

MEMENTO 2001

ECMA

Standardizing Information and Communication Systems

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## TABLE OF CONTENTS

Preface	5
Purpose and membership	7
ECMA's role in International Standardization	9
ECMA Organization	10
Management, Officers, Co-Ordinating Committee	11
General Assembly	12
Ordinary members	13
Associate members	15
SME members	16
Other Organizations	17
Technical Committees	18
Index of ECMA Standards	47
ECMA Standards and corresponding International and European Standards	50
Technical Reports	68
List of Representatives	70
ECMA By-Laws	111
ECMA Rules	118
Code of Conduct in Patent matters	123
Withdrawn ECMA Standards	125
History of ECMA	140
Past Presidents / Secretary General	141

## PREFACE

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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 forty years ECMA has actively contributed to world-wide standardization in information technology, telecommunications and consumer electronics. About 320 ECMA Standards and 80 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
- Product Safety

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 2001.**

## PURPOSE AND MEMBERSHIP

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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. Approved ECMA Standards and Technical Reports are made available free of charge and free of copyright to all interested parties.

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.

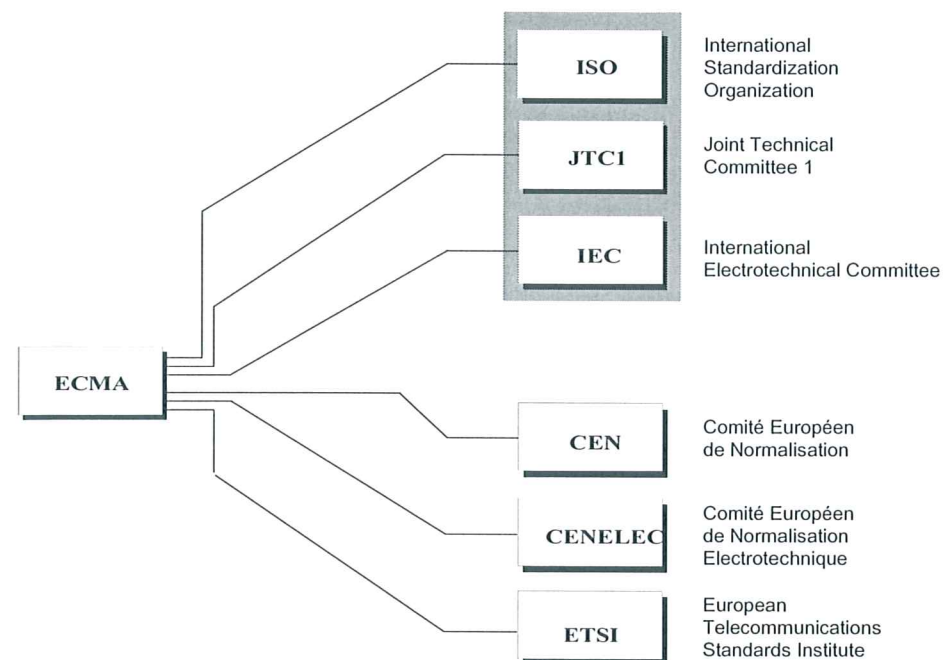
Ordinary members shall be companies which develop, produce and market in Europe hardware or software products or services in the field of information technology or telecommunications used to process digital information for business, scientific, control, communication or other similar purposes. Products 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 or 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.



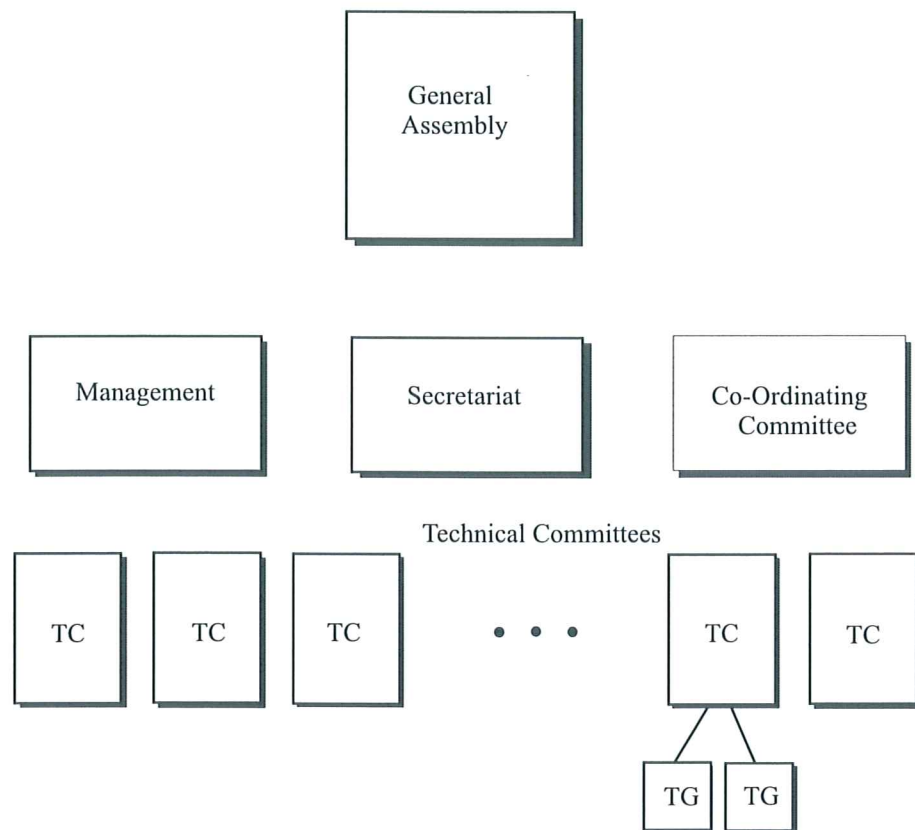
## ECMA'S ROLE IN INTERNATIONAL STANDARDIZATION



94-0006-A

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

## ECMA ORGANIZATION



94-0007-A

### Management

---

**President**  
Mr. P. Hofmann  
IBM

**Vice-President**  
Mr. S. Heil  
Microsoft

**Treasurer**  
Ms. V. Horsnell  
Sun

### Secretariat

---

**Secretary General**  
Mr. J. van den Beld  
**Senior Technical Officer**  
Mr. L. Lauri

### Co-Ordinating Committee

---

**Chairman**  
Mr. S. Statt (Lucent)

**Members**  
Ms J. Auber (HP)  
Mr. R. Gass (Alcatel)  
Mr. U. Hartmann (Siemens)  
Mr. D. Hekimi (Toshiba)  
Mr. C. Lewis (Netscape)  
Mr. M. Ryland (Microsoft)  
Mr. H. Theis (Tenovis)

## GENERAL ASSEMBLY

**Alcatel** Mr. R. Gass  
**Apple** Mr. E. Vangala  
**Avaya** Mr. G. Freundlich  
**Callscan** Mr. R. Huffadine  
**Canon** Mr. J.C. van der Linden  
**Compaq** *Vacancy*  
**Dell** Mr. R. Crabb  
     *alternate:* Mr. D. Lohbeck  
**Eastman Kodak** Mr. S.A. Munden  
     *alternate:* Mr. D.R. Hunt  
**Ecrix** Mr. D.L. Detro  
     *alternate:* Mr. J. Neumann  
**EMC** Mr. G. Robinson  
**EMTEC** Mr. P. Felleisen  
**Ericsson** Mr. L.-O. Norèn  
     *alternate:* Mr. T. Thyni  
**Exabyte** Mr. C. Mulder  
**Fujitsu/ICL** Mr. H. Narita  
**Hitachi** Mr. T. Noguchi  
**HP** Mrs K. Higginbottom  
     *alternate:* Ms S. Auber  
**IBM** Mr. P. Hofmann  
**Intel** Mr. K. Fisher  
     *alternate:* Dr. N. Oliver  
**ISLinkup** Mr. M. Ford  
**JVC** Mr. B.H. Suzuki  
**Lucent** Mr. S. Statt  
**Microsoft** Mr. M. Deese  
     *alternate:* Ms. I. Valet-Harper  
**Mitsubishi Electric** Mr. M. Nagao  
**NEC** Mr. M. Nakajima  
**Netscape/AOL** Mr. C. Lewis  
**OKI** Mr. B. Spencer  
**Openwave** Mr. J. Crollick  
**Panasonic/Matsushita**  
     Mr. T. Yoshino  
     *alternate:* Mr. T.J. Nelson  
**Philips** Mr. F.T.A. van Noesel  
     *alternate:* Dr. P. Weijenbergh  
**Pioneer** Mr. M. Sugimoto  
**Pixo** Mr. B. Gibbons  
**Plasmon** Mr. R.J. Longman  
**Quantum** Mr. P. Trivedi  
**Ricoh** Mr. M. Takahashi  
**Rockwell** *Vacancy*  
**Seagate** Mr. J. Wold  
**Siemens** Mr. U. Hartmann  
**Sony** Mr. M. Ogawa  
**Sun** Ms V. Horsnell  
     *alternate:* Mr. R. Reed  
**Tenovis:** Mr. H. Theis  
     *alternate:* Mr. W. Krautkrämer  
**Toray** Mr. Y. Ogawa  
**Toshiba** Mr. H. Kodani  
     *alternate:* Mr. D. Hekimi  
**Verbatim** Mr. T. Mutsu  
**Xerox** *Vacancy*

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Raheen Industrial Estate  
LIMERICK  
Ireland

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United Kingdom

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CUPERTINO, CA 95014  
USA

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Plasmon Plc  
Melbourn  
Whiting Way  
Nr. ROYSTON SG8 6EN  
United Kingdom

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## OTHER ORGANIZATIONS

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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.

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Amorphouse Research Lab., Beijing University of Aeronautics & Astronautics

EACEM - European Association of Consumer Electronics Manufacturers

MCI Metro

Monash University

NIST, Computer Systems Laboratory

Object Management Group (OMG)

Physikalisch-Technische Bundesanstalt (PTB)

SHARE

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
Office Devices	TC 34
IT Security	TC 36
Product-related Environmental Attributes	TC 38
Programming and Scripting Languages	TC 39

### 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
User System Interface	TC 35
Application Programming Interface for Windows (APIW)	TC 37
Object Data Interfaces	TC 40
Platform Independent Computing Environment	TC 41

**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.

**Officers:****Chairman**

Mr. H.B.B. van Dam (Philips)

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**Vice-Chairman**

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Mr. B. Wärme (Ericsson)



## TC 15 - VOLUME AND FILE STRUCTURE

---

### Scope:

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

### Programme of work:

1. To specify volume and file structure standards for media used in interchange.
2. To specify such standards so that they are independent, where possible, of the standards for the underlying medium.
3. To constitute a coherent family of standards where possible.
4. To assume responsibility for the maintenance of ECMA Standards prepared by TC15.
5. To maintain liaison with other standards organizations in order to present ECMA proposals to them and to make comments on their proposals.

### Officers:

#### Chairman

Mr. S. Heil (Microsoft)

---

#### Vice-Chairman

Mr. J.R. Sims, III (HP)

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Mr. T.J. Whitcher (Kodak)  
Mr. M. Yoshioka (Fujitsu/ICL)

## TC 17 - MAGNETIC TAPES AND TAPE CARTRIDGES

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### 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.

### Officers:

#### Chairman

Mr. P.J. Seger (IBM)

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#### Vice-Chairman

Mr. P. W. Watts (HP)

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### Members

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Mr. P. Trivedi (Quantum)  
Mr. G.A. Unruh (Seagate)



## 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.

### Officers:

#### Chairman

Mr. R. Gehrman (HP)

#### Vice-Chairman

Mr. H.R. Hofmann (Lucent)

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Mr. J.P. Wagner (Avaya)  
Mr. M. Yamaguchi (Fujitsu/ICL)  
Mr. M. Yamaji (Hitachi)

## TC 26 - ACOUSTICS

### Scope:

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

### Programme of work:

1. To categorize the acoustical environments in which information technology equipment is required to work.
2. To survey the various recommendations and requirements for the acoustical environments of these areas.
3. To make recommendations for standard methods of measuring and specifying the noise output of equipment, taking into account the work of ISO/TC43.
4. To consider any special requirements that may arise during non-standard operation, e.g. servicing.
5. To consider what information should be supplied by the manufacturer to facilitate optimum installation and to make recommendations.
6. To follow developments affecting acoustical environment in places of work.

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

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

### Officers:

#### Chairman

Dr. E.K. Dunens (Compaq)

#### Vice-Chairman

*Vacancy*

### Members

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Mr. L. Wittig (Quantum)  
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Mr. V. Zabai (IBM)

## TC 31 - OPTICAL DISKS AND DISK CARTRIDGES

### 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.

### Officers:

#### Chairman

Mr. J. Neumann (Hitachi)

#### Vice-Chairman

Mr. I.E. Henderson (IBM)

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Mr. J. Barnard (Kodak)  
Mr. N.A. Davies (Plasmon)  
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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 and TC32-TG14);
- Computer Supported Telecommunications Applications (CSTA) (see TC32-TG11);
- IP-based multimedia communications in a business environment (see TC32-TG17).

### 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, IETF, 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 Integration (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

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### 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 possible 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;
- interconnection 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).

7. To maintain existing standards for broadband private networks (B-PISN).

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## TC32-TG17 - IP-BASED MULTIMEDIA COMMUNICATIONS

### 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 34- OFFICE DEVICES

### Scope:

To identify and standardize the basic characteristics, excluding interfaces, of office devices (such as printers and copiers). To specify standard performance tests, to specify the use of already standardized supplies (such as stationery, spools, etc.), and, where needed, to develop standards for such supplies.

### Programme of work:

1. To specify the basic characteristics of, and performance test methods for, printers.
2. To specify the basic characteristics of, and performance test methods for, copiers..
3. To investigate print quality aspects.
4. To investigate existing international standards for supplies. To specify their use where applicable. To develop standards where needed.
5. To maintain liaison with other standards organizations in order to present ECM proposals to them and to make comments on their proposals.

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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 acceptance 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 verify, 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 registry.
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 - PROGRAMMING AND SCRIPTING LANGUAGES

### Scope:

To standardize the syntax and semantics of a general purpose, cross platform, vendor-neutral scripting language (ECMAScript), the programming language C<sup>#</sup> (C "sharp") and a Common Language Infrastructure (CLI).

### Programme of work:

1. Develop a dynamic scripting language standard (ECMAScript).
2. Develop a programming language (C<sup>#</sup>, pronounced C "sharp").
3. Develop a Common Language Infrastructure standard (CLI).
4. Contribute the standards to ISO/IEC JTC 1.
5. On completion of standards 1, 2 and 3 investigate the further direction of the ECMAScript, C<sup>#</sup> and CLI.
6. Evaluate and consider proposals for complementary or additional technology.
7. To maintain liaison with appropriate other ECMA TCs and TGs.

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## TC39-TG1 – DYNAMIC SCRIPTING LANGUAGE

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### Scope:

To standardize the syntax and semantics of a general purpose, cross platform, vendor-neutral dynamic scripting language called ECMAScript.

### Programme of work:

1. Develop ECMAScript language standards.
2. Upon completion of item 1, to investigate the future direction of ECMAScript standards, and to evaluate and consider proposals for complementary or additional technology.
3. To establish and maintain liaison with other ECMA TCs and with other Standards Development Organisations (SDOs) as appropriate to facilitate and promulgate the work of the TG.

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### Scope:

To standardize the syntax and semantics of a modern, component-based, general purpose, object oriented, and type-safe programming language called C# (pronounced C sharp).

### Programme of work:

1. Develop C# language standards.
2. Upon completion of item 1, to investigate the future direction of C# standards, and to evaluate and consider proposals for complementary or additional technology.
3. To establish and maintain liaison with other ECMA TCs and with other Standards Development Organisations (SDOs) as appropriate to facilitate and promulgate the work of the TG.

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Mr. O. Wickström (Ericsson)

### Scope:

To standardize a common language infrastructure (CLI) to support C#, ECMAScript and other modern languages.

### Programme of work:

1. Develop CLI standards including:
  - \* A common type system used across all supported programming languages
  - \* Execution Engine Architecture
  - \* A system architecture and type system
  - \* Metadata syntax and semantic
  - \* File format including validation rules
  - \* Program verification rules that ensure type safety
  - \* A common intermediate language format for code download and execution, along with metadata that describes the requirements and capabilities of the code
  - \* A small set of base classes that provide language support and basic application portability.
2. Upon completion of item 1, to investigate the future direction of CLI standards, and to evaluate and consider proposals for complementary or additional technology.
3. To establish and maintain liaison with other ECMA TCs and with other Standards Development Organisations (SDOs) as appropriate to facilitate and promulgate the work of the TG.

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## INDEX OF ECMA STANDARDS

<b>General</b>	<b>Safety, EMC,</b>	ECMA-74	ECMA-199
	<b>Acoustics,</b>	ECMA-108	ECMA-200
	<b>Environmental</b>	ECMA-109	ECMA-237
	<b>Product</b>	ECMA-160	ECMA-275
	<b>Attributes</b>	ECMA-172	ECMA-287

### Software Engineering and Interfaces

<b>PCTE,</b>	ECMA-149
	ECMA-158
	ECMA-162
	ECMA-230
	ECMA-270
<b>API for Windows</b>	ECMA-234
	ECMA-262
	ECMA-290
<b>ECMAScript</b>	ECMA-262
	ECMA-290
	ECMA-290

### Data Presentation

<b>Character Sets and Coding</b>	ECMA-6	ECMA-114
	ECMA-35	ECMA-118
	ECMA-43	ECMA-121
	ECMA-48	ECMA-128
	ECMA-94	ECMA-144
	ECMA-113	
<b>Labelling, Volume and File Structure</b>	ECMA-13	ECMA-167
	ECMA-107	ECMA-168
	ECMA-119	ECMA-208

### Data Communication

<b>PISN</b>	ECMA-106	ECMA-242
	ECMA-133	ECMA-243
	ECMA-142	ECMA-244
	ECMA-143	ECMA-245
	ECMA-148	ECMA-250
	ECMA-155	ECMA-251
	ECMA-156	ECMA-252
	ECMA-157	ECMA-253



	ECMA-161	ECMA-254
	ECMA-163	ECMA-261
	ECMA-164	ECMA-263
	ECMA-165	ECMA-264
	ECMA-173	ECMA-265
	ECMA-174	ECMA-266
	ECMA-175	ECMA-276
	ECMA-176	ECMA-277
	ECMA-177	ECMA-281
	ECMA-178	ECMA-282
	ECMA-185	ECMA-283
	ECMA-186	ECMA-284
	ECMA-191	ECMA-289
	ECMA-192	ECMA-294
	ECMA-193	ECMA-295
	ECMA-194	ECMA-296
	ECMA-202	ECMA-297
	ECMA-203	ECMA-298
	ECMA-211	ECMA-299
	ECMA-212	ECMA-300
	ECMA-213	ECMA-301
	ECMA-214	ECMA-302
	ECMA-215	ECMA-303
	ECMA-216	ECMA-304
	ECMA-220	ECMA-305
	ECMA-221	ECMA-306
	ECMA-224	ECMA-310
	ECMA-225	ECMA-311
	ECMA-226	ECMA-312
	ECMA-232	ECMA-313
	ECMA-233	ECMA-314
	ECMA-241	ECMA-318
<b>CSTA</b>	ECMA-179	ECMA-218
	ECMA-180	ECMA-269
	ECMA-217	ECMA-285
<b>IT-Security</b>	ECMA-205	ECMA-235
	ECMA-206	ECMA-271
	ECMA-219	

## Data Interchange by Physical Media

<b>Flexible Disk Cartridges</b>	ECMA-99	ECMA-147
	ECMA-100	ECMA-207
	ECMA-125	
<b>Magnetic Tapes and Tape Cartridges</b>	ECMA-120	ECMA-231
	ECMA-139	ECMA-236
	ECMA-145	ECMA-246
	ECMA-146	ECMA-247
	ECMA-150	ECMA-248
	ECMA-152	ECMA-249
	ECMA-169	ECMA-258
	ECMA-170	ECMA-259
	ECMA-171	ECMA-278
	ECMA-182	ECMA-286
	ECMA-196	ECMA-288
	ECMA-197	ECMA-291
	ECMA-198	ECMA-292
	ECMA-209	ECMA-293
	ECMA-210	ECMA-315
		ECMA-316
<b>Optical Disks and Disk Cartridges</b>	ECMA-130	ECMA-239
	ECMA-153	ECMA-240
	ECMA-154	ECMA-260
	ECMA-183	ECMA-267
	ECMA-184	ECMA-268
	ECMA-189	ECMA-272
	ECMA-190	ECMA-273
	ECMA-195	ECMA-274
	ECMA-201	ECMA-279
	ECMA-223	ECMA-280
	ECMA-238	ECMA-317
<b>Data Compression</b>	ECMA-151	ECMA-222
	ECMA-159	

## ECMA STANDARDS AND CORRESPONDING INTERNATIONAL AND EUROPEAN STANDARDS

<b>ECMA-6</b>	7-Bit Coded Character Set, 6 <sup>th</sup> Edition (December 1991)	ISO/IEC 646
<b>ECMA-13</b>	File Structure and Labelling of Magnetic Tapes for Information Interchange, 4 <sup>th</sup> Edition (December 1985)	ISO 1001
<b>ECMA-35</b>	Character Code Structure and Extension Techniques, 6 <sup>th</sup> Edition (December 1994)	ISO/IEC 2022
<b>ECMA-43</b>	8-Bit Coded Character Set Structure and Rules 3 <sup>rd</sup> Edition (December 1991)	ISO/IEC 4873
<b>ECMA-48</b>	Control Functions for Coded Character Sets 5 <sup>th</sup> Edition (June 1991)	ISO/IEC 6429
<b>ECMA-74</b>	Measurement of Airborne Noise Emitted by Information Technology and Telecommuni- cations Equipment, 6 <sup>th</sup> Edition (December 1999))	ISO 7779
<b>ECMA-94</b>	8-Bit Single-Byte Coded Graphic Character Sets - Latin Alphabets No. 1 to No. 4, 2 <sup>nd</sup> Edition (June 1986)	ISO 8859-1, - 2, -3 and -4
<b>ECMA-99</b>	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
<b>ECMA-100</b>	Data Interchange on 90 mm Flexible Disk Cartridges Using MFM Recording at 7 958 ftprad on 80 Tracks on Each Side - ISO Type 301, 2 <sup>nd</sup> Edition (December 1988)	ISO 8860
<b>ECMA-106</b>	PTN - Signalling Protocol at the S Reference Point - Circuit Mode Basic Services (SSIG-BC), 3 <sup>rd</sup> Edition (December 1993)	ETS 300 192
<b>ECMA-107</b>	Volume and File Structure of Disk Cartridges for Information Interchange, 2 <sup>nd</sup> Edition (June 1995)	ISO/IEC 9293

<b>ECMA-108</b>	Measurement of High Frequency Noise Emitted by Information Technology and Telecommunications Equipment, 3 <sup>rd</sup> Edition (December 1996)	ISO 9295
<b>ECMA-109</b>	Declared Noise Emission Values of Information Technology and Telecommunications Equipment, 4 <sup>th</sup> Edition (December 1996)	ISO 9296
<b>ECMA-113</b>	8-Bit Single-Byte Coded Graphic Character Sets - Latin/Cyrillic Alphabet, 3 <sup>rd</sup> Edition (December 1999)	ISO 8859-5
<b>ECMA-114</b>	8-Bit Single-Byte Coded Graphic Character Sets - Latin/Arabic Alphabet, 2 <sup>nd</sup> Edition (December 2000)	ISO 8859-6
<b>ECMA-118</b>	8-Bit Single-Byte Coded Graphic Character Sets - Latin/Greek Alphabet, (December 1986)	ISO 8859-7
<b>ECMA-119</b>	Volume and File Structure of CDROM for Information Interchange, 2 <sup>nd</sup> Edition (December 1987)	ISO 9660
<b>ECMA-120</b>	Data Interchange on 12,7 mm 18-Track Magnetic Tape Cartridges, 3 <sup>rd</sup> Edition (December 1993)	ISO 9661
<b>ECMA-121</b>	8-Bit Single-Byte Coded Graphic Character Sets - Latin/Hebrew Alphabet, 2 <sup>nd</sup> Edition (December 2000)	ISO 8859-8
<b>ECMA-125</b>	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
<b>ECMA-128</b>	8-Bit Single-Byte Coded Graphic Character Sets - Latin Alphabet No. 5, 2 <sup>nd</sup> Edition (December 1999)	ISO 8859-9
<b>ECMA-130</b>	Data Interchange on Read-only 120 mm Optical Data Disks (CD-ROM), 2 <sup>nd</sup> Edition (June 1996)	ISO/IEC 10149
<b>ECMA-133</b>	PISN - Reference Configuration for PISN Exchanges (PINX), 2 <sup>nd</sup> Edition (December 1998)	ISO/IEC 11579- 1



<b>ECMA-139</b>	3,81 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - DDS Format (June 1990)	<b>ISO/IEC 10777</b>
<b>ECMA-142</b>	PISN - Circuit Mode 64kbit/s Bearer Services - Service Description, Functional Capabilities and Information Flows (BCSD), 2 <sup>nd</sup> Edition (June 1997)	<b>ETS 300 171</b> <b>ISO/IEC 11574</b>
<b>ECMA-143</b>	PISN - Circuit Mode Bearer Services - Inter-Exchange Signalling Procedures and Protocol (QSIG-BC), 3 <sup>rd</sup> Edition (June 1997)	<b>ETS 300 172</b> <b>ISO/IEC 11572</b>
<b>ECMA-144</b>	8-Bit Single-Byte Coded Character Sets - Latin Alphabet No. 6, 3 <sup>rd</sup> Edition (December 2000)	<b>ISO/IEC 8859-10</b>
<b>ECMA-145</b>	8 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording (December 1990)	<b>ISO/IEC 11319</b>
<b>ECMA-146</b>	3,81 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - DATA/DAT Format (December 1990)	<b>ISO/IEC 11321</b>
<b>ECMA-147</b>	Data Interchange on 90 mm Flexible Disk Cartridges using MFM Recording at 31 831 ftpad on 80 Tracks on Each Side - ISO Type 303 (December 1990)	<b>ISO/IEC 10994</b>
<b>ECMA-148</b>	PISN - Specification, Functional Model and Information Flows - Identification Supplementary Services (ISSD), 3 <sup>rd</sup> Edition (June 1997)	<b>ETS 300 173</b> <b>ISO/IEC 14136</b>
<b>ECMA-149</b>	Portable Common Tool Environment (PCTE) - Abstract Specification, 4 <sup>th</sup> Edition (Dec. 1997)	<b>ISO/IEC 13719-1</b>
<b>ECMA-150</b>	3,81 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - DDS-DC Format using 60 m and 90 m Length Tapes, 2 <sup>nd</sup> Edition (June 1992)	<b>ISO/IEC 11557</b>
<b>ECMA-151</b>	Data Compression for Information Interchange - Adaptive Coding with Embedded Dictionary - DCLZ Algorithm (June 1991)	<b>ISO/IEC 11558</b>

<b>ECMA-152</b>	Data Interchange on 12,7 mm 18-Track Magnetic Tape Cartridges - Extended Format, 2 <sup>nd</sup> Edition (December 1993)	<b>ISO/IEC 11559</b>
<b>ECMA-153</b>	Information Interchange on 130 mm Optical Disk Cartridges of the Write Once, Read Multiple (WORM) Type, Using the Magneto-Optical Effect, 2 <sup>nd</sup> Edition (June 1994)	<b>ISO/IEC 11560</b>
<b>ECMA-154</b>	Data Interchange on 90 mm Optical Disk Cartridges, Read Only and Rewritable, M.O., 2 <sup>nd</sup> Edition (June 1994)	<b>ISO/IEC 10090</b>
<b>ECMA-155</b>	Private Integrated Services Networks - Addressing, 2 <sup>nd</sup> Edition (June 1997)	<b>ETS 300 189</b> <b>ISO/IEC 11571</b>
<b>ECMA-156</b>	PTN - Signalling at the S Reference Point - Generic Keypad Protocol for the Support of Supplementary Services (SSIG-KP), 2 <sup>nd</sup> Edition (June 1993)	<b>ETS 300 190</b>
<b>ECMA-157</b>	PTN - Signalling Protocol at the S Reference Point - Identification Supplementary Services (SSIG-ID), 2 <sup>nd</sup> Edition (June 1993)	<b>ETS 300 191</b>
<b>ECMA-158</b>	Portable Common Tool Environment (PCTE) - C Programming Language Binding, 4 <sup>th</sup> Edition (December 1997)	<b>ISO/IEC 13719-2</b>
<b>ECMA-159</b>	Data Compression for Information Interchange - Binary Arithmetic Coding Algorithm (December 1991)	<b>ISO/IEC 12042</b>
<b>ECMA-160</b>	Determination of Sound Power Levels of Computer and Business Equipment Using Sound Intensity Measurements; Scanning Method in Controlled Rooms, 2 <sup>nd</sup> Edition (December 1992)	<b>ISO 9614-2</b>
<b>ECMA-161</b>	PTN - Signalling at the S Reference Point - Generic Feature Key Management Protocol for the Control of Supplementary Services (SSIG-FK), 2 <sup>nd</sup> Edition (June 1993)	<b>ETS 300 240</b>
<b>ECMA-162</b>	Portable Common Tool Environment (PCTE) - Ada Programming Language Binding, 4 <sup>th</sup> Edition (December 1997)	<b>ISO/IEC 13719-3</b>



<b>ECMA-163</b>	PISN - Specification, Functional Model and Information Flows - Name Identification Supplementary Services (NISD), 3 <sup>rd</sup> Edition (September 1997)	ETS 300 237 ISO/IEC 13864
<b>ECMA-164</b>	PISN - Inter-Exchange Signalling Protocol - Name Identification Supplementary Services (QSIG-NA), 3 <sup>rd</sup> Edition (September 1997)	ETS 300 238 ISO/IEC 13868
<b>ECMA-165</b>	PISN - Generic Functional Protocol for the Support of Supplementary Services - Inter-Exchange Signalling Procedures and Protocol (QSIG-GF), 3 <sup>rd</sup> Edition (June 1997)	ETS 300 239 ISO/IEC 11582
<b>ECMA-167</b>	Volume and File Structure for Write-Once and Rewritable Media using Non-Sequential Recording for Information Interchange, 3 <sup>rd</sup> Edition (June 1997)	ISO/IEC 13346
<b>ECMA-168</b>	Volume and File Structure of Read-Only and Write-Once Compact Disk Media for Information Interchange, 2 <sup>nd</sup> Edition (December 1994)	ISO/IEC 13490
<b>ECMA-169</b>	8 mm Wide Magnetic Tape Cartridge Dual Azimuth Format for Information Interchange - Helical Scan Recording (June 1992)	ISO/IEC 12246
<b>ECMA-170</b>	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
<b>ECMA-171</b>	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
<b>ECMA-172</b>	Procedure for Measurement of Emissions of Electric and Magnetic Fields from VDUs from 5 Hz to 400 kHz (June 1992)	
<b>ECMA-173</b>	PISN - Specification, Functional Model and Information Flows - Call Diversion Supplementary Services (CFSD), 2 <sup>nd</sup> Edition (June 1997)	ETS 300 256 ISO/IEC 13872

<b>ECMA-174</b>	PISN - Inter-Exchange Signalling Protocol - Call Diversion Supplementary Services (QSIG-CF), 2 <sup>nd</sup> Edition (June 1997)	ETS 300 257 ISO/IEC 13873
<b>ECMA-175</b>	PISN - Specification, Functional Model and Information Flows - Path Replacement Additional Network Feature (ANF-PRSD), 3 <sup>rd</sup> Edition (December 1998)	ETS 300 258 ISO/IEC 13863
<b>ECMA-176</b>	PISN - Inter-exchange Signalling Protocol - Path Replacement Additional Network Feature (QSIG-PR), 3 <sup>rd</sup> Edition (December 1998)	ETS 300 259 ISO/IEC 13874
<b>ECMA-177</b>	PISN - Specification, Functional Model and Information Flows - Call Transfer Supplementary Service (CTSD), 2 <sup>nd</sup> Edition (September 1997)	ETS 300 260 ISO/IEC 13865
<b>ECMA-178</b>	PISN - Inter-Exchange Signalling Protocol - Call Transfer Supplementary Service (QSIG-CT), 2 <sup>nd</sup> Edition (September 1997)	ETS 300 261 ISO/IEC 13869
<b>ECMA-179</b>	Services for Computer Supported Telecommunications Applications (CSTA) Phase I (June 1992)	
<b>ECMA-180</b>	Protocol for Computer Supported Telecommunications Applications (CSTA) Phase I (June 1992)	
<b>ECMA-182</b>	Data Interchange on 12,7 mm 48 Track Magnetic Tape Cartridges - DLT1 Format (December 1992)	ISO/IEC 13421
<b>ECMA-183</b>	Data Interchange on 130 mm Optical Disk Cartridges - Capacity: 1 Gigabyte per Cartridge (December 1992)	ISO/IEC 13481
<b>ECMA-184</b>	Data Interchange on 130 mm Optical Disk Cartridges - Capacity: 1,3 Gigabytes per Cartridge (December 1992)	ISO/IEC 13549
<b>ECMA-185</b>	PISN - Specification, Functional Model and Information Flows - Call Completion Supplementary Services (CCSD), 2 <sup>nd</sup> Edition (June 1997)	ETS 300 365 ISO/IEC 13866

<b>ECMA-186</b>	PISN - Inter-Exchange Signalling Protocol - Call Completion Supplementary Services (QSIG-CC), 3 <sup>rd</sup> Edition (February 2000)	ETS 300 366 ISO/IEC 13870
<b>ECMA-189</b>	Information Interchange on 300 mm ODCs of the WORM Type Using the SSF Method (June 1993)	ISO/IEC 13614
<b>ECMA-190</b>	Information Interchange on 300 mm ODCs of the WORM Type Using the CCS Method (June 1993)	ISO/IEC 13403
<b>ECMA-191</b>	PISN - Specification, Functional Model and Information Flows - Call Offer Supplementary Service (COSD), 2 <sup>nd</sup> Edition (June 1997)	ETS 300 361 ISO/IEC 14841
<b>ECMA-192</b>	PISN - Inter-Exchange Signalling Protocol - Call Offer Supplementary Service (QSIG-CO), 3 <sup>rd</sup> Edition (June 1997)	ETS 300 362 ISO/IEC 14843
<b>ECMA-193</b>	PISN - Specification, Functional Model and Information Flows - Do Not Disturb and Do Not Disturb Override Supplementary Services (DND(O)SD), 2 <sup>nd</sup> Edition (June 1997)	ETS 300 363 ISO/IEC 14842
<b>ECMA-194</b>	PISN - Inter-Exchange Signalling Protocol - Do Not Disturb and Do Not Disturb Override Supplementary Services (QSIG-DND(O)), 3 <sup>rd</sup> Edition (June 1997)	ETS 300 364 ISO/IEC 14844
<b>ECMA-195</b>	Data Interchange on 130 mm Optical Disk Cartridges - Capacity: 2 Gigabytes per Cartridge, 2 <sup>nd</sup> Edition (June 1995)	ISO/IEC 13842
<b>ECMA-196</b>	Data Interchange on 12,7 mm 36-Track Magnetic Tape Cartridges (December 1993)	ISO/IEC 14251
<b>ECMA-197</b>	Data Interchange on 12,7 mm 112-Track Magnetic Tape Cartridges - DLT2 Format (December 1993)	ISO/IEC 13962
<b>ECMA-198</b>	3,81 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - DDS-2 Format using 120 m Length Tapes, 2 <sup>nd</sup> Edition (June 1995)	ISO/IEC 13923
<b>ECMA-199</b>	Immunity of VDUs to Power Frequency Magnetic Fields (December 1993)	

<b>ECMA-200</b>	Immunity of Information Technology Equipment to Lightning Surges (December 1993)	
<b>ECMA-201</b>	Data Interchange on 90 mm Optical Disk Cartridges - Capacity: 230 Megabytes per Cartridge, 2 <sup>nd</sup> Edition (December 1994)	ISO/IEC 13963
<b>ECMA-202</b>	PISN - Specification, Functional Model and Information Flows - Call Intrusion Supplementary Service (CISD), 2 <sup>nd</sup> Edition (June 1997)	ETS 300 425 ISO/IEC 14845
<b>ECMA-203</b>	PISN - Inter-Exchange Signalling Protocol - Call Intrusion Supplementary Service (QSIG-CI), 3 <sup>rd</sup> Edition (June 1997)	ETS 300 426 ISO/IEC 14846
<b>ECMA-205</b>	Commerically Oriented Functionality Class for Security Evaluation (COFC) (December 1993)	
<b>ECMA-206</b>	Association Context Management including Security Context Management (December 1993)	
<b>ECMA-207</b>	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
<b>ECMA-208</b>	System-Independent Data Format - SIDF (December 1994)	ISO/IEC 14863
<b>ECMA-209</b>	Data Interchange on 12,7 mm 128-Track Magnetic Tape Cartridges - DLT3 Format (December 1994)	ISO/IEC 14833
<b>ECMA-210</b>	12,65 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - DATA-D3-1 Format, 2 <sup>nd</sup> Edition (December 1995)	ISO/IEC 14840
<b>ECMA-211</b>	PISN - Specification, Functional Model and Information Flows - Advice of Charge Supplementary Services (AOCSD), 2 <sup>nd</sup> Edition (June 1997)	ISO/IEC 15049 EN 301 254
<b>ECMA-212</b>	PISN - Inter-Exchange Signalling Protocol - Advice of Charge Supplementary Services (QSIG-AOC), 2 <sup>nd</sup> Edition (June 1997)	ISO/IEC 15050 EN 301 264



<b>ECMA-213</b>	PISN - Specification, Functional Model and Information Flows - Recall Supplementary Service (RESN), 2 <sup>nd</sup> Edition (June 1997)	ISO/IEC 15051 EN 301 257
<b>ECMA-214</b>	PISN - Inter-Exchange Signalling Protocol - Recall Supplementary Service (QSIG-RE), 2 <sup>nd</sup> Edition (June 1997)	ISO/IEC 15052 EN 301 258
<b>ECMA-215</b>	PISN - Cordless Terminal Mobility (CTM) - Inter-Exchange Signalling Protocol - Cordless Terminal Incoming Call Additional Network Feature (QSIG-CTMI), 2 <sup>nd</sup> Edition (September 1997)	ETS 300 696
<b>ECMA-216</b>	PISN - Cordless Terminal Mobility (CTM) - Inter-Exchange Signalling Protocol - Cordless Terminal Location Registration Supplementary Service (QSIG-CTLR), 2 <sup>nd</sup> Edition (September 1997)	ETS 300 693
<b>ECMA-217</b>	Services for Computer Supported Telecommunications Applications (CSTA) Phase II (December 1994)	
<b>ECMA-218</b>	Protocol for Computer Supported Telecommunications Applications (CSTA) Phase II (December 1994)	
<b>ECMA-219</b>	Authentication and Privilege Attribute Security Application with Related Key Distribution Functions - Part 1, 2 and 3, 2 <sup>nd</sup> Edition (March 1996)	
<b>ECMA-220</b>	PISN - Specification, Functional Model and Information Flows - Call Interception Additional Network Feature (ANF-CINTSD), 2 <sup>nd</sup> Edition (June 1997)	ISO/IEC 15053 EN 301 256
<b>ECMA-221</b>	PISN - Inter-Exchange Signalling Protocol - Call Interception Additional Network Feature (QSIG-CINT), 2 <sup>nd</sup> Edition (June 1997)	ISO/IEC 15054 EN 301 265
<b>ECMA-222</b>	Adaptive Lossless Data Compression Algorithm (June 1995)	ISO/IEC 15200
<b>ECMA-223</b>	Data Interchange on 90 mm Optical Disk Cartridges - Capacity: 385 Megabytes per Cartridge (June 1995)	

<b>ECMA-224</b>	PISN - Specification, Functional Model and Information Flows - Transit Counter Additional Network Feature (ANF-TCSD), 2 <sup>nd</sup> Edition (June 1997)	ISO/IEC 15055 EN 301 047
<b>ECMA-225</b>	PISN - Inter-Exchange Signalling Protocol - Transit Counter Additional Network Feature (QSIG-TC), 2 <sup>nd</sup> Edition (June 1997)	ISO/IEC 15056 EN 301 048
<b>ECMA-226</b>	PISN - Mapping Functions for the Employment of Dedicated Circuit Mode Connections as Inter-PTNX Connections (MAPPING-CM-STATIC) (June 1995)	
<b>ECMA-230</b>	Portable Common Tool Environment (PCTE) - IDL Binding (Interface Definition Language), 2 <sup>nd</sup> Edition (December 1997)	ISO/IEC 13719-4
<b>ECMA-231</b>	Data Interchange on 12,7 mm 128-Track Magnetic Tape Cartridges - DLT 4 Format (December 1995)	ISO/IEC 15307
<b>ECMA-232</b>	PISN - Profile Standard for the Connection of Radio Paging Equipment (RPE) to a PISN (December 1995)	ETS 300 739
<b>ECMA-233</b>	PISN - Cordless Terminal Mobility (CTM) - Inter-Exchange Signalling Protocol - Cordless Terminal Outgoing Call Additional Network Feature (QSIG-CTMO), 2 <sup>nd</sup> Edition (September 1997)	I-ETS 300 808
<b>ECMA-234</b>	Application Programming Interface for Windows (APIW) (December 1995)	
<b>ECMA-235</b>	The ECMA GSS-API Mechanism (March 1996)	
<b>ECMA-236</b>	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
<b>ECMA-237</b>	Limits and Methods of Measurement of Immunity Characteristics of Information Technology Equipment (June 1996)	



<b>ECMA-238</b>	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
<b>ECMA-239</b>	Data Interchange on 90 mm Optical Disk Cartridges - HS-1 Format - Capacity: 650 Megabytes per Cartridge (June 1996)	ISO/IEC 15498
<b>ECMA-240</b>	Data Interchange on 120 mm Optical Disk Cartridges using Phase Change PD Format - Capacity: 650 Mbytes per Cartridge (June 1996)	ISO/IEC 15485
<b>ECMA-241</b>	PISN - Specification, Functional Model and Information Flows - Message Waiting Indication Supplementary Service (MWISD), 3 <sup>rd</sup> Edition (December 1998)	ISO/IEC 15505 EN 301 260
<b>ECMA-242</b>	PISN - Inter-Exchange Signalling Protocol - Message Waiting Indication Supplementary Service (QSIG-MWI), 3 <sup>rd</sup> Edition (December 1998)	ISO/IEC 15506 EN 301 255
<b>ECMA-243</b>	PISN - Cordless Terminal Mobility (CTM) - Inter-Exchange Signalling Protocol - Cordless Terminal Authentication Supplementary Services (QSIG-CTAU), 2 <sup>nd</sup> Edition (September 1997)	I-ETS 300 809
<b>ECMA-244</b>	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 ISO/IEC 17309
<b>ECMA-245</b>	PISN - Inter-Exchange Signalling Protocol - PINX Clock Synchronization (SYNC-SIG), 2 <sup>nd</sup> Edition (September 1997)	ISO/IEC 15507 EN 301 259
<b>ECMA-246</b>	8 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - AIT-1 Format, 2 <sup>nd</sup> Edition (June 1998)	ISO/IEC 15780

<b>ECMA-247</b>	8 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - HH-1 Format, 2 <sup>nd</sup> Edition (June 1998)	ISO/IEC 15718
<b>ECMA-248</b>	12,65 mm Wide Magnetic Tape Cassette for Information Interchange - Helical Scan Recording - DTF-1 Format, 2 <sup>nd</sup> Edition (June 1998)	ISO/IEC 15731
<b>ECMA-249</b>	8 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - DA-2 Format, 2 <sup>nd</sup> Edition (June 1998)	ISO/IEC 15757
<b>ECMA-250</b>	PISN - Specification, Functional Model and Information Flows - Common Information ANF (ANF-CMNSD), 2 <sup>nd</sup> Edition (December 1998)	ISO/IEC 15771
<b>ECMA-251</b>	PISN - Inter-Exchange Signalling Protocol - Common Information ANF (QSIG-CMN), 2 <sup>nd</sup> Edition (December 1998)	ISO/IEC 15772
<b>ECMA-252</b>	B-PISN - Inter-Exchange Signalling Protocol - Transit Counter ANF (B-QSIG-TC) (December 1996)	ISO/IEC 15773
<b>ECMA-253</b>	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 ISO/IEC 17310
<b>ECMA-254</b>	B-PISN - Inter-Exchange Signalling Protocol - Generic Functional Protocol, 2 <sup>nd</sup> Edition (December 1999)	ISO/IEC DIS 19058
<b>ECMA-258</b>	Data Interchange on 12,7 mm 128-Track Magnetic Tape Cartridges - DLT 3-XT Format (June 1997)	ISO/IEC 15895
<b>ECMA-259</b>	Data Interchange on 12,7 mm 208-Track Magnetic Tape Cartridges - DLT 5 Format (June 1997)	ISO/IEC 15896
<b>ECMA-260</b>	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

<b>ECMA-261</b>	B-PISN - Service Description - Broadband Connection Oriented Bearer Services (June 1997)	<b>ISO/IEC 15899</b>
<b>ECMA-262</b>	ECMAScript Language Specification, 3 <sup>rd</sup> Edition (December 1999)	<b>ISO/IEC 16262</b>
<b>ECMA-263</b>	PISN - Specification, Functional Model and Information Flows - Call Priority Interruption and Call Priority Interruption Protection Supplementary Services (CPI(P)SD), 2 <sup>nd</sup> Edition (December 1998)	<b>ISO/IEC 15991 EN 301 655</b>
<b>ECMA-264</b>	PISN - Inter-Exchange Signalling Protocol - Call Priority Interruption and Call Priority Interruption Protection Supplementary Services (QSIG-CPI(P)), 2 <sup>nd</sup> Edition (December 1998)	<b>ISO/IEC 15992 EN 301 656</b>
<b>ECMA-265</b>	B-PISN - Inter-Exchange Signalling Protocol - Signalling ATM Adaptation Layer (B-QSIG-SAAL) (September 1997)	<b>ISO/IEC 13246</b>
<b>ECMA-266</b>	B-PISN - Inter-Exchange Signalling Protocol - Basic Call/Connection Control (B-QSIG-BC) (September 1997)	<b>ISO/IEC 13247</b>
<b>ECMA-267</b>	120 mm DVD - Read-Only Disk, 2 <sup>nd</sup> Edition (December 1999)	<b>ISO/IEC 16448</b>
<b>ECMA-268</b>	80 mm DVD - Read-Only Disk, 2 <sup>nd</sup> Edition (December 1999)	<b>ISO/IEC 16449</b>
<b>ECMA-269</b>	Services for Computer Supported Telecommunications Applications (CSTA) Phase III, 4 <sup>th</sup> Edition (June 2000)	<b>ISO/IEC 18051</b>
<b>ECMA-270</b>	Portable Common Tool Environment (PCTE) - Mapping from CASE Data Interchange Format (CDIF) to PCTE (December 1997)	
<b>ECMA-271</b>	Extended Commercially Oriented Functionality Class for Security Evaluation (E-COFC), 2 <sup>nd</sup> Edition (December 1999)	
<b>ECMA-272</b>	120 mm DVD Rewritable Disk (DVD-RAM), 2 <sup>nd</sup> Edition (June 1999)	<b>ISO/IEC 16824</b>

<b>ECMA-273</b>	Case for 120 mm DVD-RAM Disks (February 1998)	<b>ISO/IEC 16825</b>
<b>ECMA-274</b>	Data Interchange on 120 mm Optical Disk using +RW Format - Capacity: 3,0 Gbytes and 6,0 Gbyte, 2 <sup>nd</sup> Edition (June 1999)	<b>ISO/IEC 16969</b>
<b>ECMA-275</b>	Measurement of structure-borne vibration induced by small air moving devices (AMDs) (June 1998)	
<b>ECMA-276</b>	PISN - Reference Configuration for PINX Extension Lines (June 1998)	
<b>ECMA-277</b>	PISN - Circuit Emulation Specification - Emulation of Basic Access by ATM Networks (June 1998)	
<b>ECMA-278</b>	Data Interchange on 12,7 mm 128-Track Magnetic Tape Cartridge - Parallel Serpentine Format, 2 <sup>nd</sup> Edition (June 2000)	<b>ISO/IEC 17913</b>
<b>ECMA-279</b>	80 mm (1,23 Gbytes per side) and 120 mm (3,95 Gbytes per side) DVD-Recordable Disk (DVD-R) (December 1998)	<b>ISO/IEC 20563</b>
<b>ECMA-280</b>	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)	<b>ISO/IEC 18093</b>
<b>ECMA-281</b>	PISN - Specification, Functional Model and Information Flows - Private User Mobility (PUM) - Registration Supplementary Service (PUMRSD), 2 <sup>nd</sup> Edition (June 2000)	<b>ISO/IEC 17875</b>
<b>ECMA-282</b>	PISN - Inter-Exchange Signalling Protocol - Private User Mobility (PUM) - Registration Supplementary Service (QSIG-PUMR), 2 <sup>nd</sup> Edition (June 2000)	<b>ISO/IEC 17876</b>
<b>ECMA-283</b>	PISN - Specification, Functional Model and Information Flows - Private User Mobility (PUM) - Call Handling Additional Network Features (PUMCHSD), 2 <sup>nd</sup> Edition (June 2000)	<b>ISO/IEC 17877</b>



<b>ECMA-284</b>	PISN – Inter-Exchange Signalling Protocol – Private User Mobility (PUM) – Call Handling Additional Network Features (QSIG-PUMCH), 2 <sup>nd</sup> Edition (June 2000)	ISO/IEC 17878
<b>ECMA-285</b>	Protocol for Computer Supported Telecommunications Applications (CSTA) Phase III, 2 <sup>nd</sup> Edition (June 2000)	ISO/IEC 18052
<b>ECMA-286</b>	Data Interchange on 12,7 mm 208-Track Magnetic Tape Cartridges - DLT 6 Format, 2 <sup>nd</sup> Edition (June 2000)	ISO/IEC 16382
<b>ECMA-287</b>	Safety of electronic equipment (June 1999)	
<b>ECMA-288</b>	3,81 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - DDS-4 Format (June 1999)	ISO/IEC 17462
<b>ECMA-289</b>	PISN - Mapping Functions for the Employment of 64 kbit/s Circuit Mode Connections with 8 kbit/s Sub-Multiplexing (Mapping/8) (June 1999)	ISO/IEC 17311
<b>ECMA-290</b>	ECMAScript Components Specification (June 1999)	
<b>ECMA-291</b>	8 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording AIT-1 with MIC Format (December 1999)	ISO/IEC 18809
<b>ECMA-292</b>	8 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording AIT-2 with MIC Format (December 1999)	ISO/IEC 18810
<b>ECMA-293</b>	8 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording – MammothTape-2 Format (December 1999)	ISO/IEC 18836
<b>ECMA-294</b>	B-ISDN and B-PISN - Digital Subscriber Signalling System No. two (DSS2), Broadband Inter-Exchange Signalling (B-QSIG), and Signalling System No. 7 (SS7) - Call Control in a Separated Call and Bearer Control Environment - Part 1: Protocol Specification (December 1999)	EN 302 092-1

<b>ECMA-295</b>	B-ISDN and B-PISN - Digital Subscriber Signalling System No. two (DSS2), Broadband Inter-Exchange Signalling (B-QSIG), and Signalling System No. 7 (SS7) - Call Control in a Separated Call and Bearer Control Environment - Part 2: Protocol Implementation Conformance Statement (PICS) Proforma Specification (December 1999)	EN 302 092-2
<b>ECMA-296</b>	B-ISDN and B-PISN - Digital Subscriber Signalling System No. two (DSS2), Broadband Inter-Exchange Signalling (B-QSIG), and Signalling System No. 7 (SS7) - Prenegotiation - Part 1: Protocol Specification (December 1999)	EN 302 091-1
<b>ECMA-297</b>	B-ISDN and B-PISN - Digital Subscriber Signalling System No. two (DSS2), Broadband Inter-Exchange Signalling (B-QSIG), and Signalling System No. 7 (SS7) - Prenegotiation - Part 2: Protocol Implementation Conformance Statement (PICS) Proforma Specification (December 1999)	EN 302 091-2
<b>ECMA-298</b>	Broadband Private Integrated Services Network (B-PISN) - Inter-Exchange Signalling Protocol – Separated Bearer Control (SBC) (B-QSIG-SBC) (December 1999)	prEN 301 776
<b>ECMA-299</b>	PISN - Specification, Functional Model and Information Flows - Single Step Call Transfer Supplementary Service (SSCT-SD) (February 2000)	ISO/IEC DIS 19459
<b>ECMA-300</b>	PISN - Inter-Exchange Signalling Protocol - Single Step Call Transfer Supplementary Service (QSIG-SSCT) (February 2000)	ISO/IEC DIS 19460
<b>ECMA-301</b>	PISN - Specification, Functional Model and Information Flows - Wireless Terminal Location Registration Supplementary Service and Wireless Terminal Information Exchange Additional Network Feature (WTMLR-SD) (June 2000)	ISO/IEC 15428



<b>ECMA-302</b>	PISN - Inter-Exchange Signalling Protocol - Wireless Terminal Location Registration Supplementary Service and Wireless Terminal Information Exchange Additional Network Feature (QSIG-WTMLR) (June 2000)	<b>ISO/IEC 15429</b>
<b>ECMA-303</b>	PISN - Specification, Functional Model and Information Flows - Wireless Terminal Call Handling Additional Network Features (WTMCH-SD) (June 2000)	<b>ISO/IEC 15430</b>
<b>ECMA-304</b>	PISN - Inter-Exchange Signalling Protocol - Wireless Terminal Call Handling Additional Network Features (QSIG-WTMCH) (June 2000)	<b>ISO/IEC 15431</b>
<b>ECMA-305</b>	PISN - Specification, Functional Model and Information Flows - Wireless Terminal Authentication Supplementary Services (WTMAU-SD) (June 2000)	<b>ISO/IEC 15432</b>
<b>ECMA-306</b>	PISN - Inter-Exchange Signalling Protocol - Wireless Terminal Authentication Supplementary Services (QSIG-WTMAU) (June 2000)	<b>ISO/IEC 15433</b>
<b>ECMA-307</b>	Corporate Telecommunication Networks - Signalling Interworking between QSIG and H.323 - Generic Functional Protocol for the Support of Supplementary Services (June 2000)	<b>ISO/IEC DIS 21409</b>
<b>ECMA-308</b>	Corporate Telecommunication Networks - Signalling Interworking between QSIG and H.323 - Call Transfer Supplementary Services (June 2000)	<b>ISO/IEC DIS 21410</b>
<b>ECMA-309</b>	Corporate Telecommunication Networks - Signalling Interworking between QSIG and H.323 - Call Diversion Supplementary Services (June 2000)	<b>ISO/IEC DIS 21411</b>
<b>ECMA-310</b>	PISN - Specification, Functional Model and Information Flows - Simple Dialog Supplementary Service (June 2000)	<b>ISO/IEC DIS 21407</b>

<b>ECMA-311</b>	PISN - Inter-Exchange Signalling Protocol - Simple Dialog Supplementary Service (June 2000)	<b>ISO/IEC DIS 21408</b>
<b>ECMA-312</b>	PISN - Profile Standard for the Use of PSS1 (QSIG) in Air Traffic Services Networks (June 2000)	<b>PrEN 301 846</b>
<b>ECMA-313</b>	PISN - Specification, Functional Model and Information Flows - Call Identification and Call Linkage Additional Network Feature (CIDLSD) (September 2000)	<b>ISO/IEC DIS 21888</b>
<b>ECMA-314</b>	PISN - Inter-Exchange Signalling Protocol - Call Identification and Call Linkage Additional Network Feature (QSIG-CIDL) (September 2000)	<b>ISO/IEC DIS 21889</b>
<b>ECMA-315</b>	12,65 mm Wide Magnetic Tape Cassette for Information Interchange - Helical Scan Recording - DTF-2 (December 2000)	<b>ISO/IEC DIS 20061</b>
<b>ECMA-316</b>	8 mm Wide Magnetic Tape Cartridge for Information Interchange - Helical Scan Recording - VXA-1 Format (December 2000)	<b>ISO/IEC DIS 20062</b>
<b>ECMA-317</b>	Data Interchange on 300 mm Optical Disk Cartridges of Type WORM (Write Once Read Many) using Irreversible Effects - Capacity: 30 Gbytes per Cartridge (December 2000)	<b>ISO/IEC DIS 20162</b>
<b>ECMA-318</b>	PISN - Use of QSIG at the C Reference Point between a PINX and an Interconnecting Network (December 2000)	<b>ISO/IEC DIS 20161</b>

## TECHNICAL REPORTS

- 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, 2<sup>nd</sup> 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, 2<sup>nd</sup> Edition (June 1992)
- ECMA TR/55** Reference Model for Frameworks of Software Engineering Environments, 3<sup>rd</sup> Edition (June 1993)
- ECMA TR/56** Information Technology Equipment - Recommended Measuring Method for Ozone Emission (June 1991)
- ECMA TR/57** Private Integrated Services Networks, 2<sup>nd</sup> Edition (June 1999)
- ECMA TR/58** Databases and Networking (June 1992)
- ECMA TR/59** Object-Oriented Databases (June 1992)
- ECMA TR/61** User Interface Taxonomy (June 1992)
- ECMA TR/62** Product Noise Emission of Computer Business Equipment (June 1993)
- ECMA TR/64** Secure Information Processing versus the Context of Product Evaluation (December 1993)
- 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, 2<sup>nd</sup> Edition (June 1999)
- 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, 3<sup>rd</sup> Edition (June 2000)
- ECMA TR/73** H.323 / B-ISDN Signalling Interoperability (December 1998)
- ECMA TR/74** A Guide to the Application of the EMC Directive to ITE (June 1999)
- ECMA TR/75** Corporate Telecommunication Networks (CN) - Standardization Plan, 2<sup>nd</sup> Edition (June 2000)
- ECMA TR/76** PISN - Architecture and Scenarios for Private Integrated Services Networking (December 1999)
- ECMA TR/77** Telephony System with Integrated Internet Access - Overview (December 1999)
- ECMA TR/78** ECMA Protection Profile - E-COFC Public Business Class (December 1999)
- ECMA TR/79** PISN - Wireless Terminal Mobility (WTM) - WTM between networks - Requirements (February 2000)
- ECMA TR/80** Migrating to CSTA Phase III (June 2000)
- ECMA TR/81** Interoperation of PISNs with IP Networks (September 2000)
- ECMA TR/82** Scenarios for Computer Supported Telecommunications Applications (CSTA) Phase III (December 2000)

## LIST OF REPRESENTATIVES

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**NOT FOR PUBLIC RELEASE**

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



### Art. 1

#### CONSTITUTION AND HEAD OFFICE

##### 1.1

ECMA, an international industry association, based in Europe, 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:

- The General Assembly.
- The Management.
- 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

Member 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

### 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, 2 <sup>nd</sup> Edition (September 1966)	ISO 1004
ECMA-4	Flow Charts, 2 <sup>nd</sup> Edition (September 1966)	ISO 1028
ECMA-5	Data Interchange on 7 Track Magnetic Tape, 3 <sup>rd</sup> Edition (June 1970)	
ECMA-7	7 Bit Code in Punched Cards (April 1965)	1113
ECMA-8	Nominal Character Dimensions of the Numeric OCR-A Font, 2 <sup>nd</sup> Edition (January 1977)	ISO 1973-1
ECMA-9	FORTTRAN (April 1965)	ISO/IEC 1539
ECMA-10	Data Interchange on Punched Tape, 2 <sup>nd</sup> Edition (July 1970)	ISO 1113
ECMA-11	Alphanumeric Character Set OCR-B for Optical Recognition, 3 <sup>rd</sup> Edition (March 1976)	ISO 1073-2
ECMA-12	Data Interchange on 9-Track Magnetic Tape at 32 bits per mm (800 bpi), 2nd Edition (June 1970)	ISO/IEC 1863
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 Recognition, 2nd Edition (August 1975)	ISO 1831
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 Characters of the ECMA 7-Bit Coded Character Set for Information Interchange (November 1968)	ISO 2047
ECMA-18	Printing Line Position on OCR Single Line Documents, 2nd Edition (January 1977)	ISO 1831
ECMA-19	Coding of Character Sets for MICR and OCR (June 1969)	ISO 2033
ECMA-20	Implementation of the ECMA 7 Bit Coded Character Set on Punched Cards (June 1969)	ISO 1113
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 of the Characters of the ECMA 7-Bit Coded Character Set, 2nd Edition (January 1975)	ISO/IEC 9995
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-Row Punched Cards (June 1970)	ISO 6586
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, 2 <sup>nd</sup> 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, 2 <sup>nd</sup> 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-97	Local Area Networks - Safety Requirements, 2 <sup>nd</sup> Edition (December 1992)	
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, 2 <sup>nd</sup> 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, 2 <sup>nd</sup> Edition (July 1987)	
ECMA-103	Physical Layer at the Basic Access Interface between Data Processing Equipment and Private Switching Networks, 2 <sup>nd</sup> Edition (December 1987)	
ECMA-104	Physical Layer at the Primary Rate Access Interface between Data Processing Equipment and Private Switching Networks (September 1985)	
ECMA-105	Data Link Layer Protocol for the D-Channel of the Interfaces at the Reference Point between Terminal Equipment and Private Telecommunication Networks, 4 <sup>th</sup> Edition (June 1993)	I-ETS 300 169
ECMA-110	Ergonomics - Requirements for Monochromatic Visual Display Devices (December 1985)	
ECMA-111	Small Computer System Interface - SCSI (December 1985)	
ECMA-112	X.25 (1980) Subnetwork-Dependent Convergence Protocol (December 1985)	
ECMA-115	Common Secondary Keyboard Layout for Languages Using a Latin Alphabet (June 1986)	
ECMA-116	BASIC (June 1986)	
ECMA-117	Domain Specific Part of Network Layer Adresses (June 1986)	
ECMA-122	MIDA, Mailbox Service Description and Mailbox Access Protocol Specification (July 1987)	
ECMA-123	In Band Parameter Exchange in Private Pre-ISDN Networks Using Standard ECMA-102, 2 <sup>nd</sup> Edition (June 1990)	



ECMA-124	Designation of Unrecorded Flexible Disk Cartridges (December 1987)	
ECMA-126	Ergonomics - Requirements for Colour Visual Display Devices (December 1987)	
ECMA-127	Remote Procedure Call (RPC) Using OSI, 2 <sup>nd</sup> Edition (June 1990)	
ECMA-129	Information Technology Equipment - Safety, Second Edition (April 1994)	IEC 950
ECMA-131	Referenced Data Transfer (July 1988)	
ECMA-132	Method for Measuring Printer Throughput, 2 <sup>nd</sup> Edition (June 1991)	ISO 10561
ECMA-134	Method for the Specification of Basic and Supplementary Services of Private Telecommunication Networks (April 1989)	ETS 300 387
ECMA-135	Scenarios for Interconnections Between Exchanges of Private Telecommunication Networks (April 1989)	
ECMA-136	Ergonomics - Requirements for Non-CRT Visual Display Units (June 1989)	
ECMA-137	Document Filing and Retrieval Application (December 1989)	ISO 10166
ECMA-138	Security in Open Systems - Data Elements and Service Definitions (December 1989)	
ECMA-140	Document Printing Application (DPA) (June 1990)	ISO/IEC 10175
ECMA-141	PTN - Inter-Exchange Signalling - Data Link Layer Protocol (PTN QSIG-L2), 2 <sup>nd</sup> Edition (June 1993)	I-ETS 300 170
ECMA-166	Information Technology Equipment - Routine Electrical Safety Testing in Production (June 1992)	EN 50116

ECMA-181	Uncertainty of Measurement as Applied to Type Approval of Products (December 1992)	
ECMA-187	ODA-API - Application Profile Interface for Handling Compound Documents (June 1993)	
ECMA-204	PTN - Inter-Exchange Signalling Protocol - Supplementary Service Interactions (QSIG-IA) (December 1993)	ETS 300 427
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)
- ECMA TR/54 A Management Framework for Private Telecommunication  
Networks (December 1990)

- ECMA TR/60 Supplementary Services and Additional Network Features  
in Private Telecommunication Networks (June 1992)
- ECMA TR/63 Alphabetical Reference Index to IEC 950, 3<sup>rd</sup> Edition  
(December 1995)
- 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)



## HISTORY OF ECMA

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

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

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

By December 1960 the form that the Association would take was fairly well defined and it had been decided that the headquarters should be in Geneva to be near the headquarters of the International Organization for Standardization and the International Electrotechnical Commission. In May 1961 the Association officially came into being and all those Companies which attended the original meeting became members. The constituent assembly was held on 17<sup>th</sup> 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.

## PAST PRESIDENTS / SECRETARY GENERAL

1961-1962

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

1963-1964

Prof. Dr. J. Engelfriet (EL)

1965-1966

Mr. M. R. Pedretti (IBM)

1967-1968

Dr. J. M. M. Pinkerton (ICL)

1969-1970

Mr. P. J. Davous (Bull)

1971-1972

Dr. K. Scheidhauer (AEG-Tfk)

1973-1974

Dr. J. M. M. Pinkerton (ICL)

1975

Mr. J. van Eijbergen (Philips)

1976-1977

Mr. W. Heimann (Siemens)

1978-1979

Mr. M. H. Johnson (Ferranti)

1980-1981

Mr. J. van Eijbergen (Philips)

1982-1983

Mr. H. Feissel (Cii HB)

1984-1985

Mr. J. Scherpenhuizen (Digital)



1986-1987

Mr. C. Rossetti (STET)

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1988-1989

Mr. J. Dubos (Bull)

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1990

Mr. J. van den Beld (Philips)

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1991-1992

Mr. G. Haberzettl (Siemens Nixdorf)

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1993-1994

Mr. W. Brodbeck (IBM)

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1995-1996

Mr. D. Gann (HP)

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1997-1998

Dr. P.A. Trudgett (BT)

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1999-2000

Mr. M. Bermange (Xerox)

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**Past Secretary General**

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1961-1991 Mr. Dara Hekimi