Information and communications technologies in Europe

Commission of the
European Communities
Directorate-General XIII
Telecommunications, Information
Industries and Innovation

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Contents

Preface 5

INFORMATION AND COMMUNICATIONS TECHNOLOGIES — A STRATEGIC CHALLENGE 6

- Europe's position 8
- The added value of Community action 10

ELECTRONIC INFORMATION AND COMPUTER INDUSTRY 16

- Esprit, the key to reviving European technology 18
- The new specific programme of R&D in the field of information technology 22
- The challenge of high-definition television 27

TELECOMMUNICATIONS POLICY 30

- A double challenge 32
- Europe's response 35
- RACE and the specific programme of R&D in communications technology 41

EUROPE-WIDE COMMUNICATIONS NETWORKS 48

- Towards a European nervous system: the specific programme of R&D in the field of telematic systems in areas of general interest 50
- Public authorities 50
- Transport services 55
- Health care 55
- Distance learning 56
- Libraries 57
- Linguistic research and engineering 57
- Rural areas 58

ACROSS-THE-BOARD ACTIVITIES 60

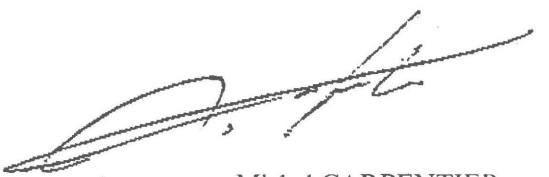
- Standardization 62
- Promoting innovation and the optimum use of R&D 65
- Promoting information services 66
- Data protection 68
- International aspects 71

The closing years of the twentieth century will see a constant increase in new information and communications services and equipment in Europe. As we move ever more rapidly into an age when electronics renders geography a factor of diminishing importance, the convergence of previously separate techniques and services will bring home the full and remarkable range of possibilities offered by these new technologies, in daily life, for industry and for society at large. In an area of such far-reaching significance, Europe is determined to play its rightful role at world level.

In 1986 the Commission of the European Communities created a Directorate-General, DG XIII, with the responsibility of developing initiatives to strengthen the competitivity of the information and communications technology industry in Europe and to promote the multiple applications of these technologies. The programmes and other activities described in this publication derive from the work of DG XIII.

It will be clear from what follows that all aspects of electronic information are covered, from capture and storage to processing and transmission. At the same time, the work of Directorate-General XIII has a specific character: besides standardization and regulatory questions, it includes various activities under the European Community Treaties such as the implementation of research and development programmes and international trade negotiations.

This publication is intended for a wide readership, from the non-specialists to the researchers, engineers, politicians, journalists, students and academic professionals with a practical or personal interest in the construction of Europe and the emergence of this new information and communications society. Developing in parallel, they are inter-related.



Michel CARPENTIER
Director-General

INFORMATION AND COMMUNICATIONS TECHNOLOGIES — A STRATEGIC CHALLENGE

Expertise in information and communications technologies is of worldwide strategic importance. By the year 2000 the annual turnover of the electronics, computer and communications industries is expected to be some ECU 2 000 billion, constituting the world's leading industrial sector. These are 'enabling' technologies: they are progressively infiltrating the whole of our economic and social activity and becoming an integral part of development strategy.

Information and communications technologies have a major impact on the competitiveness of the whole of the modern economy, economic growth and the level of employment. They are therefore of crucial importance to the success of the 1993 economic and social area, essential factors enabling Europe to control its own destiny.

These technologies are increasingly providing society with a new form of intangible wealth — information — which is transforming the way we organize our work and our lives; they are influencing a growing number of activities in fields as far apart as education, health, transport and communications. In short, they are affecting the whole of society.

Europe's position

The following figures give an idea of the importance of information and communications technologies:

(i) World production of electronic goods, excluding the Eastern Bloc countries, totalled USD 904 billion in 1990, and is expected to reach USD 1 000 billion by 1992. Information and communications technologies already contribute about 5% of world GDP and about 8% of the GDP of the industrialized countries. Their importance is set to increase, thanks especially to the rapid development of telecommunications.

(ii) Between now and the year 2000, information and communications technologies will be one of the main sources of technological progress. They will also be the most 'enabling': two out of three people will use their products and services at work.

(iii) Information and communications technologies are growing faster than any other industrial sector: at 9% worldwide and 10% in the Community, the average annual growth rate is about twice as high as that of the world economy in general. World market growth rates over the next five years will vary from product to product: an average of 6% a year for consumer electronics, 9% for computers, 11% for integrated circuits and 15% for software.

The semiconductor industry, which has existed for less than 30 years, is a good example of this rate of growth: world production, which totalled ECU 55 billion in 1989, is expected to reach ECU 110 billion in 1994.

(iv) World research and development (R&D) expenditure on information and communications technologies increased from ECU 35 billion in 1985 to about ECU 90 billion in 1990.

How is Europe's[1] performance to be rated in this rapidly expanding sector? It occupies a medium position: European production accounted for 25% of the world market in 1990, but there was an alarming trade deficit, totalling ECU 34 billion for the electronics sector as a whole in 1990.

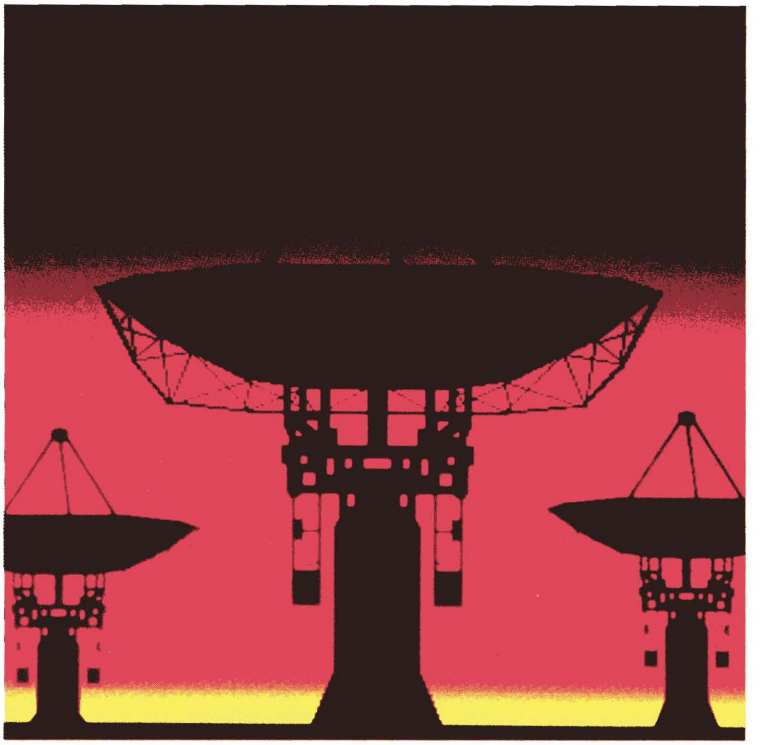
Although it has gained substantial market shares since 1985, the European electronics industry is finding it difficult to remain competitive against a background of very fierce competition on the world market. The many reasons for this include its dependence on imports of microelectronics and computer peripherals, the fact that some sectors are still too small to cope with the growing need for massive investment which must be recouped over very short periods, a market which is still too fragmented, and competitiveness which sometimes falls short of the world level.

Thus in the strategically important semiconductor industry, Europe was responsible for just 10% of world production in 1989 and used just 17% of this world output. The latter figure reveals the comparative weakness of European industries which use semiconductors, such as consumer electronics and peripherals.

On the other hand, in 1989 Europe was still the world's leading producer of telecommunications equipment. Europe has also retained solid positions in medical electronics, professional electronics, and computer services and software.

Europe is spending too little on R&D in information technologies: 55% of world expenditure is American, 27% Japanese and only 18% European. Community R&D is highly concentrated in a few Member States, four of which (Germany, France, United Kingdom and Italy) account for nearly 80% of Community R&D in information and communications technologies.

1 European Community plus the countries of the European Free Trade Association (EFTA).



Close analysis of the situation in Europe shows that after a long period of uncertainty and hesitation Europe is now on the road to recovery and is making more determined and coordinated use of its assets. The technological base of European industries improved between 1985 and 1989. The level of investment expressed as a percentage of turnover doubled to equal that of the United States (14%).

With a total GDP of ECU 4 200 billion in 1988 and a current population of 340 million, the European Community is today the largest market in the world. (The GDP of the United States is ECU 4 300 billion and that of Japan is ECU 2 600 billion). Industrial output is second only to that of the United States, and Europe's share of world trade is equivalent to 1.2 times that of the United States and twice that of Japan. The Community also has considerable technological resources. Up to now, however, little use has been made of this potential, basically owing to the Community's fragmentation. The main effects of this have been difficulty in funding the investment needed, duplication of research and development, low mobility among researchers, uncoordinated development of R&D strategies and of telecommunications networks and services, the existence of national markets of subcritical size, and major disparities in technical standards.

The added value of Community action

In order to meet all these challenges and make optimum use of Europe's collective resources, the Community adopted a comprehensive strategy in the early 1980s, conceived and implemented in close collaboration with industry and the research world. Its basic objective is to bring the added value of the European dimension to existing private and national efforts, so as to place the industries and services which produce and use information and communications technologies in the best possible competitive position. This approach means going beyond individual approaches, such as certain nationally oriented R&D and production structures which prevailed in the past.

The strategy adopted by the Community forms a coherent whole; in recent years it has mainly been aimed at:

(i) enabling European industry to increase its competitiveness by stepping up precompetitive R&D on a cooperative basis;

(ii) helping to set up a vast, solid internal market by promoting standardization and opening up procurement;

(iii) speeding up the marketing of new technologies by implementing programmes for the application of information technologies;

(iv) establishing a European telecommunications policy;

(v) paving the way for a society where a leading part will be played by information as a raw material, by consultation with the social partners and a training effort in the new technologies;

(vi) enabling the least developed regions of the Community to have access to new technologies, so as to increase Community cohesion in the information and communications technologies sector;

(vii) seeking a consensus among the Member States in negotiations with non-EEC countries.

The Single European Act, which entered into force in 1987, helped underpin this strategy. It brought with it a whole set of amendments to the Treaties establishing the European Communities, with the aim of making real progress towards European Union. In particular, it gives the Community a major new objective, that of strengthening the scientific and technological base of European industry so as to encourage it to become more competitive at international level (Article 130f).

In order to achieve this objective, the Single Act sets up a special instrument: a multiannual framework programme of research and technological development, which lays down the scientific and technical objectives, defines their respective priorities and, above all, fixes the amount deemed necessary for achieving them.

The third framework programme (1990-94), adopted by the Council on 23 April 1990, has an overall budget of ECU 5.7 billion, including ECU 2 221 million for information and communications technologies, the other budget headings covering R&D in a range of areas including the environment, health, biotechnology and energy (see p. 13). The second framework programme (1987-91) had a budget of ECU 5.4 billion, including ECU 2 275 million for information and communications technologies. The two programmes overlap in 1990 and 1991, thus ensuring the continuity of Community activities.

Directorate-General XIII of the Commission has been given the task of implementing Community policy in this vast field. It is divided into six Directorates (see p. 15). Far from acting in isolation, DG XIII operates together with all the other Directorates-General within the framework of the Commission's overall endeavour to make European industry competitive and make a success of the single market. Activities in the educational field, to promote SMEs, to encourage R&D in other areas, to defend the Community's standpoints in respect of non-member States and to complete the large market are all closely linked to and complement the activities of DG XIII.

The Commission's action in the IT and telecommunications field would not be what it is without the support and active participation of a variety of partners, including the Member States, industry, the research sector and the universities. It is with their concerted action and their cooperation that the European Community is meeting the challenge of information and communications technologies.

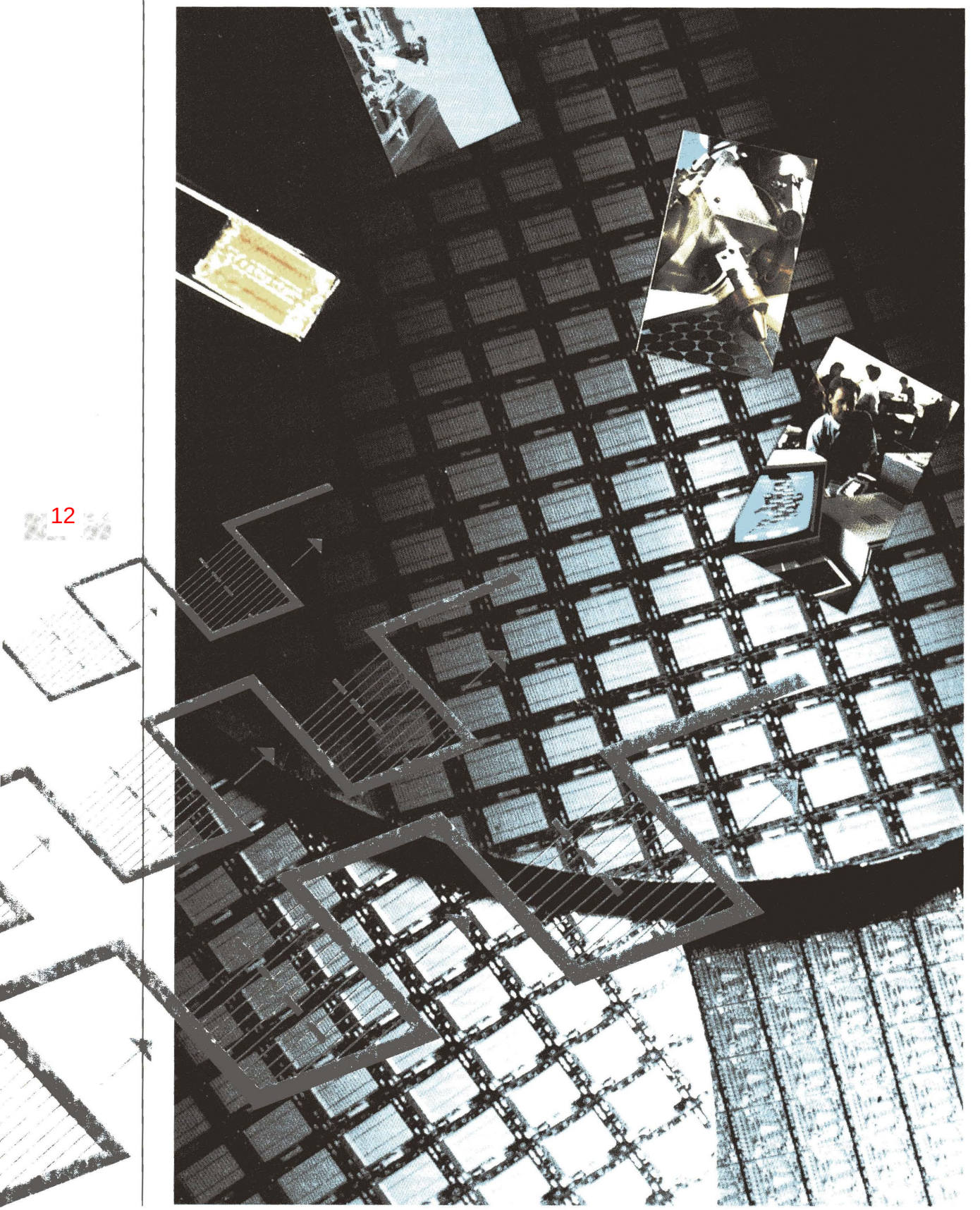
For consistency and clarity in what follows, the various aspects of the Community strategy have been grouped under four main headings:

(i) the electronic information and computer industry,

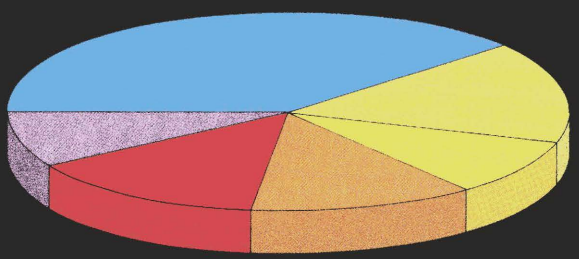
(ii) telecommunications policy,

(iii) information services,

(iv) across-the-board activities.



Framework programme of Community research and technological development (1990—94)



(million ECU)

I. Enabling technologies

1. Information and communications technologies — 2 221
   - — Information technologies — 1 352
   - — Communications technologies — 489
   - — Development of telematic systems in areas of general interest — 380

2. Industrial and materials technologies — 888
   - — Industrial and materials technologies — 748
   - — Measurement and testing — 140

II. Management of natural resources

3. Environment — 518
   - — Environment — 414
   - — Marine science and technology — 104

4. Life sciences and technologies — 741
   - — Biotechnology — 164
   - — Agricultural and agro-industrial research — 333
   - — Biomedical and health research — 133
   - — Life sciences and technologies for developing countries — 111

5. Energy — 814
   - — Non-nuclear energy — 157
   - — Nuclear fission safety — 199
   - — Controlled nuclear fusion — 458

III. Management of intellectual resources

6. Human capital and mobility — 518

Total — 5 700

DG XIII organization chart
Telecommunications, Information Industries and Innovation

Administrative unit
Strategic and general economic aspects of programmes, technology watch and liaison with Eureka

Directorate A
Information technology and Esprit

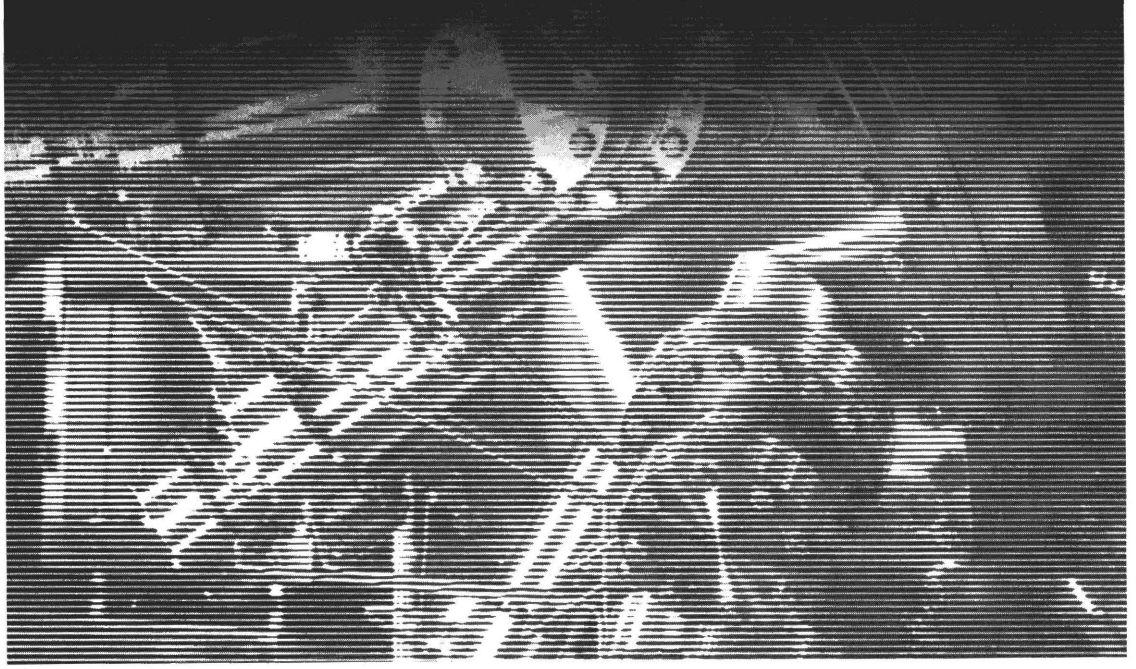
Directorate B
Information industry and market

Directorate C
Exploitation of research and technological development, technology transfer and innovation

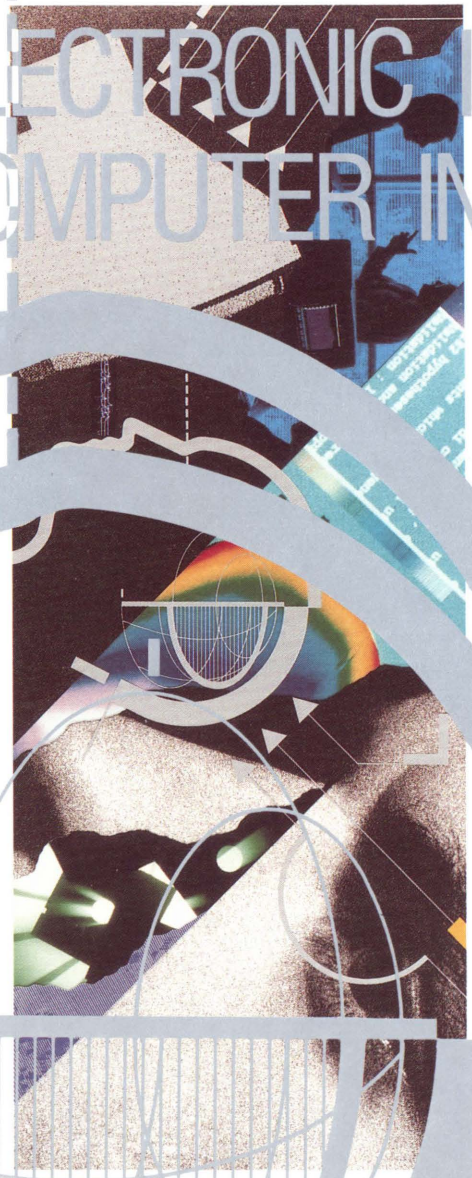
Directorate D
Telecommunications policy

Directorate E
General affairs

Directorate F
RACE programme and development of advanced telematics services



ELECTRONIC INFORMATION AND COMPUTER INDUSTRY



Information technologies have two quite different characteristics. On the one hand they constitute an increasingly important industry producing a complex range of goods and services: components, computers, consumer electronics, software, computer advisory services, etc. On the other hand they are a vehicle for generic, enabling technologies which are incorporated in products and services produced or used in a whole range of economic activities which thereby become more competitive. They also open up new areas of research and development, especially in high-technology fields (biotechnology, new materials, etc.).

Expertise in these technologies is therefore essential for the future of our societies. Staying in the race will require substantial — and growing — human and financial resources, particularly for research and development (R&D).

Facing up to these challenges will require a variety of actions. The Community started at the base by stimulating cooperation between European bodies — industries, research centres and universities — active in precompetitive generic R&D[1] in order to raise their technological level: that is the object of the Esprit programme and the specific information technologies programme under the new Community framework R&D programme (1990-94).

Developments in the world computer and electronics industry demonstrate the growing interdependence of the various families of technologies and the need to develop increasingly comprehensive strategies. An example of this is high-definition television, which brings together many different information and communications technologies and on which the future of the European consumer electronics industry is highly dependent. The Community has developed a programme in this area.

Esprit, the key to reviving European technology

The Esprit programme (European strategic programme for research and development in information technologies) is the biggest Community R&D programme undertaken to date. It was launched in February 1984 for a period of 10 years, with three aims:

(i) to provide European industry with the basic technologies needed to be competitive on international markets in the following fields: microelectronics, software technology, advanced information processing, office automation systems and computer-integrated manufacturing;

(ii) to promote cooperation in the field of information technologies between industrialists, research centres and universities in the Member States and now, in the second phase of Esprit, in the EFTA countries;

(iii) to help draw up and achieve international recognition for the technical standards essential for the development of information technologies.

Esprit is not only a key programme of the Community strategy but also a model. It has helped test a new, dynamic way of using Community funds to enhance cooperation between the worlds of industry and science. The Esprit arrangements have inspired a wide range of Community R&D programmes such as RACE (telecommunications).

How does Esprit work? It funds R&D projects associating at least two industrial partners from different Member States, possibly joined by research institutes and universities. Calls for proposals are published in the *Official Journal of the European Communities;* the proposals received are appraised by groups of independent experts and contracts are concluded with those selected. The Community provides 50% of project funds, while the participants are required to find the other 50%. All partners in a given project have equal access to the results of the project.

[1] Precompetitive research does not go beyond the production of prototypes. In other words, the industrial application and marketing of products, processes and services resulting from Community precompetitive R&D programmes depend exclusively on programme participants and market forces.

Implementation of the Esprit programme was divided into two five-year phases — Esprit I finished at the end of 1988. Its overall budget was ECU 1.5 billion, half of which came from the Community budget. It involved some 3 000 researchers. The overall budget of Esprit II (1988-92) is more than twice as big — ECU 3.2 billion — and nearly 6 000 researchers are involved.

This second phase continues and develops the activities of Esprit I; the main thrust continues to be precompetitive R&D. However, a number of changes have been made.

(a) More emphasis is placed on the industrial nature of the programme, with funds being concentrated in three areas in order to:

(i) create a lasting European capability in the field of advanced components, and in particular application-specific integrated circuits (ASICs);

(ii) provide the technology necessary for the next generation of information processing systems;

(iii) enhance the capabilities of European industry to integrate information technologies into complete systems which can be used in a broad range of applications.

One consequence of this development is enhanced cooperation between makers and users in many projects: more than 170 user groups are participating in Esprit II. Another consequence is the appearance of new fields such as home automation.

However, this emphasis on industry must not be at the expense of fundamental knowledge. For this reason Esprit II has a new component — basic research — covering three broad fields: microelectronics, information sciences, and artificial intelligence and cognitive sciences. Examples of the work carried out in these fields are superconductivity, optical computing and neural networks. More than 3 000 European researchers are involved.

(b) Another major development is the attention which Esprit II pays to training researchers. This takes the form of an operation to train some 3 000 engineers to design very large-scale integrated (VLSI) circuits and a similar operation to develop the skills of European researchers in the field of parallel computing.

(c) Esprit II is open to organizations in the EFTA countries. However, the latter do not benefit from Community financial assistance.

Since the launch of the second phase of Esprit in 1988, 1 457 organizations have participated in the programme. This includes 600 small and medium-sized enterprises — SMEs have been involved in 67% of projects.

Organizations involved in Esprit II since 1988

Large companies	*350*
SMEs	*612*
Universities	*334*
Research institutes and others	*161*

The achievements of Esprit

The average duration of a typical project being four to five years, many results became available in 1988 and 1989. By the end of 1989 a total of 313 significant results had been recorded. These break down as follows:

152 contributed directly to the marketing of specific products and services;

118 produced tools and methods resulting in improvements in manufacturing and production processes;

43 made a substantial contribution to the preparation of international standards.

The achievements of Esprit go beyond the immediate technological results.

Esprit has succeeded in promoting a system which will henceforth be a model for the methods and objectives of Europe-wide cooperation. It has given industry, the universities and research centres the chance to establish a firm technological foundation for themselves in Europe by promoting the necessary synergy, by improving the cost-effectiveness of research and by speeding up projects.

'Esprit has produced many results but, far more importantly, it has enabled links to be established between companies and cooperation in industry.'
(Dr P. Pistorio, Chairman and Managing Director of SGS-Thomson Microelectronics)

Esprit has given rise to a true European Technology Community, the members of which are learning to work together, to appreciate each other and to discover the virtues of cooperation. Many universities have been encouraged to focus their research on areas with industrial applications.

A few examples of the outstanding achievements of the Esprit programme

(a) In advanced information processing, the Supernode project. This project led to the development of a modular parallel processing machine, the T800 Transputer, with a capacity of 1.5 million floating point operations or 10 million instructions per second, together with supporting systems software and demonstration applications.

'Esprit's success has been in allowing different partners to develop internationally competitive products where there are promising gaps in the market.'
G. Dudkiewicz, Chairman and Managing Director of the Telmat Group (France), a participant in the Supernode project

A range of very high-speed parallel computers using this transputer is already on the market. They offer a very competitive price/performance ratio and are proving particularly well-suited to numerous applications including image processing, simulation, computer-aided design and problem-solving in engineering. In 1989 more T800 Transputers were sold than any other 32-bit RISC microprocessor.

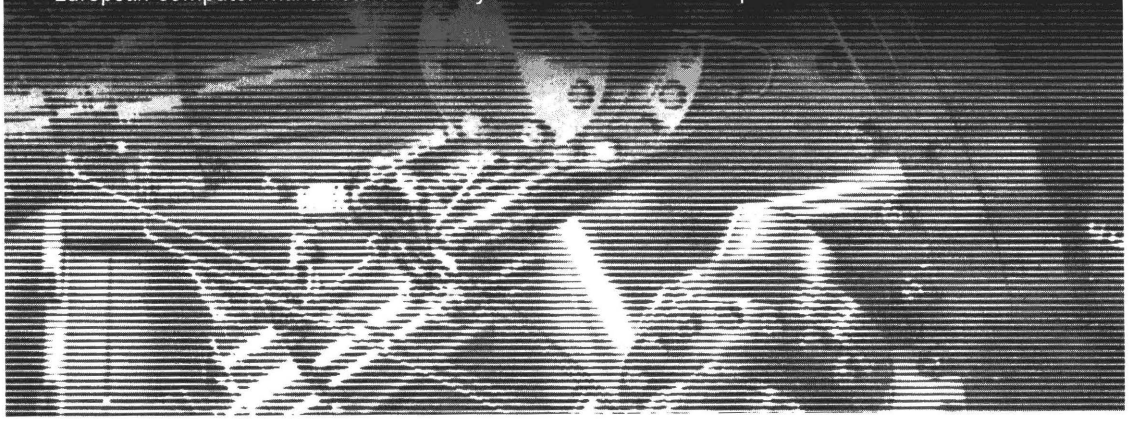
(b) In software technology, the PCTE (Portable common tool environment) programme. The software tools developed by the various projects in this programme are now used by all European computer manufacturers and by IBM. PCTE is in the process of becoming a world industrial standard.

(c) In computer-integrated manufacturing, the CNMA (Communications networking for manufacturing applications) project.
This project gives Europe a leading role in the establishment of standards for electronic communications in industry. Communications networks of this type are already up and running in BMW, British Aerospace and Aeritalica factories and others are to be installed at Renault, Magneti Marelli and Aerospatiale.

(d) In microelectronics, the Cathedral project was intended to reduce the size and design time of VLSI and ASIC chips. It enabled a 100 cm^2 compact disk printed circuit to be scaled down to a single 1 cm^2 chip. The design time for the circuit was reduced from a month to a week.

(e) Project 281 led to the development of world-class high-speed bipolar semiconductor technology. The process used permits circuit densities of more than 5 000 units per mm^2 with response times of just 70 picoseconds per port.

(f) The reception capacity of the opto-electronic component developed by project 263 enabled a world record to be beaten: it is capable of providing a video link over a distance of 10 km without the use of intermediate amplification.



New relations have been established between firms from the biggest and the smallest Member States.

Finally, and this is not the least of its successes, Esprit has given Europe's firms and research workers their confidence back and developed their technological ambitions. For example, many European researchers — particularly those working in the field of basic research — now tend to spend their sabbatical leave with their European partners, whereas they traditionally spent it outside Europe.

The new specific programme of R&D in the field of information technology

The third framework programme for research and technological development (1990-94) has a budget of ECU 1 352 million from Community funds to spend on R&D in the field of information technologies. Research will be carried out, on the basis of the work carried out under Esprit, in the following five areas.

1. Microelectronics

The main objective is to provide a broad range of users with microelectronic solutions tailored to their needs. As under Esprit II, emphasis is placed on application-specific integrated circuits (ASIC). A new subject is included — manufacturing science and technology — in order to produce better quality integrated circuits (ICs) at lower cost.

The work on IC technology will deal with both higher-density and higher-speed circuits and high-performance integrated circuits in order to achieve a 'chip system' enabling different characteristics such as analogue and digital functions, non-volatile storage, low voltage, power switching and captors to be combined on a single chip. Work on high-density ICs will be carried out in conjunction with the Jessi programme (see p. 24).

Jessi

The Joint European submicron silicon (Jessi) strategic programme was launched as a Eureka[1] project in 1986. Its aim is to make European industry capable of mass-producing future generations of intelligent chips. Its ultimate objective is the production by 1996 of dynamic memories with a capacity of 64 megabits (64 million individual information elements) on a single chip and 16 Mbit static memory chips. The intermediate objective is to develop dynamic memory chips with a capacity of 16 Mbits and static memories of 4 Mbit capacity by 1992.

After a preparatory phase which ended in February 1989, the programme itself will develop over eight years (1989-96) along four axes:

(i) technology: development of advanced technologies, both for memory chips and for the manufacturing sciences;

(ii) equipment and materials: R&D in semiconductor production equipment and processing materials;

(iii) application: computer-aided design (CAD) development tools and complex key integrated microelectronic systems;

(iv) basic research, long-term action designed to support the industrial objectives of the Jessi programme.

The total budget for the programme is estimated at around ECU 3.5 billion, in principle provided 50 % by the partners, 25 % by national governments and 25 % by the Community.

1 The Eureka programme was launched in 1985. It is not a Community programme, but an intergovernmental initiative involving 19 European countries and the Commission of the European Communities. Its aim is to improve cross-border cooperation in order to increase Europe's productivity and competitiveness on the world market in nine areas: energy, medical technology and biotechnology, communications, informatics, transport, new materials, robotics and the automation of manufacturing, lasers, environment. Projects are selected by those active in the industrial development field. They have the responsibility for securing the financing of these projects (govenment aid is possible, however). Eureka is resolutely geared towards the marketing of new, high-performance products.

2. Information processing systems and software

This work covers the main elements which will determine future systems: parallel architectures, improved interfaces (particularly man-machine interfaces), and systems for the perception and synthesis of information from very complex signals (in particular for voice recognition and image comprehension).

In order to overcome the constraints on European software production capabilities, work is needed to increase productivity and to promote tools and methods permitting improved systems integration. To meet this challenge, particular attention will be paid to the dissemination of modern design methods, the preparation of standardized modules and improvements in productivity, software quality and software security.

3. Advanced office automation and home automation systems, peripherals

The aim is to improve functional integration. As regards office automation, particular attention will be paid to the integration of mobile terminals and improving working conditions. For home automation, the R&D work is aimed at integrating information technologies in other construction functions such as security, protection of privacy, voice communication and document transmission, lighting and energy management.

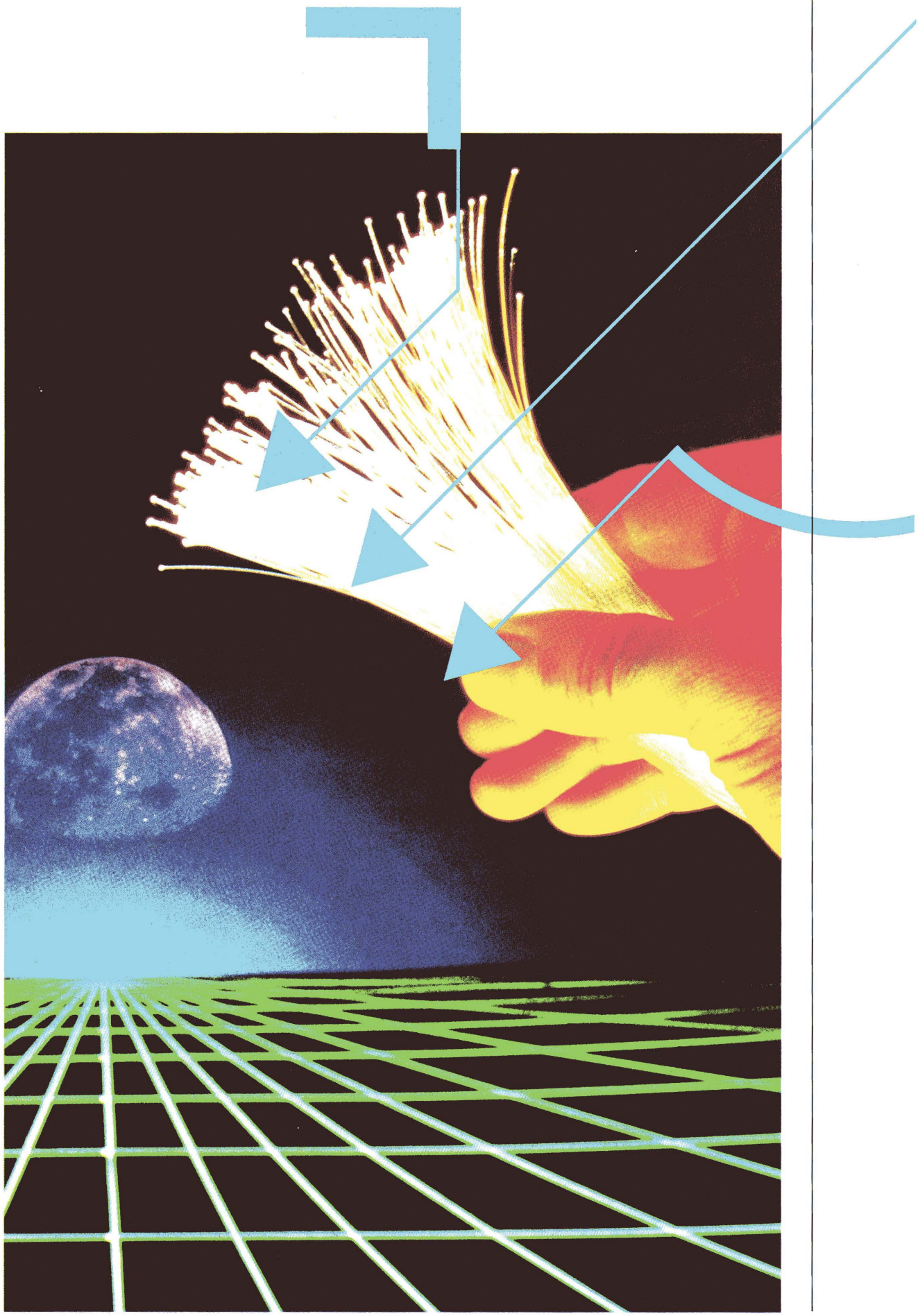
Peripherals are of major importance in both cases. The work will aim to improve their reliability and reduce costs. It will also cover the specific technologies used in printers, screens, data acquisition equipment and storage units (flat screen technology, magneto-optical storage systems, no-impact printing systems, etc.).

4. Computer-integrated manufacturing and engineering

The emphasis is on the technological base needed for open systems and multi-supplier environments and the integration of advanced information processing systems in engineering. The fundamental aim is to help users in small and medium-sized enterprises, which constitute the majority of engineering enterprises, and major users who are the first to apply new technology. A further aim is to encourage collaboration between users and suppliers and to pay particular attention to making industry cleaner.

5. Basic research

This work is clearly upstream of industrial R&D. The aim is to make progress in various fields including superconductivity, electronic circuits on the nanometric scale (e.g. research on the physical properties of organic and optical materials with high potential for use in information processing equipment and systems), the logical and algebraic foundations of computing, large-scale parallel systems, neural computers, etc.



The challenge of high-definition television

High-definition television (HDTV) is of utmost strategic importance. Europe's Heads of State or Government accordingly gave it political priority at the Rhodes Summit in December 1988.

The world market for television receivers will be worth some ECU 100 billion in 1992, and about one billion television sets should be in use worldwide by 1995. HDTV is a major economic challenge, offering the European consumer electronics industry a unique opportunity for revival. HDTV also has great influence on information technologies on account of its specific display requirements (colour tubes, projectors, flat screens, etc.), integrated circuits (especially image memories and highly complex integrated circuits for the reception, processing and control of signals) and software (for means of transmission). The future HDTV receiver will contain about five times as many semiconductors as a conventional television. HDTV will also have an impact on various allied sectors of industry: optical disks, data transmission, peripherals, etc.

HDTV is certain to find a wide range of industrial applications in medicine, publishing, education, computer-aided manufacturing, etc. It is a multi-media technology which should enable Europe to preserve its cultural plurality while extending its influence. Technological, economic, social and cultural issues are therefore at stake.

Commission activities

The Commission acted first of all in two complementary areas, by adopting a new broadcasting standard for satellite television, and by drawing up a proposal for a world production standard and promoting European HDTV technology.

With regard to broadcasting, the MAC system adopted by the Community in 1986 was introduced in 1989 on French and German satellites. The advantages it offers (the possibility of multiple sound channels and wide-screen format) pave the way for the transition to HDTV.

As regards production, the Commission supported the idea of compatibility, which is at the centre of the European approach and means that existing equipment will not automatically become obsolete. The Japanese proposal presented to the International Radio Consultative Committee (CCIR) meeting in 1986 did not satisfy this condition. Japanese HDTV is a completely separate new medium which will not allow the current generation of TV sets to receive the new pictures. All TV sets would have to be replaced and additional networks created.

The European countries opposed this approach and the Commission actively supported the drawing-up of a European proposal for a world production standard using the parameters 1250/50. This led to the decision taken by the Council in December 1989, which provides for the Member States to take common action to promote the European standard. At the CCIR meeting held in Düsseldorf on 23 May 1990, 23 of the 34 basic parameters considered necessary for full definition of an HDTV standard were agreed. All correspond to the European proposals.

The Commission supports the development of European HDTV technologies under several Esprit and RACE projects conducted jointly with Eureka project 95.[1] Other examples are RACE project 1080, which is experimenting with various uses of existing prototype equipment, RACE project 1001 for the development of digital video technology and Esprit projects 2283 and 2633 on liquid crystal screen technology and high-density magnetic tapes respectively.

[1] The joint development of the parameters for the European standard and corresponding equipment was started in 1986 under project 95 of the Eureka programme.

A European strategy

Transition from R&D activities to the introduction of HDTV services is a critical step. On 27 April 1989 the Council adopted a comprehensive strategy based on five objectives to enable Europe to prepare itself under the best possible conditions:

(i) To enable European industry to develop in time all the technology, components and equipment required for the launching of HDTV services.

Some 40 European companies participated in the first phase of Eureka 95 (1986-90); the second phase (1990-92) has 54 participants and synergy between Eureka 95 and the Esprit and RACE projects for HDTV is continuing.

(ii) To promote adoption of the European proposal as the single world standard for the origination and exchange of HDTV programme material.

Agreement on all the parameters defining a single HDTV standard should be reached at the next plenary meeting of the CCIR in 1994.

Europe must make use of the intervening period to produce the maximum amount of equipment using the European standard and to attract the greatest possible number of potential users of such equipment, both in Europe and throughout the world.

(iii) To promote the broadest possible use of the European HDTV system throughout the world.

For this objective to be achieved, programme producers, broadcasters and viewers need to be prepared. That is the aim of the European Economic Interest Grouping (EEIG) Vision 1250, officially launched at Strasbourg on 11 July 1990.[1] Vision 1250 aims to install and administer fixed and mobile equipment and to make such equipment available to TV and audiovisual professionals and European broadcasters. Vision 1250 has the further task of helping to promote the European system by organizing a series of demonstrations in Europe and throughout the world, in particular at the 1992 Olympic Games.

At the beginning of 1991 Vision 1250 had 24 participants, including members of Eureka project 95, television stations belonging to the European Broadcasting Union, independent television producers and operators and telecommunications operators.

(iv) To promote the introduction of HDTV services in Europe from 1992.

The introduction of HDTV services requires coordination. A great deal of cooperation is needed at national and cross-border level between manufacturers of consumer and professional equipment, programme and film producers, private and public television service directors, broadcasting companies, satellite and cable distributors, the relevant public authorities, and, of course, the general public.

(v) To enable the European film and television industry to gain the capability, experience and physical size necessary to be competitive on the world HDTV market.

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1 The Council Regulation of 25 July 1985, which applies from 1 July 1989, makes it possible to set up a European Economic Interest Grouping (EEIG). This is a flexible legal framework governing cross-border cooperation between members from different EC countries wishing to pool their resources for the purposes of a joint project. Setting up an EEIG provides the legal capacity to accomplish any legal act throughout the Community, fiscal transparency so that payments (e.g. reimbursement of costs to a member) from one country to another can be properly justified, and operational flexibility, since no minimum capital is required and the members are not obliged to hold regular meetings.

HDTV gives the European film and television industry a new chance for competitiveness on world markets. In order to promote the use of and expertise in HDTV in Europe, other activities are needed to supplement the EEIG Vision 1250 initiative: training, experiments with new forms of co-financing and co-production, improved cooperation between producers, etc.

As they have already done to meet the technological challenge of HDTV, Europeans must pool their resources to meet the new challenge of the introduction of HDTV services.

TELECOMMUNICATIONS POLICY

Telecommunications are a major factor in the completion and success of the single European market, because they form the backbone of the information revolution: they stimulate industrial productivity, promote the growth of a service economy and provide the link between industry, services and the market. As technology evolves, it is making telecommunications one of the driving forces behind market growth and the future prosperity of Europe.

What is more, telecommunications are attracting enormous investment, both in infrastructure and in value-added services. It is in this sector and in aerospace that the bulk of European civil investment in new technology will be made in the next 15 to 20 years.

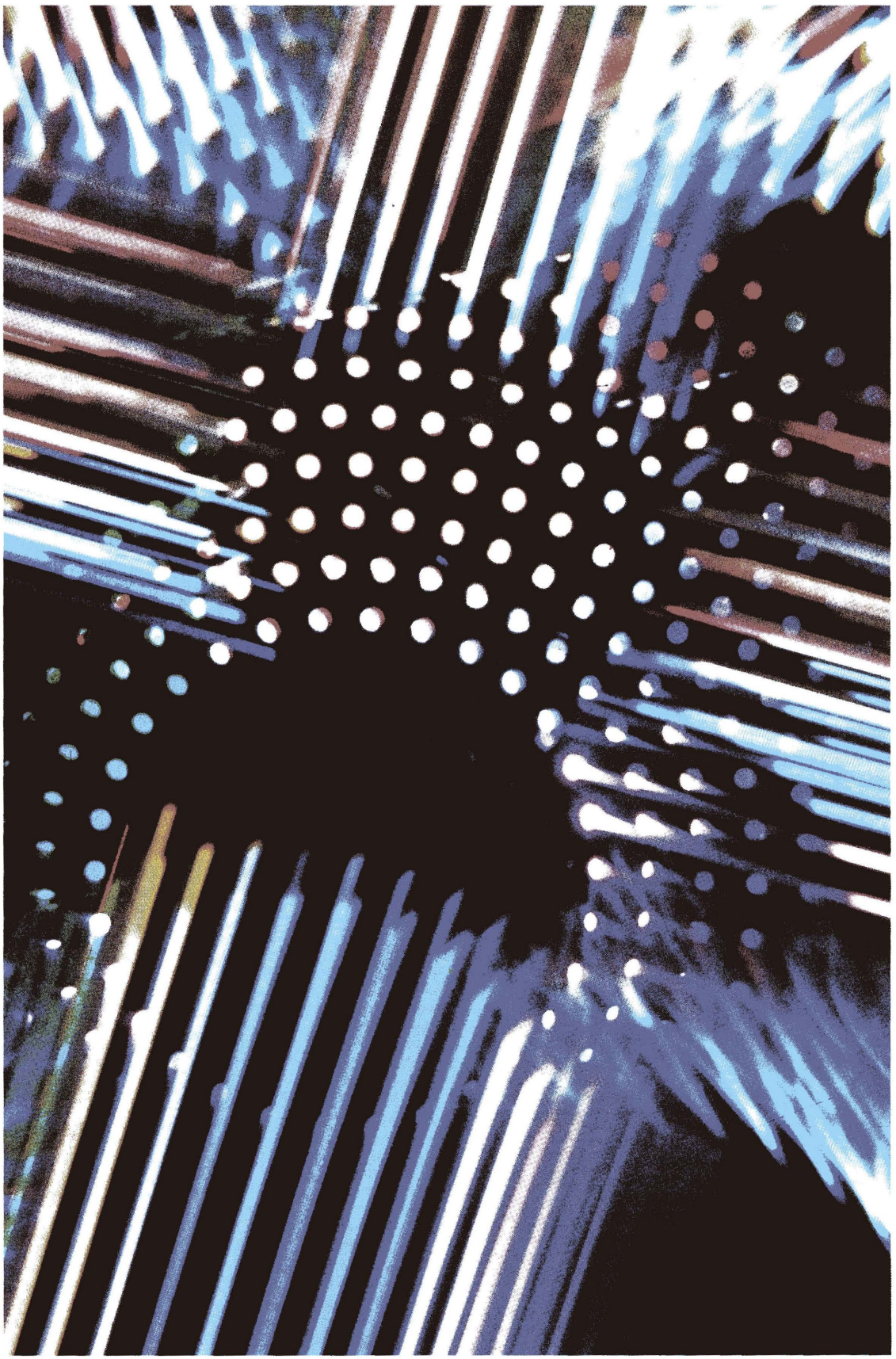
A double challenge

In recent years Europe has faced a double challenge: the challenge of the technology revolution, born of the convergence of telecommunications, data processing and broadcasting; and the challenge presented by the opening of markets in the United States during the first half of the 1980s, and since then elsewhere in the world to varying degrees. European telecommunications have had to approach these two revolutions with a fragmented market structure, without the economies of scale, profitability and flexibility that a vast European telecommunications area might have offered.

Technological developments no longer allow Europe the luxury of an increasingly costly duplication of R&D efforts confined within the bounds of traditionally separate national markets which are the preserve of 'national champions'. (It is estimated, for example, that the cost of the R&D needed to set up a public switched network with some three million programmed instructions is about ECU 1 billion today compared with a total cost of ECU 15 to 20 million for the electromechanical systems of the 1970s.) A well-known example of what maintaining the 'national champion' approach has meant in the past is the expensive development of eight digital switching systems in Europe, as against two in Japan and three in the United States.

Similarly, Europe can no longer accept differences between standards, which affect in particular the development of new value-added services. There are plenty of examples, such as the six mobile communication systems that prevailed in Europe until 1990, or the equally caricatural example of the three videotex systems (Bildschirmtext in Germany, Teletel in France and Prestel in the UK), which are incompatible without complex adaptation modules, a situation which has impeded the development of this new service in the Community.

In the administrative field there was until recently a lack of competition in most Member States, given the virtual monopoly of the national postal and telecommunications administrations. One of the many perverse effects of this situation has made itself felt in the area of public procurement contracts: in countries where equipment suppliers are based, more than 95% of these contracts have traditionally been reserved for national suppliers, which is a serious handicap for other European undertakings. This *de facto* situation deprived them of a vast internal market, essential for building up a strategic capability at the world level. The monopoly situation also proved a handicap for customers, who had to accept a whole set of restrictions with regard to tariffs, terminals and services without being able to bring into play any form of competition.



The telecommunications sector in figures

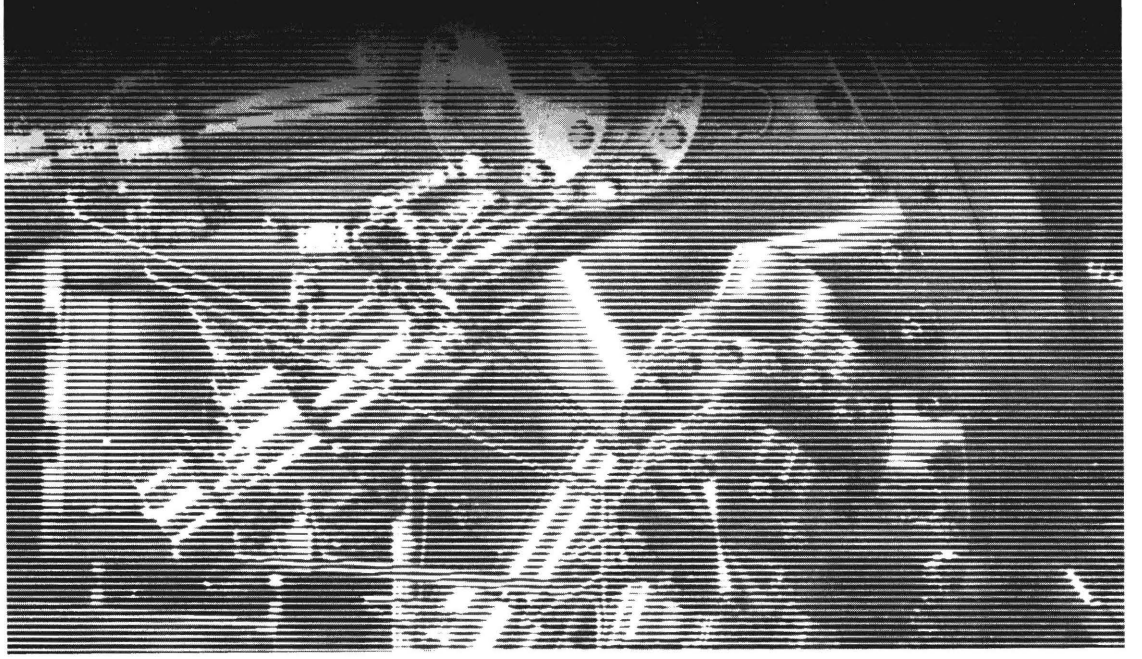
(i) Telecommunications will soon be one of the main sectors of the economy. Towards the end of the century they should represent between 5 and 7% of the Community's GDP compared with just under 3% today.

(ii) Between 1987 and 1993, the world market for telecommunications equipment should increase from nearly ECU 80 billion to about ECU 120 billion. Over the same period, the world market for telecommunications services is expected to increase from ECU 290 billion to about ECU 500 billion.

(iii) The European equipment market currently represents a little over ECU 25 billion, or 25% of the world market. The services market represents ECU 90 to 95 billion, again about 25% of the world market.

(iv) The European Community's trade surplus in the telecommunications sector has declined considerably since the mid-1980s, falling from more than ECU 1.5 billion in 1985 to less than ECU 100 million in 1989. The main reason for this clear downward trend is the worsening trade deficit with Japan, which over the same period grew from ECU 536 million to ECU 1 170 million. This situation indicates the need both to improve the integration of the Community market and to step up competition within it in order to develop Europe's competitiveness and innovative drive in this sector.

(v) The new digital switching systems need to gain 8% of the world market to become profitable. At present none of the national telecommunications markets within the Community represents more than 7% of the world market. An integrated European telecommunications area, on the other hand, with nearly 25% of the world market, will be at an intermediate position between the American (30%) and Japanese (11%) markets.



Europe's response

In order to respond to these challenges and to profit from the vast potential of a unified European telecommunications area, a Community policy was launched in this sector in 1984, with three major objectives:

(i) to make available to users, at minimum cost, with maximum efficiency and with minimum delay, a wide range of services which will sustain the competitiveness of the European economy;

(ii) to promote the competitiveness of the European telecommunications industry to ensure that it maintains a strong position at European and world levels;

(iii) to enable network operators to confront under the best possible conditions the technological and industrial challenges with which they will be faced.

These objectives are closely linked to implementation of the Single European Act and to the internal market. Without a single market for telecommunications, the free movement of people, goods, services and capital would be seriously compromised. To achieve these objectives, several types of action, which can be summed up schematically as follows, are progressively being implemented:

(a) The development of a modern interconnected network infrastructure — Integrated services digital network (ISDN), mobile telephones, radiomessaging, etc. — not only in the Community but throughout western Europe, in order to provide a whole set of advanced interconnected services on advantageous terms. A prerequisite for such an infrastructure is the definition of an 'open network' of telecommunications in which the conditions of access and use and the tariff principles are common to the whole of the Community (see p. 37).

Major progress was made on installing ISDN in 1989. By 1990 four Member States were already offering commercial services; four others started up experimental services and expect to make them available commercially in the near future. At the end of 1992 ISDN will be introduced in all Member States.

The progressive installation in 26 European countries of a single standard for mobile radiotelephony (GSM) started at the beginning of 1991. GSM is to replace the six different, incompatible systems previously in force in the 12 EC Member States.

From 1992 a single radiomessaging standard (Ermes — European radio messaging), applicable in 26 countries in Europe, will progressively replace the five systems previously in force in the Community.

In December 1990 the Council adopted a common position on a recommendation and a proposal for a Directive on DECT (digital European cordless telecommunications). DECT should be implemented from 1 January 1992.

112 — A single emergency phone number throughout the Community

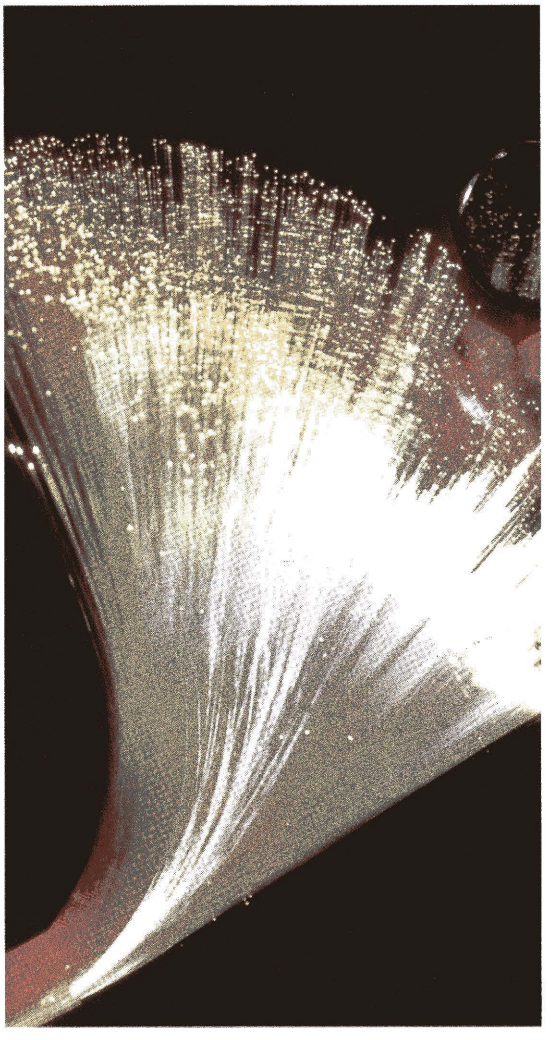
The Council of Ministers reached political agreement in November 1990 on the adoption on 31 December 1992 of the telephone number 112 as the single emergency number valid throughout the European Community.

(b) The creation of a European telecommunications area.

Action is required on various fronts, including:

(i) standardization (in particular complying with three fundamental requirements: interoperability of equipment, network security and confidentiality of data);

(ii) the opening-up of the equipment, terminals and services markets;



(iii) mutual recognition of the testing and conformity of terminal equipment;

(iv) opening up national public procurement contracts to all European suppliers, etc.

Passing beyond immediate market considerations and entering a more political context, the initiative of the Green Paper and its implementation are one of the major factors in the creation of this market. In June 1987 the Commission published its Green Paper on the development of the common market for telecommunications services and equipment. Its purpose was to set off a European debate on the future regulation of telecommunications, with a view to the completion of the internal market.

The message of the Green Paper is clear: while there is no question of uncontrolled deregulation of the market, it must be gradually opened up to healthy competition in order to exploit the potential of telecommunications to the full in a rapidly changing environment.

The action programme defined in the Green Paper has been recognized by all concerned — both public and private bodies — as a suitable framework for the discussion and introduction of practical reforms in the Member States. The European telecommunications ministers gave the document their overall support at a meeting held on 30 June 1988. Since then a range of practical proposals have already been adopted (see p. 37).

(c) Developing the technologies necessary for setting up the future broadband networks.

This is the purpose of the RACE programme, which is described at the end of this chapter.

(d) The harmonious and balanced development of telecommunications throughout the Community.

In the less-developed peripheral regions of the Community, telecommunications are a low-cost way of reducing the disadvantages of geographical remoteness that no other technology has so far allowed. The purpose of the STAR programme (Community programme for the development of certain less-favoured regions of the Community by improving access to advanced telecommunications services) is to develop advanced communications and make use of advanced services in these less-favoured regions. It concerns seven Member States: Greece, Ireland, Portugal, Italy (Mezzogiorno), the United Kingdom (Northern Ireland), France (Corsica and overseas departments), and 15 regions of Spain.

Implementing the Green Paper

Some of the priority actions already implemented are listed below.

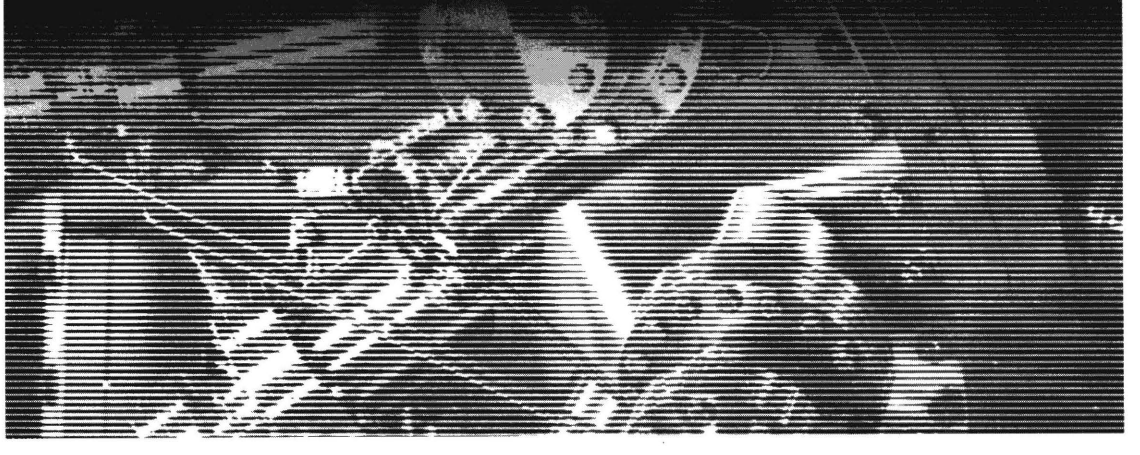
1. Opening up the terminals market. The Directive adopted by the Commission on 16 May 1988 on the basis of Article 90(3) of the EEC Treaty opens up to competition the market in all telecommunications terminal equipment, including the first telephone set and receive-only satellite stations. Certain Member States have challenged the use of Article 90 as the legal basis for the Directive. There is, however, consensus on the content of the Directive. The terminals market has in fact already been virtually liberalized in most Member States.

2. Opening up the services market. Once more on the basis of Article 90(3) of the EEC Treaty, in June 1989 the Commission finally adopted the Directive on competition in the markets for telecommunications services. Telex, mobile radiotelephony, radiomessaging and satellite communications are not covered by the Directive. However, all value-added services can now be offered not only by the postal and telecommunications administrations but also by private service providers.

3. Open network provision (ONP). This framework Directive, based on Article 100a of the EEC Treaty, was adopted by the Council in June 1990 at the same time as the Directive on services. It sets out a work programme for the preparation of proposals concerning the supply conditions of the open network (harmonization of technical interfaces, harmonized conditions for supply and use, harmonized tariff provisions, etc.). This harmonization work will be carried out in close collaboration with ETSI (European Telecommunications Standards Institute).

4. Opening up public contracts. In September 1990 the Council of Ministers adopted a Directive on the procurement procedures of entities operating in the water, energy, transport and telecommunications sectors. In the case of telecommunications, the Directive applies to contracts above ECU 600 000.

5. The mutual recognition of type approval for terminal equipment. In July 1990 the Council adopted a common position on the Directive, which is intended to regulate, at the same time and by the same procedure, the marketing in the Community of terminal equipment and its connection to the public networks. Henceforth a terminal equipment manufacturer will no longer have to go through a dozen different type-approval procedures for the same type of device before it is approved for connection to the networks of all the Member States.



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Through the European Regional Development Fund (ERDF), the Community contributes ECU 780 million to the STAR programme, which has a total budget of ECU 1 540 million (1986-91). The rest of the budget is financed by the Member States.

STAR hinges on two major lines of action:

(i) helping to set up infrastructure offering users advanced services (speeding up digitalization, establishing networks prior to ISDN, links with advanced networks already existing in the Community, etc.);

(ii) supporting measures designed to stimulate demand and encourage the use of advanced services, in particular by SMEs.

The services part of the STAR programme, which ends in October 1991, will be extended in 1992 and 1993 under a telematics programme, the aim of which is to develop telematic services in the less-developed regions of the Community. It is planned to extend the infrastructure part of the STAR programme from 1993.

(e) Establishing the consensus view in international negotiations.

Each time the Community speaks with a single voice in its discussions with non-member countries, the experience proves positive. Telecommunications are no exception to this rule, and the Community's negotiating position depends on its ability to reach consensus. Action taken in this area is summarized in the section on international aspects of the chapter on across-the-board activities.

(f) Taking social and societal aspects into account in the changes that have to be made.

Keeping on top of the changes that are under way in the telecommunications field depends very closely on the amount of social consensus there is on them. The Commission has accordingly developed a dialogue with the social partners involved, dealing in particular with the effects of the development of telecommunications on employment and training. In October 1989 the Commission sent the Council a communication on the social dimension of telecommunications, which stressed the need:

(i) to manage the changes under way in employment profiles in telecommunications, in a European environment;

(ii) to ensure that the new potential offered by telecommunications is made available to all social groups (in particular the old and handicapped) and that consumers benefit from reduced telecommunications charges;

(iii) to arrive at a common social perception of the new communications environment.

A joint committee was set up in October 1990 to involve the social partners in the implementation of Community policy. It brings together employers and representatives of the staff employed by telecommunications network operators.

(g) Green Paper on satellite communications.

Satellite communications have developed dramatically during recent years. They are a vital element of the Europe-wide networks and services needed for the single market and an essential element of the common European audiovisual area. The recent changes in Eastern Europe open up a range of applications which may prove particularly suited to satellite technology. However, the satellite communications market is still highly compartmentalized, and this has so far ruled out appropriate use of the potential of this new technology for the provision of Europe-wide systems and services. The fragmentation of the Community market cannot be maintained in view of 1992. Several Member States have already liberalized parts of their satellite communications sector. Some have authorized operators to provide cross-border satellite services to other Member States. This raises a number of questions for which joint answers must be found.

The Green Paper is intended to extend the application of the general principles of Community telecommunications policy to satellite communications. Four major changes are proposed: full liberalization of the earth segment; free access to space segment capacity; full commercial freedom for space segment providers; and the harmonization measures required to facilitate the provision of Europe-wide services.

After a consultation period, the Commission will present its conclusions on the implementation of a Community policy in this field to the Council.

(h) Green Paper on postal services.

A Green Paper on the liberalization of postal services is expected some time in 1991.

RACE and the specific programme of R&D in communications technology

The RACE programme (Research and development in advanced communications technologies for Europe) is the R&D part of European telecommunications policy. After a pilot phase started in 1985, the first projects got under way in January 1988.

The aim is to promote precompetitive R&D enabling Europe to set up an integrated broadband communications (IBC) network by 1995-2000. The IBC network is to take over from ISDN (integrated services digital network) which does not have a broad band width and is therefore unsuitable for the transmission of large flows of data. Broadband communications enable large quantities of data to be transmitted at high speed.

RACE straddles fundamental and applied research, covering the telecommunications infrastructure, equipment and services of the future. RACE is not restricted to technology: it is a programme leading to the carefully planned installation of appropriate technology meeting specific needs at the right time and at the best price. It is the current focus of attention of all intellectual and industrial work on advanced telecommunications in Europe.

Integrated broadband communications

The current revolution in telecommunications technology has its basis in three types of technological development:

(i) the development of microelectronics;

(ii) digitalization, which makes it possible to encode data — voice, music, text, pictures, figures — in the form of 'bits' or binary digits, the basic units of information for data processing;

(iii) the change in transmission techniques brought about by satellites and optical fibres.

Integrated broadband communications (IBC) combine these different advances, integrating in them — in the case of the R&D carried out by RACE — numerous technological developments such as asynchronous transfer mode (ATM), which combines the advantages of packet and circuit switching, optical communications, coding techniques reducing the number of data which need to be transmitted for video communication, multi-function terminal architecture, etc.

The purpose of IBC is to have a single network of terminals, cables, node processors, computers and satellites with a very high transmission rate. Such a network will provide integrated distribution of the traditional services (telephone, telex, etc.), the new services (colour facsimile, high-quality videotex, electronic mail, etc.), conventional or interactive television programmes, the ultrafast transmission of computer data, videoconferencing, high value-added services (financial services, electronic data interchange), etc.

This integration has the great advantage of avoiding the proliferation of incompatible networks.

Integrated broadband communications will therefore not only increase considerably the ability of private and professional users to exchange data and communicate, but also offer them a wide range of advanced telecommunications services.

Their main effect will be to improve the competitiveness of many economic sectors. For example, remote computer-assisted design will benefit from low transmission costs and data exchange between design offices and factories will speed up production cycles. Integrated broadband communications will also directly affect society in a number of ways: in particular they will permit the decentralization of economic activities, the opening-up of rural and peripheral regions and the development of teleworking.

Thus broadband communications are the essential infrastructure of an economy based on the use of information and they are at the very heart of the communications revolution.

Apart from its main goal of introducing integrated broadband communications into the European Community in 1995, RACE is pursuing several objectives: promoting the Community's telecommunications industry; developing the competitiveness of European network users; creating a single European market in IBC equipment and services; and developing the poorest regions of the Community, which will thereby be able to benefit fully from advanced telecommunications.

RACE consists of three parts:

(i) definition of the strategies and specifications to be adopted and the resulting standards;

(ii) research and technological development for IBC;

(iii) the 'test' section, which will make it possible to test the system, particularly in full-scale pilot applications.

To achieve these aims, RACE is being coordinated with certain national and/or intergovernmental programmes, e.g. Eureka in the case of the development of high-definition television.

The main stages of RACE

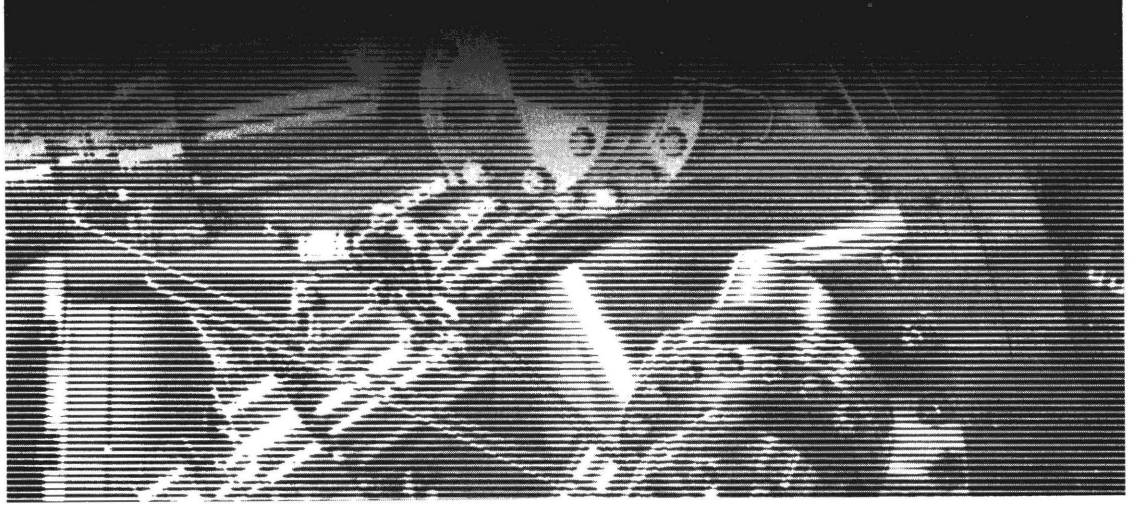
Mid-1988: preparation of a set of initial hypotheses on the configuration and environment of an IBC system, the number and breakdown of users, calling rates, etc.

Mid-1989: final decision on an initial IBC network and the strategies to be adopted for its introduction and development, on the basis of the results of technical research and trials.

Mid-1990: definition of a set of systems architecture projects, which will be tested and validated in all Member States.

End-1991: agreement on an IBC network architecture. This key product of part I of the programme will serve as a basis for presenting proposals for functional specifications, establishing consensus views in international negotiations and drafting standards.

End-1995: market launch of IBC.



RACE (June 1987 to June 1992) brings together 294 organizations (including 25 from EFTA countries) in 92 projects. The Community is contributing ECU 550 million, or just under half of the total budget, estimated at ECU 1 200 million.

Virtually all the main parties involved in European R&D in the telecommunications sector are participating in the RACE programme (national authorities, equipment manufacturers, network operators, IT industries, universities, research centres, etc.). This rather exceptional situation makes it possible to take full advantage of the vast intellectual, scientific and technical potential available in Europe. It has other advantages as well:

(i) For one thing, it reduces the risks of failure. It also allows RACE to act as a catalyst in the key sectors of technological development where there is an important leverage effect, i.e. where limited R&D appropriations lead to much more substantial independent investment.

(ii) For another, it speeds up the standardization process, a well-known bottleneck in the exploitation of high technology. It guarantees that profitable products will be available at the right time. Proposals for technical standards and common functional specifications resulting from the collaboration taking place under the RACE programme have a very good chance of gaining wide international acceptance. This should help open up a vast external market to European telecommunications operators, service providers and industrialists.

Following the adoption by the Council in April 1990 of a third Community R&TD framework programme, on 23 May 1990 the Commission presented a proposal concerning a specific programme of research and technological development in the field of communications technologies. This is the logical follow-up to RACE. It includes a financial contribution from the Community of ECU 489 million for the period 1990-94.

As well as continuing to develop the integrated broadband network and stepping up research into optical communications and synchronous and asynchronous switching techniques, the new programme will focus on the following priority areas:

(a) intelligence in broadband networks/flexible communications management;

(b) mobile and personal communications;

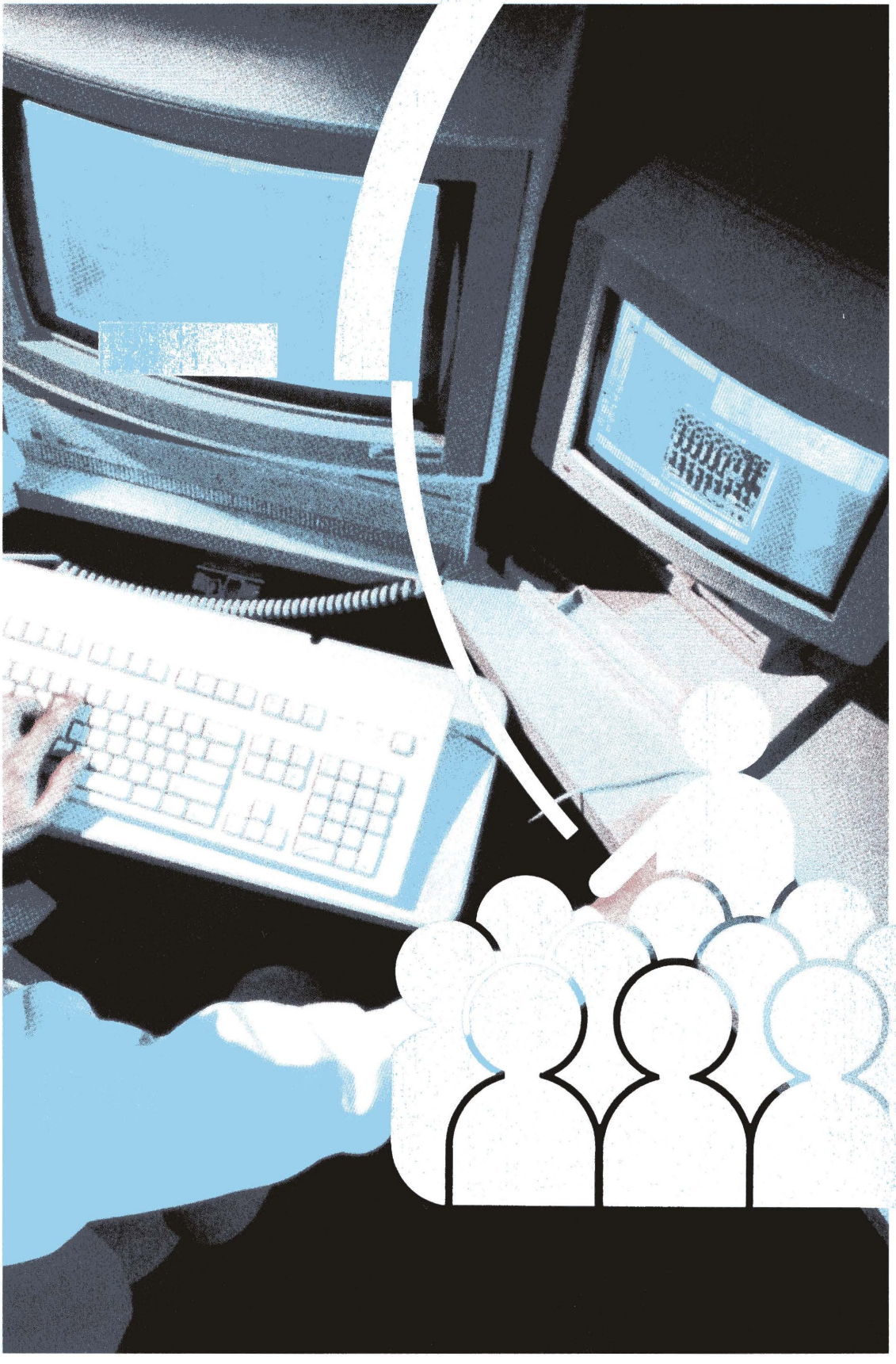
(c) image and data communications;

(d) integrated services technologies;

(e) information security technologies;

(f) advanced communications experiments;

(g) test infrastructures (R&D area common to all the other priority areas).



Some future applications of RACE

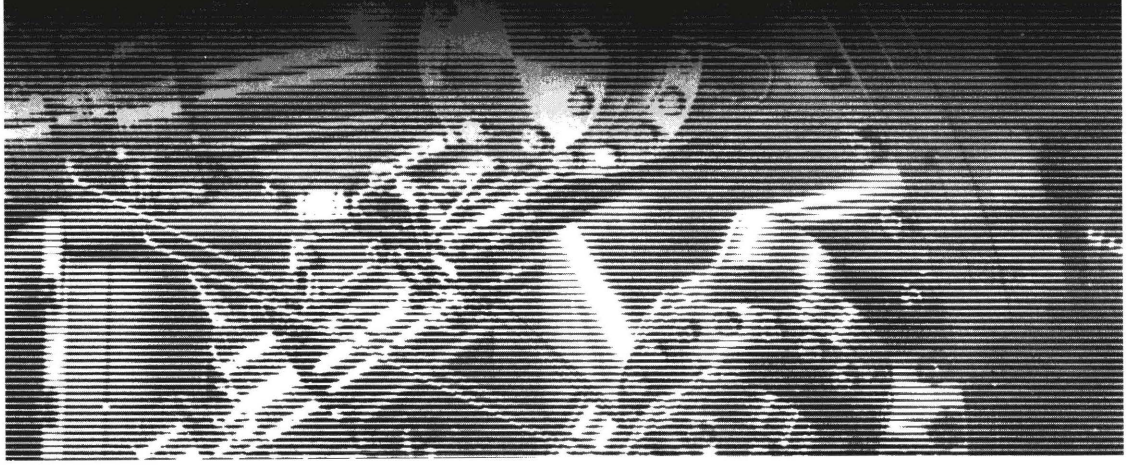
Several RACE projects involve direct trials with pilot applications so that the results can be used to benefit the other parts of the programme: either the network infrastructure or the technologies needed for IBC or terminal equipment. A substantial part of the RACE budget is aimed at improving knowledge of user expectations of future IBC networks in terms of media and services. Here are some examples of such pilot applications:

The Telemed project will make it possible to respond to the following type of situation: a Dutch tourist is rushed to hospital in Greece; thanks to the Telemed network, the hospital he is taken to will immediately be able to obtain information on his medical history so that it can quickly treat him with full background knowledge. Apart from the transfer of patient information between medical practitioners (even from one Member State to another), the main fields of action of this programme are remote diagnosis, remote consultation of specialists, consultation of specialist databases and distance instruction for scientists, students and practitioners.

A project entitled Resam (Remote expert support for aircraft maintenance) is aimed at developing an information system for aircraft maintenance so as to improve safety and reduce the time aircraft must be kept on the ground, thereby reducing costs. It will consist of a videoconferencing system with voice, text, stills or moving pictures, representing components or operations to be performed. The network will be extended to different airports and their maintenance teams, to airlines' maintenance centres and to aircraft designers.

The Telepublishing project is to do with the remote publication of newspapers and books. The aim here is to make this field of activity more competitive and to provide a better service to readers. The system developed will be a revolution in the press world, because instead of receiving a standard daily newspaper we will all be able to order a personal printout of the parts which interest us. It will also provide more up-to-date information, enabling a newspaper with the latest updates and the most recent news to be printed directly in a local agency, or even in the reader's home.

The aim of the European Museums Network project is to integrate 15 or more major European museums in a common telematics network. The objective is to provide the visitor to an individual museum with information from all the museums in the network, thanks to an approach based on the association of ideas. It is planned to use the most advanced technology for multimedia workstations (pictures, text, music, sound), means of communication, software and data storage.

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EUROPE-WIDE COMMUNICATIONS NETWORKS

The success of the Community's objective of creating an economic and social area depends largely on how the Community manages to master the information revolution, i.e. to develop the capacity for Europeans to communicate easily and quickly, to exchange all types of data and to have easy access to data. Information and the capacity to exchange data have become strategic elements essential for the competitiveness of the majority of economic activities. They are increasingly stimulating social progress in fields as far apart as education, environmental protection and transport safety.

Towards a European nervous system: the specific programme of R&D in the field of telematic systems in areas of general interest

In view of the need for the rapid development of the whole range of telematic services throughout the Community, the third framework programme (1990-94) includes a specific programme for the development of telematic systems in areas of general interest. The programme has many objectives: it will contribute to the completion of the internal market, in particular by providing for the growing need to exchange information between the main socio-economic actors and giving them increasingly powerful, integrated and interconnected information exchange systems; it will help make Community industry more competitive; and it will progressively enable truly Europe-wide services to be offered.

Seven major action areas have been defined:

(i) the authorities most closely concerned with implementation of the internal market (social security, customs, indirect taxation, border police, statistics);

(ii) transport services, in order to improve safety and efficiency and reduce the negative impact of transport on the environment;

(iii) health care, to ensure that the medical sector benefits from the new technologies offered by telematics;

(iv) distance learning, to facilitate access to educational resources;

(v) libraries, to give as many people as possible access to the wealth of knowledge available in Europe;

(vi) linguistic research and engineering, in order to counteract the constraints imposed on the exchange of information by language differences, without thereby reducing the cultural richness of those languages;

(vii) the development of telematic systems in rural areas, in order progressively to make rural infrastructure comparable to that of urban centres.

The plan is for the identification of needs in these areas and research into systems integration to lead to pilot applications which can verify the technological feasibility of services and whether they meet the needs of their users. On the basis of the experience thus gained by users, services providers, network operators and equipment manufacturers, the various parties will establish, beyond the scope of the Community programme, the necessary Europe-wide infrastructure and services.

Most of the activities of this programme will be undertaken in close cooperation with other existing programmes (Insis, Caddia and Tedis in the administrative field, Eurotra in the linguistic field). They will be based on the results of earlier programmes (Drive, AIM and Delta respectively for transport, health care and distance learning) and on certain parts of the Esprit and RACE programmes. The programme will be implemented by means of shared-cost research projects (i.e. the Community will contribute up to 50% of project costs). The Community has set aside a budget of ECU 376.2 million for the period 1990-94.

Public authorities

The following examples illustrate the new challenges which will confront the national authorities from 1993:

(a) Mobility within the Community will create new social security needs for European citizens: applications for the reimbursement or payment of allowances by the authorities of the country of origin, information and counselling requirements. To cope with this new situation, social security departments will require telematic systems enabling them to exchange the information they need to manage

cases, to monitor cases in accordance with the national legislation of the various countries concerned and to process applications anywhere in the Community.

(b) With the elimination of intra-Community frontiers as a result of the completion of the internal market, it will no longer be possible to monitor goods in transit[1] at national border posts. Customs control of such goods will require the exchange of information between the customs of the country of entry into or exit from the territory of the Community and the country of destination or origin of the goods.

(c) Elimination of intra-Community frontiers likewise disrupts the existing arrangements for the collection of VAT and excise duties. Mutual assistance between national tax authorities is essential to prevent fraud while respecting the national sovereignty of customs in their own territory.

In response to this new situation, the administrative systems area of the programme is aimed at promoting the development of telematic networks linking the various national authorities responsible for social security, customs, indirect taxation, statistics and border

1 Either between the place of entry into the Community territory and the place of customs clearance (corresponding to the goods' destination), or between the place of customs clearance and the place of exit from the Community territory.

police. The Community funds earmarked for this total some ECU 41 million. The existing data exchange programmes (Insis, Caddia and Tedis) will continue.

Insis (Interinstitutional integrated services information system) was set up in 1982 to develop communications systems among the Community institutions and between them and the Member States (electronic mail, videoconference, videotex, etc.). The Caddia (Cooperation in the automation of data and documentation for imports/exports and agriculture) programme was set up in 1985 with the aim of progressively automating the transfer of customs, agricultural and statistical data between the Member States and the Commission on a uniform, coordinated basis in accordance with international standards.

The Tedis (Trade electronic data interchange systems) programme concerns electronic data interchange (EDI) between traders. Launched in 1988 for a period of two years, the first phase had a budget of ECU 5.3 million. Its launch coincided with an explosion of interest in EDI. In view of its success and the needs which it meets, a second phase should be adopted by the Council in 1991.

The first phase of Tedis had two main objectives:

(i) To coordinate development work on the electronic transfer of trade data in the following areas: standardization of EDI messages; specific telecommunications requirements of EDI; legal aspects of EDI; security of EDI messages; software appropriate to EDI; conformity of EDI messages and software to international and/or European standards.

In addition to generic work in these fields, the Tedis programme coordinated EDI initiatives from various sectors: motor industry, chemicals, electronics and data processing, distribution and retailing, re-insurance and transport.

(ii) To promote awareness among potential users and European equipment and software producers: 12 pilot projects on the installation and use of EDI by SMEs were set up, along with other actions, including a survey of the level of knowledge and use of EDI in Europe.

The objectives of the second phase of the Tedis programme (July 1991-June 1994) are as follows:

(i) sectoral integration of the work carried out in the Member States when EDI systems are developed and installed;

(ii) examination of the impact of EDI on the management of public and private enterprises and the economic and social repercussions of EDI;

(iii) promotion of the awareness of potential users of EDI systems, including small and medium-sized firms, and of European equipment and software producers and service providers.

The main task of the new phase is the integration of EDI activities in sectoral and across-the-board projects. The across-the-board projects correspond to the problems with which virtually all sectoral projects have to deal during development, namely:

(i) the standardization of EDI messages,

(ii) the specific telecommunications requirements of EDI,

(iii) legal aspects of EDI,

(iv) the security of EDI messages.

Coordination of sectoral EDI projects will be continued, and indeed stepped up. These projects will involve certain branches of industry, the public authorities, banks and insurance companies.

The budget set aside for the second phase is ECU 31.5 million.

What is EDI?

EDI — electronic data interchange — combines the power of computers with that of telecommunications to replace paper documents and serve as a data carrier for all commercial activities and services. It is the simplest way of doing business without paper, by making the computer systems of the trading partners correspond directly with one another.

However, EDI is not a free form of electronic mail. It involves the exchange of data in a standard format, which can be processed efficiently and unambiguously by computer.

EDI applies to all commercial and related activities:

(i) trade and industry, manufacturing, finance, banking, insurance, construction, tourism, travel, etc.;

(ii) transport, mail, handling, warehousing, etc.;

(iii) the administration of customs duties and taxes in national and international trade, statistics, etc.

EDI has many advantages:

(i) It eliminates the many documents which are produced, transferred, manipulated, corrected, transcribed and copied in normal commercial transactions. It also eliminates all errors and delays due to such paperwork and therefore brings with it a considerable reduction of costs.

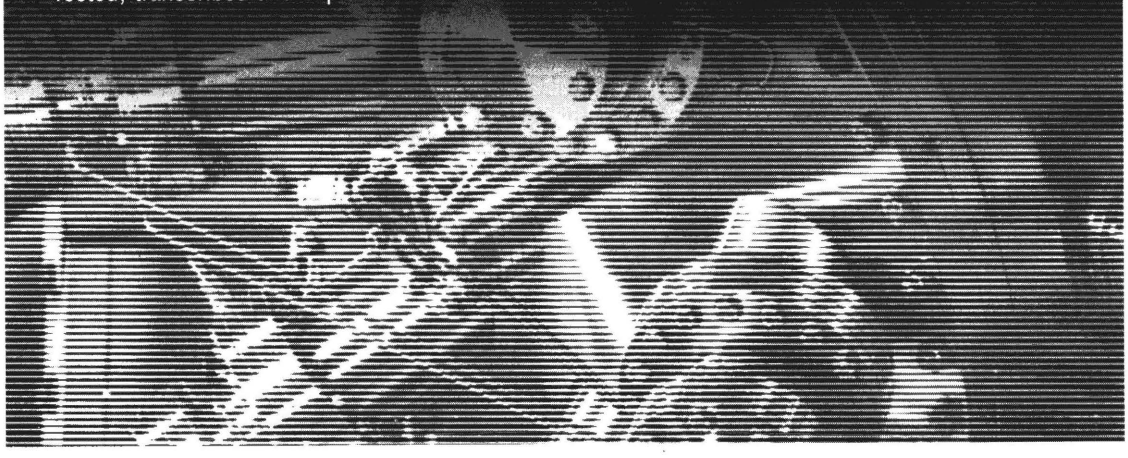
(ii) It significantly improves stock management by permitting more accurate sales forecasting, shorter ordering times and smaller contingency reserves. For example, in the automobile industry EDI rationalizes the dispatch of spare parts from subcontractors to vehicle manufacturers.

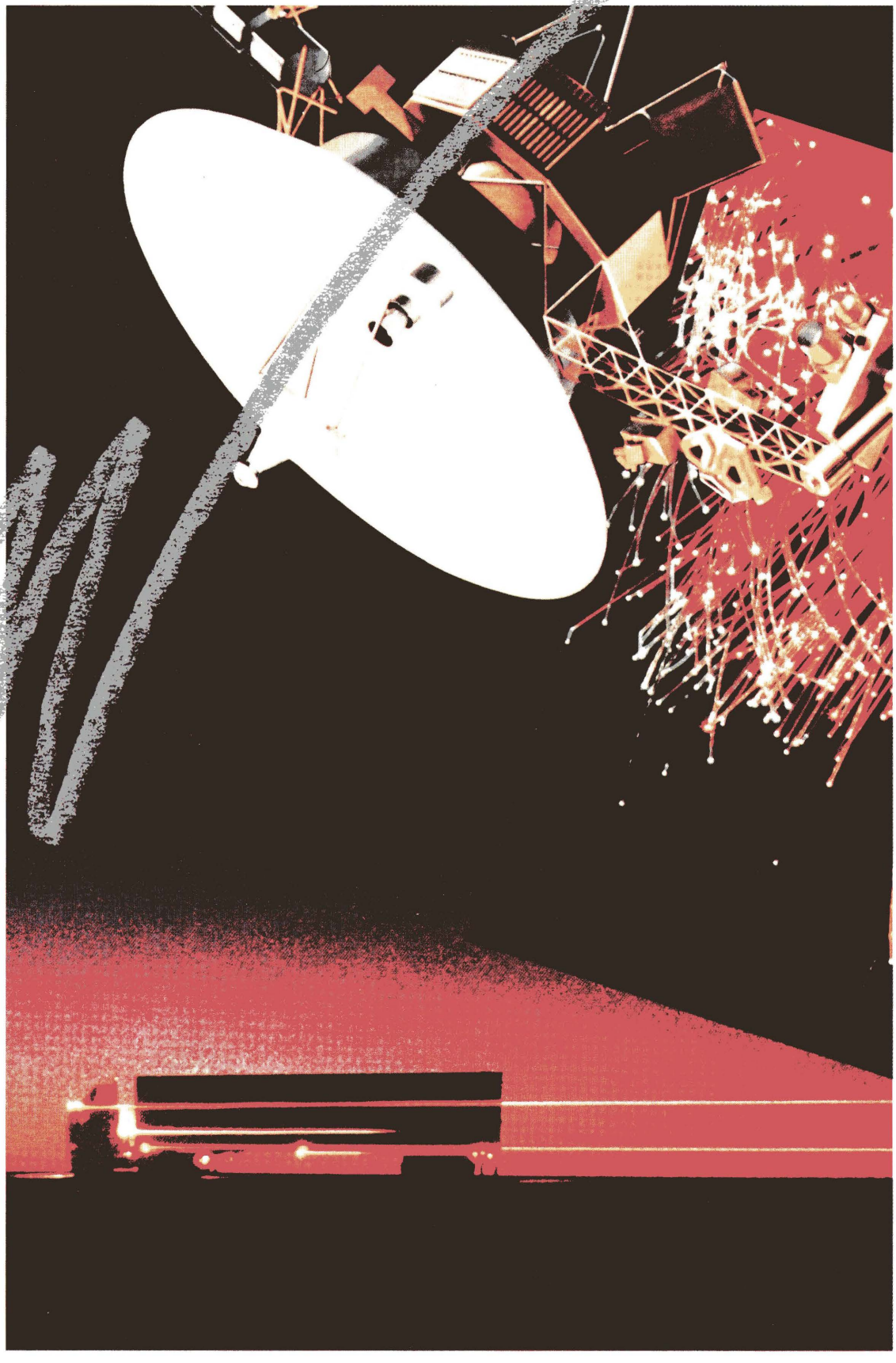
(iii) It improves customer service: orders are processed more quickly, progress chasing is better and customer information is quicker and of a higher quality.

(iv) It speeds up the sales/invoicing/payment cycle, which considerably improves cash flow.

(v) Another significant advantage is that EDI is available 24 hours a day and seven days a week, and is independent of time zones. Information is therefore right up to the minute.

In short, EDI facilitates the movement of goods and services, helps to improve the competitiveness of businesses (including SMEs, which are particularly sensitive to the burden of financing expenses and the tying-up of stock) and develops cooperation between firms.





Transport services

Transport plays a major role in Europe's economy, accounting for more than 6% of GDP and more than 10% of the average family budget. There are at present more than 120 million cars in Europe. However, the number of cars per 1 000 inhabitants (330) is still well below the level in the United States (550), which suggests that road problems are likely to be aggravated in the future. Each year 55 000 people are killed, 1.7 million injured and 150 000 handicapped for life in road accidents in Europe, which represents an annual financial cost of some ECU 50 billion, without counting the human cost of this ongoing tragedy.

Road traffic also causes substantial nuisance and financial losses through congestion. The environmental impact of road traffic is estimated to cost Europe between ECU 5 and 10 billion a year. Road transport is therefore an area in which information and communications technologies can find immediate applications and be of service to the people of Europe. This is also a very promising area of application for these technologies: world road information sales totalled some ECU 25 billion in 1990.

The transport services area of the telematic systems programme is aimed at developing a set of European integrated networks in order to improve road safety and transport efficiency, while at the same time reducing the negative effects road transport has on the environment. The aim is to create a true European road transport environment in which 'intelligent' vehicles will be able to communicate with an infrastructure which has itself been made 'intelligent' and where drivers will be kept constantly informed of the latest traffic news. Systems will be developed to guide drivers, inform them about road traffic conditions and locate vehicles; to control the distance between vehicles and their speed in order to increase safety; to protect the most vulnerable road users (in particular pedestrians); to improve the management of goods flows; etc. These projects will be developed in collaboration with similar projects under the Eureka programme. The Community budget for this work amounts to nearly ECU 125 million for the period 1990-94.

This strategy will be implemented on the basis of the work carried out under the Drive programme (Dedicated road infrastructure for vehicle safety in Europe), which is aimed at identifying the needs and the technologies available in this field. The three-year Drive programme (1989-91) has a total budget of ECU 120 million, half of which comes from Community funds. Its 70 projects involve 231 organizations, including 19 from EFTA countries.

Health care

Health care is at present the largest of the service sectors in Europe: about 8% of the GDP of the Member States is devoted to health care, and the Community has some 800 000 doctors and 15 000 hospitals with a total capacity of more than 3 million beds. With an annual growth rate of 8%, health care is also one of the fastest growing sectors. Its socio-economic potential, the scientific progress in prospect and the expectations to which it gives rise all give health care a central place in our societies. However, health care is becoming increasingly difficult to manage efficiently as it is both complex and compartmentalized.

The health care area of the programme is aimed at using telematics technologies to fend off the danger of compartmentalization of health care and the multiple effects which this would have on health professionals, European industry, and above all patients. Its aims are to:

(a) Implement strategies for the cross-border use of telematics in medicine. This covers various areas including: the definition of a joint approach to confidentiality and data protection; the harmonization of data and terminology to make it possible to transfer

medical data without delay; the preparation of communication standards and protocols to ensure the Europe-wide interoperability of multimedia workstations, medical instruments, systems which assist in decision-making, communication networks, memory cards, archiving systems, etc.

(b) Develop medical applications of telematics technologies: multimedia medical remote services, remote diagnostic and control technologies, the development of standardized medical telematics interfaces in order to integrate the various systems in use (e.g. imaging and primary care systems) into a comprehensive architecture, establishment of mobile telematics services for emergency care, etc.

The Community budget set aside for this area of the programme is ECU 97 million (1990-94). It will be based on the AIM (Advanced informatics in medicine) programme, which brought doctors, researchers, industry and representatives of the public authorities together in a two-year exploratory project (1989-90). With a total budget of ECU 40 million, half of which came from Community funds, AIM involved 275 organizations, including one from an EFTA country, in 42 projects.

It covered the application of information and communication technologies to biomedical instrumentation (electronic imaging, laboratory equipment, instruments for monitoring patients, etc.) and to medical computer systems and techniques (systems for the coding and classification of medical data, hospital information and communication systems, image networks, etc.).

Distance learning

A fifth of the population of the European Community is at any one time involved in education and training activities. Education and training form an ongoing process underlying most activities of advanced societies. Hence the aim of this area of the programme: to give everyone in Europe access to the educational resources available in Europe by means of an interactive, interoperable network of telematics services. The following activities are planned:

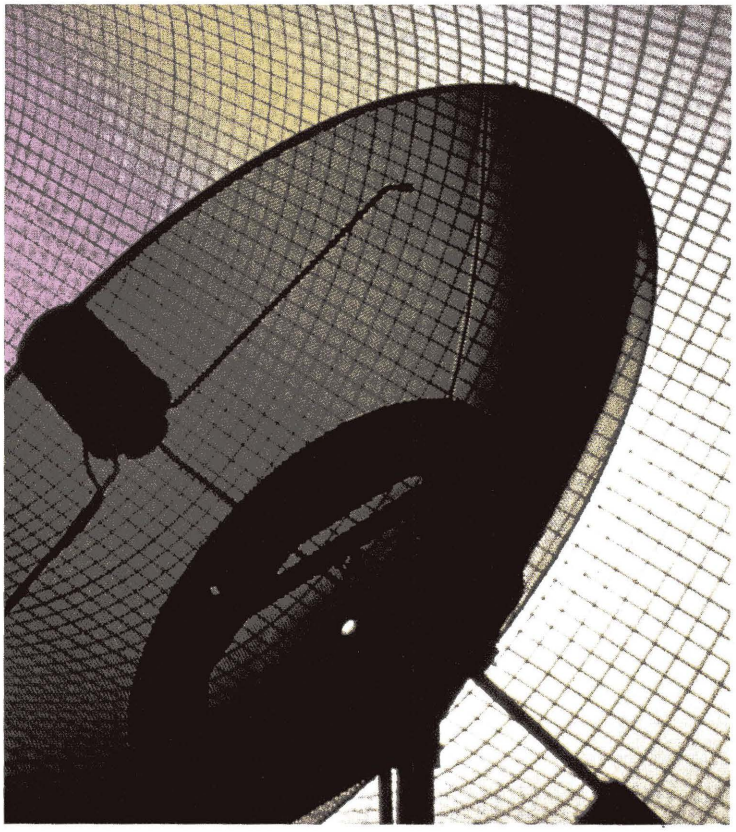
(a) Drawing up a comprehensive strategy highlighting the various options available, given the users' interests, technical difficulties (incompatibility of existing systems), economic difficulties (costs linked to fragmentation of the market and diversity of users) or legal difficulties (copyright, etc.).

(b) Devising methods of producing multimedia educational materials which are portable and transferable between different systems, with a view to cross-border use. Appropriate conventions will also need to be drawn up determining invoicing procedures, the administration of distance learning courses and the remote supply of educational materials.

(c) Developing systems and technologies offering a flexible, efficient, modular and interoperable telematics service for distance education and training. Research work in this field should make interactive, real-time use of multimedia teaching materials possible via land and satellite communications. It will in particular ensure that the various systems are compatible and portable, develop special educational software, facilitate access to pedagogical and multimedia materials and the use of workstations for educational purposes, etc.

These activities will be coordinated with Comett (programme of cooperation between universities and enterprises regarding training in the field of technology) and Eurotecnet (Community-wide programme in the field of new information technologies and vocational training). The Community budget set aside is ECU 54.5 million (1990-94).

The distance learning area of the programme will be based on the exploratory work of the Community's Delta programme (Developing European learning through technological ad-



vance). The Delta programme (1989-90) had a total budget of ECU 40 million — half of which came from the Community budget — and involved 219 organizations, including two from EFTA countries, in 30 projects.

Libraries

The aim of this area of the programme is to enable as many people as possible to have access to the wealth of knowledge stored in Europe's libraries, whatever the geographical disparities in infrastructure. This means promoting the rapid penetration of new technologies into libraries. The programme hinges on four areas:

(i) promoting the creation of computerized bibliographies and catalogues;

(ii) facilitating the international interconnection of the systems managing these data for various purposes (shared cataloguing, inter-library loans, etc.) and thus encouraging the preparation and application of a range of international or European standards;

(iii) stimulating the provision of new services to small libraries and developing a broad range of innovative, experimental services;

(iv) developing projects intended to encourage the development of a European market for telematic products and services meeting the specific needs of libraries.

The Community has set aside a budget of ECU 22.5 million (1990-94).

Linguistic research and engineering

Translation from each of the Community's nine official languages (Spanish, Danish, German, Greek, English, French, Italian, Dutch and Portuguese) into each of the others involves a total of 72 language pairs. This multilingualism is a cultural asset which must be preserved but which is costly in economic terms and which results in many obstacles to trade.

To meet this challenge and turn it to good account, the Community has decided to implement an ambitious programme of linguistic research and engineering based on the results and experience drawn from the Eurotra programme, certain specific projects conducted under Esprit and national research programmes. Eurotra (Community research and development programme for a machine translation system of advanced design) was launched in 1983 for a period of seven years. It led to the design of a prototype multilingual translation machine for the nine Community languages, with an objective of 20 000 entries per language. It has been succeeded by a

specific two-year programme (July 1990-June 1992) for the preparation of an operational Eurotra system.

The linguistic research and engineering area of the telematics programme has the following aims:

(i) to strengthen the scientific basis of linguistic technology (e.g. to develop automatic techniques for reducing the number of possible interpretations of a given text);

(ii) to develop methods, tools and linguistic resources with various applications, including the processing of natural language;

(iii) to develop pilot applications, such as the automatic entry of large volumes of natural-language text in knowledge bases and expert systems.

The Community budget set aside for this area of the programme is ECU 22.5 million (1990-94).

The development and implementation of the Systran automatic translation system and of terminology services are continuing, thanks to close coordination between the Commission's translation service and Directorate-General XIII. Systran is currently being developed for 16 language pairs and its services are already accessible on-line to all departments of the Commission of the European Communities. Systran translates about 2 000 pages a month. The Eurodicautom terminology bank, which contains some 500 000 terms used in various fields of interest to the Community, provides a valuable service in all Community languages, principally to translators.

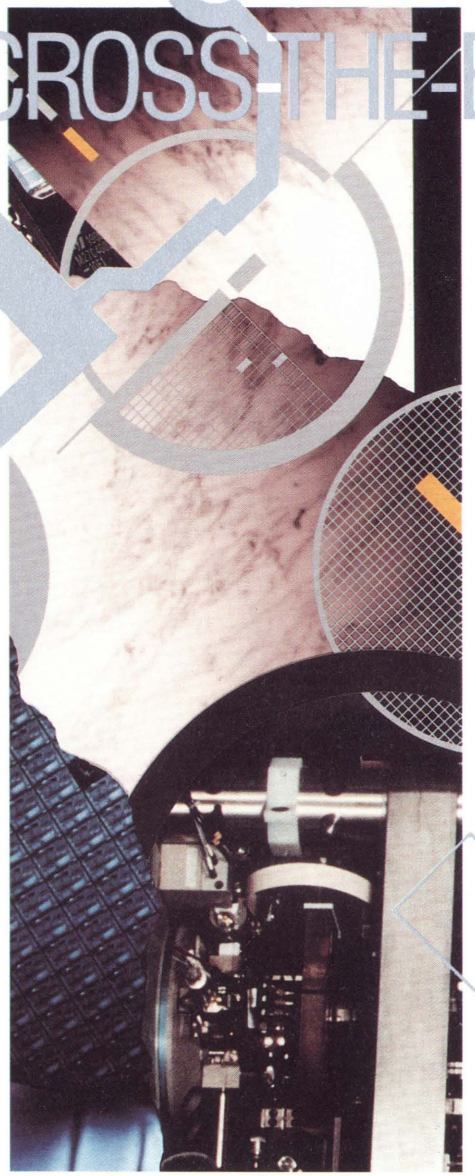
Rural areas

Half of the population of Europe still lives outside the main towns. It is therefore important to enable rural areas to balance their economic activities and offer more diversified employment by providing them with telematics infrastructures, comparable to that of urban centres. That is the aim of the part of the programme devoted to telematics systems in rural areas, which has a Community budget of ECU 14 million (1990-94).

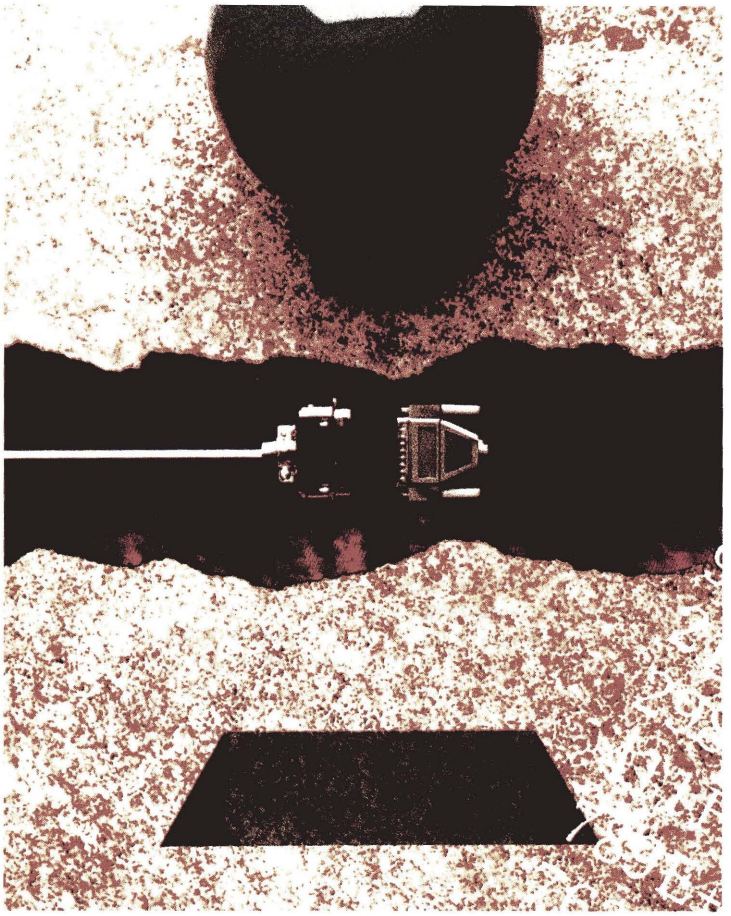
The idea is to create conditions enabling small, geographically dispersed enterprises to provide more diversified employment and more balanced economic activities in rural areas; to lay the foundations for better service provision for scattered population groups; to promote awareness of the potential of information and communications technologies in rural areas; to encourage the production of equipment and the provision of services which are easier to use in rural communities; and to ensure that the introduction of information and communications technologies into rural areas does not contribute to further centralization of economic and administrative activities and the loss of cultural and economic diversity in rural parts of Europe.

Such services will be introduced progressively in rural areas by means of investment in infrastructure which, though costly, will remain in use for several decades. It is therefore essential to choose the right technology and systems configurations. In addition to this objective, there will be prenormative work with a view to harmonizing throughout the Community the markets for equipment and services tailored to the needs of rural areas. A further aim will be to develop and stimulate specialized services and to carry out a consistent evaluation of the introduction of telematics services into rural areas.

ACROSS-THE-BOARD ACTIVITIES



The Community strategy is not limited to action to promote R&D, meet the telecommunications challenge and develop telematics systems of general interest. Such action is complemented by across-the-board activities which ensure that the strategy is truly comprehensive. These activities include standardization, innovation and the exploitation of R&D, information services, data protection and international relations.



Standardization

Standardization is a basic tool for the integration and cohesion of the European market, since it is essential for guaranteeing hardware compatibility and the interoperability of equipment and services. It also helps strengthen the market and improve its competitiveness, since advanced technologies are developed jointly, thus resulting in economies of scale. It is a very important competitive factor because it prevents certain firms from cornering part of the market. Without standardization, the Community would be condemned to remain a Tower of Babel with respect to new technologies.

Numerous technical functions have to be standardized in the field of information and communications technologies. The body of standards applying to these functions is collected together within an international reference model (open system interconnection — OSI), which defines the framework within which the detailed standards have to be developed.

European policy consists in promoting the development and harmonization of these 'open' OSI standards, in the Community and at world level. Machinery has been set up to ensure that standards formally adopted at European level are also adopted in the Member States. Where international standards do not yet exist or are not sufficiently precise, functional European standards are drawn up; these are, however, complementary to international standards and entirely consistent with them. In recent years the Community's policy has made a significant contribution to promoting greater awareness of the importance of international standards. It has encouraged numerous initiatives in this field and permitted a dynamic dialogue between Europe and other regions of the world, principally North America and the Far East.

The Community's policy can be summarized as follows:

The Commission monitors the application of Community legislation, which is designed to prevent standardization creating barriers to trade and provides for the automatic transposition of European standards to the national level. Two key elements are Directive 83/189/EEC, which obliges the Member States to notify the Commission in advance of all draft technical regulations and standards concerning the technical specifications which they intend to introduce in their own territory, and

Decision 87/95/EEC, which contains three important provisions: the establishment of European standards to fill the gaps left by international standards which are not sufficiently precise; the obligation to use such standards for public procurement contracts; and reference to standards in national regulations.

The Commission does not act as a standards body and does not establish standards itself. It helps promote open systems, contributes to the definition of priorities and mandates the European standards bodies. These bodies are CEN-Cenelec (European Committee for Standardization, European Committee for Electrotechnical Standardization) and ETSI (European Telecommunications Standards Institute). They work together with the national standards bodies. The Commission covers part of the cost of establishing such standards.

Manufacturers and users are making an increasingly large contribution to the work of these standards bodies. The numerous groups involved include: the European Workshop for Open Systems (EWOS), which, within the framework of CEN/Cenelec, aims to promote the international convergence of standards; the Standards Promotion and Application Group (SPAG), whose prime objective is to promote functional standards for the benefit of users and manufacturers; the European Computer Manufacturers Association (ECMA), the European Telecommunications and Professional Electronics Industry Association (Ectel), and the association coordinating European interests in the field of office automation standards (Ositop).

The Commission also contributes to European standardization policy with a range of activities upstream and downstream of this process.

Upstream examples include precompetitive R&D programmes such as Esprit and RACE, which test new standards. The Commission also encourages the use of European and international standards (ISO standards) in programmes such as Tedis.

The most important downstream activity is the Conformance Testing Services (CTS) programme, which is aimed at establishing services to test conformity with standards. Such tests are essential since the products of the information and communications technologies sector are increasingly complex and must meet increasingly demanding requirements. The fact that they correspond to identical standards does not by itself guarantee their interoperability: it is also necessary to ensure that they really do satisfy the requirements defined by the standards — that is the purpose of conformity testing — and this requires harmonized test procedures. These are carried out by the network of laboratories which participate in the CTS programme.

European standards and their status

A few definitions:

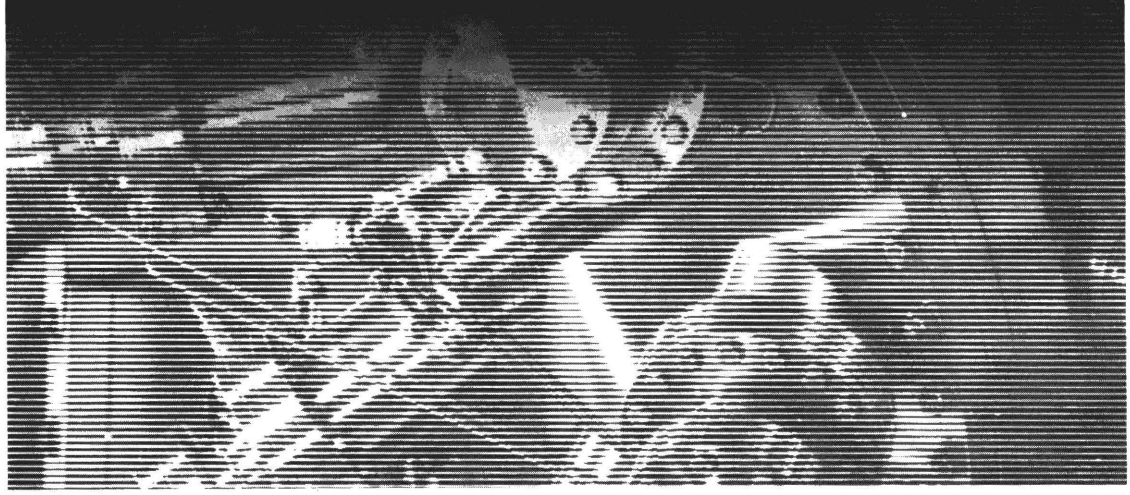
(i) The basic European standard is the European norm (EN), published by CEN or Cenelec. It is applicable in the European Community and EFTA countries. It is mandatory in so far as it has to be adopted as a national standard and any national standard that contradicts it has to be withdrawn. When a European norm cannot be put into effect immediately, CEN and Cenelec publish harmonization documents and provisional pre-standards.

(ii) A harmonization document (HD) allows a few national variations from the EN standard to be maintained temporarily (for example, to allow for a transitional period or to take into account differences such as climate). It does not have to be converted into a national standard, but conflicting national standards have to be withdrawn.

(iii) An ENV is a provisional European pre-standard which has to be available in each country but does not yet have to be implemented; national standards that conflict with existing ENVs can remain in force.

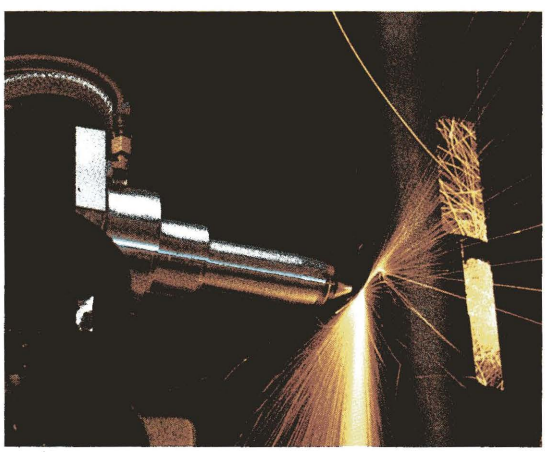
(iv) In the telecommunications field, the CEPT (European Conference of Postal and Telecommunications Administrations) publishes recommendations. Some of these are then converted into ENs, ENVs and HDs by CEN/Cenelec and apply as described above. Others, NETs (Normes européennes de télécommunications, or European telecommunications standards), are common technical standards covering access to public networks and the equipment to be connected to the networks. These are mandatory for the type approval of equipment connected to the public telecommunications networks. ETSI (European Telecommunications Standards Institute), founded in 1988, will henceforth be taking over the standardization role of CEPT.

(v) In the absence of any world or European standards, functional standards serve to specify how certain basic standards are to be used in order to perform particular technical functions, as defined by the OSI reference model. Functional standards are published first of all in the form of pre-standards (ENVs). They allow progress to be made with implementing the OSI reference model while avoiding errors of interpretation and/or contradictions.



Promoting innovation and the optimum use of R&D

The efforts being undertaken in the field of information and communications technology can bear fruit only if Europe manages to put right one of its major weaknesses: insufficient mastery of the processes of innovation and exploiting of the results of R&D with a view to marketing new products and services responding to market needs. Two programmes, Sprint and Value, are designed to meet these objectives.



Sprint

After a preparatory phase which was completed in 1988, the main Sprint programme (Strategic programme for innovation and technology transfer) was launched in 1989 for a period of five years with a budget of ECU 90 million. Its aims are:

(i) to strengthen the innovative capacity of European producers of goods and services;

(ii) to promote rapid penetration by new technologies and the dissemination of innovation throughout the economic fabric of the Community;

(iii) to enhance the effectiveness and coherence of existing instruments and policies, whether regional, national or Community, in the field of innovation and technology transfer.

To achieve these aims, Sprint provides for three main lines of action:

(a) The promotion of a European service infrastructure for innovation and technology transfer:

(i) by consolidating the intra-Community networks which already exist and bringing together innovation and technology transfer consultants, sectoral research centres, and risk capital enterprises within the framework of the European Venture Capital Association (EVCA);

(ii) by developing new intra-Community networks, associating contract research organizations, technical consultancies, university/industry liaison units, science parks, etc.;

(iii) by means of measures designed to enhance the performance and long-term efficiency of the networks referred to above, e.g. by training middlemen and company managers in innovation management and the establishment of networks of experts in disciplines such as quality control and value analysis.

(b) Support for specific projects for intra-Community innovation transfer; this concerns the application of available technologies in regions in industrial decline or lagging behind in their development, the promotion of advanced technologies in traditional industries, awareness promotion and training activities, etc.

(c) Improving the innovation environment through a better understanding of the processes involved and more cooperation between the Member States and the Commission. The aim here is in particular to develop within the Community a regulatory, legal, economic and fiscal environment favourable to innovation and technology transfer.

Value

Value (programme for the dissemination and utilization of scientific and technological research results) was launched in 1989 for a period of four years. It has a budget of ECU 38 million. Value is open to all contractors in Community-financed research programmes, not only those of Directorate-General XIII but also all other programmes such as Brite (manufacturing technology), Euram (advanced materials), Joule (energy), BAP (biotechnology), STEP and Epoch (environment), etc. Value is also open to European and international experts, selected following an invitation to tender, whose assistance is essential for the successful dissemination and utilization of results.

Value uses a wide variety of methods to encourage the dissemination and utilization of the results of Community R&D: the collection and dissemination of information on current or planned programmes; the identification, characterization and selection of the results of Community research projects with a view to their use and dissemination; securing of legal protection for results (patents, etc.); dissemination of results by means of publications, seminars and databases in collaboration with the Member States; activities to promote the use of results (assistance and advisory services to enterprises, exhibitions, search for industrial and financial partners, participation in the financing of prototypes).

At the end of 1990 Value started the phased introduction of the Cordis service (Community Research and Development Information Service), offering a single and easy means of access to various databanks of use to the R&D community. Cordis has the further aim of enabling participants in Community R&D programmes to publicize the non-confidential aspects of their results and to indicate their needs regarding the effective exploitation of those results. Cordis is accessible via ECHO, the Commission's database server.

As part of the Value programme the Commission subsidizes Proteas, a European databank of R&D results, innovatory ideas, and new technologies and prototypes in the following fields: biology and medicine, industrial and manufacturing technology, materials, energy, and the environment.

In December 1990 the Commission sent the Council a proposal for centralized action for the dissemination and use of knowledge resulting from Community R&D programmes. Although it provides the essential continuity of certain projects under the Value programme, it is more than just an extension of the programme. It combines activities designed to strengthen the initiatives already undertaken to intensify the research/industry interface and new activities aimed at enriching the research/society interface (in order to measure and analyse the impact on society of the scientific and technical knowledge resulting from Community activities) and the research/scientific community interface (in order to contribute to the current interdisciplinary debate on research and research methods).

Promoting information services

Europeans are talking to each other more and more: each year their communications facilities grow by some 40% and the turnover of information services by some 25%. The number of direct participants in the information industry — databank producers, information providers, publishers, libraries and manufacturers of telecommunications equipment — is growing. Some 700 000 new jobs are expected to be created in the sector by the year 2000. Nevertheless, the level of activity in electronic and information services in Europe is still only half of the level in the United States. The European market is fragmented by technical, legal, tariff, language and other barriers which are all obstacles to the free movement of information. To overcome these obstacles and make the best use of the Community's assets, including its considerable resources of all kinds of information and know-how in the telecommunications field, the Impact (Information market policy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actions) programme has been launched. Its first phase was implemented over a two-year period (1989-90), with a budget of ECU 36 million. It is to be succeeded by a five-year programme. Impact 2, covering the period 1991-95.

The aim of Impact is to create a real common market in information services, an essential part of the single market. Under the first phase of the programme:

(i) A European information market observatory was set up to give a better insight into the information services market and provide the Commission with a basis for the formulation of its policy in this field;

(ii) An advisory group of experts on information and communications law was set up to examine the legal questions raised by the development of the new electronic information services and to advise the Commission on Community initiatives to overcome problems in this field;

(iii) Guidelines were drawn up for enhancing synergy between the public and private sectors, with a view to developing the information market;

(iv) 18 pilot and demonstration projects were launched in key sectors (intelligent interfaces, picture banks, tourist information, road transport, patents and standards);

(v) The assistance and guidance tools available to users, especially those accessible via the ECHO server, were improved. ECHO has been used to test new techniques simplifying the interrogation of databases in a multilingual context: menu-assisted interrogation, natural-language interrogation, voice interrogation and return of information by synthesized voice;

(vi) The specific action programme for the introduction of new technology in libraries was drawn up as part of the new Community R&D framework programme (1990-94).

Proposals for the second phase of Impact (1991-95) were presented to the Council at the beginning of 1991. They include four main areas of activity:

(i) improving knowledge of the market;

(ii) removing legal and administrative obstacles;

(iii) making information services and information culture more user-friendly;

(iv) supporting shared-cost strategic information initiatives with public- or private-sector bodies.

Data protection

In July 1990 the Commission sent the Council an important communication on protection in relation to the processing of personal data in the Community and the security of information systems. The communication contains the most comprehensive plan of action in this field so far drawn up anywhere in the world. It proposes a strategic framework based on the following measures:

(i) A proposal for a general directive aimed at establishing a high level of data protection throughout the Community, in both the private and public sectors; it also provides protection against the transfer of personal data to non-member countries;

(ii) Other proposals would extend the principles of the general directive to public-sector activities not covered by Community law, apply the principles to the bodies and institutions of the Community, and open negotiations with a view to the accession of the European Community to Convention 108 of the Council of Europe;

(iii) A sectoral proposal is designed to protect personal data and privacy in the context of public digital telecommunications networks (in

ECHO

ECHO (European Community Host Organization) is the Commission's database server. It was set up in 1980 to encourage the growth of information services in the Community and promote understanding of them. Its main functions are:

(i) to provide basic information on Community information services in the nine official languages of the Community;

(ii) to help new users by providing training and assistance courses, especially in regions where there is a lack of information services;

(iii) to test new advanced methods of accessing information.

ECHO is:

(i) a demonstration server: it proves that electronic information services can provide databases in all Community languages;

(ii) a server which develops initiatives: it offers new user-friendly services, such as access in natural language, and can also provide urgent commercial information by telex or telefax;

(iii) a server which stimulates commercial services: its training courses and demonstrations have created new opportunities in poor regions which other servers had previously considered not to be commercially viable.

To find out more about ECHO, contact:

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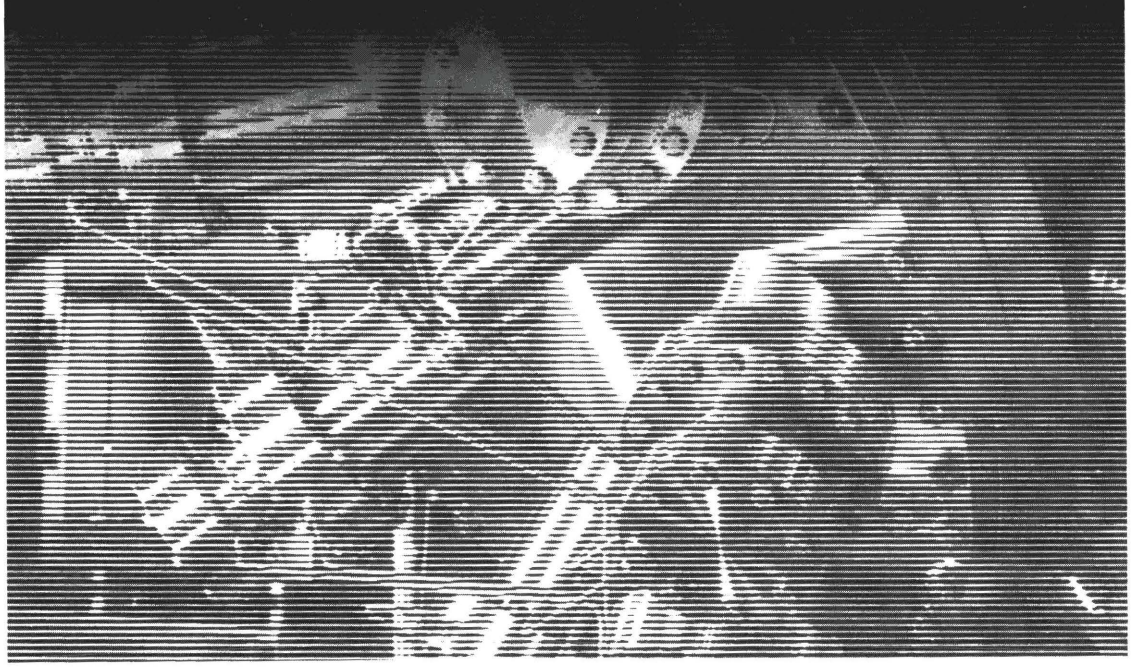


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prioritaires et exemplaires
EC collaborative research work to be extended
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particular ISDN and public digital mobile networks);

(iv) A proposal for a two-year plan of action on the security of information systems.

International aspects

Another aspect of the Community's information and communications technology strategy is that the Community should prove its cohesion and stand up for its own interests in as united a fashion as possible, in particular in the context of its bilateral relations with the United States and Japan, and in international settings such as GATT (General Agreement on Tariffs and Trade), ISO (International Organization for Standardization), ITU (International Telecommunications Union), etc.

After 1992 the Community intends to remain open, as it has always been, not only in order to comply with the principles of free trade but also because it is in its interests to do so: it is the world's leading trading power. However, as President Delors put it, the Europe of 1993 'will not be given away'. The Community's policy is accordingly to ensure compliance with GATT rules and disciplines, while developing bilateral contacts with the United States and Japan in order to establish a balanced and acceptable relationship with these two partners.

Contacts with the United States are very frequent, both at the level of Commission and Community officials and, in the Member States, at ministerial level. Since 1982 a yearly 'round table' has been held between the US Secretary of State and several of his colleagues, on the one side, and the Commission President and the Commission Members concerned, on the other, to review all aspects of EC-US relations. To reinforce these links it was decided in 1988 to hold regular meetings between the US Under-Secretary of State responsible for economic relations and the Commission's Director-General for external relations. An increasing amount of dialogue is also to be seen at the level of European political cooperation.

During a visit to Washington in March 1990, Commission Vice-President Pandolfi proposed five priority areas for R&D cooperation with the United States, one of which was information technology.

The Community has established and deepened a political dialogue with Japan by regular meetings held in the context of European political cooperation. It is trying to encourage Japan to integrate more into the world economy and to assume the responsibilities of a major economic power. The Community is insisting that Japan reduce its dependence on exports and move towards an economy based on internal demand, with all the structural reforms, opening of markets and internationalization that that requires. Japan has to be persuaded to increase its imports on a lasting basis and to reduce its surpluses.

However, the structural trade imbalances observed cannot be redressed quickly. Under these circumstances the Community considers it all the more important to stick to the generally recognized multilateral negotiating rules and mechanisms — particularly within GATT — founded on the general principle of reciprocity. This is why it protested against the agreement on semiconductors concluded between Japan and the US in 1986. It asked for a GATT panel to be set up and its views were substantiated by the conclusions the panel delivered in 1988.

An important area in which the Community forcefully affirms its cohesion is telecommunications. At the World Administrative Telegraph Conference, held in Melbourne in December 1988, it adopted a joint position which stated that the Member States of the EC would apply international rules on telecommunications in accordance with their obligations under the Treaty establishing the EC. During the conference the Commission also obtained observer status at the international Telecommunications Union (ITU). The Community presents a united position in negotiations on services within the Uruguay

Round of GATT talks. The aim of the negotiations is to apply rules comparable to the GATT rules on goods to services. Telecommunications play a major part in these negotiations, because many services depend on them.

Given the progressive establishment of a European telecommunications area, the Commission is also following various issues being discussed within the International Telegraph and Telephone Consultative Committee (CCITT) and the International Radio Consultative Committee (CCIR).

Another example which demonstrates the Community's determination to speak with a single voice concerns standardization in the field of high-definition television: in December 1989 the Council adopted a decision which provides for the Member States to take common action to promote the European 1250/50 standard.

Following the recent changes in the East European countries and the development of relations between the EFTA countries and the European Community, in June 1990 the Commission adopted a communication on cooperation with non-member countries in the field of science and technology. The communication describes the cooperation activities already being undertaken with other countries, including the newly industrialized countries and the developing countries; it also proposes a set of principles and guidelines for future Community policy in this field. In June 1990 the Commission also adopted a communication on the role of telecommunications in the development of relations with the countries of Central and Eastern Europe. In December 1990 the Council adopted, on the basis of the communication, a series of conclusions in accordance with which the Commission will be able to play a major role, at the request of the countries concerned, in liaison with other bodies, in various fields including:

(i) the establishment of new organizational structures which are more open to competition,

(ii) active participation in European standardization procedures,

(iii) improvements to telecommunications networks.

For further information on the programmes referred to in this brochure please contact:

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