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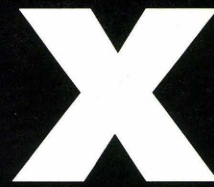
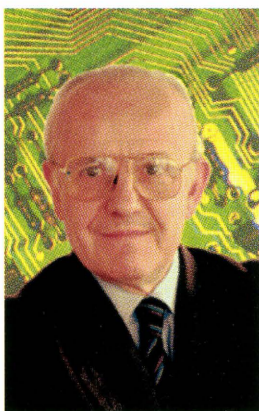## M A G A Z I N E

EUROPEAN COMMUNITY POLICY FOR
TELECOMMUNICATIONS, INFORMATION
INDUSTRIES AND INNOVATION.

ESPRIT
AND
BEYOND

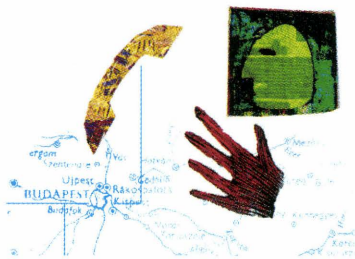April 1991 Issue No. 1

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CONVERGENCE AND INTEGRATION

CHANGES IN INFORMATION and telecommunications technologies are reaching further, faster and have increasing influence on daily life and society at large. The same goes for the companies that develop these technologies and those that rely on them. Today we are witnessing a trend towards the integration of technologies, services and industries. Against this backdrop the Community is in the process of rethinking its strategy and redirecting the actions it has set in motion with the aim of adapting its policy to new requirements. This new publication, XIII Magazine, itself reflects this process of adaptation.

Today, technologies and services are becoming intertwined. The transition from a multitude of dispersed and independent computerized entities towards one large accessible information system goes hand in hand with greater synergy between telecommunications and audiovisual technologies and services. At the same time, we are seeing a redoubling of efforts at restructuring among many large businesses in this sector. Some are meeting with more success than others, but it is difficult to identify the most effective formula in the long term. Since the start of the 1980s, the Community has been developing a series of instruments designed to deal with the impending and sweeping changes in this sector. In 1983 the Commission proposed the creation of the Esprit programme in order to consolidate the position of the European information technology industry through cooperation in research. Now the Commission's Directorate-General XIII, which is responsible for the Esprit programme, is also handling research and policies in the fields of telecommunications, standards for telecoms and information technology, innovation, assessment of research results and the deregulation of the information services market.

Closer cooperation between the fields of technology and services, as well as revamping in the industrial sector, has prompted the Community to classify its research and development actions in the telecommunications and information technology sector under three broad headings. These are electronics and data processing; telecommunications; and networks and Europe-wide on-line services. The new 1990-1994 technological research and development framework programme pays close attention to the development of applications to ensure that they fill the needs of users. Another of its major goals is to introduce a European "nervous system" that would tie in all the national networks of Member States, a prerequisite for the completion of the single European market. This sizeable project must be backed by other EC policies in the areas of social affairs, specialized training, regional development, international trade relations and competition rules.

Convergence of technologies and services, industrial activities and EC efforts have all given rise to new needs. In response, the Community should unify and reinforce the image of its policy in communications and information technologies. This effort has been given shape by the launching of XIII Magazine, which will further the task of providing information undertaken by the bulletins IES News, I&TT and I'M. These publications have done a great deal to bring down the barriers between the scientific communities in the Member States. XIII Magazine, by merging the essential part of these bulletins and pooling their editorial efforts, will shore up and broaden the scope of DG XIII's aims.

XIII Magazine contains two parts. The first covers strategic and general topics. The second part, published as a supplement, will offer more factual information such as late news and technical, scientific or organizational information. The supplement will be made up of several sections that will carry on the task of the bulletins, whose readers will be receiving XIII Magazine. The new publication is therefore designed to reach out to decision-makers, university research directors and all those active in information technologies and communications, with the aim of helping them to assess the impact of their decisions in R&D and to help them guide their work in keeping with general strategic concerns.

XIII Magazine is written by journalists, independent experts and representatives of EC institutions and other organizations active in communications and information technologies. It welcomes contributions from anywhere in Europe, where it will be distributed once every three months this year and once every two months beginning in 1992.

This new magazine will offer an opportunity to those working in communications and information technologies to get in touch with each other. It will also be an essential instrument to support our continuous efforts at adapting EC policy to new needs in this ever-changing sector. XIII Magazine will gladly publish your ideas and comments. Only through feedback and discussion will we be able to forge a strong, open Europe in these areas that are so vital for economic and social development. ▪

Michel Carpentier, *Director-General DG XIII, Commission of the European Communities*
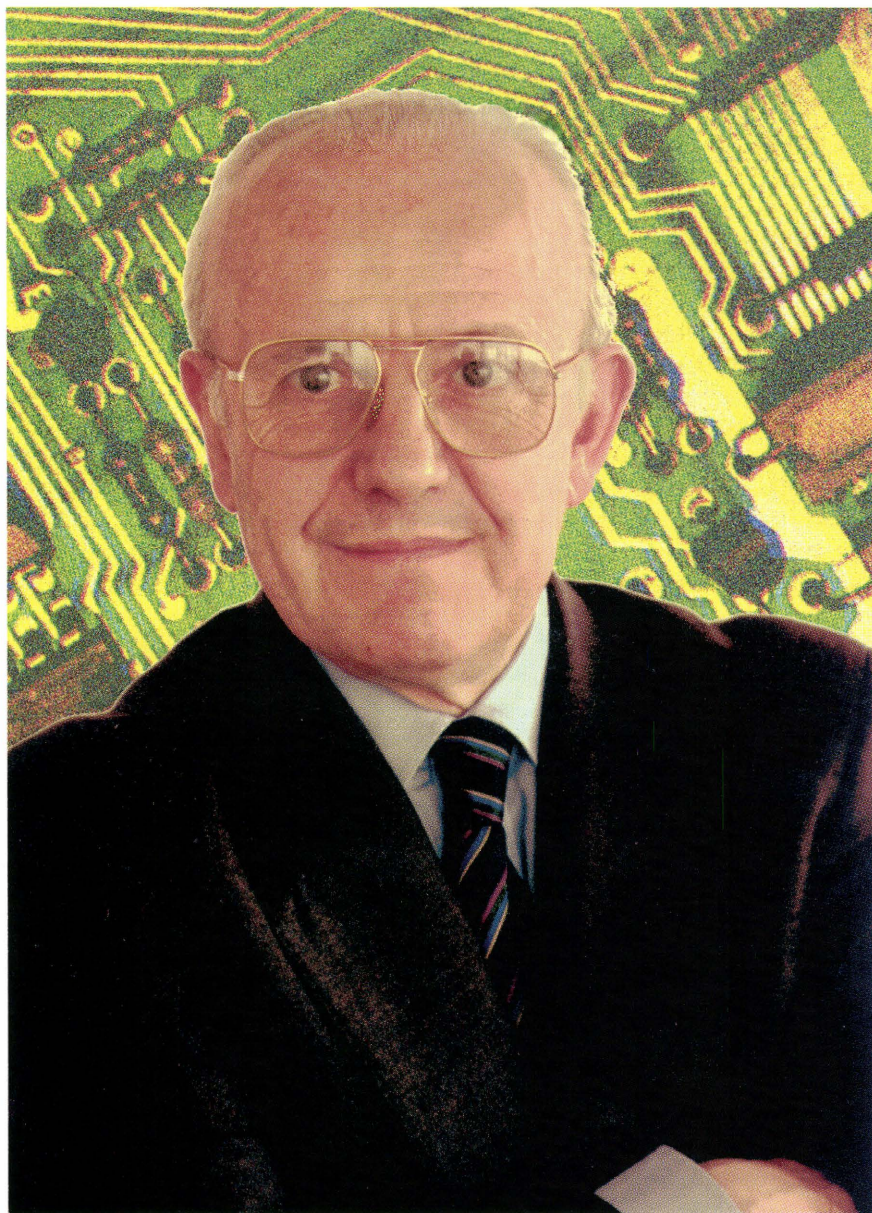
THE EUROPEAN electronics industry is in a critical situation. From microchips to the high-definition television generation of the year 2000, the EC is facing the onslaught of Japanese competition. The opening of the telecoms market for 1992 could expose new European weaknesses. What should be done? Commission Vice-President Filippo Maria Pandolfi, responsible for research and development policy in information and communications technology, plays a central role in the future of such initiatives as the ESPRIT programme. His view is that looking for non-existent scapegoats is a waste of time. Instead of dramatizing the situation, Mr Pandolfi aims for a clear and concrete strategy, based on the facts, to counter the difficulties faced by a sector which is in some respects the victim of its own mistakes. And in the area of research, cooperation needs to be strengthened both within the Community and at international level.

EC Commission Vice-President Pandolfi emphasizes
the need for wider cooperation and closer concentration
on key areas of European electronics.

RETARGETING IT POLICY

At a time of crisis, there is a tendency to lose track of the underlying fundamentals. What are these structural elements, in your view ?

A tendency for supply and demand to be out of balance, reflecting an excess capacity which was quite unforeseeable only a few years ago and a slowdown in consumption. A further factor is an inadapted industrial structure, particularly at European level, with duplicated research efforts, everyone trying to produce everything, the absence of synergy and an inadequate policy on granting licenses. Instead of giving full attention to all these points, the tendency is to focus on Community research policy. This seems to me a rather free and easy application of the principle of causality, given that the present restructuring in many sectors goes well beyond research.

Should Esprit be revised or is it fine in its present form ?

Esprit, like all Community programmes, must be improved and brought up to date. The third EC R + D framework programme differs from the second in that there is an endeavour to concentrate thematically and a rejection of the previously dispersed approach, the idea of large integrated projects, and brand new procedures to deal with proposals coming directly from industry. We really are talking about second-generation Esprit projects.

Now that Philips is pulling out of certain projects, it seems likely that JESSI will also lose ground in research on semiconductors - a strategic sector for Europe.

I wouldn't say that. Philips is getting out on the static memory front, which is not the heart of the problem. Europe's effort in semiconductors must be kept up. We can neither afford to lose strategic know-how nor to find ourselves in a situation of total dependence across a great range of intermediate products, from memories to microprocessors. We should look

beyond Europe. In particular, we should look at possible synergy with the American programme, Sematech.

Seven years ago, with the decision to back research in an effort to catch up with American and Japanese competition, did Europe take on more than it could handle?

Absolutely not. That said, it would be a mistake to try and solve the sector's problems by action at Community level alone. Only a mix of measures can help the electronics industry to overcome the crisis. One concerns supply - competitive products are needed. This involves research, large integrated projects bringing together producers and users, new software standards and greater commitment to innovation.

You mention supply, but is there a way to strengthen demand ? Has the Commission any specific projects in mind here ?

The European industry does need more demand. This can come from the implementation of the informatic and telematic infrastructures necessary for the single market, the interconnection of networks, the development of computerized systems to connect together the different organizations, public administrations, companies, banks - including central banks - on a continental rather than simply national level. To achieve this an extra 15 to 20 billion dollars must be invested.

Would a heavy injection of demand, as you describe, be sufficient to overcome the crisis?

No. The present shape of the European electronics industry must be remodelled, restructured. This is the difficult task the companies have before them. The Community can and must play its part by supervising the rules of the game at international level to guarantee the "balance of benefits", through initiatives designed to ensure a favourable environment at the internal level and better common opportunities at the levels of research and development, training and promotion. It then remains up to the companies themselves to find the best way through the current difficult period without suffering too much damage.

So, some European manufacturers will have to go ?

No doubt. The map of the Community industry will be redrawn because there are too many producers and companies are too small. There is still a tendency to duplicate production rather than taking a more realistic view of the possibilities of the market. Against this background, each producer will have to reshape his production structure. From time to time, systems do need a special overhaul.

Moving to the other strategic sector, telecommunications, what is your recipe for this ?

My recipe is the programmed opening up of the EC market. The Twelve accepted this with the December 1989 agreement on telecommunications policy. My next objective is to apply the same balanced mixture of liberalization and harmonization to communications by satellite, which are important to Europe's challenge in high-definition television. The Council of Ministers will be discussing this formula, in an ad hoc Green Paper, in the next few weeks. I hope for a favourable response. ▨

**Interview by Adriana Cerretelli**
journalist

THE OTHER EUROPE
HUNGARY

First in a series on information and communications technologies in central and eastern Europe

IN DECIDING TO SWITCH to a market economy the east European countries have set themselves a gigantic task. The situation is particularly critical as regards information and communications technologies, where the gulf separating east Europe from the western world is clearly wider than in other areas. The difference is such that the lack of telecommunications services is currently the biggest stumbling block to the development of those countries. This type of service is only provided by state-run bodies and, since they form part of what has come to be known as the non-productive sphere, they have traditionally been neglected. Low density and poor quality are the two main characteristics of the telecommunications networks in the former East bloc countries where, in 1987, there were on average only nine lines per 100 inhabitants as compared with 60 lines per 100 in the FRG and 89 per 100 (the highest score) in Sweden.

Adequate systems providing adequate service have thus become a priority for the new governments in Hungary, Czechoslovakia, Poland, Bulgaria, Romania and the USSR. Most of these countries are considering reforms that are largely based on the concepts set out in the European Commission's telecoms Green Paper and all have expressed a desire to comply with European standards. The Community has an obvious part to play here, firstly in financial and technical terms, and above all through the Phare programme. The association agreements to be negotiated with Poland, Hungary and Czechoslovakia in 1991 would soon follow on from that "emergency" programme. The stakes are very high and piecemeal action by European interests could prove counterproductive and hand their advantage to
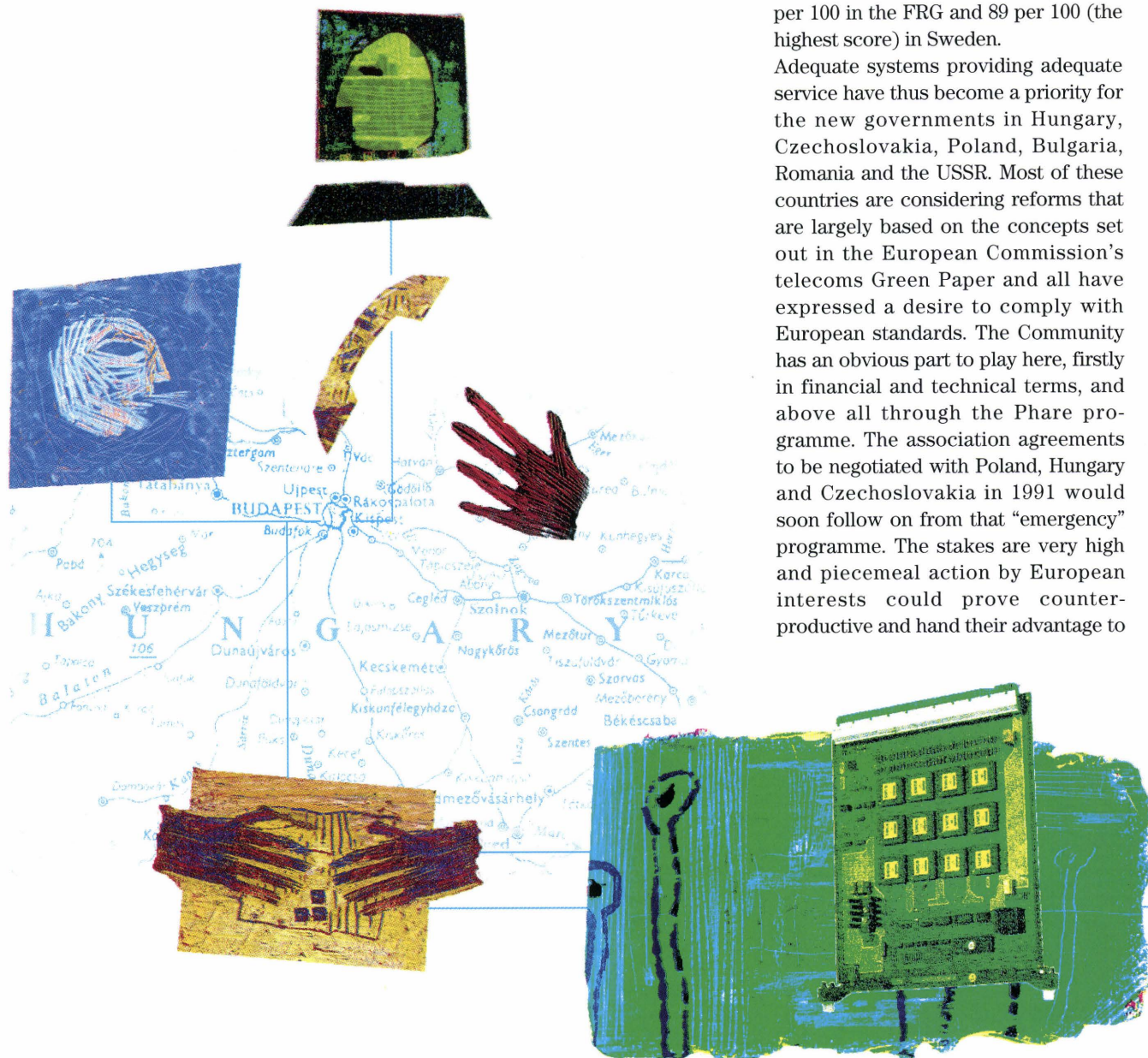
their main industrial competitors. It is not only the communications market that draws strong interest from foreign investors. Data-processing, like telecommunications, has suffered from the restrictions hitherto imposed by COCOM. However, in intellectual terms, the former East bloc countries have enormous potential. For instance, the Soviet Union has recently put on the European market a 'vaccine' software able to deal with computer viruses. Nevertheless, it has been shown that the COCOM rules need to be relaxed quickly and effectively if a real challenge is to be mounted against a major influx of data-processing products that are not covered by those restrictions (especially those from south-east Asia). Even if the east European countries manage to obtain the 'top-flight' computers that are essential to certain economic activities, they will sooner or later be faced with the problems involved in modernizing telecommunications: the networks that are an absolute necessity for data transmission.

In Hungary, communications are still considerably less developed than the country as a whole and have thus over the years greatly hampered its modernization. In late 1989 the Hungarian network only comprised 1,770,000 telephone lines, or on average less than 17 lines/100 inhabitants - and there was a 12-year waiting list. Out of a total of 3,100 built-up areas, only 1,400 have automatic switching.

A thorough shake-up of Hungarian Telecom was needed in order to save the situation as it then was. In mid-1989 Hungary was the first of the former East bloc countries to announce its intention to privatize the state corporations and to permit foreign investors to acquire minority holdings. A first step was taken in January 1990, when Magyar Poszta (the Hungarian Post Office) decided to split its operations into three independent organizations: the Hungarian Broadcasting Corporation, the Post Office and the Telecommunications Company. It is currently being suggested that the latter be restructured. Thus the basic services (telephone and telex networks) should continue to be a state monopoly, while mobile telephones and data supply services, the only value-added services which would benefit from total deregulation, would be exposed to limited competition.

The Hungarian government is in a hurry, aiming to make the new privatized services operational from the end of 1991. There is a great deal of work to be done: according to the latest estimates, over the next 10 years there will be a demand for some three million new lines. The estimated cost is $6 billion, almost one third of which will have to be sought abroad. The Hungarian authorities have thus already shown an interest in funding by the European Bank for Reconstruction and Development (EBRD). This project would enable a digital network (ISDN) to be introduced. In the meantime, Hungarian Telecom has set out its priorities. These are, first of all, to meet professional requirements by 1993; by the same deadline, to install public telephones that are linked to the international network in all Hungarian conurbations; and finally, to reduce the wait for telephones to one year.

The challenge to be met is enormous. Hungary knows that she will never make it on her own. Several foreign companies have therefore already offered their services and the Hungarian Radio Telephone company (a new subsidiary of Hungarian Telecom) recently announced a joint venture with US West Inc. As a result more than $10 million are to be invested in building up a cellular system in Budapest. In addition, DEC recently set up a joint venture with two Hungarian state corporations in order to sell electronic equipment to banks, electricity supplies and telecommunications companies. However, south-east Asian suppliers have so far made the greatest inroads into the Hungarian data-processing market. As it has not been subject to the restrictions of COCOM, Korea's electronics industry doubled its trade with Hungary in 1989. Against this backdrop, Hungary's calls for help under the Phare programme have proved to be far-reaching in both technical and training terms, where a very great deal of work remains to be done. In the meantime, Budapest is already receiving data-processing assistance under the Phare budget for 1990. This provides for an extension of the information network to cover research and development and the modernization of the Hungarian Central Technical Library. ■

Marie-Martine Buckens *journalist*
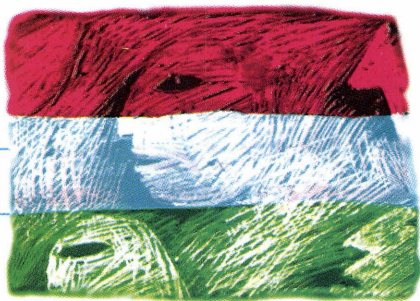
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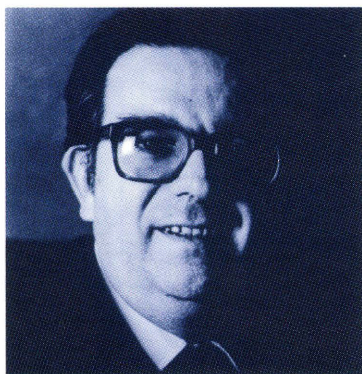
*Is the European
IT industry capable of competing?
Jean-Marie Cadiou, Director, European
Strategic Programme for R&D in
Information Technology.*

THE QUESTION OF the competitiveness of the European information technology (IT) industry has recently come to the fore, with some commentators implying that it is chronically, if not genetically, incapable of competing on the world stage. Words like "lost cause" or "hopeless" have been used. The issue is indeed serious and therefore deserves a serious analysis - that is, one based on facts rather than opinions.

**Some facts about the European IT industry**
The first thing to bear in mind is that the European IT industry is made up of many companies of all shapes and sizes, and not just the few large ones that attract the media's attention. There are over 13,000 IT companies in Europe, and between 1984 and 1989 they collectively increased their overall European market share from 47% to 55%: an impressive 8 percentage point achievement in a very competitive and fast-growing sector. Their total R&D investment more than doubled. Small and medium-sized enterprises (SMEs) tripled their revenue over the

same period, and the growth rate of large companies - a substantial 14% per year - matched that of their Japanese counterparts. The European companies are especially well positioned in the software and services part of the market, which is growing at more than 20% per year. Even in the Japanese-dominated semiconductor market, two European companies have achieved good positions in some products: SGS-Thomson is now number two in the world in non-volatile memories (EPROMs), which represent 30% of the total semiconductor memory market, while Siemens has gained an acknowledged presence in the DRAM market, the main area of strength of Japanese producers. That company now supplies 6% of the world market for 1 Mbit chips, and is starting production of the 4 Mbit generation. These facts do not support the thesis that European companies are permanently or inherently incapable of competing. Of course, this is not to say that there is no cause for concern: obviously, some companies are now experiencing very real difficulties,

which are highly visible in terms of losses or profit reductions and workforce cuts. These difficulties are, I believe, mainly the result of two completely different factors which happen to reinforce each other.

A fast-changing scene
The first factor is an unexpected slowing down of demand in the IT sector, stemming, amongst other things, from fear of a US-led recession and the uncertainties generated by the Gulf crisis. This slow-down is exactly the opposite of what was predicted. Everyone was preparing for 1992 and, anticipating the extra growth, our companies had invested heavily and recruited accordingly. They are now experiencing difficult cash-flow problems as their revenues fail to match expectations, problems which are compounded by a low dollar exchange rate. At the same time, US and Japanese companies are aggressively moving into Europe to position themselves in time for 1992, which makes the situation worse. The second and longer-term factor is the
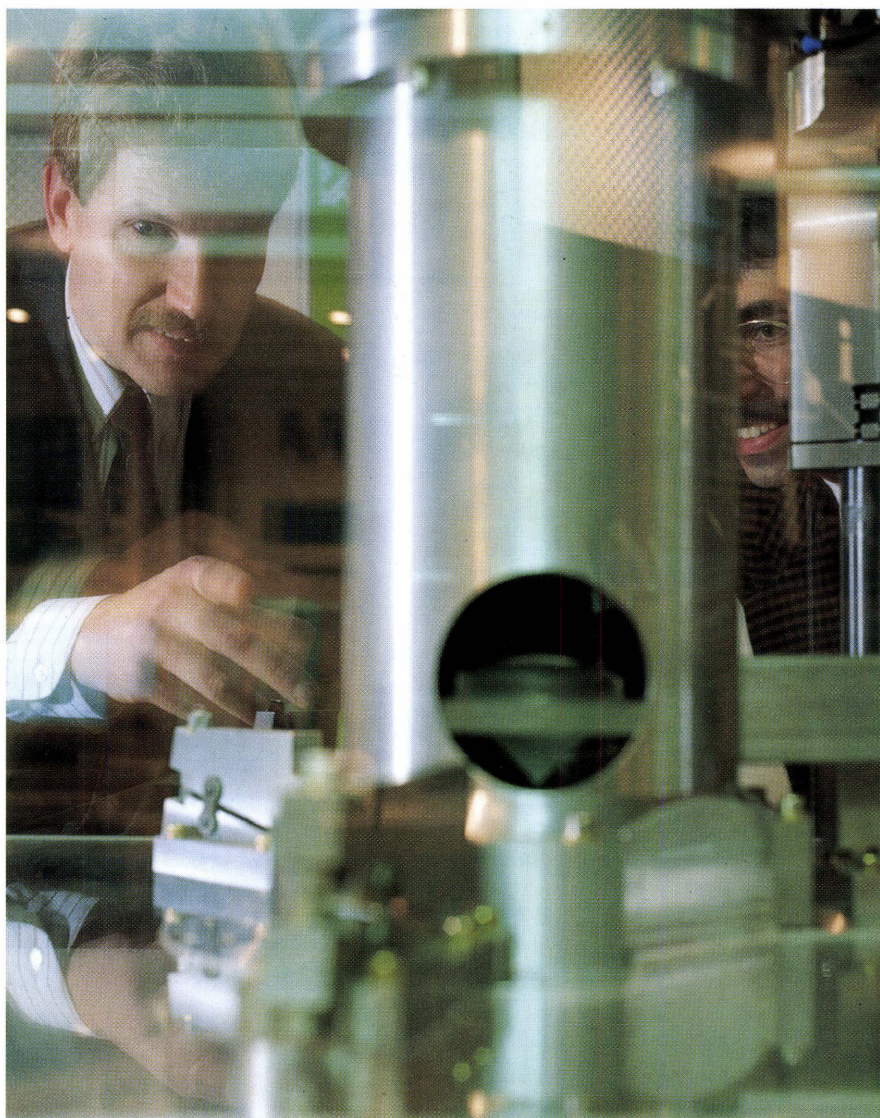
More than 300 major
technology results have
been reported from
Esprit projects so far
and the outlook for the
projects selected under
the second phase of
Esprit funding is very
promising. The
exhibition held by the
Commission at the
Esprit 90 Conference
in Brussels
demonstrated a cross-
section of impressive
results from the
programme, including
micro-electronics,
information processing
systems, computer
integrated
manufacturing, office
and business systems
and basic research.

trend away from proprietary to open systems. This profound user-driven change is causing a complete reorientation of the IT industry and a drastic lowering of manufacturers' profit margins. While our companies are leading the way in the transition to open systems, it is, nevertheless, a source of difficulties for them in the short term. But this is a worldwide move, and all companies will have to make it sooner or later. In fact, European companies are not the only ones experiencing difficulties at present, as is visible in some of the large US manufacturers.

The industry depends on continual technological innovation

Under these conditions, the need for higher R&D investment is stronger than ever, despite the lower profit margins. Open systems lead to more competition and hence shorter product life-cycles. The basic technology itself is developing at an ever-accelerating pace and is far from having reached its limits. Indeed, in some areas it is on the verge of a new revolution. For example, high-performance computing will soon offer the ability to model complex phenomena at a level of detail and with a speed that will allow totally new approaches, using simulation and computer modelling instead of physical experiments such as car crashes or wind-tunnels. This will have a profound impact on manufacturing industries as well as on science. This example brings out a more general point, namely the increasing complexity of users' needs, which calls for a much closer coupling between users and IT providers at a very early stage of technology development. These factors translate into high costs and high risks, despite the lower margins, which inevitably leads to a greater need for the sharing of both resources and risks through cooperation.

Given the importance of technology in this field, it is worth examining how Europe is doing vis-à-vis its main competitors. Europe's record so far in this respect is more impressive

Europe's record so far is more impressive than it has generally been given credit for.

than it has generally been given credit for. In a recent study published by the US Department of Commerce, 10 of the 13 emerging technologies identified are related to the IT sector; of these, Europe is ahead or even with the US on 7, and ahead or even with Japan on 6.

The high cost of capital penalizes European IT companies

Yet European companies are placed at a severe disadvantage in the technology race by the environment in which they operate. In the US, public funding for R&D in IT is very high: at least $5 billion per year, of which $1.5 billion comes from DARPA and other research agencies, and the rest from the R&D part of the total $70 billion spent on defence procurement contracts. In Japan, the mechanisms are different, but the order of magnitude of the financial savings in R&D costs enjoyed by the IT companies is similar. Recent major studies, including one by the Federal Reserve Bank of New York, have compared the full cost of capital for R&D, taking into account not only interest rates but also factors such as the taxation system and requirements for equity in relation to debt. They show that Japanese companies have much lower long-term capital costs for R&D than their European counter-parts. The difference - 10 percentage points during 1989 - effectively doubles the actual cost of R&D for European firms, and led to an estimated R&D cost saving of $6 billion for Japanese IT companies in 1989 alone (and note that previously the relative cost of capital in Japan was even lower). Under these circumstances, one needs to assess carefully whether or not European high technology companies, especially IT companies, are truly placed in a situation of fair competition.

Esprit catalyses successful technology developments

Compared to these figures, the contribution of Esprit to the European IT industry in purely financial terms is very small. But this is not the point. The Esprit mechanism does not act as a subsidy, but rather as a catalyst to bring together organizations from all over Europe and trigger multiplier effects through cooperation. The results achieved by this mechanism are very impressive. To illustrate the sort of progress which has been made possible by Esprit, I will select here three examples of important tech-

nology developments: lithography, parallel computer systems and systems integration.

Lithography, the imprinting of microcircuits onto a chip, is of fundamental importance in the chip manufacturing process because it determines the smallest possible feature size. The most widely used type of equipment in this technology is the wafer-stepper, with each new generation of memory chips roughly corresponding to a generation of steppers. The current generation, known as i-line after the frequency range of light employed, corresponds to 16 Mbit DRAM memory and works down to a 0.5 micron minimum feature size. Deep ultraviolet (UV) equipment operating down to 0.3 microns will be needed for 64 Mbit DRAM production by 1995-96, and its availability has a major strategic impact on current industrial R&D. Today the position of Europe in this technology is very good. Thanks to a unique interdisciplinary cooperation, Esprit has enabled a prototype deep UV stepper to be developed with world-beating performance which is already in use producing 0.25 micron geometries.

necessary now than ever. Indeed, the work programme for a new phase is currently being prepared in close consultation with representatives of all interested parties in the IT industry and research community. It is hoped to obtain the final Council decision on this new phase this spring. The new phase of Esprit will be different in several important respects. There will be an increased level of user involvement; a new initiative in technology transfer and acquisition, especially in the software area; an emphasis on critical microelectronics components (in conjunction with Jessi); new "horizontal", or integrating, projects (such as the Open Micro-systems Initiative); and a doubling of the Basic Research part of the programme.

The present situation of the industry calls for serious evaluation. Information technology is crucial for Europe's future and will remain so for as long as can be predicted. Public authorities and industrialists through-out the Community - both suppliers and users - must develop a sense of solidarity and mutual responsibility about this issue. There is still time to act, but no time to waste. ▪

Esprit robotics : the LAMA (Large Manipulations) approach is intended to support applications where powerful forces have to be applied in precise movements over a long distance. The demonstration at Esprit 90 showed the mock-up of a LAMA system for washing aircraft.believed to be the tallest robot in the world.

The second example of successful technology development catalysed by Esprit involves parallel computer systems. Cooperation within the programme led to the development of the T800 Transputer, the most commercially successful of the new generation of microprocessors: over 500 products have so far been designed around it worldwide. Esprit has fostered the start of a new industry: high-performance, low-cost parallel computers, based on the T800, offering supercomputer performance at a fifth of the price. Over 200 systems have been installed - more than all the US competition's put together - giving Europe a solid foothold in a fast-growing market that is expected to reach 1 billion ecus in 1995.

The third and concluding example concerns systems integration tech-nology. Mastery of this is critical if Europe is to compete successfully in the open systems market. Esprit has played a key role in reinforcing Europe's strong position in this area, with many projects developing both

generic techniques for portable, interoperable distributed systems and specific solutions for particular operating environments. Results include a standard environment for the development of portable software, standard communications architec-tures for offices and factories, and techniques for integrating robot operations in flexible manufacturing systems.

Overall, more than 300 major technology results have been achieved by Esprit projects up to now. The programme is having a very broad impact on its more than 1500 participating organizations, especially on SMEs (who participate in over two-thirds of projects), and user companies are getting more and more involved.
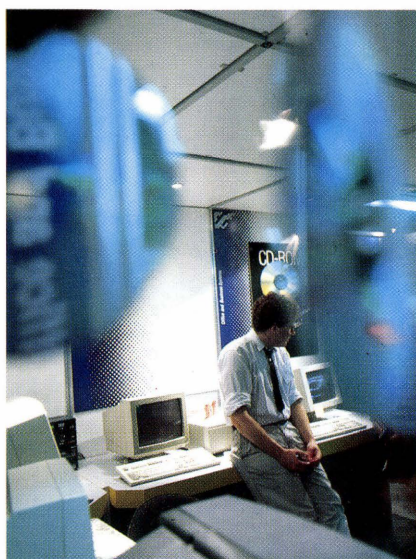
The future

Looking into the future, the necessity of higher investments in R&D, together with the lowering of profit margins, point to an increasing need for cooperation: the need for an Esprit mechanism is, if anything, more

ESPRIT 90

*The Esprit Conference offers an
opportunity for researchers to exchange ideas and
to reinforce their membership in a highly
dynamic scientific community.*

THE ANNUAL CONFERENCE of ESPRIT - the European Strategic Programme for Research and Development in Information Technology - was held in Brussels from November 12 to 15 1990. As European Commission Vice-President Filippo Maria Pandolfi pointed out, it was important for two reasons . First, repeating the successful formula of past Esprit conferences, it was the setting for a broad exchange of views among all interested parties, including political and government officials, industrialists and researchers. Second, the participants at the 1990 conference assessed a number of essential topics at a time when information technology is going through a difficult period .

The Esprit conference offered an opportunity for researchers to exchange ideas and to reinforce their membership in a highly dynamic scientific community.

The conference brought together about 3,000 participants, mostly from the 12 EC Member States and the 6 EFTA countries. For the first time it was open to experts from the United States, Japan, China and the central and east European countries. Participation in the various conference activities, ranging from the plenary sessions and round tables to workshops on general subjects and specialized talks, was abundant. The subjects of the specialized talks covered key areas for cooperation handled by Esprit, i.e. microelectronics, information processing systems, office and business systems, computer integrated manufacturing, basic research and information exchange systems.

An exhibition in parallel with the conference presented 98 projects out of the 500 or so Esprit projects currently in progress. The exhibition was a striking illustration of the high-quality results achieved and the specific benefits being gained by EC industry.

To choose the best among the projects presented would be difficult, but there were three that exemplified certain fundamental aspects of the Esprit programme. In the first project, from the field of microelectronics and dealing with deep UV lithography, a new design of wafer-stepper was displayed. Using an ultra-violet laser and quartz projection lenses, it can etch the microscopic sub-0.3 micron circuits required for the 64 Mbit DRAMs scheduled for production in 1995-96. The second project, Vasari, featured a system able to memorize and reconstitute images with very high colour and texture fidelity. The results are being used in high-definition image processing. The Vasari application demonstrated, concerning colour changes in art collections over a number of years, can be used in restoration and could make available a nearly infinite electronic catalogue of art using digital colour imaging. And

the Niro (Neutral interfaces for robotics) project in the CIM area demonstrated the feasibility of a universal representation of images and data-structuring in communications between the various elements of a manufacturing system. By acting as an intermediary clearing-house, this considerably facilitates conversion from one set of standards to another. For both suppliers and users, the project should provide the full range of methods and tools required to integrate modules of various makes into a single coherent system. The demonstration took a welding robot through the different phases of conception, simulation and implementation.

The final day of the conference presented an IT Forum on topics of general interest. One participant described the forum as offering a "look back on the past year in order to help us go further and to draw a comparison between where we are and where we would like to go". In the morning session, leading politicians and industrialists took the floor to voice their views on the current state of the European IT industry. Vice-President Pandolfi spoke of the trying times in the IT industry, not only in Europe but across the Atlantic as well, and countered some critical statements. "The IT sector is now experiencing some difficulties, despite the good results of Esprit", he said, adding that the Commission was determined to assume its responsibilities and that the EC had the virtue "of having initiated the excellent Esprit programme". Professor Antonio Ruberti, the Italian research and higher education minister then chairing the Council of Research Ministers, supported Mr Pandolfi by pointing out that "Esprit continues to be in the vanguard of research. Its role will grow in the 1990-94 five-year programme". Esprit, the minister added, helped to improve cohesion in research in the Community, stimulated SMEs and made EC companies more competitive on a market that is attracting an increasing number of non-EC businesses. The programme was also a true intermediary between companies and universities.

Thomas von der Vring, chairman of the European Parliament's budget committee, was more incisive in stating that "unless a new EC policy on information technologies is set up, the future will be gloomy. The United States will be the leader in software and large computers; Japan will be at the fore in semiconductors. Europe, however, will be nothing more than a client". According to Mr von der Vring, action must be taken both at the pre-competitive stage and to devise a real European industrial policy that would reverse the current world trend in IT towards monopolies. He called for specific European solutions to be found to the problems besetting EC companies. Looking at things from a different angle, AEG board member Frank Dieter Maier maintained that thanks to Esprit there was real cooperation between producers, particularly in the sector of micro-electronics. On the other hand, he questioned the strategy of some European companies that, he admitted, "has not so far met with great success". He advocated the establishment of a "vertical integration alliance" between users and producers, and between market needs and technological possibilities. This strategy, which also concerns SMEs, needs support from national governments and the Commission. Pierre Aigrain, Philip Hughes and Hans G. Danielmayer expressed similar views.

Esprit director Jean-Marie Cadiou emphasised the considerable efforts made by the overall European IT sector, numbering some 13,000 companies which together raised their share of the European market from 47 % in 1984 to 55% in 1989 despite a context of falling profit margins and rising R & D costs.

Mr Cadiou did not minimize the severity of the slowdown in demand for information technology nor the cyclical and structural difficulties affecting the sector. Further, he pointed out that the cost of financing for R&D, taking into account all factors amounting to the equivalent of an interest rate, was 8.5% in Japan, compared with 18.5% in Europe. Mr Cadiou stated emphatically that "there is still time to act but there is no time to waste" and that "it is now more pressing than ever to decide in favour of cooperation". He gave it as his conviction that the next generation of Esprit, due to be adopted by the Council this spring, will help build a more powerful technological base in essential areas in the framework of a comprehensive strategy. In addition, it will accelerate the application of results, intensify the creation of a closer relationship between user demand and industrial supply, and facilitate professional access to the latest technology through a greater effort in training and dissemination.

The afternoon session was turned over to a panel discussion on the impact of IT on society, which broached five particularly significant areas: health, private life, education, the workplace and the environment. Chaired by Michel Carpentier, Director-General of DG XIII, the debate brought together journalists and leading specialists in these areas in a lively discussion, with strong audience participation, which set out eloquent arguments in favour of establishing an electronic European infrastructure for health care. There was equal support for the development of an interactive multimedia network for training and for the use of informatics as an especially appropriate means of communicating information on civic rights, while safeguarding the protection of individual privacy; for improving working conditions; and for gaining greater control over environmental problems. The session provided fresh insight into the positive contribution to a number of contemporary social issues being made by Community R&D programmes in information technology and telecommunications. In concluding, Michel Carpentier confirmed the importance to the Commission and the construction of Europe of committing these programmes to such issues. ▨

Stéphane Lejeune *journalist*

The exhibition was a striking illustration of the high-quality results achieved and the specific benefits being gained by EC industry.

Opening Up

*Herbert Ungerer reports
on the progress
of implementing the
EC Green Paper
on telecommunications.*

THE COMMISSION'S 1987 Green Paper on telecommunications initiated moves towards liberalization and reform of the telecommunications sector in most EC Member States. The process is now well under way so it is a good time to ask whether and how the Green Paper's regulatory objectives have been implemented and what should be the next steps.

Open markets for terminals and services with Europe-wide access

As regards terminal equipment, a Commission directive was issued on 16 May 1988 to open up the market for terminal equipment to competition. The directive is based on article 90 of the Treaty of Rome, describing the Commission's mandate under EC competition law. The directive is in force, and its deadline (end-1990) past. By 1 July 1990 more than 95% in value of the EC's terminal equipment market was open to competition. The

Commission will apply the procedures foreseen in the treaty to overcome remaining obstacles.

The full mutual recognition of type approval for terminal equipment is necessary in order to make a Europe-wide market work effectively. This means that equipment once approved according to European standards can subsequently be freely sold across the Community. Telecommunications ministers have already agreed on a common position as regards the adoption of the necessary EC directive. Final adoption of this directive is expected in early 1991.

Regarding services, the Commission issued a directive in July 1990 which was also based on article 90 of the treaty. The directive reflects a compromise between the Commission and the Council of Ministers, based on a differentiated approach to three categories of services: voice, data, and value-added services. While

competition will be introduced for all value-added services, data communications services will be progressively liberalized, as follows: simple resale of capacity will be allowed from 1 January 1993 at the latest; for Member States with less advanced public data networks, this deadline may be extended up to 1996. Member States may request providers of data communication services to meet obligations on issues such as quality and coverage; the Commission will be allowed to scrutinize proposed obligations in order to ensure that they are in line with the Community's competition rules.

For the provision of voice telephony, Member States may decide whether or not to introduce competition. The impact of these measures will be rapid and substantial. The directive will lift most current restrictions. In particular, the market for value-added services - electronic data interchange, electronic

funds transfer, electronic mail, online database access, etc - will be fully liberalized, with a substantial impact on the service sectors of the European economy at large.

The development of a Europe-wide market for services is directly linked to the idea of Open Network Provision (ONP). The basic principles of Open Network Provision are the opening and harmonization of conditions of access to the network infrastructure, for new service providers and for users. This harmonization is to apply to technical interfaces, usage conditions and tariff principles so as to allow for the development of pan-European services, in which service providers will be able to make use of the network according to common principles and forms of access. To this end the Council of Ministers adopted a framework directive on ONP which came into force on the same day as the Commission's "services directive". The framework directive will be followed by specific implementation directives. As stated in the ONP framework directive, ONP will initially be defined for leased lines and the voice telephony service through the adoption of specific directives. For packet-switched data services and ISDN, harmonized technical interfaces and/or service features were to be implemented by 1 January 1991. By 1 July 1991, the Council should adopt a recommendation on the supply of technical interfaces, conditions of usage and tariff principles applying to the provision of packet-switched data services complying with open network principles.

Further milestones on the road to the open market

In parallel to the elaboration and adoption of these directives, other proposals put forward in the 1987 Green Paper have already been implemented.

The market for receive-only satellite earth stations not connected to the public network has been liberalized.

Telecommunications reform in Member States has led or will lead to the separation of regulatory powers and operational activities of network operators.

The European Telecommunications Standards Institute has been created.

Guidelines for the application of competition rules to the sector are under preparation; they are expected to be adopted by the Commission in early 1991.

Opening of procurement by the telecommunications administrations to bidders from other Member States will be obligatory as from 1 January 1993 onwards. To this end the Council of Ministers adopted a directive in October 1990.

Where to go from here?

Substantial progress has been made in many areas, but work is far from being completed. The next phase of Community action needs to bring about more visible effects for the European user. The major challenges lying ahead are likely to be:

1. ONP implementation.

Now that the ONP framework directive has been agreed, the task is to translate it into real user benefit. The specific ONP directive for leased lines was recently adopted by the Commission and forwarded to the Council.

Intra-European telephone tariffs are still on average 2.5 times more expensive than the highest-priced national long-distance calls. In some cases, call charges between two EC countries are three times higher in one direction than in the other.

2. Tariffs.

According to the Green Paper implementation plan, telecommunications tariffs need to be cost-oriented. The deadline for the achievement of this goal is 1992. Problems in this area are substantial: intra-European telephone tariffs are still on average 2.5 times more expensive than the highest-priced national long-distance calls. In some cases, tariffs from Member State A to Member State B are still three times higher than those from B to A.

Similarly, the benefits of cheap-rate calls are not fully extended to international intra-Community tariffs. Whereas a cheap-rate discount is offered for domestic long-distance calls in all Member States, and the reduction is as great as 76%, the reductions for intra-Community international calls are nowhere higher than 36%. Five Member States do not offer such reductions at all.

The arrangements governing international telephone charges are currently under examination to see whether they are compatible with the competition rules of the Treaty of Rome. A Commission communication on this issue is due to be published in early 1991.

3. Satellite and mobile communications

In the 1987 Green Paper satellite and mobile communications were set aside for 'special consideration'. They are now being tackled.

Satellite communications

In November 1990, the Commission adopted a Green Paper on satellite communications and invited public comment. The satellite Green Paper aims at a radical change of the regulatory environment of satellite communications in Europe, in the sense of a substantial reduction of existing restrictions. Its main policy lines are: full liberalization of the earth segment, including the abolition of all exclusive rights in this area so as to allow for unrestricted purchasing and use of satellite dishes for direct reception, notably of television. Type approval and licensing procedures may

apply, to avoid harmful interference and to guarantee data protection and the protection of privacy. Access to space segment capacity will be unrestricted, subject to adequate licensing procedures. In conformity with these procedures, service providers will be able to obtain transmission capacity through contracts with satellite providers and these service providers will themselves be able to transmit signals via satellite. Commercial freedom for space segment providers needs to be assured in order to enable satellite providers, in particular Eutelsat, to sell satellite transmission capacity directly to service providers and users. Harmonization measures have to be taken to facilitate the provision of Europe-wide services. These concern in particular the mutual recognition of licensing and type-approval procedures, frequency coordination and the definition of Community standards to ensure better compatibility of equipment and techniques.

Taken together these changes will allow for the provision of a broad range of specialized services.

Mobile communications.

The mobile telecommunications industry in Europe continues to grow. The 1989 growth rate was a record 30%. New technologies and systems will ensure the continuing growth of this market through the next decade. So far the Commission's regulatory involvement in mobile communications has been in the field of international frequency coordination.

A directive on the reservation of radio frequencies for the future pan-European digital mobile system, GSM (car telephony), was adopted in 1987. In October 1990, the Council of Ministers adopted a directive concerning the introduction of the future pan-European radio-paging system, Ermes. A directive concerning future Digital European Cordless Telecommunications DECT (cordless telephony), is currently under discussion in Council.

Now "personal communications" (PCN systems) are the buzzwords for a new dimension of broad use of mobile communications. Mobile communications need to be seen in a still broader context as they enter the centre stage
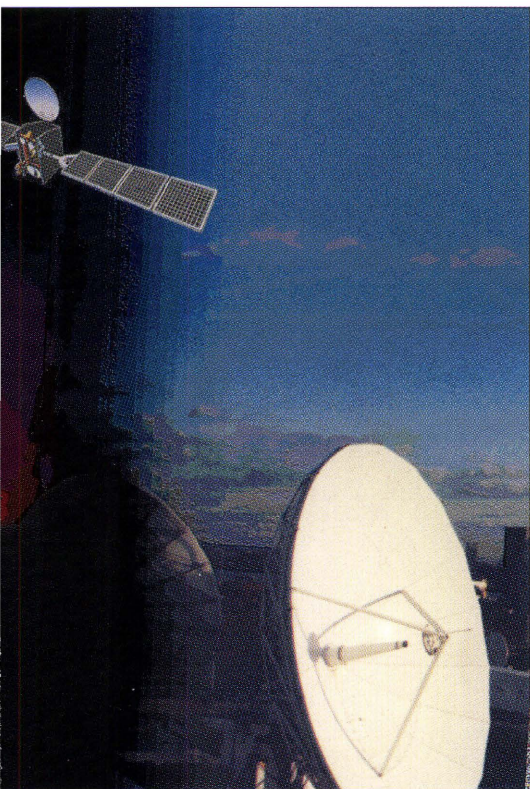
of European telecommunications. A genuinely European approach is needed in order to respond to the important regulatory questions which are emerging: Europe-wide operation of mobile operators, access of private mobile systems to the public network, preservation of interoperability in a multi-operator environment and issues such as agreements on numbering must be tackled to safeguard the interworking of systems.

Preparatory work in these areas has been started, and it is hoped to submit the results of this review - possibly in the form of a Green Paper on mobile communications - by the end of 1991.

### 4. Data protection and the protection of privacy

The introduction of intelligent digital networks and services makes data protection and the protection of privacy a central topic for both fixed and mobile networks. Aware of the social and societal implications of these issues, the Commission is now addressing these aspects of the new telecommunications environment.

With the encouragement of the European Parliament, the Commission has recently submitted a comprehensive package of measures in this field, including a proposal for an EC directive concerning the protection of personal data and privacy in the context of public digital telecommunications networks, in particular ISDN and public digital mobile networks. This brief review of current advances in telecommunications policy towards 1992 must also mention other key aspects which have a direct impact on the Community's telecommunications policies, such as: the GATT Uruguay Round and the current discussion on the telecommunications content of the agreement on services; the 1990-1994 EC Framework Programme for Research and Technological Development, which builds on current programmes such as Race and Esprit and includes a new line concerning telematic systems in areas of general interest; and the developments in central and eastern Europe, where telecommunications are expected to play a major role in the restructuration of societies and economies. Reforms which are taking place there will have substantial repercussions on the basic positions in European telecommunications policy. The latter consideration emphasises the overall goal of Community telecommunications policy: creating a continent-wide area where people can freely, efficiently and securely communicate with each other. ▩

Herbert Ungerer *heads the DG XIII division responsible for the regulatory aspects of telecommunications as well as the analyses and studies carried out in this sector.*

For both fixed and mobile networks the protection of data and privacy has become a central issue, on which the Commission has put forward a comprehensive package of measures.
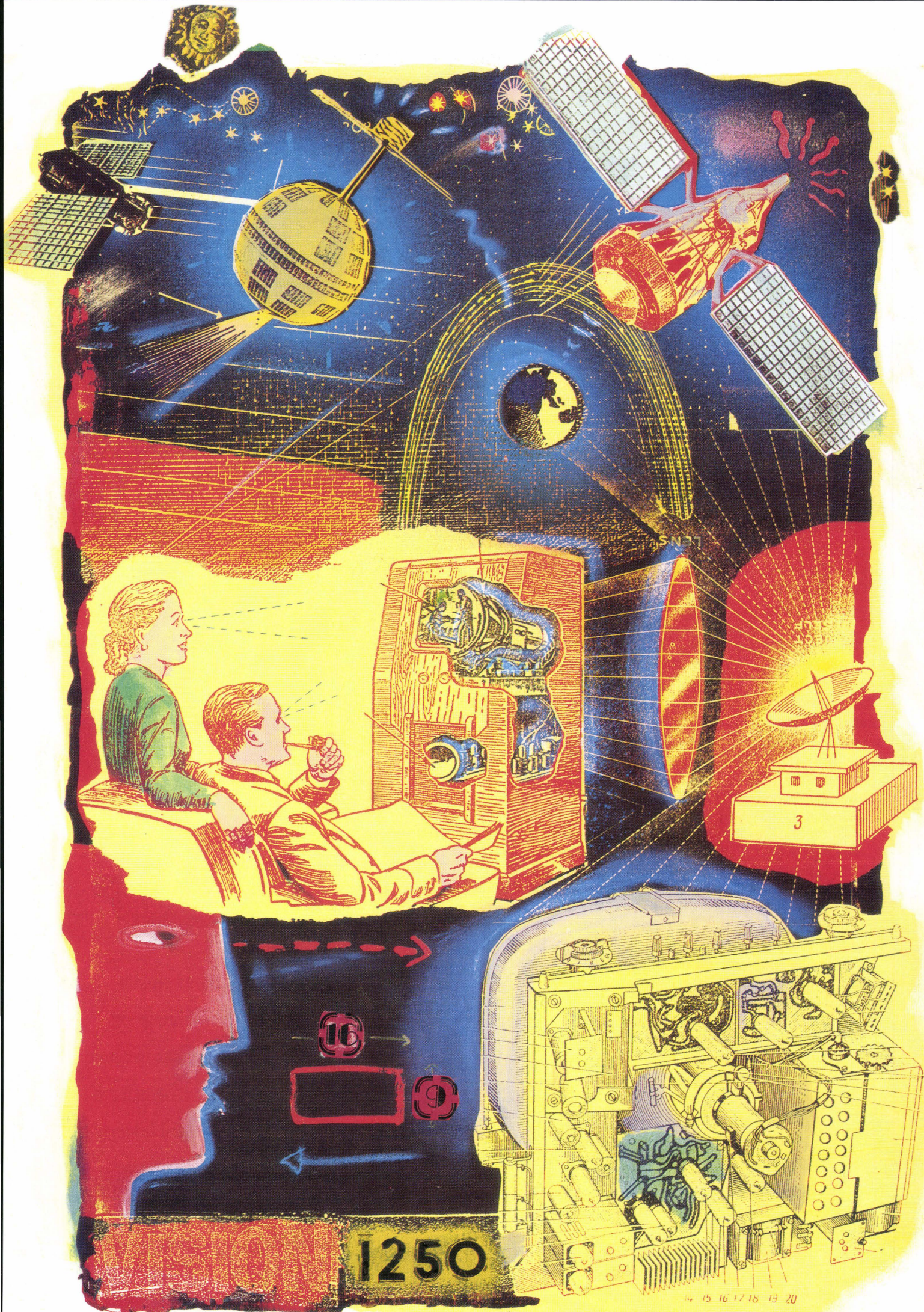
TV: A NEW IMAGE

*Standards from the 1950s still limit European broadcasting.
With the launch of Vision 1250, HDTV has emerged from the research stage and
is about to enter the commercial phase.*

CREATED ON 29 JUNE 1990 and launched officially by the European Commission at the European Parliament in Strasbourg on 11 July 1990, Vision 1250 is a European Economic Interest Grouping (EEIG) with the task of promoting the high-definition television standard (1250/50) developed under the European project Eureka 95.

This grouping was created at the instigation of the Commission on the basis of a decision by the Council of Ministers in April 1989 setting out an overall strategy for the introduction of HDTV services in Europe. With the launch of Vision 1250, European HDTV has emerged from the research and development laboratories and is about to enter the operational phase. Apart from the manufacturers, it is now of concern to the programme networks, the directors and producers of audiovisual material and the bodies responsible for transmission and distribution systems.

Two dozen of the main European players on the HDTV stage have already opted to become involved in this initiative: manufacturers who are members of Eureka 95, a number of television networks belonging to the European Broadcasting Union, independent operators and producers as well as telecommunications operators.* The decision to opt for an EEIG was no coincidence. This type of structure is the only one in Europe capable of reconciling the interests of national entities pursuing such a varied range of activities.

At the operational level, Vision 1250 relies solely on the support of its members. The manufacturers provide equipment which they place at the disposal of directors and producers responsible for making the audiovisual software. This original initiative is backed up by the provision of additional services, such as HDTV equipment maintenance and training, as well as advisory and technical assistance facilities.

Who pays what? Structural and travel costs as well as overheads are funded from members' annual subscriptions (currently fixed at 40,000 ecus a year). The operating budget, which covers equipment maintenance, technical assistance and the organization of demonstrations, is taken care of by the Commission. The manufacturers, supported by their national governments, are responsible for the financing and supply of HDTV equipment. The cost of the audiovisual

"HDTV is a symbol of the European electronics industry's resistance in the face of the Japanese onslaught."

productions themselves is borne by the directors and producers. Thus, Vision 1250 has at its disposal a budget which will enable it to launch its HDTV production and promotion activities. Furthermore, different degrees of involvement will be possible through the admission of certain companies as associate members of the EEIG.

Vision 1250 will cover the main European media events scheduled over the next three years. In 1991 its equipment will be used to provide HDTV demonstrations at the international exhibitions to be held in Montreux and Berlin. Its outside broadcasting units will also be attending the Mediterranean Games (Athens) in the same year, and then in 1992 they will travel to Albertville and Barcelona to enable European broadcasters to pick up and retransmit high-definition pictures of the Olympic Games. In the same year the HDTV resources will be placed at the disposal of the Community countries exhibiting at the international exhibition in Seville. By then Vision 1250 will have numerous HDTV events and productions to its credit. For instance, RAI has just used two Vision 1250 outside broadcasting units to produce "Captain Cosmos", a full-length science fiction feature film teeming with special effects.

The management committee of Vision 1250 is chaired by Mr Kurt Schips (Bosch), with Mr Michel Oudin (SFP) and Mr Vinsintin (RAI) holding the posts of director-general and deputy director-general respectively. The Commission's Michel Carpentier (DG XIII) has been appointed chairman of the Sponsorship Board and the post of chairman of the General Assembly has been assigned to Massimo Fichera (RAI).

Consensus at this level for the promotion of a new television standard marks a first for Europe. For many EC countries, HDTV is a symbol of the European electronics industry's resistance in the face of the Japanese onslaught. It was therefore logical that these 24 companies should decide to join forces and entrust Vision 1250 with the task of promoting and defending the European HDTV standard. ▨

Olivier Bellin *journalist*

** BBC, BHDTV, BSB, BTS, France Telecom, Laser Creations, Nokia Unterhaltungs-electronik, OFRT, Philips Gloeilampen-fabrieken, RAI, SFP, Thames Television Plc, Thomson Consumer Electronics, Unitel Film und Fernseh-Produktionsgesellschaft GmbH & Co-Unitel, Retevision, Deutsche Bundespost Telekom, DR, H.D. Synergetic, ERT S.A., RTP, TVE, RTL Productions sarl, RTI, Metropolitan GmbH & Co. Kg.
There is no time limit on the numbers of members and this list can be modified.*

COUNTDOWN TO OPEN COMMUNICATIONS

STANDARDIZATION IS A CRUCIAL factor in the establishment of a genuine European telecommunications area. Work in this field is already well under way and success will depend to a large extent on the achievements of a key organization: the European Telecommunications Standards Institute, ETSI. A combination of factors - proximity to an international airport, good telecommunications, premises supplied by France Telecom, plus a favourable climate and location - led to the Sophia Antipolis technology park on the Côte d'Azur being chosen as the headquarters of this new institute. ETSI, an independent organization created in 1988 on the initiative of the CEPT (European Conference of Postal and Telecommunications Administrations, has grown rapidly and now has over 200 members (network operators, manufacturers and users). Its secretariat, headed by Karl-Heinz Rosenbrock, is divided into four departments - administration, technical organization, standards administration

Work to establish a genuine European telecommunications area is already well under way. Success will depend to a large extent on the achievements of a key organization, ETSI.

and work programme management - comprising nearly 40 staff.
Before ETSI came into being, all technical standardization in the field of telecommunications at European level was carried out within the CEPT in collaboration, where necessary, with other organizations such as CEN/CENELEC. The Commission's telecoms Green Paper in 1987 then provided the springboard for the setting-up of an independent standardization body.

Professor Diodato Gagliardi, the institute's first director from 1988 to 1990, summarizes three ETSI objectives: acceleration of the standardization process, greater transparency and increased participation by all parties involved. Previously, standardization had been the sole preserve of the CEPT. Now public enquiries afford an opportunity for wide-ranging debate prior to the adoption of a European Telecommunications Standard (ETS). Furthermore, only public administrations and public network operators were represented in the CEPT. ETSI also includes manufacturers, research centres, users and private service providers among its members. EC and EFTA representatives also take part in its activities in an advisory capacity.
In the view of ETSI deputy director Frede Ask, this transition has been particularly beneficial to industry. Certainly, manufacturers have been quick to recognize the opportunities afforded by this opening: with over 60

per cent of the total membership, they are by far the largest group represented within ETSI. Another feature is the large proportion of members from the United Kingdom: 54 out of 212. This high level of participation, explains Professor Gagliardi, is related to the structure of the UK's industry and the extensive deregulation of its telecommunications sector.

While the General Assembly is ETSI's main administrative body, the Technical Assembly is the body responsible for the production and approval of standards. It supervises 12 technical committees, which are themselves subdivided into 52 subcommittees. These cover the various aspects of the telecommunications sector, from mobile telecommunications to terminal equipment, including satellite, earth stations and one-way message handling systems. With approximately 1,200 experts at their disposal, these committees draw up standards which are then forwarded to national standardization bodies for public enquiry. This is done on the basis of a work programme drawn up by the committees and approved by the Technical Assembly. ETSI has also created a special committee on intellectual property and a policy review committee which, as Yves Chauvel, head of work programme management, points out, is responsible for forward planning to identify the sectors in which ETSI must concentrate its future activities.

While the specific task of standardization is the responsibility of the technical committees, very complex subjects may be assigned to project teams. In this case, the aim is to enable standards to be finalized in a matter of months, as against several years under the normal procedure. The teams are very flexible and are based most of the time in Sophia Antipolis for periods extending from one week to several years, depending on the circumstances. They also intervene in response to a specific request from a limited number of members, from EFTA or from the Commission, as was the case with the administration of standards for ISDN and mobile telecommunications. These operations are paid for from the special voluntary account which is financed mainly by the Commission.
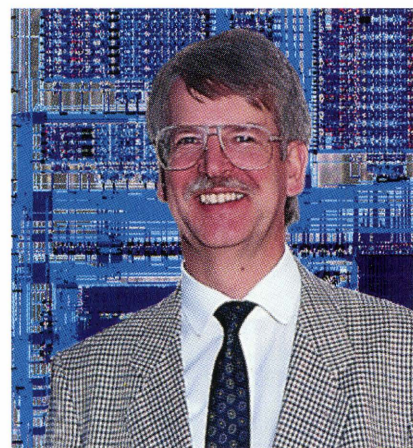
As Yves Chauvel points out, a large number of the project teams set up .with the Commission's support are linked to the policy review committee. The initial allocation of 600,000 ecus to this account in the 1990 budget will have more than doubled by the end of the financial year. In 1991 it is likely to be increased threefold, bringing it close to the amount allocated for scheduled operations under the work programme. Pierre de Courcel, head of administration, stressed that this was a matter of strategic policy currently being debated by members of ETSI.

After a running-in period - ETSI produced its first standards in 1989 (some 20 in all), along with 10 or so technical reports - 1991 should be a decisive year. At least 100 ETSs in the process of completion, the creation of an open informatics network, the likelihood that a number of organizations from east European countries may join, a single budget under which the public administrations would pay the same contribution as other members, dispensing with previous special arrangements - these are some of the many issues which ETSI has to address in order to deliver the standards needed for telecommunications in Europe. ∎

Patrick Baragiola *journalist*

Manufacturers have been quick to recognize the opportunities and with over 60% of the total membership they are by far the largest group represented within ETSI.

Karl-Heinz Rosenbrock