MEMENTO 1999

ECMA

Standardizing Information and Communication Systems

TABLE OF CONTENTS

PREFACE

Information Technology, Telecommunications and Consumer Electronics are key factors in today's economic and social environment. Effective interchange both of commercial, technical, and administrative data, text and images and of audiovisual information is essential for the growth of economy in the world markets. Through the increasing digitalization both information technology, telecommunications and consumer electronics are getting more and more integrated.

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 five years ECMA has actively contributed to world-wide standardization in information technology, telecommunications and consumer electronics. About 250 ECMA Standards and 75 Technical Reports of high quality have been published.

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

- Multimedia
- High Speed Telecommunications
- IT Security
- Environmental Product Attributes
- IP-based Services for Corporate Networks
- High Capacity Storage Media
- Programming and Scripting Languages
- Computer Telephony Integration
- Screenphone Terminals

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 European and international standardization bodies.

ECMA Standards are developed by highly qualified experts from information technology,consumer electronics 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 high technology 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 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, February 1999.

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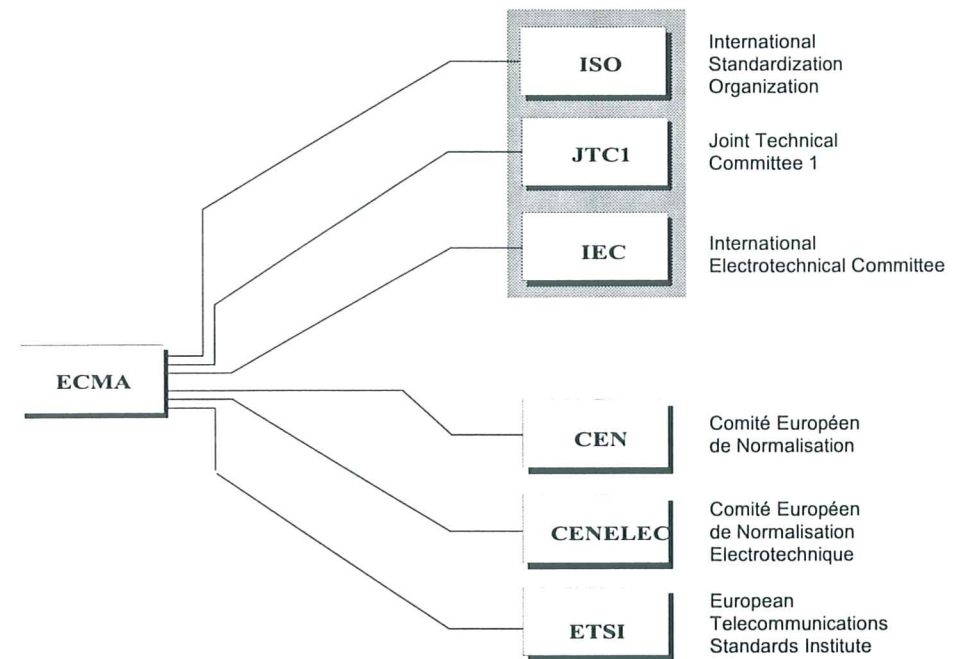
The Association shall consist of ordinary, associate and SME members, and such other classes of members as may be created by the ordinary members at a General Assembly.

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 Technical Committees of the Association. No company qualifying for ordinary membership can be elected associate member. A company which has similar interests as an associate member and an annual turnover of less than one hundred million Swiss Francs, may be admitted as SME member (Small and Medium-sized Enterprise).

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

ECMA'S ROLE IN INTERNATIONAL STANDARDIZATION

ISO — International Standardization Organization

JTC1 — Joint Technical Committee 1

IEC — International Electrotechnical Committee

CEN — Comité Européen de Normalisation

CENELEC — Comité Européen de Normalisation Electrotechnique

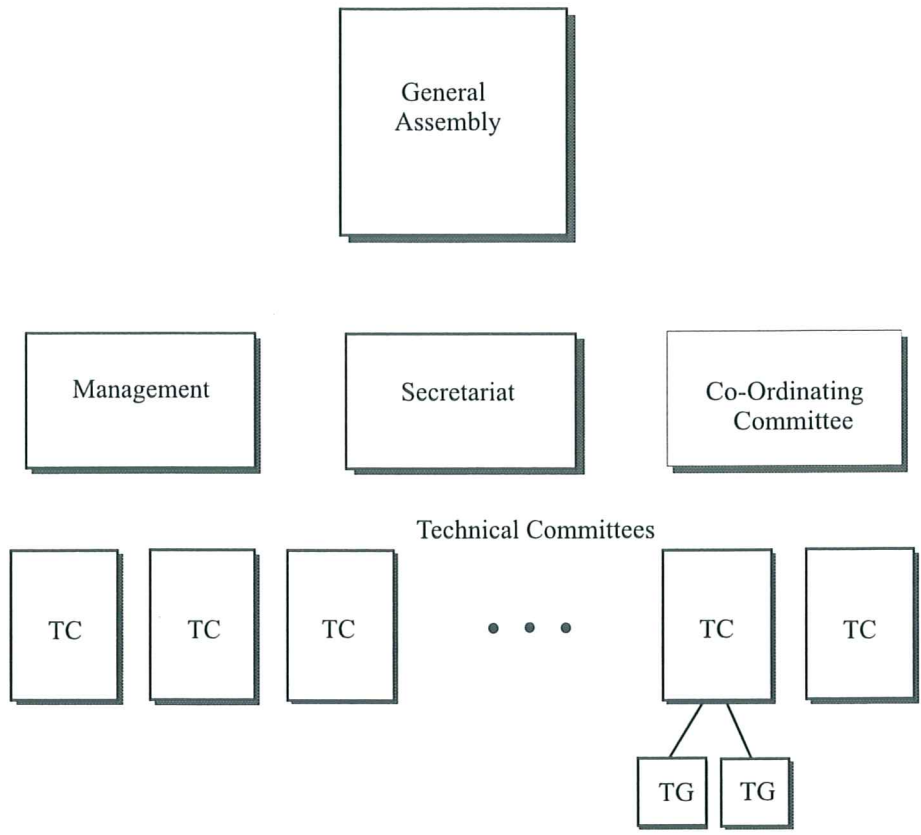ETSI — European Telecommunications Standards Institute

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

ECMA ORGANIZATION

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                    ┌─────────────┐
                    │   General   │
                    │  Assembly   │
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│  Management  │   │  Secretariat │   │ Co-Ordinating│
│              │   │              │   │  Committee   │
└──────────────┘   └──────────────┘   └──────────────┘

              Technical Committees

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OTHER ORGANIZATIONS

Participation in the technical work of ECMA is open to experts from organizations not qualifying for membership, e.g. national institutes or user organizations (Art. 7.2 of the Rules). Such experts are considered as full members of the Technical Committees and as such, will be exercising voting rights.

Amorphouse Research Lab., Beijing University of Aeronautics & Astronautics

EACEM - European Association of Consumer Electronics Manufacturers

MCI Metro

NIST, Computer Systems Laboratory

Object Management Group (OMG)

Physikalisch-Technische Bundesanstalt (PTB)

Universität Dresden

University of Savoye

US EPA - Office of Pollution Prevention

VCCI

TECHNICAL COMMITTEES

Active Committees

Product Safety	TC 12
Volume and File Structure	TC 15
Magnetic Tapes and Tape Cartridges	TC 17
Electromagnetic Compatibility (EMC)	TC 20
Acoustics	TC 26
Optical Disk Cartridges	TC 31
Communication, Networks and Systems Interconnection	TC 32
IT Security	TC 36
Product-related Environmental Attributes	TC 38
Scripting Languages	TC 39
Object Data Interfaces	TC 40

Committees having accomplished their task

Codes (Coded Character Sets)	TC 1
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
Flexible Disk Cartridges	TC 19
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
Portable Common Tool Environment (PCTE)	TC 33
Office Devices	TC 34
User System Interface	TC 35
Application Programming Interface for Windows (APIW)	TC 37

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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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 minimum 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 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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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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Mr. C.J. Wong (Xerox)

Mr. V. Zabai (IBM)

Scope:

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

Programme of work:

1. To develop standards for optical disks and disk cartridges of 80 mm, 90 mm, 120 mm (both CD and DVD), 130 mm, 300 mm and 356 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 maintain an overall view and strategy for standardization in the field of private/corporate telecommunications, and to prepare ECMA Standards and Technical Reports required in this field. To monitor and pursue standardization at a global level with regard to ISO/IEC JTC1 and the international standardization world in general. To work together with ETSI within the framework for standardization under the terms of the Cooperation Agreement between ETSI and ECMA, for publication of European standards and technical reports. To promote unified international standards.

The field of private/corporate telecommunications includes architecture, service, protocol, interoperability, management and application aspects of Corporate Telecommunication Networks (CNs). CNs include narrowband and broadband Private Integrated Services Networks (PISNs) and private networks based on the Internet Protocol (IP). In particular the field includes the following:

- architecture, service and protocol aspects of narrowband and broadband Private Integrated Services Networks (PISNs) (see TC32-TG13, TC32-TG14 and TC32/TG15);

- interoperability of narrowband and broadband PISNs with IP networks (see TC32-TG13, TC32-TG14 and TC32-TG15);

- Computer Supported Telecommunications Applications (CSTA) (see TC32-TG11); and ScreenPhones that support both telephony and Internet access (see TC32-TG16).

Programme of work:

1. To address requirements and strategic plans for standardization in the field of private/corporate telecommunications, and to align, harmonize, and as far as possible remain compatible with standards for public telecommunications as well as standards in related fields.

2. To address and resolve high-level strategic issues affecting the future direction and scope of standardization in the field of private/corporate telecommunications.

3. To be responsible for and co-ordinate the planning and work of the task groups within TC32. In particular to review and approve work items of the task groups.

4. To recommend the creation of new task groups as necessary to pursue new and evolving fields of work, and closure of task groups that have accomplished their missions.

5. To review and approve draft Standards and Technical Reports prepared by the task groups for submission to the ECMA General Assembly and onwards submission to ISO/IEC JTC1, ETSI and other standardization organizations as appropriate.

6. To maintain liaisons with other ECMA TCs working in related fields.

7. To maintain liaison with, monitor and contribute to the work of ISO/IEC JTC1, ITU-T, ETSI, the TTC, the ATM Forum and other international, regional and national standards organizations and consortia, to present ECMA proposals and to comment on their proposals.

8. To assist non-standards organizations in getting ECMA Standards developed and further processed, depending on TC members' agreement, and active participation from such organizations.

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TC32-TG11 - COMPUTER SUPPORTED TELECOMMUNICATIONS APPLICATIONS (CSTA)

Scope:

To develop and refine a standardized Computer-Telecommunications Interface (CTI) to provide third party interactions between computer applications and the telecommunications network. This standard, known as Computer Supported Telecommunications Applications (CSTA), is specified in a number of documents available from ECMA. The specification has focussed on the needs of private telephony networks but also takes into account the requirements of other public and private networks.

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 PISNs/CNs 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-TG13 - PRIVATE INTEGRATED SERVICES / CORPORATE NETWORKS - NETWORK ARCHITECTURE, NUMBERING, NAMING AND ADDRESSING

Scope:

To develop Standards and Technical Reports for narrowband and broadband architectural aspects, naming, numbering and addressing of Private Integrated Services / Corporate Networks (PISNs/CNs).

Programme of work:

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

2. To develop Standards for architectural functions and numbering of PISNs/CNs, including their impact on public network numbering, thereby enabling interconnected PISN/CN equipment to co-operate in a multi-vendor environment within the PISN/CN, with public ISDNs, and with other public network infrastructures.

3. To co-operate with other standardization bodies in the development of Standards for the architecture, naming, numbering and addressing of PISNs/CNs in relation to:

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

4. To co-ordinate liaison with ITU-T, ISO/IEC JTC 1, ETSI and the ENF in the field of PISN/CN architecture and numbering.

5. To monitor and to contribute to the work of other international and European bodies studying matters related to PISN/CN architecture, numbering and addressing (e.g. ISDN, LAN and ATM developments).

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TC32-TG14 - PRIVATE INTEGRATED SERVICES / CORPORATE NETWORKS - SERVICES AND SIGNALLING

Scope:
To develop Standards and Technical Reports for services and signalling in Private Integrated Services / Corporate Networks (PISNs/CNs).

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

2. To develop Standards for intra-PISN/CN services and signalling protocols, thereby supporting harmonized telecommunications services on multi-vendor PISNs/CNs, and to align these services as far as possisble with the public ISDN telecommunications services.

3. To co-operate with other standardization bodies in the development of Standards for the services and signalling of PISNs/CNs in relation to:

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

4. To develop Standards for the Stage 1, Stage 2 and Stage 3 aspects of PISN/CN services.

5. To co-ordinate liaison with ITU-T, ISO/IEC JTC 1 and ETSI in the field of ISDN services and protocol standards.

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

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TC32-TG15 - BROADBAND PRIVATE NETWORKS

Scope:

To develop Technical Reports and Standards for signalling and other aspects in broadband private networks.

Programme of work:

1. To identify requirements of broadband private networks on architecture, modelling, addressing, etc. and to co-operate with the responsible task group (e.g. TC32-TG13) or standardization body, in order to achieve, where necessary, Standards or Technical Reports in these areas.

2. To adapt, where necessary, existing service standards (e.g. those developed for basic and supplementary services of narrowband private networks) to the requirements of broadband private networks, in co-operation with other task groups and standardization bodies.

3. To promote a worldwide unique set of standards for broadband private networks.

4. To develop standards for intra-broadband private network signalling protocols for basic call, generic procedures, supplementary services and additional network features, thereby supporting harmonized broadband telecommunication services on multi-vendor broadband private networks.

5. To develop standards for future broadband-specific services and features.

6. To co-ordinate liaison with ITU-T, ETSI and the ATM Forum in the field of B-ISDN protocol standards.

7. To monitor and to contribute to the work of other international and European bodies studying broadband matters, in particular ITU-T, the ATM Forum, ISO/IEC JTC1 and ETSI.

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TC32-TG16 - SCREEN-PHONE, TERMINALS, SERVICES AND APPLICATIONS

Scope:

To develop standards and technical reports for architectural, services and protocol aspects of screen-phone terminals with telephony and Internet access.

Programme of work:

1. To develop standards for enabling the development of easy to use Internet based services through screen-phone terminals.

2. To develop architectural standards for the connection of screen-phone terminals to telecommunications networks. The aim is to provide telephony services as well as access to web servers and coordination between them.

3. To identify:

- which protocols to be used

- which parameters to be used in order to configure the applications

- which security model to be used (access control and security)

- the functional split between the terminal and the network

- constraints in case of multiple users and/or multiple Internet Service Providers (ISP), and/or multiple Telecommunication Service Providers.

4. To coordinate liaison with ITU-T, ISO/IEC JTC1, ETSI and other relevant bodies.

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TC32-TG17 - C-OASIS (CORPORATE OPEN ARCHITECTURE AND SYSTEMS FOR IP-BASED SERVICES) (UNDER CONSTRUCTION)

Scope:

To develop Standards and Technical Reports for IP-based multimedia communications in a business environment.

Programme of work:

1. To identify requirements for IP-based multimedia communication in a corporate network environment, including architectural, addressing, mobility, service, protocol, interworking, QoS, security and management aspects.

2. To co-operate with the responsible Task Groups, Technical Committees and other standardization bodies in order to achieve where necessary Standards or Technical Reports in these areas.

3. To adapt, where necessary, existing standards for narrowband and broadband PISNs to the requirements of IP-based multimedia communication in a business environment.

4. To develop, where necessary, standards for interoperation of IP-based networks and telecommunication networks.

5. To promote a worldwide unique set of standards for IP-related multimedia communication in a business environment.

6. To co-ordinate liaison on related matters with ITU-T, ETSI, TIA, IETF, IMTC, ISO/IEC JTC1.

7. To monitor, and contribute to, related work in other bodies.

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TC 36- IT SECURITY

Scope:

1. To research and develop standards, methodologies and guidelines that promote appropriate IT security practices which enable the expansion of the IT market. Such development may include expert contributions to other committees and organizations.

2. To promote the accpetance and usage of these standards.

3. To research and further the development of a Registry of commercial and government Protection Profiles in support of the International Common Criteria for evaluating IT security products.

Programme of work:

1. To verity, update and promote the acceptance and usage of COFC and E-COFC network-based IT standards.

2. To work with US NIST and other standards organizations on the development of Protection Profiles for the COFC and E-COFC.

3. To investigate the feasibility of creating an ECMA-based Registry of Commercial Protection Profiles by researching the need for such Protection Profiles (PP) and such a registra.

4. To work with ISO/IEC JTC1/SC27/WG3 and the CCIB on determining the requirements of PP registration procedures and on developing those procedures.

5. To provide advice, support and guidance for other ECMA groups in IT security matters.

6. To provide liaison with ISO/IEC JTC1/SC27, the CCIB, OECD and ETSI.

7. To assume responsibility for the maintenance of ECMA Standards and Technical Reports prepared by TC36.

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TC38 - PRODUCT-RELATED ENVIRONMENTAL ATTRIBUTES

Scope:
To identify and describe the environmental attributes related to ICT (Information and Communication Technology) and CE (Consumer Electronics) products, during their entire life cycle, from conception to end-of-life treatment.

Programme of work:
1. To develop recommendations, e.g. Standards, on environmental attributes and the presentation thereof for ICT and CE products.

2. To monitor the development of environmental standards, regulations, conformity schemes and other requirements related to ICT and CE products.

3. To promote and maintain ECMA Standards covering product-related environmental attributes. To comment on standards and regulations from outside organizations.

4. To establish and maintain close liaison with other organizations and other fora working in the same or similar fields of activity.

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TC39 - SCRIPTING LANGUAGES

Scope:
To standardize the syntax and semantics of a general purpose, cross platform, vendor-neutral scripting language.

Programme of work:
1.Develop scripting language standards.

2.Contribute Ecmascript standard to ISO/IEC JTC 1.

3.Upon completion of item 1, to investigate the future direction of Ecmascript standards, and to evaluate and consider proposals for complementary or additional technology.

4.To maintain liaison with appropriate other ECMA TCs and TGs.

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TC40 - OBJECT DATA INTERFACES

Scope:

To standardize the syntax and semantics of vendor-neutral object storage interfaces for object programming languages.

Programme of work:

1. to develop object storage interface standards that extend, but do not alter the CC++, Smalltalk, and Java object programming languages.

2. To develop object storage interface standards for additional programming languages as needed.

3. To enhance the ECMA object storage interfaces standard as needed.

4. To contribute the ECMA object storage interfaces standard to ISO/IEC JTC 1.

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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INDEX OF ECMA STANDARDS

	ECMA-161	ECMA-233
	ECMA-163	ECMA-241
	ECMA-164	ECMA-242
	ECMA-165	ECMA-243
	ECMA-173	ECMA-244
	ECMA-174	ECMA-245
	ECMA-175	ECMA-250
	ECMA-176	ECMA-251
	ECMA-177	ECMA-252
	ECMA-178	ECMA-253
	ECMA-185	ECMA-254
	ECMA-186	ECMA-261
	ECMA-191	ECMA-263
	ECMA-192	ECMA-264
	ECMA-193	ECMA-265
	ECMA-194	ECMA-266
	ECMA-202	ECMA-276
	ECMA-203	ECMA-277
	ECMA-211	ECMA-281
	ECMA-212	ECMA-282
	ECMA-213	ECMA-283
	ECMA-214	ECMA-284
CSTA	ECMA-179	ECMA-218
	ECMA-180	ECMA-269
	ECMA-217	ECMA-285
IT-Security	ECMA-205	ECMA-219
	ECMA-206	ECMA-235
		ECMA-271

Data Interchange by Physical Media

Flexible Disk Cartridges	ECMA-99	ECMA-147
	ECMA-100	ECMA-207
	ECMA-125	
Magnetic Tapes and Tape Cartridges	ECMA-120	ECMA-198
	ECMA-139	ECMA-209
	ECMA-145	ECMA-210
	ECMA-146	ECMA-231
	ECMA-150	ECMA-236
	ECMA-152	ECMA-246
	ECMA-169	ECMA-247
	ECMA-170	ECMA-248
	ECMA-171	ECMA-249
	ECMA-182	ECMA-258
	ECMA-196	ECMA-259
	ECMA-197	ECMA-278
		ECMA-286
Optical Disks and Disk Cartridges	ECMA-130	ECMA-238
	ECMA-153	ECMA-239
	ECMA-154	ECMA-240
	ECMA-183	ECMA-260
	ECMA-184	ECMA-267
	ECMA-189	ECMA-268
	ECMA-190	ECMA-272
	ECMA-195	ECMA-273
	ECMA-201	ECMA-274
	ECMA-223	ECMA-280
Data Compression	ECMA-151	ECMA-222
	ECMA-159	

ECMA STANDARDS AND CORRESPONDING
INTERNATIONAL AND EUROPEAN STANDARDS

ECMA-6	7-Bit Coded Character Set, 6th Edition (December 1991)	**ISO/IEC 646**
ECMA-13	File Structure and Labelling of Magnetic Tapes for Information Interchange, 4th Edition (December 1985)	**ISO 1001**
ECMA-35	Code Extension Techniques, 6th Edition (December 1994)	**ISO/IEC 2022**
ECMA-43	8-Bit Coded Character Set Structure and Rules 3rd Edition (December 1991)	**ISO/IEC 4873**
ECMA-48	Control Functions for Coded Character Sets 5th Edition (June 1991)	**ISO/IEC 6429**
ECMA-74	Measurement of Airborne Noise Emitted by Information Technology and Telecommunications Equipment, 5th Edition (December 1997)	**ISO DIS 7779**
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-97	Local Area Networks - Safety Requirements, 2nd Edition (December 1992)	
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**
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 Disk Cartridges for Information Interchange, 2nd Edition (June 1995)	**ISO/IEC 9293**
ECMA-108	Measurement of High Frequency Noise Emitted by Information Technology and Telecommunications Equipment, 3rd Edition (December 1996))	**ISO 9295**
ECMA-109	Declared Noise Emission Values of Information Technology and Telecommunications Equipment, 4th Edition (December 1996)	**ISO 9296**
ECMA-113	8-Bit Single-Byte Coded Graphic Character Sets - Latin/Cyrillic Alphabet, 2nd Edition (July 1988)	**ISO 8859-5**
ECMA-114	8-Bit Single-Byte Coded Graphic Character Sets - Latin/Arabic Alphabet(June 1986)	**ISO 8859-6**
ECMA-118	8-Bit Single-Byte Coded Graphic Character Sets - Latin/Greek Alphabet (December 1986)	**ISO 8859-7**
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**
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-128	8-Bit Single-Byte Coded Graphic Character Sets - Latin Alphabet No. 5 (July 1988)	**ISO 8859-9**
ECMA-129	Information Technology Equipment - Safety, 2nd Edition (April 1994)	**IEC 950**
ECMA-130	Data Interchange on Read-only 120 mm Optical Data Disks (CD-ROM), 2nd Edition (June 1996)	**ISO/IEC 10149**

ECMA-133	Reference Configurations for Calls Through Exchanges of Private Telecommunication Networks, 2nd Edition (December 1998)	
ECMA-139	3,81 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - DDS Format (June 1990)	ISO/IEC 10777
ECMA-142	Specification, Functional Model and Information Flows for Control Aspects of Circuit Mode Basic Services in Private Telecommunication Networks, 2nd Edition (June 1997)	ETS 300 171 ISO/IEC DIS 11574
ECMA-143	PISN - Circuit Mode Bearer Services - Inter-Exchange Signalling Procedures and Protocol (QSIG-BC), 3rd Edition (June 1997)	ETS 300 172 ISO/IEC DIS 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	PISN - Specification, Functional Model and Information Flows - Identification Supplementary Services (ISSD), 3rd Edition (June 1997)	ETS 300 173 ISO/IEC 14136
ECMA-149	Portable Common Tool Environment (PCTE) - Abstract Specification, 4th Edition (Dec. 1997)	ISO/IEC 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 (June 1994)	ISO/IEC 10090
ECMA-155	Private Integrated Services Networks - Addressing, 2nd Edition (June 1997)	ETS 300 189 ISO/IEC 11571
ECMA-156	PTN - Signalling at the S Reference Point - Generic Keypad Protocol for the Support of Supplementary Services (SSIG-KP), 2nd Edition (June 1993)	ETS 300 190
ECMA-157	PTN - Signalling Protocol at the S Reference Point - Identification Supplementary Services (SSIG-ID), 2nd Edition (June 1993)	ETS 300 191
ECMA-158	Portable Common Tool Environment (PCTE) - C Programming Language Binding, 4th Edition (December 1997)	ISO/IEC 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

ECMA-162	Portable Common Tool Environment (PCTE) - Ada Programming Language Binding, 4th Edition (December 1997)	**ISO/IEC 13719-3**
ECMA-163	PISN - Specification, Functional Model and Information Flows - Name Identification Supplementary Services (NISD), 3rd Edition (September 1997)	**ETS 300 237** **ISO/IEC 13864**
ECMA-164	PISN - Signalling between Private Telecommunication Exchanges - Protocol for the Support of Name Identification Supplementary Services (QSIG-NA), 3rd Edition (September 1997)	**ETS 300 238** **ISO/IEC 13868**
ECMA-165	PISN - Generic Functional Protocol for the Support of Supplementary Services - Inter-Exchange Signalling Procedures and Protocol (QSIG-GF), 3rd Edition (June 1997)	**ETS 300 239** **ISO/IEC 11582**
ECMA-166	Information Technology Equipment - Routine Electrical Safety Testing in Production (June 1992)	**EN 50116**
ECMA-167	Volume and File Structure of Write-Once and Rewritable Media using Non-Sequential Recording for Information Interchange, 3rd Edition (June 1997)	**ISO/IEC 13346**
ECMA-168	Volume and File Structure of 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	PISN - Specification, Functional Model and Information Flows - Call Diversion Supplementary Services (CFSD), 2nd Edition (June 1997)	**ETS 300 256** **ISO/IEC 13872**
ECMA-174	PISN - Inter-Exchange Signalling Protocol - Call Diversion Supplementary Services (QSIG-CF), 2nd Edition (June 1997)	**ETS 300 257** **ISO/IEC 13873**
ECMA-175	PISN - Specification, Functional Model and Information Flows - Path Replacement Additional Network Feature (ANF-PRSD), 3rd Edition (December 1998)	**ETS 300 258** **ISO/IEC 13863**
ECMA-176	PISN - Inter-exchange Signalling Protocol - Path Replacement Additional Network Feature (QSIG-PR), 3rd Edition (December 1998)	**ETS 300 259** **ISO/IEC 13874**
ECMA-177	PISN - Specification, Functional Model and Information Flows - Call Transfer Supplementary Service (CTSD) , 2nd Edition (September 1997)	**ETS 300 260** **ISO/IEC 13865**
ECMA-178	PISN - Inter-Exchange Signalling Protocol - Call Transfer Supplementary Service (QSIG-CT), 2nd Edition (September 1997)	**ETS 300 261** **ISO/IEC 13869**
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	PISN - Specification, Functional Model and Information Flows - Call Completion Supplementary Services (CCSD), 2nd Edition (June 1997)	ETS 300 365 ISO/IEC 13866
ECMA-186	PISN - Inter-Exchange Signalling Protocol - Call Completion Supplementary Services QSIG-CC), 2nd Edition (June 1997)	ETS 300 366 ISO/IEC 13870
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	PISN - Specification, Functional Model and Information Flows - Call Offer Supplementary Service (COSD), 2nd Edition (June 1997)	ETS 300 361 ISO/IEC 14841
ECMA-192	PISN - Inter-Exchange Signalling Protocol - Call Offer Supplementary Service (QSIG-CO), 3rd Edition (June 1997)	ETS 300 362 ISO/IEC 14843
ECMA-193	PISN - Specification, Functional Model and Information Flows - Do Not Disturb and Do Not Disturb Override Supplementary Services (DND(O)SD), 2nd Edition (June 1997)	ETS 300 363 ISO/IEC 14842
ECMA-194	PISN - Inter-Exchange Signalling Protocol - Do Not Disturb and Do Not Disturb Override Supplementary Services (QSIG-DND(O)), 3rd Edition (June 1997)	ETS 300 364 ISO/IEC 14844
ECMA-195	Data Interchange on 130 mm Optical Disk Cartridges - Capacity: 2 GigaBytes per Cartridge, 2nd Edition (June 1995)	ISO/IEC 13842
ECMA-196	Data Interchange on 12,7 mm 36-Track Magnetic Tape Cartridges (December 1993)	ISO/IEC 14251
ECMA-197	Data Interchange on 12,7 mm 112-Track Magnetic Tape Cartridges - DLT2 Format (December 1993)	ISO/IEC 13962
ECMA-198	3,81 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - DDS-2 Format using 120 m Length Tapes, 2nd Edition (June 1995)	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	PISN - Specification, Functional Model and Information Flows - Call Intrusion Supplementary Service (CISD), 2nd Edition (June 1997)	ETS 300 425 ISO/IEC 14845
ECMA-203	PISN - Inter-Exchange Signalling Protocol - Call Intrusion Supplementary Service (QSIG-CI), 3rd Edition (June 1997)	ETS 300 426 ISO/IEC 14846
ECMA-205	PTN - Commerically Oriented Functionality Class for Security Evaluation (COFC) (December 1993)	
ECMA-206	Association Context Management including Security Context Management (December 1993)	
ECMA-207	Data Interchange on 90 mm Flexible Disk Cartridges - 326 Data Tracks on each Side - Capacity: 21 Mbytes - ISO Type 305 (June 1994)	ISO/IEC 14169
ECMA-208	System-Independent Data Format - SIDF (December 1994)	ISO/IEC 14863
ECMA-209	Data Interchange on 12,7 mm 128-Track Magnetic Tape Cartridges - DLT3 Format (December 1994)	ISO/IEC 14833

ECMA-210 12,65 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - DATA-D3-1 Format, 2nd Edition (December 1995) **ISO/IEC 14840**

ECMA-211 PISN - Specification, Functional Model and Information Flows - Advice of Charge Supplementary Services (AOCSD), 2nd Edition (June 1997) **ISO/IEC 15049**

EN 301 254

ECMA-212 PISN - Inter-Exchange Signalling Protocol - Advice of Charge Supplementary Services (QSIG-AOC), 2nd Edition (June 1997) **ISO/IEC 15050**

EN 301 264

ECMA-213 PISN - Inter-Exchange Signalling Protocol - Advice of Charge Supplementary Services (QSIG-AOC), 2nd Edition (June 1997) **ISO/IEC 15051**

EN 301 257

ECMA-214 PISN - Inter-Exchange Signalling Protocol - Recall Supplementary Service (QSIG-RE), 2nd Edition (June 1997) **ISO/IEC 15052**

EN 301 258

ECMA-215 PISN - Inter-Exchange Signalling Protocol - Cordless Terminal Incoming Call Additional Network Feature (QSIG-CTMI), 2nd Edition (September 1997) **ETS 300 696**

ECMA-216 PISN - Inter-Exchange Signalling Protocol - Cordless Terminal Location Registration Supplementary Service (QSIG-CTLR), 2nd Edition (September 1997) **ETS 300 693**

ECMA-217 Services for Computer Supported Telecommunications Applications (CSTA) Phase II (December 1994)

ECMA-218 Protocol for Computer Supported Telecommunications Applications (CSTA) Phase II (December 1994)

ECMA-219 Authentication and Priviledge Attribute Security Application with Related Key Distribution Functions - Part 1, 2 and 3, 2nd Edition (March 1996)

ECMA-220 PISN - Specification, Functional Model and Information Flows - Call Interception Additional Network Feature (ANF-CINTSD), 2nd Edition (June 1997) **ISO/IEC 15053**

EN 301 256

ECMA-221 PISN - Inter-Exchange Signalling Protocol - Call Interception Additional Network Feature (QSIG-CINT), 2nd Edition (June 1997) **ISO/IEC 15054**

EN 301 265

ECMA-222 Adaptive Lossless Data Compression Algorithm (June 1995) **ISO/IEC 15200**

ECMA-223 Data Interchange on 90 mm Optical Disk Cartridges - Capacity: 385 MBytes per Cartridge (June 1995)

ECMA-224 PISN - Specification, Functional Model and Information Flows - Transit Counter Additional Network Feature (ANF-TCSD), 2nd Edition (June 1997) **ISO/IEC 15055**

EN 301 047

ECMA-225 PISN - Inter-Exchange Signalling Protocol - Transit Counter Additional Network Feature (QSIG-TC), 2nd Edition (June 1997) **ISO/IEC 15056**

EN 301 048

ECMA-226 PISN - Mapping Functions for the Employment of Dedicated Circuit Mode Connections as Inter-PTNX Connections (MAPPING-CM-STATIC) (June 1995)

ECMA-230 PCTE - IDL Binding (Interface Definition Language), 2nd Edition (December 1997) **ISO/IEC 13719-4**

ECMA-231 Data Interchange on 12,7 mm 128-Track Magnetic Tape Cartridges - DLT 4 Format (December 1995) **ISO/IEC 15307**

ECMA-232 PISN - Profile Standard for the Connection of Radio Paging Equipment (RPE) to a PISN (December 1995) **ETS 300 739**

ECMA-233 PISN - Cordless Terminal Mobility (CTM) - Inter-Exchange Signalling Protocol - Cordless Terminal Outgoing Call Additional Network Feature (QSIG-CTMO), 2nd Edition (September 1997) **I-ETS 300 808**

ECMA-234 Application Programming Interface for Windows (APIW) (December 1995)

ECMA-235 The ECMA GSS-API Mechanism (March 1996)

ECMA-236 3,81 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - DDS-3 Format using 125 m Length Tapes (June 1996) — ISO/IEC 15521

ECMA-237 Limits and Methods of Measurement of Immunity Characteristics of Information Technology Equipment (June 1996)

ECMA-238 Data Interchange on 130 mm Optical Disk Cartridge of Type WORM (Write Once Read Many) using Irreversible Effects - Capacity: 2,6 Gbytes per Cartridge (June 1996) — ISO/IEC 15486

ECMA-239 Data Interchange on 90 mm Optical Disk Cartridges - HS-1 Format - Capacity: 650 Mbytes per Cartridge (June 1996) — ISO/IEC 15498

ECMA-240 Data Interchange on 120 mm Optical Disk Cartridges using Phase Change PD Format - Capacity: 650 Mbytes per Cartridge (June 1996) — ISO/IEC 15485

ECMA-241 PISN - Specification, Functional Model and Information Flows - Message Waiting Indication Supplementary Service (MWISD), 3rd Edition (December 1998) — ISO/IEC 15505, EN 301 260

ECMA-242 PISN - Inter-Exchange Signalling Protocol - Message Waiting Indication Supplementary Service (QSIG-MWI), 3rd Edition (December 1998) — ISO/IEC 15506, EN 301 255

ECMA-243 PISN - Cordless Terminal Mobility (CTM) - Inter-Exchange Signalling Protocol - Cordless Terminal Authentication Supplementary Services (QSIG-CTAU), 2nd Edition (September 1997) — I-ETS 300 809

ECMA-244 PISN - Mapping Functions for the Employment of a Circuit Mode Basic Service and the Supplementary Service User-to-User Signalling as a pair of On-demand Inter-PINX Connections (Mapping-UUS) (June 1996) — EN 301 102

ECMA-245 PISN - Inter-Exchange Signalling Protocol - PINX Clock Synchronization (SYNC-SIG), 2nd Edition (September 1997) — ISO/IEC 15507, EN 301 259

ECMA-246 8 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - AIT-1 Format, 2nd Edition (June 1998) — ISO/IEC 15780

ECMA-247 8 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - HH-1 Format, 2nd Edition (June 1998) — ISO/IEC 15718

ECMA-248 12,65 mm Wide Magnetic Tape Cassette for Information Interchange - Helical Scan Recording - DTF-1 Format, 2nd Edition (June 1998) — ISO/IEC 15731

ECMA-249 8 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - DA-2 Format, 2nd Edition (June 1998) — ISO/IEC 15757

ECMA-250 PISN - Specification, Functional Model and Information Flows - Common Information ANF (ANF-CMNSD), 2nd Edition (December 1998) — ISO/IEC 15771

ECMA-251 PISN - Inter-Exchange Signalling Protocol - Common Information ANF (QSIG-CMN), 2nd Edition (December 1998) — ISO/IEC 15772

ECMA-252 Broadband Private Integrated Services Network (B-PISN) - Inter-Exchange Signalling Protocol - Transit Counter ANF (B-QSIG-TC) (December 1996) — ISO/IEC 15773

ECMA-253 PISN - Mapping Functions for the Employment of 64 kbit/s Circuit Mode Connection with 16 kbit/s Sub-multiplexing (Mapping/16) (December 1996) — EN 301 039

ECMA-254	B-PISN - Inter-Exchange Signalling Protocol - Generic Functional Protocol, (December 1996)	
ECMA-258	Data Interchange on 12,7 mm 128-Track Magnetic Tape Cartridges - DLT3XT Format (June 1997)	ISO/IEC 15895
ECMA-259	Data Interchange on 12,7 mm 208-Track Magnetic Tape Cartridges - DLT5 Format (June 1997)	ISO/IEC 15896
ECMA-260	Data Interchange on 356 mm Optical Disk Cartridges - WORM, using Phase Change Technology Capacity: 14,8 and 25 Gbytes per Cartridge, (June 1997)	ISO/IEC 15898
ECMA-261	Broadband Private-Integrated Services Network (B-PISN) - Service Description - Broadband Connection Oriented Bearer Services (June 1997)	ISO/IEC 15899
ECMA-262	ECMAScript Language Specification, 2nd Edition (August 1998)	ISO/IEC 16262
ECMA-263	PISN - Specification, Functional Model and Information Flows - Call Priority Interruption and Call Priority Interruption Protection Supplementary Services (CPI(P)SD), 2nd Edition (December 1998)	ISO/IEC 15991
ECMA-264	PISN - Inter-Exchange Signalling Protocol - Call Priority Interruption and Call Priority Interruption Protection Supplementary Services (QSIG-CPI(P)), 2nd Edition (December 1998)	ISO/IEC 15992
ECMA-265	PISN - Inter-Exchange Signalling Protocol - Signalling ATM Adaptation Layer (B-QSIG-SAAL), (September 1997)	ISO/IEC 13246
ECMA-266	B-PISN - Inter-Exchange Signalling Protocol - Basic Call/Connection Control (B-QSIG-BC), (September 1997)	ISO/IEC 13247
ECMA-267	120 mm DVD - Read-Only Disk (December 1997)	ISO/IEC 16448
ECMA-268	80 mm DVD - Read-Only Disk (December 1997)	ISO/IEC 16449
ECMA-269	Services for Computer Supported Telecommunications Applications (CSTA) Phase III, 3rd Edition (December 1998)	ISO/IEC DIS 18051
ECMA-270	PCTE - Mapping from CASE Data Interchange Format (CDIF) to PCTE (December 1997)	
ECMA-271	Extended Commercially Oriented Functionality Class for Security Evaluation (E-COFC) (December 1997)	
ECMA-272	120 mm DVD Rewritable Disk (DVD-RAM) (February 1998)	ISO/IEC 16824
ECMA-273	Case for 120 mm DVD-RAM Disks (February 1998)	ISO/IEC 16825
ECMA-274	Data Interchange on 120 mm Optical Disk using +RW Format - Capacity: 3,0 Gbytes and 6,0 Gbytes (April 1998)	ISO/IEC 16969
ECMA-275	Measurement of structure-borne vibration induced by small air moving devices (AMDs) (June 1998)	
ECMA-276	Reference Configuration for PINX Extension Lines (June 1998)	
ECMA-277	PISN - Circuit Emulation Specification - Emulation of Basic Access by ATM Networks (June 1998)	
ECMA-278	Data Interchange on 12,7 mm 128-Track Magnetic Tape Cartridge - Parallel Serpentine Format (December 1998)	ISO/IEC DIS 17913
ECMA-279	80 mm (1,23 Gbytes per side) and 120 mm (3,95 Gbytes per side) DVD-Recordable Disk (DVD-R) (December 1998)	
ECMA-280	Data Interchange on 130 mm Optical Disk Cartridges of Type WORM (Write Once Read Many) using Irreversible Effects – Capacity: 5,2 Gbytes per Cartridge (December 1998)	ISO/IEC DIS 18093
ECMA-281	PISN – Specification, Functional Model and Information Flows – Private User Mobility (PUM) – Registration Supplementary Service (December 1998)	ISO/IEC DIS 17875

ECMA-282	PISN – Inter-Exchange Signalling Protocol – Private User Mobility (PUM) – Registration Supplementary Service (December 1998)	ISO/IEC DIS 17876
ECMA-283	PISN – Specification, Functional Model and Information Flows – Private User Mobility (PUM) – Call Handling Additional Network Features (December 1998)	ISO/IEC DIS 17877
ECMA-284	PISN – Inter-Exchange Signalling Protocol – Private User Mobility (PUM) – Call Handling Additional Network Features (December 1998)	ISO/IEC DIS 17878
ECMA-285	Protocol for Computer Supported Telecommunications Applications (CSTA) Phase III (December 1998)	ISO/IEC DIS 18052

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ECMA TR/18	The Meaning of Conformance to Standards (September 1983)
ECMA TR/23	Electrostatic Discharge Susceptibility (September 1984)
ECMA TR/27	Method for the Prediction of Installation Noise Levels, 2nd Edition (June 1995)
ECMA TR/36	Guidelines on Additional Parameters Recommended for Procurement Specifications for 12,7 mm Magnetic Tapes (December 1986)
ECMA TR/40	Electrostatic Discharge Immunity Testing of Information Technology Equipment (July 1987)
ECMA TR/46	Security in Open Systems - A Security Framework (July 1988)
ECMA TR/53	Handling of Bi-directional Texts, 2nd Edition (June 1992)
ECMA TR/54	A Management Framework for Private Telecommunication Networks (December 1990)
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ECMA TR/56	Information Technology Equipment - Recommended Measuring Method for Ozone Emission (June 1991)
ECMA TR/57	Private Telecommunication Networks (December 1991)
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ECMA TR/59	Object-Oriented Databases (June 1992)
ECMA TR/60	Supplementary Services and Additional Network Features in Private Telecommunication Networks (June 1992)
ECMA TR/61	User Interface Taxonomy (June 1992)
ECMA TR/62	Product Noise Emission of Computer Business Equipment (June 1993)
ECMA TR/63	Alphabetical Reference Index to IEC 950, 3rd Edition (December 1995)
ECMA TR/64	Secure Information Processing versus the Context of Product Evaluation (December 1993)

ECMA TR/65	PTNX Functions for the Utilization of Intervening Networks in the Provision of Overlay Scenarios (Transparent Approach) - General Requirements (TR/Mapping) (June 1994)
ECMA TR/66	Mapping of PCTE to the ECMA/NIST Frameworks Reference Model (June 1994)
ECMA TR/67	Compendium of PTN Management Services (December 1994)
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)
ECMA TR/70	Product-related Environmental Attributes (June 1997)
ECMA TR/71	DVD Read-Only Disk - File System Specifications (February 1998)
ECMA TR/72	Glossary of Definitions and Terminology for Computer Supported Telecommunications Applications (CSTA) Phase III, 2nd Edition (December 1998)
ECMA TR/73	H.323 / B-ISDN Signalling Interoperability (December 1998)

LIST OF REPRESENTATIVES

NOT FOR PUBLIC RELEASE

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 the following classes of members:
- ordinary members
- associate members
- SME members (Small and Medium sized Enterprises)
- any other class of members as may be created by the ordinary members at a General Assembly.

3.2
A proposed member will not be accepted if it holds at least 50 per cent of the capital of an existing member nor if at least 50 per cent of its capital is held by an existing member.

3.3
No two or more companies where at least 50 per cent of whose capital is held by the same company, which is not a member itself, may be members but must be represented by one company only.

3.4

Additional classes of members, 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.

3.5

Companies shall be admitted to any class of membership by a majority of all ordinary members.

3.6

Membership fees for all classes of membership are decided in accordance with Rule 8.

3.7

Membership shall be terminated in the cases set out in Art. 5.

3.8

Ordinary members

3.8.1

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.

3.8.2

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. 3.8.1 which is not basically a copy of that of an existing ordinary member.

3.8.3

The representative of each ordinary member will have one vote in the General Assembly.

3.9

Associate members

3.9.1

A company may be admitted as an associate member which has interest and experience in matters related to one or more of the Technical Committees of the Association.

3.9.2

No company qualifying for ordinary membership can be elected associate member.

3.9.3

A prospective associate member shall declare the Technical Committees in whose work it proposes to take part.

3.9.4

An associate member is fully entitled 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 by the General Assembly.

3.9.5

Representatives of the associate members shall have the right to take part in the discussions at the General Assembly.

3.9.6

Associate members have no vote in the General Assembly.

3.10

SME Members

3.10.1

A company may apply for SME membership if its annual turnover is less than 100,000,000 Swiss Francs.

3.10.2

A company may be admitted as an SME member which has interest and experience in matters related to one or more of the Technical Committees of the Association.

3.10.3

A company qualifying for ordinary membership may apply for SME membership provided it meets the conditions of Art. 3.10.1.

3.10.4

SME members may apply for ordinary or associate membership provided they meet the appropriate conditions set out in Articles 3.8 or 3.9.

3.10.5

A prospective SME member shall declare the Technical Committees in whose work it proposes to take part.

3.10.6

An SME member is fully entitled 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 by the General Assembly.

3.10.7

Representatives of the SME members shall have the right to take part in the discussions at the General Assembly.

3.10.8

SME members have no vote in the General Assembly.

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 MEMBERSHIP

5.1

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 3.2 and 3.3 of the present By-Laws no longer being complied with.

d. If, in the opinion of two thirds of all ordinary members, an ordinary member no longer complies with Articles 3.8.1 and 3.8.2. In this instance the non-complying ordinary member is eligible to apply for associate or SME membership according to the conditions of Article 3.9 or Article 3.10 as appropriate.

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 no more than 8 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.

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 nominal membership fee 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 preceding years. Although the Association shall be non-profit making, reserves may be accumulated if so decided by the General Assembly. The General Assembly will decide the nominal membership fee for the following fiscal year and the annual fees payable by each class of membership shall be as follows:

Ordinary members: The full nominal fee;
Associate members: One half of the full nominal fee;
SME members: One quarter of the full nominal fee.

8.2

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

8.3

Every member on the date of the General Assembly, which decides on the budget and nominal fee for the following fiscal year, shall pay the full annual fee appropriate to its class of membership for that year.

8.4

Any withdrawing member shall pay a fee for the fiscal year following the year of withdrawal. This fee shall be equal to the annual fee for the appropriate membership class for the year of withdrawal. Representatives of a withdrawing member may continue to attend Technical Committee 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.

CODE OF CONDUCT IN PATENT MATTERS

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 no less than 2 weeks before the GA or the end of the postal voting period 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.

Withdrawn ECMA Standards (Blue cover)

(no longer available)

ECMA-1   6 Bit Input/Output Character Code
(March 1963)

ECMA-2   Subset of ALGOL 60 - ECMALGOL

ECMA-3   CMC7 Printed Image Specification, 2nd Edition   ISO 1004
(September 1966)

ECMA-4   Flow Charts, 2nd Edition (September 1966)   ISO 1028

ECMA-5   Data Interchange on 7 Track Magnetic Tape,
3rd Edition (June 1970)

ECMA-7   7 Bit Code in Punched Cards (April 1965)   1113

ECMA-8   Nominal Character Dimensions of the Numeric   ISO 1973-1
OCR-A Font, 2nd Edition (January 1977)

ECMA-9   FORTRAN (April 1965)   ISO/IEC 1539

ECMA-10 Data Interchange on Punched Tape,   ISO 1113
2nd Edition (July 1970)

ECMA-11 Alphanumeric Character Set OCR-B for   ISO 1073-2
Optical Recognition, 3rd Edition (March 1976)

ECMA-12 Data Interchange on 9-Track Magnetic Tape at   ISO/IEC
32 bits per mm (800 bpi),   1863
2nd Edition
(June 1970)

ECMA-14 Rules for the Definition of 4 Bit Sets Derived
from the ECMA 7 Bit Coded Character Set
(November 1967)

ECMA-15 Printing Specifications for Optical Character   ISO 1831
Recognition, 2nd Edition
(August 1975)

ECMA-16 Basic Mode Control Procedures for Data
Communication Systems using the ECMA 7-Bit
Code, 2nd Edition
(June 1973)

ECMA-17 Graphic Representation of the Control   ISO 2047
Characters of the ECMA 7-Bit Coded
Character Set for Information Interchange
(November 1968)

ECMA-18 Printing Line Position on OCR Single Line   ISO 1831
Documents, 2nd Edition
(January 1977)

ECMA-19 Coding of Character Sets for MICR and OCR   ISO 2033
(June 1969)

ECMA-20 Implementation of the ECMA 7 Bit Coded   ISO 1113
Character Set on Punched Cards
(June 1969)

ECMA-21 Character Positioning on OCR Journal Tape
(June 1969)

ECMA-22 Electrical Safety Requirements for Data
Processing Machines
(June 1969)

ECMA-23 Keyboards Generating the Code Combinations   ISO/IEC
of the Characters of the ECMA 7-Bit Coded   9995
Character Set, 2nd Edition
(January 1975)

ECMA-24 Code Independent Information Transfer (An
extension to the Basic Mode Transmission
Control Procedures)
(December 1969)

ECMA-25 Representation of 8-Bit combinations on 12-   ISO 6586
Row Punched Cards
(June 1970)

ECMA-26 Recovery Procedures (An Extension to the
Basic Mode Control Procedures for Data
Communication Systems)
(April 1971)

ECMA-27 Abort and Interrupt Procedures (An Extension
of the Basic Mode Control Procedures for Data
Communication Systems)
(April 1971)

ECMA-28	Multiple Station Selection Procedures (An Extension of the Basic Mode Control Procedures for Data Communication Systems) (April 1971)	
ECMA-29	Conversational Information Transfer (An Extension of the Basic Mode Control Procedures for Data Communication Systems) (September 1971)	
ECMA-30	OCR B Subsets for Numeric Applications, 2nd Edition (March 1976)	
ECMA-31	Mechanical Safety Requirements for DTA Processing Machines (September 1971)	
ECMA-32	Mechanical, Physical and Magnetic Characteristics of Interchangeable 6-Disk Packs (September 1971)	
ECMA-33	Track Format Characteristics of Interchangeable 6-Disk Packs (September 1971)	ISO 3561
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-36	Data Interchange on 9-Track Magnetic Tape at 63 bpmm (1600 bpi) Phase-Encoded (December 1971)	ISO/IEC 3788
ECMA-37	Supplementary Transmission Control Functions (An Extension of the Basic Mode Control Procedures for Data Communication Systems) (June 1972)	
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-40	High-Level Data Link Control Procedures (HDLC) - Frame Structure, 3rd Edition (January 1980)	ISO/IEC 3309
ECMA-41	Magnetic Tape Cassette Labelling and File Structure for Information Interchange (December 1973)	ISO 4341
ECMA-42	Alpha-numeric Character Set for 7x9 Matrix Printers (December 1973)	
ECMA-44	Implementation of the ECMA 7-Bit and 8-Bit Coded Character Sets on Punched Cards (September 1975)	ISO 6586
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-47	Limits and Measurements Methods for Radio Interference from EDP Units (March 1976)	
ECMA-49	HDLC-Elements of Procedure, 2nd Edition (August 1979)	ISO/IEC 4335
ECMA-50	Programming Language PL/1 (December 1976)	ISO 6160
ECMA-51	Implementation of the Numeric OCR-A Font with 9x9 Matrix Printers (January 1977)	
ECMA-52	Magnetic 12-Disk Packs (200 Mbytes) (September 1977)	

ECMA-53	Representation of Source Programs for Program Interchange - APL, COBOL, FORTRAN, Minimal BASIC and PL/1 (January 1978)	ISO 5653
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-57	Safety Requirements for Data Processing Equipment, 2nd Edition (September 1981)	
ECMA-58	Flexible Disk Cartridge Labelling and File Structure for Information Interchange (August 1979)	
ECMA-59	Data Interchange on 200 mm Flexible Disk Cartridges Using Two-Frequency Recording at 13 262 ftprad on Both Sides (August 1979)	ISO 5654-1
ECMA-60	HDLC-Unbalanced Class of Procedure (August 1979)	ISO/IEC 7809
ECMA-61	HDLC-Balanced Class of Procedure (August 1979)	ISO/IEC 7809
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-63	Representation of Numerical Values in Character Strings for Information Interchange (September 1980)	

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-67	130 mm Flexible Disk Cartridge Labelling and File Structure (January 1981)	
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)	ISO/IEC 3309 & 4335
ECMA-72	Transport Protocol (January 1981)	ISO/IEC 8073
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-75	Session Protocol (January 1982)	ISO 8327

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 7929
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 Cartridge 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)	ISO/IEC 8802-3
ECMA-82	Local Area Networks (CSMA/CD Baseband) Link Layer, 2nd Edition (March 1984)	ISO/IEC 8802-3
ECMA-83	Safety Requirements for DTE-to-DCE Interface in Public Data Networks, 2nd Edition (September 1985)	
ECMA-84	Data Presentation Protocol (September 1982)	ISO/IEC 8823-1
ECMA-85	Virtual File Protocol (September 1982)	
ECMA-86	Generic Data Presentation - Services Description and Protocol Definition (March 1983)	ISO/IEC 8822
ECMA-87	Generic Virtual Terminal - Service and Protocol Description (March 1983)	ISO 9040
ECMA-88	Basic Class Virtual Terminal - Service Description and Protocol Definition (March 1983)	ISO 9040 & 9041
ECMA-89	Local Area Networks - Token Ring Technique, 2nd Edition (March 1985)	ISO/IEC 8802-5
ECMA-90	Local Area Networks - Token Bus Technique (September 1983)	ISO/IEC 8802-4
ECMA-91	Flexible Disk Cartridges - File Structure and Labelling for Information Interchange (March 1984)	ISO 7665
ECMA-92	Connectionless Internetwork Protocol (March 1984)	
ECMA-93	Distributed Application for Message Interchange (MIDA) (September 1984)	
ECMA-95	Limits of Interference and Measurement Methods (March 1985)	
ECMA-96	Syntax of Graphical Data for Multiple-Workstation Interface (GDS) (September 1985)	
ECMA-98	Data Interchange on 6,30 mm Magnetic Tape Cartridge Using NRZ1 Recording at 394 ftpmm - Streaming Mode (September 1985)	ISO 8462
ECMA-101	Open Document Architecture (ODA) and Interchange Format, 2nd Edition (December 1988)	ISO 8613
ECMA-102	Rate Adaptation for the Support of Synchronous and Asynchronous Equipment Using the V. Series Type Interface on a PCSN, 2nd Edition (July 1987)	

ECMA-227 PCTE - Extensions for Support of Fine-Grain
Objects - Abstract Specification (October
1995)

ECMA-228 PCTE - Extensions for support of Fine-Grain
Objects - C Programming Language Binding
(October 1995)

ECMA-229 PCTE - Extensions for Support of Fine-Grain
Objects - Ada Programming Language Binding
(October 1995)

ECMA-255 PCTE - Object Orientation Extensions -
Abstract Specification (December 1996)

ECMA-256 PCTE - Object Orientation Extensions - C
Programming Language Binding
(December 1996)

ECMA-257 PCTE - Object Orientation Extensions - Ada
Programming Language Binding (December
1996)

Withdrawn ECMA Technical Reports (White cover)

(no longer available)

ECMA TR/1   A Set of I/O Procedures for ECMALGOL
(January 1967)

ECMA TR/2   Formal Definition of the Syntax of COBOL
(September 1970)

ECMA TR/3   Continuous Sprocket Punched Stationery Part II (Physical
Properties, Fastenings, Packaging and Storage)
(March 1972)

ECMA TR/4   Continuous Stationery in Roll Form
(June 1972)

ECMA TR/5   Suggestions for a Disk Labelling System
(June 1972)

ECMA TR/6   Recommended Sizes of Forms for Optical Reading
(June 1972)

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

ECMA TR/8   Recommended OCR Paper Specifications, 2nd Edition
(January 1977)

ECMA TR/9   Safety Requirements for Data Processing Equipment
(January 1978)

ECMA TR/10 Listing of Software Names, 2nd Edition
(March 1982)

ECMA TR/11 Guidelines for Magnetic Tape Handling and Storage
(January 1981)

ECMA TR/12 Radio Interference from DP/OE Limits and Measurement
Methods
(September 1982)

ECMA TR/13 Network Layer Principles (September 1982)

ECMA TR/14 Local Area Networks - Layers 1 to 4 Architecture and
Protocols
(September 1982)

ECMA TR/15 Analysis of European X.25 Networks
(September 1983)

ECMA TR/16 Interface Characteristics for a DTE to Operate with
European Rec.X.25 Networks (September 1983)

ECMA TR/17 Permission to Connect - PTT Requirements for Obtaining
Approval to Connect Apparatus to the Network
(September 1983)

ECMA TR/19 Local Area Networks - Safety Requirements
(March 1984)

ECMA TR/20 Layer 4 to 1 Addressing (March 1984)

ECMA TR/21 Local Area Networks - Interworking Units for Distributed
Systems (March 1984)

ECMA TR/22 Ergonomics - Recommendations for VDU Work Places
(March 1984)

ECMA TR/24 Interface between Data Processing Equipment and Private Automatic Branch Exchange (March 1985)

ECMA TR/25 OSI Sub-Network Interconnection Scenarios Permitted within the Framework of the ISO-OSI Reference Model (March 1985)

ECMA TR/26 Planning and Installation Guide for CSMA/CD 10 MBit/s Baseband Local Area Networks, 2nd Edition (June 1990)

ECMA TR/28 Safety Verification (Save) Report ECMA-57/IEC 435 (September 1985)

ECMA TR/29 Open Systems Interconnection Distributed Interactive Processing Environment (DIPE) (September 1985)

ECMA TR/30 Remote Database Access Service and Protocol (December 1985)

ECMA TR/31 Remote Operations - Concepts, Notation and Connection- Oriented Mappings (December 1985)

ECMA TR/32 OSI Directory Access Service and Protocol (December 1985)

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

ECMA TR/35 Particular Safety Requirements for Equipment to be Connected to Telecommunication Networks (December 1986)

ECMA TR/37 Framework for OSI Management (December 1986)

ECMA TR/38 End System Routing (December 1986)

ECMA TR/39 Compliance Verification (COVER) Report, 3rd Edition (December 1992)

ECMA TR/41 ODA - Document Specification Language (July 1987)

ECMA TR/42 Framework for Distributed Office Application (July 1987)

ECMA TR/43 Packetized Data Transfer in Private Switching Networks (December 1987)

ECMA TR/44 An Architectural Framework for Private Networks, 2nd Edition (December 1989)

ECMA TR/45 Information Interchange for Remote Maintenance at the DPE-to-PSN Interface (December 1987)

ECMA TR/47 Configuration Management Service Definition (July 1988)

ECMA TR/48 Study of the Translation of the ODA Formatted Form into Page Description Languages (December 1988)

ECMA TR/49 Support Environment for Open Distributed Processing (December 1989)

ECMA TR/50 Inter-Domain Intermediate System Routeing (December 1989)

ECMA TR/51 Requirements for Access to Integrated Voice and Data Local and Metropolitan Area Networks (June 1990)

ECMA TR/52 Computer Supported Telecommunications Applications (June 1990)

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. The constituent assembly was held on 17th June 1961.

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 ECMA organization the name was changed in 1994 to: ECMA - An international Europe-based industrial association for standardizing information and communication systems.

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