Standardizing Information and Communication Systems

MEMENTO 1995

ECMA

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PREFACE

Information Technology and Telecommunications are key factors in today's economical and social environment. Effective interchange of commercial, technical, and administrative data, text and images is essential for the growth of economy in the world markets.

Open Systems and Distributed Networks based on world-wide recognized standards will not only provide effective interchange of information but also help to remove technical barriers to trade. In particular harmonized standards are recognized as a prerequisite for the establishment of the European economic area.

For over thirty years ECMA has actively contributed to world-wide standardization in information technology and telecommunications. 219 ECMA Standards and 69 Technical Reports of high quality have been published.

In the coming years ECMA sees important challenges for information technology and telecommunication standardization, especially in the following areas:

- Multimedia Computing
- High Speed Telecommunications
- IT Security
- High Capacity Storage Media
- Software Engineering
- Application Portability

Standardization provides the means for economical solutions for complex technologies. Moreover, it is most effective if it is performed in a precompetitive mode and parallel with product development with all interested parties involved.

ECMA standardization work has always been recognized as far-sighted and reflecting technological trends at an early stage. As a consequence many ECMA Standards have been accepted as a base for international and European Standards. To ensure close co-operation ECMA has established formal liaisons with all European and international standardization bodies.

ECMA Standards are developed by highly qualified experts from information technology and telecommunication industry with the commitment to provide in a consensus mode technical solutions ready for implementation in product development and conformity testing.

The benefit of ECMA membership is twofold:

- Early knowledge of technological trends and better understanding of information technology and telecommunication standards requirements.

- A platform where technical contributions of member companies are evaluated by experts who through a most effective mode of operation develop ECMA Standards and Technical Reports of high quality in a very short time.

The participation of the majority of leading information technology and telecommunication companies in ECMA ensures not only the acceptance of ECMA Standards in European and International standardization but also their world-wide implementation.

The President Geneva, December 1994

PURPOSE AND MEMBERSHIP

The Purpose of ECMA is:

- To develop, in co-operation with the appropriate national, European and international organizations as a scientific endeavour and in the general interest standards and technical reports in order to facilitate and standardize the use of information processing and telecommunication systems.

- To encourage the correct use of standards by influencing the environment in which they are applied.

- To promulgate various standards applicable in the functional design and use of information processing and telecommunication systems. Promulgation of ECMA Standards and Technical Reports shall require approval by at least two-thirds of all the ordinary members.
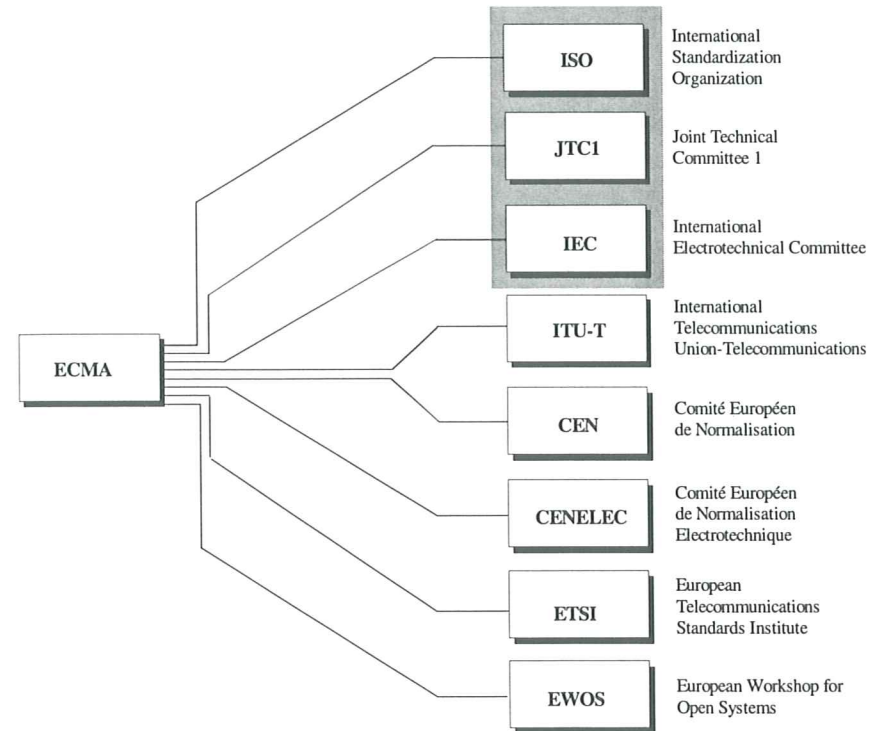
The Association shall consist of ordinary and associate members and such other classes of members as may be created by the ordinary members at a General Assembly.

Ordinary members shall be companies which develop, produce and market in Europe hardware or software products or services in the field of information technology or telecommunications used to process digital information for business , scientific, control, communication or other similar purposes. Products or services used exclusively for military purposes shall not be considered in this regard.

A company may be admitted as associate member which has interest and experience in matters related to one ore more of the TCs of the Association. No company qualifying for ordinary membership can be elected associate member.

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

ECMA'S ROLE IN INTERNATIONAL STANDARDIZATION

Box	Description
ISO	International Standardization Organization
JTC1	Joint Technical Committee 1
IEC	International Electrotechnical Committee
ITU-T	International Telecommunications Union-Telecommunications
CEN	Comité Européen de Normalisation
CENELEC	Comité Européen de Normalisation Electrotechnique
ETSI	European Telecommunications Standards Institute
EWOS	European Workshop for Open Systems

ECMA connects to all of the above.

ECMA has close working relations - such as liaisons, co-operation agreements, memberships - with European and international standardization bodies.

Software Engineering

IT Security

Programming
Languages

Software Tools

High Speed
Telecommunication

Wide Area
Network

High Capacity
Storage Media

Multimedia
Computing

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Application
Portability

ECMA ORGANIZATION
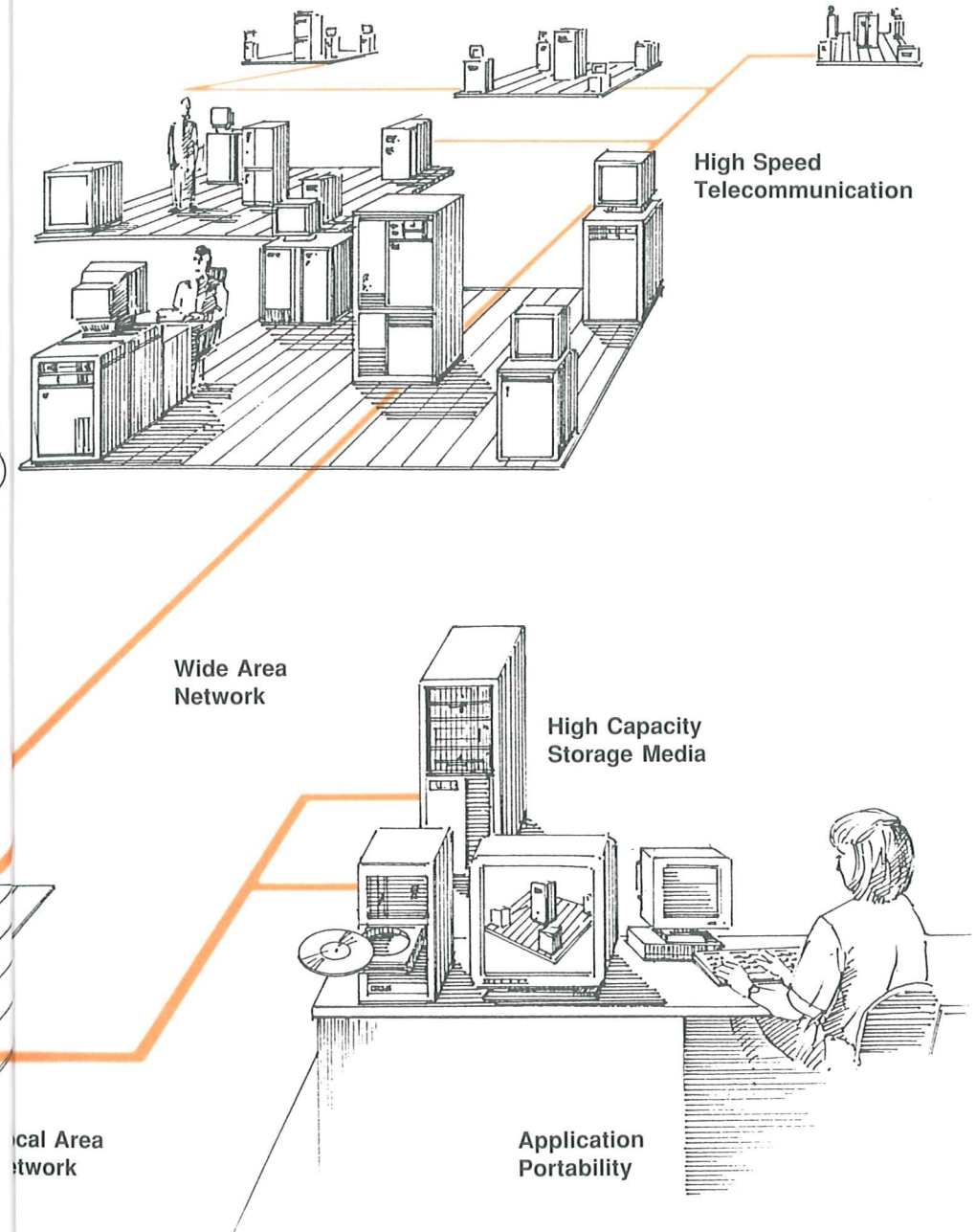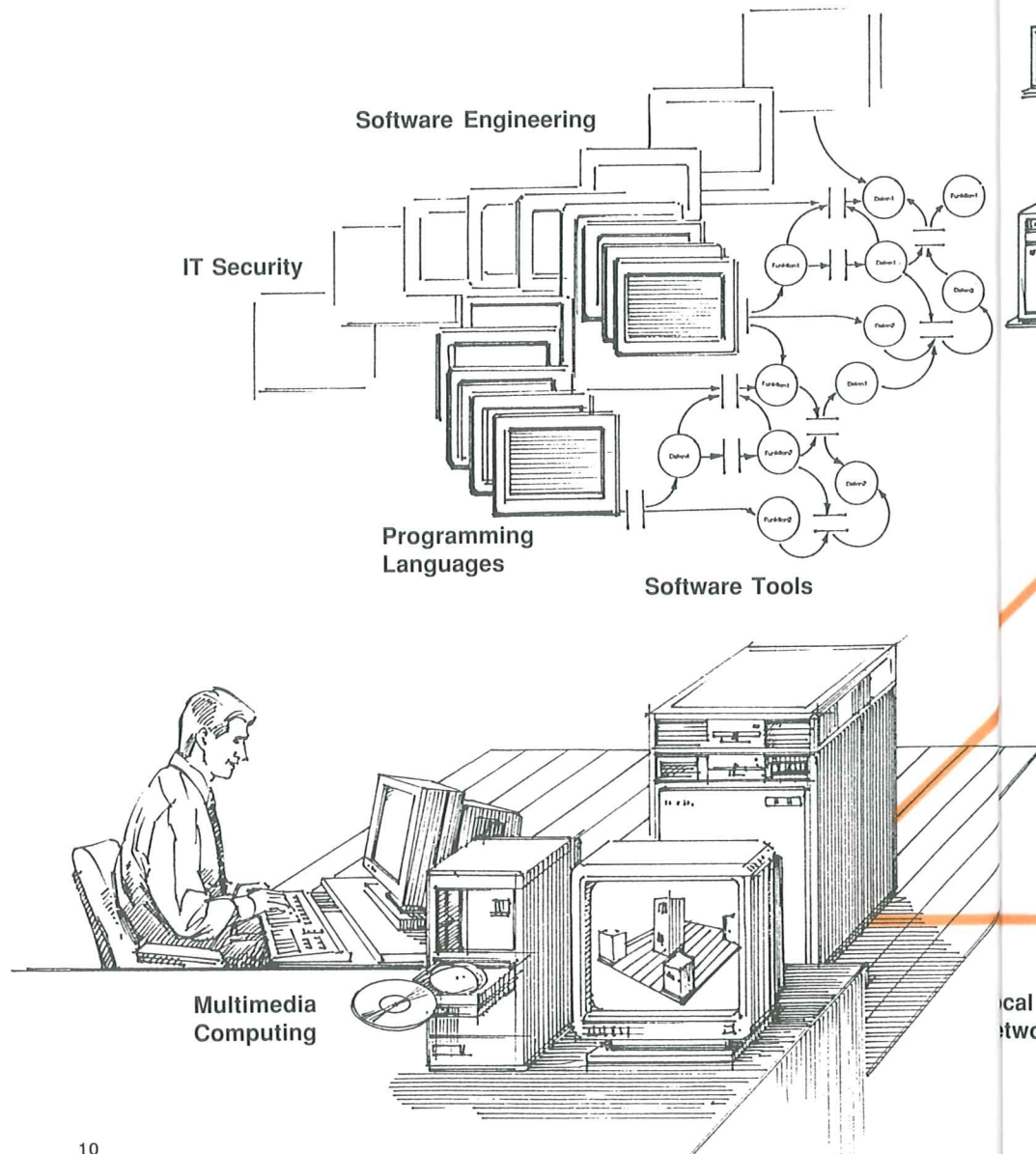
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                    │   General    │
                    │   Assembly   │
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   │ Management │   │ Secretariat│   │ Co-Ordinating│
   │            │   │            │   │  Committee   │
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Technical Committees
   ┌────┐ ┌────┐ ┌────┐         ┌────┐ ┌────┐
   │ TC │ │ TC │ │ TC │  ● ● ●  │ TC │ │ TC │
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Task Groups
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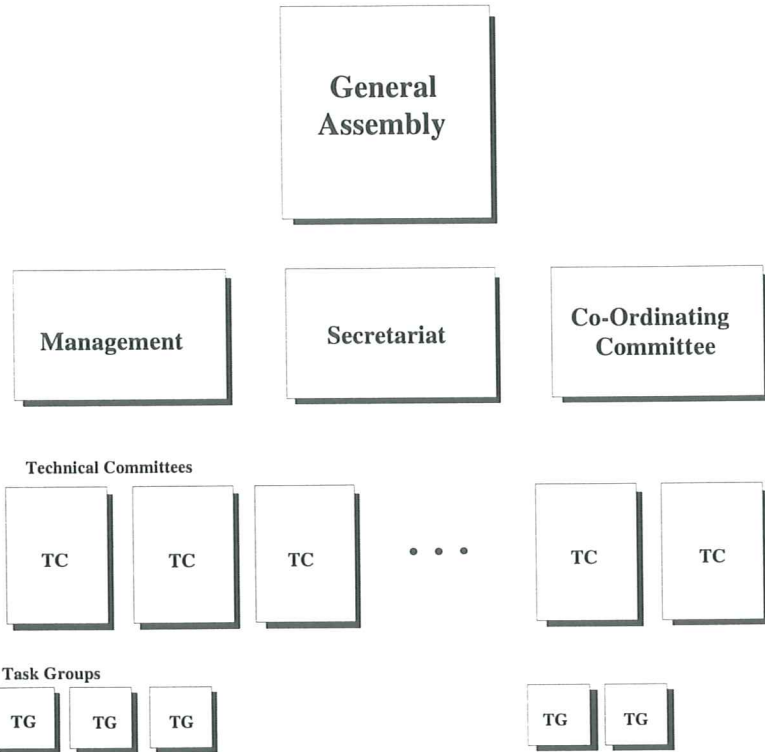
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TECHNICAL COMMITTEES

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Codes	TC 1
Product Safety	TC 12
Volume and File Structure	TC 15
Magnetic Tapes and Tape Cartridges	TC 17
Flexible Disk Cartridges	TC 19
Electromagnetic Compatibility	TC 20
Acoustics	TC 26
Optical Disk Cartridges	TC 31
Communication, Networks and Systems Interconnection	TC 32
Portable Common Tool Environment	TC 33
IT Security	TC 36
Public Windows Interface *(under investigation)*	
Fibre Channel *(under investigation)*	

Committees having accomplished their task

General Programming Languages	TC 2
Problem Analysis and Flow Charting	TC 3
Optical Character Recognition	TC 4
ALGOL	TC 5
COBOL	TC 6
Magnetic Ink Character Recognition	TC 7
FORTRAN	TC 8
Data Transmission	TC 9
PL/1	TC 10
Numerical Control	TC 11
Keyboards	TC 13
Paper Sizes	TC 14
Rigid Magnetic Disks	TC 16
I/O Interface	TC 18
BASIC	TC 21
Database	TC 22
Open Systems Interconnection	TC 23
Communications Protocols	TC 24
Data Networks	TC 25
Ada	TC 27
Ergonomics of Work Stations	TC 28
Document Architecture and Interchange	TC 29
SCSI Small Computer Systems Interface	TC 30
Office Devices	TC 34
User System Interface	TC 35

TC 1 - CODES

Scope:

Definition of common character sets (including alphabets, digits, punctuation marks, special symbols and control functions) and their coded representation suitable for input/output media, data transmission and text communication in order to facilitate interchange of information between DP equipment. To define the implementation of codes on media.

Programme of work:

1. Determination of common sets which shall take into account the European and international requirements for graphic characters, and control function representations in data handling and programming, in accordance with computer and auxiliary equipment characteristics.

2. Consideration shall be given in defining the coded character sets to permit possible expansion and contraction.

3. To participate in the work of ITU-T and ISO/IEC JTC1 to develop a standard character set and coding for text communication.

4. To assume responsibility for the maintenance of the ECMA Standards prepared by TC1.

5. To maintain liaison with other standards organizations in order to present ECMA proposals to them and to make comments on their proposals.

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TC 12 - PRODUCT SAFETY

Scope:

To consider national and international safety regulations with a view to establishing appropriate safety standards for information technology equipment so that they are intrinsically safe and safe for operating and maintenance personnel.

Programme of work:

1. To survey existing national and international standards and recommendations concerned with safety requirements.

2. To study the safety requirements associated with power control and distribution and establish recommendations where appropriate.

3. To consider short circuit and overcurrent protection, earthing, voltage exposure limits, mechanical design, etc., and establish recommendations where appropriate.

4. To assume responsibility for the maintenance of ECMA Standards prepared by TC 12.

5. To establish and maintain liaison with other standards organizations in order to present ECMA proposals to them and to make comments on their proposals.

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TC 15 - VOLUME AND FILE STRUCTURE

Scope:

To facilitate the interchange of information on media by specifying the format on the recorded structures that contain descriptive information about volumes and the files/directories recorded on the media.

Programme of work:

1. To specify volume and file structure standards for media used in interchange.

2. To specify such standards so that they are independent, where possible, of the standards for the underlying medium.

3. To constitute a coherent family of standards where possible.

4. To assume responsibility for the maintenance of ECMA Standards prepared by TC15.

5. To maintain liaison with other standards organizations in order to present ECMA proposals to them and to make comments on their proposals.

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TC 17 - MAGNETIC TAPES AND TAPE CARTRIDGES

Scope:

To identify and standardize the mimimum number of parameters necessary to ensure interchangeability of magnetic tapes and tape cartridges using appropriate methods of recording and taking account of existing standards.

Programme of work:

1. To develop standards for 3,81 mm, 6,30 mm, 8 mm and 12,65/12,7 mm wide magnetic tape cartridges.

2. To monitor the revision of International Standards for magnetic tapes and tape cartridges.

3. To develop standards for algorithms for the lossless compression of data.

4. To assume responsibility for the maintenance of ECMA Standards prepared by TC17.

5. To maintain liaison with other standards organizations in order to present ECMA proposals to them and to make comments on their proposals.

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TC 19 - FLEXIBLE DISK CARTRIDGES

Scope:
To identify and standardize the physical properties and the relevant track format of flexible disk cartridges for digital applications in order to ensure interchangeability.

Programme of work:
1. To identify the requirements of low-cost and compact digital data recording for data collection and data entry systems as well as for easy mailing and to review the extent to which existing designs possibly derived from existing standards in other areas, fulfil these requirements.

2. To specify the physical properties, recording method and track location of magnetic flexible disk cartridges in order to ensure interchangeability.

3. To specify the relevant track format and code representation for these disks to ensure interchangeability.

4. To assume responsibility for the maintenance of ECMA Standards prepared by TC 19.

5. To maintain liaison with other standards organizations in order to present ECMA proposals to them and to make comments to their proposals.

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TC 20 - ELECTROMAGNETIC COMPATIBILITY

Scope:
To study the conditions necessary to guarantee reciprocal electromagnetic compatibility between information technology equipment and the external environment, to prepare corresponding standards and to contribute to international standardization.

Programme of work:

1. To survey existing international and national standards concerned with electromagnetic compatibility.

2. To establish measuring methods and limits for electromagnetic interference generated by information technology equipment.

3. To establish standards for methods of assessment and suitable levels for the immunity of information technology equipment to electromagnetic interference.

4. To assume responsibility for the maintenance of ECMA Standards and Technical Reports prepared by TC20.

5. To maintain liaisons with other standards organizations in order to present ECMA proposals to them and to make comments on their proposals.

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TC 26 - ACOUSTICS

Scope:

To recommend standards for determining the noise outputs of different categories of individual items of information technology equipment intended for use in defined working environments; standards for determining total noise levels in the said working environments, these standards to include corresponding methods of measurement; preferred methods of predicting total levels if units of known noise output are installed together.

Programme of work:

1. To categorize the acoustical environments in which information technology equipment is required to work.

2. To survey the various recommendations and requirements for the acoustical environments of these areas.

3. To make recommendations for standard methods of measuring and specifying the noise output of equipment, taking into account the work of ISO/TC43.

4. To consider any special requirements that may arise during non-standard operation, e.g. servicing.

5. To consider what information should be supplied by the manufacturer to facilitate optimum installation and to make recommendations.

6. To follow developments affecting acoustical environment in places of work.

7. To assume responsibility for the maintenance of ECMA Standards prepared by TC26.

8. To maintain liaison with other standards organizations in order to present ECMA proposals to them and to make comments on their proposals.

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TC 31 - OPTICAL DISK CARTRIDGES

Scope:

To identify and develop the minimum number of standards necessary for data interchange by means of optical data disk cartridges.

Programme of work:

1. To develop standards for optical disk cartridges of 90 mm, 120 mm, 130 mm and 300 mm.

2. To assume responsibility for the maintenance of ECMA Standards prepared by TC31.

3. To monitor technological developments in the field of optical disk cartridges.

4. To maintain liaison with other standards organizations in order to present ECMA proposals to them and to make comments to their proposals.

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TC32 - COMMUNICATION, NETWORKS AND SYSTEMS INTERCONNECTION

Scope:

To take the overall responsibility for the ISO Reference Model for Open Systems Interconnection (OSI) within ECMA. To develop service and protocol standards for the seven layers of the Reference Model and Distributed Applications.

To study services and protocol standards in relation to networking services including Management. To prepare co-ordinated viewpoints of interest to ECMA and their users. To standardize selected facilities within these services for selected applications. To develop interface Standards for the connection of information technology equipment (ITE) to Private Telecommunication Networks (PTN).

Programme of work:

1. To be responsible for, and co-ordinate, the work of the Task Groups within TC32. To approve drafts prepared by the Task Groups for submission to the General Assembly and deal with all matters requiring voting within TC32.

2. To maintain an ECMA view of the OSI Reference Model and to contribute to its maintenance and extension.

3. To develop service and protocol Standards for all layers of the Reference Model.

4. To develop a set of OSI management standards.

5. To develop Standards for applications that are functionally integrated using both computing and switched networks.

6. To study the scope, definitions and standardization possibilities of local communication systems (e.g. LAN, PTNX); to develop Standards where a need is identified.

7. To study ITU-T/ETSI defined Integrated Services Digital Networks (ISDN) and propose modifications for private communications.

8. To maintain liaison with other ECMA TCs as appropriate.

9. To maintain liaison with ITU-T, IEC, ISO and ETSI.

10. To maintain liaison with other standards organizations in order to present ECMA proposals to them and make comments on their proposals.

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TC32-TG11 - COMPUTER SUPPORTED TELECOMMUNICATION APPLICATIONS (CSTA)

Scope:

To develop and refine architectural frameworks and the requirements on, and the use of, services and network control protocols allowing computing and switching networks to cooperate in support of functionally integrated applications. To develop OSI Application Layer protocols for the execution of transactions between computing and switching applications.

The work continues to focus on bi-directional operations between computer and private telephony networks. The work takes into account the requirements of other telecommunication services within both the private and public telecommunication domains.

Programme of work:

1. To study aspects of CSTA, with special emphasis on:

   - application descriptions and scenarios;
   - functional requirements for integrated telephony;
   - protocol architecture appropriate for the defined scenarios;
   - implications for system security and integrity;
   - functional requirements for integrated data access, accounting, data input/output and other applications;
   - the management of CSTA objects;
   - support for PTNs and other ISDNs

2. To produce Technical Reports outlining enhanced architecture and additional services of CSTA.

3. To produce OSI Application Layer based Standards specifying the services, functional entities and protocols required to enable CSTA operation in a variety of environments.

4. To liaise with standards organisations studying similar topics including groups working within ITU-T and ISO/IEC JTC 1/SC6, to promote unified international standards.

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TC32-TG12 - PRIVATE TELECOMMUNICATION NETWORKS - MANAGEMENT

Scope:

To develop Technical Reports and Standards for the management of Private Telecommunication Networks (PTNs), such management being based upon the work of ITU-T and ETSI on Telecommunication Management Network (TMN), adapted and extended to suit PTNs.

PTN Management seeks to encompass the management of all aspects which can go to make up a PTN. Thus the work seeks to integrate the Simple Network Management Protocol (SNMP), which is commonly used for the management of equipment supporting the TCP/IP protocol, with PTN management.

Programme of work:

1. To adapt and expand the set of TMN Management Service descriptions so that they can be applied to PTN Management, and publish these as Technical Reports.

2. To develop an architecture to allow interworking of SNMP with PTN management.

3. In collaboration with the IETF, to specify the interworking of SNMP in a PTN environment.

4. To study jointly with ITU-T and ETSI the area of management interworking between PTNs and public networks so as to develop suitable specifications.

5. To establish a set of instructions which is compatible with ETSI and ITU-T to guide the development of management information to be exchanged at PTN Management interfaces.

6. To adapt and extend TMN management information models to be suitable for a PTN environment, and develop new models as appropriate.

7. To monitor and contribute to the work of other International and European bodies studying matters related to PTN Management.

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TC32-TG13 - PRIVATE TELECOMMUNICATION NETWORKS - NETWORKING AND SERVICES

Scope:

To develop Technical Reports and Standards for Private Telecommunication Networks (PTNs) and Services.

Programme of work:

1. To develop service Standards for the connection of terminals, computers, and Wide Area Networks (WANs) to a PTN, utilising, and remaining compatible with, existing Standards and recommendations, as far as possible.

2. To develop Standards for intra-PTN services, thereby supporting harmonized telecommunication services on multi-vendor PTNs, and to align these services as far as possible with the public ISDN telecommunications services.

3. To cooperate with other standardization bodies in the development of Standards for the architecture of PTNs in relation to:

- interconnection of PTN exchanges;
- connection of terminal equipment (TE);
- interconnection with LANs;
- interconnection with private and public WANs.

4. To develop Standards for the Stage 1 and Stage 2 aspects of PTN Services for publication by ETSI.

5. To co-ordinate the liaison with ITU-T, and ISO/IEC JTC1 in the field of ISDN services.

6. To monitor and to contribute to the work of other international and European bodies studying matters related to PTN Services (e.g. ISDN and LAN developments).

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TC32-TG14 - PRIVATE TELECOMMUNICATION NETWORKS - SIGNALLING

Scope:
To develop Technical Reports and Standards for signalling in Private Telecommunication Networks (PTN).

Programme of work:
1. To develop interface protocol signalling Standards for the connection of terminals, computers, LANs and Wide Area Networks (WANs) to a PTN, utilising, and remaining compatible with, existing Standards and recommendations.

2. To develop Standards for intra-PTN signalling protocols, thereby supporting harmonized telecommunication services on multi-vendor PTNs.

3. To monitor and to contribute to the work of other international and European bodies studying matters related to PTN Services (e.g. ISDN and LAN developments).

4. To co-ordinate the liaison with ITU-T and ETSI in the field of ISDN protocol standards.

5. To develop Standards for the Stage 3 aspects of PTN Services for publication by ETSI.

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TC 33 - PORTABLE COMMON TOOL ENVIRONMENT (PCTE)

Scope:

To standardize a Public Tool Interface (PCTE : Portable Common Tool Environment) implementable on a wide range of operating environments, to ensure a suitable foundation for portable, integrated tools and tool sets for systems engineering. To standardize the specification of data interchange facilities required to interchange data between PCTE repositories or between PCTE and non-PCTE repositories. To standardize schemas allowing data to be shared between tools in a given PCTE repository.

Programme of work:

1. To work with ISO/IEC JTC1 to attain global approval for and to maintain actively the ECMA PCTE standards.

2. To define the abstract specification and bindings of new services in the domain of:

- object orientation, and
- high performance access to fine grain objects.

3. To develop new bindings and standardize them through ECMA and other standardization bodies as appropriate.

4. To produce the standard specification of a facility allowing two different repositories (of which at least one complies with PCTE) to exchange their data.

5. To facilitate the sharing of data between tools by producing the standard specification of PCTE schemas covering systems engineering domains, in liaison with appropriate standardization bodies.

6. To maintain Technical Report ECMA TR/55, specifying a reference model for CASE frameworks, in liaison with the U.S. National Institute of Standards and Technology (NIST).

7. To maintain Technical Report ECMA TR/66, Mapping of PCTE to the ECMA/NIST Frameworks Reference Model.

8. To maintain Technical Report ECMA TR/69, specifying the Reference Model for Project Support Environment, in liaison with the U.S. National Institute of Standards and Technology (NIST).

9. To provide strategic direction for the work of the Task Groups of TC33.

10. To maintain liaisons with appropriate TCs of ECMA and with other standardization bodies and industry consortia with the goal of enhancing PCTE.

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TC 33 - TGOO - OBJECT ORIENTATION

Scope:

To prepare the specification and language bindings for new services in the domain of O-O and Fine Grained data, and to validate these extensions by means of technical support documents. To maintain the current standards.

Programme of work:

1. To maintain the PCTE standards in answer to industry's requests.

2. To identify requirements to extend the existing PCTE standard with new complementary and compatible services in the domain of:

- object orientation, and
- high performance access to fine grained objects.

3. To define the abstract specification and bindings of the new services.

4. To develop new bindings for PCTE and for the new complementary services, in particular:

- CORBA IDL,
- C++,
- ADA 9x.

5. To ensure uniqueness of the proposed extensions by means of either liaisons or joint work with industry and standardization bodies sharing similar objectives.

6. To liaise with groups producing PCTE conformance tests in order to ensure that conformance test methods are compatible with the PCTE standards.

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TC 33 - TGDI - DATA INTEGRATION

Scope:

To write standards and technical reports enabling data integration of independently supplied tools through the use of a PCTE repository by a variety of means, including data interchange and common data schemas.

Programme of work:

1. To identify requirements for the interchange of data between different data repositories, of which one or more complies with PCTE.

2. To define PCTE Schema Definition Sets corresponding to Subject Areas of the CDIF integrated meta-model.

3. To define a programme of work for the production of standards and technical reports aiding the interchange of data between different data repositories, of which one or more complies with PCTE.

4. To investigate the route towards the publication of common data schemas for PCTE.

5. To write a technical report defining the PCTE pre-defined Schema Definition Sets in graphical format as an aid in communication with other standards groups.

6. To liaise technically with other organisations concerned with relevant standards for data interchange, information models and data repositories, including the EIA CDIF Technical Committee and relevant ISO/IEC JTC1 Subcommittees.

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TC 36- IT SECURITY

Scope:

1 To provide a framework for the standardization of security evaluation criteria for commercial and governmental IT products and systems.

2 To provide a framework for the provision of logical (as opposed to physical) security in an Open System environment including relevant management functions.

Programme of work:

To co-ordinate and supervise the work of TC36-TG1 and TC36-TG9.

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TC36-TG1 - IT SECURITY EVALUATION CRITERIA

Scope:
To provide a framework for the standardization of security evaluation criteria for commercial and governmental IT products and systems.

To develop, within this framework, a set of standards for such criteria based on established criteria such as TCSEC (Trusted Computer System Evaluation Criteria) and ITSEC (Information Technology Security Evaluation Criteria).

Programme of work:

1. To develop a framework covering those areas for which security evaluation criteria can be standardized.

2. To prioritize the areas identified within the framework with emphasis on the criteria covered by ITSEC and TCSEC.

3. To develop a set of standards for security evaluation criteria.

4. To maintain liaison with other standards organizations in order to present ECMA proposals to them and to make comments on their proposals.

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TC36-TG9 - SECURITY IN OPEN SYSTEMS

Scope:

To provide a framework for the provision of logical (as opposed to physical) security in an Open System environment including relevant Management functions.

To develop standards for security-related services and protocols or protocol elements as required for this environment.

Programme of work:

1. To maintain Technical Report ECMA TR/46 on Security Framework.

2. To maintain Standard ECMA-138 on DATA Elements and Service Definitions.

3. To develop standards for Supportive Security applications and protocols or protocol elements as required in a distributed application environment. This work will include considerations of quality of security and related characteristics of cryptographic facilities. Priority will be given to requirements of the Distributed Offices Applications environment.

4. To liaise, within ECMA, with TC32 regarding the provision of security facilities at the lower layers of the OSI model.

5. To liaise with the relevant working groups in ISO/IEC JTC1/SC18, SC21 and SC27, as well as ITU-T regarding security in Open Systems and the promotion of security standards developed by TC32 where appropriate liaison arrangements do not exist.

6. To advise TC32 of work items with regard to security.

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ECMA-6	7-Bit Coded Character Set, 6th Edition (December 1991)	**ISO/IEC 646**
ECMA-8	Nominal Character Dimensions of the Numeric OCR-A Font, 2nd Edition (January 1977)	**ISO 1073-1**
ECMA-10	Data Interchange on Punched Tape, 2nd Edition (July 1970)	**ISO 1113**
ECMA-11	Alphanumeric Character Set OCR-B for Optical Recognition, 3rd Edition (March 1976)	**ISO 1073-2**
ECMA-13	File Structure and Labelling of Magnetic Tapes for Information Interchange, 4th Edition (December 1985)	**ISO 1001**
ECMA-15	Printing Specifications for Optical Character Recognition, 2nd Edition (August 1975)	**ISO 1831**
ECMA-17	Graphic Representation of the Control Characters of the ECMA 7-Bit Coded Character Set for Information Interchange (November 1968)	**ISO 2047**
ECMA-18	Printing Line Position on Single Line Documents, 2nd Edition (January 1977)	
ECMA-21	Character Positioning on OCR Journal Tape (June 1969)	
ECMA-30	OCR-B Subsets for Numeric Applications, 2nd Edition (March 1976)	
ECMA-34	Data Interchange on 3,81 mm Magnetic Tape Cassette (63 ftpmm, Phase Encoded at 32 bpmm), 3rd Edition (September 1976)	**ISO 3407**
ECMA-35	Code Extension Techniques, 6th Edition (December 1994)	**ISO/IEC 2022**
ECMA-38	Mechanical, Physical and Magnetic Characteristics of Interchangeable Single Disk Cartridges (Top Loaded) (September 1973)	**ISO 3562**
ECMA-39	Track Format Characteristics of Interchangeable Single Disk Cartridges (Top Loaded) (September 1973)	**ISO 3563**
ECMA-41	Magnetic Tape Cassette Labelling and File Structure for Information Interchange (December 1973)	**ISO 4341**
ECMA-42	Alphanumeric Character Set for 7x9 Matrix Printers (December 1973)	
ECMA-43	8-Bit Coded Character Set Structure and Rules 3rd Edition (December 1991)	**ISO/IEC 4873**
ECMA-44	Implementation of the ECMA 7-Bit and 8-Bit Coded Character Sets on Punched Cards (September 1975)	
ECMA-45	Data Interchange on Magnetic 12-Disk Packs (100 Mbytes) (September 1975)	**ISO 4337**
ECMA-46	Data Interchange on 6,30 mm Magnetic Tape Cartridge (63 bpmm, Phase Encoded) (March 1976)	**ISO 4057**
ECMA-48	Control Functions for Coded Character Sets 5th Edition (June 1991)	**ISO/IEC 6429**
ECMA-51	Implementation of the Numeric OCR-A Font with 9x9 Matrix Printers (January 1977)	
ECMA-53	Representation of Source Programs for Program Interchange - APL, COBOL, FORTRAN, Minimal BASIC and PL/1 (January 1978)	
ECMA-54	Data Interchange on 200 mm Flexible Disk Cartridges using Two-Frequency Recording at 13 262 ftprad on One Side, 2nd Edition (January 1982)	**ISO 5654**
ECMA-55	Minimal BASIC (January 1978)	**ISO 6373**

ECMA-56	Self-Loading Cartridges for 12,7 mm Wide Magnetic Tapes (September 1978)	**ISO 6098**
ECMA-59	Data Interchange on 200 mm Flexible Disk Cartridges Using Two-Frequency Recording at 13 262 ftprad on Both Sides (August 1979)	
ECMA-62	Data Interchange on 12,7 mm 9-Track Magnetic Tape - 32 ftpmm, NRZ1, 32 cpmm - 126 ftpmm, Phase Encoding, 63 cpmm - 356 ftpmm, NRZ1, 246 cpmm GCR, 2nd Edition (March 1985) (for reference see also ISO 1863, ISO 3788 and ISO 5652)	**ISO 1864**
ECMA-64	Magnetic Disk for Data Storage Devices, 160 000 Flux Transitions per Track, 356 mm Diameter, 2nd Edition (September 1982)	**ISO 6901**
ECMA-65	Magnetic Disk for Data Storage Devices, 107 500 Flux Transitions per Track, 266 mm and 356 mm Diameter (September 1980)	**ISO 6902**
ECMA-66	Data Interchange on 130 mm Flexible Disk Cartridges Using Two-Frequency Recording at 7 958 ftprad on One Side (September 1980)	**ISO 6596**
ECMA-68	Reels for 12,7 mm Wide Magnetic Tapes (Sizes 16, 18 and 22) (January 1981)	**ISO 8064**
ECMA-69	Data Interchange on 200 mm Flexible Disk Cartridges Using MFM Recording at 13 262 ftprad on Both Sides (January 1981)	**ISO 7065**
ECMA-70	Data Interchange on 130 mm Flexible Disk Cartridges Using MFM Recording at 7 958 ftprad on 40 Tracks on Each Side, 2nd Edition (June 1986)	**ISO 7487**
ECMA-71	HDLC-Selected Procedures (January 1981)	
ECMA-73	Magnetic Disk for Data Storage Devices 95 840 Flux Transitions per Track, 200 mm Outer Diameter, 63,5 mm Inner Diameter, 2nd Edition (September 1982)	**ISO 7297**
ECMA-74	Measurement of Airborne Noise Emitted by Computer and Business Equipment, 3rd Edition (December 1992)	**ISO 7779**
ECMA-76	Magnetic Disk for Data Storage Devices, 158 000 Flux Transitions per Track, 210 mm Outer Diameter, 100 mm Inner Diameter (September 1982)	**ISO 7298**
ECMA-77	Magnetic Disk for Data Storage Devices, 83 000 Flux Transitions per Track, 130 mm Outer Diameter, 40 mm Inner Diameter (September 1982)	**ISO 7928**
ECMA-78	Data Interchange on 130 mm Flexible Disk Cartridges Using MFM Recording at 7 958 ftprad on 80 Tracks on Each Side, 2nd Edition (June 1986)	**ISO 8378**
ECMA-79	Data Interchange on 6,30 mm Magnetic Tape Cartridges Using IMFM Recording at 252 ftpmm, 2nd Edition (September 1985)	**ISO 8063**
ECMA-80	Local Area Networks (CSMA/CD Baseband) Coaxial Cable System, 2nd Edition (March 1984)	
ECMA-81	Local Area Networks (CSMA/CD Baseband) Physical Layer, 2nd Edition (March 1984)	
ECMA-82	Local Area Networks (CSMA/CD Baseband) Link Layer, 2nd Edition (March 1984)	
ECMA-84	Data Presentation Protocol (September 1982)	
ECMA-85	Virtual File Protocol (September 1982)	
ECMA-86	Generic Data Presentation - Services Description and Protocol Definition (March 1983)	
ECMA-87	Generic Virtual Terminal - Service and Protocol Description (March 1983)	

ECMA-88	Basic Class Virtual Terminal - Service Description and Protocol Definition (March 1983)	ISO 9040 and 9041
ECMA-89	Local Area Networks - Token Ring Technique 2nd Edition (March 1985)	
ECMA-91	Flexible Disk Cartridges - File Structure and Labelling for Information Interchange (March 1984)	ISO 7665
ECMA-92	Connectionless Internetwork Protocol (March 1984)	
ECMA-94	8-Bit Single-Byte Coded Graphic Character Sets - Latin Alphabets No. 1 to No. 4, 2nd Edition (June 1986)	ISO 8859-1, -2, -3 and -4
ECMA-96	Syntax of Graphical Data for Multiple-Workstation Interface (GDS) (September 1985)	
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ECMA-99	Data Interchange on 130 mm Flexible Disk Cartridges Using MFM Recording at 13 262 ftprad on Both Sides 3,8 Tracks per mm (September 1985)	ISO 8630
ECMA-100	Data Interchange on 90 mm Flexible Disk Cartridges Using MFM Recording at 7 958 ftprad on 80 Tracks on Each Side - ISO Type 301, 2nd Edition (December 1988)	ISO 8860
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ECMA-106	Layer 3 Protocol for Signalling over the D-Channel of Interfaces at the S Reference Point between Terminal Equipment and Private Telecommunication Networks for the Control of Circuit-Switched Calls, 3rd Edition (December 1993)	ETS 300 192
ECMA-107	Volume and File Structure of Flexible Disk Cartridges for Information Interchange (December 1985)	ISO/IEC 9293
ECMA-108	Measurement of High Frequency Noise Emitted by Computer and Business Equipment, 2nd Edition (June 1989)	ISO 9295
ECMA-109	Declared Noise Emission Values of Computer and Business Equipment, 3rd Edition (December 1992)	ISO 9296
ECMA-110	Ergonomics - Requirements for Monochromatic Visual Display Devices (December 1985)	

ECMA-112	X.25 (1980) Subnetwork-Dependent Convergence Protocol (December 1985)	
ECMA-113	8-Bit Single-Byte Coded Graphic Character Sets - Latin/Cyrillic Alphabet, 2nd Edition (July 1988)	ISO 8859-5
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ECMA-119	Volume and File Structure of CDROM for Information Interchange, 2nd Edition (December 1987)	ISO 9660
ECMA-120	Data Interchange on 12,7 mm 18-Track Magnetic Tape Cartridges, 3rd Edition (December 1993)	ISO 9661
ECMA-121	8-Bit Single-Byte Coded Graphic Character Sets - Latin/Hebrew Alphabet (July 1987)	ISO 8959-8
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ECMA-125	Data Interchange on 90 mm Flexible Disk Cartridges Using MFM Recording at 15 916 ftprad on 80 Tracks on Each Side - ISO Type 302 (December 1987)	ISO 9529
ECMA-126	Ergonomics - Requirements for Colour Visual Display Devices (December 1987)	
ECMA-127	Remote Procedure Call (RPC) Using OSI, 2nd Edition (June 1990)	
ECMA-128	8-Bit Single-Byte Coded Graphic Character Sets - Latin Alphabet No. 5 (July 1988)	ISO 8859-9
ECMA-129	Safety of Information Technology Equipment (ITE) (July 1988)	IEC 950
ECMA-130	Data Interchange on Read-only 120 mm Optical Data Disks (CD-ROM) (July 1988)	ISO/IEC 10149
ECMA-131	Referenced Data Transfer (July 1988)	
ECMA-132	Method for Measuring Printer Throughput, 2nd Edition (June 1991)	ISO 10561
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ECMA-136	Ergonomics - Requirements for Non-CRT Visual Display Units (June 1989)	
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ECMA-138	Security in Open Systems - Data Elements and Service Definitions (December 1989)	
ECMA-139	3,81 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - DDS Format (June 1990)	ISO/IEC 10777
ECMA-140	Document Printing Application (DPA) (June 1990	ISO/IEC 10175
ECMA-141	PTN - Inter-Exchange Signalling - Data Link Layer Protocol (PTN QSIG-L2), 2nd Edition (June 1993)	I-ETS 300 170

ECMA-142	Specification, Functional Model and Information Flows for Control Aspects of Circuit Mode Basic Services in Private Telecommunication Networks (June 1990)	ETS 300 171
		ISO/IEC DIS 11574
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		ISO/IEC 11572
ECMA-144	8-Bit Single-Byte Coded Character Sets - Latin Alphabet No. 6, 2nd Edition (December 1992)	ISO/IEC 8859-10
ECMA-145	8 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording (December 1990)	ISO/IEC 11319
ECMA-146	3,81 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - DATA/DAT Format (December 1990)	ISO/IEC 11321
ECMA-147	Data Interchange on 90 mm Flexible Disk Cartridges using MFM Recording at 31 831 ftprad on 80 Tracks on Each Side - ISO Type 303 (December 1990)	ISO/IEC 10994
ECMA-148	Identification Supplementary Services in Private Telecommunication Networks - Specification, Functional Model, Information Flows, 2nd Edition (June 1993)	ETS 300 173
ECMA-149	Portable Common Tool Environment (PCTE) - Abstract Specification, 2nd Edition (June 1993)	ISO/IEC DIS 13719-1
ECMA-150	3,81 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - DDS-DC Format using 60 m and 90 m Length Tapes, 2nd Edition (June 1992)	ISO/IEC 11557
ECMA-151	Data Compression for Information Interchange - Adaptive Coding with Embedded Dictionary - DCLZ Algorithm (June 1991)	ISO/IEC 11558

ECMA-152	Data Interchange on 12,7 mm 18-Track Magnetic Tape Cartridges - Extended Format, 2nd Edition (December 1993)	ISO/IEC 11559
ECMA-153	Information Interchange on 130 mm Optical Disk Cartridges of the Write Once, Read Multiple (WORM) Type, Using the Magneto-Optical Effect, 2nd Edition (June 1994)	ISO/IEC 11560
ECMA-154	Data Interchange on 90 mm Optical Disk Cartridges, Read Only and Rewritable, M.O., 2nd Edition (December 1994)	ISO/IEC 10090
ECMA-155	Addressing in Private Telecommunication Networks (June 1991)	ETS 300 189
		ISO/IEC 11571
ECMA-156	Generic Stimulus Procedure for the Control of Supplementary Services Using the Keypad Protocol at the S Reference Point, 2nd Edition (June 1993)	ETS 300 190
ECMA-157	Protocol for Signalling over the D-Channel of Interfaces at the S Reference Point between Terminal Equipment and Private Telecommunication Networks for the Support of Identification Supplementary Services, 2nd Edition (June 1993)	ETS 300 191
ECMA-158	Portable Common Tool Environment (PCTE) - C Programming Language Binding, 3rd Edition (December 1994)	ISO/IEC DIS 13719-2
ECMA-159	Data Compression for Information Interchange - Binary Arithmetic Coding Algorithm (December 1991)	ISO/IEC 12042
ECMA-160	Determination of Sound Power Levels of Computer and Business Equipment Using Sound Intensity Measurements; Scanning Method in Controlled Rooms, 2nd Edition (December 1992)	ISO 9614-2

ECMA-161	PTN - Signalling at the S Reference Point - Generic Feature Key Management Protocol for the Control of Supplementary Services (SSIG-FK), 2nd Edition (June 1993)	ETS 300 240
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ECMA-163	PTN - Specification, Functional Model and Information Flows - Name Identification Supplementary Services (NISD), 2nd Edition (December 1993)	ETS 300 237
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ECMA-166	Information Technology Equipment - Routine Electrical Safety Testing in Production (June 1992)	prEN 50116
ECMA-167	Volume and File Structure of Write-Once and Rewritable Media Using Non-Sequential Recording for Information Interchange, 2nd Edition (December 1994)	ISO/IEC 13346
ECMA-168	Volume and File Structure for Read-Only and Write-Once Compact Disk Media for Information Interchange, 2nd Edition (December 1994)	ISO/IEC 13490
ECMA-169	8 mm Wide Magnetic Tape Cartridge Dual Azimuth Format for Information Interchange - Helical Scan Recording (June 1992)	ISO/IEC 12246
ECMA-170	3,81 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - DDS Format Using 60 m and 90 m Length Tapes (June 1992)	ISO/IEC 12247
ECMA-171	3,81 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - DATA/DAT-DC Format Using 60 m and 90 m Length Tapes (June 1992)	ISO/IEC 12248
ECMA-172	Procedure for Measurement of Emissions of Electric and Magnetic Fields from VDUs from 5 Hz to 400 kHz (June 1992)	
ECMA-173	PTN - Specification, Functional Model and Information Flows - Diversion Supplementary Services (CFSD) (June 1992)	ETS 300 256
ECMA-174	PTN - Inter-exchange Signalling Protocol - Diversion Supplementary Services (QSIG-CF) (June 1992)	ETS 300 257
ECMA-175	PTN - Specification, Functional Model and Information Flows - Path Replacement Additional Network Feature (PRSD) (June 1992)	ETS 300 258
ECMA-176	PTN - Inter-exchange Signalling Protocol - Path Replacement Additional Network Feature (QSIG-PR) (June 1992)	ETS 300 259
ECMA-177	PTN - Specification, Functional Model and Information Flows - Call Transfer Supplementary Service (CTSD) (June 1992)	ETS 300 260
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ECMA-179	Services for Computer Supported Telecommunications Applications (CSTA) Phase I (June 1992)	

ECMA-180	Protocol for Computer Supported Telecommunications Applications (CSTA) Phase I (June 1992)	
ECMA-182	Data Interchange on 12,7 mm 48 Track Magnetic Tape Cartridges - DLT1 Format (December 1992)	**ISO/IEC 13421**
ECMA-183	Data Interchange on 130 mm Optical Disk Cartridges - Capacity: 1 Gigabyte per Cartridge (December 1992)	**ISO/IEC 13481**
ECMA-184	Data Interchange on 130 mm Optical Disk Cartridges - Capacity: 1,3 Gigabytes per Cartridge (December 1992)	**ISO/IEC 13549**
ECMA-185	PTN - Specification, Functional Model and Information Flows - Call Completion Supplementary Services (CCSD) (December 1992)	**ETS 300 365**
ECMA-186	PTN - Inter-exchange Signalling Protocol - Call Completion Supplementary Services (QSIG-CC) (December 1992)	**ETS 300 366**
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ECMA-189	Information Interchange on 300 mm ODCs of the WORM Type Using the SSF Method (June 1993)	**ISO/IEC 13614**
ECMA-190	Information Interchange on 300 mm ODCs of the WORM Type Using the CCS Method (June 1993)	**ISO/IEC 13403**
ECMA-191	PTN - Specification, Functional Model and Information Flows - Call Offer Supplementary Service (COSD) (June 1993)	**ETS 300 361**

ECMA-192	PTN - Inter-Exchange Signalling Protocol - Call Offer Supplementary Service (QSIG-CO), 2nd Edition (December 1994)	**ETS 300 362**
ECMA-193	PTN - Specification, Functional Model and Information Flows - Do Not Disturb and Do Not Disturb Override Supplementary Services (DND(O)SD) (June 1993)	**ETS 300 363**
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ECMA-195	Data Interchange on 130 mm Optical Disk Cartridges - Capacity: 2 GigaBytes per Cartridge (September 1993)	**ISO/IEC 13842**
ECMA-196	Data Interchange on 12,7 mm 36-Track Magnetic Tape Cartridges (December 1993)	**ISO/IEC 145251**
ECMA-197	Data Interchange on 12,7 mm 112-Track Magnetic Tape Cartridges - DLT2 Format (December 1993)	**ISO/IEC 13962**
ECMA-198	3,18 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - DDS-2 Format using 120 m Length Tapes (December 1993)	**ISO/IEC 13923**
ECMA-199	Immunity of VDUs to Power Frequency Magnetic Fields (December 1993)	
ECMA-200	Immunity of Information Technology Equipment to Lightning Surges (December 1993)	
ECMA-201	Data Interchange on 90 mm Optical Disk Cartridges - Capacity: 230 MBytes per Cartridge, 2nd Edition (December 1994)	**ISO/IEC 13963**
ECMA-202	PTN - Specification, Functional Model and Information Flows - Call Intrusion Supplementary Service (CISD) (December 1993)	**prETS 300 425**

ECMA-203	PTN - Inter-Exchange Signalling Protocol - Call Intrusion Supplementary Service (QSIG-CI), 2nd Edition (December 1994)	**prETS 300 426**
ECMA-204	PTN - Inter-Exchange Signalling Protocol - Supplementary Service Interactions (QSIG-IA) (December 1993)	**prETS 300 427**
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TECHNICAL REPORTS

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ECMA TR/7 Continuous Sprocket-Punched Stationery Part I (Recommended Sizes) (December 1973)

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ECMA TR/33 Visual Displays - Health Aspects (December 1985)

ECMA TR/34 Maintenance at the Interface Between Data Processing Equipment and Private Switching Network (June 1986)

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ECMA TR/61	User Interface Taxonomy (June 1992)
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ECMA TR/68	Scenarios for Computer Supported Telecommunications Applications (CSTA) Phase II (December 1994)
ECMA TR/69	Reference Model for Project Support Environments (December 1994)

LIST OF REPRESENTATIVES

NOT FOR PUBLIC RELEASE

Kindly note that the Ecma memento pages containing the contact details of the representatives have been intentionally removed.

ECMA BY-LAWS

Art. 1
CONSTITUTION AND HEAD OFFICE

1.1
ECMA, a European association for standardizing information and communication systems, has been constituted according to these By-Laws and Articles 60 et seq. of the Swiss Civil Code.

1.2
The Headquarters of the Association is in Geneva.

Art. 2
PURPOSE

2.1
The purpose of the Association is:
2.1.1
To develop, in co-operation with the appropriate national, European and international organizations as a scientific endeavour and in the general interest standards and technical reports in order to facilitate and standardize the use of information processing and telecommunication systems.
2.1.2
To promulgate various standards applicable in the functional design and use of information processing and telecommunication systems.

2.2
The Association shall be a non-profit-making organization and shall devote itself to no commercial activity whatsoever.

Art. 3
MEMBERSHIP

3.1
The Association shall consist of ordinary members and such other classes of members as may be created by the ordinary members at a General Assembly.

3.2
The ordinary members shall fulfil the qualifications set forth under Article 3.3 of the present By-Laws, and be accepted according to Article 4.

3.3
Ordinary members shall be companies which develop, produce and market in Europe hardware or software products or services in the field of information technology or telecommunications used to process digital information for business, scientific, control, communication or other similar purposes. Products or services used exclusively for military purposes shall not be considered in this regard.

3.4
A proposed ordinary member will not be accepted if it holds at least 50 per cent of the capital of an existing ordinary member nor if at least 50 per cent of its capital is held by an existing ordinary member.

3.5
No two or more companies, at least 50 per cent of whose capital is held by the same company, which is not a member itself, may be ordinary members but must be represented by one company only.

3.6
Applications for ordinary membership will not be accepted unless the proposed member develops, produces and markets some major product or service as defined in Art. 3.3 which is not basically a copy of that of an existing ordinary member.

3.7
Additional classes of members which may be established according to Article 3.1 shall have such qualifications and be entitled to such rights and privileges and have such obligations as shall be determined at a General Assembly by a majority of two thirds of all the ordinary members.

3.8
Associate members

3.8.1
A company may be admitted as associate member which has interest and experience in matters related to one or more of the Technical Committees of the Association. No company qualifying for ordinary membership can be elected associate member.
3.8.2
A prospective associate member shall declare the Technical Committees in whose work it proposes to take part.
3.8.3
The restrictions of Articles 3.4 and 3.5 of the By-Laws shall apply to associate members.
3.8.4
Associate members shall be admitted by a majority of all the ordinary members.
3.8.5
An associate member is entitled fully to participate in the work of the authorized committees and receive all relevant papers. In addition, it may be authorized to participate in the work of such other committees as may be decided in a General Assembly.
3.8.6
Art 4.1 of the Rules applies to associate members. Representatives of the associate members shall have the right to take part in the discussions at the General Assembly relevant to the Technical Committees in which they participate. However, they have no vote in the General Assembly.

3.8.7
Associate membership shall be terminated in the cases listed in Art. 5.1; Art. 5.2 to 5.5 also apply.

3.8.8
The membership fee for associate members is one half of the fee for ordinary members. Rule 8 applies to associate members.

Art. 4
ACCEPTANCE OF NEW MEMBERS

4.1
Application for membership shall be made to the Secretariat.

4.2
Decisions on compliance with conditions shall be made by a two-thirds majority of all the ordinary members.

4.3
When it has been decided that the conditions are complied with, the applicant shall be admitted to the relevant class of membership.

Art. 5
TERMINATION OF ORDINARY MEMBERSHIP

5.1
Ordinary membership shall be terminated in the following cases:
a. Withdrawal upon written notice given to the Secretary General, to take effect on receipt.
b. The company ceasing to exist.

c. The conditions for membership set forth in Articles 3.4 and 3.5 of the present By-Laws no longer being complied with.
d. In the opinion of two-thirds of all the ordinary members the conditions the conditions set forth in Articles 3.3 and 3.6 no longer being complied with.
e. By expulsion for violation of By-Laws and Rules or for any other conduct prejudicial to the interest and correct functioning of the Association.

5.2
No member may be expelled for failure to adhere to one or several agreed standards.

5.3
Any proposal to expel a member must be backed by at least one-fifth of all the ordinary members. The proposal to expel must be on the agenda for the General Assembly at which it is to be discussed so as to give the member the opportunity to present its case.

5.4
A two-thirds majority of all the ordinary members is necessary to expel a member. Such expulsion will become effective 15 days after notification by registered mail.

5.5
Notwithstanding Article 4.3 a member which has been expelled can only be re-admitted on a two-thirds majority of all ordinary members.

Art. 6
STRUCTURE

6.1
The Association shall consist of:
a. The General Assembly.
b. The Management.
c. The Co-ordinating Committee.

6.2
The General Assembly of the ordinary members shall be the highest authority of the Association. It shall control the Association and appoint and control its Management.

6.3
The Management shall consist of a President, a Vice-President and a Treasurer. The Management shall be discharged by the President or, if circumstances require, by the Vice President.

6.4
The President and the Vice-President shall be individuals elected for one year by the ordinary members at a General Assembly. Only representatives of ordinary members can be nominated. The President and the Vice-President can be re-elected any number of times provided that neither serves more than two consecutive years.

6.5
The President shall, through his signature, commit the Association in any business or transaction directly connected with the purpose of the Association.

6.6
There shall be a Treasurer whose duty shall be determined by the General Assembly. The Rules set out in 6.4 shall apply to his office, except that there shall be no limit in the number of consecutive years in office.

6.7
The Co-ordinating Committee shall comprise 6 members and make recommendations to the General Assembly regarding the formation, activities, reorganization or dissolution of Technical Committees.

Art. 7
GENERAL ASSEMBLY

7.1
The President will each year call at least two ordinary General Assemblies of the ordinary members. Written notice of the time and place of the Assembly shall be given at least thirty days before the date of the Assembly. The Agenda and supporting documents for the Assembly shall be circulated at least fifteen days before the Assembly.

7.2
Unless otherwise restricted by these By-Laws or the Rules of the Association, any action required or permitted to be taken at an Assembly may be taken without a meeting, provided that no ordinary member opposes such a procedure within 20 days from the mailing date.

7.3
Special General Assemblies for any purpose or purposes unless otherwise prescribed by these By-Laws or the Rules of the Association may be called by the President, and shall be called by him, at the request in writing of at least one-fifth of all the ordinary members. Such request shall state the purpose or purposes of the proposed assembly. The business transacted at any special assembly shall be limited to the purposes stated in the notice.

7.4
Written notice of Special General Assemblies stating the time, place and object thereof, shall be given to each ordinary member at least twenty days before the date of the Assembly and shall include the agenda and supporting documents for the Assembly.

7.5
A majority of all the ordinary members must be present or represented by proxy at any General Assembly, in order to constitute a quorum for transaction of the business except as otherwise provided by these By-Laws or the Rules of the Association.

7.6
Unless otherwise prescribed by these By-Laws or the Rules of the Association, the vote of the majority of all the ordinary members shall decide any question.

Art. 8
PROMULGATION OF STANDARDS AND TECHNICAL REPORTS

8.1
Promulgation of such documents by the Association shall require approval by at least two-thirds of all the ordinary members.

8.2
Proposed drafts shall be circulated by the Secretary General at least two months in advance of the General Assembly at which they will be voted upon.

8.3
It is not obligatory for members to follow any standard.

8.4
All documents when approved shall be made available to all interested parties without restriction.

Art. 9
AD HOC COMMITTEES

9.1
The General Assembly may delegate authority for specific purposes to ad hoc committees. The tasks, terms of reference and membership of these committees will be adopted if a majority of all the ordinary members assent.

9.2
Unless otherwise decided at the time of its appointment each ad hoc committee may co-opt additional members should it so desire.

9.3
No ad hoc committee may meet for more than one year without being reappointed.

Art. 10
SECRETARIAT

10.1
There shall be a permanent Secretariat of the Association responsible to the General Assembly.

10.2
A Secretary General shall be appointed by the General Assembly and shall be responsible for the operation of the Secretariat.

Art. 11
TECHNICAL COMMITTEES

11.1
Technical Committees (TCs) will be formed by the Secretary General when so decided at a General Assembly.

11.2
Any ordinary member may participate in any TC.

Art. 12
FISCAL YEAR

12.1
The fiscal year shall commence on January 1 and end on December 31.

Art. 13
FINANCE

13.1
The annual budget of the Association shall be approved by at least two-thirds of the ordinary members present or represented at an ordinary General Assembly.

13.2
The Association shall be financed by an equal levy on all ordinary members and half this levy on all associate members. The fees are set by the ordinary members during an ordinary General Assembly and based on the current year budget. Such fees shall be used to finance the activity of the Association and its administrative expenses and shall not be returnable.

13.3
The Secretary General will be responsible for expenditures within the budget.

13.4
The President may authorize expenditures outside the budget to an amount not exceeding 10 per cent of the corresponding item in the current year budget. Any expense above this must be approved by the ordinary members.

Art. 14
DISSOLUTION

14.1
In the event of the dissolution of the Association, its assets are first used to discharge its liabilities. Any balance of liability shall be borne by the members in proportion to their annual fees. Any surplus funds remaining after the liabilities have been discharged will be distributed to those which are members at the date of dissolution in proportion to their total contributions to the Association.

Art. 15
AMENDMENTS

15.1
The By-Laws and any Rules that may be adopted by the General Assembly can only be modified at an ordinary or special General Assembly. The proposed amendments must be included in the agenda and notified to the members according to the provisions of Articles 7.1 and 7.4.

15.2
Amendments shall require two-thirds approval of all the ordinary members.

Art 16
LITIGATION

16.1
Any dispute arising during the life of the Association or during its dissolution either between the members of the Association and its Management or between the members and the Association or between the members themselves as a consequence of the Association's activity shall be decided upon by the Courts of the Canton of Geneva. Swiss law is applicable in all cases.

ECMA RULES

1.
LANGUAGE

1.1
The English language, as written in the United Kingdom, will be the official language of the Association.

2.
SYSTEM OF MEASUREMENTS

2.1
The metric system of measurements will be used.

3.
MINIMUM PERIOD OF MEMBERSHIP

3.1
There is no minimum period of membership.

4.
REPRESENTATION OF MEMBERS

4.1
Each member shall designate the name of one of its officers or executives who shall represent them in General Assemblies and who shall have full authority to commit the member on all matters concerning the Association. Members shall notify the Association of any changes in their representation.

5.
GENERAL ASSEMBLIES

5.1
Representatives may invite additional individuals from their respective member company to participate in an advisory capacity at a General Assembly.

5.2
The members entitled to attend and vote at a General Assembly may be represented by a proxy. A written proxy shall be established indicating the item or items of the agenda to which it is restricted.

5.3
The President or in his absence the Vice-President shall preside at all General Assemblies. In absence of both, the members present or represented by proxy shall elect a Chairman for that particular meeting.

6.
CO-ORDINATING COMMITTEE

6.1
An ad hoc Committee consisting of individuals elected by the General Assembly will be set up under the name of Co-ordinating Committee (CC), whose terms of reference will be as follows:

6.1.1
To prepare terms of reference for new Technical Committees in accordance with the rules for the formation of a Technical Committee.

6.1.2
To nominate a provisional Chairman and Vice-Chairman for each new Technical Committee.

6.1.3
To review from time to time the terms of reference given to Technical Committees.

6.1.4
To have every six month meetings with Chairmen of Technical Committees at which the progress of the TCs will be reviewed and co-ordinated.

6.1.5
To make recommendations to the disbandment of Technical Committees.

6.1.6
To provide assistance to the Management as and when required.

6.2
The members and the Chairman of the Co-ordinating Committee shall be individuals elected for one year at a General Assembly by the ordinary members. The Chairman shall be eligible for re-election, subject to a maximum term of office of 3 consecutive years. The other members can be re-elected any number of times. Only representatives of ordinary members can be nominated.

7.
TECHNICAL COMMITTEES

7.1
Formation of Technical Committees (TCs):

7.1.1
TCs will be formed by the Secretary General (SG) when so decided at a General Assembly.

7.1.2
Any proposal for the setting up of a TC must give the suggested terms of reference, including the scope, and be sent to the SG.

7.1.3
The CC shall nominate a provisional Chairman and Vice-Chairman.

7.1.4
The SG shall then convene the first meeting of the TC.

7.2
Operating procedure of TC-Rules and recommendations for the TCs:

7.2.1
Members of TCs are:
- representatives of ECMA member Companies,
- other participants invited by the SG at the request of the TC or of the Management.

7.2.2
Members Companies of ECMA are entitled to send one or more representatives to any TC. These representatives shall be employees of the member Companies.

7.2.3
Voting on any matter shall be by simple majority of TC members present at the meeting. Each member Company has only one vote. Several invited participants belonging to one organization, have only one vote between them.

7.2.4
One-time visitors can attend a meeting only at the special invitation of the SG at the request of the TC. They have no voting rights.

7.2.5
It is recommended that in the course of its ordinary work the TC should not use voting unless it is impossible to make progress without a vote.

7.2.6
The provisional Chairman and Vice-Chairman nominated by the CC shall act for an initial period which shall be not less than 6 months from the date of the first meeting and which shall include the first 3 meetings.

7.2.7
At the first meeting of the TC which takes place after the end of the initial period, a Chairman and Vice-Chairman shall be elected from among the member Company representatives.

7.2.8
The Chairman and Vice-Chairman, having been elected from among the member Company representatives, shall hold office for a term of 12 months. They shall be eligible for re-election, subject to a maximum term of office of 3 consecutive years.

7.2.9
Meetings of the TCs shall be conducted by the Chairman, according to the By-Laws and Rules of ECMA. An officer of the Secretariat shall act as Secretary at all TC meetings. The Vice-Chairman shall assist the Secretary and shall act for the Secretary if the latter is unable to attend.

7.2.10
Agenda for meetings of the TCs shall be prepared by the Chairman and an officer of the Secretariat taking into account suggestions made by members of the Committee. The agenda shall be circulated to all members 3 weeks before each meeting; at the opening of the meeting it can be modified if wanted and must be approved.

7.2.11
The SG shall be responsible for the preparation of minutes of the meetings.

7.2.12
The minutes shall be distributed by the SG within 3 weeks to all members of the TC, to the Chairmen of all TCs, to the official representatives of the member companies, and to the members of the CC.

7.2.13
The first item on the agenda of each TC shall be the amendment and approval of the minutes of the preceding meeting. The minutes, after approval, shall constitute the official record of the meeting of a TC.

7.2.14
Any suggestions for the amendment of terms of reference of TCs shall be addressed to the SG for discussion between the TC Chairman and the CC.

7.2.15
The Chairman is responsible for the preparation of a semi-annual report for each TC: He will be assisted by the Vice-Chairman and an officer of the Secretariat in this task and the report will be submitted to the General Assembly. The report will contain a description of the results achieved to date and an outline of the work to be carried out during the next year.

7.2.16
This report will be circulated to all members of the TC for approval.

7.2.17
Any member of a TC has the right to ask for a minority report to be submitted if he so desires.

7.2.18
The work of all TCs will be discussed every 6 months at a meeting of the CC and the SG at which meetings the semi-annual report will be presented.

7.2.19
First priority in discussion at the meetings of the TCs must be given to items on the agenda.

7.2.20
Under no circumstances should any technical contribution be decided upon at a TC meeting unless it has been circulated to all Committee members at least 3 weeks before the meeting.

7.2.21
In the interest of economy and efficiency, meetings may be held in Geneva.

7.3
Task Groups (TGs)

7.3.1
A Technical Committee may form TGs for the accomplishment of specific tasks within the scope of the TC.

7.3.2
At least two members of the TC shall agree to take an active part in the work of a TG.

7.3.3

Terms of reference of the TG shall be included in the minutes of the meeting of the Technical Committee at which the TG has been formed.

7.3.4

TGs shall report at each meeting to the TC on their activities; these reports shall appear in the minutes of the TC.

7.3.5

The Convenor of a TG shall be appointed by the TC upon nomination by the TG. He shall be eligible for re-election, subject to a maximum term of office of 3 consecutive years.

7.3.6

In the interest of economy and efficiency, meetings of TGs may be held in Geneva.

8.
MEMBERSHIP FEES

8.1

The membership fees shall be based on an estimate for the current year's operating expenses with adjustments for any deviation between the estimated and actual expenses for the preceding years. Although the Association shall be non-profit-making, reserves may be accumulated if so decided by the General Assembly.

8.2

Any new member shall pay the full annual fee for the fiscal year in which it is admitted as member.

8.3

Every member on the date of the General Assembly which decides on the budget for the following fiscal year shall pay the full annual fee for that year.

8.4

Any withdrawing member shall pay a fee for the fiscal year following the year of withdrawal (Art. 5.1a of the By-Laws). This fee shall be equal to the annual fee for the year of withdrawal. Representatives of a withdrawing member may continue to attend TC and TG meetings and to receive all technical papers during the full fiscal year following the year of withdrawal.

9.
OPERATING EXPENSES

9.1

Operating expenses of the Association shall consist of salaries, travel and office expenses of the Secretariat and publication costs.

9.2

Expenses of members including those connected with ad hoc committees, TCs and TGs are not part of the operating expenses of the Association.

9.3

The Secretary General of ECMA is responsible to the Treasurer for the operating expenses of the Association.

9.4

The general accounting of the Secretariat will be reviewed once a year by an Auditor appointed by the Treasurer and approved by the General Assembly.

1.

POLICY

General Declaration:
The General Assembly of ECMA shall not approve recommendations of Standards which are covered by patents when such patents will not be licensed by their owners on a reasonable and non-discriminatory basis.

1.1

In case the proposed Standard is covered by issued patents of ECMA members only:
Members of the General Assembly are asked to state the Company licensing policy with respect to these patents.

1.2

In case the proposed Standard is covered by issued patents by non ECMA members: A written statement from the patentee is required, according to which he is prepared to grant licences on a reasonable, non-discriminatory basis.
The General Assembly and/or the Management shall decide in this case which steps must be undertaken in order to obtain such a statement.

1.3

In case the proposed Standard is covered by patent applications of ECMA members (which is not known, neither during the work of the TC nor at the time of the vote in the General Assembly):

1.3.1

Each member of the TCs and/or of the General Assembly of ECMA will determine whether any proposed standard may be covered by any patent for which his company has a pending application; if such a patent application exists, his continued participation to the relevant committee will imply that such a patent, when obtained later, will be made available from his company for licensing on a reasonable, non-discriminatory basis.

1.3.2

Each member of the TCs and/or of the General Assembly of ECMA will determine whether any proposed standard may be covered by any patent for which his company has a pending application; if such a patent application exists, the favourable vote of the Company to the General Assembly will imply that such a patent, when obtained later, will be made available from his company for licensing on a reasonable, non-discriminatory basis.

1.4

In case the proposed Standard is covered by patent applications of third parties (which is not known during the work of the TC nor at the time of the vote in the General Assembly):
In this case practically nothing can be done at the time of the vote. When afterwards said patents are issued, it should be tried to obtain reasonable, non-discriminatory licences. If this proves to be impossible, the standard will have to be cancelled.

2.

PROCEDURE

2.1

The questions related to protective rights are in the competence of the General Assembly of ECMA and should not be discussed at the TC level.

2.2

Each draft standard shall be submitted two months ahead of a General Assembly, by registered mail. All members are required to state within two months whether they claim any issued protective rights covering the subject matter of the proposed standard and/or have knowledge of such rights of third parties.

2.3

Replies to this request will be circulated in due time before the General Assembly.

2.4

When an answer is not received from a Company, the General Assembly may proceed to a vote on the assumption that this Company will act in accordance with the General Declaration, that is to license possible relevant issued patents on a reasonable and non-discriminatory basis.

Adopted at the General Assemblies of 29th March 1963, 2nd June 1966 and 15th December 1988 and 23rd June 1994.

HISTORY OF ECMA

By 1959 the growing use of computers, built by several different manufacturers, showed the necessity for standardization in operational techniques, such as programming, and also input and output codes. Such standards would make it possible to use data prepared for, or even by, a computer made by one manufacturer to be on a computer made by another with the minimum of alteration. Also it would avoid duplication of work in the preparation of, for example, programming languages by several manufacturers.

Though certain National Bodies had, before 1960, started work on standards in this field, e.g. paper tape and codes, there did not appear to be collaboration between them, nor between the manufacturers themselves. Different countries may have different requirements, so that it may not be necessary to have the same standards everywhere, but the standards should at least be compatible.

With the object of co-ordinating such work, the Heads of the Companies of longest standing in Europe in the data processing field (Compagnie des Machines Bull, IBM World Trade Europe Corporation and International Computers and Tabulators Limited) sent a joint letter to all the known computer manufacturers within Europe, inviting these companies to send representatives to a meeting. This meeting was held on April 27, 1960, in Brussels; it was decided that an association of manufacturers should be formed which would be called European Computer Manufacturers Association, and a Committee was nominated to prepare the formation of the Association and to draw up By-Laws and Rules.

By December 1960 the form that the Association would take was fairly well defined and it had been decided that the headquarters should be in Geneva to be near the headquarters of the International Organization for Standardization and the International Electrotechnical Commission. In May 1961 the Association officially came into being and all those Companies which attended the original meeting became members.

Just prior to the official registration of ECMA, it was invited to be represented at a Round-Table Conference to be held in Geneva organized by ISO and IEC to discuss standardization in the general field of computers. This meeting resulted in the formation of TC97 and in the organization of its own Working Groups, and ECMA was asked to become a liaison member. In 1987, when TC97 became part of ISO/IEC JTC1, ECMA became A-liaison member of JTC1.

To reflect the international activities of the Europe-based ECMA organization the name was changed in 1994 to: ECMA - European association for standardizing information and communication systems.

PAST PRESIDENTS / SECRETARY GENERAL

1961-1962
Mr. C. G. Holland-Martin (ICT)

1963-1964
Prof. Dr. J. Engelfriet (EL)

1965-1966
Mr. M. R. Pedretti (IBM)

1967-1968
Dr. J. M. M.Pinkerton (ICL)

1969-1970
Mr. P. J. Davous (Bull)

1971-1972
Dr. K. Scheidhauer (AEG-Tfk)

1973-1974
Dr. J. M. M. Pinkerton (ICL)

1975
Mr. J. van Eijbergen (Philips)

1976-1977
Mr. W. Heimann (Siemens)

1978-1979
Mr. M. H. Johnson (Ferranti)

1980-1981
Mr. J. van Eijbergen (Philips)

1982-1983
Mr. H. Feissel (Cii HB)

1984-1985
Mr. J. Scherpenhuizen (Digital)

1986-1987
Mr. C. Rossetti (STET)

1988-1989
Mr. J. Dubos (Bull)

1990
Mr. J. van den Beld (Philips)

1991-1992
Mr. G. Haberzettl (Siemens Nixdorf)

1993-1994
Mr. W. Brodbeck (IBM)

Past Secretary General

1961-1991 Mr. Dara Hekimi

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