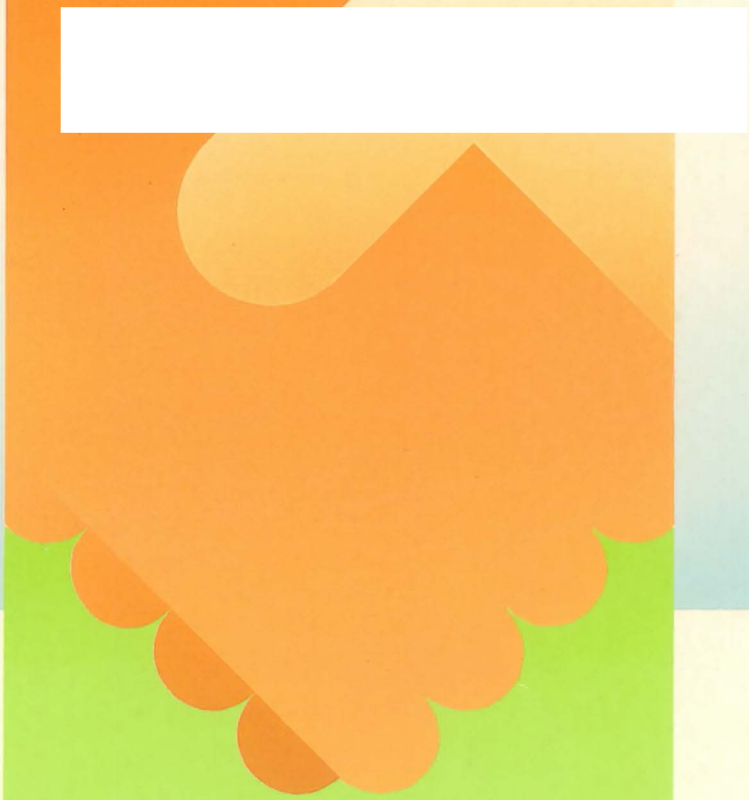
EUREKA



ANNUAL PROGRESS REPORT 1990

INTRODUCTION

Launched in 1985, EUREKA has already changed the face of Research and Development cooperation within Europe. It is an innovative tool helping Europe to master and exploit the technologies, which will prove decisive in the worldwide race for competitiveness and a better quality of life.

EUREKA interacts with companies and research institutes in EUREKA member countries and helps them pool their resources in the development of leading edge technology.

The Annual Progress Report 1990 provides a general picture of EUREKA's project portfolio as at 15 october 1990. The nearly 400 projects covered in this report have a total estimated cost of more than 7.5 billion ECU and involve some 2,000 participants, 950 of which are larger companies, 394 small and medium sized companies, 495 research institutes including universities and 108 other organisations. 18 participants come from non-member countries. 10 of these are from other European countries.

EUREKA's members are:

Austria
Belgium
Commission of the European Communities
Denmark
Federal Republic of Germany
Finland
France
Greece
Iceland
Ireland
Italy
Luxembourg
Netherlands
Norway
Portugal
Spain
Sweden
Switzerland
Turkey
United Kingdom

EUREKA - an open initiative

"Bottom up" is EUREKA's ground rule. Participants have full responsibility for defining and implementing their scientific and technological cooperation projects. They are their own judges of the best course towards new markets for Europe.

EUREKA's structure is built to harness the dynamism and innovative strength in Europe's industry and research. The groundrule prevents unnecessary bureaucracy, and provides a simple set of criteria for establishing EUREKA projects.

The projects must:

- involve at least two partners from different EUREKA countries
- aim at securing a significant technological advance in the product, process or service concerned
- aim at applications in the civilian sector.

Any company or research institute in a EUREKA member country, which has a proposal fitting the EUREKA project criteria is invited to contact the relevant National Project Coordinator (NPC) listed on pages 44-45 in this report.

The NPC will advise and assist the applicant and handle further contacts within the EUREKA structure, thus allowing industry and research institutes to concentrate on the content and business aspects of the proposed projects.

EUREKA: A flexible decentralised structure.

National Project Coordinators

The NPCs are the core of the EUREKA network. They run the national EUREKA offices and are the interface between participants and the EUREKA network. They also form a link with the relevant national authorities and are in close contact with their counterparts in the other EUREKA member countries. Through the NPC network, the national EUREKA offices will usually be able to find suitable partners for national industry or research institutes, and help them create sound projects.

EUREKA Secretariat

The Secretariat is a small support unit in Brussels. It gathers and distributes information on projects, facilitates contacts between partners and promotes the EUREKA concept in conjunction with national authorities.

High Level Group

This Group is made up of High Level Representatives appointed by the EUREKA governments and the Commission of the European Communities. It formulates general EUREKA policy for approval by the Ministerial Conference. It also monitors the implementation of ministerial decisions.

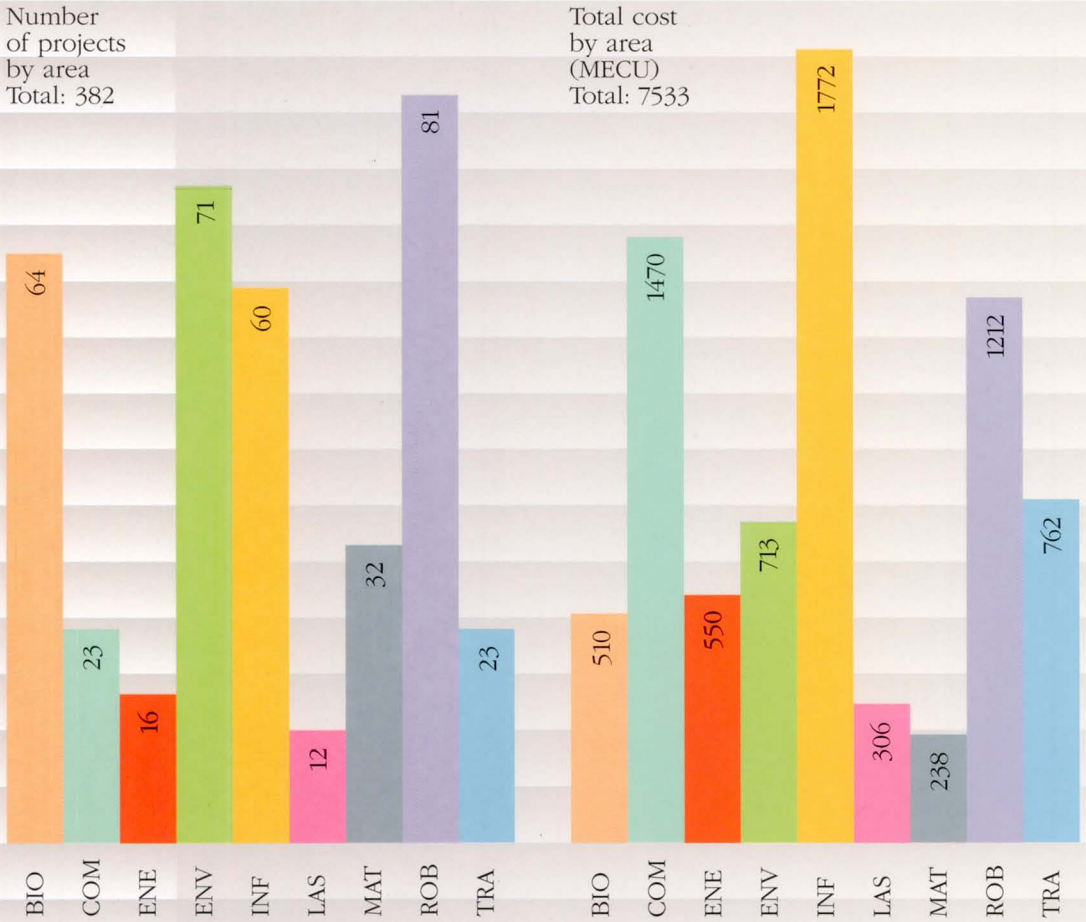
Ministerial Conference

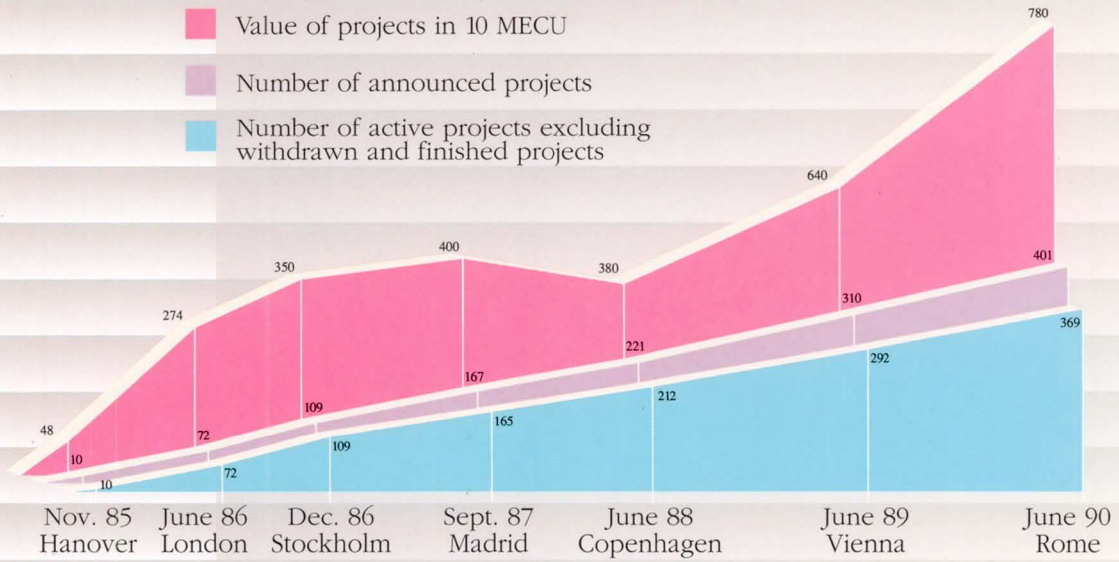
The Ministerial Conference is the political body of EUREKA and is responsible for furthering the Initiative and its aims. It is composed of Ministers from the nineteen EUREKA member countries and a Commissioner from the European Communities. It meets a minimum of once a year to lay down the political guidelines for EUREKA's work and announce new EUREKA projects.

Abbreviations used in this report:

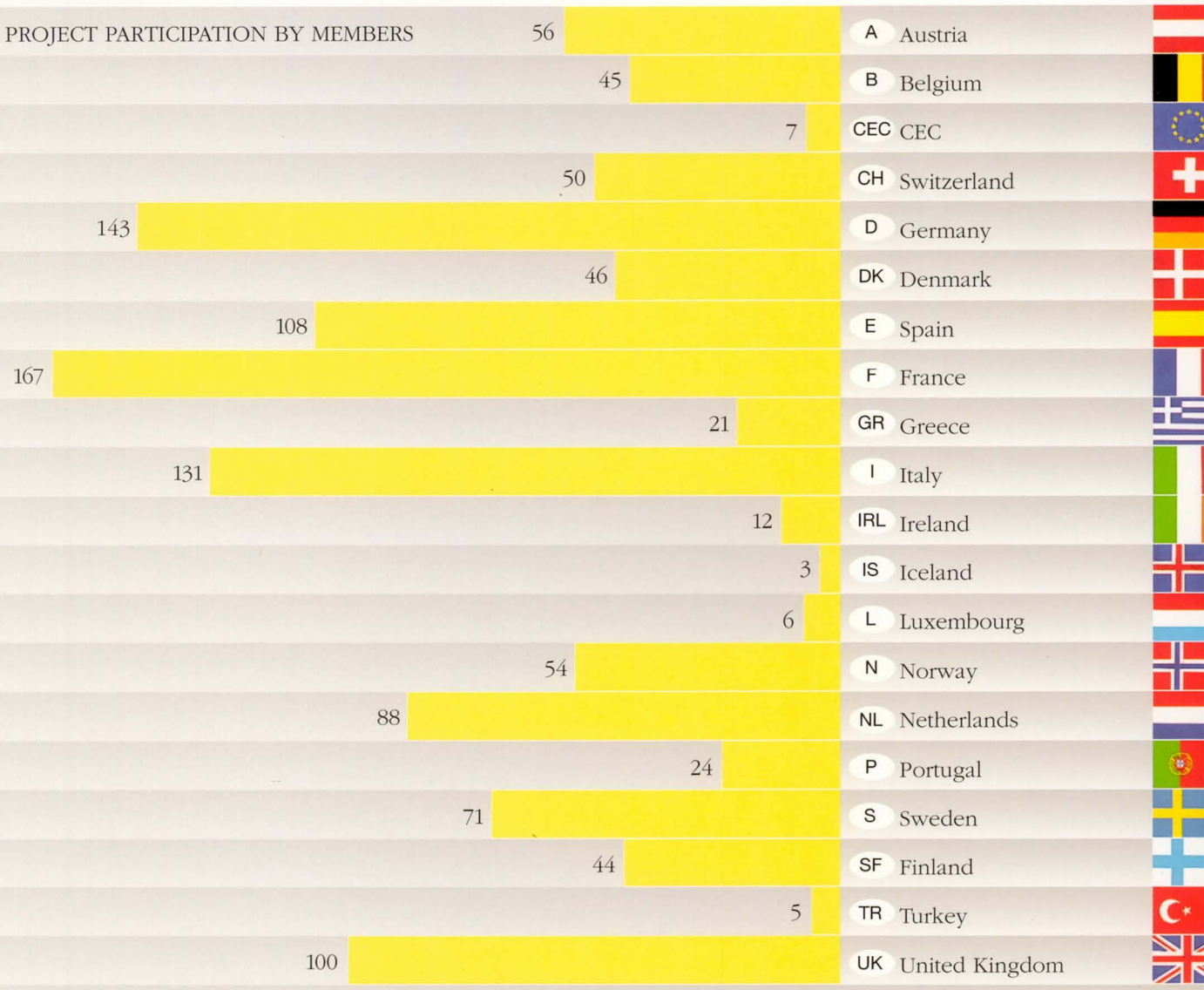
BIO	Medical- and Biotechnology
COM	Communications Technology
ENE	Energy Technology
ENV	Environment Technology
INF	Information Technology
LAS	Lasers Technology
MAT	New Materials
ROB	Robotics and Production Automation
TRA	Transport Technology

STATISTICAL TABLES





PROJECT PARTICIPATION BY MEMBERS



NUMBER OF ANNOUNCED PROJECTS
(by ministerial conference)

EUREKA - THE FORUM FOR EUROPEAN TECHNOLOGICAL DEVELOPMENT

By Antonio Ruberti, Minister for Universities and Scientific and Technological Research, Italy

This year sees the fifth anniversary of EUREKA and the Ministerial Conference in Rome marked the end of the first major cycle: the launch and consolidation of the Initiative. The experience acquired during this fifth year reflects EUREKA's positive trend and bears out its total viability and dynamism.

Even solely on the basis of the projects announced in Rome, EUREKA results are very satisfactory. However, after five years, it is perhaps appropriate to consider future development trends as well as a number of political implications in addition to the technological achievements.

EUREKA is becoming increasingly more complex and its innovative effects on industry must be seized. In addition, its growing impact on environmental issues as well as its political relevance in dealings with non-member states, which view technological research as an indispensable tool for growth, need to be considered.

EUREKA is no longer just a list of projects. It is a forum wherein European technological development is being fashioned. It provides a foretaste of people's expectations in terms of growth and quality of life, partly prompted by technological innovation. Furthermore, EUREKA is becoming an increasingly essential benchmark for those countries, wrestling with problems of growth, which are looking to western Europe as an indispensable partner. As far as quality is concerned, the numerous small and medium-sized projects clustering around the main lead projects can be considered as a positive sign, reflecting the vitality of our small and medium-sized companies and the substantial contribution they are making towards the development of EUREKA projects, thereby enhancing European technology.

The Initiative is stimulating the establishment of an increasingly more complex network of contacts between the companies from the 19 member countries offering them horizons and choices beyond Europe.

EUREKA is therefore exploiting its potential to the full, and we may soon be able to look forward to many more intra-European cooperation ventures and heightened integration.

Another quality-related factor which must be constantly borne in mind, is the crucial relationship between the European technological system and the Environment.

Under pressure from public opinion and politicians, EUREKA has demonstrated its capability to take on board the ecological concerns of our age. The last two Chairmanships have seen an extraordinary growth in the number of environmental research projects. This is yet further proof of EUREKA's ability to react to the sensitivities reflected in our society. However, as the Initiative gathers momentum, it is already becoming clear that it is not sufficient simply to define projects which are solely designed to rehabilitate the environment.

EUREKA must consider its environmental image, not only in evaluation and monitoring terms but also, and above all, by actively disseminating non-polluting processes in every technological sphere. This means every technological concern for the environment must be promoted horizontally in order to ensure that Europe's technological progress is in total harmony with the environment, making it a genuine service to mankind.

EUREKA's present magnitude and its continuing growth logically make it an increasingly natural pole of attraction to other areas of the world, which aspire to share the spin-offs of technological research, both as active participants in research ventures and as users. Unmistakable signs of this were apparent during the Italian Chairmanship.
The more successful the Initiative becomes, the greater the interest shown by third countries in the EUREKA system.

EUREKA countries are naturally keen to foster these forms of cooperation. However, experience acquired during this Chairmanship has shown that before any more active tech-

nical cooperation ventures between East and West can be made, it will be necessary to iron out some of the discrepancies between the two areas of Europe, discrepancies relating to: their financial structures, the market, the education and scientific research levels and their industrial development.
A gradual standardisation process must therefore be carried through before we can hope for greater cooperation. Governments of Western Europe will encourage this by promoting forms of cooperation paving the way for technological relationships. I am thinking here of cooperation in the fields of education and training, pre-competitive scientific research and inter-university cooperation.

Developing countries have an ever-increasing perception of the relevance of technological research to growth and to finding solutions to acute problems faced by the Third World such as environmental issues, health care, agri-food production, etc.

Given its original purpose, EUREKA cannot be transformed into a development cooperation agency. However, its products can be put to good use in overcoming some of the Third World's acute problems. The issue at stake is therefore matching what EUREKA has to offer with Third World demands.
The conference organised by the Italian Chairmanship on this subject, highlighted the constraints and difficulties in relationships between advanced technologies and the Third World, but it also showed that EUREKA provides a new and important opportunity which should not be overlooked by those responsible for development cooperation. It offers a new opportunity to those that already exist and is none the less stimulating for that. It should not be underestimated.

I therefore think I can say that the Italian Chairmanship was given the task of coordinating a most fascinating phase in EUREKA's development process, a phase which has not only provided further confirmation of the Initiative's viability, but has also proved EUREKA to be a technological system with enormous economic and political potential.
In the next few years, it will mainly be the responsibility of national governments to ensure that this potential is developed.
Ever more efficient and timely supportive measures will become increasingly more necessary together with a heightened integration of the legal and economic infrastructure of the European technological system.

In conclusion, we are therefore sure that EUREKA's dynamic approach will also prove to be a stimulus to governments to pursue more and more assiduously the goal of European integration in the area of research.
It is with this conviction that we are pinning great hopes on the future of EUREKA, for we are convinced that the forthcoming Chairmanships - both Dutch and Finnish - are going to steer EUREKA towards the thresholds of enhanced quality and closer integration within the more general framework of an increasingly more united Europe.

EUREKA IN 1990

Scientific Instrumentation
EUREKA CONSIDERS MEASURES

To date, very few EUREKA projects have been specifically directed at technological developments in the area of scientific instrumentation. On EUREKA France's initiative, an interesting meeting was held in Marseille in February 90. The aim was to encourage new cooperative ventures between European industrialists and scientists in this sector. "Traditionally, Europe has had a pretty good position in the measuring instrument sector, but closer diagnosis shows that European industry is having to fight hard to keep its place", emphasised Jean-Pierre Rozelot, one of the main instigators of this meeting. The presence in Marseille of some 100 participants demonstrated that European industrialists are banking on the EUREKA framework for activating new focal points of cooperation which the sector needs.

Technology Transfer
EUREKA AND THE THIRD WORLD

In March 1990, the city of Florence played host to a lively and well attended EUREKA seminar on "Advanced Technologies for Developing Countries". The meeting, called by the Italian EUREKA chairmanship, aimed at investigating the possibilities and desirability of transferring advanced technologies promoted by EUREKA to the developing countries, to the mutual benefit of both parties. The very intense debates were, among others, lead by Antonio Ruberti (Italian Minister for Universities and for Scientific and Technical Research), Umberto Colombo (President of Italy's Agency for Alternative Energy - ENEA), Paolo Fasella (Director General DG XII, CEC), Edgard Pisani (Advisor to the President of the French Republic), Alberto Araoz (Deputy Director General, UNIDO). A number of obstacles to this transfer were identified, as were a number of promising possibilities. The overall conclusion of the meeting was that this process is very desirable and a number of possibilities to try out this transfer with selected technologies exist.

Survey in France
PARTICIPANTS SATISFIED WITH EUREKA

In France, almost 90% of industrialists and 80% of research institutions working in EUREKA projects state that they are very happy with their participation. This is the outcome of an operational audit commissioned by the French EUREKA team.
The survey, carried out last year, covered nearly 70 companies and 48 research bodies involved in 45 different projects.
The item most frequently highlighted by the French participants as being the prime benefit of EUREKA participation is the new possibilities of cooperation which EUREKA has opened up to them. In addition to 16% of enterprises which previously had no experience of any cooperation with foreign partners, those which already had this type of experience underline the positive effect of EUREKA. For almost 70% of industrial players questioned, EUREKA projects have enabled them to discover new partners with whom they had never worked before.

Communications
FIRST COSINE OSI SERVICE

The EUREKA COSINE project (EU 8) is now installing its first service, based on the International OSI (Open Systems Interconnection) standards. The Commission of the European Communities (CEC) has signed a contract, on behalf of COSINE, for a pan-European backbone service which provides data networking interconnections between national research networks. Operating in accordance with the international X.25 standard, which is used in public data networks, this service enables other services, such as electronic mail, to be provided to EUREKA - and all other - research workers in Europe.
Involving all EUREKA members and Yugoslavia, the purpose of COSINE is to provide electronic communications support for researchers in industry, universities, public laboratories etc, on the basis of international standards - the most important of which are those for OSI. Using these standards, computer systems from different suppliers can communicate, exchanging messages, documents and programmes, access remote databases and use remote computer systems. COSINE will develop a number of services over the next 3 years with the intention of continuing to make them available on a commercial basis.

Lasers
SAFETY FOR TOOLS OF LIGHT

An industrial Forum promoted by the German Minister for Research and Technology (BMFT) of Germany was held in October 1990 in Hanover, under the auspices of EUROLASER. This EUREKA umbrella project is very active in promoting new cooperation in this area throughout Europe.
The meeting, organised in cooperation with the VDI-Technology Centre (a division of the Association of German Engineers) and the Hannover Laser Zentrum focused on the central topic of "Laser Safety".

EUREKA publications in 1990

A new folder on the Robotics and Production Automation area.
Following the publication of a first Environmental folder, a new EUREKA portfolio was printed, giving an explanatory description of each of the 62 projects in one of EUREKA's largest sectors, the Robotics and Production Automation area.
Proceedings of the three international Conferences organised by the EUREKA Italian Chairmanship during its mandate from June 1989 to June 1990.

Theses proceedings have been published by the Italian authorities in a bilingual Italian/English edition. They concern:

- The Industrial Forum on "Technology, Production and the Environment", held in Venice in October 1989.
- The Seminar on "Advanced Technologies for Developing Countries" held in Florence in March 1990.
- The EUREKA Interparliamentary Meeting, held in Rome in May 1990.

The "EUREKA Technological Capabilities Directory".
Taking advantage of the "treasures" of its project database, the EUREKA Secretariat has just published a directory of nearly 700 pages. The Directory contains information on the technological skills of 1250 EUREKA participants. Organised by technological areas and countries it is an efficient way of finding new EUREKA partners.

Land Environment
EUROENVIRON IN BRITAIN

As environmental regulations tighten, and the single European market draws near, many people on the European industrial scene are becoming aware that collaboration is the key to developing new technologies and new products aimed at this fast-growing market. A good example of this trend was given at the beginning of this year, when the UK department of Trade and Industry pushed the boat out for the launch of the new large umbrella project EUROENVIRON in the UK.
The response has been very encouraging. Many organisations are interested, particularly small companies. The EUROENVIRON project is attracting firms which have not previously been active in the environment field.

Atmospheric Environment
FIRST EUROTRAC SYMPOSIUM

At the beginning of April 90 in Garmisch-Partenkirchen (FRG), the 1st EUROTRAC Symposium was attended by 400 participants. Dr. Peter Borrell, the Scientific Secretary of this important EUREKA project (EU 7), gathering some 17 European countries on the crucial topic of the atmospheric chemistry research in Europe, was pleased with the "very encouraging response reflecting the enormous amount of work taking place in EUROTRAC".
Over four days, several work sessions were held, including presentations by leading scientists, which were followed by "vigorous" discussions. "The conclusion of the symposium", Mr. Borrell emphasised, "is that scientific work within EUROTRAC is going very well. It is beginning to yield results which will be useful not only for the scientific community but also for the general public at large, because in the long run it will provide a predictive capacity for environmental problems in the troposphere and climate".

EUREKA INTER-PARLIAMENTARY MEETING: A SUCCESS TO BE REPEATED

In reply to the invitation from their Italian colleagues, they came from every corner of Europe. No less than fifteen national delegations as well as one from the Parliament of the European Communities were present at the EUREKA Interparliamentary Meeting held in Rome in May 1990.

Over two days, parliamentarians from different EUREKA Member States met for the first time in the same room to exchange their opinions and desires on the development and direction of the new "European technological space" to which EUREKA contributes. One unanimous wish expressed by all participants is that this type of contact be organised on a regular basis in the future. They are looking for regular democratic debates on the key technological issues to which European countries must respond.

Robotics
FAMOS FULL SPEED AHEAD

A FAMOS workshop on 'Human Factors in Assembly' (FAMOS is the surname of a very large family of EUREKA projects launched in the field of flexible automated assembly processes) was held, in May 1990 in Espoo (Finland). This event took place in conjunction with the Finnish National Robot Conference and Exhibition.

The objective of the workshop was to study the different methods available for taking into account the human factors when designing assembly systems. The topics discussed included ergonomics, mental and physical work loading, man-machine interfacing, computer-aided training, job design, workplace and assembly system design and participative planning methods.

On 18 and 19 September FAMOS was busy in Besancon, France with an international workshop on Micro-Assembly.

The well attended workshop followed a very ambitious programme with many lively discussions, a fruitful exchange of ideas and methods. The final round table discussion established a solid foundation for work within this area in coming years.

The results of the workshop are available in a report which can be obtained from the French FAMOS Secretariat, 4, place Jussieu, Tour 66, 75252 - Paris CEDEX 05, France. Later during the year, three other events were organised by the FAMOS umbrella organisation: an advanced course in flexible automated assembly technology was held in Venice in October and in mid-November, the FAMOS people met for an international workshop on Flexible Automation in Textile and Apparel Industries in Oporto, Portugal and to round off the FAMOS year in true style, the first international FAMOS Conference on results and perspectives in flexible automated assembly technology took place in Milan in late November.

Sea protection
EUROMAR MARKET

After the success of the first EUROMAR technology market in Scheveningen in September 1988, a second one was held from 5 - 7 June in Venice. The EUROMAR umbrella project involves 13 countries and the EC and aims at launching new projects in the field of marine environmental protection technology. This forum brought together around 50 industrial and scientific participants from most EUREKA countries, all of which were involved in marine-related areas, including both national and international scientific organisations, research institutions, universities, companies and competent ministries.

The meeting made possible the definition of eight new project proposals which may see the light of day in the coming months and receive the EUREKA label.

Industrial waste
HOW TO MANAGE IT?

The problems posed by industrial waste affect not only environmental protection but also the health of enterprises themselves. The rigorous management of this aspect of economic activity now forms an integral part of the competitive constraints which must be mastered by industrial companies.

In addition, the risks created by the growing abundance of waste clearly require transnational solutions. This is why the Minister of Research and Technology of the Federal Republic of Germany judged the time right to organise a EUREKA forum in Bonn in October 1990. The meeting aimed at creating contacts between firms and research centres interested in cooperation in the area of waste management.

Information and Communications

FIRST "EUREKA PRESS SEMINAR"

Thirty four journalists representing the 19 EUREKA countries and the Commission of the European Communities, participated, from 31 May to 1 June, 1990, in the first EUREKA press seminar, held in parallel to the Ministerial Conference in Rome. The media which attended were the following: Agence Europolitique and Agence Europe SA (Agencies)/ Eurotec (Commission of the European Community)/ Die Presse and Salzburger Nachrichten (Austria)/ Le Soir and De Standaard (Belgium)/ Jyllands-Posten and Børsen (Denmark)/ Tekniika & Talous (Finland)/ Le Monde and Le Nouvel Economiste (France)/ TA NEA and Eleftherotypia (Greece)/ Morgunbladid and Icelandic National Broadcasting (Iceland)/ Irish Times and Irish Independant (Ireland)/ Luxemburger Wort (Luxembourg)/ Aftenposten and Dagens Naeringsliv (Norway)/ Expresso and Diario de Noticias (Portugal)/ Süddeutsche Zeitung (RFA)/ El Pais and La Vanguardia (Spain)/ Svenska Dagbladet (Sweden)/ Journal de Genève (Switzerland)/ NCR Handelsblad and Het Financiële Dagblad (The Netherlands)/ TRT and Anadolu Ajansi (Turkey)/ Daily Telegraph and New Scientist (United Kingdom).

In parallel to this seminar, the EUREKA Italian Chairmanship held a 3 day national press seminar, attended by most of the above journalists. The seminar gave them the opportunity to see at first-hand the research centres of some of the main Italian EUREKA participants: SGS-Thomson (Milan), Olivetti and Fiat (Turin), Aeritalia (Naples), Selenia and ENEA (Rome).

TECHNOLOGICAL AREAS

In this section the 382 projects are classified into 9 technological areas.
Each area is described separately in a way which provides a short overview of the EUREKA activities in that area. It is not possible in this Annual Progress Report to list all the EUREKA projects in each area, but a full list is available upon request from the national EUREKA offices or from the EUREKA Secretariat in Brussels.

SUPPORTIVE MEASURES
The successful development and implementation of the results of EUREKA projects may require certain "enabling conditions" to be met which are beyond the capabilities and influence of the project participants themselves.

In these cases the concept of "supportive measures" proves to be important.
The process is "bottom-up", beginning with identification of the project needs. However, fulfilling the conditions may require action by governments and international bodies, initiated and supported by EUREKA bodies.

MEDICAL-AND BIOTECHNOLOGY

BIOTECHNOLOGY refers to the application of living organisms and their cellular subcellular or molecular components to create products and processes that are useful to mankind. It consists of a powerful set of tools and techniques used to develop and produce medicines, agricultural products, foods and many other goods for everyday personal consumption or industrial use.

The EUREKA project group MEDICAL and BIOTECHNOLOGY does not include any umbrella projects.

Of the total 64 projects in this area, 28 are directly linked to medical technology. These projects cover both clinical and diagnostic applications touching upon a range of diseases. Four projects involve R & D on cancer detection and treatment, one of them also includes AIDS detection and treatment. Three deal with sexually transmitted diseases, others aim at developing a malaria vaccine, diagnosis and vaccination against fasciola hepatica, advanced diagnosis and treatment of diabetes, allergies and high blood pressure, chronic coronary disease, treatment of free radicals formed in the human body and development of medicines acting on the central nervous system. Further work is in progress on a variety of different aspects such as:

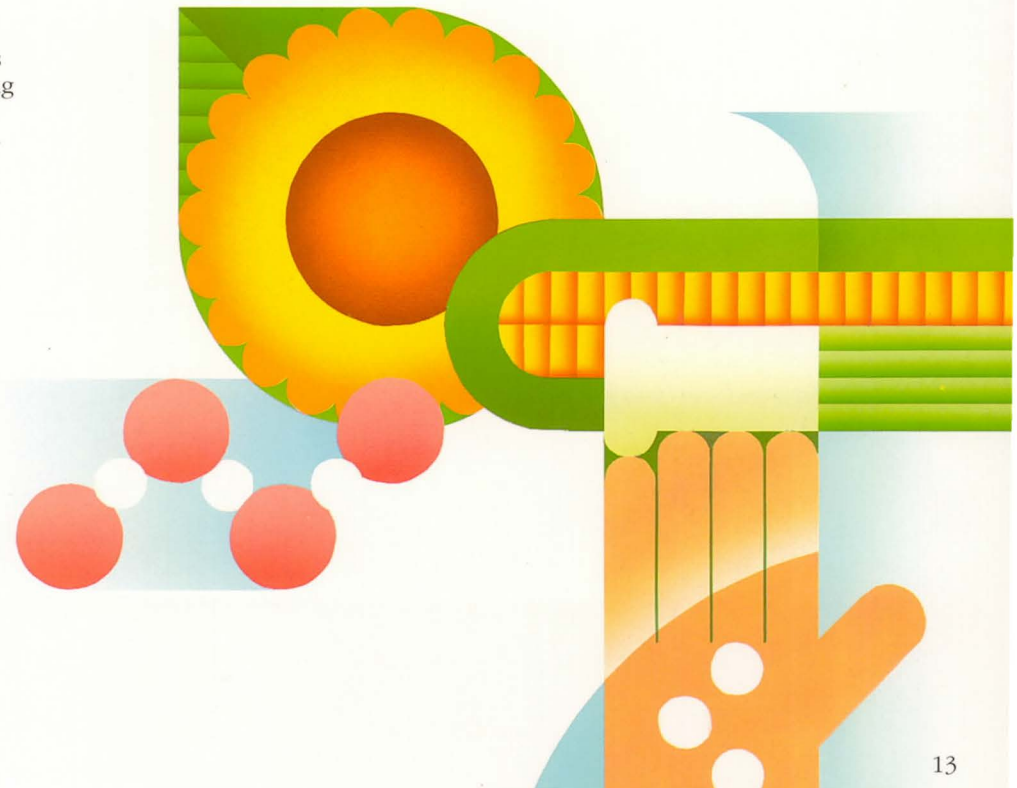
- an Expert System for health examination
- the electronic identification of blood bags
- the functional restoration of the ability to walk by implanted neurostimulation
- bio-medical sensors
- new biocompatible ceramics
- development of artificial pancreas
- magnetic resonance imaging systems
- computer aided tomography scanning and planar image acquisition.

There are 14 projects in the agro-biotech area, some relating to genetic engineering to improve the quality and disease-resistance of plants such as sunflowers, tomatoes, corn, onions, artichokes, leeks, carrots, peppers, etc. Others deal with the production of growth promoters, natural flavours and the development of new sparkling beverages.

15 of the biotechnology projects have primarily a production methods orientation. Several of these projects centre on process applications, such as the high volume production of animal and/or human cell cultures, antigen marking and filtration/separation techniques, the production of synthetic peptides for clinical nutrition and flexible fabrication of higher quality dairy products. One project deals with separation processes functioning under zero gravity conditions (e.g. in space), another with an automated and programmable laboratory for work with DNA (analysis, hybridisation, cloning, sequencing, etc.). There are 7 projects in the animal breeding area dealing with: animal identification and registration, biochemical applications for the animal breeding industry and the development of production technology for the culture of flat fish (e.g. turbot) and salmon.

Two projects have successfully finished:
Clinical diagnosis of Gonorrhoea.
Crop management Expert Systems.

Projects: 64
of which announced in Rome: 9
Total Cost: 510 MECU
of which cost of Rome projects: 48 MECU
Participating Organisations: 150
Main Subjects:
- *Diagnosis and treatment of diseases*
- *Genetic engineering of plants*
- *Biotechnological production processes*
- *Animal breeding*



COMMUNICATIONS

Projects: 23
of which announced in Rome: 4
Total Cost: 1470 MECU
of which cost of Rome projects: 67 MECU
Participating Organisations: 153
Main Subjects:

- *Standards/Norms*
- *High Definition Television*
- *Specific Systems Improvement*
- *Networking/ Systems Integration*
- *Communication Techniques*

Communications have been described as the nervous system of the economic environment; they are crucial for the development of tomorrow's Europe. The EUREKA Initiative has, therefore, been conscious of the importance of assisting R & D in the communication area.

Many projects involve aspects of standardisation, but three of them aim explicitly at using the Open Systems Interconnection (OSI) reference model. One of these aims at strengthening the European academic and industrial research infrastructure. Another project focuses on communications security by developing software and a third project is developing man-machine interfaces which comply with ISO-OSI.

Several projects deal with signal transmission: one is working on the digitalisation of radio signals, two others on algorithms used for speech coding/decoding and bit reduction rate respectively, a third one on a very high bit-rate optical transmission system and another is developing a CODEC compliant with CCITT recommendations for high quality sound in telephone sets.

Projects dealing with specialised applications are working on, among others, an improved system for stereophonic sound reproduction, intrusion identification for personal telephones, mobile communication, electromagnetic compatibility and the combination of computer imaging with computer-assisted live shooting techniques in TV and video production.

In industrial applications, one project concentrates on fieldbus networks which meet the requirements of individual islands of automation for real-time process and machine control. Another is a model of information used for the definition, design and manufacturing of industrial products in the management of large cooperation programmes.

The most important EUREKA communications project, HDTV (High Definition Television), upon completion of its definition phase obtained the approval of its implementation phase at the Rome Ministerial Conference and is now working full speed ahead towards the industrialisation of HDTV.

A related project is developing a bit rate reduction algorithm and aims to implement CODEC prototypes in line with the standards emerging from the RACE programme. Two large projects are working on the development and marketing of a generation of advanced reservation and information systems for easier travel by introducing a modern cover-it-all concept in the travel and tourism business. There are two projects which straddle the Information Technology and Robotics areas: one deals with thin film magnetic heads on silicon, to be applied in peripheral equipment and in sensors; the other involves a process improvement in the semiconductor industry and is developing an integrated vacuum instrumentation system.

The Integrated Home System Project is now finished as regards its EUREKA phase.
Its objective was to set an industry standard for cordless, mains-borne and wired bus communications inside the home and to encourage market development by demonstrating inter-connectability between different systems.

SUPPORTIVE MEASURES: coherent and timely actions are being taken to pave the way for the acceptance of European standard proposals for HDTV, digital broadcasting, telephone security and optical transmission, to name just a few.

ENERGY TECHNOLOGY

Projects: 16
of which announced in Rome: 2
Total Cost: 550 MECU
of which cost of Rome projects: 27 MECU
Participating Organisations: 77
Main Subjects:
- *Gas turbines*
- *Drilling of hydrocarbon wells*
- *Power plants*
- *Energy saving machinery*

Gas turbine projects are well represented, with applications ranging from small car engine turbines to large ones for electricity supply, marine or fast trains propulsion or power generation. Most of these projects involve new materials (e.g. ceramics) or electronic control reducing turbine weight and increasing efficiency and speed. This will also reduce fuel consumption and pollution.

Three projects fall into the power plant category. One involves the development of a commercial scale solar energy demonstration plant rated at 30 MW, which goes one step beyond existing research and test plants. Another solar power plant project places an emphasis on problems due to extreme meteorological conditions, especially in alpine regions. Therefore key issues are the increase of system efficiency, reliance and expected lifetime, reduction of maintenance and minimisation of environmental impact. A third project aims to build a compact, non-polluting 300 MW coal-fired power station which will meet the most stringent environmental requirements in a cost effective way, even using fuels with a very high sulphur content.

Two projects involve the use of amorphous silicon in photovoltaic cells for autonomous electric power supply. In the first project the new thin film technology is scaled up in size and production throughput with the focus on photovoltaic modules for solar energy applications. A significant number of photovoltaic modules developed in this project have already been sold and another product of this project, a photovoltaic sun roof for cars, will soon be commercialised.
The second photovoltaic project, alongside the development of solar cells for commercialisation, focuses on amorphous silicon particle detectors for industrial, medical and synchrotron radiation experiments.

The remaining projects all share the aim of increasing the efficiency of existing systems, while reducing costs and minimising side-effects. One project intends to develop anew concept in uninterrupted power supply whereby the UPS unit, in addition to other improvements, will no longer pollute the supply network. The development and construction of two wind power stations with 3 MW rated power, is the aim of a further project. The windmills will be larger, lighter, more efficient and quieter than their predecessors. One project will create an integrated electric drive for home automation which involves new motor designs. The civil aviation market is addressed by a project which is developing a new generation of more reliable, lighter and cheaper pumps running without conventional lubricants.

A recently announced project is endeavouring to thoroughly reshape the conventional cokemaking system since the long-term, low cost supply of blast furnace coke is a key factor in the competitive steel industry.
The new high capacity coking reactor which will be demonstrated is going to reduce production costs, increase the rational use of energy, resolve the problems of environmental protection and health and safety in the workplace.

A second new project will design a low cost oil and gas production facility for small reserves in deep water. The unmanned floating station will be remotely operated from the main production platform in an offshore field.

Two projects have successfully finished:
New designs and technologies for high power semi-conductor devices
(see project description).

PACA - Development and industrialisation of absorption heat pumps and heat transformers for industrial use and high power applications.

ENVIRONMENT

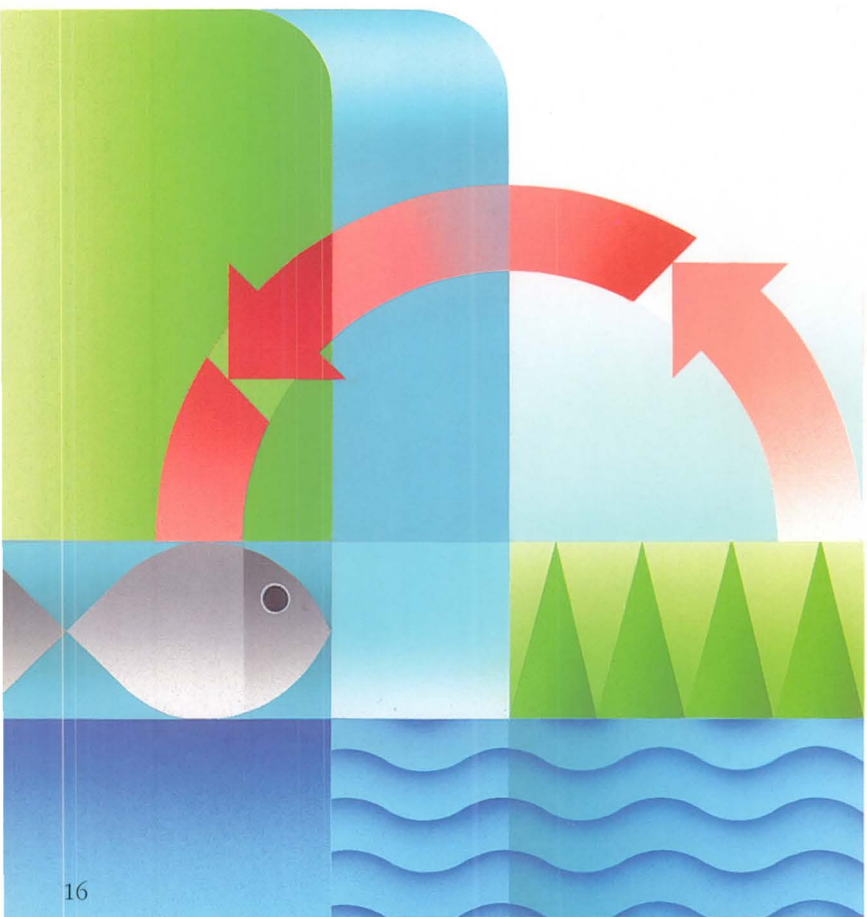
Projects: 71
of which announced in Rome: 38
Total Cost: 713 MECU
of which cost of projects announced in Rome: 254 MECU
Participating Organisations: 288
Main Subjects:

- *Atmospheric pollution*
- *Restoration and preservation of buildings and artifacts*
- *Marine technology*
- *Environmental monitoring*
- *Water treatment*

The area of environment is characterised by its number of Umbrella projects (EUROMAR, EUROCARE, EUROENVIRON), one large individual project (EUROTRAC) and a cluster of projects (ENVINET). Out of the 71 environmental projects, 54 fall into these groups leaving 17 independent projects.

EUROTRAC is the largest individual environmental EUREKA project with emphasis on the transport and transformation of pollutants over Europe. The project involves almost 150 organisations from 17 different EUREKA members plus institutes from three European non-member countries, thus representing a real European joint enterprise in atmospheric sciences.

The EUROMAR umbrella project focuses on the development, application and successful exploitation of Europe's advanced marine technology which has worldwide market potential. EUROMAR brings together marine researchers, agencies, designers and industries from thirteen European countries plus the CEC. Eighteen specific projects have been announced involving remote sensing, models, data systems, bottom systems, instruments and carrier systems and atmospheric input.



The EUROCARE umbrella project deals with conservation and restoration of the cultural heritage and building stock in Europe. Fifteen individual projects have officially started addressing issues related i.a. to foundations, wood protection, wall paintings, concrete, marble, copper, Roman mosaics and protection buildings.

The EUROENVIRON Umbrella project concentrates on terrestrial environment. It has so far generated ten projects aimed at the international environmental management markets.

These projects deal with wastewater treatment, contaminated groundwater, polluted soil and atmospheric dispersion of process and accidental releases. A remote measurement system for vehicle emissions, an incinerator using car shredder residues, recovery and re-use of plastic materials from automobiles, new environmentally friendly fire fighting foam systems and a dry cleaning machine are being developed.

ENVINET is the common heading for a further group of seven projects. These projects aim to develop innovative systems of environmental monitoring.This involves advanced sensors, analysis of environmental data and integrated systems.

Moreover, there are three specific projects working towards the improvement of water treatment systems, two projects developing research and monitoring vessels and one involving a special off-road machine for soil preparation in reforestation.

Airborne instrumentation for measuring the status of vegetation and improvement of the state of health of European forests and their wood production are the objectives of two projects.

The rest of the projects address most diverse environmental aspects - new type of wave attenuator, underground repositories for hazardous waste, vehicle noise abatement, hazardous gases from industrial plants and new cleaning process for heavy duty laundry.

Two projects have successfully finished:
Chrome tanning-salts substitutes
(see project description).

ZEOL - Purification of air and water effluents especially from industrial outlets by removal of organic compounds.

INFORMATION TECHNOLOGY

The projects grouped under this heading encompass the classic IT sectors though with different emphasis and a penchant for applications. The pervasive nature of IT is invading virtually all industrial processes and products and affecting every aspect of human life. Consequently the use and exploitation of IT can be found in all EUREKA technological areas.

Currently, half of all EUREKA projects involve IT applications and/or electronic devices. Besides the totality of the Communication area, two thirds of the Factory Automation/ Robotic projects are CIM (Computer Integrated Manufacture) applications, and half the Transport and a quarter of the Environment projects are IT dependant.

EUREKA is contributing, with seven projects, to Europe's endeavour to achieve self sufficiency in integrated circuits from ASICS to EPROMS, hybrid circuits and power ICs.

The execution phase of JESSI, the largest R & D collaborative activity within the European semiconductor industry, is now well under development and a total of 54 projects have obtained the JESSI label. Conceived to meet the outside challenge and to guarantee the strategic independence of industry, JESSI has a vertically integrated structure covering the whole industrial spectrum of semiconductors by developing new technologies and processes, tools for new applications and new production equipment and by carrying forward basic research.

Of the six projects dealing with sensors and signal processing for acoustic, optical and mechanical data on pressure, acceleration, temperature, etc, one is new. In the peripheral sector, beside a picture quality colour ink jet printer and a secure card reader in bank communication, there is an open control display system project.

Software technology projects address management of software production processes and improvement in development productivity and quality assurance. One is oriented toward the ADA programming language, and others are based on the PCTE environment. Logic programming tools are being de- veloped in PROLOG and LISP environments for expert system development, while parallel computing is the basis for compiler and operating system development of the Trans-puter. Software re-usability and software quality evaluation are the aim of a number of artificial intelligence projects.

Among the projects dealing with specific software applications, some are applying artificial intelligence such as the computerisation of engineering tasks and the tackling of plant failures for security control. Models and simulations are employed in design tools and non-destructive testing. Natural language and linguistics are used in projects involving translations, dictionaries and thesauri. A medical digital information system for hospitals and portable terminals for diagnostic and therapeutic decision-making in the field are important contributions to health care. Radio-determination and messaging by satellite, automatic map making and a touring information system are other practical applications.

INDUSTRIAL PROGRESS in the IT area can be judged by the five successfully finished projects:

- DESIRE, development of an all dry single layer photolithography sub-micron device.
- UMCD, Universal Modular Colour Display system for process control.
- TRIBUNE, practical ADA workbench for real-time applications.
- FIABEX, development of an expert system for safety and reliability analysis of industrial systems.
- MOBIDICK, multi-variable on-line bi-lingual dictionary kit (definition phase) which has proven the validity of international cooperation, the achievement of its original objectives and made some prototypes available for demonstration purposes.

SUPPORTIVE MEASURES refer particularly to standards in the software sector which have to be followed in their process of adoption by the relevant international bodies.

Projects: 60
of which announced in Rome: 7
Total Cost: 1772 MECU
of which costs of Rome projects: 62 MECU
Participating Organisations: 196
Main Subjects:

- *Hardware Components Production*
- *Software Developments Production*
- *Information Storage/ and retrieval systems*
- *Specific Applications in Information Technology*

LASERS

Projects: 12
Total Cost: 306 MECU
Participating Organisations: 109
Main Subjects:

- *Evaluation by Umbrella project*
- *High power laser developments*
- *Industrial applications*
- *Specialised measurements*

Lasers are instruments which generate intensive, coherent and monochromatic light in the visible and adjacent ultraviolet and infrared wavelength regions. Various applications offer themselves in accordance with the different physical properties of different laser types and have consequently been developed during - in essence - the past 30 years. The 12 EUREKA laser projects reflect in their variety the present forefront of these developments.

The area is dominated by an umbrella project - EUROLASER - which has the goal of evaluating and developing industrial lasers of all conceivable types for material processing with special emphasis on the possibility of integrating them into flexible manufacturing systems in industry. The technological goals are primarily to improve efficiency and the physical systems properties. Most of the other projects within the laser area are related to this umbrella.

Since laser technology is still comparatively young, the development of various lasers per se including beam handling optics and elements is currently far from complete. In order to explore the potential offered by higher power, three projects concentrate their efforts on the development of high power CO2 lasers (10 and 20 kW per cell with coupling possibilities to multiples) aiming for metalworking applications in industry, where up to 5 kW lasers are currently used.

Apart from power level, other properties are also important. Four projects are therefore developing other lasers, offering industry a choice of characteristics, particularly with regard to wavelength, but also between pulsed and continuous power. Here can be found two Excimer projects (pulsed, UV light for high efficiency absorption in e.g. microlithography), one CO project and one solid-state project.

Besides the development of the respective laser itself, none of the projects neglect to study adjacent industrial applications. Three projects are, however, more expressly devoted to industrial application development: solid-state laser-based, advanced manufacturing, a database for knowledge dissemination including cooperative application research to increase this knowledge and a laser work station for advanced surface treatment.

In summary, the above laser projects aim at developing new and powerful tools for metalwork, surface treatment and fine mechanical machining with greater accuracy, better tolerances, fewer influences on the surrounding material and greatly improved efficiency, all with a view to integration in the flexible machining systems of modern industry.

Finally, there is one project in which the ability to transfer signals, not the intensity of the laser, is important: remote vibration measurement with laser avoids the old problem of interference between sensor and the vibrating object.

Industrial progress is reported by most of the projects in this area such as well kept time schedules, a steady success in solving technical problems, minimal cooperation problems and promising market contacts. The heavy emphasis on application development in most projects can be taken as solid ground for market orientation and efficient transfer of the findings from research to industrial reality.

Supportive measures in the laser area are concentrated on standards - especially regarding safety - as reported in previous years. This work continues in line with the progress in application knowledge, all in close cooperation with the EUROLASER Governmental Coordination Committee and the CEC.

NEW MATERIALS

In contrast to most other areas, the New Materials project group does not include any umbrella projects nor indeed any of the remarkably large projects, but certainly some of impressive size. The various projects represent the development of new materials as such, new processes to produce new as well as conventional materials, application of new materials and the development of measurement instruments within the materials field.

Within the first two of these groups, a trend towards more sophisticated materials, available through - or requiring - more advanced production processes can be clearly observed. This goes for modern composites as well as seemingly conventional metals and their combinations. Emphasis is on better strength, less weight, improved environmental properties, higher efficiency and higher reliability of the various products, which these new materials would make possible.

2 out of the 13 projects in these two groups aim at applications, which are not normally thought of under the heading of new materials: one addresses the "hotmelt laminating" method for bulky textiles containing foams and waddings as found in e.g. ski wear. Another tries to exploit the potential offered by hardening by natural phenomena of loose ground material aiming at application in rarely frequented and/or low budgetroads or similar ground reinforcements in e.g. developing countries or forestry/agriculture.

Within the area of new applications, seven projects are working towards the mechanical industry - for higher strength steel structures, the improved car, vehicle engines, reinforced ceramics for diesel engines and turbines, which will consequently be capable of running at higher temperatures, hence improved efficiency, even sputtered films for better slide bearings and strong/light panels for aircraft. The construction sector has four projects: sewage pipe, sub-sea oil and gas piping, design of aluminum structures under fatigue and reinforced composites for civil engineering.

The electrical/optics industry is addressed by yet another four projects - mirrors in very large (optical active mode) telescopes, the "smart window" allowing control of heat and light flux through the window, new household appliances of the heat generating type by applying isolating coatings directly on the heating metal, and superconducting magnets for very high field applications - whilst finally one project concentrates on the process industry with the development of a ceramic non-consumable anode for aluminum electrolysis, an application of potentially considerable economic importance.

The development of mobile high flux neutron radioscopy equipment for non-destructive testing and of different gas proportional scintillation counters for advanced materials testing are the goals of the two projects within the instrumentation area, demonstrating the obvious need for more sophisticated instrumentation alongside the development of more sophisticated materials.
Industrial progress within this area can be demonstrated by good, steady progress in the majority of the projects, a number of commercial contracts being signed between partners, prototype and demonstration installations being put in place and initial sales being currently made as the result of some cooperative ventures.

Projects: 32
of which announced in Rome: 5
Total Cost: 238 MECU
of which cost of Rome projects: 36 MECU
Participating Organisations: 96
Main Subjects:

- *Development of new materials*
- *New processes to produce new and old materials*
- *New applications in mechanical, construction, el/optical and process industry*
- *Testing equipment*

ROBOTICS AND PRODUCTION AUTOMATION

Projects: 81
of which announced in Rome: 22
Total Cost: 1212 MECU
of which cost of Rome projects: 264 MECU
Participating Organisations: 319
Main Subjects:

- *flexible manufacturing and automated assembly systems*
- *computer integrated manufacturing*
- *enabling technologies (sensors, software tools and components)*
- *robots*

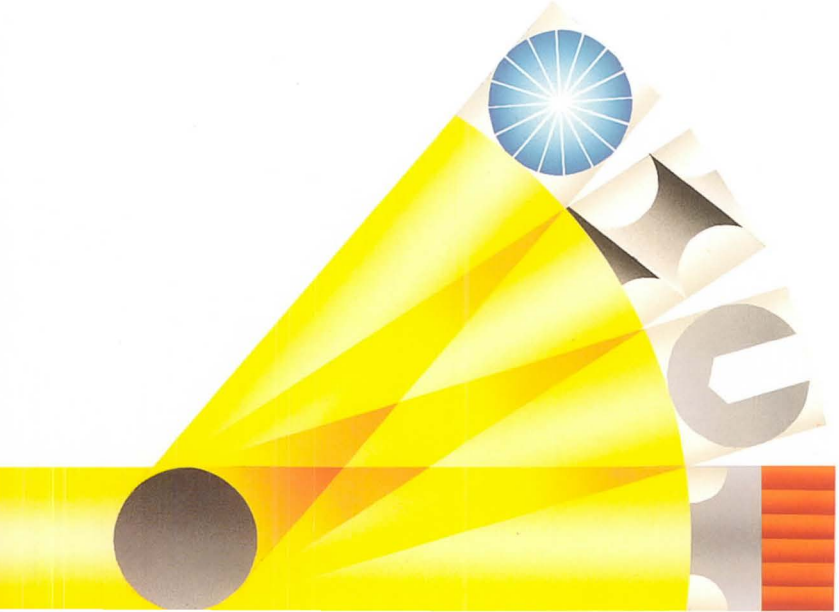
The EUREKA project portfolio deals with all aspects of the increase in productivity of today's and tomorrow's factories and therefore covers almost the entire field of manufacturing and robotics. Consequently it has become one of the largest fields of activity within the EUREKA initiative, with a current total number of 81 projects, 22 of which were announced at the last Ministerial Conference.

In contrast to Computer Aided Design and Engineering, only represented by a limited number of projects, 34 projects now cover the area of Manufacturing, Production improvement as such, Flexible Manufacturing and Automated Assembly Systems (FMS and FAS).

The largest area in this manufacturing field covers, with 26 projects, the entire spectrum of FMS, ranging from improvement of assembly line productivity and of the quality of products assembled by real on-line quality control, to stock level reduction, application of just-in-time principles and flexibility enhancement of products and production.

The great number of projects in the FAS-FMS area can, applied to a large variety of industries, of course, be explained by the existence of the Umbrella project FAMOS, a project generating mechanism which has launched 36 projects to date. This intensive network, represented in 17 countries, spreads information on project ideas and tries to link suppliers and appliers of the assembly techniques. In 1990 the project organised a number of workshops on the application of FAS.

Information on ongoing projects and activities was also disseminated at a FAMOS Conference in Milan and a summer school on flexible assembly in Venice, aimed at young researchers in industry.



More and more, FAS projects have recently tended to go further than the scope of FAS alone and tried to integrate CAD, CAM, FAS and FMS into the overall concept of Computer Integrated Manufacturing. 12 projects have this CIM concept as their main aim, offering either solutions to a variety of industrial branches or to a single sector.

Such developments are impossible without a parallel development in enabling technologies and tools for this new manufacturing scheme. 19 projects can be classified in this area, 8 of them announced in Rome.

3 of these projects deal with the development of sensors of high accuracy and/or applicable for quality control systems in CIM.

10 of these projects deal with the development of special software. Among these is the project EUROPARI which has generated 4 new projects this year, thereby creating more than 60 modules for application invarious areas of aircraft manufacturing systems.

5 of the 19 projects are working towards the development of special tools and components in some special manufacturing processes.

The last area in the Robotics and Production Automation sector contains 15 projects devoted to the design and development of independent movable robots in and outside the traditional industrial conditions.
3 of these projects were announced in Rome.

2 of them involve an application in more traditional industrial sectors (welding and warehousing): 3 projects deal with robots intended for applications in the building and construction sector. 4 others deal with applications in the agriculture and fishing area. 3 others focus on special underwater applications. Finally, 3 projects aim to use robots for interventions and surveillance in conditions in which it is too dangerous for humans to operate.

Although most of the projects in the Robotics and Production Automation area have a rather long project duration (more than 24 months) or have only recently started, the first industrial and/or feasibility results have been obtained with four projects.

In the area of supportive measures, there is heightend awareness of projects, especially in the FAMOS area, relating to the ongoing and scheduled standardisation work of CEN/CENELEC in information technology in advanced manufacturing.

TRANSPORT

Mobility is one of the predominant characteristics of our modern society. Safeguarding and increasing this mobility for man and goods transport, offering solutions to the environmental problems of this mobility and increasing its efficiency, comfort and safety, are the main aims of the 23 projects listed so far in this area. Four of them were announced in Rome.

3 projects focus on aircraft development and air transport: the development of an advanced amphibious aircraft and feasibility studies on the introduction of a new type of aerial transportation system based on the tilt rotor aircraft and on the introduction of a new, lighter than air, air transportation vehicle, to transport heavy loads.

Railway improvement is the goal of 3 other projects. These projects cover the development of a new generation of high power thyristors for railway traction and, especially for high speed trains, the development of a lineal train motor on one hand and new engineering solutions for expansion joints for the continuous rail on the other.

The main group of projects in the transport area is related to land and road transport. The largest project in this sector aims to create concepts and solutions to improve all the features of road traffic in Europe; it therefore teams up the automobile industry with both electronics and the vehicle components supply industry and basic research specialists.

Some practical solutions to these features are under development by separate EUREKA projects (car status information and environmental information).

In this information package for the driver, the development of digital cartography plays a major role.It was the basis for two projects focusing on the development of a common standard in this area and on digital databases for various countries.

3 projects focus on the development of components for all sorts of vehicles: a range of gearboxes and engines for industrial vehicles, new gear technology for all terrain vehicles and a new vehicle headlight system based on short arc discharge lamps.

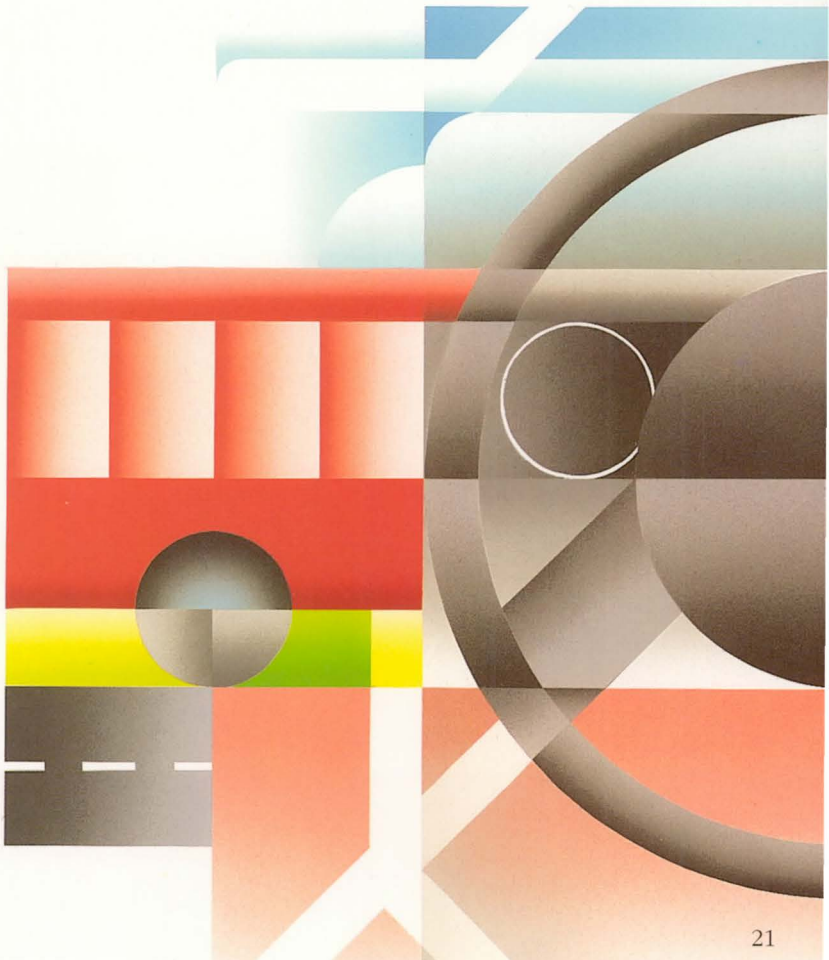
Logistics is another important project area: controlling the product flows on land and inland waterways, thereby creating integrated information and transport networks throughout Europe including contact and data exchange between the vehicles and their home base and the development of a concept for physical centres of trade and transport, are some of the main aims of the projects in this area.

Transport needs an adequate infrastructure. 3 projects aim at the development of certain aspects of infrastructure such as fire protection in tunnels, new concrete highway surfaces to be applied in a cold environment and advanced systems and technologies to be added to the traditional road infrastructure in order to solve problems faced by today's urban and interurban road traffic.

Finally, 2 projects deal with the development of new transport vehicles: a fuel cell bus and an all terrain amphibious vehicle (land and marine environment).

A number of these projects have already reached the marketing stage. There is no doubt that the results will affect tomorrow's traffic and transport.

Projects: 23
of which announced in Rome: 4
Total Cost: 762 MECU
of which cost of Rome projects: 191 MECU
Participating Organisations: 180
Main Subjects:
- *road and rail transport*
- *logistics*
- *infrastructure*
- *air transport systems*



STATISTICAL TABLES

FINANCIAL SIZE OF PROJECTS (PC) IN MECU

Project Cost (MECU)	Total N° of projects	N° of projects per area								
		BIO	COM	ENE	ENV	INF	LAS	MAT	ROB	TRA
PC ≤ 1	46	7	3	1	20	5	1	3	4	2
1 < PC ≤ 2	43	10	–	1	10	5	1	6	5	5
2 < PC ≤ 5	104	21	4	4	18	21	1	12	19	4
5 < PC ≤ 10	61	10	2	2	11	8	–	4	20	4
10 < PC ≤ 20	51	10	3	1	5	11	4	4	12	1
20 < PC ≤ 40	39	4	5	3	2	4	1	2	15	3
PC > 40	38	2	6	4	5	6	4	1	6	4

PROJECT PROGRESS

According to schedule	Total N° of projects*	N° of projects per area								
		BIO	COM	ENE	ENV	INF	LAS	MAT	ROB	TRA
Announced, June 90	91	9	4	2	38	7	–	5	22	4
< 1/4	13	2	–	–	3	3	1	2	2	–
1/4 - 1/2	101	20	3	5	13	18	5	11	22	4
1/2 - 3/4	69	14	8	2	4	13	1	4	18	5
> 3/4	60	5	5	3	5	13	4	5	12	8

*Based on information received from 334 projects

PLANNED PROJECT DURATION (PD)

Project Duration (months)	Total N° of projects	N° of projects per area								
		BIO	COM	ENE	ENV	INF	LAS	MAT	ROB	TRA
PD ≤ 24	55	4	2	–	15	11	1	1	12	9
24 < PD ≤ 48	184	34	11	8	33	32	2	16	40	8
48 < PD ≤ 72	114	21	9	6	14	12	8	13	27	4
PD > 72	29	5	1	2	9	5	1	2	2	2

PLANNED PROJECT END DATES

Project End Dates	Total N° of projects*	N° of projects per area								
		BIO	COM	ENE	ENV	INF	LAS	MAT	ROB	TRA
≤ 31.12.90	61	11	5	3	4	14	2	3	10	9
≤ 31.12.91	76	12	7	5	4	17	2	4	20	5
≤ 31.12.92	67	13	4	1	7	9	4	9	18	2
≤ 31.12.93	30	8	–	–	1	7	3	6	4	1
≤ 31.12.94	16	3	–	2	3	2	1	1	3	1
≥ 1.1.95	13	2	1	1	4	1	–	–	3	1

*Based on information received from 263 projects

STATISTICAL TABLES

PARTICIPATING ORGANISATIONS PER EUREKA MEMBER

Number of organisations

Member	Industry	of which SME	Research	of which University	Government/ Nat. Bodies	Others
A Austria	42	12	13	7	4	2
B Belgium	41	17	12	8	1	1
CEC CEC	–	–	1	–	1	–
CH Switzerland	48	35	15	7	3	1
D Germany	290	69	99	39	12	3
DK Denmark	29	11	14	5	1	1
E Spain	103	30	38	15	5	2
F France	231	45	98	27	7	3
GR Greece	18	7	6	2	1	–
I Italy	164	26	53	17	5	2
IRL Ireland	6	1	4	4	2	–
IS Iceland	6	1	2	1	–	–
L Luxembourg	4	3	–	–	1	–
N Norway	61	23	21	5	5	1
NL Netherlands	110	43	28	7	11	2
P Portugal	16	4	16	9	3	1
S Sweden	72	21	23	7	5	–
SF Finland	53	9	4	2	3	1
TR Turkey	3	–	4	4	–	–
UK United Kingdom	134	37	36	18	11	7

JOINT PROJECT PARTICIPATION BETWEEN EUREKA MEMBERS

EUREKA AND THE EUROPEAN COMMUNITY

The European Community has been a full member of EUREKA since its inception and has contributed to its setting up and evolution. The EC R & D programmes and EUREKA converge towards the same goal: the creation of a European technological space.

The two frameworks are complementary: on one hand EUREKA projects or phases of such projects of a precompetitive nature may receive support from EC programmes, and on the other hand work started under EC programmes can be continued under EUREKA. Thus finished EC projects are informed of the possibilities under EUREKA.

Taking into account the Community's role in fostering a general economic and business environment suitable to the flourishing of transnational R & D ventures, cooperation between the two activities has been implemented through the Commission's involvement in specific EUREKA projects on a case-by-case basis.

The commitment of the Community to the promotion of significant synergies between the Community's R & D programmes and EUREKA is enshrined in the Third Framework Programme of research and technological development (1990 to 1994), adopted on 23 April 1990.

In 1990, European Community involvement in some EUREKA projects has taken the following forms:

The Commission has formally joined EUROLASER and its Government Coordinating Committee, in view of the increasing synergy between this project and the BRITE/EURAM programme in the field of high-power lasers.

The Commission played a central role in defining the policy and objectives of COSINE, computer networking, including support for the RARE R & D networking association which produced the technical specifications. In January 1990 the Implementation Phase was launched, and the Commission continues to play an active role, particularly in setting up the International X.25 Infrastructure (IXI) pilot project, which interconnects European research networks.

PROMETHEUS and the Community's DRIVE programme are recognised to be fully complementary in the road safety areas, following a common meeting of the DRIVE Management Committee and the PROMETHEUS Steering Committee in July. A number of PROMETHEUS "Common European Demonstrators" have been evaluated within the DRIVE pilot projects. The Commission is continuing its actions with other EUREKA projects related to road transportation, particularly in support of necessary European standards.

Further to the Council Decision of 1989, the Commission has been very supportive of the EUREKA HDTV project. Additional HDTV research has been proposed in the context of the RACE and ESPRIT programmes.
Also, the Commission was instrumental in the creation of the EEIG Vision 1250, which will ensure the availability of production equipment and programmes for pilot and pre-operational services.

On JESSI (microelectronics) the Commission along with the national administrations involved has established a framework governing the relation between their respective domains of activities. Under the framework it has signed the contracts for the launching of the first JESSI projects: CAD Framework, Joint Logic and Manufacturing Science.
The Commission has pursued discussion of its participation in and interaction with the JESSI SMI project, that could contribute strongly to a broader action to promote the transfer and the use of these technologies to SMEs throughout the Community.

Finally the Commission announced active participation by the Joint Research Centre in LASFLEUR, remote sensing of vegetation, EUROMAR-VISIMAR, which is to aid the visualisation of simulated marine phenomena, and EUROTRAC-BIATEX, biosphere-atmosphere exchange of pollutants.
The Commission's participation in these projects and in the overall management of EUROTRAC (trace constituents in the troposphere), EUROMAR and EUROENVIRON reflect the increasing Community concern with environmental matters.

PARTICIPATION FROM NON-EUREKA COUNTRIES

In the Declaration of Hanover (1985) the objective of the EUREKA Initiative reads as follows:

" ..... to raise through closer cooperation among enterprises and research institutes in the field of advanced technologies, the productivity and competitiveness of Europe's industries qnd national economies on the world market".

The essence of the Declaration implies a geographical limitation for the overall aim of the Initiative. However, at the Ministerial Conference held in London on 30 June, 1986 it was agreed as a guideline that:

" .... membership of EUREKA should not at present be further extended but the participation in EUREKA projects by enterprises or institutes from other European countries is not excluded; that this would be by agreement of the enterprises or institutes from EUREKA countries participating in the projects concerned; and that proposals for such projects should be discussed by the High Level Group on their merits, as they arise, within the framework or principles and objectives established by the Hanover Declaration".

At the Ministerial Conference held in Madrid on September 1987 the decision taken in London was confirmed and guidelines for participating in a project from non-member countries were laid down. The fundamental idea that lies behind these rules is the "case by case" and the "bottom-up" approach.

In conformity with these rules, out of the 2055 participants in EUREKA projects, 18 currently come from six non-member countries. These participations are in very specific projects as well as in large scaleones such as EUROMAR and EUROTRAC.

At the VIIIth Ministerial Conference in Rome, the Ministers attributed special importance to the subject non-member countries.
In the official press communique, it reads:

" .....welcomed the rapid political and social change which Eastern European countries are undergoing and the introduction of market orientations into their social and economic systems, thus facilitating their scientific and technological cooperation with Western Europe and agreed that EUREKA should play an active role in enhancing collaboration from central and eastern European companies and research institutes; they therefore strongly supported the idea that advantage be taken of the flexibility of the EUREKA rules to favour increased and earlier cooperation of companies and research institutes from Central and Eastern Europe.

- took note of the interest that companies and research institutes from non-member countries have shown in EUREKA and its achievements, while there is also wide interest in organisations from EUREKA countries to cooperate with partners from non-member countries, in particular from Eastern Europe.

- welcome both increased information on EUREKA being made available to non-member countries, as well as joint scientific and technological EUREKA activities, such as fora and seminars".

In compliance with the above statement, the EUREKA bodies are currently elaborating the issues of procedural flexibility and increased cooperation so as to determine the subsequent modus operandi.

EU N°	Acronym	Country	Sector
5	Membranes for ultra Micro filtration	Canada	Environment
7	Eurotrac	Yugoslavia USSR	Environment
8	Cosine	Yugoslavia	Communication
20	East	Canada	Informatic
22	Diane	USA	Materials
37	Euromar	Yugoslavia	Environment
226	Eurolaser	Canada	Laser
294	Biomaterials	Yugoslavia	Biotechnology
316	Eurocare-Copal	USSR	Environment
325	Galileo	USA	Communication
384	Dyes and dye sorbents	Argentina	Biotechnology
417	Euromar-Mermaid	Canada	Environment
419	Dumip	USSR	Robotics
493	Euromar-Elani	Yugoslavia	Environment

PROJECTS

In this section, 15 individual projects are presented as examples of what EUREKA projects actually involve. These have been selected to give some idea of the wide variety of fields inherent in EUREKA. This variety is reflected in the technological span of the projects as well as the geographical distribution of the participants. The wide scope of participants ranging from multinational corporations to very small companies and from dedicated production industries to university institutes serves to prove that EUREKA really does work as a catalyst, making European Industry and Research work together to improve European competitiveness. In fact, although the Initiative is only five years old, some EUREKA-developed products, processes and services have already been succesfully launched onto the market, some examples of which can also be found in this section.

GALENO 2000 LOOKS AFTER THE PATIENTS

A New Tool in Non-invasive Cardiopulmonary Function Testing and Patient Monitoring

The aim of this project is to develop an advanced system for cardiopulmonary function testing and intensive care monitoring of patients.

GALENO 2000 combines:

- Advanced noninvasive sensor technology.
- New gas exchange methods.
- Computerised data interpretation.
- Advanced smart card patient folders for fast and reliable patient identification and history recording.
- Computerised reporting and data management.

The system has a modular structure which allows configuration to the specific needs of the user. Two main configurations are available: one for cardiopulmonary function testing and the other for intensive care monitoring.

The project integrates a number of important sensors into one single system.
The following sensors and stimulation systems are included:

- Multicomponent gas analyser.
- ECG system.
- Pulseoximeter.
- Blood pressure sensor.
- Airway pressure sensor.
- Temperature sensor.
- Respiration flowmeter.
- Bicycle ergometer.
- Sine wave pressure generator.

GALENO 2000 also allows extremely easy use of state-of-the-art gas exchange methods for non-invasive estimation of essential cardio-pulmonary parameters.
The most important parameters are:

- Cardiac output and stroke volume.
- Lung tissue volume.
- Lung diffusing capacity.
- Lung residual volume.
- Ventilation distribution.
- Dynamic and static spirometry.
- Flow-volume curves.
- Airway resistance.
- Ventilation rate.
- Oxygen consumption.
- Carbon dioxide excretion.
- Respiratory quotient.
- Fowler and Bohr deadspace.
- Lung shunt.
- End-tidal gas partial pressures.
- Exercise testing programmes.

The software developed for the project gives a compressed presentation of the most significant results obtained during a measuring session. The results can be processed by an interpretation system, which suggests diagnoses based on generally accepted clinical rules.

Another output from the project is the Smart Card, an intelligent credit card type patient folder, which is carried by the patient.
The smart card is able to store important patient data such as vital information on allergies and previous diseases.

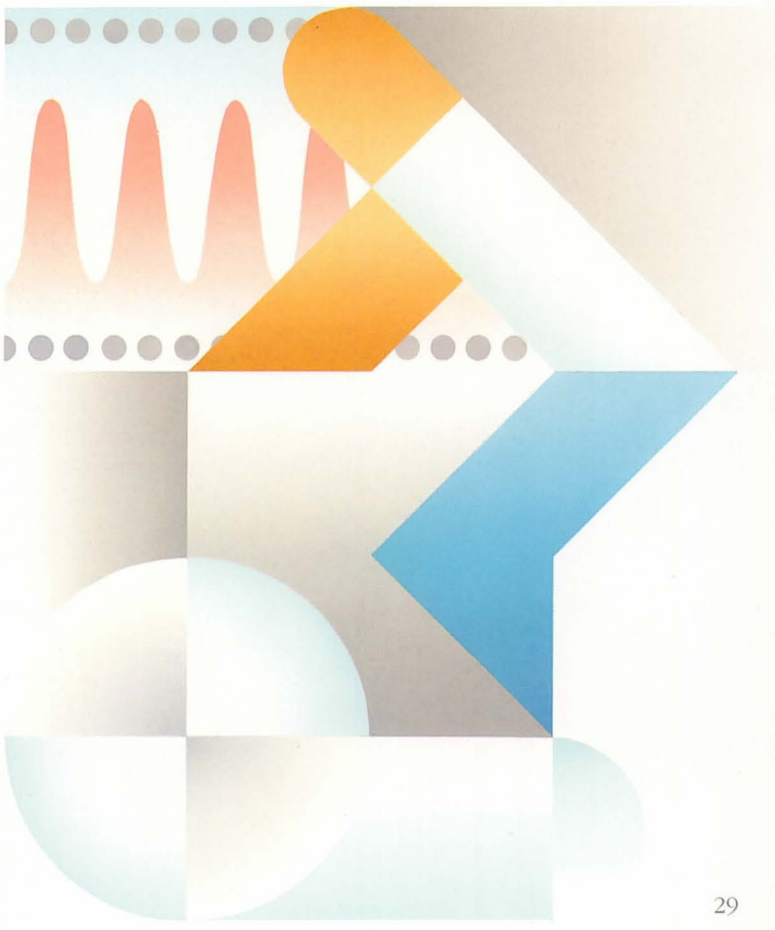
GALENO 2000 also provides compressed or extensive hard copy reports. At defined intervals, the project database is updated.

This project is developing a line of products combining different system modules.
The first products will be on the market in 1991.

EU 26

Medical- and Biotechnology

Title:	*Galeno 2000*
Participants:	*Denmark - Amis A/S France - Aerospatiale Norway - University of Tromdheim (Sintef Group)*
Main Contact:	*Amis A/S Mr. Jørgen Grønlund Nielsen Tel: +45 65 95 91 00 Fax: +45 66 17 81 74*
Estimated Cost:	*46 MECU*
Time Scale:	*76 months*



SUCCESSFUL BATTLE AGAINST A DANGEROUS DISEASE

EU 177

Medical- and Biotechnology

Title:	*Rapid Diagnosis of, Vaccination against Canine Leishmaniosis*
Participants:	*Portugal - Bioeid S.A. Spain - Instituto Llorente S.A.*
Main Contact:	*Instituto Llorente S.A. Mr. G. Boren de Unzue Tel: +34 1 233 69 06/ 233 78 02 Fax: +34 1 723 10 42*
Estimated Cost: Total	*1.50 MECU*
Time Scale:	*84 months*

Leishmaniosis is a parasite-transmitted disease which affects human beings and various animal species. It is to be found in many parts of the world, mainly in "warm" regions. In Europe it is endemic in the entire Mediterranean area.

According to a number of specialists, some 400,000 new cases of leishmanial infection occur each year. In its Special Programme for Research and Training in Tropical Diseases, the World Health Organisation selected the disease as one of three priority pathological processes for R & D projects (WHO Technical Report, 1984).

The term leishmaniosis encompasses a series of distinct clinical forms of the disease caused by various flagellate protozoa of the genus Leishmania. These affect human beings and certain animal species, and can be transmitted only by insect vectors (phlebotomine sandflies). In man, the most characteristic forms of the disease are the visceral form (or Kala azar) and the ulcerous cutaneous form (or "oriental sore").

The reservoir host of the parasite must be an animal that enables the protozoan to survive and be transmitted by the vector. Dogs are one of the main reservoirs of this disease, in particular in the Mediterranean area where it is estimated that, depending upon the area of incidence, between 10% and 30% of all dogs are infected.

The incubation period in dogs is very long; the first symptoms do not appear before 8 to 15 months. In addition, the symptoms are not very distinctive and can lead to confusion with other diseases. Treatment at such an advanced stage of the illness is not very effective and the prognosis is very reserved. Considering that dogs are popular animals and that combatting this disease in dogs will have a marked socio-economic and health impact, the Instituto Llorente S.A. in Spain tackled the problem as the main participant in the EUREKA project EU 177 entitled "Rapid diagnosis of, and vaccination against canine leishmaniosis". It is being conducted with BIOEID Laboratories of Portugal as partner, and benefits from the invaluable collaboration of other national and international public sector bodies.

The purpose is to provide veterinary surgeons with new means of combatting this disease, by first producing an early diagnosis system which can easily be used in daily practice and secondly a canine vaccine to protect the animals.

Early diagnosis enabling the animals to be treated even before the appearance of symptoms, together with a vaccine would make it possible to break one of the main transmission links of this contagious zoonosis which is becoming increasingly widespread among both humans and animals. The first aim of the project has recently been achieved and a commercial test enabling rapid and early diagnosis of canine leishmaniosis has been produced. This was presented and marketed in Spain and Portugal in the course of this year. Discussions are currently under way to launch the test in other countries.

As far as the vaccine against canine leishmaniosis is concerned, owing to the nature of the disease - and its long incubation period in particular - the project has been prolonged by another three year period in order to assess and weigh the results of the research.

BETTER SOUND QUALITY IN BROADCASTING

Through the successful introduction of Compact Disk (CD) technique and the expected spreading of Digital Audio tape recorders (DAT), the listener has experienced a qualitative improvement which can not be matched by present day (FM) Sound Broadcasting.

The EUREKA project EU 147, DAB (Digital Audio Broadcasting), is aiming at a basic improvement of the receiver quality in all situations, in order to reinstall the broadcasting stations again at the top of the sound quality scale. Also, more efficient use of the radio spectrum and lower transmission power are important goals of the project. Moreover, a new system should give a competitive edge to the European consumer electronics industry.

The partners are working on a standardisation proposal for a new broadcasting system that will hopefully get worldwide recognition and utilisation. The complexity of this task is only manageable within a cooperative project of European dimensions.
The participating partners come from Germany, France, The Netherlands and the UK.

The sound quality of received broadcastings must be of CD quality whilst occupying a minimum of radio spectrum for transmission. Undisturbed reception should be possible in fast moving vehicles. Furthermore, a sufficient capacity must be available for additional data transmission. Recording of the datareduced sound programmes on digital recording media should also be possible.
With the resources that digital sound coding and transmission as well as highly integrated circuit technologies make available, these demands can definitely be met.

Basically, the change to digital signal processing and transmission implies a major increase of bandwidth along with a greater need of broadcasting-spectrum. Therefore it is necessary to utilise the most effective methods of data-reduction for digital sound signals. This is achieved by applying the latest results of research in human sound perception, an area called psycho acoustics. The new broadcasting system must suppress distortion and disturbances, introduced by the radio channel, through signal treatment and error protection coding. Only high complex ICs will be able to provide the necessary signal processing power while maintaining the size of today's car radio receivers, their low power consumption and reasonable price.

About one year before finalisation of the project, important goals have been reached and successful tests were made in wide ranging experimental set-ups.

Within the area of sound coding the DAB's partners have participated intensively in the standardisation work within ISO/IEC and a rigorous quality test competition has left all other actors clearly behind them.
For the broadcasting signal transmission a method has been developed which, in an outstanding way, suppresses the inevitable interference of the mobile radio channel. A well laid out digital system is generally safer against disturbances than any analog system. The RF power of future DAB stations will consequently be lower than the present FM-stations by 1 to 2 in order of magnitude.

In its first implementation the complete system has already been subject to extensive test-runs in various places. A permanent installation of this experimental system has been running for more than one year in CCETT in Rennes.

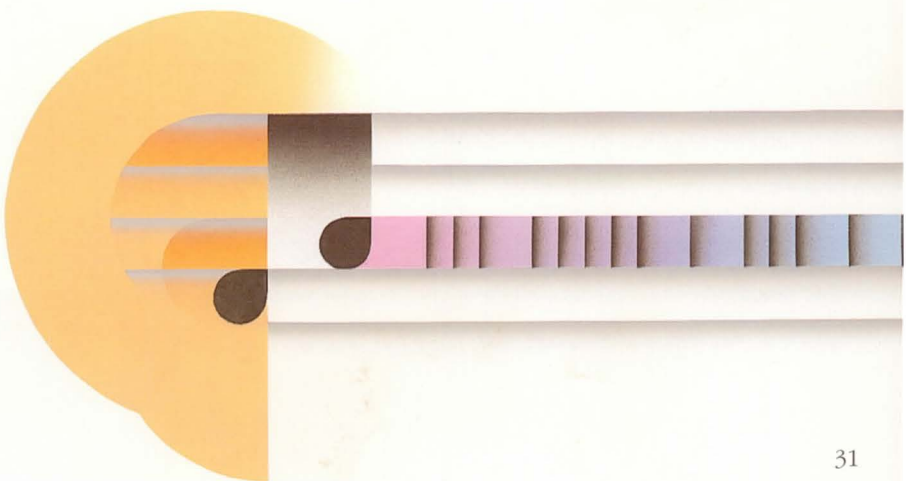
A second equipment generation is being built up with the DAB receiver now having the size of a normal home CD player. Through the continuing development of DAB VLSI circuits, even the small size of a car-radio housing will be large enough to contain a DAB receiver and a recorder.

The results achieved to date show clearly that a digital sound broadcasting systemwith overall attractive properties can be realised from a technical as well as from an economic point of view. Broadcasting organisations of many countries have recognised this and have started considering the implications of introducing within this decade a digital terrestrial sound broadcasting service. The acceptance of the standardisation proposal of EU 147 DAB within the groups of the International Telecommunication Union (ITU, CCIR) will be an important milestone.

EU 147

Communications

Title: Digital Audio Broadcasting System
Participants: France - Centre Commun d'Etudes de Tēlédiffusion & Tēlécommunications (CCETT) / La Radiotechnique-Portenseigne Germany - A.E.G. Olympia Office GmbH / Blaupunkt-Werke GmbH / DLR - Deutsche Forschungsanstalt für Luft- und Raumfahrt / Deutsche Thomson Brandt GmbH / HT - Intermetall / Institut für Rundfunk technik (IRT) / Forschungsinstitut der DBP Telekom Beim Ftz / Fraunhofer Gesellschaft IIS / Grundig A.G. / Telefunken Sendertechnik GmbH / Universität Hannover Netherlands - Philips International B.V. United Kingdom - B.B.C. Research Laboratories
Main Contact: DLR - Deutsche Forschungsanstalt für Luft- und Raumfahrt Dr. E. Meier-Engelen Tel: +49 2203 601 3331 Fax: +49 2203 601 2866
Estimated Cost: 40 MECU
Time Scale: 48 months



EXPERT SYSTEM DEALING WITH SECURITY CONTROL

EU 19

Information Technology

Title:	*Expert System for dealing with Security Control*
Participants:	*CEC - Joint Research Centre (JRC) France - Aerospatiale / CAP SESA Innovation / Aerospatiale Protection Systemes (APSYS) Norway - Det Norske Veritas / Computas Expert Systems*
Main Contact:	*Aerospatiale Mr. Jean-Louis Simonotti Tel: +33 1 34 92 12 34 Fax: +33 1 34 92 13 51*
Estimated Cost:	*23.7 MECU*
Time Scale:	*96 months*

This project, in which France, Norway, the Ispra Joint Research Centre of the CEC, and very soon other partners, are associated, consists of managing the threat and prevention of catastrophes in real-time. Its aim is to assist the operators controlling complex industrial processes in making the right decisions at the right time when faced with situations which may have dangerous consequences.

FORMENTOR strives to propose:

- a procedure for assessing these situations - tools to deal with security control in real-time.

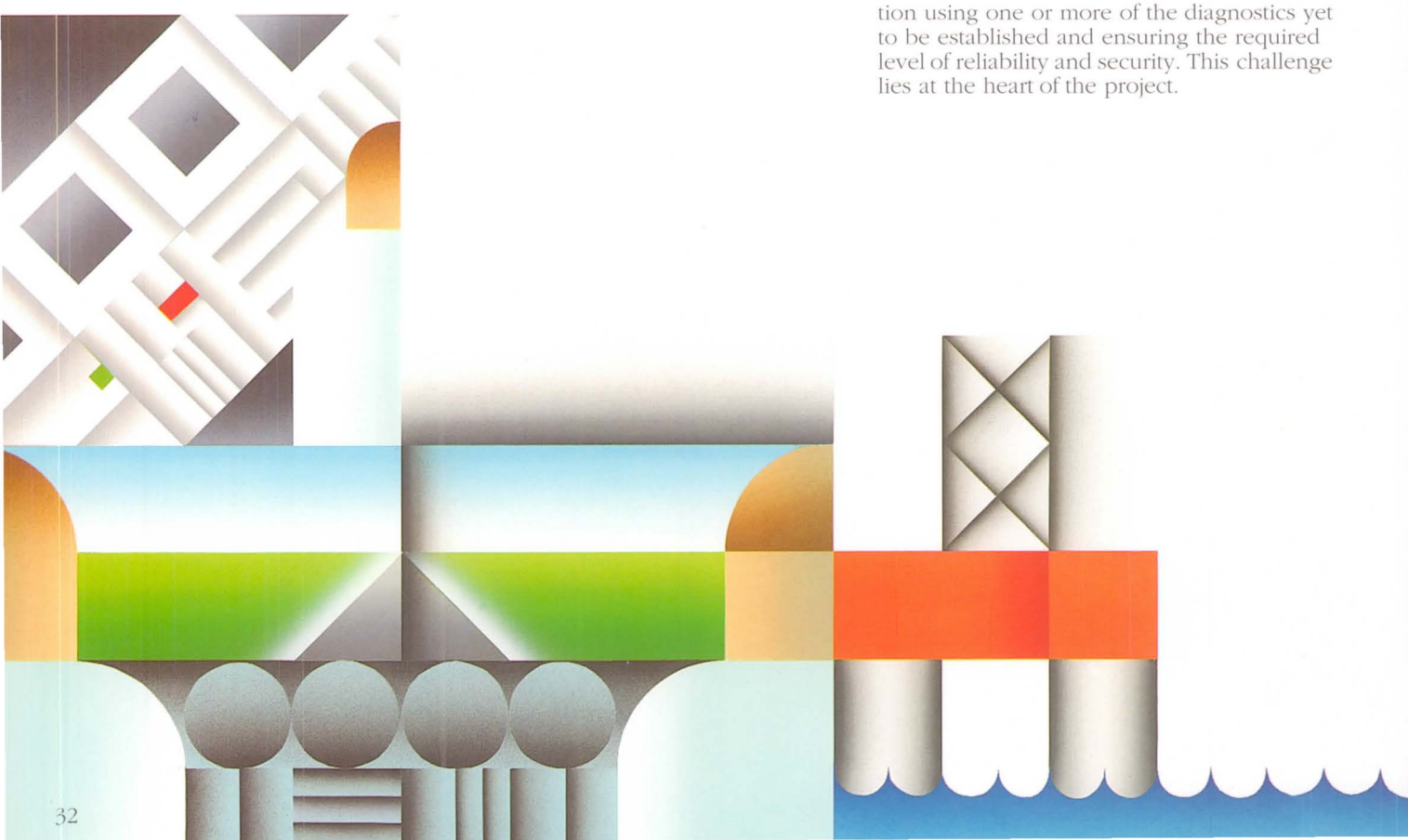
Having completed its preliminary definition phase, FORMENTOR has entered the execution phase which has the objective of developing a daring combination of three leading edge disciplines, namely:

- security analysis
- artificial intelligence
- real-time processing.

This combination should permit the launch of a commercial tool, which is both reliable and user-friendly, to assist human operators in controlling very high risk complex systems, including analysing and indicating possible human errors and their consequences. FORMENTOR lies at the crossroads of these three disciplines, hence its interest.

Having demonstrated its feasibility in the first phase, the current implementation phase enables validation and optimisation procedures to be carried out. Such methodology is already being tested in pilot applications, initially in aeronautics, involving assisted in-flight piloting in the Airbus 320 at the runway approach stage. Subsequently, the project will move to other "life-scale" applications such as the technical management of space rocket launching and the control rooms of complex industrial installations in the oil refining industy and in nuclear environments.

FORMENTOR does not consist of a newclass of automation, although it involves a high level dialogue with the operations controller. FORMENTOR envisages the development of "expert systems" capable of coping in real-time with very large numbers of uncorrelated parameters which may vary very quickly and irregularly in time. This ambitious project must signal potential dangers and propose scenarios for the return to a safe state/condition using one or more of the diagnostics yet to be established and ensuring the required level of reliability and security. This challenge lies at the heart of the project.



SOFTWARE USE AND RE-USE

The engineering world recognises software re-useability as a major goal.

For this reason, this project aims to develop a methodology, tools and supportive environment for software development with the accent very much on the practical and efficient aspects of re-useability.

In particular, SOUR intends to provide a supportive re-useability infrastructure, capable of being embedded in a variety of development environments, since most software developers have already invested in an engineering framework and new standards (such as PCTE) are emerging and must be taken into account.

In addition, a flexible approach should be adopted, since a unique environment cannot be adapted to meet all applications.

The cornerstones of SOUR are that:

- The re-useability concept is only possible if correct methodology handling abstraction is used.
- This concept can only be effective in an integrated CASE (computer aided software engineering).
- It can only be implemented if a considerable amount of formal (how) and informal (why) knowledge is recorded during the development cycle.

The basic innovative components for re-useability are the comparator, modifier and an abstract objects' repository.

When developing a new application in a software factory, the new specifications, requirements, etc., must be compared with those existing, so that similarities and/or differences can be detected.

As an example: provide a list of requirements satisfied by an existing piece of software with a list of new requirements and produce a structured report which can measure the reworking required.

In most practical situations, re-use implies modification: existing components must be modified for the new task to be accomplished.

Specific tools should therefore directly assist in developing software where emphasis is placed more on the modification and integration of existing components than on creating the new programmes from scratch. When this is taken into account there is an obvious link between re-use and maintenance and the distinction between the two may sometimes be purely conventional. "Versioning" becomes important, since various versions of the same component may be available and be embedded in different systems.

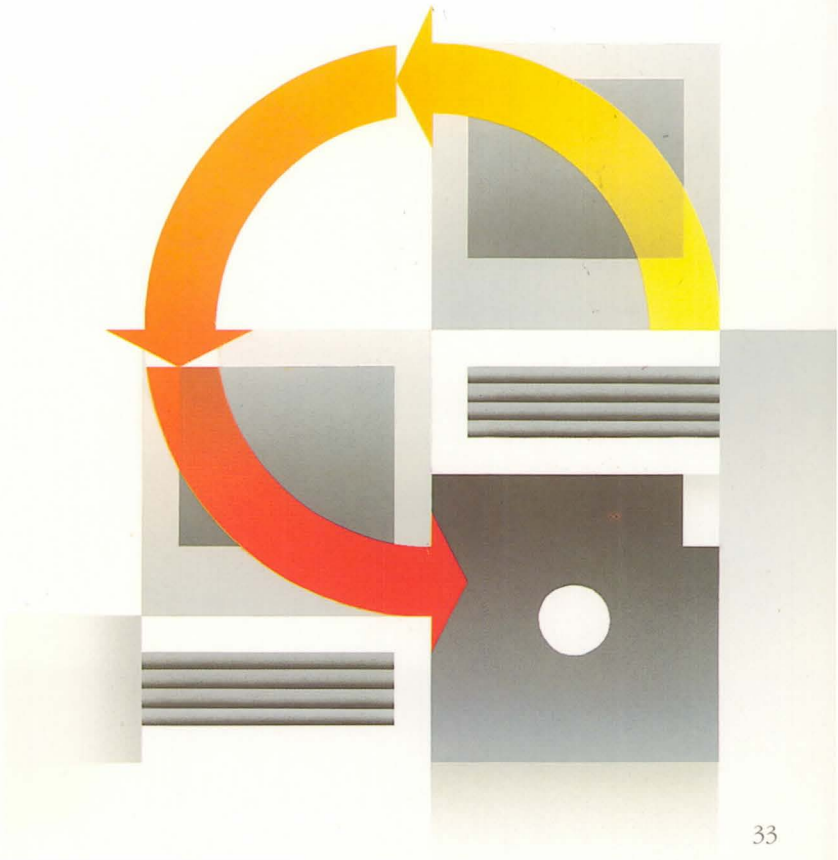
As far as awareness of re-useability is concerned, the knowledge level is crucial, which is why we need an integrated abstract objects' repository which categorises components into logical groups at all description levels and one which is capable of responding to advanced queries.

The project will last for four years and at the end of this time, when the objectives have been fulfilled, the gap between supply and demand in the software market will be reduced.

EU 379

Information Technology

Title:	*Software Use and Re-use*
Participants:	*Italy - O.I.S. Ricerca S.p.A. / Systena S.P.A. / Olivetti Information Services S.P.A. (OIS) Portugal - Inesc Norte*
Main Contact:	*Systena S.P.A. Dr. Francesco Fusco Tel: +39 6 54 20 478 Fax: +39 6 70 08 041*
Estimated Cost:	*13 MECU*
Time Scale:	*48 months*



EUROLASER GIVES INDUSTRY CONTROL OF LASER POWER

EU 180

Lasers

Title: *10 kW CO_2 Laser Modules and Related Systems*

Participants: *Austria - Schweiss-technische Zentralanstalt Wien / Argelas / Technische Universitaet Wien*
Belgium - Radius Engineering C.V.
Italy - Agusta /Ansaldo / Cise / Contek / CRF / EL-EN / ENEA / IIS / INO / Laser Point / Mandelli / Off. Galileo / Prima Industrie / Proel / Quanta System / RTM / Selenia
Spain - Crilaser S.A. / G.H. Industrial

Main Contact: *Cise Tecnologie Innovative S.P.A. Prof. Alberto Sona Tel: +39 2 21 67 23 67 Fax: +39 2 21 67 26 20*

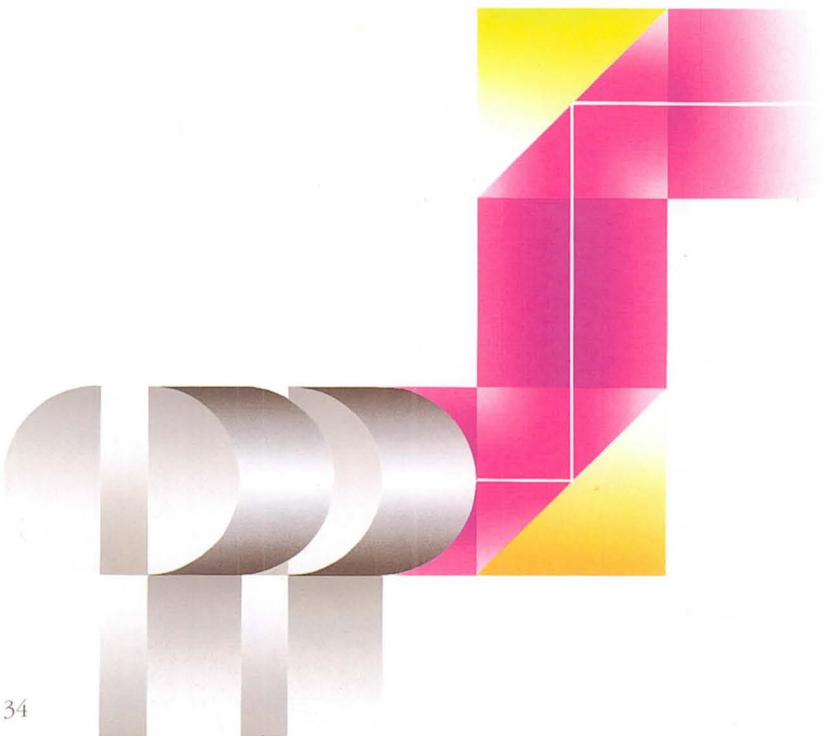
Estimated Cost: *49.94 MECU*

Time Scale: *60 months*

Lasers exploiting CO2 as the active medium have been known for more than twenty years. At present, lasers with outputs of up to approximately 20 kW are commercially available. However, in practice, most industrial lasers do not currently exceed the 5 kW level and there are only a few units with an output power of 10 kW operating in an industrial environment. Applications requiring more power might be possible in the future, provided that units with a greater degree of reliability, improved beam quality and beam control become available.

The definition phase performed within the umbrella project EU 6 has shown that the application of high power lasers in manufacturing is presently limited by the following factors, which are related to laser sources:

- Non-optimised, power dependent and often uncontrolled intensity distribution of the laser beam.
- Non-optimised reliability and high maintenance requirements especially at the higher power levels.
- No fully automated operation and self diagnostics of the source are available in high power units.
- Low efficiency and limited power per unit volume of the laser heads, resulting in impractical sizes.
- High investment and running costs.
- Even at medium power levels compact units are necessary (but not always available) to realise operations combined with robots and flexible manufacturing systems.



The technical innovations which are striven for in project EU 180 are oriented towards the aforementioned deficits and are more significant than any pure achievement of higher power levels. Careful control of the laser power in time and space is the prerequisite for reliable, effective, high quality industrial laser systems. This must be accompanied by a simultaneous reduction in the investment and running costs to create the basis for a cost effective operation.
The R & D programme activities are divided into three areas. The planned developments are to be achieved within five years.

Area 1
Development of 10 kW CO2 laser prototypes:

Modular and compact CO2 laser sources with a nominal power level of 10 kW per module are to be developed using innovative techniques for the excitation of the active medium, for internal gas transport and conditioning, and also for the outcoupling.

The combination of at least three modules is planned. Three development lines will be investigated, namely:

- Fast Axial Flow lasers.
- Transverse Flow lasers.
- Oscillator - Amplifier scheme.

Area 2
Development of high power optical components:

Transmissive and reflective optical components are to be developed for the new laser sources and related systems. Special attention is to be given to beam switching, beam transport and beam shaping systems.
The related mechanical systems such as lens and mirror mounts, angular scanning systems and autofocus systems are to be examined and optical components from transmissive Zn Se optics are to be implemented.
A similar combined effort is planned in the field of reflective and diffractive optics.

Area 3
Materials processing systems integration:

The results obtained in the other areas relate to the design and construction of prototypes serving to define and test the complete systems. These system prototypes will be equipped with one (or several) modules of the most suitable new 10 kW laser. Using the new optical components, subsystems for laser beam switching, transport and shaping have to be developed. These subsystems, the process control sensors and appropriate laser beam monitors will then be integrated into three different workstations for welding, surface treatments and combined robotic applications which will be developed and constructed according to industrial standards.

TAILORMADE POLYMER FIBRES

Today the synthetic fibre industry is much more than just a fibre production. Related sectors such as raw materials - polymers, additives, dyes and lubricants - play an important role in the developments in the textile industry.
The textile production is growing modestly these years, but the industry as such is in a state of continuous change: product design changes, new products and materials, specialisation, customer and market orientation.

This trend requires fibre manufacturers to provide:

- New and more targeted products.
- Products with new combinations of properties.
- Special technical assistance.

This project focuses on 4 different aspects of tailormaking fibres for specific textiles end uses:

- Developments of new grades of polymers for fibre spinning and textile applications.
- Optimisation of polymers and fibres through additional processing to achieve improved customer useability.
- Development of new fibres with properties especially for technical applications.
- Improvement of fibre qualities for existing market segments.

The project's objective is to further develop polyolefine grades for fibres and has brought two parties together:

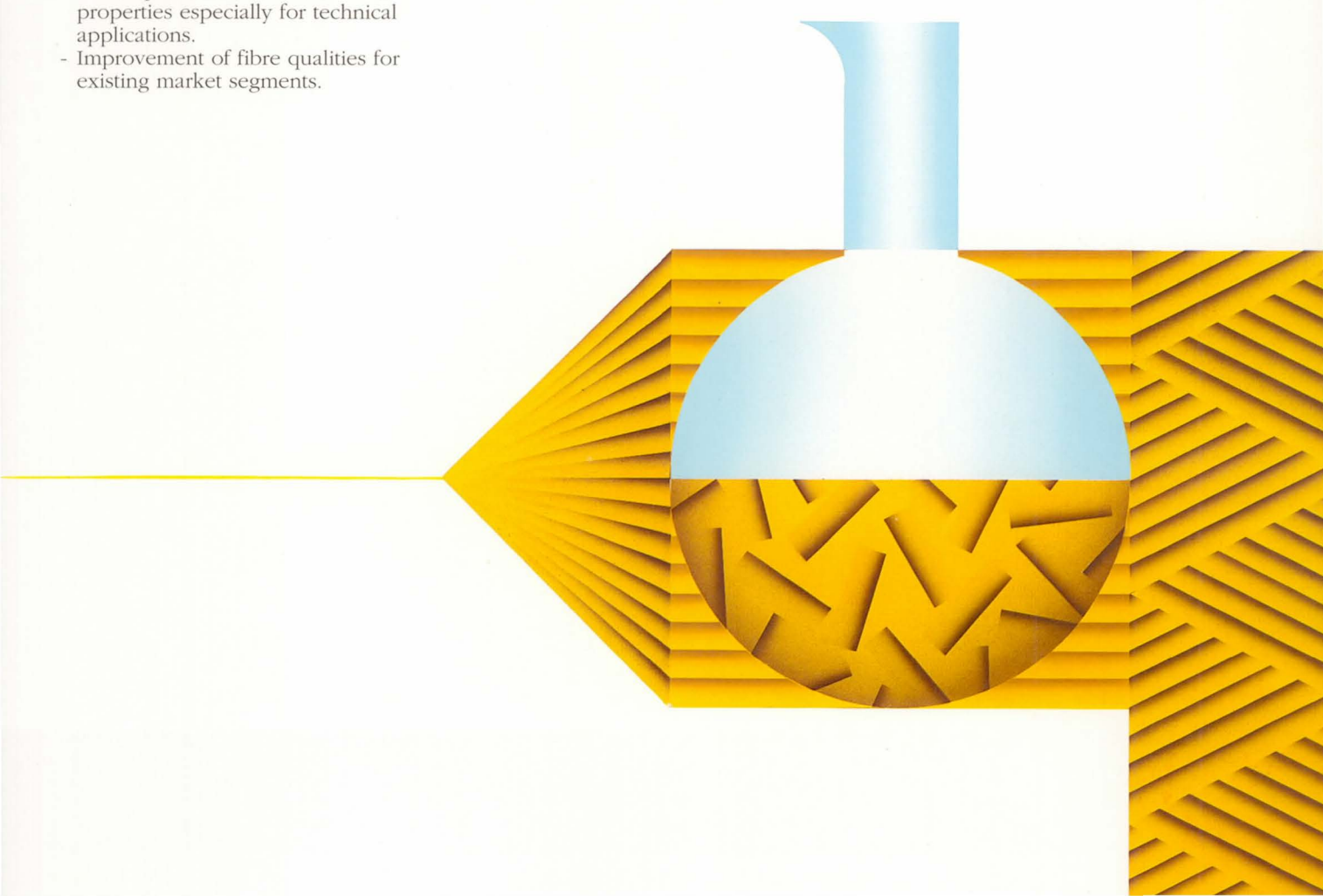
- The Finnish company, Neste OY, a major European polyethylene and polypropylene producer.
- The Danish company, Danaklon A/S, a leading supplier of polyolefine fibres to the global market.

Fibres manufactured from specialitypolyole fine grades will focus on market requirements within the nonwoven industry as well as the industry for technical textiles.
For the nonwoven industry it is the aim to develop fibres with new properties for the hygiene and medical end users and thereby substitute traditional woven fabrics.
For technical textiles the project seeks to introduce an ideal fibre for industrial materials.
The project is scheduled to finish by mid 1992.

EU 183

New Materials

Title:	*New Polymer Fibres*
Participants:	*Denmark - Danaklon A/S Finland - Neste OY*
Main Contact:	*Danaklon A/S Mr. Anders Staf Hansen Tel: +45 75 22 22 55 Fax: +45 75 22 50 59*
Estimated Cost:	*5 MECU*
Time Scale:	*55 months*



THE ADVANCED SANDWICH PANEL MAKES BETTER AIRCRAFTS

EU 272

New Materials

Title:	*Advanced Sandwich Panel*
Participants:	*Netherlands - Adprotech B.V. Switzerland - Schweizerische Gesellschaft für Tüllindustrie A.G.*
Main Contact:	*Adprotech B.V Mr. Henk G. Hilders Tel: +31 2503 405 90 Fax: +31 2503 368 03*
Estimated Cost:	*1,3 MECU*
Time Scale:	*36 months*

The EUREKA project, ASP, started with a feasibility study of one year, in order to evaluate if recently achieved progress in technology could lead to significant improvements of the well-known general sandwichconcept. The primary application is as panels in aircraft, notably floor-panels. Participants from the Netherlands and Switzerland are involved in this programme. An interesting aspect is the observation that this project was completely initiated and elaborated by four small companies.

The starting-point was to study the entire complex of properties of the current sandwich panel-generation, mainly used daily in the Aircraft Industry, in a wide range of applications.

Weight, strength, firmness, fire safety, smoke toxicity, life time and cost price are the main elements which have been scrutinised.

Optimal use of the specific material properties of the individual components, such as fibres, resin systems and core materials has led to the successful development of an innovative sandwich panel concept. All critical properties could clearly be improved, with a negligible increase in the cost price of the material.

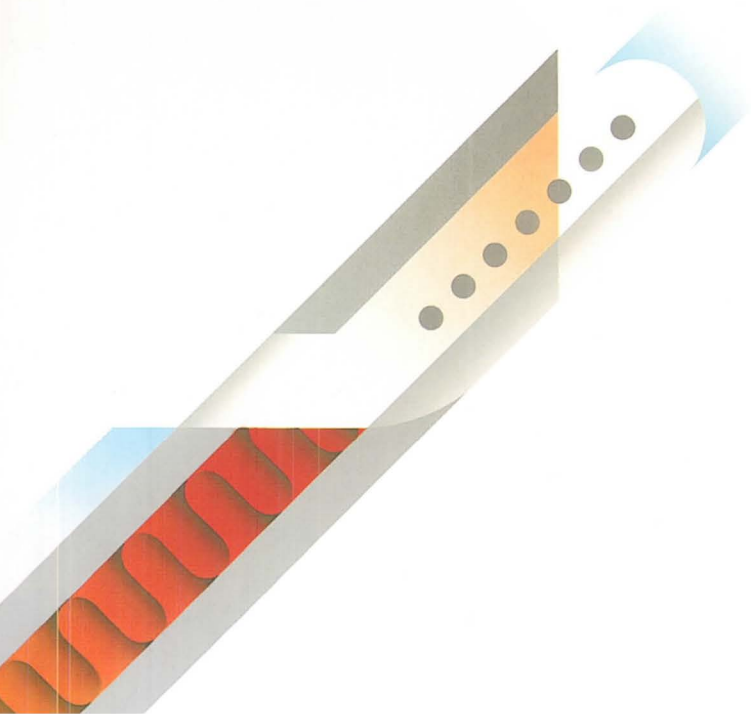
Much attention has also been paid to a second aim, which is logically connected to the product concept developed, namely the economics of advanced manufacturing technology to be considered for this product. The result of the research is the design of a complete, computer-controlled production line, dedicated to the manufacturing of individual custom-made panels in a wide variety of dimensions and specifications. Due to the high rate of production and the increased quality stability, major advantages can be expected, such as a substantial decrease in the cost price per unit and a high quality standard.

The realisation of this unique production line concept, together with the innovative product composition, could, for example, lead to a market position in the replacement market, which is currently not served by specialised manufacturers. Airlines currently exchange their floor panels, by machining standard panels into custom-made panels, more or less as hand labour, which is understandably quite expensive.

The right choice of automation and cooperation provides the opportunity for custom-made panel production following the "just-in-time" principle, with a consistent saving on costs.

The project is currently entering a pilot-phase stage in order to evaluate the production phase. Particular attention will be paid to aspects such as selection and development of special equipment, automation software, the order of processing and unforeseeable "children's diseases". If the outcome of the pilot phase is positive, the intention will be to realise the production line in close cooperation with one or two partners.

ASP, the EUREKA Advanced Sandwich Panel project could supply a substantial contribution to quality improvement and cost savings in the production and maintenance of aircraft. Spin-offs into other segments of transportation could also be possible in the future.



EASY SWITCHING IN ASSEMBLY AUTOMATION

Traditional assembly lines are manually intensive and often represent the greatest cost in the production of finished goods.

The aim of this two year FAMOS project is to develop a truly flexible automated system capable of addressing the problems associated with manual assembly. InFACT is a fully integrated machine which is flexible enough to be able to handle a wide range of small to medium sized electro-mechanical product assemblies.

The machine is based on the identification of the operations common to assembly processes. The key elements of the machine have been designed to facilitate these common "generic" processes, and are therefore suitable for use across a range of requirements, thus minimising product specific cost.

The InFACT machine incorporates material handling, parts presentation and parts manipulation systems. Components, subassem blies, tools and fixtures are moved around the machine on pallets via a shuttle system. The use of pallets allows a multi-assembly approach to be adopted. This means that each step of the assembly process is carried out on a number of products before the next step is started, thereby reducing the time spent on toolchanging. The machine has two gantry manipulators - the main manipulator is for light pick and place type operations and the power operations manipulator deals with tasks requiring greater force (such as press fitting and the insertion of screws).

The InFACT machine can feed, transport, assemble and fasten parts simultaneously for optimum production efficiency. Finished products or subassemblies are removed from the working zone of the machine by the shuttle.

The control of the machine consists of a number of action modules (subsystems capable of implementing specific machine functions) which receive commands from the machine supervisor. This in turn is instructed through user input and is sent messages from sensor integration and the machine safety systems. The human computer interface for the machine has been designed to be simple and intuitive in use, employing a pull down menu format.

The functionality of the control system is facilitated through transputer-based parallel computing technology. The transputer differs from conventional microprocessors through its capacity for easy communication with other chips of the same kind. When linked together, transputers work in parallel to provide greatly enhanced processing capacity.

The project has ten collaborators: Alcatel-ELIN GmbH (Austria); Apsis S.A. (France); Bristol Polytechnic, Britax Limited, Mari Limited, Parallel Research Limited, Salford University, University College of Wales Aberystwyth, University of Hull (United Kingdom), and HS Electtronica Progetti (Italy).

The InFACT approach to assembly is destined to provide a real step change in functionality for the user by offering a number of key benefits:

- Consistent assembly process.
- Labour savings.
- Less rework.
- Increased throughput.
- Flexible job scheduling.
- Fast product changeover time.
- Reduced tooling costs.
- Small batches with economic viability.

The project started in May 1989; the integration of the various machine parts started eighteen months later and it is expected that the InFACT assembly machine will be operational by May 1991.

EU 321

Robotics and Production Automation

Title:	*Integrated Flexible Assembly Cell Technology*
Participants:	*Austria - Alcatel-ELIN GmbH France - Apsis S.A. Italy - HS Elettronica Progetti United Kingdom - Bristol Polytechnic / Britax Limited / Mari Limited / Parallel Research Limited / Salford University / University College of Wales Aberystwyth / University of Hull*
Main Contact:	*Parallel Research Limited Dr. Jonathan Mortimer Tel: +44 272 656 261 Ext 2776 Fax: +44 272 58 37 58*
Estimated Cost:	*8.4 MECU*
Time Scale:	*30 months*

CAPS - THE PRECISION PILL PRODUCER

EU 164

Robotics and Production Automation

Title:	*Micro encapsulation*
Participants:	*Finland - PuuMan Oy United Kingdom - Manesty Machines Limited*
Main Contact:	*PuuMan Oy Mr. Hyvarinen Tel: +358 71 22 16 11 Fax: +358 71 22 17 20*
Estimated Cost:	*1.5 MECU*
Time Scale:	*40 months*

In order to achieve the best medical results, tablets have to be made to very accurate standards. Not only must they weigh exactly the same, but they must also dissolve at a predictable rate, releasing their contents in a controlled way into the body. Using a combination of specially-written software and precision engineering, EUREKA project EU 164 has developed a way of controlling very precisely the process of pressing tablets. Set up in 1986, originally by PuuMan OY (Finland) and Manesty Machines LTD (UK), the project developed along two parallel paths: systems for tablet press instruments and computer control and process study of microencapsulation.

The instrumentation is designed to measure the compaction and ejection forces and the work carried out during the compaction phase of tablets. The measuring system consists of force and position transducers fitted to the upper and lower punch of the press. The outputs from these transducers are fed via amplifiers to a computer interface unit. The output from the interface can then be taken to a PC computer where the comprehensive software enables calculations to be made and curves and results to be shown on the screen. The system can be used as a research tool and it will prove invaluable for investigating the behaviour of formulations. The instrumentation could also be used for quality control. Each batch of granulation can be checked before it is compressed.

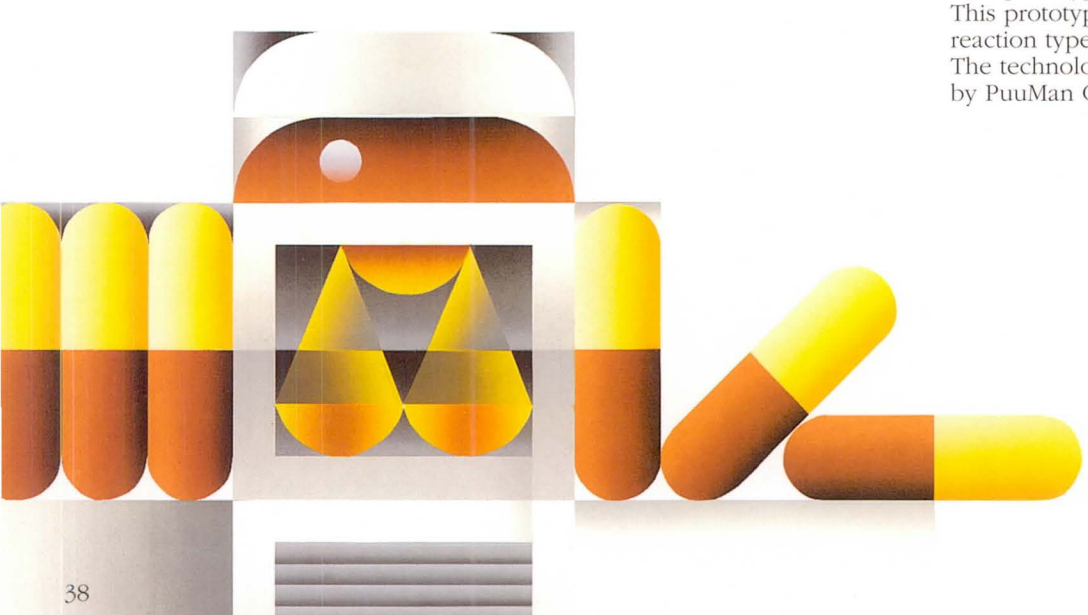
This system may also be connected to rotary tablet presses used in production. This allows compression characteristic data to be gathered and used in troubleshooting live production situations. This early identification of possible problem sources can greatly reduce lost production time.

This product, known as FDW, is now commercially available and about 30 systems have been sold worldwide to universities and pharmaceutical companies. Other products related to the instrumentation are under development. The first of these add-on products, the PC-connected annular share cell, will be ready by the end of 1990. The software package for the instrumentation will be modernised during 1991.

A process study of microencapsulation was the other aim of this project. Powders, liquids or gases can be the subject of microencapsulation. The process is one of coacervation. Chemical coatings depend very much on the release profiles required by the user.

The main object was to simulate the right conditions depending on the chemical coating and nature of the drug. This would bring a greater amount of consistency into thedrug coating process. The equipment was intended to produce small batches of microcapsules under complete computer control.

The principal advantage of the equipment will be to considerably reduce the time taken to develop the optimum manufacturing conditions for a microencapsulated product. The current method of obtaining the best manufacturing conditions for optimum yield of microcapsules is a long series of laboratory bench tests carried out manually.
One prototype has been built and tested. This prototype is limited so that only one reaction type can be used.
The technology is still under development by PuuMan OY, with promising results.



FAMOS BRICK TAKES THE HARD WORK AWAY FROM THE BRICKLAYER

The objective of the EUREKA project EU 377 is the development of highly flexible automated and integrated bricklaying system initially destined to reline converter vessels in steel mills. In 1989 a partnership was negotiated between PAUL WURTH S.A. (Luxembourg), acting as project leader and responsible for the electrical and machinery side of things, ARBED (Luxembourg), end user and in charge of the development of a sensor controlled self-adaptive bricklaying scheme based on a mechatronic gripper, HYDRAUDYNE (Boxtel, Holland) developing, in collaboration with TECHNISCHE UNIVERSITEIT DELFT (Delft, Netherlands) the specialised robot and its control, SCORIL (Metz, France) supported by INRIA Project SAGEP (Metz, France) taking care of the behaviour modelling of the machine in its environment as well as of the development of automation software.

Refractory linings of converters are submitted to the wearing action of molten steel and must therefore be replaced periodically, the lifetime being as low as 1-2 weeks depending on the chemical and physical properties of the refractory bricks, the quality of brick laying and the operating parameters of the converter.

Currently, the bricklaying is exclusively a manual operation. Although several mechanical devices have been developed for auxiliary brick handling, this manual operation remains extremely unhealthy and difficult and needs highly skilled personnel working in shifts.

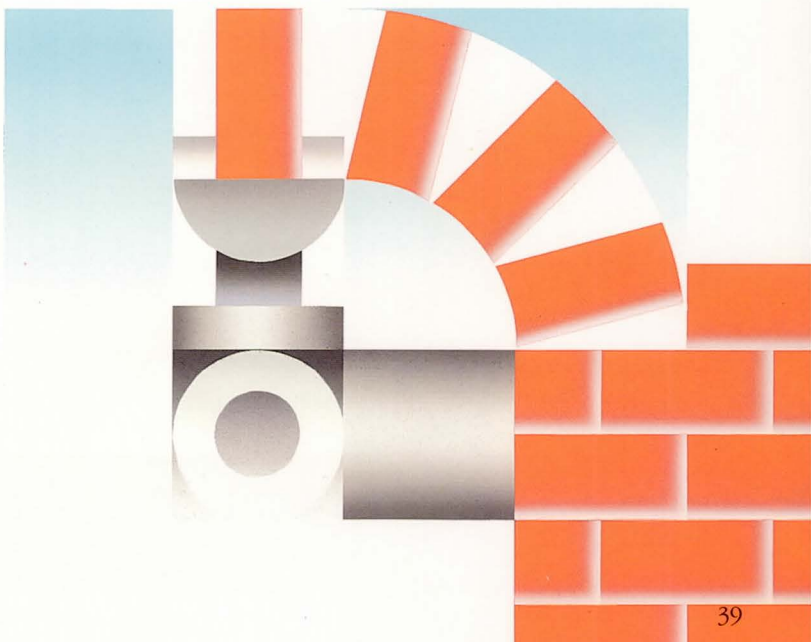
The objective of the project, as mentioned above, consists of developing the automation of each step of the operation including the depalletising of bricks, transporting bricks onto a platform in the converter, selecting between various shapes of bricks and laying each brick in an optimum way and in a minimum period of time.

Local deformation of the converter shell, deficiencies of bricks, changing geometries, etc. have to be automatically detected and taken into account by the robot. The greatest challenge of the whole project is the development of a solution to the problem of the robot operating on a rotation and lifting platform, installed on top of a flexible telescope which is fixed on a road transportable trailer. The working level of the robot varies roughly between 4 and 14 m above floor level.

EU 377

Robotics and Production Automation

Title:	*Highly Flexible Automated and Integrated Brick laying System*
Participants:	*France - Scoril-Conseil en Organisation et Informatique S.A.R.L. / Luxembourg - Paul Wurth S.A. / Arbed S.A. Netherlands / Hydraudyne*
Main Contact:	*Paul Wurth S.A. Mr. Andre Kremer Tel: +352 49 927 382 Fax: +352 49 31 50*
Estimated Cost:	*3.7 MECU*
Time Scale:	*24 months*



TELEATLAS - EUROPE ON VIDEOS AND DIGITAL MAPS

EU 145

Transport

Title:	*Electronic Publishing of Cartographic and Geographic Database*
Participants:	*Belgium - I & M Netherlands - Koninklijke Nederlandse Toeristenbond (A.N.W.B) / Tele Atlas International B.V.*
Main Contact:	*Tele Atlas International B.V. Ir. J. B. Van Reij Tel: +31 73 12 50 00 Fax: +31 73 14 14 05*
Estimated Cost:	*9.8 MECU*
Time Scale:	*36 months*

This project started some four years ago with the main objective to develop in Europe geographic databases with digitalised line segments to be linked with several geographic, topographic, traffic related and economic databases.

TELE ATLAS started to manually digitise the road network of the Netherlands. Existing quality maps have been updated and the centre lines of roads have been indicated and digitised using CAD (Computer Aided Design) techniques. As well as the road network, the railroad and waterway networks have been digitised. Administrative data such as street names, postal codes, house number ranges, road classification and traffic data (one way restrictions, no right turn, etc. etc.) have been linked to the geometric data.

The addresses are the linking mechanism to third party data, making it possible to realise thematic maps dedicated to these addressed third party data!

The products which are now available in the Netherlands are:

- NLNET10, the geographic database created as described above.
- ENET1000, a geographic database of Europe up to the border of the Soviet Union. This database has not the accuracy and contents of the NLNET10 database but it is very suitable for route planning, logistics and cartography.
- OPTIBASE, available on video tape for some 20% of the Netherlands. The recording has been made by the TELESURVEYOR. The TELESURVEYOR is a videocar with four CCD cameras installed on top of the car (two forward facing and two sideward facing cameras). The video images are linked to the geometry of NLNET10. Every user of the OPTIBASE can, using the OPTIVIEW as a reviewset, make a selection of the data from tape and create his personal spatial oriented database: his own Geographic Information System (GIS).

Partners have been sought for similar developments in other countries.

In 1989 TELE ATLAS BELGIUM was founded. TELE ATLAS BELGIUM has completed BLNET50. The area covered Belgium and Luxembourg. BLNET10, with the same specifications as NLNET10 is under construction and is estimated to be available in the spring of next year, although big cities such as Brussels, Antwerp and Gent are already available.

The information business units TELE ATLAS NEDERLAND en TELE ATLAS BELGIUM are responsible for the databases, mentioned above. TELE ATLAS has created application business units as outlets for the different market segments, discovering that the potential users of geographic information are very different in respect of applications, scientific background, culture and adoption in practice of the unlimited possibilities of spatial oriented information.

The market segments which TELE ATLAS concentrates on are:

- Transport and traffic.
  Applications such as route planning, car orientation, car navigation, fleet monitoring and fleet management are impossible with out a set of traffic-oriented data linked to the geometry of the road network.
- Authorities and public utilities.
  Application of GIS in the fields of city planning, environmental planning, traffic modelling, land use planning and facilities management.
- Cartography, geomarketing, education.
  The availability of TELE ATLAS data, the decreasing prices of hardware/software and the increasing power of these tools are promising factors for the volume of business in these segments.

TELE ATLAS INTERNATIONAL licences the know-how of TELE ATLAS. This know-how (software, manuals, training, marketing, organising etc) has proven to be portable. As soon as possible TELE ATLAS INTERNATIONAL will start up activities in other European countries. The need for geographic information (GIS) is growing very fast especially as 1992 will change many strategies in relation to transport traffic, spatial planning and management, marketing etc.

QUEST FOR ENVIRONMENTALLY FRIENDLY TANNING

Titanium which has already largely replaced poisonous lead in paint has proven to be potentially the material to take over from chrome in the tanning industry.

Titanium is a major component of today's aircraft frames thanks to its lightness and strength. For the vast majority of paints and surface coverings, titanium dioxide forms a stable base medium. It has thus in two major industrial sectors replaced other more familiar metals such as iron and lead. But as we become ever more conscious of the harmful effects of heavy-metal waste chromium, too, looks to be on the way out in a third sector of industry - leather tanning.

In 1986, this project, conceived by the Spanish group Hispano Quimica S.A. (HQ) and aimed at finding a less environmentally damaging way of tanning leather without using chrome salts, obtained EUREKA status. Substituting a different metal will also have a political consequence - independence from the chrome-producing nations.

The HQ Group designs, produces and markets chemical auxiliaries mainly for the steel, tanning, papermaking and textile industries. Like HQ, all international manufacturers of the chemicals used in tanning have been trying to develop processes which use less chrome and reduce waste.

The project, however, has struck out on a totally different path. The Barcelona-based partner decided instead to investigate the seventh most abundant element found in the earth's crust, titanium. It causes no toxicity problems when used in tanning and its waste is harmless.

Research began with titanium salts to find out the extent of its tanning powers.
The results were very interesting. It was discovered that in two of the stages of the tanning process, neutralisation and basification, titanium salts behaved quite differently to the chrome salts traditionally employed.

In collaboration with Greece's largest tanners, Hellenic Tanneries S.A., Hispano-Quimica S.A. has started developing a process which modifies the skin collagen to allow it to form a stable complex with a titanium salt, which can then be fixed.
The tanned skin can be finished according to the fashion requirements of the final article.

The project's 'godfather', Doctor Roberto Celades, says of the three-year project, "thanks to EUREKA, our 'Ledertec' process is opening the door to a more ecologically-sound and certain future for generations to come".

Bulk trials are now being conducted in tanneries to deepen the company's understanding of the way the titanium process works. Many more ideas on how to apply the formula, according to the skin type and final destination, will be piloted. The process will then be modified to produce hides which meet different clients' specifications.

The buyer of leather goods will also not be forgotten. Dr Celades says the EUREKA research has led us to a basic process, which by means of suitable modifications and the use of different auxiliary chemicals, can produce a very extensive range of leathers, whether from sheepskin, goatskin or cowhide.

But there are other spin-off effects. The new process means that the skin residues generally used to make collagen can be sold to manufacture an astonishingly wide range of things from cosmetics to animal feed and the protein constituents of detergents.

EU 25

Environment

Title:	*Chrome Tanning Salts Substitutes*
Participants:	*Greece - Hellenic Tanneries S.A.* *Spain - Hispano-Quimica S.A.*
Main Contact:	*Hispano-Quimica S.A.* *Dr. Roberto Celades* *Tel: +34 3 332 20 00* *Fax: +34 3 332 89 97*
Estimated Cost:	*2.4 MECU*
Time Scale:	*36 months*

A TOOL FOR QUIETER VEHICLES

EU 27

Environment

Title:	*Experimental Techniques for Dominant Noise Source Identification of Transportation Vehicles*
Participants:	*Belgium - LMS International n.v. / Katholieke Universiteit Leuven (KUL) Germany - Porsche A.G. / Fachhochschule Bielefeld*
Main Contact:	*LMS International n.v. Ir. Dirk Otte Tel: +32 16 22 78 54 Fax: +32 16 23 68 16*
Estimated Cost:	*1.93 MECU*
Time Scale:	*42 months*

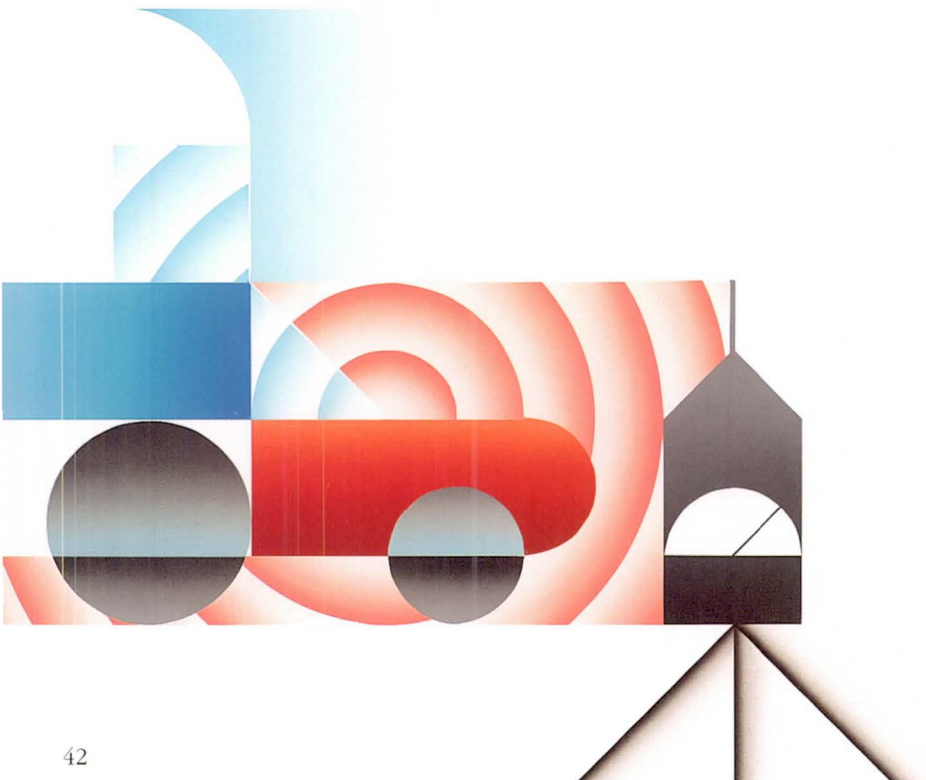
The EUROTRANS project aimed at the development and implementation of novel engineering tools for noise problem identification in transportation vehicles. In view of enhanced passenger comfort and environmental behaviour, these tools had to address both internal and external noise control. The project brought together four partners from two countries: LMS International n.v., the project leader, the Catholic University of Leuven, both from Belgium, and Porsche Entwicklungszentrum and the Fachhochschule Bielefeld from Germany.

Currently used techniques for noise problem identification are very time-consuming and cumbersome since intricate laboratory test setups are required. And, making it more difficult still, these setups insufficiently reflect the real-world conditions. To overcome these problems, methods allowing identification of the noise problem, without affecting the normal function or build-up of the vehicle, had to be developed. And all noise sources had to be analysed at the same time, each accounting for their individual contribution.

By bringing together multivariate statistical analysis methods and recent numericalmethods in a new test and analysis procedure, capable of identifying the noise problem in complex real-world situations, the goal could be achieved.

LMS International and the Leuven University carried out extensive theoretical studies and a series of simulations and controlled laboratory tests. Then the developed test procedures were put to the test and refined by Porsche and the Fachhochschule Bielefeld. Porsche successfully adapted the new tools to optimise their cars' acoustic and dynamic behaviour which was due to road-tyre interaction. In Bielefeld the technique proved successful in locating a number of important noise transmission paths that caused objectionably high noise levels in the cabin of a combine harvester.

The EUROTRANS project started in September 1986 and ended in February 1990. The combined hardware/software system, as it is currently marketed by LMS International n.v., offers an important engineering tool that gives the user a better insight and allows troubleshooting of the complex vibration and acoustic behaviour of transportation vehicles and mechanical structures in general. It is clear that the outcome of the EUROTRANS-SOURCE project will have far-reaching effects on the design of new transportation vehicles.



THE SEARCH FOR BETTER THYRISTORS

This project started in 1987 and ended in 1990 as a EUREKA project. It was devoted to the development and improvement of modern semiconductor power switches such as the GTOTs (Gate Turn-Off Thyristors) and the MCTs (MOS Controlled Thyristors) which are required in the broad field of high-power applications, such as for example, in the power control of motors for traction.

The cooperation between Switzerland and Sweden was set up with the active participation from Switzerland of the former BBC Company (Brown Boveri and Company) together with CSEM (Swiss Centre for Electronics and Microtechnology, Inc.) and from Sweden of the former ASEA Company (ASEA Drives) with the Institute for Microtechnics (IM). As the former BBC and ASEA Companies have now merged to form the actual ABB Company, it was decided that research activities in this field would be concentrated in Switzerland. Swiss federal authorities will further financially support the project through the Commission for the Encouragement of Scientific Research(CERS).

The project is based on theoretical and experimental evaluations of the technical problems related to the increasing demand for thyristors with greater efficiency, lower switching and conduction losses and capable of being easily turned-on or turned-off. To achieve these aims, new designs and technologies as well as the necessary simulation tools have been developed and successfully investigated. The collaboration of industrial partners experienced in high-power electronics with research institutes, familiar both with low-power, MOS technology and the realisation of fine structures, has proven to be an excellent choice.

This has resulted in rapid progress and very promising results at device level showing a competitive edge.

EU 97

Energy Technology

Title:	*Designs and Technologies for High-Power Semiconductor Devices*
Participants:	*Sweden - Asea Drives A.B / IM. Switzerland - BBC / CSEM*
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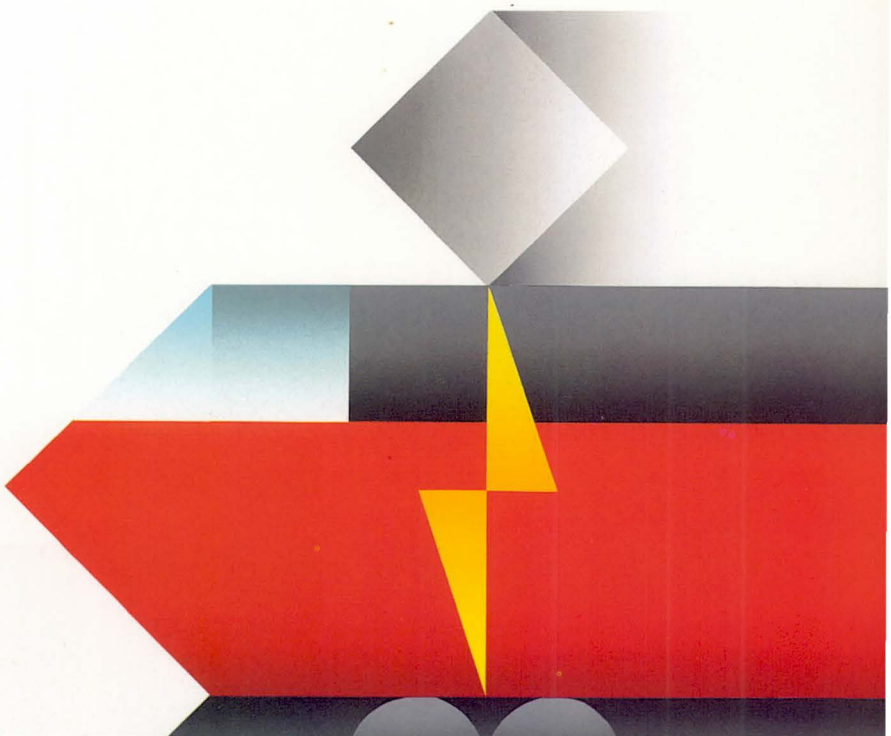
Estimated Cost:	*2.5 MECU*
Time Scale:	*36 months*



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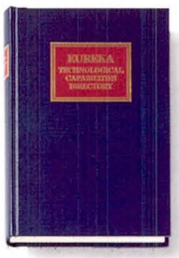

For the interested reader, further material on EUREKA is available upon request from the respective National Project Coordinators or the EUREKA Secretariat (see pages 44-45 for addresses).

Material available in English, French, German, Italian and Spanish includes:

- Annual Progress Report.
- EUREKA News (published quarterly).
- EUREKA Brochure (containing a short general description of the Initiative).
- Vade Mecum (containing:
  - The Medium Term Plan.
  - Declaration of Hanover.
  - Procedures for EUREKA projects.
  - Memorandum of Understanding on the EUREKA Secretariat).

Other publications only available in certain languages:

- EUREKA Technological Capabilities Directory.
- EUREKA Robotics and Production Automation folder.
- EUREKA Environment folder.
- Checklist for the Negotiation and Drafting of an International R & D Cooperation Agreement in the Framework of a EUREKA Project.
- Guidelines for the Protection of Technological Information.
- Guide de la Normalisation pour les Industriels impliqués dans un Project EUREKA.
- Guide to Standardization for Companies involved in EUREKA Projects.

The EUREKA Database

The EUREKA database, which is run by the EUREKA Secretariat, contains a wealth of information on announced or proposed projects. It can divulge the R & D fields covered in EUREKA, technological goals, the implementation schedule of projects, budget, participants' names and contact addresses. It is a contact tool for potential industrial and scientific partners.

The information contained in the EUREKA database can be:

- Supplied on request by National Project Coordinators or by the EUREKA Secretariat in Brussels. (see pages 44-45 for addresses).
- Accessed directly via ECHO (European Commission Host Organisation) host computer in Luxembourg. This can be done through a standard terminal linked to ECHO via the X25 data network (international adress + 270 448 112) or via the international telephone network (+ 325 43 64 28 password: EUREKA).
- Accessed via the TELETEL network in France using a Minitel terminal.
- Accessed via the French Transpac network (Code 3615) or via an international line (+33 36 43 15 15). Select EUROBASE service.

In addition, several brochures and newsletters are published at national level.