

EUROPEAN COMPUTER MANUFACTURERS ASSOCIATION

ECMA

MEMENTO 1976

ECMA

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## Introduction

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 used on a computer made by another with the minimum of alteration. Also it would avoid duplication of work in the preparation of, for example, programming languages by several manufacturers.

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

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

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

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

## Purpose

The aims of the Association will be clear from the following extract from the By-Laws:

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

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

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

## Membership

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

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

## Promulgation of Standards

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

It is not obligatory for members to follow any standard.

ECMA Standards (see page 73) are made available without restriction to all interested parties. Indeed, the proposals are intended to be drafts to be considered by ISO and the National Standards organizations, where the final standards will be adopted.

## Past Presidents

1961-1962	Mr. C. G. Holland-Martin	(ICT)
1963-1964	Prof. Dr. J. Engelfriet	(EL)
1965-1966	Mr. M. R. Pedretti	(IBM-Europe)
1967-1968	Dr. J. M. M. Pinkerton	(ICL)
1969-1970	Mr. P. J. Davous	(Bull)
1971-1972	Dr. K. Scheidhauer	(AEG-Tfk)
1973-1974	Dr. J. M. M. Pinkerton	(ICL)
1975	Mr. J. van Eybergen	(Philips-EL)

## Officers

### Management

President  
Mr. W. Heimann  
(Siemens)

Vice-President  
Mr. M. H. Johnson  
(Ferranti)

Treasurer  
Mr. G. Willibald  
(ITTE)

### Executives

Secretary General  
Mr. D. Hekimi

Technical Officer  
Mr. L. Lauri

## Office

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All correspondence should be addressed to the Secretary General

## Ordinary Members

**Allgemeine Elektrizitäts-  
Gesellschaft,  
AEG-Telefunken**

Bücklestr. 3  
D-7750 KONSTANZ,  
Germany

**Burroughs International S.A.**

18 Rue Saint-Pierre  
CH-1700 FRIBOURG,  
Switzerland

**C.I.I. Compagnie  
Internationale pour  
l'Informatique**

68 Rte de Versailles  
F-78430 LOUVECIENNES,  
France

**Compagnie Honeywell-Bull**

94 Avenue Gambetta  
F-75960 PARIS,  
France

**Digital Equipment Corporation  
International (Europe)**

81 Route de l'Aire  
CH-1211 GENEVA 26,  
Switzerland

**Ferranti Ltd**

Western Road  
BRACKNELL, RG12 1RA,  
United Kingdom

**IBM Europe**

8-10 Cité du Retiro  
F-75008 PARIS,  
France

**I.C.L. International  
Computers Ltd**

ICL House  
Putney  
LONDON, S.W.15 1SW,  
United Kingdom

**Ing. C. Olivetti & C. S.p.A.**

Via Jervis 77  
I-10015 IVREA,  
Italy

**I.T.T. Europe Inc.**

Avenue Louise 480  
B-1050 BRUXELLES,  
Belgium

**Nixdorf Computer AG**

Fürstenweg  
D-4790 PADERBORN  
Germany

**Philips - Electrológica B.V.**

Postbox 245  
APELDOORN,  
The Netherlands

**Saab-Scania AB**

S-581 01 LINKÖPING  
Sweden

**Siemens Aktiengesellschaft**

Hofmannstr. 51  
D-8000 MUNICH 70,  
Germany

**Sperry Univac L.D.C.**

141 Westbourne Terrace  
LONDON W2 6JR  
United Kingdom

## Associate Members

**Ampex S.A.**

Rue de l'Industrie  
NIVELLES,  
Belgium

**BASF Aktiengesellschaft**

D-6700 LUDWIGSHAFEN,  
Germany

**CIT-ALCATEL**

12 Rue de la Baume  
F-75008 PARIS,  
France

**SAGEM, Société d'Applica-  
tions Générales d'Electricité  
& de Mécanique**

6 Avenue d'Iéna  
F-75783 PARIS Cedex 16,  
France

**Tandbergs Radiofabrikk A/S**

Kjelsåsveien 161  
OSLO 8  
Norway

**3 M Italia S.p.A.**

S.S. 87 - Km. 20, 700  
I-81100 CASERTA,  
Italy

## General Assembly

### SCOPE:

The General Assembly of the ordinary Members is the highest authority of the Association. It controls the Association and appoints and controls its Management.

Mr. L. Faurre alt. Mr. Ph. Léger	(Sagem)	Mr. J. H. Pedersen	(Burroughs)
Mr. H. Feissel	(Honeywell)	Dr. J. M. M. Pinkerton	(ICL)
Mr. R. S. Ferguson	(Sperry Univac)	Mr. P. Reinicke	(Saab)
Mr. W. Franzelius alt. Dr. H. Mueller	(IBM)	Dr. K. Scheidhauer	(AEG-Tfk)
Mr. J. Gaudfernau alt. Mr. J. Dubos	(CII)	Mr. K. Turkiewicz	(CIT)
Mr. L. Hanewinkel	(Nixdorf)	Dr. K. Uhl	(BASF)
Mr. W. Heimann alt. Mr. G. Haberzettl	(Siemens)	Mr. J. van Eybergen	(Ph-El)
Mr. M. H. Johnson	(Ferranti)	Dr. F. Vitale	(3M)
Mr. L. Nødtvedt	(Tandberg)	Mr. G. Willibald	(ITTE)
		Mr. M. Ziliani	(Olivetti)
		Mr. ....	(Digital)

## Co-Ordinating Committee

### SCOPE:

To draw up Terms of Reference for the Technical Committees and to co-ordinate their activities. To make recommendations regarding the formation of new committees or the dissolution of old ones.

Chairman:	Mr. L. Durand	(Honeywell)
MEMBERS:	Mr. R. S. Ferguson	(Sperry Univac)
	Mr. W. Franzelius	(IBM)
	Mr. L. Hanewinkel	(Nixdorf)
	Mr. A. J. Raphael	(ICL)
	Mr. M. Ziliani	(Olivetti)

## Protection Rights Committee (PRC)

### SCOPE:

To watch the legal situation as it affects the protection of computer programs, as it develops and to report and comment on the facts to the General Assembly.

Chairman:	Dr. H. Aspden	(IBM)
MEMBERS:	Mr. J. R. Cartwright	(ICL)
	Mr. A. R. Cooper	(Ferranti)
	Mr. P. Drost	(Siemens)
	Mr. C. Falcetti	(Honeywell)
	Dr. W. Elben	(AEG-Tfk)
	Mr. J. E. M. Galama	(Ph-El)
	Mr. R. Gallois	(CII)
	Mr. S. Ravera	(Olivetti)
	Mr. P. Reinicke	(Saab)
	Mr. K. H. R. Stoess	(Burroughs)
	Mr. B. G. Suurmond	(Ph-El)

## Technical Working Committees

Input and Output Codes	TC 1
General Programming Languages *	TC 2
Problem Analysis and Flow Charting *	TC 3
Optical Character Recognition	TC 4
ALGOL *	TC 5
COBOL	TC 6
Magnetic Ink Character Recognition *	TC 7
FORTRAN	TC 8
Data Transmission	TC 9
PL/1	TC 10
Numerical Control *	TC 11
Product Safety	TC 12
Keyboards *	TC 13
Paper Sizes *	TC 14
Labelling	TC 15
Disk Packs	TC 16
Magnetic Tape	TC 17
I/O Interface *	TC 18
Magnetic Tape Cassettes and Flexible Disks	TC 19
Electromagnetic Compatibility	TC 20
BASIC	TC 21
Data Base	TC 22

\* These Committees have accomplished their task.



## Input and Output Codes Committee TC 1

### SCOPE:

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

### PROGRAM OF WORK:

1. To participate in the research of common coded character sets applicable to sequential continuous media.
2. Punched-card coding standardization is considered as a second and separate objective.
3. Determination of common sets which shall take into account the European requirements for character, symbol and control representations in data handling and programming, in accordance with computer and auxiliary equipment characteristics.
4. Consideration shall be given in defining the coded character sets to permit possible expansion and contraction.
5. To follow technical development in the field in order to maintain and improve the recommended standards.
6. To maintain liaison with other standards organizations in order to present ECMA proposals to them and to make comments on their proposals.

### OFFICERS:

Chairman:	Mr. J. Dubos	(CII)
Vice-Chairman:	Mr. L. J. Zeckendorf	(Ph.-El)
MEMBERS:	Mr. C. R. Berry	(ITTE)
	Mr. H. G. Böckmann	(Siemens)
	Mr. W. Bohn	(IBM)
	Mr. L. de Bournonville	(Honeywell)
	Mr. C. Chierici	(Olivetti)
	Mr. P. Dettmer	(Siemens)
	Mr. J. Friemelt	(Siemens)
	Mr. T. Granberg	(Saab)
	Mr. A. J. Raphael	(ICL)

## Optical Character Recognition Committee TC 4

### SCOPE:

Definition of a minimum number of character sets legible both to humans and to machines.

Specification of fonts, parameters, measurements and tolerances. Definition of document specification (size limits, ink, position of printed lines, etc.).

### PROGRAM OF WORK:

1. By considering European application requirements and the existing projects, establish basic criteria to be considered in the definition of documents and type fonts standard specifications.
2. Evaluate existing projects in the light of the defined criteria, giving careful consideration to the printing and reading problems involved in the implementation of such projects.
3. Establish a minimum number of character sets and type fonts specifying their parameters, measurement methods and tolerances to be recommended as possible standards.
4. Specify a range of document sizes, position of printed lines on documents, paper quality, etc.
5. Review periodically or when appropriate the subjects covered by items 1 to 4 in the light of changes in techniques and requirements.
6. Establish liaison from the beginning with other standards organizations and printers' associations.

### OFFICERS:

Chairman: Mr. D. Schmitt (Siemens)

Vice-Chairman: —

MEMBERS:	Mr. C. Bruant	(CIT)
	Mr. J. C. Fortin	(Honeywell)
	Mr. P. Holmberg	(Saab)
	Mr. A. Kempkes	(IBM)
	Mr. H. Kohlhage	(Nixdorf)
	Dr. M. Odasso	(Olivetti)
	Mr. H. Rihm	(AEG-Tfk)
	Mr. F. Vail	(ICL)
	Mr. R. Verstraelen	(ITTE)
	Mr.	(Ph-El)

## COBOL Committee TC 6

### SCOPE:

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

### PROGRAM OF WORK:

1. To examine the COBOL reports and standards with a view to eliminating any possible ambiguities.
2. To co-ordinate any work on translation of COBOL formats into European languages.
3. To examine the problems of input/output formats in order to make recommendations which enable compliance with National Standards and usages.
4. To work with the COBOL Committee and any other committees working in the same area with a view to ensuring that European requirements are taken into account in the maintenance of COBOL.
5. To recommend, where appropriate, improvements in the COBOL specifications.
6. To follow closely developments and the establishment of languages related to COBOL.

### OFFICERS:

Chairman:	Mr. K. H. Tuchnitz	(Siemens)
Vice-Chairman:	Mr. J. Bourgain	(Honeywell)
MEMBERS:	Mr. P. R. Brown	(Burroughs)
	Mr. G. Gauthier-Villars	(CII)
	Mr. G. Granata	(Olivetti)
	Mr. P. J. Holstege	(Ph-El)
	Mr. S. Jansson	(Saab)
	Mr. J. Lucking	(ICL)
	Dr. W. Schöniger	(Sperry Univac)
	Mr. R. Taake	(Nixdorf)
	Mr. L. Thill	(CII)
	Mr. T. van Beersum	(Ph-El)

## FORTRAN Committee TC 8

### SCOPE:

To survey the implementation and usage of FORTRAN and participate in the revision and development of current FORTRAN standards, taking into account specific European needs.

### PROGRAM OF WORK:

1. To consider sub-sets of the language, including possible sub-sets for use in Real Time operations.
2. To monitor data base activities and make recommendations as to the desirability of possible involvement by ECMA in FORTRAN data base applications.
3. To examine the available ANSI working papers and reports with a view to eliminating any ambiguous interpretation.
4. To monitor the progress of FORTREV in particular until such time as the final voting period is closed.
5. To maintain liaison with other standards organizations in order to present ECMA proposals to them and make comments on their proposals.

### OFFICERS:

#### Chairman:

Vice-Chairman: Mr. D. J. Maisey (ICL)

#### MEMBERS:

Mr. S. Jansson	(Saab)
Mrs. J. F. Kirk	(Univac)
Mr. M. Münchhausen	(Siemens)
Mr. P. Rigogne	(CII)
Mr. B. Schlenker	(Nixdorf)
Dr. M. Topschowsky	(AEG-Tfk)
Mr. G. Veissier	(Honeywell)

## Data Transmission Committee TC 9

### SCOPE:

The definition of common parameters which will facilitate communication within and between data processing systems using transmission links. The preparation of co-ordinated view-points covering those requirements which are of common interest to both the European computer manufacturers and the telecommunication services.

### PROGRAM OF WORK:

1. To investigate different data transmission systems (point to point, multipoint, etc.) and decide on those which should be studied in detail with a view to standardization.
2. To study all the parameters of the selected systems and determine those which should be defined as standards to assist in the interchange of data (e.g. message formats, synchronization, etc.). This study shall include error detection-correction.
3. To study the functions and definitions of the transmission control characters in code proposals currently under consideration.
4. To study and make contributions to the work on data communication interfaces currently in progress in other organizations.
5. To maintain liaison with ECMA/TC1 and TC15 and to co-operate with them in aspects of common interest.
6. To establish and maintain liaison with CCITT and ISO and maintain awareness of the work of these and other organizations on data transmission.
7. To make evaluations of work in progress on data transmission aspects in other organizations before commencing original work of their own.

### OFFICERS:

Chairman:	Mr. J. Finet	(Honeywell)
Mr. C. Wood	Mr. J. A. K. Frampton	(ICL)
(Sperry Univac)	Mr. P. Locatelli	(Olivetti)
	Mr. J. Markalous	(Siemens)
Vice-Chairman:	Mr. D. Matejka	(AEF-Tfk)
Mr. G. Yon	Mr. P. Mayo	(ITTE)
(Honeywell)	Mr. M. Migeon	(CII)
	Mr. Ngô-Mai	(IBM)
MEMBERS:	Mr. T. T. Nguyen	(Burroughs)
Mr. H. Adamson	Mr. O. Nilsson	(Sperry Univac)
(Honeywell)	Mr. G. Parreno	(CII)
Mr. R. Berruto	Mr. W. Raum	(Nixdorf)
(Olivetti)	Mr. O. B. P. Rikkert	
Mr. E. J. Boutmy	de Koe	(Ph-El)
(Ph-El)	Mr. J. Schwarz	(Siemens)
Mr. R. Buron	Mr. A. M. Torrance	(Sperry Univac)
(IBM)	Mr. B. P. J. van Berkel	(Ph-El)
Mr. D. Decavèle		
(CIT)		
Mr. L. Durand		
(Honeywell)		
Mr. O. Fåk		
(Saab)		

## PL/1 Committee TC 10

### SCOPE:

To study the PL/1 language and to proceed with standardization of PL/1.

### PROGRAM OF WORK:

1. To consider the reports available with a view to eliminating any ambiguous interpretation.
2. To propose improvements which, without modifying the basic philosophy of the language, should ensure the most general implementation, taking also into account specific European requirements.
3. To prepare, as the result of this work, a precise definition of the full language.
4. To consider subsets of the language and to propose, if appropriate, one or more of them, not excluding the full PL/1 language, as ECMA Standards.
5. To establish and maintain a mechanism for effective co-operation with, and participation in the work of, other organizations concerned.
6. To inform periodically the ECMA members on the progress of such standardization and co-operation.

### OFFICERS:

Chairman:	Mr. J. Bourgain	(Honeywell)
Vice-Chairman:	Mr. B. Kahan	(CII)

MEMBERS:	Mr. D. J. Andrews	(IBM)
	Mr. P. R. Brown	(Burroughs)
	Mr. D. Cohen	(ITTE)
	Mr. D. Decavèle	(CIT)
	Mr. G. Granata	(Olivetti)
	Mr. S. Jansson	(Saab)
	Dr. H. Krainer	(Siemens)
	Mr. H. Krug	(Siemens)
	Dr. L. Petrone	(Olivetti)
	Dr. W. Schöniger	(Sperry Univac)
	Mr. W. Vogel	(Nixdorf)

## Product Safety Committee TC 12

### SCOPE:

To consider national and international safety regulations with a view to establishing appropriate safety recommendations for Data Processing machines or units so that they are intrinsically safe and safe for operating and maintenance personnel.

### PROGRAM 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, grounding, voltage exposure limits, mechanical design, etc., and establish recommendations where appropriate.
4. To establish and maintain liaison with national and international organizations in order to follow developments affecting Product Safety and to present ECMA comments and proposals.

### OFFICERS:

Chairman: Mr. R. S. Ferguson (Sperry Univac)

Vice-Chairman: —

MEMBERS: Mr. G. Bianchini (Olivetti)  
Mr. P. Chapouille (Honeywell)  
Mr. R. Elnegård (Saab)  
Mr. A. Feyzeau (CII)  
Mr. P. Graauw (Ph-El)  
Mr. H. Kummer (IBM)  
Mr. L. D. Nichols (ITTE)  
Mr. R. Schäfer (Sperry Univac)  
Mr. W. Seidel (Siemens)  
Mr. C. Smaniotto (Honeywell)  
Mr. J. Trigg (ICL)

## Labelling and File Structure Committee TC 15

### SCOPE

To secure a wide scope for the interchange of data between computer systems with a view of defining standards for data formats, labelling and file structures.

### PROGRAM OF WORK:

1. To study the limitations placed on data organization by the principal methods by which operating systems manage data.
2. To study the limitations imposed by the necessity of recording and/or transmitting data.
3. To identify and define those data formats for which standardization is necessary in order to facilitate interchange between computer systems, taking into account the limitations imposed by the commonly used programming languages.
4. To identify those aspects of data organization which it would be necessary to standardize in order to standardize labels and file structures in a general manner.
5. To lay down specific standards for labels, file structures and data formats applicable to the media commonly used for data interchange.
6. To establish and maintain liaison with other standards organizations in order to present ECMA proposals and to make comments on their proposals.

### OFFICERS:

Chairman: Mrs. J. F. Kirk (Sperry Univac)

Vice-Chairman: Dr. R. Franzel (Siemens)

MEMBERS: Mr. B. Andersson (Saab)  
Mr. A. G. Clarke (ICL)  
Mr. F. Gillet (Burroughs)  
Mr. C. Le Bras (Honeywell)  
Mr. C. Rossetti (Olivetti)  
Mrs. G. Spielberg (Nixdorf)  
Mr. H. U. Stoltenberg (Ph-El)  
Mr. P. van Uffelen (IBM)  
Mr. G. Zitzwitz (IBM)

## Disk Packs Committee TC 16

### SCOPE:

To identify and standardize the minimum number of parameters necessary to ensure exchangeability of both replaceable disk packs and the information recorded thereon.

### PROGRAM OF WORK:

1. To review the extent to which existing designs allow physical interchangeability and to list the relevant parameters.
2. To propose the corresponding ranges of values for these parameters.
3. To review the interchangeability of data offered by existing practice listing the relevant factors.
4. To propose corresponding values and procedures for ensuring interchangeability of data.
5. In pursuing the above to give priority to establishing standards for the 6 disk packs.
6. To maintain liaison with other standards organizations in order to present ECMA proposals and to make comments on their proposals.

### OFFICERS:

Chairman: Mr. P. Felleisen (BASF)

Vice-Chairman:

MEMBERS:

Mr. G. Baumeister	(Siemens)
Mr. B. Condemi	(3M)
Mr. J. C. Gidrol	(Sagem)
Mr. F. Hummel	(ITTE)
Mr. A. N. McTighe	(ICL)
Mr. K. E. Neumann	(Nixdorf)
Mr. J. Pillet	(CII)
Mr. G. Prival	(Honeywell)
Mr. E. Thunholm	(Saab)
Mr. G. L. Walther	(Ph-El)

## Magnetic Tape Committee TC 17

### SCOPE:

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

### PROGRAM OF WORK:

1. To identify the relevant physical parameters affecting interchangeability.
2. To identify also the features and parameters of the physical format necessary for ensuring intelligibility of the data recovered.
3. To propose the corresponding ranges of values for all these parameters.
4. To prepare draft standards for 12,7 mm magnetic tape self-loading cartridges and for group coded recorded magnetic tapes at 246 b/mm.
5. To assume responsibility for the maintenance of current ECMA Standards.
6. To maintain liaison with other standards organizations in order to present ECMA proposals and make comments on their proposals.

### OFFICERS:

Chairman: Dr. F. Vitale (3M)

Vice-Chairman: Mr. G. Reichborn (Tandberg)

MEMBERS:

Mr. P. Dickinson	(ICL)
Mr. P. Laborde	(CII)
Mr. K. Rozsa	(Saab)
Mr. J. Vordermayer	(Siemens)

## Magnetic Tape Cassettes and Flexible Disks TC 19

### SCOPE:

To identify and standardize the physical properties and the relevant data format of magnetic tape cassettes and cartridges, and of flexible disks for digital applications—below the performance range of existing magnetic tape standards—in order to ensure interchangeability.

### PROGRAM OF WORK:

1. To identify the requirements of low cost and compact digital data recording for data collection and data entry systems as well as for easy mailing and to review the extent to which existing designs possibly derived from existing standards in other areas, fulfil these requirements.
2. To specify, based on their preliminary investigations, the physical properties, recording method and track location of magnetic flexible disks and envelopes in order to ensure interchangeability.
3. To specify the relevant track format and code representation for these disks to ensure interchangeability.
4. To assist TC15 on labelling problems.
5. To maintain liaison with other standards organizations in order to present ECMA proposals and to make comments to their proposals.

### OFFICERS:

Chairman: Mr. H. W. Schneider (Ph-El)

Vice-Chairman: Mr. J. Hack (BASF)

### MEMBERS:

Mr. G. Bonzano	(Olivetti)	Mr. A. La Maout	(CII)
Mr. P. Brevik	(Tandberg)	Mr. J. Mickel	(AEG-Tfk)
Mr. J. P. Claverie	(Honeywell)	Mr. K. E. Neumann	(Nixdorf)
Mr. J. Delahunty	(Sperry Univac)	Mr. D. Ricciardi	(3M)
Mr. J. M. Drouot	(CIT)	Mr. C. Rossetti	(Olivetti)
Mr. B. Elworthy	(ICL)	Mr. K. Rozsa	(Saab)
Mr. F. Gillet	(Burroughs)	Mr. A. Schatz	(Sagem)
Mr. Ph. Green	(ITTE)	Mr. H. Schlossbauer	(Siemens)
Mr. G. Hasler	(IBM)	Dr. F. Vitale	(3M)
Mr. A. Le Gall	(ITTE)		

## Electromagnetic Compatibility TC 20

### SCOPE:

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

### PROGRAM OF WORK:

1. To compile and maintain a list of the legal requirements existing in various countries.
2. To identify, for both radiated and conducted interference, the parameters (amplitude, frequency, length, leading edge) which can cause the defective operation of data processing and/or data communication systems.
3. To identify recommended methods for the measurement of such parameters with a view to establishing the practicability of setting limiting values for such parameters.
4. To establish and maintain liaison with other relevant organizations in order to present ECMA proposals and to make comments on their proposals.

### OFFICERS:

Chairman: Mr. R. J. Trigg (ICL)

Vice-Chairman: Mr. R. Schäfer (Sperry Univac)

MEMBERS:

Mr. R. Elnegård	(Saab)
Mr. A. Feyzeau	(CII)
Mr. R. Gaebele	(IBM)
Mr. J. H. Harding	(Ferranti)
Dr. M. Odasso	(Olivetti)
Mr. R. Roelans	(ITTE)
Mr. W. Sauer	(Ph-El)
Mr. D. Straub	(AEG-Tfk)

## BASIC Committee TC 21

### SCOPE:

To study the language BASIC and to proceed with its standardization.

### PROGRAM OF WORK:

1. To examine the available reports with a view to eliminating any ambiguous interpretation.
2. To issue recommendations to the committees working on standardization of BASIC on the specific European requirements.
3. To inform periodically the ECMA members on the progress of this standardization and to consider its implications.
4. To maintain liaison with other standards organizations in order to present ECMA proposals to them and to make comments on their proposals.

### OFFICERS:

Chairman: Dr. M. Bellardinelli (Olivetti)

Vice-Chairman: Mr. E. Köhlerberg (Ph-El)

MEMBERS: Mr. P. Barnetson (IBM)  
Mr. S. Jansson (Saab)  
Mr. B. Leroy (Honeywell)  
Mr. D. J. M. Martin (ICL)  
Mr. F. Nunes (Siemens)  
Mr. H. J. Oelkers (Nixdorf)  
Mr. P. Rigogne (CII)

## Data Base Committee TC 22

### SCOPE

To promote the standardization of data base management systems by contributing to national and international standardization or development organizations.

### PROGRAM OF WORK:

1. To consider the documents available to detect inconsistencies (CODASYL, PLC/JOD, CODASYL DDLC/JOD, ANSI/SPARC report).
2. To contribute in the first instance on the following areas that are vitally important for standardization and where standardization seems economically and technically feasible:
  - interfaces 6 and 7, external DDL and DML, candidate DBLTG proposal,
  - interface 1, conceptual DDL.
3. To propose improvements which, without modifying the basic philosophy of the CODASYL/DBTG approach, would ensure the most general implementation, and be open to future extensions. Possible improvements include the following:
  - protect integrity of data base,
  - simplify the languages,
  - make CODASYL specifications mutually consistent,
  - make the documents self-contained, as far as possible,
  - define extended basic and primitive DM functions,
  - clarify and improve flexibility of Schema/Sub-schema mapping,
  - improve the facilities for data base administration.Work on such proposals should be preceded by assessment of priorities and resources.
4. To maintain close liaison with the relevant ECMA Technical Committees, in particular with TC6.
5. To establish and maintain effective co-operation with other organizations concerned (e.g. CODASYL, ANSI, ISO, IFIP), thereby taking users' requirements into account.

### OFFICERS:

Prov. Chairman: Dr. W. Schöniger (Sperry Univac)

Prov. Vice-Chairman:

MEMBERS:

**Ordinary Members**

**REPRESENTATIVES**

**NOT FOR PUBLIC RELEASE**

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



**By-Laws and Rules  
of the Association**

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## By-Laws of the Association

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### Art. 1 CONSTITUTION AND HEAD OFFICE

- 1.1 An association to be known as " European Computer Manufacturers Association ", abbreviated ECMA, has been constituted according to these By-Laws and Articles 60 et seq. of the Swiss Civil Code.
- 1.2 The Headquarters of the Association is in Geneva.

### Art. 2 PURPOSE

- 2.1 The purpose of the Association is :
  - 2.1.1 To study and develop, in cooperation with the appropriate national and international organizations, as a scientific endeavour and in the general interest, methods and procedures in order to facilitate and standardize the use of data processing systems.
  - 2.1.2 To promulgate various standards applicable to the functional design and use of data processing equipment.
- 2.2 The Association shall be a non-profit-making organization and shall devote itself to no commercial activity whatsoever.

### Art. 3 MEMBERSHIP

- 3.1 The Association shall consist of ordinary members and such other classes of members as may be created by the ordinary members at a General Assembly.
- 3.2 The ordinary members shall fulfil the qualifications set forth under Articles 3.3 and 3.4 of the present By-Laws, and be accepted according to Article 4.
- 3.3 Ordinary members shall be companies which develop, manufacture and market in Europe data processing machines or groups of machines used to process digital information for business, scientific, control or other similar purposes. Data processing machines used exclusively for military purposes shall not be considered to be included in the above machines.

- 3.4 These machines or group of machines shall have all four of the following characteristics:
- a. Means for automatic entry of input data.
  - b. Means for comparing and manipulating logically and arithmetically, data entered through such input means.
  - c. Means for automatically carrying out a program controlling all arithmetic, internal data transfer and data output functions of the various machine units comprising the system.
  - d. Means for automatically altering or modifying the program in accordance both with information received as input and from internal manipulation.
- 3.5 A proposed ordinary member will not be accepted if it holds at least 50 per cent of the capital of an existing ordinary member nor if at least 50 per cent of its capital is held by an existing ordinary member.
- 3.6 No two or more companies, at least 50 per cent of whose capital is held by the same company, which is not a member itself, may be ordinary members but must be represented by one company only.
- 3.7 Applications for ordinary membership will not be accepted unless the proposed member develops, manufactures and markets some major data processing equipment which is not basically a copy of that of an existing ordinary member.
- 3.8 Additional classes of members which may be established according to Article 3.1 shall have such qualifications and be entitled to such rights and privileges and have such obligations as shall be determined at a General Assembly by a majority of two thirds of all the ordinary members.
- 3.9 Associate Members
- 3.9.1. A company may be admitted as associate member which has interest and experience in Europe in matters related to one or more of the TCs of the Association. No company qualifying for ordinary membership can be elected associate member.
  - 3.9.2 A prospective associate member shall declare the TCs in whose work it proposes to take part.
  - 3.9.3 The restrictions of Articles 3.5 and 3.6 of the By-Laws shall apply to associate members.
  - 3.9.4 Associate members shall be admitted by a majority of all the ordinary members.

- 3.9.5 An associate member is entitled fully to participate in the work of the authorized committees and receive all relevant papers. In addition, it may be authorized to participate in the work of such other committees as may be decided in General Assembly.
- 3.9.6 Art. 4.1 of the Rules applies to associate members. Representatives of the associate members shall have the right to take part in the discussions at the General Assembly relevant to the TCs in which they participate. However, they have no vote in the General Assembly.
- 3.9.7 Associate membership shall be terminated in the cases listed in Art. 5.1 ; Art. 5.2 to 5.5 also apply.
- 3.9.8 The membership fee for associate members is one half of the fee for ordinary members. Rule 8 applies to associate members.

#### Art. 4 ACCEPTANCE OF NEW MEMBERS

- 4.1 Application for membership shall be made to the Secretariat.
- 4.2 Decisions on compliance with conditions shall be made by a two-thirds majority of all the ordinary members.
- 4.3 When it has been decided that the conditions are complied with, the applicant shall be admitted to the relevant class of membership.

#### Art. 5 TERMINATION OF ORDINARY MEMBERSHIP

- 5.1 Ordinary membership shall be terminated in the following cases:
  - a. Withdrawal upon written notice given to the Secretary General, to take effect on receipt.
  - b. The company ceasing to exist.
  - c. The conditions for membership set forth in Articles 3.5 and 3.6 of the present By-Laws no longer being complied with.
  - d. In the opinion of two-thirds of all the ordinary members the conditions set forth in Articles 3.3, 3.4 and 3.7 no longer being complied with.
  - e. By expulsion for violation of By-Laws and Rules or for any other conduct prejudicial to the interest and correct functioning of the Association.
- 5.2 No member may be expelled for failure to adhere to one or several agreed standards.

- 5.3 Any proposal to expel a member must be backed by at least one-fifth of all the ordinary members. The proposal to expel must be on the agenda for the General Assembly at which it is to be discussed so as to give the member the opportunity to present its case.
- 5.4 A two-thirds majority of all the ordinary members is necessary to expel a member. Such expulsion will become effective 15 days after notification by registered mail.
- 5.5 Notwithstanding Article 4.3 a member which has been expelled can only be re-admitted on a two-thirds majority of all ordinary members.

#### Art. 6 STRUCTURE

- 6.1 The Association shall consist of :
- a. The General Assembly.
  - b. The Management.
  - c. The Co-ordinating Committee.
- 6.2 The General Assembly of the ordinary members shall be the highest authority of the Association. It shall control the Association and appoint and control its Management.
- 6.3 The Management shall consist of a President and a Vice-President. The Management shall be discharged by the President or, if circumstances require, by the Vice-President.
- 6.4 The President and the Vice-President shall be individuals elected for one year by the ordinary members at a General Assembly. Only representatives of ordinary members can be nominated. The President and the Vice-President can be re-elected any number of times provided that neither serves more than two consecutive years.
- 6.5 The President shall, through his signature, commit the Association in any business or transaction directly connected with the purpose of the Association.
- 6.6 There shall be a Treasurer whose duty shall be determined by the General Assembly. The Rules set out in 6.4 shall apply to this office.
- 6.7 The Co-ordinating Committee shall comprise 6 members and make recommendations to the General Assembly regarding the formation, activities, reorganization or dissolution of Technical Working Committees.

#### Art. 7 GENERAL ASSEMBLY

- 7.1 The President will each year call at least two ordinary General Assemblies of the ordinary members. Written notice of the time and

place of the Assembly shall be given at least thirty days before the date of the Assembly. The Agenda and supporting documents for the Assembly shall be circulated at least fifteen days before the Assembly.

- 7.2 Unless otherwise restricted by these By-Laws or the Rules of the Association, any action required or permitted to be taken at an Assembly may be taken without a meeting, provided that no ordinary member opposes such a procedure within 20 days from the mailing date.
- 7.3 Special General Assemblies for any purpose or purposes unless otherwise prescribed by these By-Laws or the Rules of the Association may be called by the President, and shall be called by him, at the request in writing of at least one-fifth of all the ordinary members. Such request shall state the purpose or purposes of the proposed assembly. The business transacted at any special assembly shall be limited to the purposes stated in the notice.
- 7.4 Written notice of Special General Assemblies stating the time, place and object thereof, shall be given to each ordinary member at least twenty days before the date of the Assembly and shall include the agenda and supporting documents for the Assembly.
- 7.5 A majority of all the ordinary members must be present or represented by proxy at any General Assembly, in order to constitute a quorum for transaction of the business except as otherwise provided by these By-Laws or the Rules of the Association.
- 7.6 Unless otherwise prescribed by these By-Laws or the Rules of the Association, the vote of the majority of all the ordinary members shall decide any question.

#### Art. 8 PROMULGATION OF STANDARDS

- 8.1 Promulgation of standards by the Association shall require approval by at least two-thirds of all the ordinary members. Proposed draft standards must be circulated by the Secretary General at least 4 months in advance of the General Assembly at which they will be voted upon.
- 8.2 It is not obligatory for members to follow any standard.
- 8.3 All standards when approved shall be made available to all interested parties without restriction.

#### Art. 9 AD HOC COMMITTEES

- 9.1 The General Assembly may delegate authority for specific purposes to ad hoc committees. The tasks, terms of reference and membership

of these committees will be adopted if a majority of all the ordinary members assent.

- 9.2 Unless otherwise decided at the time of its appointment each ad hoc committee may co-opt additional members should it so desire.
- 9.3 No ad hoc committee may meet for more than one year without being reappointed.

#### Art. 10 SECRETARIAT

- 10.1 There shall be a permanent Secretariat of the Association responsible to the General Assembly.
- 10.2 A Secretary General shall be appointed by the General Assembly and shall be responsible for the operation of the Secretariat.

#### Art. 11 TECHNICAL WORKING COMMITTEES

- 11.1 Technical working committees will be formed by the Secretary General when so decided at a General Assembly.
- 11.2 Any ordinary member may participate in any technical working committee.

#### Art. 12 FISCAL YEAR

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

#### Art. 13 FINANCE

- 13.1 The annual budget of the Association shall be approved by at least two-thirds of the ordinary members present or represented at an ordinary General Assembly.
- 13.2 The Association shall be financed by an equal levy on all ordinary members. The fees are set by the ordinary members during an ordinary General Assembly and based on the current year budget. Such fees shall be used to finance the activity of the Association and its administrative expenses and shall not be returnable.
- 13.3 The Secretary General will be responsible for expenditures within the budget.
- 13.4 The President may authorize expenditures outside the budget to an amount not exceeding 10 per cent of the corresponding item in the current year budget. Any expense above this must be approved by the ordinary members.

#### Art. 14 DISSOLUTION

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

#### Art. 15 AMENDMENTS

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

#### Art. 16 LITIGATION

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

## Rules of the Association

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### 1. LANGUAGE

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

### 2. SYSTEM OF MEASUREMENTS

- 2.1 The metric system of measurements will be used.

### 3. MINIMUM PERIOD OF MEMBERSHIP

- 3.1 There is no minimum period of membership.

### 4. REPRESENTATION OF MEMBERS

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

### 5. GENERAL ASSEMBLIES

- 5.1 Representatives may invite additional individuals from their respective member company to participate in an advisory capacity at a General Assembly.
- 5.2 The members entitled to attend and vote at a General Assembly may be represented by a proxy. A written proxy shall be established indicating the item or items of the agenda to which it is restricted.
- 5.3 The President or in his absence the Vice-President shall preside at all General Assemblies. In absence of both, the members present or represented by proxy shall elect a Chairman for that particular meeting.

### 6. CO-ORDINATING COMMITTEE

- 6.1 An ad hoc Committee consisting of individuals elected by the General Assembly will be set up under the name of Co-ordinating Committee, whose terms of reference will be as follows:
- 6.1.1 To prepare terms of reference for new Technical Working Committees in accordance with the rules for the formation of a Technical Working Committee.
- 6.1.2 To nominate a provisional Chairman and Vice-Chairman for each new Technical Working Committee.
- 6.1.3 To review from time to time the terms of reference given to Technical Working Committees.

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

6.2 The members and the Chairman of the Co-ordinating Committee shall be individuals elected for one year at a General Assembly by the ordinary members, they can be re-elected any number of times. Only representatives of ordinary members can be nominated.

## 7. TECHNICAL WORKING COMMITTEES

7.1 Formation of Technical Working Committees:

7.1.1 Technical Working Committees will be formed by the Secretary General when so decided at a General Assembly.

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

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

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

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

7.2.1 All members of ECMA are entitled to send one or more representatives to any TC, but no member Company may have more than one vote. These representatives must be employees of the member Company. Anyone else can attend a meeting only at the special invitation of the Committee as a whole.

7.2.2 Voting shall be by simple majority of member Companies present at the meeting.

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

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

7.2.5 At the first meeting of the TC which takes place after the end to the initial period, a definitive Chairman and Vice-Chairman shall be elected.

7.2.6 The Chairman and Vice-Chairman, having been elected, shall hold office for a term of 12 months. They shall be eligible for re-election, subject to a maximum consecutive term of office of 3 years.

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

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

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

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

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

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

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

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

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

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

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

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

7.2.19 In the interest of economy and efficiency, alternate meetings will be held in Geneva.

### 7.3 Task Groups

7.3.1 Technical committees may form Task Groups for the accomplishment of specific tasks within the scope of the committee.

7.3.2 At least two members of the committee should agree to take an active part in the work of the Task Groups.

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

7.3.4 Task Groups shall report at each meeting to the committee on their activities; these reports shall appear in the minutes of the committee.

## 8. MEMBERSHIP FEES

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

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

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

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

## 9. OPERATING EXPENSES

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

9.2 Expenses of members including those connected with ad hoc and Technical Working Committees 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

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### 1. POLICY

General Declaration :

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

- 1.1 In case the proposed Standard is covered by issued patents of ECMA members only:  
Members of the General Assembly are asked to state the Company licensing policy with respect to these patents.
- 1.2 In case the proposed Standard is covered by issued patents by non ECMA members : A written statement from the patentee is required, according to which he is prepared to grant licences on a reasonable, non-discriminatory basis.  
The General Assembly and/or the Management shall decide in this case which steps must be undertaken in order to obtain such a statement.
- 1.3 In case the proposed Standard is covered by patent applications of ECMA members (which is not known, neither during the work of the TC nor at the time of the vote in the General Assembly) :
  - 1.3.1 Each member of the TCs and/or of the General Assembly of ECMA will determine whether any proposed standard may be covered by any patent for which his company has a pending application, if such a patent application exists, his continued participation to the relevant committee will imply that such a patent, when obtained later, will be made available from his company for licensing on a reasonable, non-discriminatory basis.
  - 1.3.2 Each member of the TCs and/or of the General Assembly of ECMA will determine whether any proposed standard may be covered by any patent for which his company has a pending application; if such a patent application exists, the favourable vote of the Company to the General Assembly will imply that such a patent, when obtained later, will be made available from his company for licensing on a reasonable, non-discriminatory basis.
- 1.4 In case the proposed Standard is covered by patent applications of third parties (which is not known during the work of the TC nor at the time of the vote in the General Assembly) :  
In this case practically nothing can be done at the time of the vote. When afterwards said patents are issued, it should be tried to obtain reasonable, non-discriminatory licences. If this proves to be impossible, the standard will have to be cancelled.

## 2. PROCEDURE

- 2.1 The questions related to protective rights are in the competence of the General Assembly of ECMA and should not be discussed at the TC level.
- 2.2 With each draft standard submitted four months ahead of a General Assembly, the Secretary General shall ask, by registered mail, all members to state within two months whether they claim any issued protective rights covering the subject matter of the proposed standard and/or have knowledge of such rights of third parties.
- 2.3 Replies to this request will be circulated in due time before the General Assembly.
- 2.4 Where an answer is not received from a Company, the General Assembly may proceed to a vote on the assumption that this Company will act in accordance with the General Declaration, that is to license possible relevant issued patents on a reasonable and non-discriminatory basis.

Adopted at the General Assemblies of March 29, 1963 and June 2, 1966.

## Publications

Free copies of all documents listed below are available upon request:

### ECMA Standards (Blue cover)

- |   |              |
|---|--------------|
| <b>ECMA-2</b> — Subset of ALGOL 60 — ECMALGOL   | (April 1965) |
| <b>ECMA-3</b> — CMC7 Printed Image Specification, 2nd Edition   | (Sept. 1966) |
| <b>ECMA-4</b> — Flow Charts, 2nd Edition  | (Sept. 1966) |
| <b>ECMA-5</b> — Data Interchange on 7-Track Magnetic Tape, 3rd Edition  | (June 1970)  |
| <b>ECMA-6</b> — 7-Bit Input/Output Coded Character Set, 4th Edition   | (Aug. 1973)  |
| <b>ECMA-8</b> — Nominal Character Dimensions of the Numeric OCR-A Font  | (April 1965) |
| <b>ECMA-10</b> — Data Interchange on Punched Tape, 2nd Edition  | (July 1970)  |
| <b>ECMA-11</b> — Alphanumeric Character Set OCR-B for Optical Recognition, 3rd Edition  | (March 1976) |
| <b>ECMA-12</b> — Data Interchange on 9-Track Magnetic Tape at 32 bits per mm (800 bpi), 2nd Edition                                 | (June 1970)  |
| <b>ECMA-13</b> — Magnetic Tape Labelling and File Structure for Information Interchange, 2nd Edition                                | (Aug. 1973)  |
| <b>ECMA-14</b> — Rules for the Definition of 4-Bit Sets Derived from the ECMA 7-Bit Coded Character Set                             | (Nov. 1967)  |
| <b>ECMA-15</b> — Printing Specifications for Optical Character Recognition, 2nd Edition   | (Aug. 1975)  |
| <b>ECMA-16</b> — Basic Mode Control Procedures for Data Communication Systems using the ECMA 7-Bit Code, 2nd Edition                | (June 1973)  |
| <b>ECMA-17</b> — Graphic Representation of the Control Characters of the ECMA 7-Bit Coded Character Set for Information Interchange | (Nov. 1968)  |
| <b>ECMA-18</b> — Printing Line Position on Single Line Documents  | (Nov. 1968)  |
| <b>ECMA-19</b> — Coding of Character Sets for MICR and OCR  | (June 1969)  |
| <b>ECMA-21</b> — Character Positioning on OCR Journal Tape  | (June 1969)  |

- ECMA-22** — Electrical Safety Requirements for Data Processing Machines (June 1969)
- ECMA-23**—Keyboards Generating the Code Combinations of the Characters of the ECMA 7-Bit Coded Character Set, 2nd Edition (Jan. 1975)
- ECMA-24** — Code Independent Information Transfer (An Extension to the Basic Mode Transmission Control Procedures) (Dec. 1969)
- ECMA-26** — Recovery Procedures (An Extension to the Basic Mode Control Procedures for Data Communication Systems) (April 1971)
- ECMA-27** — Abort and Interrupt Procedures (An Extension of the Basic Mode Control Procedures for Data Communication Systems) (April 1971)
- ECMA-28** — Multiple Station Selection Procedures (An Extension of the Basic Mode Control Procedures for Data Communication Systems) (April 1971)
- ECMA-29** — Conversational Information Transfer (An Extension of the Basic Mode Control Procedures for Data Communication Systems) (Sept. 1971)
- ECMA-30** — OCR-B Subsets for Numeric Applications, 2nd Edition (March 1976)
- ECMA-31** — Mechanical Safety Requirements for Data Processing Machines (Sept. 1971)
- ECMA-32** — Mechanical, Physical and Magnetic Characteristics of Interchangeable 6-Disk Packs (Sept. 1971)
- ECMA-33** — Track Format Characteristics of Interchangeable 6-Disk Packs (Sept. 1971)
- ECMA-34** — Data Interchange on 3,81mm Magnetic Tape Cassette (32 bpmm, Phase Encoded), 2nd Edition (July 1973)
- ECMA-35** — Extension of the 7-Bit Coded Character Set (Dec. 1971)
- ECMA-36** — Data Interchange on 9-Track Phase Encoded Magnetic Tape at 63 bpmm (1600 bpi) (Dec. 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) (Sept. 1973)

- ECMA-39** — Track Format Characteristics of Interchangeable Single Disk Cartridges (Top Loaded) (Sept. 1973)
- ECMA-40** — High-Level Data Link Control Procedures (HDLC) — Frame Structure (Dec. 1973)
- ECMA-41** — Magnetic Tape Cassette Labelling and File Structure for Information Interchange (Dec. 1973)
- ECMA-42** — Alphanumeric Character Set for 7 × 9 Matrix Printers (Dec. 1973)
- ECMA-43** — 8-Bit Coded Character Set (Dec. 1974)
- ECMA-44** — Implementation of the ECMA 7-Bit and 8-Bit Coded Character Sets on Punched Cards (Sept. 1975)
- ECMA-45** — Data Interchange on Magnetic 12-Disk Packs (100 Mbytes) (Sept. 1975)
- ECMA-46** — Data Interchange on 6,30 mm Magnetic Tape Cartridge (63 bpmm, Phase Encoded) (March 1976)
- ECMA-47** — Limits and Measurement Methods for Radio Interference from EDP Units (March 1976)

#### Other Documents (White cover)

- A Set of I/O Procedures for ECMALGOL (Jan. 1967)
- Recommended OCR Paper Specification (March 1970)
- Formal Definition of the Syntax of COBOL (Sept. 1970)
- Continuous Sprocket-Punched Stationery Part I (Recommended Sizes) (April 1973)
- Continuous Sprocket-Punched Stationery Part II (Physical Properties, Fastenings, Packaging and Storage) (March 1972)
- Safety Requirements for Data Processing Machines (Fire Protection — Physical Safety — Chemical Safety) (March 1972)
- Continuous Stationery in Roll Form (June 1972)
- Suggestions for a Disk Labelling System (June 1972)
- Recommended Sizes of Forms for Optical Reading (June 1972)
- Implementation of Standard ECMA-8 for the Nominal Character Dimensions of the Numeric OCR-A Font with 9 × 9 Matrix Printers (Dec. 1973)

