sectional Committee on welding, develops and approves welding standards. The Canadian Welding Bureau then tests and certifies fabricators and contractors for conformance to these standards.

(x) Reference 11, Article 1.3.

FINANCE

Sustaining membership fees are an important source of revenue, but income also comes from publication of standards and other publications, certification fees and various other sources. The Association has the right to borrow money, issue bonds and debentures, and mortgage its property.

TECHNICAL WORK

The procedure for developing and establishing a CSA standard starts with a request to the CSA from any consumer group, governmental department, or other interested party that standards be written in a given area. The Association then investigates the stated need and forms a committee to write the required standards. The Committee consists of knowledgeable experts in the area of concern, users, and representatives of regulatory authorities. CSA has over 600 such committees with a total membership of more than 5,000 participants. Standards developed by CSA are used as the basis of legislation passed by all three governmental levels in Canada.

Canadian standards in the information processing field are developed by the Sectional Committee on Computers, Information Processing and Office Machines (CIPOM). Through its Canadian Advisory Committee, CIPOM is responsible to the Canadian National Committee and ISO for Technical Committees 97 and 95. CIPOM was organized in 1969; its principal duties are "to ensure balanced representation of the technical work performed by the Standards Committees, to ensure that relevant and timely standards are prepared for the community and to provide liaison with other agencies involved in standardization in the government, industry, and national bodies outside Canada." (y)

As of 1975 CIPOM had nine Committees and three Subcommittees under its jurisdiction, each of which is assigned to a particular area of CIPOM's scope. These committees and the scope of each are given below:

Committee on Character Sets and Coding.
SCOPE: The standardization of coded character sets, code extension, definitions of characters for representation by single and multiple bytes, and coded representation of characters recorded in media for the interchange of coded information between devices, equipment and systems.

Committee on Representations of Data Elements.
SCOPE: Standardization of the representations of commonly interchanged data elements to facilitate information interchange and information processing.

(y) Reference 12, page 1.

Committee on Problem Definition and Systems Analysis.
SCOPE: To process appropriate standards on problem definition
and systems analysis which assure a complete and valid description
of information processing problem requirements, and the most
appropriate means and plans to meet them, to consider means,
format, context and other techniques by which the foregoing may
be described. In particular, the area of methodology, data
representation and flowchart symbology are pertinent to the
problem of achieving a systematic means of preparing the
required information for analysis.

Committee on Data Communications.
SCOPE: To develop national standards for system functions,
procedures and parameters necessary for the transfer of data
between data systems over communication networks.

Committee on Character Recognition.
SCOPE: The standardization of the shapes of characters and marks
for input and output of data, for exchange among data processing
systems and associated equipment using machine-legible characters
or marks printed by hand or by machine, and of the associated
print quality requirements.

Committee on Programming Languages.
SCOPE: The standardization of programming languages and other
software of broad utility, with provision for revision,
expansion and strengthening and for the definition and
approval of test problems as aids in assessing the conformity of
compilers to one or other of the standardized programming
languages.

Committee on Magnetic Input/Output Media.
SCOPE: The standardization of those physical characteristics
of magnetic input/output media which are required for the
interchange of information among data processing systems of
associated equipment.

Committee on Keyboards.
SCOPE: Standardization concerning keyboard arrangements
in the areas of office machines, data processing equipment,
and other related fields.

Committee on "Credit Cards" and Identification Cards.
SCOPE: To develop recommendations for specifications for credit
cards and identification cards and develop a universal
numbering system to facilitate data interchange.

Subcommittee on Paper Tape
SCOPE: Standardization of the physical characteristics of paper
tape which is used for the interchange of information among data
processing systems and associated equipment.

Subcommittee on Vocabulary.
SCOPE: To provide a glossary for information processing systems
and related subjects covered in the general scope of ISO/TC 97 and
where appropriate, abbreviations and letter symbols.

Subcommittee on Publicity.
SCOPE: Preparation and issuance of news releases to appropriate
news media and to the CSA Public Relations Department.   (z)

(z) Reference 13.

JAPANESE INDUSTRIAL STANDARDS COMMITTEE
(JISC)

HISTORY

Industrial standardization was initiated as a Japanese national project in 1921 with the establishment of the Japanese Engineering Standards Committee as the Government advisory organization on standards development. At its First General Meeting in October 1921, the JESC established four technical divisional councils--one each for metallic materials, non-metallic materials, electric machines, and general machines. In 1929 the JESC joined the International Federation of National Standardizing Associations (ISA) as Japan's representative in the predecessor organization of ISO. (A)

Though from its inception Japanese standardization was a Government activity, there was no legislation governing the effort until the enactment of the Industrial Standardization Law in 1949. This legislation established the Japanese Industrial Standards Committee which now serves as the Japanese representative for ISO and IEC activities.

OBJECTIVES

Japan's Industrial Standardization Law specifies the procedures required for the enactment (or revision) of Japanese Industrial Standards. The consent of the JISC must be obtained by the competent Minister(s) of the Agency of Industrial Science and Technology (AIST) in advance of any proposed enactment or revision. The JISC is also responsible for the designation of items for the JIS Marking System as well as for associated enforcement provisions of the Law.

The work of JISC is directed toward the promotion of industrial standardization so as to:

Improve the quality of mining and manufacturing industrial products.
Increase production efficiency.
Establish simple and fair business practice.
Promote the rationalization of the production process.
Rationalize use or consumption.
Contribute to the improvement of public welfare.

(A) Reference 36, page 17.

A large portion of the work of JISC is directed toward the popularization of Japanese Industrial Standards, and acting as a consultative body to Japan's nine ministers of trade and industry.

MEMBERSHIP

The membership of the JISC consists of 240 regular members, plus an indefinite number of temporary and specialist members. As of March 1975 the total membership was a little over 16,000 people. (B)

ORGANIZATION

The Japanese Industrial Standards Committee functions as a part of the agency of Industrial Science and Technology which reports to the Ministry of International Trade and Industry. The Standards Department of the Agency, in addition to its administrative responsibilites, acts as the secretariat of JISC and is in charge of the Committee's operation.

The organizational structure of the JISC comprises the General Assembly, the Standards Council, Division Councils, and Technical Committees. The General Assembly meets biennially to elect the Chairman and ViceChairman of the Committee. The Assembly also attends to matters arising from the enforcement provisions of Japan's Industrial Standardization Law. The Standards Council is "the supreme organ to decide the policy and other affairs of JISC." As such, the Council is responsible for the definition and adherence to procedures established for the development of Japanese Industrial Standards. (C)

The Divisional Councils have been established for industrial groups; currently there are 27 of them. Two additional Divisional Councils have been established to carry on JISC responsibilities associated with the ISO and IEC. Each Divisional Council has several Technical Committees that were established to work on the development of standards within their assigned areas of activity. As of March 1975, there were 1950 Technical Committees active. Of these, the Divisional Council for Electronics had 64; and the Divisional Council for Information Processing had 22 Technical Committees. (D)

RELATION TO OTHER ORGANIZATIONS

JISC through the ISO and IEC Divisional Councils represents Japan in the respective organizations.

TECHNICAL WORK

Japanese Industrial Standards are enacted by a board of nine which includes the Ministers of International Trade and Industry, of Public Welfare, of Agriculture and Forestry, of Education, of Postal Service, of Labor, and of Local and Municipal Governments.

(B) Reference 38, page 2.
(C) Reference 36, page 56.
(D) Reference 38, page 4.

Proposed Japanese standards are developed by the relevant technical committee which reports its conclusions on proposed standards to the appropriate Divisional Council which conducts further deliberations on the proposal. The Standards Council may mediate or resolve problems during the developmental process. The final conclusion regarding a proposed standard is reported by the JISC to the Minister who submitted the proposal.

The Minister in question is responsible for the determination that the proposed standard accurately reflects the opinion of all interested parties and that it contains no discriminatory material. After this determination is made, the Minister is responsible for the enactment of the proposed standard and for notifying the public of this event.

There are about 150 institutions and organizations in Japan concerned with standardization. These non-governmental organizations function in much the same way as JISC in that each may prepare proposed draft standards, each is responsible for reviewing Draft International Standards or national standards, and each may conduct research studies or make investigations related to industrial standardization.

Each existing Japanese Industrial Standard is reviewed every three years for its relevance; the procedures for revision of Japanese standards are identical to those established for new standards.

The preparation or research for a JIS may be assigned to a private technical society or trade association through the Ministry of International Trade and Industry. The Agency of Industrial Science and Technology may make such assignments to non-governmental organizations in cases where its affiliated testing and research institutes lack the proper technological resources. The procedures specified by the Industrial Standardization Law for the development or revision of standards prevail in all cases, regardless of the origin of proposals or the identity of the sponsoring organization.

THE JIS MARKING SYSTEM

The JIS Marking System is an important provision of the Industrial Standardization Law for popularization of industrial standards and for the protection of consumers. Manufacturers whose products conform to JIS requirements may aply to use the JIS Mark. The mark uses the letters "JIS" in one of two designs, one for products and the other for articles processed according to specified JIS techniques.

Producers licensed to use the mark are inspected by staff members of the Ministry of International Trade and Industry. All deliberations on the selection of commodities and processing techniques, licensing criteria, and similar matters are accomplished through the JISC. The training of inspection personnel for quality control is handled by the Japanese Standards Association and to some extent by the regional Bureaus of the Ministry of International Trade and Industry.

JAPANESE STANDARDS ASSOCIATION
(JSA)

HISTORY

The Japanese Standards Association was established in 1945 as a public service corporation for the promotion of industrial standardization under government authorization. The Association has a prominent role as a complementary organ of the Japanese Industry Standards Committee in the promotion of standardization and quality control. (E)

In 1970 JSA took over the "Group Training Course on Standardization and Quality Control" which was planned by the Overseas Technical Cooperation Agency as a part of the technical cooperation with developing countries. The course is given annually to approximately 15 participants who spend three months in Tokyo studying the industrial standardization process through lectures and visits to Japanese factories.

In March 1970, JSA established an office in Geneva, with the cooperation of the Japan External Trade Recovery Organization (JETRO).

The President and Board of Directors of JSA are located in the Toyko Headquarters; seven Branch Offices are located throughout Japan. The Tokyo office and two of the branch offices maintain a library of Japanese Industrial Standards, and those of foreign countries.

OBJECTIVES

JSA has as its objectives the improvement of productivity in industries by rationalization of production, distribution, and consumption, through the promotion of standardization and quality control.

TECHNICAL WORK

The Association is responsible for the distribution and sale of standards as well as for some investigative and research work. JSA cooperates in ISO and IEC work in actively supporting several National Committees. In addition, JSA provides financial support for Japanese delegates to ISO and IEC meetings as well as for studies relating to international standardization activities.

To carry out its research activities, JSA has established three Committees: the Control System Committee for the study and application of quality control and related techniques; the Standing Committee for the Study of Principles of Standardization whose mission is stated in its title; and the Design and Drafting Practice Committee which was established as a national counterpart of ISO/TC 10 (Technical Drawings) to promote the standardization of mechanical and architectural engineering drawings. (F)

Publication of JIS Standards. All new and revised JIS standards are put into print by JSA. Distribution is mainly by subscription with over 5,000 company subscribers.

Translation of JIS Standards. JIS standards are translated into English for sale, for transmittal to ISO, and for exchange with ISO member body countries.

Publication of Periodicals. The Association publishes the monthly magazines: Standardization, Quality Control, and Standardization Journal. JSA also publishes the JIS Yearbook and various catalogues.

Seminars and Training Courses. JSA holds seminars to train quality control technicians and conducts short-term lectures on the contents and application of new and revised JIS standards. JSA also provides technical instruction to factories requesting licenses for use of the JIS mark on their products.

Other Publications. JSA publishes annually many technical books, both in Japanese and in English. Most noteworthy of these is Statistical Tables and Formulas with Computer Applications published to commemorate the 20th anniversary of the Association. In addition to books, the Association maintains and publishes several compilations of Japanese Standards, as for example, environmental standards, sectional compilations in English and in Japanese.

RELATION TO OTHER ORGANIZATIONS

The Japanese Standards Association is an important adjunct to JISC, and provides the Committee with English translation and publication services. JSA assists in the popularization of Japanese Industrial Standards and contributes to the education of consumers in their use.

JSA takes an active part in the work of ISO and IEC and contributes to the financial support of relevant international standardization activities by Japanese organizations.

(F) Reference 38, page 21.

JAPAN ELECTRONIC INDUSTRY DEVELOPMENT ASSOCIATION
(JEIDA)

HISTORY

The Japan Electronic Industry Development Association was established in April 1958 in response to the government's promotion policy based on the Provisional Measures Law for Promotion of Electronic Industry. The organization has the backing of the Japanese Ministry of International Trade and Industry.

OBJECTIVES

The objective of JEIDA is to promote the advancement of the electronic industry through research and development of electronic equipment and industrial rationalization, in order to contribute to Japan's economic prosperity. Several research and investigation projects on new electronic technology and industry are conducted to meet this basic policy.

MEMBERSHIP

Manufacturers of electronic computers and other component products comprise the membership.

ORGANIZATION

Headed by a Board of Directors and administered by an Executive Director, JEIDA consists of two basic departments: the General Affairs Department and the Development Department.

The General Affairs Department is concerned with overall planning and administration; the administration of accounting, personnel, documentation and other general work; control of public relations and liaison; investigation of important subjects relating to the electronic industries; and issuance and distribution of several publications.

As part of its work JEIDA conducts surveys on industrial demand and supply, technological trends, and on the economic outlook. The results of their surveys are distributed in the form of bulletins and periodicals to members and parties concerned.

To promote the electronic industry, projects are initiated on such subjects as improvement of the tax system so as to expedite further research and development, and ways to reform the patent system to keep up with scientific and technological progress.

Included in the work of the Development Department are research and development of electronic computers, automation equipment and systems and other applied electronic apparatus, as well as electronic components and materials, rationalization of production and promotion of computer utilization; technical research and standardization of electronic components and devices; and management of the Environmental Testing Center.

The JEIDA Environmental Testing Center performs reliability tests of electronic components and materials to compile scientific data and conducts studies of the testing methods being used.

RELATION TO OTHER ORGANIZATIONS

JEIDA is listed as a non-official organization concerned with standardization. As such it makes investigations and accomplishes the research associated with industrial standardization. It also cooperates with JISC in the preparation of original drafts of Japanese Industrial Standards, and is involved in the deliberations on the draft Standards. JEIDA may also comment on draft International Standards.

The JEIDA Standardization Committee has established liaison with the ANSI committee and the CODASYL Programming Language Committee to work toward a common standard for COBOL.

TECHNICAL WORK

The technical work is accomplished under the Development Department, which is composed of three technological sections and the Environment Testing Center. The Electronic Computer Section and the Automation Systems Section have Supervisory Committees reporting directly to the Board of Directors.

Under the Electronic Computer Supervisory Committee are the following subcommittees:

Coordinating Committee
Patent Committee
Standards Committee
Technical Committee
Software Committee
Computer Market Survey Committee

INFORMATION PROCESSING SOCIETY OF JAPAN
(IPS JAPAN)

IPS Japan is a professional society which has no information processing counterpart in the United States. One of the immediately apparent differences is the role taken by IPS Japan in regard to standards and standards development.

IPS Japan sponsors the IPS/Standards Committee which functions as the Japanese National Committee for TC 97 of the ISO. The subcommittees of the IPS/Standards Committee bear the same numbers as those of TC 97, but the working groups under these sbucommittees vary somewhat.

IPS Japan also sponsors project-oriented committees to develop Japanese Industrial Standards. Examples of project-oriented committees are: I/O Media, Vocabulary for Information Processing, OCR, Punched Cards, Flowcharts, COBOL and Magnetic Tape Labelling.

The IPS/Standards Committee is responsible for evaluating all ISO documents related to computers and information processing and these evaluations serve as the JISC comments on ISO/TC 97 issues.

JAPAN SOCIETY OF MECHNICAL ENGINEERS
(JSME)

JSME is the professional society which has been authorized by the Japanese National Committee for TC 95, Typewriters and Keyboards. In relation to standards JSME is organized and functions in much the same way as the IPS/Standards Committee.

BRITISH STANDARDS INSTITUTION
(BSI)

HISTORY

The British Standards Institution was organized in 1901 as the Engineering Standards Committee. In 1918 the Committee changed its name to the British Engineering Standards Association and was chartered under that name on May 23 of that year. In 1929 the Association was granted a Royal Charter which defines the Association's object and purposes.

OBJECTIVES

The objectives and purposes of BSI are set forth in the Royal Charter on:

To coordinate the efforts of producers and users for the improvement, standardization, and simplification of engineering and industrial materials so as to simplify production and distribution, and to eliminte the national waste of time and material involved in the production of an unnecessary variety of patterns and sizes of articles for one and the same purpose.

To set up standards of quality and dimensions, and prepare and promote the general adoption of British Standard specifications and schedules in connection therewith and from time to time to revise, alter and amend such specifications and schedules as experience and circumstances may require.

To register in the name of the Association, marks of all descriptions, and to prove and affix or license the affixing of such marks or other proof, letter, name, description or device.

To take such action as may appear desirable or necessary to protect the objects or interests of the Association. (G)

A supplemental Charter was granted in 1930 in order to integrate chemical standards into the Association's program of work which until that time was confined almost entirely to engineering. The supplemental Charter granted in 1930 changed the name of the Association to its present form, the British Standards Institution.

MEMBERSHIP

Membership of the Institution is open to companies, professional, research, trade, and consumer organizations, educational institutions, nationalized industries, consultant and professional engineers.

(G) Reference 63, page 12.

The Standards Associates Section was formed for standards engineers, i.e., individuals interested in the promotion of standards as a tool of good management. In 1955 the first conference for standards engineers was held, and has become an annual event of the Standard Associates Section. The First International Conference for Standards Engineers met in Paris in 1973/1974, and marked the beginning of a series of triennial international conferences on the subject. The Paris meeting also marked the founding of the International Federation for the Application of Standards organized to foster cooperation with ISO and IEC in the promotion of uniform implementation of international standards among member countries.

ORGANIZATION

BSI is organized along much the same line as other organizations of the same type. It has an Executive Board of Management, a Commercial and Management Division, Engineering and Construction Technical Division, General Chemical, Textiles, Services and Consumer Goods Technical Division.

The two technical divisions are responsible for the development of BSI standards and may establish technical advisory groups as required.

RELATION TO OTHER ORGANIZATIONS

BSI is the recognized body in the United Kingdom for the preparation and promulgation of national standards. BSI represents the United Kingdom in the International Standards Organization, in the International Electrotechnical Commission, and in west European organizations concerned with harmonization of standards.

Through the Test Center, BSI has a cooperative arrangement with the Canadian Standards Association to enable manufacturers to obtain CSA approval of electrical products before they leave a United Kingdom factory. The BSI has similar cooperative arrangements for other countries and other products.

FINANCE

The Institution is a nonprofit concern. It is financed by member subscriptions, by government funding, and by the sale of its publications.

TECHNICAL WORK

The scope of BSI standards work includes: glossaries containing precise definitions of the terminology used in a particular field of technology; dimensional standards; performance standards; standard methods of test as, for example, how a given level of performance or a particlar composition may be determined; and codes of practice. BSI is also concerned with certification and approval of products as complying with standards, and with the international aspects of the subject. (H)

(H) Reference 63, page 3.

The Institution's technical committees are responsible for the preparation of standards. The organizational bylaws require that technical committees be representative of the main interests concerned with the scope of work assigned to each committee. The technical committees are grouped under Industry Standards Committees, which, in turn, are grouped under four Divisional Councils--Engineering, Building, Chemical, and Textile.

Within the Industry Standards Committee (in the Engineering Division) there are three Technical Committees of interest to this study--Office Machines and Equipment, Telecommunication, and Data Processing. The Industry Standards Committee is responsible for authorization of new projects, work programs and priorities of each technical committee within its purview. The IS Committee also approves all final drafts prepared by its technical committees. In the United Kingdom proposals for new standards or revisions of existing ones usually emanate from established organizations. However, any responsible body may propose the development of new standards to the appropriate committee of the BSI.

THE TEST HOUSE. The Hemel Hempstead Centre was established in 1959 by the British Standards Institution which until that time had had to rely almost entirely on independent laboratories for the services associated with testing, quality assurance, and certification to standards activity. The Quality Assurance Department of the BSI has been established at the Centre and, under authority of the Quality Assurance Council, administers the Kitemark schemes. The Kitemark is owned by the BSI and is an indicator of product compliance with relevant British Standards.

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1865	International Telegraph Union	1945	Japanese Standards Association
1894	Underwriters Laboratories, Inc.	1947	Pan American Standards Commission (COPANT)
1901	British Standards Institution	1949	Japanese Industrial Standards Committee
1901	National Bureau of Standards		
1906	International Electrotechnical Commission	1957	CCITT
1907	U.S. National Committee	1958	Japan Electronic Industry Development Association
1918	American National Standards Institute	1959	CODASYL
1919	Canadian Standards Association	1960	International Federation for Information Processing
1924	Electronic Industries Association	1961	European Committee for Standardization
1926	International Organization for Standardization	1961	ANSC X3, ANSC X4
1930	National Fire Protection Association	1961	ISO/TC95, ISO/TC97
		1961	European Computer Manufacturers Association
1940	ANSC Z39	1970	Standards Council of Canada

Figure 1. Founding Dates of Selected Standards Organizations

	J	
	F	
	M	
	A	
1	M	CODASYL organizational meeting.
9	J	First International Conference on Data Processing.
5	J	
9	A	
	S	
	O	
	N	
	D	COBOL existed as a language.
	J	IFIP founded.
1	F	
9	M	Proposal to ISO that a TC for information processing be formed.
6	A	ECMA formed. COBOL-60 published.
0	M	
	J	ASA called meeting as proposed secretariat for new ISO/TC.
	J	
1	A	
9	S	X3/X4 organization announced with CBEMA as sponsor (now secretariat).
6	O	
0	N	
	D	
	J	First ANSC X3 meeting held.
	F	
	M	
	A	ISO meeting, TC 95 and TC 96 officially formed.
1	M	EMCA officially registered.
9	J	Round Table Conference organized by ISO and IEC.
6	J	IEC TC 53 approved.
1	A	
	S	
	O	
	N	
	D	

Figure 2.   Chronological Chart Showing the Founding of Standards Organizations
Associated with Computers and Information Processing

Type of Organization	International	National	Standards Committee	European
Example	ISO	ANSI	ANSC X3	ECMA
Membership	Country represented by leading standards organization	Trade and professional associations, companies, government agencies	Equal number of consumers, producers and general interests	Companies which manufacture DP equipment in Europe
Type of Membership	Participating (P) Observer (O) Correspondent	Company member Government member Organizational Sustaining Honorary	Principal and alternate Liaison Observer	Ordinary member Associate member
Approved By	ISO Council	Board of Directors	Secretariat	Two-thirds vote of the membership
Officers	President, Vice President, Treasurer, Secretary-General	President, three Vice Presidents, Managing Director	Chairman, Vice Chairman Secretary	President, Vice President, Secretary
Executive Officer	Secretary-General	Managing Director	X3 Secretary	Secretary General
Governing Body	Council	Board of Directors	None	General Assembly
Technical Advisory Body	Advisory Committees as required	Standards Management Boards	SPARC	Co-ordinating Committee
Administrative Body (Standards)	Council	Executive Standards Board	X3/SSC	Co-ordinating Committee
Highest Level of Standard	International Standard	American National Standard	Proposed American National Standard	ECMA Standard
Adjudicating Body	Council	Board of Standards Review	Secretariat	General Assembly
Vote Required to Approve	75% of Member Bodies	Two-thirds of Board of Standards Review	Two-thirds of the X3 Members	Two-thirds of Ordinary Members

Figure 3. Comparison of Functions of Standards Organizations

PLANNING

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┌──────────────┐     ┌──────────────┐     ┌──────────────┐     ┌──────────────┐     ┌──────────────┐
│              │     │    SPARC     │     │ SPARC STUDY  │     │    SPARC     │     │   ANSC X3    │
│  CANDIDATE   │     ├──────────────┤     │    GROUP     │     ├──────────────┤     ├──────────────┤
│              │ ──▶ │ Logs in,     │ ──▶ ├──────────────┤ ──▶ │ Reviews and  │ ──▶ │ Reviews and  │
│  PROPOSAL    │     │ reviews, and │     │ Documents    │     │ recommends   │     │ authorizes   │
│              │     │ initiates    │     │ feasibility  │     │ project      │     │ project      │
│              │     │ study        │     │ and need     │     │              │     │              │
└──────────────┘     └──────────────┘     └──────────────┘     └──────────────┘     └──────────────┘
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Distribute
for
Comments

DEVELOPMENT

```
┌──────────────┐     ┌──────────────┐     ┌──────────────┐
│     SSC      │     │  TECHNICAL   │     │ SPARC        │
├──────────────┤     │  COMMITTEE   │     │ IAC          │
│ Develops     │     ├──────────────┤     │ SSC          │
│ project plan │ ──▶ │ Develops work│ ──▶ │ SECRETARIAT  │
│ and assigns  │     │ plan, skeleton│    │ X3 MEMBERS   │
│ to technical │     │ standard and │     │ X4 MEMBERS   │
│ committee    │     │ proposed     │     ├──────────────┤
│              │     │ standard     │     │ COMMENTS     │
└──────────────┘     └──────────────┘     └──────────────┘
                     ┌──────────────┐
                     │    ECMA      │
                     │    ISO       │
                     └──────────────┘
```

APPROVAL

```
┌──────────────┐     ┌──────────────┐     ┌──────────────┐     ┌──────────────┐     ┌──────────────┐
│      X3      │     │    PRESS     │     │      X3      │     │      X3      │     │     ANSI     │
├──────────────┤     ├──────────────┤     ├──────────────┤     ├──────────────┤     ├──────────────┤
│ Resolves     │     │ Publishes    │     │ Letter ballot│     │ Resolves     │     │ Reviews,     │
│ comments     │ ──▶ │ text and     │ ──▶ │              │ ──▶ │ comments     │ ──▶ │ approves,    │
│              │     │ notices      │     │              │     │              │     │ and          │
│ Accepts for  │     │              │     │              │     │              │     │ publishes    │
│ review       │     │              │     │              │     │              │     │              │
└──────────────┘     └──────────────┘     └──────────────┘     └──────────────┘     └──────────────┘
```

Figure 4.   ANSC X3 Standardization Process (Simplified)
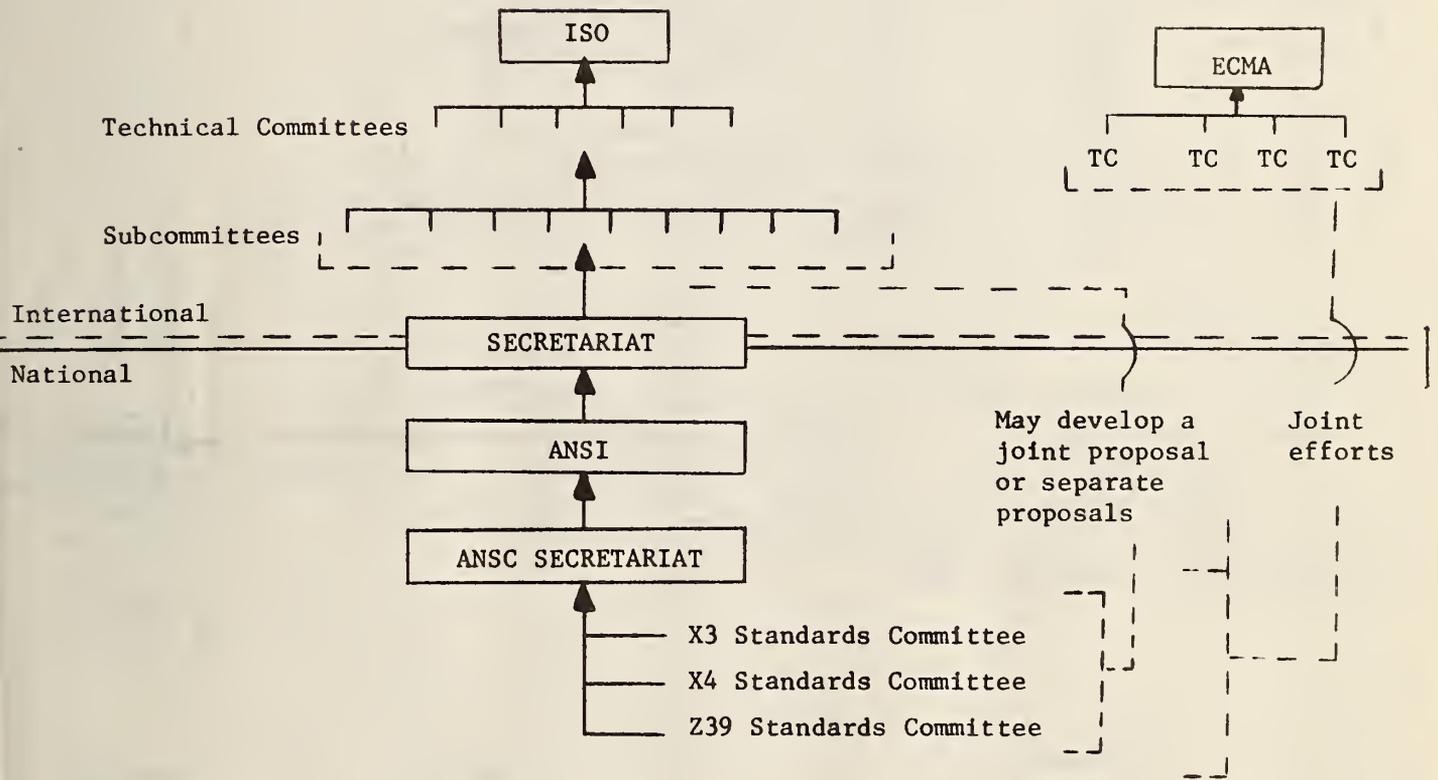
Figure 5.   Typical Hierarchical Relationships of International
            Standardization
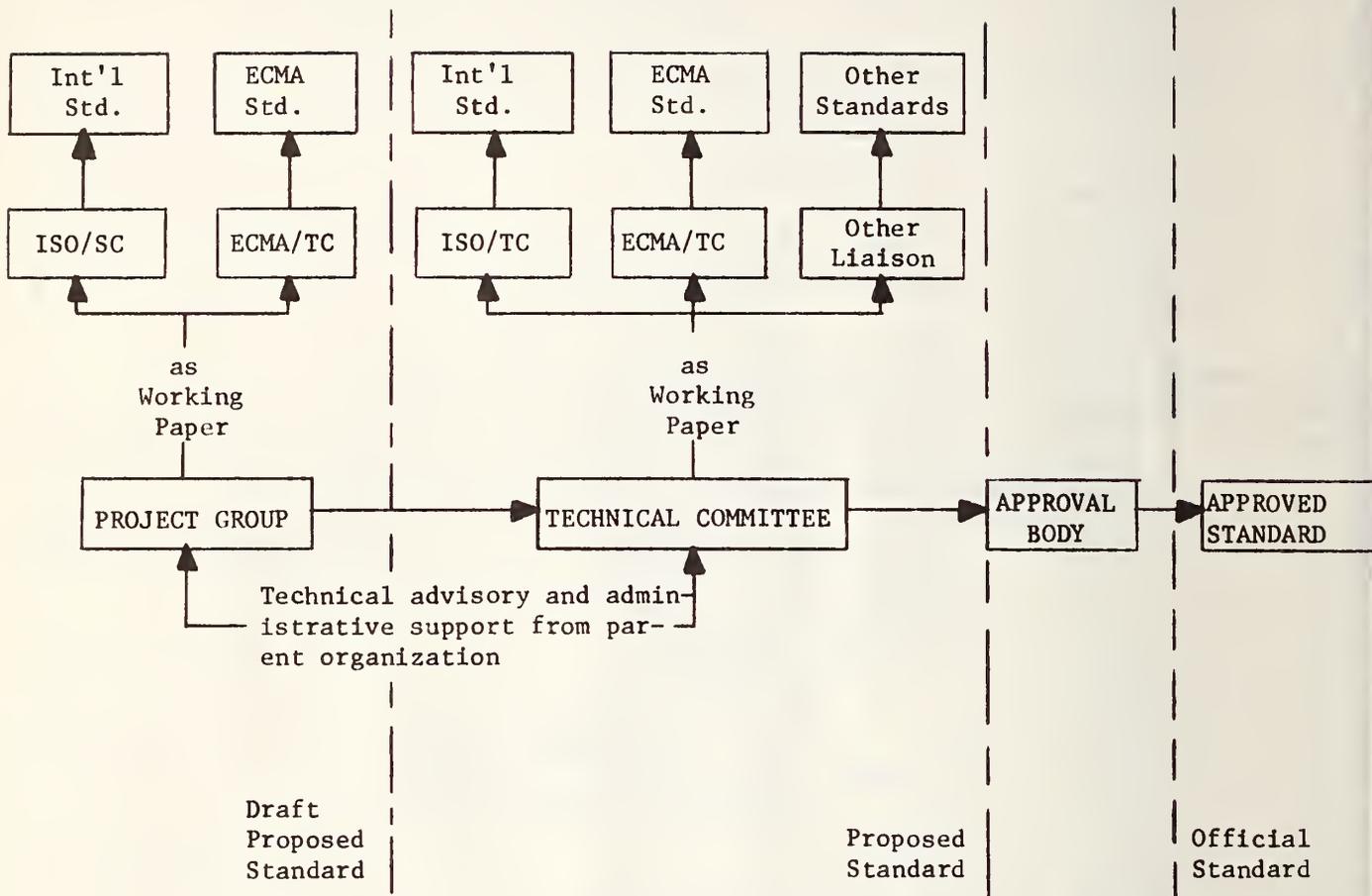
Figure 6.   Ballot Milestones

```
┌─────────────────────────────────────────────┐
│                    COUNCIL                    │
├─────────────────────────────────────────────┤
│                  President                    │
│                Past President                 │
│        Presidents of National Committees      │
│          Treasurer, General Secretary         │
└─────────────────────────────────────────────┘

┌─────────────────────────────────────────────┐
│               COMMITTEE OF ACTION             │
├─────────────────────────────────────────────┤
│                  President                    │
│                Past President                 │
│     Presidents of 9 National Committees       │
│          Treasurer, General Secretary         │
└─────────────────────────────────────────────┘

┌────────────────────┐          ┌──────────────────────┐
│   Central Office    │──────────│ Advisory Committees  │
└────────────────────┘          └──────────────────────┘

┌──────────────┐        ┌──────────────┐        ┌──────────────┐
│  TECHNICAL   │        │  TECHNICAL   │        │  TECHNICAL   │
│  COMMITTEE   │        │  COMMITTEE   │        │  COMMITTEE   │
└──────────────┘        └──────────────┘        └──────────────┘

┌──────────────┐  ┌──────────────┐  ┌──────────────┐  ┌──────────────┐
│ SUBCOMMITTEE │  │ SUBCOMMITTEE │  │ SUBCOMMITTEE │  │   EDITING    │
└──────────────┘  └──────────────┘  └──────────────┘  │  COMMITTEE   │
                                                       └──────────────┘
┌──────────────┐                              ┌──────────────────┐
│WORKING GROUP │                              │  WORKING GROUP   │
└──────────────┘                              └──────────────────┘
```

Figure 7.   International Electrotechnical Commission, General Organization

ABNT	Brazil	JISC	Japan
AFNOR	France	JZS	Yugoslavia
ANSI	United States of America	KBS	Korea, Rep. of
BCS	Sri Lanka	LIBNOR	Lebanon
BDSI	Bangladesh	MSZH	Hungary
BSA	Albania	NC	Cuba
BSI	United Kingdom	NHS	Greece
COVENIN	Venezuela	NNI	Netherlands
CSK	Korea, Dem. P. Rep. of	NSF	Norway
CSN	Czechoslovakia	NSO	Nigeria
DGN	Mexico	ON	Austria
DIN	Germany	PKNiM	Poland
DKC	Bulgaria	PS	Philippines
DS	Denmark	PSI	Pakistan
EOS	Egypt, Arab Rep. of	SAA	Australia
ESI	Ethiopia	SABS	South Africa, Rep. of
GOST	USSR	SANZ	New Zealand
GSB	Ghana	SASO	Saudi Arabia
IBN	Belgium	SCC	Canada
ICONTEC	Columbia	SFS	Finland
IGPAI	Portugal	SII	Israel
IIRS	Ireland	SIRIM	Malaysia
INAPI	Algeria	SIS	Sweden
INN	Chile	SISIR	Singapore
IOS	Iraq	SNIMA	Morocco
IRANOR	Spain	SNV	Switzerland
IRS	Romania	SSD	Sudan
ISI	India	TISI	Thailand
ISIRI	Iran	TSE	Turkey
ITINTEC	Peru	UNI	Italy
JBS	Jamaica	YDNI	Indonesia
		ZSI	Zambia

Figure 8. Member Bodies of ISO

Source: ISO Memento 1976, p 13.
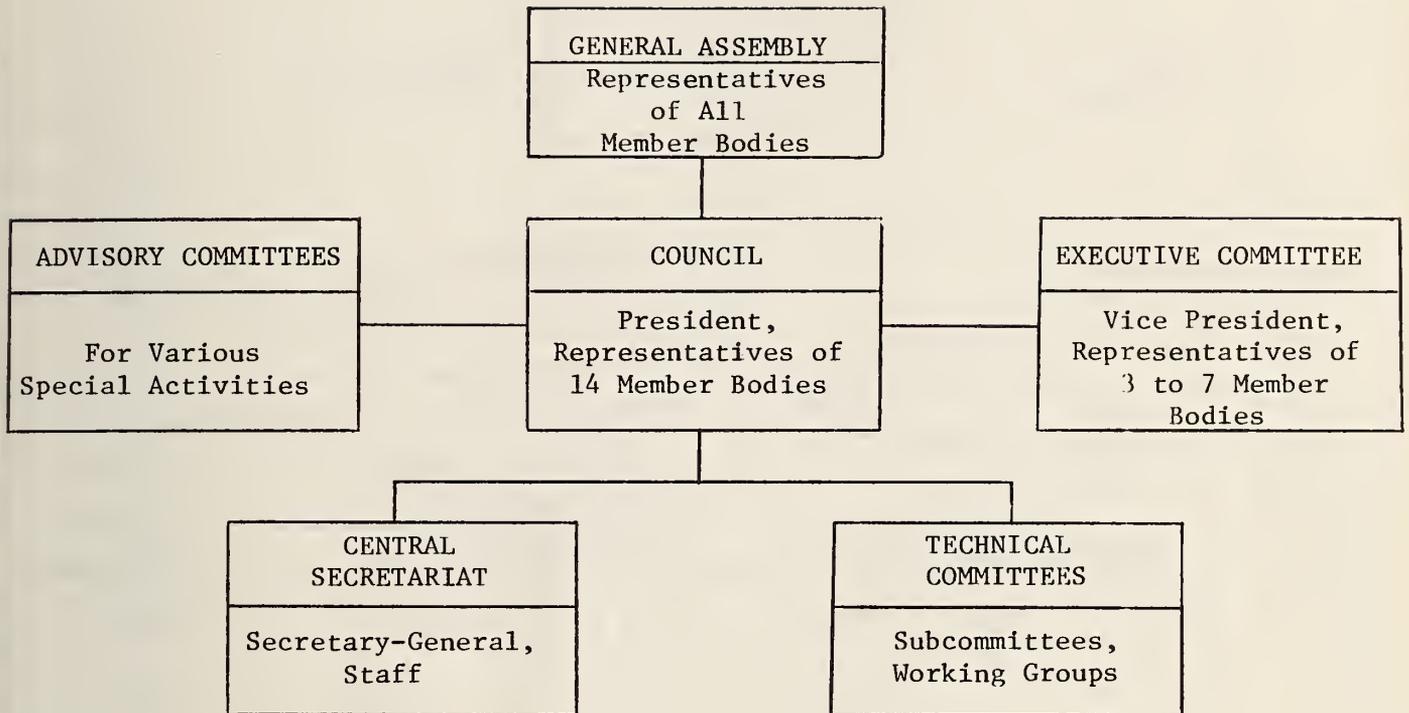
Figure 9.   International Organization for Standardization, General Organization
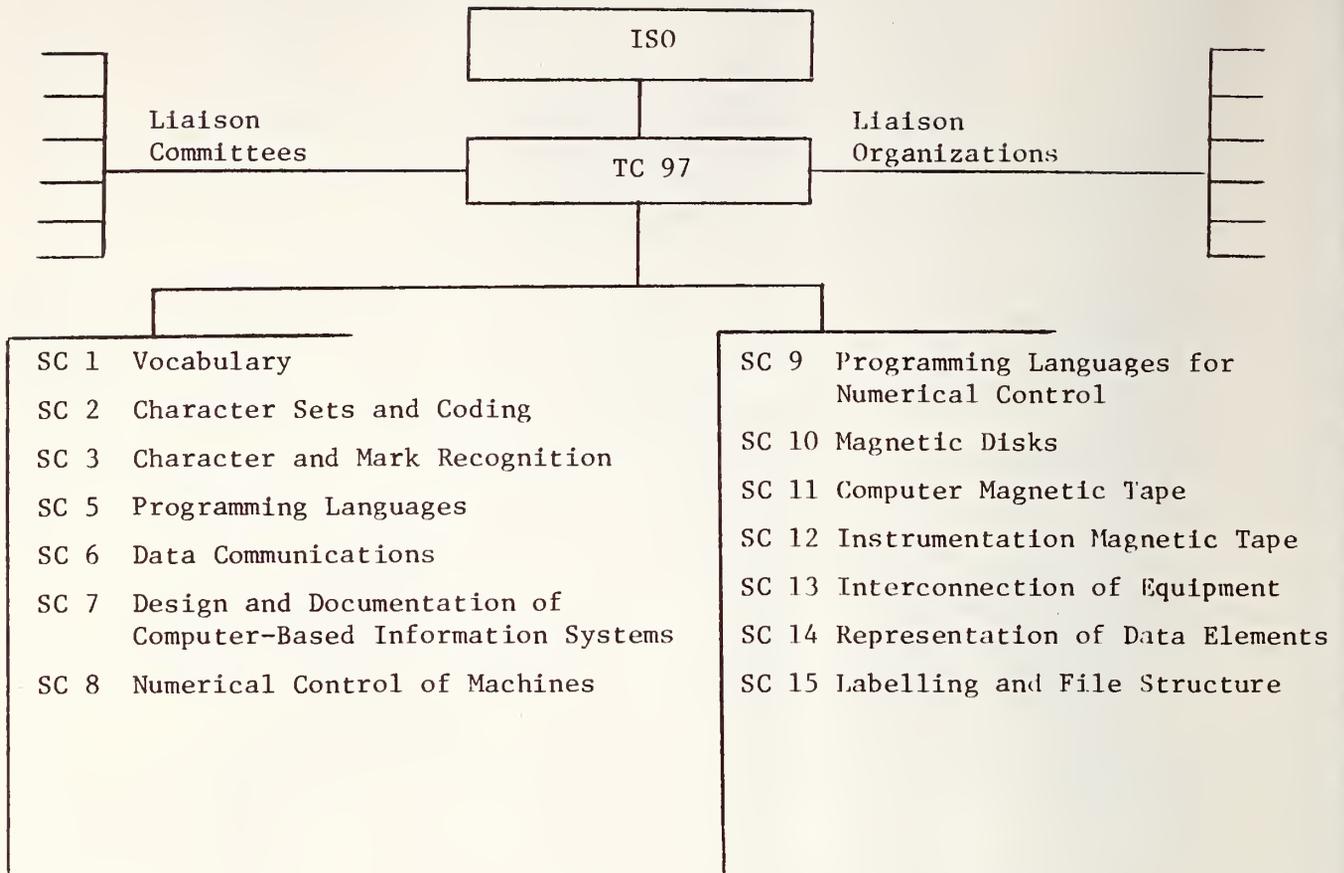
Figure 10.   Subcommittees of ISO/TC97
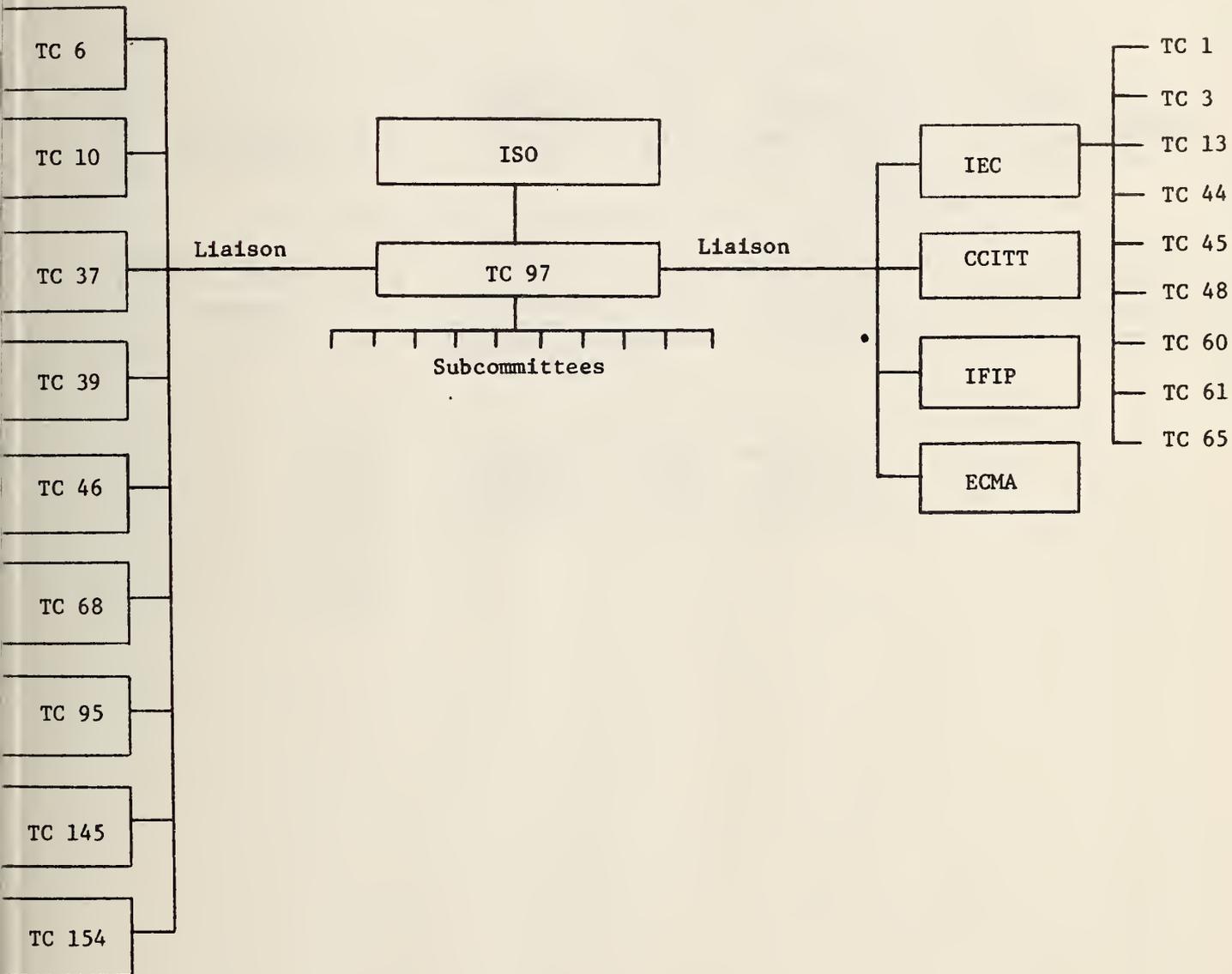
Figure 11.   ISO/TC97 Liaison Relationships

Source: Report on the Work of ISO/TC97 for the Year 1975.

```
                        ┌─────────────────────────┐
                        │   BOARD OF DIRECTORS     │
                        ├─────────────────────────┤
                        │   EXECUTIVE COMMITTEE    │
                        └─────────────────────────┘
```

| ORGANIZATIONAL MEMBER COUNCIL | COMPANY MEMBER COUNCIL | CONSUMER COUNCIL | BOARD COMMITTEES |

| CERTIFICATION COMMITTEE | INTERNATIONAL STANDARDS COUNCIL | EXECUTIVE STANDARDS COUNCIL | BOARD OF STANDARDS REVIEW |

| U.S. NATIONAL COMMITTEE OF IEC | STANDARDS MANAGEMENT BOARDS |
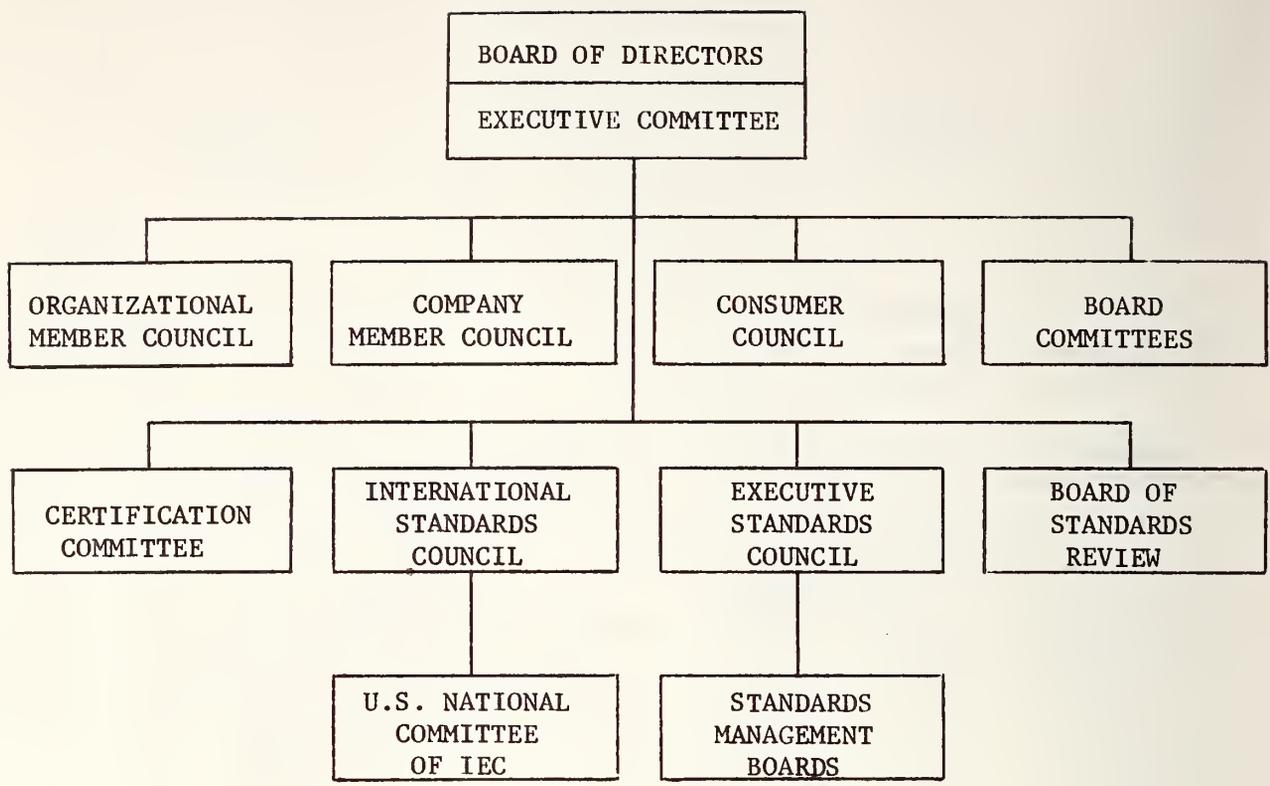
Figure 12.   American National Standards Institute

Source: ANSI Progress Report 1975.
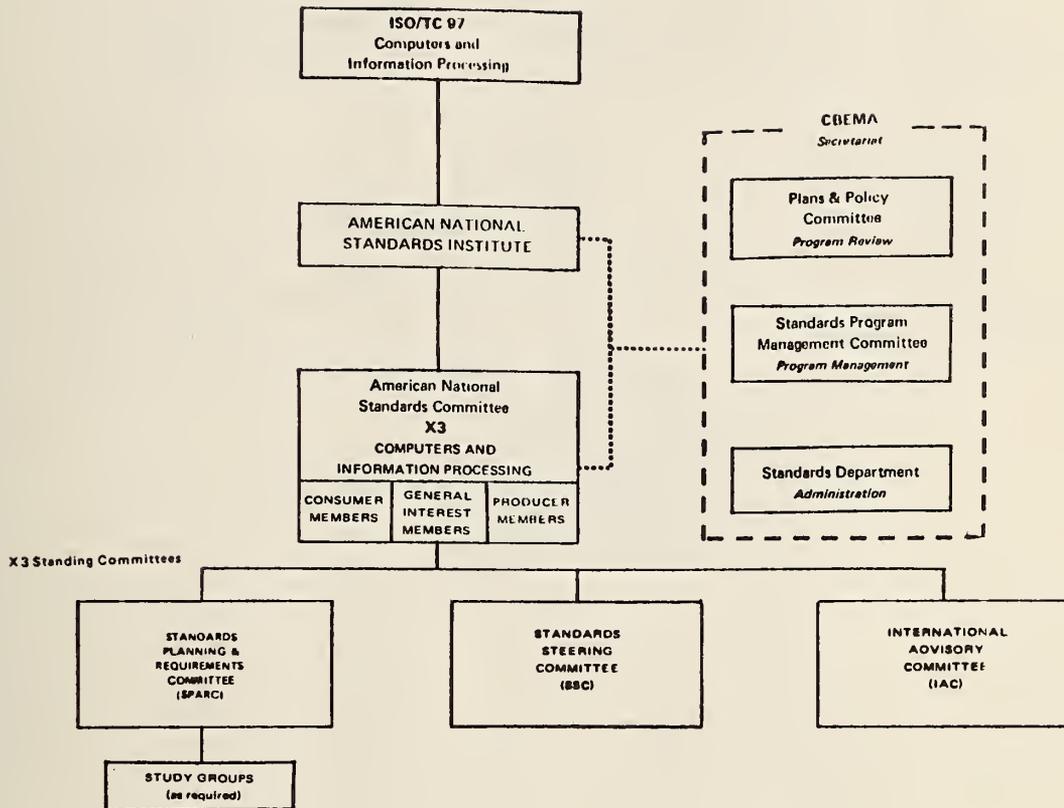
Figure 13.   Organization of ANSI X3 Standards Committee
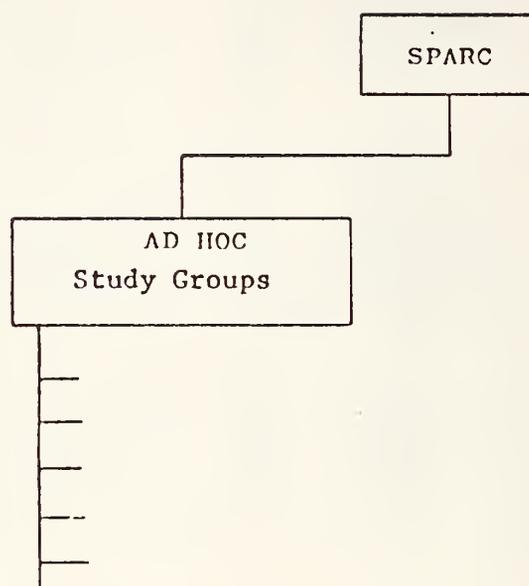
Figure 14.   Basic Structure of the Standards Planning
             and Requirements Committee (SPARC)

X3 Technical Committees

Hardware Group	Software Group	Systems Group
"A" - RECOGNITION SECTION X3A1 OCR X3A7 MICR **"B" - MEDIA SECTION** X3B1 Magnetic Tape X3B2 Perforated Media X3B3 Punched Cards X3B5 Magnetic Tape Cassettes X3B6 Instrumentation Tape X3B7 Magnetic Disks X3B8 Flexible Disks	**"J" - LANGUAGES SECTION** X3J1 PL/I X3J2 BASIC X3J3 FORTRAN X3J4 COBOL X3J5 COMPACT/ACTION/SPLIT X3J7 APT X3J8 ALGOL **"K" - DOCUMENTATION SECTION** X3K1 Project Documentation X3K2 Flow Charts X3K5 Vocabulary X3K6 Network Oriented Project Management Systems X3K7 Program Abstracts **"L" - DATA REPRESENTATION SECTION** X3L2 Codes & Character Sets X3L5 Labels & File Structures X3L8 Data Representation	**"S" - DATA COMMUNICATIONS SECTION** X3S3 Data Communications X3S31 Data Communications Planning X3S32 Vocabulary X3S33 Data Communications Formats X3S34 Control Procedures X3S35 Communication System Performance X3S36 Transmission Speeds X3S37 Public Data Networks **"T" - SYSTEMS TECHNOLOGY SECTION** X3T9 I/O Interface

Figure 15.   Standardization Projects Under the Standards Steering Committee

```
        ┌─────────────────────────────────────────────┐
        │   AMERICAN NATIONAL STANDARDS INSTITUTE      │
        │     International Standards Council          │
        └─────────────────────────────────────────────┘
                          │
        ┌─────────────────────────────────────────────┐
        │      U.S. National Committee for IEC         │
        │           (20 Organizations)                 │
        └─────────────────────────────────────────────┘
                          │
          ┌───────────────┴───────────────┐
┌──────────────────────┐      ┌──────────────────────┐
│    U.S. National      │      │                      │
│ Committee for Partic- │      │  Executive Committee │
│   ipation in CEE      │      │                      │
│     (USNC/CEE)        │      │                      │
└──────────────────────┘      └──────────────────────┘
```

International Secretariats (30)	Technical Committee	Technical Committee	Technical Committee
	Technical Advisors and Advisory Groups	Technical Advisors and Advisory Groups	Technical Advisor and Advisory Group

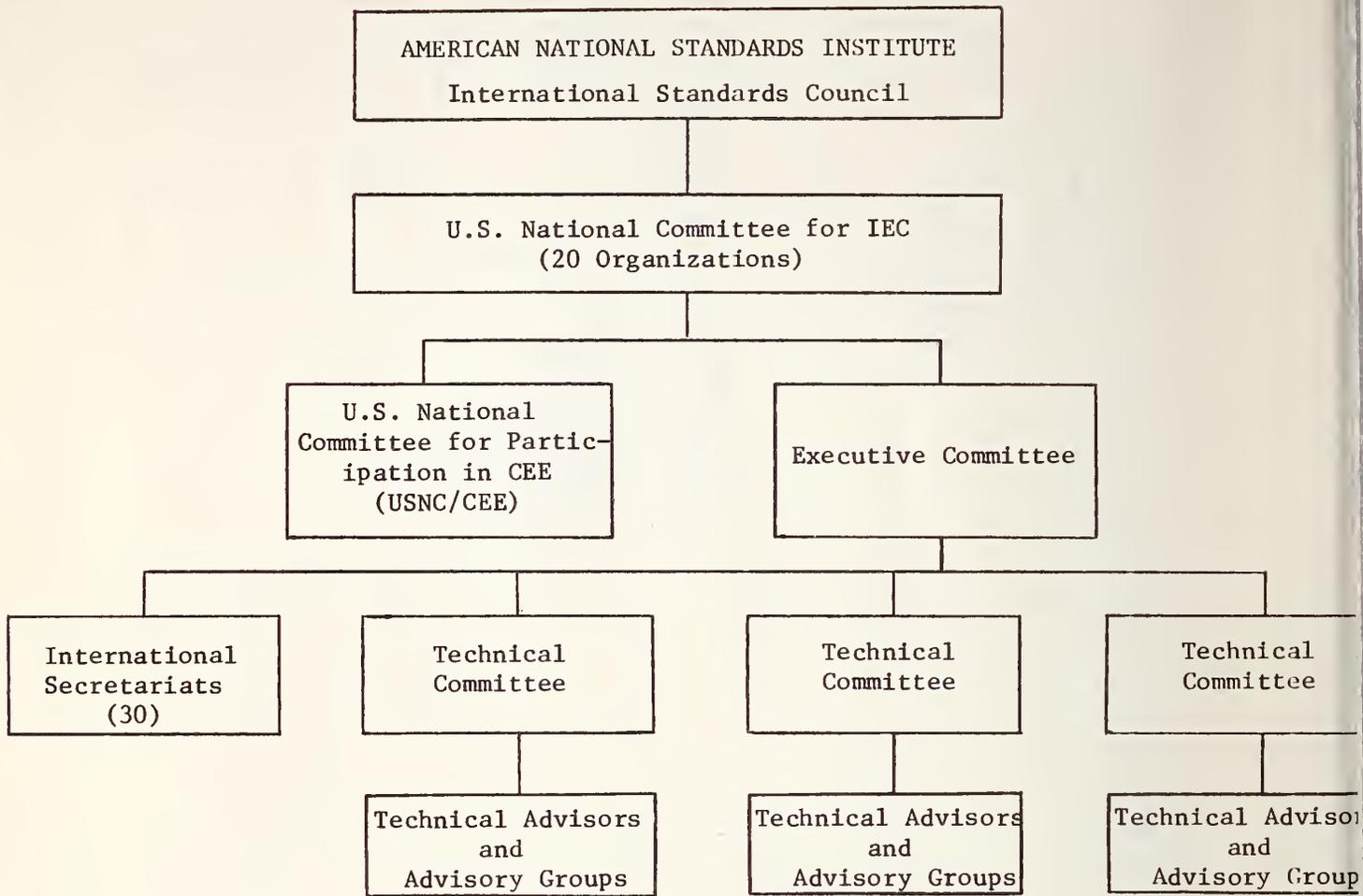Figure 16.   U.S. National Committee of the IEC
(Partial Structure)

FIPS No.	Title	Publication Date	Adopted From ANSI Standard
I. STANDARDS			
1	Code for Information Interchange	November 1, 1968	X
2	Perforated Tape Code for Information Interchange	November 1, 1968	X
3-1	Recorded Magnetic Tape for Information Interchange (800 CPI,NRZI)	June 30, 1973	X
* 4	Calendar Date	November 1, 1968	
*5-1	States and Outlying Areas of the U.S.	June 15, 1970	
*6-2	Counties and County Equivalents of the States of the U.S.	September 15, 1968	
8-4	Standard Metropolitan Statistical Areas (SMSAs)	June 30, 1974	
9	Congressional Districts of the U.S.	November 14, 1969	
10-1	Countries, Dependencies and Areas of Special Sovereignty	June 15, 1974	
13	Rectangular Holes in 12-Row Punched Cards	October 1, 1971	X
14	Hollerith Punched Card Code	October 1, 1971	X
15	Subsets of Standard Code for Information Interchange	October 1, 1971	
16	Bit Sequencing of Code for Information Interchange in Serial-By-Bit Data Transmission	October 1, 1971	X
17	Character Structure and Character Parity Sense for Serial-By-Bit Data Communication in Code for Information Interchange	October 1, 1971	X
18	Character Structure and Character Parity Sense for Parallel-By-Bit Data Communication in Code for Information Interchange	October 1, 1971	X
21-1	COBOL	December 1, 1975	X
22	Synchronous Signaling Rates Between Data Terminal and Data Communication Equipment	November 1, 1972	X
24	Flowchart Symbols and Their Usage in Information Processing	June 30, 1973	X

*FIPS PUB Adopted as ANSI Standard

Figure 17. FIPS Documents

FIPS No.	Title	Publication Date	Adopted From ANSI Standard
I.	STANDARDS (continued)		
25	Recorded Magnetic Tape for Information Interchange (1600 CPI, PE)	June 30, 1973	X
26	One-Inch Perforated Paper Tape for Information Interchange	June 30, 1973	X
27	Take-Up Reels for One-Inch Perforated Tape	June 30, 1973	X
30	Software Summary for Describing Computer Programs and Data Systems	June 30, 1974	
32	Optical Character Recognition Character Sets	August 15, 1974	X
33	Character Set for Handprinting	October 1, 1974	X
35	Code Extension Techniques in 7 or 8 Bits	June 1, 1975	X
36	Graphic Representation of Control Characters of ASCII	June 1, 1975	X
37	Synchronous High Speed Data Signaling Rates Between Data Terminal Equipment and Data Communications Equipment	June 30, 1975	X
II.	GUIDELINES		
11	Vocabulary for Information Processing	November 15, 1970	X
19	Guidelines for Registering Data Codes	February 1, 1972	
*20	Guidelines for Describing Information Interchange Formats	March 1, 1972	
29	Interpretation Procedures for Federal Standard COBOL	June 30, 1974	
31	Guidelines for ADP Physical Security and Risk Management	June, 1974	
38	Guidelines for Documentation of Computer Programs and Automated Data Systems	February 15, 1976	
39	Glossary for Computer Systems Security	February 1, 1976	
40	Guidelines for Optical Character Recognition	May 1, 1976	
41	Computer Security Guidelines for Implementing Privacy Act of 1974	May 30, 1975	

*FIPS PUB Adopted as ANSI Standard

Figure 17. FIPS Documents (continued)

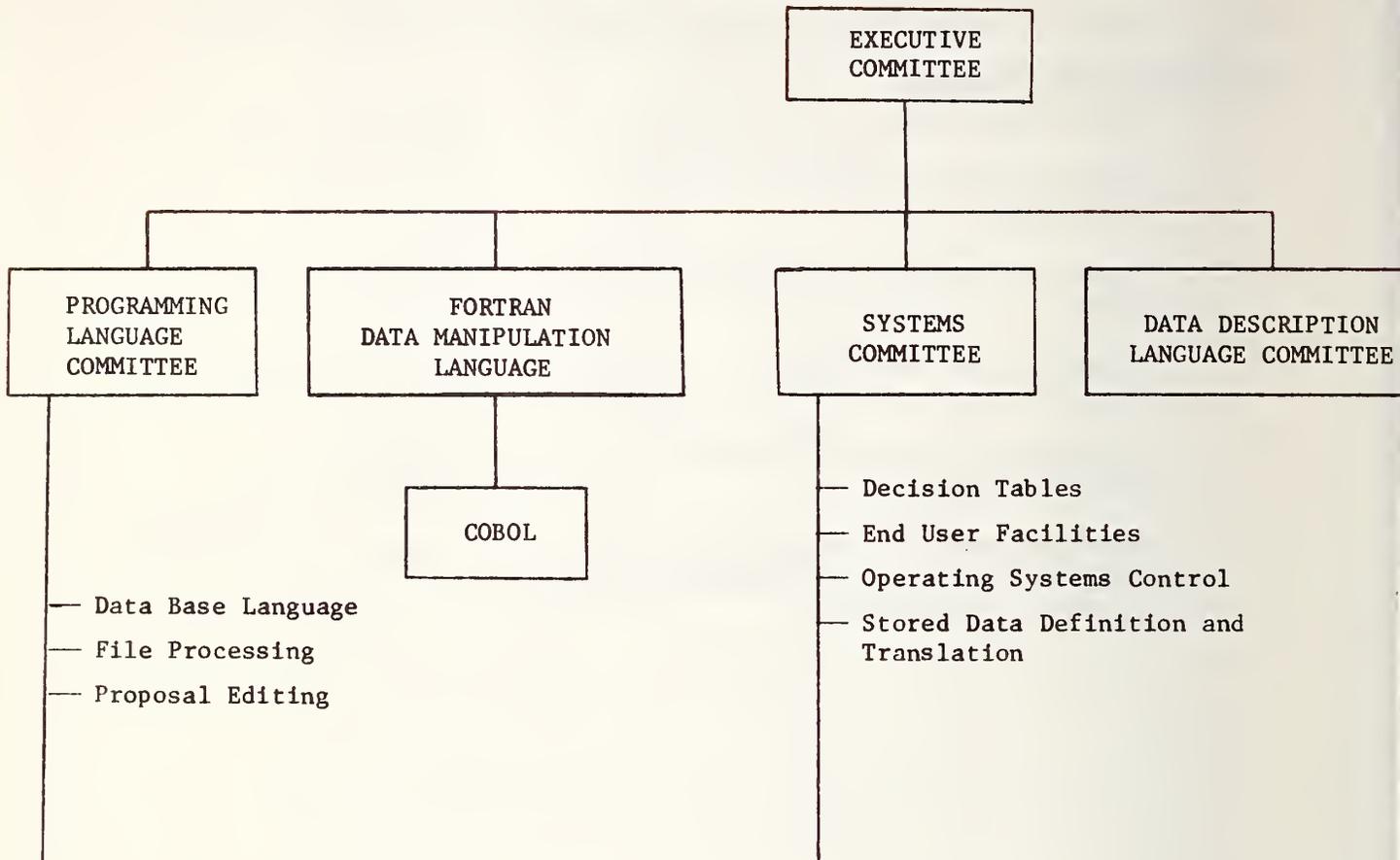| FIPS No.	Title	Publication Date	Adopted From ANSI Standard
II.	GUIDELINES (continued)		
42	Guidelines for Benchmarking ADP Systems in the Competitive Procurement Environment	December 15, 1975	
43	Aids for Program COBOL Conversion (FIPS 21-21-1)	January 1, 1975	
III.	PROGRAM MANAGEMENT DOCUMENTS		
0	General Description of FIPS Register	November 1, 1968	
7	Implementation of Code for Information Interchange	March 7, 1969	
12-2	Federal Information Processing Standards Index	December 1, 1974	
23	Objectives and Requirements of the FIPS Program	February 15, 1973	
28	Standardization of Data Elements and Representations	December 5, 1973	
34	Guide for Use of International System of Units (SI) in Federal Information Processing Standards Publications	January 1, 1975	

Figure 17. FIPS Documents (continued)

Figure 18. Organization of CODASYL

U.S. DEPT. OF COMM. **BIBLIOGRAPHIC DATA SHEET**	**1. PUBLICATION OR REPORT NO.** NBSIR 77-1195	**2. Gov't Accession No.**	**3. Recipient's Accession No.**
4. TITLE AND SUBTITLE The World of EDP Standards		**5. Publication Date** December 1976	
		6. Performing Organization Code	
7. AUTHOR(S) Marjorie F. Hill and Josephine L. Walkowicz		**8. Performing Organ. Report No.**	
9. PERFORMING ORGANIZATION NAME AND ADDRESS **NATIONAL BUREAU OF STANDARDS DEPARTMENT OF COMMERCE WASHINGTON, D.C. 20234**		**10. Project/Task/Work Unit No.**	
		11. Contract/Grant No.	
12. Sponsoring Organization Name and Complete Address *(Street, City, State, ZIP)* Same as No. 9.		**13. Type of Report & Period Covered**	
		14. Sponsoring Agency Code	

15. SUPPLEMENTARY NOTES

16. ABSTRACT *(A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here.)*

This publication describes the activities and relationships of the many organizations and individuals involved at the national, regional, and international levels in the development of standards for computers and information processing. A generalized description of the standardization process is presented first and then used as a basis for describing the activities of the principal organizations that comprise The World of EDP Standards. This Second Edition of The World brings up-to-date the information contained in the First Edition and retains the format used therein. The description of each organization is structured in a uniform manner and includes the history of each organization, its objectives, membership, organization, finance, relationship to other organizations, and its technical work.

17. KEY WORDS *(six to twelve entries; alphabetical order, capitalize only the first letter of the first key word unless a proper name; separated by semicolons)* ADP standards; international standardization; national standardization; national standards bodies; practice; procedures; regional standardization; standardization; standards development.

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