



EUROPEAN FILE

Telecommunications:
the new highways
for the single
European market

Telecommunications pose a major challenge for the completion of the single European market by 1992. Rapid technological change has turned this sector into a spearhead of market growth and of our future prosperity. Modernizing telecommunications increases productivity throughout the economy and makes a range of services more marketable; it requires enormous investment, both in infrastructure and in high value-added telecommunications services. Telecommunications, along with space technology, will receive the major share of European civil investment in new technology.¹

After the age of coal and steam, and the era of oil and electricity, has come a third industrial revolution. It is based on new technology sectors, which have over recent years achieved average growth rates of 7 % on the international market, in contrast to the lower rate of expansion in the economy generally. Among these advanced sectors, whose massive demand will increasingly affect the economy as a whole, information management and transfer – combining telecommunications and data processing – represents a world market worth more than 500 000 million ECU.²

Europe has two options: either to participate on equal terms in this dynamic transformation of the world economy, or to become a second-rank partner and grow steadily poorer. The Community has taken up the challenge. Since 1983 it has rapidly built up a European telecommunications policy. The principal stages of this process included:

- the proposal and adoption in 1984 of the first action programme, prepared with the help of a group of senior national telecommunications officials;
- in 1984 and 1985, the signing of cooperation agreements with the European Conference of Postal and Telecommunications Administrations (CEPT) and with the major European standardization bodies CEN and Cenelec;
- the adoption by the Council of Ministers, between autumn 1984 and the end of 1987, of 12 Directives, Decisions, Regulations or Recommendations. Two of these decisions enabled the ambitious RACE research programme to be launched;
- the judgment of the European Court of Justice on 29 March 1985 in the 'British Telecom' case, of fundamental importance for opening up the market for high value-added services. Also the efforts of the European Commission to open up the whole telecommunications market;
- the Green Paper published by the Commission in June 1987, which opened a broad debate on the adjustment and liberalization of this sector; the first ever

¹ This file replaces our No 13/86. Text based on Herbert Ungerer, with the collaboration of Nicholas Costello: 'Telecommunications in Europe - Free choice for the user on Europe's 1992 market', in the series *European Perspectives* published by the Commission of the European Communities.

² One ECU (European currency unit) = about £ 0.65, IR £ 0.77 or US \$ 1.1 (at exchange rates current on 29 August 1988).

Telecommunications Council (Council of Ministers of 30 June 1988), which gave strong support to the Green Paper orientation. Henceforth these Councils will be held regularly, in recognition of the enhanced importance of the sector.

The technological revolution

The Europe of the 1970s witnessed a silent revolution: the telephone became an instrument of daily use for the wider public; telecommunications administrations are now among the Community's principal employers. Today the sector is undergoing a new revolution as a result of technological progress and in particular:

- digitization, which allows data – the human voice, text, numbers, images, etc. – to be encoded in the form of bits, which are the basic elements of binary computer language. The consequence of this is a growing interpenetration of telecommunications and computer technology. An integrated services digital network (ISDN) is being established; this will improve the quality of traditional services (telephone, telex, etc.) and will enable new ones to be provided: high-speed facsimile, enhanced videotex, electronic mail, tele-shopping, data transmission, etc. Thus combined, computer technology and telecommunications will engender decisive change, adapting information and the processing of it to the particular needs of the user, and availing of all the resources of the network and its terminals. In that way the number of high value-added services can multiply: electronic exchange of commercial data, financial services, etc.;
- the changes in transmission techniques, due to satellites and fibre optics. Replacing the copper wire of the traditional telephone and made of a substance similar to glass, optical fibre carries information in the form of binary light pulses and can handle an enormous mass of data at low cost.¹ Broadband or high bit-rate optical cable will be the telecommunications highway of the future: it will be able to transmit, besides the services of the ISDN, television programmes (both traditional and interactive) and new services such as videotelephony (telephone with pictures), videoconferencing, colour facsimile, high-speed transmission of computer data. In the twenty-first century, the marriage of telecommunications, computerized data processing and audio-visual technology will become a reality.

Europe faces up to the challenge

In the early 1990s telecommunications will be one of the main sectors of the economy. Towards the end of the century, they will account for about 7 % of the

¹ Two optical fibres, with their glass core of the thickness of a human hair, can transmit up to 8 000 simultaneous telephone conversations, compared with the few hundred carried by the traditional coaxial copper cable. With the new generations of satellites, the transmission capacity has grown in 25 years from 300 simultaneous telephone calls to 80 000.

Community's gross domestic product, compared with 3 % at present. At the same time the emergence of new telecommunications services will have a major impact on the tradability of services in general and on the location of economic activities.

The growth of the sector will however require a healthy interaction between public and private investment, supply and demand, and economic and social considerations. The economic regulations to be applied to telecommunications are therefore crucial: Europe needs powerful operators who can develop its infrastructure, as well as a liberalized market to stimulate private investment in new services and provide users with freedom of choice, which is the key to public acceptance of new technology. A whole new balance must be struck, as Europe must compete with the dynamic forces which deregulation has released in the United States and Japan.

The new conditions must be created at European level. There is no longer any alternative to the Community market. The fragmentation of that market into 12 national ones is too costly. Though traditionally strong in the telecommunications sector, by the early 1980s Europe had fallen behind:

- in computer technology, particularly in 'chips' – the highly integrated circuit components which form the heart of the new technology;
- in adapting regulations and opening up the telecommunications sector to new opportunities.

Today national markets in the Community are no longer big enough to cover the ever-increasing costs of research and development. The growth of those costs is such that software has become much more expensive than hardware. It is estimated that at the beginning of the 1990s the software for a public switching system, which will incorporate about three million programmed instructions (compared with one million at present), will represent 80 % of the total cost of the system: in 1970 the proportion was 20 %. The research and development cost of such a system is now 1 000 million ECU, where the electro-mechanical systems of 1970, which had a useful life two or three times longer, cost only 15 to 20 million ECU. Investment on that scale cannot be undertaken unless one can count on obtaining 8 % of the world market, but none of the national markets in the Community amounts to more than 6 % (while Japan has 11 % and the United States 35 %).

It is therefore no longer possible to develop European telecommunications according to the traditional model of 'national champions', which has led to the development of eight different types of digital switching systems in Europe, compared with two in Japan and three in the United States. Europe can no longer afford the luxury of costly duplication of research and development within national markets that are partitioned from each other. It cannot allow continuation of the equally serious delays and shortcomings in the development of new high value-added services, due to divergences between the timetables and standards of the various Member States.

Nor can the Community be content with a strategy that is only industrial and regulatory. To bear fruit, the joint European effort must have a favourable environment. This means that it is equally vital:

- to manage the social effects of technological change, which will create many jobs but will do away with others;
- to determine a common approach to access to information, protection of private life, etc., so that the individual feels at ease in the new technological environment;
- to take account of the interests of less-favoured regions, so that modernization of telecommunications helps to increase the cohesion of the Community rather than widen the existing gaps.

The telecommunications action programme

The principal objective of Community action in the telecommunications field is to take full advantage of the vast potential of a unified European market. In 1984 the Community's Council of Ministers approved an action programme for this sector. This had been drawn up by the European Commission with the aid of a group of senior national government officials. On that basis, activities have been initiated in five areas:

- coordination of future development of telecommunications:
 - in 1986 the Council adopted a Recommendation on the coordinated introduction of the integrated services digital network; a common approach was determined to standards, tariffs and services; under the timetable laid down, 80 % of consumers would have the option of access to the ISDN by 1993 and 5 % would actually be connected to it (five million lines);
 - in 1987 the Council adopted a Recommendation and a Directive on the pan-European digital mobile telephone. This service is to be started in 1991 and the main urban areas are to be covered by 1993, so that 2.5 million motorists will have the equipment in 1996. (In 1985 there were only 150 000 users and the noncompatibility of the technologies restricted the services);
 - also in 1987, the Tedis programme was launched to study ways and means (standardization, promotion, etc.) of developing the electronic exchange of commercial data, and facilitating in that way the European activities of firms on the large market after 1992;
 - the Council should soon deal with the Commission's proposals on developing the transnational infrastructure of a future broadband 'telecommunications highway' network, based on fibre-optic and satellite links.
- creation of a common market for terminals and equipment. It is estimated that adoption of common European standards would allow savings of 5 to 10 % (about 1 000 million ECU per year) on the equipment market alone. We have already noted that the Commission concluded cooperation agreements in 1984

and 1985 with CEPT (European Conference of Postal and Telecommunications Administrations) and CEN-Cenelec (responsible for standardization). A Directive adopted in 1986 on mutual recognition of conformity tests for terminals should allow the industry to market these throughout the Community on the strength of tests carried out in approved laboratories and based on European standards; in this way a single procedure replaces the 12 existing national procedures;

- development of joint research. Upstream from marketing and standardization, a major research effort is required to develop the technology of the year 2000. The Community's RACE programme is intended to enable the necessary technology and standards to be perfected for the future broadband integrated network: high-speed and high-complexity integrated circuits, integrated optoelectronics, broadband switching, passive optical components, high bit-rate links, concepts for system development and integration, etc. The RACE programme is based on cooperation between industrial laboratories and universities all over Europe and has a budget of 1 200 million ECU, financed by equal contributions from the Community and industry. Other Community programmes also encompass certain aspects of telecommunications: Esprit II (information technology), AIM (Advanced informatics in medicine), Delta (Developing European learning through technological advance) and Drive (Dedicated road infrastructure for vehicle safety in Europe);
- promotion of modern telecommunications services and networks in the less-favoured regions of the Community. Modernization of telecommunications could and should contribute to strengthening the cohesion of the Community and to developing its peripheral regions. Between 1987 and 1991 the Community will devote 780 million ECU to the STAR programme, which operates in Greece, Ireland, Portugal and certain regions of Spain, France, Italy and Britain. In 1987 alone, total aid from the European Regional Development Fund for better equipping the less-favoured regions was nearly 200 million ECU. These regions also benefit from most of the long-term loans granted by the European Investment Bank to finance the extension and modernization of networks, the deployment of satellites, cables and stations, and the production of materials involving advanced technology (more than 350 million ECU in 1987);
- adoption of common positions on the international scene. The Community is a driving force in discussions with the United States, Japan, etc. on future standards for high-definition television¹ as well as in GATT negotiations, which for the first time are now to cover trade in services.

In addition, the Community takes advantage of its position as a large user of telecommunications to encourage the development of modern services. A video-communications system has been established between Brussels, Luxembourg,

¹ On the issue of television, see *European File* No 4/88: 'Towards a large European audio-visual market'.

Strasbourg and the capitals of Member States, and specific systems have been created for the exchange of information between institutions (Insis) and for exchanges of data on agricultural markets and trade (Caddia).

Opening up markets: the Green Paper and its follow-up

What regulation is to be applied to telecommunications in view of the single market of 1992? That is the central theme of the Green Paper on Telecommunications published by the European Commission in June 1987. To ensure the future vitality and prosperity of the Community and to respond to users' needs, the regulatory framework should be adapted to the evolution of technology and of the markets; according to the Commission, it is by concerted adaptation that the twin objectives of public service and free consumer choice can be attained. Current developments in many countries are making for liberalization, whether in regard to access to the network, connecting terminals to it, or offering services through it. The Community must make sure that regulatory changes take account of the European dimension, and that they do not furnish a pretext for new barriers to trade but allow the elimination of existing barriers.

The common market for telecommunications must be achieved in three areas:

- terminals, so as to offer a wide choice to users;
- services, so as to stimulate the development of this sector and the support it offers to the economy as a whole;
- network equipment, so as to consolidate the international position of the European industry. This objective entails opening public purchasing, which alone will make possible the economies of scale necessary for the profitable development of new technology.

The analyses in the Green Paper are founded on a search for balance between the demands of public service, of users and of the market. It enabled a wide process of consultation to be undertaken with all the interested organizations and groups across Europe. On that basis the Commission was able in February 1988 to present a communication on the achievement, by 1992, of a common market in telecommunications. The objectives of the action plan set out therein were given strong support by the Council of Telecommunications Ministers when they met in Berlin in April 1988.¹ The Commission's programme provides for:

- full opening of the terminal equipment market to competition, by the end of 1990;

¹ This informal approval was confirmed formally by the resolution of the Council of Ministers of 30 June 1988, concerning the Green Paper.

- progressive opening of the telecommunications services market to competition from 1989 onwards. All services other than telephone, telex and data transmission are to be opened by the end of 1989;
- full opening, by the end of 1989, of the market for receiving antennae for satellite broadcasts;
- progressive alignment of tariffs with costs;
- a series of accompanying measures: separation of the regulatory and operational activities of telecommunications administrations; definition of common principles for access to the network (ONP, open network provision) for providers and users of services; creation of a European Telecommunications Standards Institute (this was set up by CEPT in March 1988); full mutual recognition between countries of type approval for terminals; application of VAT to telecommunications; application to the sector of Community competition rules; opening of public procurement.

By the end of 1988, the Community is to define its positions on a series of other questions:

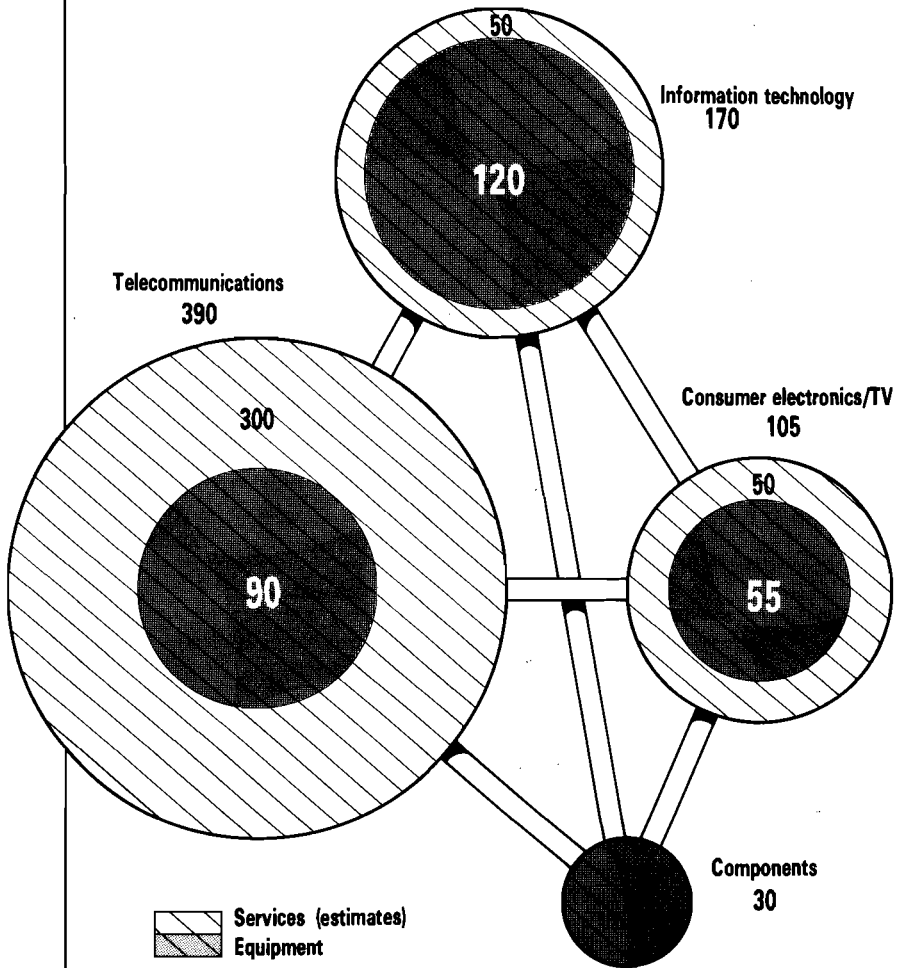
- development of satellite communications: the regulation to be applied, development of earth stations, relations with the specialized bodies, both European (Eutelsat, European Space Agency) and international (Intelsat, Inmarsat, etc.);
- promotion of Europe-wide services (public data services, videotex, ISDN, mobile communications, etc.): compatibility and interoperability of systems; common tariff principles, to ensure reasonable, market-led prices; development of European high value-added services, particularly through the Tedis programme and other initiatives designed to create a European information market;
- defining a Community position on international problems, particularly as regards relations with the Community's European neighbours (EFTA), the United States, Japan and the Third World, as well as in international organizations and negotiations (the GATT and ITU, the International Telecommunications Union);
- the social dimension: development of the social dialogue on the bases of joint analysis; examining the training and retraining required by the evolution of technology, qualifications and employment; taking account of other social problems raised by new services and activities, particularly as regards protection of privacy.

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Telecommunications are a major component of the general information technology sector, representing more than 50 % of its world market (see diagram). Since the

beginning of the 1980s Europe has shown its capacity for solidarity in this area, once the need was clearly perceived. With its 320 million highly-qualified inhabitants and the positions already reached by its firms, the Community has enormous potential in this field – potential which must be exploited, in order to improve growth, employment, and the quality of life ■

The world market for management and transmission of information in the mid-1980s (× 1 000 million ECU).



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