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Preface

Information and Communication Technology (ICT) and Consumer Electronics (CE) are key factors in today’s economic and social environment. Effective interchange of commercial, technical, and administrative data, with text, images and, increasingly, audiovisual information is vital for the growth of economy in the world markets. Through the increasing digitalization of media, automation of processes, and pervasive use of lightweight communicating devices (from notebooks to tablets to smart phones), information technology, telecommunications and consumer electronics are getting more and more integrated.

Standardization provides the means for economical solutions to complex technologies, and is required for data interchange and interoperability. Moreover, it is most effective when performed in a pre-competitive mode during product development and with all interested parties involved.

The Association - one of the oldest worldwide standard bodies active in the area of ICT and CE standardization - was founded more than 50 years ago, in May 1961, and was registered in Switzerland as a not-for-profit organization.

From 1961 until 1994, ECMA (European Computer Manufacturers Association), then Ecma International (Ecma, for short) has actively contributed to worldwide standardization of ICT. So far 411 high quality Ecma Standards and 106 Technical Reports (and their updates) have been published.

Standardization is a never ending story especially in the area of ICT and CE, bursting with innovation and new usages. There are always new technologies waiting for urgent standardization. Therefore, we are optimistic about the next decades of standardization in Ecma.

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 basis for International and European Standards. To ensure close co-operation Ecma has established formal liaisons with European and international standardization bodies.

The liaison with ISO and in particular the A-liaison with ISO/IEC JTC 1 (and its predecessor TC97), goes back to 1961. This fruitful co-operation led in 1987 to the acceptance of the Fast-Track procedure by ISO (and IEC) on a proposal by Ecma.

Ecma combines the agility of consortia with the quality of the de jure standardization organizations. By combining its efficient infrastructure and proven yet adaptive working methods with the well-established formal liaisons at International and European level, Ecma has established a strong position in the area of ICT and CE standardization.

Ecma Standards are developed by its members, which are highly qualified experts from information technology, consumer electronics and telecommunication industrial firms, from smaller companies, or from the academic or research community, with the commitment to provide, in a consensus mode, technical solutions ready for implementation in product development and testing.

The benefit of Ecma membership is the following:

- It provides early knowledge of technological trends and better understanding of technology standards requirements, especially in emerging technology areas.
- It provides a platform where technical contributions of member companies are evaluated by experts who via an effective process develop high quality Ecma Standards and Technical Reports in a very short time. In Ecma small working structures dominate, working is fast, consensus is usually easy to achieve.
- Also public reviews are made possible: the process is defined, but its use is not systematic (Technical Committees have a choice to use it for a given topic). In this way, it is possible to obtain input to and review of intermediate drafts either from the general public or from targeted organizations in liaison.
- Ecma adheres to WTO principles for standardization. For a given topic there needs to be a middle ground between speed and wider consensus. Ecma can do both. Ecma experience, like elsewhere, is that the wider the consensus, the more time it takes.
- Ecma is part of the larger standardization landscape. There is a choice to have an Ecma standard as final step or to propose it to another SDOs, e.g. to JTC 1 for fast-track.

The participation in Ecma of many worldwide leading companies ensures not only the acceptance of Ecma Standards in European and International standardization but also their worldwide implementation.

Our goal for the next decade is to continue to play a key role in the extraordinary development in IT, telecommunications and Consumer Electronics, via dissemination of new technologies, and by the delivery of first class standards to our members, partners and the standard user community. We aim to continue to bring in major contributions, to move technology from our members to mature standards and to collaborate with the world’s major SDOs.

The President, Geneva, January 2015.
Purpose and Membership

The Purpose of Ecma International 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 the fields of information and communications
  technologies.
- To encourage the correct use of standards by influencing the environment in which they are applied.
- To publish the Ecma Standards and Technical Reports - after their approval by at least two-thirds of all Ordinary
  Members - free of charge and freely copyable to all interested parties.

The Association shall consist of Company members (i.e., ordinary, associate, SME and SPC members), and not-for-profit
(NFP) members.

Ordinary membership may be applied for by a company which has interest and experience in matters related to one or more
Technical Committees of the Association, and which wishes to exert the right to vote at the Technical Committees and at the
General Assembly and to exert other exclusive rights defined in the By-laws and Rules.to vote at the General Assembly and
and to exert other exclusive rights defined in the By-laws and Rules.

All other membership classes have the right to vote on the Technical Committee level only.

Associate membership may be applied for by a company which has interest and experience in matters related to one or more
of the Technical Committees of the Association but without the right to vote in the General Assembly.

A company which has similar interests as an associate member and an annual, global turnover of less than one hundred
million Swiss Francs, may be admitted as SME member (Small and Medium-sized Enterprise).

An organization - a company or other legal for-profit organization - which has similar interests as an associate member, an
annual global turnover of less than five million Swiss Francs and no more than five employees, may be admitted as SPC
member (Small Private Company).

NFP membership may be applied for by a non-profit-making organization. If an NFP is an organization with several
organizations as members, then normally it can only become an NFP member in Ecma if its members do not qualify for
Company membership in Ecma. NFPs may only participate in the work of no more than one Ecma Technical Committee.

The Association is a non-profit-making organization and does not devote itself in any commercial activity.
Ecma's role in International Standardization

Ecma International has close working relations - such as liaisons, co-operation agreements, and memberships - with European and international standardization bodies as well as to some Fora and Consortia.

* SSO – Standard Setting Organization
+ ESOs – European Standardization Organizations
Organization of Ecma International*

* Often called Ecma short for Ecma International.
Management

President
Mr. K. Yamashita
(Hitachi)

Vice-President
Ms I. Valet-Harper
(Microsoft)

Treasurer
Dr. J. Friedrich
(IBM)

Secretariat

Secretary General
Dr. I. Sebestyen

Mr. P. Charollais  Mr. O. Elzinga  Mrs. I. Walch

Co-ordinating Committee

Chair

Members
Mr. C. Cargill (Adobe),
Mrs. R. Porath (Intel)
General Assembly

Adobe       Mr. C. Cargill
 alternate: Mr. P. Secor
AMD         Mr. W. Fry
Apple       Mr. E. Vangala
 alternate: Mr. D. Singer
Axa Rosenberg  Mr. E. Bezault
Canon       Mr. K. Inatomi
China IWNCOMM Ms Z. Li
eBay        Mr. C. Morningstar
 alternate: Mr. E. Toth
Facebook    Mr. J. Morrison
Fujitsu      Mr. S. Matsumura
 alternate: Mr. T. Igarashi
Google      Mr. W. Horwat
Hitachi     Mr. K. Yamashita
 alternate: Mr. S. Nomura
HP          Mr. J. Laurens
 alternate: Mrs. K. Higginbottom
IBM         Dr. J. Friedrich
Intel       Mrs. R. Porath
 alternate: Mr. P. Wennblom
JR East Mechatronics Mr. T. Minakata
Konica Minolta Mr. T. Nohnishi
 alternate: Mr. K. Tsutsumi
Meteor Development Mr. G. Schmidt
Microsoft    Ms I. Valet-Harper
 alternate: Mr. D. Welsh
Netflix      Mr. J. Husain
NXP         Mr. H. Dollee
OMRON       Mr. S. Mitamura
Ricoh       Mr. N. Yazaki
Sony        Mr. Y. Takayama
 alternate: Mr. K. Brookes
Swissaudec  Mr. C. Par
The Nippon Signal Mr. Y. Kusakabe
Toshiba     Mr. K. Hasebe
Trustwave   Mr. J. L. Podmolik
Xamarin     Mr. M. de Icaza
Yahoo       Mr. E. Ferraiuolo
Ordinary members

Adobe Systems Incorporated
345 Park Avenue
SAN JOSE, CA 95110-2704
USA

Advanced Micro Devices, Inc.
7171 Southwest Parkway
AUSTIN, TX 78735
USA

eBay, Inc.
2211 N. First Street
SAN JOSE, CA 95131
USA

Google Inc.
1600 Amphitheatre Parkway
MOUNTAIN VIEW, CA 94043
USA

Hewlett-Packard Company
10955 Tantau Avenue
Building 45
CUPERTINO, CA 95014
USA

Hitachi Ltd
Hitachi Ohmori 2nd Bldg.
6-27 18 Minami-Oi, Shinagawa-ku
TOKYO 140
Japan

IBM Europe
Avenue de Cortenbergh 116
B-1000 BRUSSELS
Belgium

Intel, Europe, Middle East & Africa
Pipers Way
SWINDON SN3 1RJ
United Kingdom

Konica Minolta Holdings, Inc.
1-6-1 Marunouchi
Chiyoda-ku
TOKYO 100-0005
Japan

Microsoft Corporation
One Microsoft Way
REDMOND, WA 98052
USA

Trustwave
70 W Madison St.
Suite 1050
CHICAGO, IL 60602
USA

Yahoo, Inc.
701 First Avenue
SUNNYVALE, CA 94089
USA
# Associate members

<table>
<thead>
<tr>
<th>Company</th>
<th>Address</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple Computer, Inc.</td>
<td>1 Infinite Loop CUPERTINO, CA 95014 USA</td>
<td>USA</td>
</tr>
<tr>
<td>Canon Inc.</td>
<td>30-2, Shimomaruko 3-chome Ohta-ku TOKYO 146-8501 Japan</td>
<td>Japan</td>
</tr>
<tr>
<td>Facebook, Inc.</td>
<td>1601 Willow Rd MENLO PARK, CA 94025 USA</td>
<td>USA</td>
</tr>
<tr>
<td>Fujitsu Ltd</td>
<td>4-1-1 Kamikodanaka Nakahara-ku KAWASAKI 211-8588 Japan</td>
<td>Japan</td>
</tr>
<tr>
<td>JR East Mechatronics Co., Ltd</td>
<td>Shinjuku Maynds Tower 22F 2-1-1 Yoyogi Shibuya-Ku TOKYO 151-0053 Japan</td>
<td>Japan</td>
</tr>
<tr>
<td>Netflix</td>
<td>2095 Jackson St SAN FRANCISCO, CA 94109 USA</td>
<td>USA</td>
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<tr>
<td>NXP B.V.</td>
<td>High Tech Campus 46 NL-5656 AG EINDHOVEN The Netherlands</td>
<td>The Netherlands</td>
</tr>
<tr>
<td>OMRON Social Solutions Co., Ltd.</td>
<td>Shinagawa Front Building 7F 2-3-13 Konan, Minato-ku TOKYO 108-0075 Japan</td>
<td>Japan</td>
</tr>
<tr>
<td>Ricoh Company Ltd</td>
<td>3-2-3, Shin-yokohama Kohoku-ku YOKOHAMA 222-8530 Japan</td>
<td>Japan</td>
</tr>
<tr>
<td>Sony Europe GmbH</td>
<td>Kemperplatz 1 D-10785 BERLIN Germany</td>
<td>Germany</td>
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<tr>
<td>The Nippon Signal Co., Ltd</td>
<td>1-5-1, Marunouchi Chiyoda-ku TOKYO 100-6513 Japan</td>
<td>Japan</td>
</tr>
<tr>
<td>Toshiba Corporation</td>
<td>1-1 Shibaura 1 Chome Minato-ku TOKYO 105-8001 Japan</td>
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### SME members

<table>
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<th>AXA Rosenberg</th>
<th>Swissaudec Sàrl</th>
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<tr>
<td>4 Orinda Way, Bldg E</td>
<td>c/o Fidacor Sàrl</td>
</tr>
<tr>
<td>ORINDA, CA 94563</td>
<td>Av. de la Gottaz 30</td>
</tr>
<tr>
<td>USA</td>
<td>CH-1110 MORGES</td>
</tr>
<tr>
<td>China IWNCOMM Co., Ltd.</td>
<td>Switzerland</td>
</tr>
<tr>
<td>A201,QinFeng Ge,</td>
<td></td>
</tr>
<tr>
<td>Xi'an Software Park</td>
<td></td>
</tr>
<tr>
<td>No. 68 Keji 2nd Road</td>
<td></td>
</tr>
<tr>
<td>Xi'an Hi-Tech Industrial Dev. Zone</td>
<td></td>
</tr>
<tr>
<td>Xi'AN CITY, Shaanxi Province 710075</td>
<td></td>
</tr>
<tr>
<td>China</td>
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<table>
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<th>Meteor Development Group</th>
<th>Xamarin, Inc</th>
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<tr>
<td>140 10th St.</td>
<td>2 Park Plaza</td>
</tr>
<tr>
<td>SAN FRANCISCO, CA 94103</td>
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</tr>
<tr>
<td>USA</td>
<td>BOSTON, MA 02116</td>
</tr>
<tr>
<td></td>
<td>USA</td>
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</table>
SPC members

Knowledge Initiatives
158 Camino Sobrante
ORINDA, CA 94563
USA

New Audio Technology GmbH
Warnholtzstr. 4
D-22767 HAMBURG
Germany

Nomad3D
Pépinière d'Entreprises Nice Côte d'Azur
Parc d'activités Nice la Plaine 1
Immeuble F4
Avenue Emmanuel Pontremoli
F-06200 NICE
France

QUADRAC Co., Ltd.
406 Luke, 1-2-20 Meguro
Meguro-ku
TOKYO 152-0063
Japan
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<tr>
<th>Aarhus University</th>
<th>Imperial College London</th>
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<td>Huxley Building</td>
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<tr>
<td>DK-8200 AARHUS</td>
<td>South Kensington Campus</td>
</tr>
<tr>
<td>Denmark</td>
<td>LONDON, SW7 2RH</td>
</tr>
<tr>
<td>Archive Disc Test Center – NPO Entity</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>c/o Bifrost Inc.</td>
<td>Indiana University</td>
</tr>
<tr>
<td>Inaoka Kudan Bldg, 6th floor</td>
<td>107 S Indiana Ave</td>
</tr>
<tr>
<td>Chiyoda-ku</td>
<td>BLOOMINGTON, IN 47405</td>
</tr>
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<td>Dr. G.R. Damodaran College of Science</td>
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<tr>
<td>Civil Aerodrome Post</td>
<td>NEW DELHI 110016</td>
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<td>COIMBATORE 641014</td>
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<tr>
<td>Ecole Polytechnique Fédérale de Lausanne (EPFL)</td>
<td>Inria</td>
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<tr>
<td>Station 11</td>
<td>Zirst / 655, avenue de l’Europe</td>
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<tr>
<td>CH-1015 LAUSANNE</td>
<td>F-38330 MONTBONNOT SAINT-MARTIN</td>
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<tr>
<td>Switzerland</td>
<td>Institute for InfoComm Research</td>
</tr>
<tr>
<td>ETH Zürich</td>
<td>21 Heng Mui Keng Terrace</td>
</tr>
<tr>
<td>ETH Zentrum</td>
<td>SINGAPORE 119613</td>
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<tr>
<td>Clausiusstr. 59</td>
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<tr>
<td>CH-8092 ZÜRICH</td>
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<td>France Télévisions</td>
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<tr>
<td>Bat. C</td>
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<tr>
<td>23 rue Leblanc</td>
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<td>F-75015 PARIS</td>
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</tr>
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<td>505 10th Street</td>
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<tr>
<td>ATLANTA, GA 30332-0415</td>
<td>CHRISTCHURCH 8042</td>
</tr>
<tr>
<td>USA</td>
<td>New Zealand</td>
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<tr>
<td>Hosei University</td>
<td>Lawrence Berkeley National Laboratory (LBNL)</td>
</tr>
<tr>
<td>3-7-2, kajinocho</td>
<td>1 Cyclotron Road</td>
</tr>
<tr>
<td>Koganei-shi</td>
<td>Mail Stop 90R4000</td>
</tr>
<tr>
<td>TOKYO 184-0002</td>
<td>BERKELEY, CA 94720</td>
</tr>
<tr>
<td>Japan</td>
<td>USA</td>
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<tr>
<td>Humanitarian Toolbox</td>
<td>McGill University</td>
</tr>
<tr>
<td>P.O. Box 212</td>
<td>845 Sherbrooke St. W.</td>
</tr>
<tr>
<td>MEDINA WA 98039</td>
<td>MONTREAL H3A 0G4</td>
</tr>
<tr>
<td>USA</td>
<td>Canada</td>
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<tr>
<td>Interuniversitair Micro-Electronica Centrum vzw (IMEC)</td>
<td>Mozilla Foundation</td>
</tr>
<tr>
<td>Kapeldreef 75</td>
<td>543 Howard Street, 5th Floor</td>
</tr>
<tr>
<td>B-3001 LEUVEN</td>
<td>SAN FRANCISCO, CA 94105</td>
</tr>
<tr>
<td>Belgium</td>
<td>USA</td>
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<tr>
<td>iMinds</td>
<td>Northeastern University</td>
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<tr>
<td>Gaston Crommenlaan 8/201</td>
<td>College of Computer and Information Science</td>
</tr>
<tr>
<td>B-9050 GENT</td>
<td>360 Huntington Avenue</td>
</tr>
<tr>
<td>Belgium</td>
<td>MS: WVH 202</td>
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## Technical Committees

### Active Committees

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<tr>
<td>Product Safety</td>
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<tr>
<td>Electromagnetic Compatibility and Electromagnetic Fields (EMC &amp; EMF)</td>
<td>TC20</td>
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<tr>
<td>Acoustics</td>
<td>TC26</td>
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<tr>
<td>Optical Disks and Disk Cartridges</td>
<td>TC31</td>
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<td>Multimedia Coding and Communications</td>
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<td>Universal 3D (U3D)</td>
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<td>Office Open XML Formats</td>
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<td>Open XML Paper Specification (OpenXPS®)</td>
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<td>High Rate Wireless Communications</td>
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<td>Programming Languages</td>
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<td>Close Proximity Electric Induction Data Transfer</td>
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<td>Access Systems</td>
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<th>Committees having accomplished their task</th>
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<td>Codes (Coded Character Sets)</td>
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TC12 – Product Safety

Scope:
To consider national and international safety regulations to establish 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 develop principles and guidance to identify safeguards.
5. To investigate functional safety aspects.
6. TC20 handles EMF, which is a safety subject, because of their electromagnetic expertise.
7. To assume responsibility for the maintenance of Ecma Standards prepared by TC12.
8. To establish and maintain liaison with other standards organizations in order to present Ecma proposals to them and to make comments on their proposals.

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TC20 – Electromagnetic Compatibility and Electromagnetic Fields (EMC and EMF)

Scope:
Electromagnetic Compatibility and Electromagnetic Fields related to ICT and CE equipment.

Programme of work:
1. To survey Electromagnetic Compatibility (EMC) and Electromagnetic Field (EMF) standards of ICT & CE equipment.
2. To establish measurement methods and limits for the electromagnetic emission and immunity of Information Communication Technology (ICT) & Consumer Electronics (CE) equipment.
3. To establish assessment methods and limits for electromagnetic fields from ICT & CE equipment to prevent excessive human exposure.
4. To maintain Ecma Standards and Technical Reports prepared by TC20.
5. To maintain liaison with other standards organizations dealing with EMC and EMF, to comment on their proposals and to present Ecma proposals.

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TC26 – Acoustics

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

Programme of work:
1. To categorize the acoustical environments in which information technology equipment is required to work.
2. To survey the various recommendations and requirements for the acoustical environments of these areas.
3. To make recommendations for standard methods of measuring and specifying the noise output of equipment, taking into account the work of ISO/TC43.
4. To consider any special requirements that may arise during non-standard operation, e.g. servicing.
5. To consider what information should be supplied by the manufacturer to facilitate optimum installation and to make recommendations.
6. To follow developments affecting acoustical environment in places of work.
7. To assume responsibility for the maintenance of Ecma Standards prepared by TC26.
8. To maintain liaison with other standards organizations in order to present Ecma proposals to them and to make comments on their proposals.

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TC26-TG1 – Noise and Vibration Measurement of Small Air-Moving Devices

Scope:

- To develop and maintain standard(s) and technical report(s) for the noise and vibration measurement and analysis of small air-moving devices (AMDs) used for cooling information technology and telecommunications equipment (ITTE);
- To investigate noise and vibration issues of small AMDs used in the cooling of ITTE, and to propose recommended technical solutions.

Programme of work:

1. To maintain ECMA-275 (including investigation of ISO counterparts, ISO 10302 Parts 1 and 2).
2. To monitor technological developments and issues of noise and vibration from small AMDs and other related technologies for efficient cooling of ITTE.
3. To develop recommendations, e.g. standards, for small AMD noise and vibration issues.

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TC31 – Information Storage

Scope:
To identify and develop the minimum number of standards necessary for data interchange and/or storage by means of digitally recorded systems, e.g. optical, magnetic and holographic systems (such as disks, cartridges,…), and standards necessary for determining the life expectancy of such media.

To study existing Ecma and ISO/IEC labeling / volume and file structure standards and, where necessary, initiate and pursue the development of volume and file structure standards.

Programme of work:
1. To develop standards for optical disks and disk cartridges of 60 mm, 80 mm, 90 mm, 120 mm, 130 mm, 300 mm and 356 mm.
2. To develop standards on methods for determining the life expectancy of optical storage media.
3. To assume responsibility for the maintenance of Ecma Standards prepared by TC31.
4. To monitor technological developments in the field of optical disks and disk cartridges.
5. To maintain liaison with other standards organizations in order to present Ecma proposals to them and to make comments to their proposals.

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TC31-TG2 – Holographic Information Storage

Scope:
To maintain an overall view and strategy for standardization in the field of holographic information storage systems, and to identify and develop Standards, Technical Reports and Guidelines in this field. To monitor and pursue standardization at a global level with regard to ISO/IEC JTC 1 and the international standardization community in general, including but not limited to the AV/IT and computer interfaces community.

Programme of work:
1. To develop standards for media recorded by holographic means.
   This includes but is not limited to:
   • the recording format;
   • the minimum number of parameters, test methods and reference materials necessary to ensure interchangeability of recorded media;
   • protective cases/cartridges/coverings with recording/reproduction devices and equipment.
2. To develop standards on methods for determining the life expectancy of holographic storage media.
3. To assume responsibility for the maintenance of Ecma Standards prepared by TC31-TG2.
4. To monitor technological developments in the field of holographic media.
5. To maintain liaison with other standards organizations in order to present Ecma proposals to them and to make comments to their proposals.

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TC32 – Multimedia Coding and Communications

Scope:
To maintain an overall view and strategy for standardization and to prepare and maintain Ecma Standards and Technical Reports required in the field of multimedia coding and communications, including transmission.

To monitor, coordinate and pursue standardization at a global level with regard to ISO/IEC JTC 1, including its SC06 and SC29, and the international standardization world in general.

To work together with ETSI within the framework for standardization under the terms of the Co-operation Agreement between ETSI and Ecma, for publication of European standards and technical reports.

To promote unified international standards.

General items addressed by standards and technical reports are architecture, service, protocol, interface, compatibility, management and applications aspects.

The field of communications includes:
- Computer Supported Telecommunications Applications (CSTA).
- Architecture, service and protocol aspects of narrowband and broadband Private Integrated Services Networks (PISNs).
- IP-based multimedia communications in a business environment, including interoperability of narrowband and broadband PISNs with IP networks.
- Personal Networks and their federations.

In scope are also energy efficient solutions for coding and transmission of 3D audio content, including, but not limited to:
- Spatial Audio.

Further subjects for standardization are:
- Test sequences and methods for quality assessment of multimedia output.

Programme of work:
1. To address requirements and strategic plans for standardization in the scope, and to align, harmonize and as far as possible remain compatible with standards for multimedia coding and communications as well as standards in related fields.
2. 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.
3. 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 JTC 1, ETSI and other standardization organizations as appropriate.
4. To maintain liaisons with other Ecma TCs working in related fields
5. To maintain liaison with, monitor and contribute to the work of ISO/IEC JTC 1, ITU-T, ETSI, IETF, and other international, regional and national standards organizations and consortia, to present Ecma proposals and to comment on their proposals.

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TC32-TG11 – Computer Supported Telecommunications Applications (CSTA)

Scope:
Develop and refine the Computer Supported Telecommunications (CSTA) standard.
CSTA specifies an Applications Interface and Protocols for monitoring and controlling calls and devices in a communications network.

These calls and devices may support various media and can reside in various network environments such as IP, Switched Circuit Networks and mobile networks. CSTA however, abstracts various details of underlying signalling protocols (e.g. SIP/H.323) and networks for the applications.

Programme of work:
1. To study aspects of CSTA, with special focus to:
   - improve CSTA and SIP interoperability;
   - improve CSTA and Web interoperability (leverage CSTA XML usage with e.g. WSDL/UDDI);
   - provide conferencing enhancements for collaboration applications;
   - provide finer grained media control;
   - improve support for non-voice media.
2. To produce Technical Reports illustrating how CSTA fits into various environments such as in call/contact centres, voice-browser and Internet environments.
3. To produce Standards specifying the services, functional entities and protocols required enabling CSTA operation in a variety of environments.
4. To liaise with organizations studying similar topics including groups working within ITU-T and ISO/IEC JTC 1/SC 6, IETF, W3C and ETSI, to promote unified international standards.

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TC32-TG14 – Private Integrated Services / Corporate Networks - Services and Signalling

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

Programme of work:
1. To develop service Standards and interface protocol signalling Standards for the connection of terminal equipment 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 (i.e. QSIG/PSS1), 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).
4. To develop Standards for the service description, information flows and signalling protocols 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 developments).
7. To maintain existing standards for broadband private networks (B-PISN).
8. To maintain existing standards for architectural, naming numbering and addressing aspects of narrowband and broadband PISNs/CNs.

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TC32-TG17 – IP-based Multimedia Business 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 IP-based interoperation of corporate networks with other networks.
5. To promote a worldwide unique set of standards for IP-related multimedia communication in a business environment.
7. To monitor, and contribute to, related work in other bodies.

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Scope:
To develop Standards and Technical Reports for a digital spatial audio system which uses Inverse Coding to achieve highly efficient coding of localization and ambiance information.

Programme of work:
1. To develop and maintain Standards/Technical Reports for an Inverse Coding based audio system covering:
   - Requirements on data formats and preprocessing of the audio source
   - Overall S5 architecture
   - Coding format of Inverse Coding parameter data
   - Recommendations/References regarding Base audio encoders
   - Multiplexing of base audio stream and Inverse Coding parameter data
     a) External multiplexing
     b) Internal multiplexing by embedding Inverse Coding parameter data in audio stream
2. To develop and maintain Standards/Technical Reports on binaural rendering with Head Related Transfer Functions (HRTF).
3. To develop and maintain Standards/Technical Reports on highly efficient/low power binaural rendering with Head Related Transfer Functions (HRTF).
4. To develop and maintain Standards/Technical Reports on conformance testing tools for implementations.
5. To develop and maintain Standards/Technical Reports on quality testing tools for implementations.
6. To cooperate and liaise with Ecma TCs and external organizations and standardization bodies working in related technical fields (e.g. ISO/IEC JTC 1/SC 29/WG 11 (MPEG)).

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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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TC38-TG1 – Chemical Emissions

Scope:
Chemical Emissions.

Programme of work:
1. To survey existing national and international standards and recommendations.
2. To monitor regulatory developments.
3. To standardize and harmonise methods to determine the chemical emissions.
4. To maintain its published work.
5. To liaise with relevant standards organizations.

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TC38-TG2 – Energy Efficiency

Scope:
Energy Consumption.

Programme of work:
1. To survey national and international standards, specifications and recommendations.
2. To survey energy consumption drivers (regulatory, NGO, industry, eco label etc).
3. To determine a definition of "energy consumption".
4. To determine how to measure energy consumption in a manner that allows comparisons of like products.
5. To maintain its published work.
6. To liaise with organizations dealing with energy efficiency / consumption.

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TC38-TG3 – Environmental Declarations

Scope:
Environmental Declarations

Programme of work:
1. To survey existing national and international standards and recommendations.
2. To monitor regulatory developments.
3. To standardize and harmonise environmental declarations.
4. To maintain its published work.
5. To liaise with relevant standards organizations.

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TC38-TG4 – Proxying Support for Sleep Modes

Scope:
Network proxying of ICT devices to reduce energy consumption

Programme of work:
1. To develop Standards and Technical Reports for network proxying; a proxy is an entity that maintains network presence for a sleeping higher-power ICT device.
2. To specify:
   • the protocols that network proxies must handle to maintain connectivity while hosts are asleep;
   • the proxy behaviour including ignoring packets, generating packets and waking up host systems; and
   • the definition of messages exchanged between hosts and proxies.
3. To maintain their published work; and
4. To liaise and co-operate with other standards organizations.

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TC38-TG5 – Environmental Conscious Design

Scope:
Environmental Conscious Design (ECD) for ICT & CE products and systems

Programme of work:
1. To survey existing national and international standards e.g. IEC 62430 and 62075.
2. To monitor regulatory developments.
3. To standardize procedures for ECD.
4. To maintain its published work, e.g. ECMA-341.
5. To liaise with relevant standards organizations including IEC TC 100, 108 and 111.

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**Scope:**
Business Video Conferencing (BVC) is a video conference with multi-locations, by interconnecting multi-vendor’s and multi-system-range (from legacy to latest) video conference systems efficiently to promote use of video conferencing on business.

This BVC aims to promote use of video conference systems, and eventually to contribute reduction of CO2 emitted by transport systems.

**Programme of work:**
The goal of this TC38-TG7 is to develop specifications for the BVC. The TG7 will discuss to:
1. determine end-user’s requirements for promoting video conferencing;
2. determine BVC architecture to realize the end-user’s requirements;
3. determine specifications for implementing the BVC architecture;
4. and report items to be standardized (International Standards).

NOTE: Specifications produced by the TG7 will be reviewed from the point of view of (a) qualifying and quantifying the environmental impacts and effects and (b) harmonizing with relevant SDO’s standards.

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TC39 – ECMAScript®

Scope:
Standardization of the general purpose, cross platform, vendor-neutral programing language ECMAScript. This includes the language syntax, semantics, and libraries and complementary technologies that support the language.

Programme of work:
1. To maintain and update the standard for the ECMAScript programming language.
2. To identify, develop and maintain standards for libraries that extend the capabilities of ECMAScript.
3. To develop test suites that may be used to verify correct implementation of these standards.
4. To contribute selected standards to ISO/IEC JTC 1.
5. To evaluate and consider proposals for complementary or additional technologies.

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ECMA-Script® is the registered trademark of Ecma International.
TC43 – Universal 3D (U3D)

Scope:
To facilitate the reuse of 3D CAD data by developing global 3D standards intended for downstream 3D visualization applications.

Programme of work:
1. To standardize a Universal 3D extensible file format and infrastructure focused on the repurposing of 3D CAD data for non-engineering and non-design applications, e.g. training and visualization applications. Notable U3D features include binary encoding, domain-specific compression, continuous level of detail, progressive data representation, animation support, and extensibility to address evolving market needs.
2. To develop a usage and implementation strategy guide for users of U3D to be published as an Ecma Technical Report (TR).
3. To contribute the Ecma U3D standards to ISO/IEC JTC 1 for approval and adoption by ISO and IEC.
4. To establish and maintain liaison with other standards organizations in order to present Ecma U3D proposals to them and to make comments on their proposals.
5. Upon completion of items 1 - 3, to investigate the future direction of 3D standards, and to evaluate and consider proposals for complementary or additional technology, e.g. support for advanced physics based lighting and rendering applications.
6. To assume responsibility for the maintenance of Ecma Standards prepared by TC43.

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TC45 – Office Open XML Formats

Scope:
The goal of the Technical Committee is to produce a formal standard for office productivity applications within the Ecma International standards process which is fully compatible with the Office Open XML Formats. The aim is to enable the implementation of the Office Open XML Formats by a wide set of tools and platforms in order to foster interoperability across office productivity applications and with line-of-business systems. The Technical Committee will also be responsible for the ongoing maintenance and evolution of the standard.

Programme of work:
1. To produce a formal Standard for office productivity documents which is fully compatible with the Office Open XML Formats.
   This includes:
   a) Produce a standard which is fully compatible with the Office Open XML Formats, including full and comprehensive documentation of those formats in the style of an international standard, with particular attention given to enabling the implementation of the Office Open XML Formats by a wide set of tools and platforms in order to foster interoperability across office productivity applications and with line-of-business systems.
   b) Produce a comprehensive set of W3C XML Schemas for the Office Open XML Formats, with particular attention given to self documentation of the schemas and testing of the XSDs for validation using a wide variety of XSD tools of the market and cross platform.
2. To contribute the Ecma Office Open XML Formats standards to ISO/IEC JTC 1 for approval and adoption by ISO and IEC.

Upon completion of the Previous Items, the role of the Technical Committee will be:
3. To assume responsibility for maintaining the Ecma Office Open XML standard.
4. To evaluate and consider proposals for complementary or additional technology.
5. To assume responsibility for the evolution of the Ecma standard while ensuring backward compatibility with the previous versions to guarantee continuity in the use of the current and future formats.
6. To establish and maintain liaison with other Ecma Tcs and with other Standards Development Organizations (SDOs) as appropriate to facilitate and promulgate the work of the TC.

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TC46 – Open XML Paper Specification (OpenXPS®)

Scope:
The goal of the Technical Committee is to produce a formal standard for an XML-based electronic paper format and XML-based page description language which is consistent with existing implementations of the format called the Open XML Paper Specification (OpenXPS). The Technical Committee will use the format called the Open XML Paper Specification (OpenXPS) as a starting point with the aim to provide a standard, secure, and highly trustworthy format that enables a wide set of applications, devices, tools and platforms to implement compatible paginated-document workflows. An additional goal will be to enable the interoperability of independently created software and hardware systems that produce, consume or otherwise process XPS content. The Technical Committee will be responsible for the ongoing maintenance and evolution of the standard.

Programme of work:
1. Produce a formal standard for an XML-based electronic paper format and XML-based page description language which is consistent with existing implementations of the format called the Open XML Paper Specification, including:
   • Produce a fully documented and unambiguous standard for an XML-based electronic paper format and page description language;
   • Produce appropriate W3C XML Schemas to enable automatic verification of files written to the standard;
   • Enable interoperability between existing industry implementations of applications, devices, tools and platforms.
2. Assume responsibility for the ongoing maintenance and evolution of this Ecma International standard.
3. Support backwards compatibility with implementations targeted to prior versions of the standard.
4. Evaluate and consider proposal for complementary or related additional technologies.
5. Establish and maintain liaison with other Ecma TCs and with other Standards Setting Organizations (SSOs) as appropriate to facilitate and promulgate the work of the TC.
6. Evaluate and consider contributing the Ecma standard to an ISO and/or IEC TC for approval and adoption.

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OpenXPS® is the registered trademark of Ecma International.
TC47 – Near Field Communications

Scope:
To develop Standards and Technical Reports for Near Field Communication Systems, for the realization of simple wireless communication between close coupled devices for network products and consumer equipment.

Programme of work:
1. To develop and maintain Standards and Technical Reports for Near Field Communication.
2. To cooperate and liaise with other organizations and standardization bodies, where appropriate, in particular with ISO/IEC JTC 1, to achieve and promote a unique worldwide set of standards in the area of Near Field Communication Systems.
3. To monitor NFC technology developments and to promote and support its use in suitable application areas.

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TC48 – High Rate Wireless Communications

Scope:
To develop Standards and Technical Reports for high rate wireless communications.

Programme of work:
1. To develop and maintain Standards and Technical Reports for high rate wireless communication systems, for the following subjects:
   - Physical Layer (RF and Baseband);
   - MAC layer (Media Access Control);
   - PHY-MAC interface;
   - protocol and rules for coexistence with other wireless technologies.
2. To cooperate and liaise with other organizations and standardization bodies.

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TC48-TG1 – TV White Spaces

Scope:
Wireless communications using Television White Spaces (TVWS).

Programme of work:
1. To develop and maintain Standards and Technical Reports for TVWS wireless communication systems, including:
   - Physical Layer (RF and Baseband);
   - MAC layer (Media Access Control);
   - Protocol and mechanisms for coexistence.
2. To cooperate and liaise with other organizations and standardization bodies.

Officers:

Convenor
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Members
Mr. Seungil Yoon (GTRC)
TC49 – Programming Languages

Scope:
To standardize:
• the programming language C# (C "sharp");
• the programming language Eiffel;
• a Common Language Infrastructure (CLI);
• a CLI binding for C++;
• additional programming languages with cross-language bindings;
• additional vendor-neutral, cross-language programming platforms.

Programme of work:
1. To develop a standard for the programming language C# (pronounced C "sharp").
2. To develop a standard for the Common Language Infrastructure (CLI).
3. To develop a standard for the programming language Eiffel.
4. To develop a standard set of language extensions to provide a CLI binding for C++.
5. To contribute the standards to ISO/IEC JTC 1.
6. To investigate the further direction of standards developed by TC49.
7. To evaluate and consider proposals for complementary or additional technology.
8. To maintain liaison with appropriate other Ecma TCs and TGs and with ISO/IEC JTC 1/SC 22.

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TC49-TG2 – C#

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 Organizations (SDOs) as appropriate to facilitate and promulgate the work of the TG.

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TC49-TG3 – Common Language Infrastructure

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 Organizations (SDOs) as appropriate to facilitate and promulgate the work of the TG.

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TC49-TG4 – EIFFEL Language

Scope:
To standardize the syntax and semantics of a modern, component-based, general purpose, object oriented, and type-safe programming language called Eiffel.

Programme of work:
1. Develop Eiffel language standards.
2. Upon completion of item 1, to investigate the future direction of Eiffel language 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 Organizations (SDOs) as appropriate to facilitate and promulgate the work of the TG.

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TC50 – Close Proximity Electric Induction Data Transfer

Scope:
High-Speed Close Proximity Wireless Communications using Longitudinal Electric Induction Coupling.

Programme of work:
1. To develop and maintain Standards and Technical Reports for the wireless data interface between devices, including physical and link layers using the unique properties of the electric induction coupling principle. Basic technology will be optimized for one-to-one, point-to-point topology for close proximity bi-directional data transfer between two active devices.
2. To cooperate and liaise with other organizations and standardization bodies.

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TC51 – Access Systems

Scope:
- Access System specifies a common language, modular architecture template, interfaces and protocols for the interoperability between (distributed) modules and sub-systems for access to assets.
- Such assets may be physical such as buildings, transport means, care centres, computers or digitized assets and services e.g. health care.
- The Access System specification is a generic template for existing and new systems that provide access to specific assets.

Programme of work:
1. To develop and maintain Technical Reports and standards for interoperability between modules and sub-systems for access systems.
2. To monitor related standardization activities to avoid duplication, to promote synergies and to promote complementary efforts via internal and external liaisons with - and contribute to - the work of international SDOs.

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TC52 – Dart

Scope:
To standardize the syntax and semantics of a modern, object oriented programming language called Dart as well as standardizing core libraries and complementary technologies that support the language. This work should not use patents or if so then only royalty free patents. To aid in achieving that objective, this TC will use an experimental TC52 RF patent policy similar that has been developed for use by TC39.

Programme of work:
1. To Develop Dart language standards and standards for libraries that extend the capabilities of Dart.
2. Upon completion of item 1, to investigate the future direction of Dart language standards, and to evaluate and consider proposals for complementary or additional technology.
3. To develop test suites that may be used to verify the correct implementation of these standards.
4. To establish and maintain liaison with other Ecma TCs and with other Standards Development Organizations (SDOs) as appropriate to facilitate and promulgate the work of the TG.

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Ecma Standards and corresponding International and European Standards

In the third column of the table below you can find:

- the ISO/IEC equivalent to the Ecma Standard which can be downloaded as freely available standard from [ISO/IEC](https://www.iso.org)
- the ETSI equivalent to the Ecma Standard which can be downloaded as limitedly freely available publication from [ETSI](https://www.etsi.org)

**Legend:**

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The ETSI TS and TR are approved by the parent technical committee. The others deliverables are approved by the ETSI community. For more detailed information on ETSI deliverables, see the [ETSI directives](https://www.etsi.org).
## Ecma Standards in force (electronically available here)

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ECMA-230  Portable Common Tool Environment (PCTE) - IDL Binding (Interface Definition Language), 2nd edition (December 1997)  
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ECMA-235  The ECMA GSS-API Mechanism (March 1996)

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ECMA-239  Data Interchange on 90 mm Optical Disk Cartridges - HS-1 Format - Capacity: 650 Megabytes per Cartridge (June 1996)  
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ECMA-240  Data Interchange on 120 mm Optical Disk Cartridges using Phase Change PD Format - Capacity: 650 Mbytes per Cartridge (June 1996)  
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ECMA-244  Private Integrated Services Network (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-PTNX Connections (Mapping-UUS), 2nd edition (September 2000)  
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ECMA-258  Data Interchange on 12.7 mm 128-Track Magnetic Tape Cartridges - DLT 3-XT Format (June 1997)  ISO/IEC 15895
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ECMA-260  Data Interchange on 356 mm Optical Disk Cartridges - WORM, using Phase Change Technology Capacity: 14,8 and 25 Gbytes per Cartridge (June 1997)  ISO/IEC 15898
ECMA-261  Broadband Private Integrated Services Network (B-PISN) - Service Description - Broadband Connection Oriented Bearer Services (B-BCSD) (June 1997)  ISO/IEC 15899
ECMA-263  Private Integrated Services Network (PISN) - Specification, Functional Model and Information Flows - Call Priority Interruption and Call Priority Interruption Protection Supplementary Services (CPI(P)SD), 3rd edition (December 2001)  ISO/IEC 15991
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ECMA-393  ProxZzy® for sleeping hosts, 2nd edition (June 2012)  ISO/IEC 16317
ECMA-394  Recordable Compact Disc Systems CD-R Multi-Speed (December 2010)
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ECMA-400  Smart Data Centre Resource Monitoring and Control, 2nd edition (June 2013)  ISO/IEC 19395
ECMA-401  Close Capacitive Coupling Communication Physical Layer (CCCC PHY) (December 2011)  ISO/IEC 17982
ECMA-402  ECMAScript® Internationalization API Specification (December 2012)
ECMA-403  NFCIP-2 Test Methods (June 2013)  ISO/IEC 19369
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### Technical Reports in force (electronically available here)

| ECMA TR/18 | The Meaning of Conformance to Standards | (September 1983) |
| 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/53 | Handling of Bi-directional Texts, 2<sup>nd</sup> edition | (June 1992) |
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| 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) |
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Ecma By-laws

Art. 1
Constitution and Head Office

1.1 Ecma International - further called Ecma - is an international industry association based in Europe, and 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 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 the fields of information and communications technologies and to publish them free of charge in printed and electronic form.

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 Ecma members:

a) Companies
   - ordinary members
   - associate members
   - SME members (Small and Medium sized Enterprises)
   - SPC members (Small Private Companies)

b) NFPs (Not-For-Profit organizations)

Any other class of members shall be determined by the General Assembly with a two thirds majority of all ordinary members.

3.2 a) For non-SPC members:
    A proposed company member shall not be accepted if it holds at least 50 per cent of the capital of an existing company member nor if at least 50 per cent of its capital is held by an existing company member.

b) For SPC members:
    A proposed SPC member shall not be accepted if it holds at least 50 per cent of the capital of an existing company member nor if at least 35 per cent of its capital is held by an existing company member.

3.3 a) For non-SPC members:
    No two or more companies where at least 50 per cent of whose capital is held by the same company, which is not a company member itself, may be company members but shall be represented by one of these companies only.

b) For SPC members:
    No two or more SPCs where at least 35 per cent of whose capital is held by the same company, which is not a company member itself, may be SPC members but shall be represented by one of these SPCs only.

3.4 Additional classes of Ecma 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 by the General Assembly with a two thirds majority of all the ordinary members.

3.5 Companies shall be admitted to any class of company membership in accordance with Art. 4.

3.6 Membership fees for all classes of company membership are decided by the General Assembly with a two thirds majority of all ordinary members.

3.7 Ecma membership shall be terminated in the cases set out in Art. 5.
3.8 Ordinary members

3.8.1 Ordinary membership may be applied for by a company which has interest and experience in matters related to one or more Technical Committees of the Association, and which wishes to exert the right to vote at the General Assembly and to exert other exclusive rights defined in the By-laws and Rules.

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

Voting rights may be exerted with effect from the first full month upon admission as Ecma member.

3.9 Associate members

3.9.1 Associate membership may be applied for by a company which has interest and experience in matters related to one or more of the Technical Committees of the Association but without the right to vote in the General Assembly.

3.9.2 An associate member is fully entitled to participate in the work of the Technical Committees and obtain all relevant papers.

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

3.10 SME Members

3.10.1 SME membership may be applied for by a company the annual turnover of which is less than Swiss Francs 100'000'000.-

3.10.2 The rights of SME members are identical with those of associate members as specified in Art. 3.9.

3.11 SPC members

3.11.1 SPC membership may be applied for by an organization - a company or other legal for-profit organization - with no more than five employees and a global annual turnover of less than Swiss Francs 5'000'000.-.

3.11.2 The rights of SPC members are identical with those of associate members as specified in Art. 3.9, with the following exceptions:

1. An SPC member is only entitled to participate in one TC.
2. An SPC has no right to take part in the discussions at the General Assembly.

3.12 NFP members

3.12.1 Annual NFP membership may be applied for by a non-profit-making organization. Further yearly extensions of an NFP membership are possible, via application to the Secretary General by November of each year for the following year.

3.12.2 The rights of NFP members are identical with those of SPC members as specified in Art. 3.11.

Art. 4

Acceptance of a new Ecma member

4.1 Application for membership and membership class shall be made to the Secretary General.

The application shall specify that the applicant has received the By-laws, the Rules and the Code of Conduct in Patent Matters, and declare that it adheres to them without restriction. The applicant shall indicate the Technical Committees in the work of which it intends to take part.

4.2 Decisions on acceptance shall be made by the General Assembly with a two thirds majority of all the ordinary members.

Art. 5

Termination of Ecma membership

5.1 a) Membership of a company shall be terminated in the following cases:
Withdrawal by the company member:
Withdrawal by a company can only occur at the end of a calendar year and requires a written 3-month notice to the Secretary General.

The company ceasing to exist.

The conditions for membership set forth in Articles 3.2 and 3.3 of the present By-laws no longer being complied with.

By expulsion for violation of By-laws and Rules or for any other conduct prejudicial to the interest and correct functioning of the Association.

By expulsion after failure to pay the membership fee during the year in which it becomes due. This will happen automatically on December 31st and shall not relieve the member of the obligation to pay such fees that are due or past due according to the terms of the invoice. In justified hardship cases the Ecma management may extend - on a case by case basis - the membership payment deadline.

b) Membership of an NFP shall be terminated in the following cases:

At the end of the year, unless extension of NFP membership has been granted by the Ecma GA.
Withdrawal upon written notice to the Secretary General, to take effect upon receipt.
The NFP ceasing to exist.
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 company member may be expelled for failure to adhere to one or several agreed standards.

5.3 Any proposal to expel an Ecma 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 an Ecma member. Such expulsion will become effective 15 days after notification by registered mail.

5.5 An Ecma member which has been expelled can only be re-admitted by the General Assembly with a two-thirds majority of all ordinary members.

Art. 6
Change of class of company membership

6.1 If a company member wishes to change its membership class it shall apply for one of the other classes of membership according to the conditions set out in these By-laws.

6.2 An application for a change to a higher class of membership (more rights, higher fee) shall be notified in writing to the Secretary General before October 1st. Decisions on acceptance shall be made by the General Assembly with a two thirds majority of all the ordinary members.

6.3 An application for a change to a lower class of membership (less rights, lower fee) shall be notified in writing to the Secretary General before October 1st. Decisions on acceptance shall be made by the General Assembly with a two thirds majority of all the ordinary members.

6.4 If a company member does not fulfil the conditions of its current membership class due to modifications of the By-laws the company member is not obliged to change its current class of membership. However, the conditions of the modified By-laws shall apply.

Art. 7
Structure

7.1 The Association shall consist of:
The General Assembly.
The Management.
The Co-ordinating Committee.

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

7.3 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.

7.4 The President and the Vice-President shall be individuals elected for one year by the ordinary members at a General Assembly.

After a call for nominations by the Secretary General, the Co-ordinating Committee and all Ecma Members may nominate candidates for election no later than 1.5 months before the General Assembly. Only representatives of ordinary members can be nominated. Candidates should have previously served on the Co-ordinating Committee for a reasonable amount of time.

The Secretary General shall post the names of nominees no later than 1 month before the General Assembly.

The President and the Vice-President can be re-elected any number of times provided that neither serves more than two consecutive years.

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

7.6 There shall be a Treasurer whose duty shall be determined by the General Assembly. The Rules set out in 7.4 shall apply to his office, except that there shall be no limit in the number of consecutive years in office.

7.7 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.

The members and the Chairman of the Co-ordinating Committee shall be individuals elected by simple majority for one year at a General Assembly by the Ordinary Members.

After a call for nominations by the Secretary General, the Ecma Management and all Ecma Members may nominate candidates for election no later than 1.5 months before the General Assembly. Only representatives of ordinary members can be nominated.

The Secretary General shall post the names of nominees no later than 1 month before the General Assembly.

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 one representative per Ordinary Member can be elected.

Art. 8

General Assembly

8.1 The President shall each year call at least two ordinary General Assemblies. Notice of the time and place of the General Assembly shall be given at least thirty days before the date of the General Assembly. The agenda and supporting documents for the General Assembly shall be made available at least fifteen days before the General Assembly.

8.2 Unless otherwise restricted by these By-laws or the Rules of the Association, any action required or permitted to be taken at a General Assembly may be taken without a meeting by a postal ballot, if it has been announced in advance and has been approved by the General Assembly.

8.3 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 General Assembly. The business transacted at any special General Assembly shall be limited to the purposes stated in the notice.

8.4 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 General Assembly and shall include the agenda and supporting documents for the General Assembly.

8.5 A majority of all the ordinary members must be present or represented by proxy at any General Assembly, or respond to a postal ballot, 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.
8.6 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. 9

Publication of Standards and Technical Reports

9.1 The adoption of such documents for publication by the Association shall require approval by at least two thirds of all the ordinary members.

9.2 Proposed drafts shall be made available by the Secretary General at least two months in advance of the date at which they will be voted upon.

9.3 It is not mandatory for Ecma members to implement any Ecma standard.

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

Art. 10

Ad Hoc Committees

10.1 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.

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

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

Art. 11

Secretariat

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

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

Art. 12

Technical Committees

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

12.2 Any Ecma member may participate in any TC.

Art. 13

Fiscal year

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

Art. 14

Finance

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

14.2 The Association shall be financed by its company members. The fees for each membership class are set in advance by the ordinary members during an ordinary General Assembly and are based on the budget for the following fiscal year. Such fees shall be used to finance the activity of the Association and its administrative expenses. Any surplus of income over the expenses shall be carried over to the next budget.

14.3 The Secretary General shall be responsible for expenditures within the budget.
14.4
The Management 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 majority of all ordinary members.

Art. 15
Dissolution
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 company members in proportion to their annual fees. Any surplus funds remaining after the liabilities have been discharged will be distributed to those which are company members at the date of dissolution in proportion to their total contributions to the Association.

Art. 16
Amendments
16.1
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 shall be presented with the rationales for the change enclosed with the agenda and notified to the company members according to the provisions of Articles 8.1 and 8.4.

16.2
Amendments shall require approval by two thirds of all the ordinary members.

Art. 17
Litigation
Any dispute arising during the life of the Association or during its dissolution either between the members of the Association and its Management or between the members and the Association or between the members themselves as a consequence of the Association's activity shall be decided upon by the Courts of the Canton of Geneva. Swiss law is applicable in all cases.
Ecma Rules

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

2. System of measurement
The metric system of measurement according to ISO 1000 and the International System of Units (SI) according to ISO 31 shall be used.

3. Representation of company members
Each company member shall appoint one of its officers or executives who shall represent this member in General Assemblies and who shall have full authority to commit the member on all matters listed in the agenda of the General Assembly. Company members shall notify the Association of any changes in their representation. Each company member may appoint one alternate representative.

4. General Assemblies

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

4.2 The ordinary members 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.

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

5. Co-ordinating Committee

5.1 A 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:

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

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

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

5.1.4 To have every six month a meeting at which the progress of the TCs will be reviewed and co-ordinated. Where required, Chairmen of TCs shall attend the meeting.

5.1.5 To make recommendations to the disbandment of Technical Committees.

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

5.1.7 To propose nominations for the election of the Management at the General Assembly.

5.2 The Co-ordinating Committee may hold its meeting separately or jointly with the Ecma Management.
6. Technical Committees

6.1 Formation of Technical Committees (TCs):

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

6.1.2
a) 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.

b) Any new work item proposal in a TC or TG shall be supported by at least three members of which there is at most one NFP.

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

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

6.2 Operating procedures - Rules and recommendations for the TCs:

6.2.1 Members of TCs are:

- representatives of Ecma members,
- other participants invited by the SG at the request of the TC or of the Management.

6.2.2 Members of Ecma are entitled to send one or more representatives to any TC.

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

6.2.4 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.

6.2.5 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.

6.2.6 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.

6.2.7 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 ordinary member representatives.

6.2.8 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.

6.2.9 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.

6.2.10 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 made available to all members 3 weeks before each meeting; at the opening of the meeting it can be modified, if wanted, and it must be approved.

6.2.11 The secretary of a TC shall be responsible for the preparation of minutes of the meetings.

6.2.12 The minutes shall be made available by the secretary within 3 weeks after a meeting to all members of the TC, the General Assembly, and the CC.
6.2.13 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.

6.2.14 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.

6.2.15 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.

6.2.16 This report will be made available to all members of the TC for approval.

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

6.2.18 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 reports will be presented.

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

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

6.2.21 Meetings may be held in Geneva or at any other place. Economy and efficiency shall be a factor in choosing the meeting place.

7. Task Groups (TGs)

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

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

7.3 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.

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

7.5 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.

7.6 Meetings may be held in Geneva or at any other place. Economy and efficiency shall be a factor in choosing the meeting place.

8. Membership and fees

8.1 The General Assembly shall set the annual membership fee for the following fiscal year based on the budget for that year. Although the Association shall be non-profit making, reserves may be accumulated if so decided by the General Assembly.

For each class of company membership the annual fee shall be:

Ordinary members: The full nominal fee
Associate members: One half of the full nominal fee
SME members: One quarter of the full nominal fee
SPC members: Five percent of the full nominal fee.

There is no fee for NFPs (Not-For-Profit organizations).
8.2
Annual membership begins on the first day of the fiscal year and continues throughout this year.
Existing members as of the last day of the current fiscal year continue as members of the same class as of the first day of
and throughout the following fiscal year, unless a change of the membership category has been approved (see 8.5).
The company membership fee is due within 60 days upon receipt of an invoice.
If the membership fee is not paid within four months upon receipt of the invoice the access right of the member to all Ecma
members’ privileged resources and its participation in the Ecma standardization work will be automatically suspended without
any further notice by Ecma.
8.3
The Secretary General shall indicate at the first ordinary General Assembly of the fiscal year the name(s) of the company
member(s) having not paid the annual fee. The General Assembly shall decide on the sanctions to be taken, up to and
including temporary suspension of all voting privileges.
8.4
Any withdrawing company member shall pay the full annual fee for the appropriate membership class for the fiscal year at the
end of which the withdrawal becomes effective.
8.5
Any new company member admitted at the General Assembly held in the first half of a fiscal year shall pay one half of the full
annual fee for its membership class in that fiscal year.
Any new company member admitted at the General Assembly held in the second half of a fiscal year shall not pay a fee for
that fiscal year, but shall pay the full annual fee for its membership class in the following fiscal year.
Any upgraded (see By-laws Art.6.2) company member admitted at the General Assembly held in the first half of a fiscal year
shall pay one half of the full annual fee for its new membership class for the second half of that fiscal year.
Any upgraded company member admitted at the General Assembly held in the second half of a fiscal year shall not pay an
additional fee for its new membership class for that fiscal year, but shall pay the full annual fee for its new membership class
in the following fiscal year.
Downgraded membership (see By-laws Art. 6.3) becomes effective at the beginning of the fiscal year following the fiscal year
when the downgrading was approved.

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 Ecma 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*  
Version 1 (approved by the Ecma GA in December 2009)

1. Ecma considers it is desirable that fullest available information should be disclosed to those selecting technology for Ecma International Standards 1 and those interested in adopting Ecma International Standards. Ecma desires to develop standards for which licenses for any essential patents are available on a non-discriminatory basis and on reasonable terms and conditions. Therefore, Ecma desires that any party participating in a technical committee of Ecma International promptly disclose any patent or pending patent application that it believes contain claims that may be required to implement an Ecma International Standard, in accordance with the following provisions.

2. If an Ecma International Standard is developed and a party may own or control a patent or application with claims that are required to implement such Ecma International Standard, three different situations may arise:

2.1 The patent holder is prepared to grant licenses free of charge to other parties on a non-discriminatory basis on reasonable terms and conditions. Negotiations are left to the parties concerned and are performed outside of Ecma International.

2.2 The patent holder is prepared to grant licenses to other parties on a non-discriminatory basis on reasonable terms and conditions. Negotiations are left to the parties concerned and are performed outside of Ecma International.

For patented technology contributed to and incorporated into a Final Draft Ecma International Standard by a patent holder member, the patent holder member may select 2.1 or 2.2. If such patent holder member does not make a selection, 2.2 shall apply.

2.3 For patented technology contributed by a party other than the patent holder, the patent holder is not prepared to comply with the provisions of either Paragraph 2.1 or Paragraph 2.2.

3. Whatever case applies (2.1, 2.2 or 2.3), the patent holder shall, for patents and pending applications it owns or controls that it believes contains claims that may be required to implement the identified Draft Ecma International Standard, provide a timely written statement to be filed with the Ecma Secretary General at the Ecma International Secretariat, using the attached “Patent Statement and Licensing Declaration Form for an Ecma International Standard” (the “Form” available here in WORD format and here in PDF format). Any licensing commitment selected will only apply to those claims that end up being required to implement the Final Ecma International Standard.

3.1 In the event the patent holder selects per Paragraph 2.1 and 2.2, the patent holder may identify specific patents associated with box 1 or box 2 of the Form. If an Ecma member does not identify specific patents on the list, the designated licensing commitment will apply to all of the Ecma member’s claims in patents and pending applications it owns or controls that end up being required to implement the finalized Standard. The patent holder may submit multiple Forms to document additional patents, each Form applying to patents associated with one of the boxes. A patent holder may re-designate as follows: Box selections cannot be changed, except that identified patents may be re-designated from box 3 to box 1 or 2, or from box 2 to box 1. For licenses executed before a re-designation, the licensees may continue under the existing license or may request terms in accordance with the re-designation.

3.2 In the event a patent holder selects per Paragraph 2.3, the patent holder must identify the specific patents it owns or controls and believes are required to implement the Ecma Standard in a Form under box 3.

3.3 The Form must not include additional provisions, conditions, or any other clauses that may interpret, restrict or vary the terms of the selected box on the Form.

4. Pursuant to Article 9 of the Ecma International by-laws, each Final Draft Ecma International Standard to be approved shall be submitted two months ahead of a General Assembly (GA).

4.1 Each Ecma member participating in the development of the proposed standard shall, and other Ecma members may, submit a Form at the latest two weeks before the GA (if the vote occurs at the GA) or the end of the postal voting period (if the vote is by mail), if they own or control any patents or patent applications that they believe are required to implement such standard. For so long as such Standard remains an approved Ecma International Standard, the member will be prepared to grant licenses for its essential claims in patents and patent applications in accordance with Paragraph 2 above. In the event Paragraph 2.3 is selected, a patent license may not be available and the technical committee should explore other options.

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1 Ecma International Standards hereafter means Ecma International Standards as well as Ecma Technical Reports.
4.2
This Policy creates no duty for Ecma members to search for any patents or patent applications at any time. A Member’s general licensing commitment shall apply to the claims in any patents or patent applications that are required to implement the Standard even if such patents are acquired by the Member after the Standard is finalized. If Paragraph 2.1 or 2.2 is selected, a commitment attaches to a Standard, then the same commitment would automatically apply to future versions of the Standard if the same implicated patent claims (i) are required for implementation of the revised Standard, and (ii) are used in a substantially similar manner, to a substantially similar extent, to achieve a substantially similar result as the same patent claims were used in the prior version for which the Member has made a licensing commitment.

4.3
An Ecma member that has not submitted a Form regarding a Final Draft Ecma International Standard within the period mentioned in Paragraph 4.1 is obliged to license any claims in patents or patent applications required to implement the Standard on a reasonable and non-discriminatory basis.

5.
Anybody may disclose, in written form identifying the title and patent information, another party’s patents and applications that it reasonably believes may be required to implement an Ecma Standard. Such disclosure is not an assertion that such patents or applications are required for the Ecma Standard, but is provided for informational purposes. The Ecma Secretary General will, as feasible, send a Form to each such potential patent holder. A non-member may submit a Form to the Ecma Secretary General that lists the non-member’s patents and applications that it believes may be essential to a draft or final Ecma Standard and select one of the options described above in Paragraph 2.

6.
Ecma International shall not provide legal opinions about evidence, validity or enforceability of patents, or whether a claim is required to implement a standard. Accordingly, in instances where a patent or pending patent application is disclosed to the Ecma Secretary General and it is not subject to a license commitment in accordance with boxes 1 or 2 of the Form, approval and publication of a proposed standard is authorized if 2/3 of the GA by vote in person or via letter ballot, support proceeding with the standard notwithstanding possible uncommitted patent(s) and patent application(s) of Ecma members or non-members. As a condition to proceeding, the Ecma Secretary General must provide notice of all identified and possibly uncommitted patents or patent applications and their disposal (if any) (i) to the voting members at least 10 days before the vote on the standard will be completed and (ii) to the public if and when the standard is published as final.

7.
If a patent or pending patent application, that is not subject to a license commitment in accordance with boxes 1 or 2 of the Form, is disclosed to the Ecma Secretary General after an Ecma International Standard has been approved, the process of Paragraph 6 shall be followed to determine if the standard shall be continued, withdrawn or modified.

The Ecma list of patent statements can be found [here](#).

* The old Ecma Code of Conduct in Patent Matters that was valid until 3 December 2009 is to be found [here](#).
Experimental Royalty Free Patent Policy for TC39


Experimental Royalty Free Patent Policy for TC52

On December 10, 2013, the Ecma General Assembly approved an experimental Royalty Free Patent Policy for Ecma TC52.
Software Copyright Matters

On June 17, 2010 the Ecma General Assembly approved an experimental software copyright policy. This policy is being applied by Ecma TC39.
Text Copyright Matters

All Ecma Standards and Technical Reports are covered by the following Ecma copyright notice.

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(iv) works by making use of this specification in standard conformant products by implementing (e.g. by copy and paste wholly or partly) the functionality therein.

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Trademark Matters

Ecma International has trademarked some of its standardization related terms, such as:

- Ecma International (logo and text)
- OpenXPS (in ECMA-388)
- ECMAScript (e.g. in ECMA-262)
- ProxZzzy (in ECMA-393)
Withdrawn Ecma Standards and Technical Reports

Withdrawn Ecma Standards
(not in force, electronically available here)

ECMA-1  6 Bit Input/Output Character Code (March 1963)
ECMA-2  Subset of ALGOL 60 - ECMALGOL
ECMA-3  CMC7 Printed Image Specification, 2nd edition
        (September 1966)  ISO 1004
ECMA-4  Flow Charts, 2nd edition (September 1966)  ISO 1028
ECMA-5  Data Interchange on 7 Track Magnetic Tape, 3rd edition
        (June 1970)  ISO 1113
ECMA-7  7 Bit Code in Punched Cards (April 1965)  ISO 1113
ECMA-8  Nominal Character Dimensions of the Numeric OCR-A
ECMA-9  FORTRAN (April 1965)  ISO/IEC 1539
ECMA-10 Data Interchange on Punched Tape, 2nd edition
         (July 1970)  ISO 1113
ECMA-11 Alphanumeric Character Set OCR-B for Optical
         Recognition, 3rd edition (March 1976)  ISO 1073-2
ECMA-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)  ISO 2047
ECMA-17 Graphic Representation of the Control Characters of the
         ECMA 7-Bit Coded Character Set for Information
         Interchange (November 1968)  ISO 1831
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)  ISO 1113
ECMA-22 Electrical Safety Requirements for Data Processing
         Machines (June 1969)  ISO/IEC 9995
ECMA-23 Keyboards Generating the Code Combinations of the
         Characters of the ECMA 7-Bit Coded Character Set,
         2nd edition (January 1975)
ECMA-24 Code Independent Information Transfer (An extension
         to the Basic Mode Transmission Control Procedures)
         (December 1969)  ISO 6586
ECMA-25 Representation of 8-Bit combinations on 12-Row
         Punched Cards (June 1970)
ECMA-26 Recovery Procedures (An Extension to 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-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) |
| ECMA-34 | Data Interchange on 3.81 mm Magnetic Tape Cassette (63 ftppm, Phase Encoded at 32 bppm), 3rd edition (September 1976) |
| ECMA-36 | Data Interchange on 9-Track Magnetic Tape at 63 bphm (1600 bpi) Phase-Encoded (December 1971) |
| 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) |
| ECMA-39 | Track Format Characteristics of Interchangeable Single Disk Cartridges (Top Loaded) (September 1973) |
| ECMA-40 | High-Level Data Link Control Procedures (HDLC) - Frame Structure, 3rd edition (January 1980) |
| ECMA-41 | Magnetic Tape Cassette Labelling and File Structure for Information Interchange (December 1973) |
| 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) |
| ECMA-45 | Data Interchange on Magnetic 12-Disk Packs (100 Mbytes) (September 1975) |
| ECMA-46 | Data Interchange on 8,30 mm Magnetic Tape Cartridge (63 bphm, Phase Encoded) (March 1976) |
| ECMA-47 | Limits and Measurements Methods for Radio Interference from EDP Units (March 1976) |
| ECMA-49 | HDLC-Elements of Procedure, 2nd edition (August 1979) |
| ECMA-50 | Programming Language PL/1 (December 1976) |
| 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 3561
ISO 3407
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ISO 4341
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ISO 4337
ISO 4057
ISOIEC 4335
ISO 6160
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-59 Data Interchange on 200 mm Flexible Disk Cartridges using Two-Frequency Recording at 13 262 ftprad on Both Sides (August 1979)
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 fpm, NRZI, 32 cpm - 126 fpm, Phase Encoding, 63 cpm - 356 fpm, NRZI, 246 cpm GCR, 2nd edition (March 1985) (for reference see also ISO 1863, ISO 3788 and ISO 5652) ISO 1864
ECMA-63 Representation of Numerical Values in Character Strings for Information Interchange (September 1980)
ECMA-64 Magnetic Disk for Data Storage Devices, 160 000 Flux Transitions per Track, 356 mm Diameter, 2nd edition (September 1982) ISO 6901
ECMA-65 Magnetic Disk for Data Storage Devices, 107 500 Flux Transitions per Track, 266 mm and 356 mm Diameter (September 1980) ISO 6902
ECMA-66 Data Interchange on 130 mm Flexible Disk Cartridges using Two-Frequency Recording at 7 958 ftprad on One Side (September 1980) ISO 6596
ECMA-67 130 mm Flexible Disk Cartridge Labelling and File Structure (January 1981)
ECMA-68 Reels for 12,7 mm Wide Magnetic Tapes (Sizes 16, 18 and 22) (January 1981) ISO 8064
ECMA-69 Data Interchange on 200 mm Flexible Disk Cartridges using MFM Recording at 13 262 ftprad on Both Sides (January 1981) ISO 7065
ECMA-70 Data Interchange on 130 mm Flexible Disk Cartridges using MFM Recording at 7 958 ftprad on 40 Tracks on Each Side, 2nd edition (June 1986) ISO 7487
ECMA-71 HDLC Selected Procedures (January 1981) ISO/IEC 3309 & 4335
ECMA-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 fppm on 80 Tracks on Each Side, 2nd edition (June 1986) | ISO 8378 |
| ECMA-79 | Data Interchange on 6.30 mm Magnetic Tape Cartridge using IMFM Recording at 252 fppmm, 2nd edition (September 1985) | ISO 8063 |
| 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) | ISO 9040 |
| ECMA-84 | Data Presentation Protocol (September 1982) | ISO/IEC 8823-1 |
| ECMA-85 | Virtual File Protocol (September 1982) | ISO 8462 |
| 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-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-93 | Distributed Application for Message Interchange (MIDA) (September 1984) | ISO 8802-5 |
| ECMA-95 | Limits of Interference and Measurement Methods (March 1985) | ISO 8802-5 |
| ECMA-96 | Syntax of Graphical Data for Multiple-Workstation Interface (GDS) (September 1985) | ISO 8802-5 |
| ECMA-98 | Data Interchange on 6.30 mm Magnetic Tape Cartridge using NRZ1 Recording at 394 fppmm - Streaming Mode (September 1985) | ISO 8462 |
| ECMA-102 | Rate Adaptation for the Support of Synchronous and Asynchronous Equipment using the V. Series Type Interface on a PCSN, 2nd edition (July 1987) | ISO 8613 |
| ECMA-103 | Physical Layer at the Basic Access Interface between Data Processing Equipment and Private Switching Networks, 2nd edition (December 1987) | ISO 8613 |
| ECMA-104 | Physical Layer at the Primary Rate Access Interface between Data Processing Equipment and Private Switching Networks (September 1985) | ISO 8613 |
ECMA-105 Data Link Layer Protocol for the D-Channel of the Interfaces at the Reference Point between Terminal Equipment and Private Telecommunication Networks, 4th edition (June 1993)

ECMA-110 Ergonomics - Requirements for Monochromatic Visual Display Devices (December 1985)

ECMA-111 Small Computer System Interface – SCSI (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 Addresses (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, 2nd 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, 2nd edition (June 1980)


ECMA-130 Referenced Data Transfer (July 1988)


ECMA-134 Method for the Specification of Basic and Supplementary Services of Private Telecommunication Networks (April 1989)

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)

ECMA-138 Security in Open Systems - Data Elements and Service Definitions (December 1989)

ECMA-140 Document Printing Application (DPA) (June 1990)

ECMA-141 Private Telecommunication Networks (PTN) - Inter-Exchange Signalling - Data Link Layer Protocol (PTN QSIG-L2), 2nd edition (June 1993)

ECMA-166 Information Technology Equipment - Routine Electrical Safety Testing in Production (June 1992)

ECMA-172 Procedure for Measurement of Emissions of Electric and Magnetic Fields from VDUs from 5 Hz to 400 kHz (June 1992)

ECMA-181 Uncertainty of Measurement as Applied to Type Approval of Products (December 1992)
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Withdrawn Ecma Technical Reports
(not in force, electronically available here)

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/23  Electrostatic Discharge Susceptibility (September 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/40  Electrostatic Discharge Immunity Testing of Information Technology Equipment (July 1987)
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/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 Routing (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/56  Information Technology Equipment - Recommended Measuring Method for Ozone Emission (June 1991)
ECMA TR/60  Supplementary Services and Additional Network Features in Private Telecommunication Networks (June 1992)
ECMA TR/63  Alphabetical Reference Index to IEC 950, 3rd 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)
ECMA TR/89  Common Language Infrastructure (CLI) - Common Generics, 2nd edition (June 2006)
History of Ecma International

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 or for short ECMA, 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. On 17th May 1961 the Association officially came into being and all those Companies which attended the original meeting became members. The constituent assembly was held on 17th June 1961.

Just prior to the official registration of Ecma, it was invited to be represented at a Round-Table Conference to be held in Geneva organized by ISO and IEC to discuss standardization in the general field of computers. This meeting resulted in the formation of TC97 and in the organization of its own Working Groups, and Ecma was asked to become a liaison member. In 1987, when TC97 became part of ISO/IEC JTC 1, Ecma became A-liaison member of JTC 1.

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

Though before 1994, ECMA was known as "European Computer Manufacturers Association", after 1994, when the organization became global, the "trademark" "Ecma" was kept for historical reasons.
About the Ecma Mementos

The Ecma Mementos are the Annual Report of Ecma International. They aim to provide comprehensive overview about the work of Ecma International, its working rules, its membership and so on.

The first Ecma Memento was published in 1962.

The current and old Ecma Mementos can be downloaded here.
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<th>Year</th>
<th>President/Secretary General</th>
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<tr>
<td>1961-1962</td>
<td>Mr. C. G. Holland-Martin (ICT)</td>
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<td>1963-1964</td>
<td>Prof. Dr. J. Engelfriet (EL)</td>
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<td>1965-1966</td>
<td>Mr. M. R. Pedretti (IBM)</td>
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<td>2005-2006</td>
<td>Mr. H. Theis (Avaya)</td>
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<td>2007-2008</td>
<td>Mr. J. Neumann (Toshiba)</td>
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<td>Ms J. Auber (HP)</td>
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<td>2013-2014</td>
<td>Ms I. Valet-Harper (Microsoft)</td>
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**Past Secretaries General**

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<tr>
<td>1961-1991</td>
<td>Mr. Dara Hekimi († 2002-02-18)</td>
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<td>1992-2007</td>
<td>Mr. Jan van den Beld</td>
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