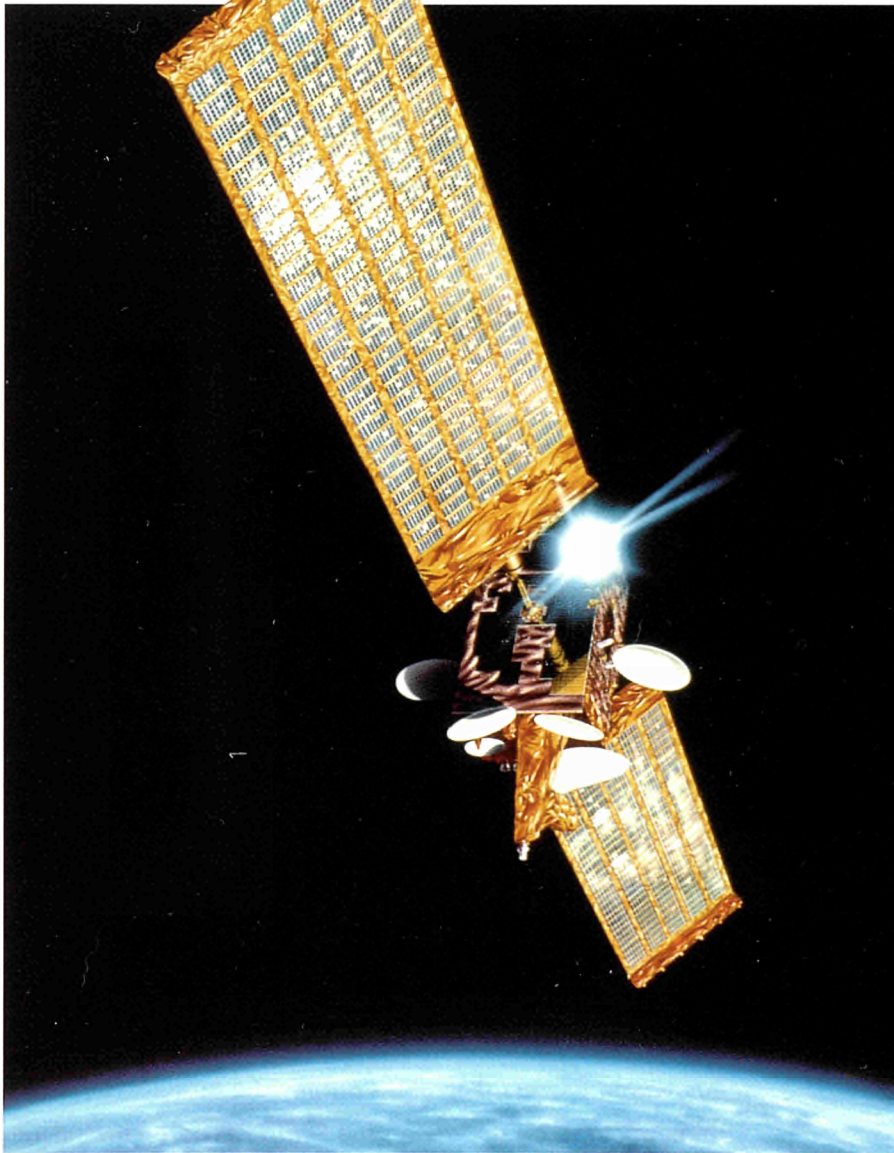


Innovation & Technology Transfer

3/94

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Transferring Space Technologies

+ VALUE NEWS • JRC & REGIONAL DEVELOPMENT •
SPRINT NEWS • TELEMATICS CASE STUDY • AND MORE

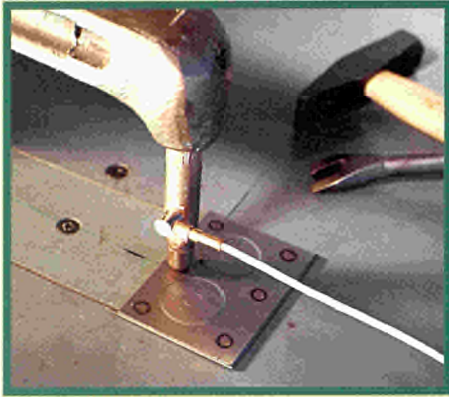


DG XIII-D

Directorate for Dissemination
and Exploitation of RTD Results,
Technology Transfer and Innovation



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INNOVATION & TECHNOLOGY TRANSFER

Newsletter published by the European Commission

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Framework Programme Moves Ahead

With the Fourth Framework Programme for Research and Technological Development adopted, attention now focuses on the individual specific programmes.

THE APPROVAL PROCESS for the specific programmes within the Framework Programme is already well underway. It is therefore time for those interested in applying for research funding under these programmes to think about how to respond to the European Commission's Calls for Proposals, the first of which should be published later this year. As the leading article in Policy News points out (see facing page), CORDIS (the Community R&D Information Service), can help to find the right partners and

prepare projects. And as this edition goes to press CORDIS is launching a new database - RTD-Contacts - with details of national as well as European contact points who can supply information on different aspects of the EU's research activities.

ALSO IN THIS ISSUE, the Dossier article covers the transfer of technologies both from and to the space technology sector. The article looks at EU activities in this field as well as the technology transfer activities of the European Space Agency.

The inclusion of a Dossier article examining an issue in depth is one of several changes introduced to Innovation and Technology Transfer since the beginning of the year. The first two Dossiers of 1994 extensively profiled the VALUE and SPRINT Programmes - the two main programmes specifically concerned with innovation and technology transfer. Each issue also includes VALUE and SPRINT News sections, reporting the latest developments in the two programmes.

ANOTHER THEME IN THIS ISSUE is the regional dimension of the innovation process. There is a profile of a busy VALUE Relay Centre in Germany, and an update on the SPRINT Programme's Regional Innovation and Technology Transfer audits (RITT) and inter-firm technology transfer (C-Network) initiatives.

THE PROGRAMME BRIEFING AND CASE STUDY SECTIONS (again, regular sections of the newsletter since the beginning of 1994) also have a regional aspect. The former profiles a new type of regional technology development project, recently launched by four institutes of the Joint Research Centre, while the Case Study reports on a 'teleworking' project - a technology with much to offer the less-developed regions. ■

Planning Project Proposals

The Specific RTD Programmes of the Fourth Framework Programme are currently under examination, with adoption of the first of them in the coming month. The first Calls for Proposals are expected to follow soon after, so now is the time to start looking for partners.

As noted briefly in the Stop Press of issue 2/94 of *Innovation and Technology Transfer*, the European Parliament and Council agreed on March 21 on the overall budget of the Fourth Framework Programme (1). A month later the European Parliament approved the agreement by an absolute majority, followed by the Council of the EU on April 26.

The overall amount will be 12.3 billion ECUs, with another possible 700 MECU to be made available - again by the 'codecision procedure' - by June 30, 1996, at the latest. This agreement concerns both the Fourth Framework Programme for Research, Technological Development and Demonstration (1994-1998) and the Framework Programme for Research and Training for the European Atomic Energy Community (EAEC), also for 1994-1998. The former has a budget of 11,046 MECU, while the latter has 1,254 MECU. Lastly, the overall budget of the Joint Research Centre (JRC) was set at 900 MECU.

These figures are slightly different from the 'common position' of the Ministers of the Member States, which was analysed in greater depth in issue 1/94. The Specific RTD Programmes (Activity 1) now have an overall budget of 10,686 MECU (up from 10,536 MECU), while 'Cooperation with Third Countries' and 'Diffusion and Valorisation of Results' (Activities 2 and 3, respectively) have also had budget increases.

Each Specific RTD Programme must now be debated and approved, a process which has already begun (2). The first Calls for Proposals for the Fourth Framework Programme are therefore expected in the second half of this year.



Finding Partners on CORDIS

Every project proposal, of course, must have at least two collaborators from different EU Member States. If you are considering applying for research funding under any of these Programmes, and as yet have more ideas than partners, the CORDIS RTD-Partners database is a good place to start.

Many organisations have already found RTD-Partners to be an extremely useful tool for finding partners, particularly for calls for proposals. One of its many advantages is that it covers all sectors of research and includes organisa-

tions from both EU and EFTA countries. Users from all around Europe spend almost 100 hours every month examining the more than 11,500 records on the database. According to surveys, a significant number of organisations already on the database have formed some kind of partnership as a result.

Many of these records have just been or will shortly be updated prior to the Calls for Proposals of the Fourth Framework Programme. There are two ways of using RTD PARTNERS, and both are free and highly recommended: ■ Searching through the database for possible partners with similar

interests and complementary skills; ■ Placing your own entry on the database, outlining your activities, ideas and capabilities.

Details can be found in a brochure on the database and from the contact addresses below, while an entry form for the database was distributed with this magazine. □

(1) For the complete text of the Fourth Framework Programme, see CORDIS (RTD-News, RCN = 2252 or the special CORDIS focus supplement May 20, 1994).

(2) For a detailed breakdown of the European Commission's proposals for the Specific Programmes, published on March 10, see CORDIS focus newsletter, issue 12 (March 25, 1994).

Contact

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Fax: +32 2 280 1749.
 ■ To become a CORDIS User:
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Fax: +352 3498 1248.
Email: X400: C=DE;
ADMD=DBP; PRMD=GEO-
NET; S=CORDIS-
HELPDESK

Task Forces Report to Corfu Summit

The two Task Forces, set up in response to last December's White Paper (1) to speed up the establishment of trans-European networks, will present their reports to the European Council, which meets in Corfu on 24-25 June at the conclusion of the Greek Presidency.

The presentation of the reports to the Council will be the culmination of a busy round of meetings and consultations by the Bangemann and Christophersen Task Forces, which are focusing on telecommunication networks and energy and transport networks, respectively (see issue 2/94).

The 'White Paper' on Growth, Competitiveness and Employment (see issue 2/94) included a list of 26 transport projects considered to be of major importance to Europe. The Christophersen Task Force established selection criteria, which, after four meetings of the group and comments from the Member States, has resulted in an indicative list distinguishing between those projects to be implemented immediately and those to be considered at later stages. The list will be used to organise future work, with the Commission submitting proposals on how to proceed with some types of projects as soon as possible.

The report Mr Christophersen will present to the Council in June will be an interim one, with a final version expected for the next European Council in Essen, (Germany), in December. Mr Christophersen has said that progress has been beyond expectations as far as identifying suitable projects is concerned. However, more work remains to be done in order to resolve the question of how these projects will be financed.

Information Highways: International Consultation

The Bangemann Task Force's second meeting was held in the United States on 5-6 April. The pur-

pose of this trip was to exchange views with the working group set up by President Clinton, which is carrying out similar work.

The visit highlighted the importance of 'global solutions' relating to standards, intellectual property and personal data protection. There was a broad consensus for the alignment of the standards-making process and the need for technical solutions to ensure the interworking of networks. It was felt that intellectual property should be dealt with on a case-by-case basis because of the complexities it presented.

It was also accepted that agreement was needed to govern the sort of data that could be exchanged between the United States and Europe, in order to deal with personal privacy and other issues. Lastly, the need for closer international cooperation to ensure interoperability and system compatibility was stressed.

For this reason both the US and European sides felt that it was

important that Japan be fully involved in any future discussions.

Deregulation in Europe

In Europe, the Bangemann Task Force has emphasised the importance of preventing national laws from giving rise to artificial barriers in the creation of data highways. This brought into focus the question of deregulation, a particularly relevant issue to Europe's international competitiveness as the US is estimated to be around ten years' ahead in this respect.

So far, three sectors have been identified as likely target areas for the information highways. These include the health sector, networks of administrations and traffic management. The advent of smart cards and multimedia have also attracted the specific attention of the Task Force.

The report from the Bangemann Task Force will include the reports, published in May, of the Task Force's two sub-groups, led by Mr. Carlo de Benedetti and Mr.

Etienne Davignon. The Davignon sub-group's remit was to examine the political implications of the information society, while the de Benedetti sub-group dealt mainly with economic issues, such as the creation of new markets, novel uses of technologies and the development of new communications networks.

For example, this sub-group has discussed a personal electronic card, known as a 'euro-chip' or 'smart card', which would provide a diverse range of services such as electronic payment. The development of the audiovisual sector was also assessed. The view emanating from the group is that the thrust of the future information society should be directed towards industrial needs as opposed to household and entertainment activities. □

(1) 'Growth, Competitiveness, Employment - The Challenges and Ways Forward into the 21st Century,' COM (93) 700 of 5-12-1993, published as Supplement 6/93 to the Bulletin of the European Community.

► EUROPEAN ASSEMBLY OF SCIENCES AND TECHNOLOGIES

Assembling Policy Expertise

The European Commission has created the 'European Assembly of Sciences and Technologies', as announced in last December's 'White Paper'. The aim is to ensure that there is a direct and permanent contact between the European Commission and Europe's scientific and industrial community. Comprising some 100 top-level scientists and industrial leaders responsible for high-level research, the Assembly will work

on the model of the US National Research Council and the Japan Research Council.

Most importantly, according to Mr. Ruberti, the Commissioner for Science, Research and Development who is behind the initiative, the Assembly will be both representative (both in terms of scientific disciplines and geography) and independent. The Assembly will be systematically consulted for opinions on the scientific and technol-

ogical contents of the European RTD programmes, criteria and methods of evaluating positions and more. Moreover, it will be allowed to prepare reports and air opinions on different aspects of EC research policy on its own initiative.

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► CONFERENCE

SMEs: A European Focus

Speaking at a conference on SMEs held in Limerick (Ireland) on 24-25 March, Mr Pdraig Flynn, the Member of the Commission responsible for Social Affairs and Employment, highlighted the economic importance of SMEs and drew attention to the reform of the Social Fund which is now underway.

In particular, in his keynote address he pointed to the Social Fund's new Objective 4 element, which, he explained, aims to "co-finance activities which can help workers adapt to industrial change and to changes in production systems."

This new Objective 4 action will be supported by two new Community initiatives, currently awaiting approval: ADAPT and a specific programme for SMEs in the Community's Less Developed Regions. ADAPT, with a budget of 1.4 billion ECUs, seeks to support national programmes through the development of trans-national partnerships. The SME programme will have a budget of 1 billion ECUs.

The two day conference, which was co-sponsored by DG V of the Commission and Shannon Development, the local economic development agency, also provided an opportunity for consul-

tant and experts from a wide variety of backgrounds to address a broad range of topics relevant to SMEs. Each session included Case Studies from organisations as diverse as the Danish Environmental Protection Agency and the Plassey National Technological Park (1), Ireland.

The three sessions considered:

- **Business Environment Factors:** factors influencing SMEs' opportunities such as taxation policies, labour law and social policy, industrial grants, public sector programming at member state and European level;
- **Human Factors:** public and private education and training policy, the impact of changing work patterns and employment structures, training for a multi-skilled flexible workforce;
- **Competition and Finance:** access to finance for start-ups and expansion, bargaining with multinationals and the public sec-



Padraig Flynn addressing the First European Conference on SMEs.

tor, accessing non-financial resources such as marketing and research expertise and new technologies, dealing with documentation.

Selected papers and a short report summarising the conference's findings are now available from Plassey Management and Technology Centre, the University-based company which co-organised the conference.

(1) One of the companies located in Plassey Technological Park is the National Microelectronics Applications Centre, a partner in the MITRE project (see Case Study, pages 21-22).

C o n t a c t
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► INTERNATIONAL

EC/Australia Science Agreement

A science and technology agreement was signed between the EU and Australia last February, opening up new avenues for joint research ventures.

Signed by Sir Leon Brittan (Member of the Commission for External Economic Affairs) and Senator Peter Cook (Australian Minister for Industry, Technology and Regional Development), the EC-Australia Science and Technology Agreement is the first of its kind between the EU and a non-European industrialised country. It is not, however, expected to be the last, particularly now that the Uruguay Round of GATT

has been signed.

Under the agreement, European researchers will be able to participate in Australian research projects, and vice-versa. The agreement's timing will mean that Australian researchers will be able to develop proposals with their European counterparts for the first Calls for Proposals for the Specific RTD Programmes of the upcoming Fourth Framework Programme.

Each project will feature a tech-

nology management plan to ensure that all participants gain an equitable share in the research results. Joint research projects involving both European and Australian researchers are now possible in the following areas:

- Biotechnology;
- Medical and Health Research;
- Marine Science;
- Environmental Sciences;
- Information and Communication Technologies.

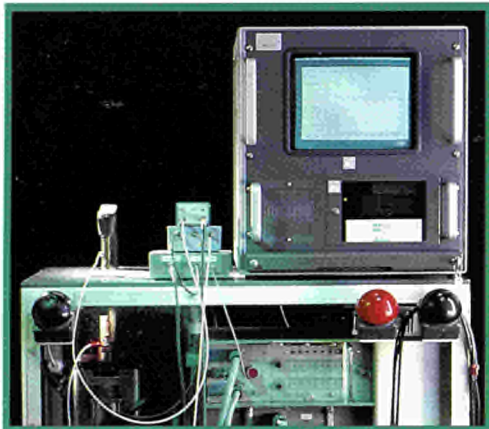
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► CASE STUDY: VALORISATION

Testing Welds Ultrasonically

The inability to measure the strength of a standard spot weld non-destructively costs manufacturing industries a great deal. As a result of a Valorisation project, however, innovative ultrasonic technology, originally developed in a BRITE-EURAM project, will soon reach the market and solve the problem.

The IZFP's prototype: from BRITE-EURAM to Bosch GmbH, via VALUE.



VALUE IN BRIEF

VALUE is the Community Programme for the Diffusion and Utilisation of Scientific and Technological Research Results, and was extensively covered in the February issue (1/94) of Innovation and Technology Transfer.

Contact
 VALUE, European Commission, DG XIII,
 Tel: +352 4301 33610;
 Fax: +352 4301 34129;

To contact any of the VALUE Relay Centres (VRCs), consult the 'Quick Reference Guide', which was also included in issue 1/94. To order this issue, see the subscription form on the back page.

Of the approximately 4,000 spot welds that go into a typical medium-sized car, around half are not actually necessary, according to Dr. Eckhardt Waschkies of the Saarbrücken-based Fraunhofer-Institut für Zerstörungsfreies Prüfverfahren (IZFP).

"The basic problem is that these welds cannot be tested without destroying them," he explains. "Car manufacturers, for example, currently have to carry out regular tests to ensure that their spot-welding machinery is performing properly. Even then, they use twice as many spot welds as they actually need, simply because the uncertainty regarding their strength is so high and the safety issues are so serious. Both the tests and the extra welds cost time and money, which the European car industry could do without."

From Reinforced Concrete ...

Along with the IZFP, Dr. Waschkies has been involved in several BRITE-EURAM projects. One of them (1), launched for four years in

August 1986 and led by the Institut für Massivbau in Darmstadt, aimed to develop and refine a number of techniques for assessing the condition of reinforced concrete structures.

"The trouble with this widely used material, which is composed of a matrix of iron rods within a slab of concrete, is that faults only come to light when the damage is already serious, making repair work very expensive," Dr. Waschkies continues. "The BRITE-EURAM project aimed to develop methods to spot incipient failure earlier, and was divided into five sub-projects. Our Institute was involved in developing damage assessment methods using acoustic emission analysis."

The team proved that they could diagnose cracks within the concrete-metal structure by bathing it in ultrasonic waves and analysing the way the sound energy interacts with it. That project ended in 1990, but in October 1992 the IZFP was granted a VALUE project to develop a laboratory prototype of the technology for analysing spot welds.

"This was a classic 'spin-off' from the original work," Dr. Waschkies says. "We were given around 150,000 ECU to develop the prototype to the point where we could attract industrial partners."

... to Manufacturing Industry

This is exactly what happened. The prototype was finished in October 1993, and the IZFP has now teamed up with German manufacturing equipment supplier

Bosch GmbH to develop it further. The first prototype can measure the diameter of the spot weld - which correlates closely with the weld's strength - efficiently and with extremely high and consistent accuracy. The partnership with Bosch is designed to bring it onto the factory floor.

The new ultrasonic probe will be electronically linked to the automatic welder on the assembly line. It will analyse the spot weld as it is being made, controlling the current into the welder to ensure that each weld is made properly, reducing the number of defective welds to negligible levels.

"We expect to have this second prototype ready in two years' time, and Bosch expects to launch an industrial product onto the market in around 1998," Dr. Waschkies says. "This is significant news for manufacturers using spot welds. Car manufacturers, to return to our example, will know that every weld they use is properly made, so they will only have to use half of them and will no longer need to carry out tests. With a few thousand welds, each costing around 0.05 ECU, saved on every one of the 13 to 14 million cars made in Europe every year, you can see what a difference this technology will make." □

(1) Testing of Structural Integrity of Building Structures and Measurement of the Position of the Reinforcement (BREU 1353).

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 Fax: +49 681 395 80.

► VRC PROFILE: NORTH RHINE-WESTPHALIA, GERMANY

A Regional Window to European RTD

The Zentrum für Innovation und Technik (ZENIT) in the west of Germany hosts one of the four German VALUE Relay Centres (VRCs) and is responsible for the Länder of North Rhine-Westphalia, Lower Saxony and Hessen.



The ZENIT headquarters.

ZENIT is the central technology transfer agency for North Rhine-Westphalia, Germany's 'industrial heartland'. Launched in July 1984, it is a non-profit organisation co-funded by both the regional economics and technology ministry and industry.

Around half of its 50 staff are engineers, scientists and economists. Together, they offer advisory and consultancy services on market research and technology marketing, quality assurance, environmental management, information and communication technologies and European topics. Typical activities include screening R&D project ideas and proposals, providing advice on application procedures and proposal formulation, mediating R&D cooperation ventures and result exploitation, and arranging regional, national and European funding and seed and venture capital. They have a great deal of experience with the European technology-oriented programmes: apart from being a VRC, they are also a Euro Info Centre, are involved in various SPRINT Network groups and are a BC-Net member.

"We find that combining various regional roles together under the same roof helps a great deal," comments Peter Wolfmeyer, deputy general manager of ZENIT. "It allows us to combine our activities and achieve synergies quite frequently. As a result, we are well known as the local 'window to Brussels', as well as being a 'partnering window' to all of Europe, particularly in R&D. Since we have become the VRC, our technology brokerage activities are also becoming very well known."

Experience in Technology Transfer

Their activities are many and varied. Their monthly R&D newsletter 'The Technological and Structural Programmes of the EU' covers background information and news (particularly Calls for Proposals) on the Specific RTD Programmes, VALUE, SPRINT and other EC-funded programmes, as well as information on events such as Information Days, scientific seminars and more. It is sent to around 500 companies and 'multipliers', who disseminate the information further.

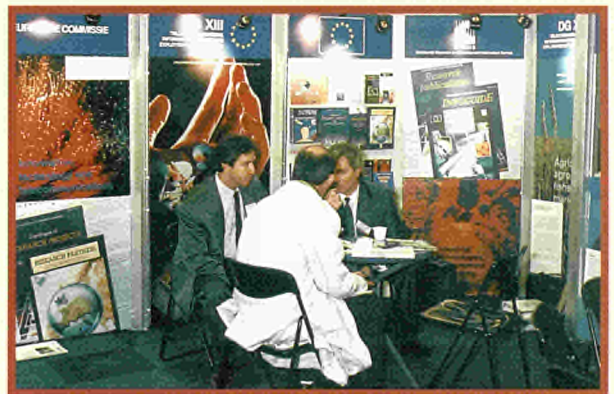
An example of just such a multiplier is the network of around 50 Technology Centres in North Rhine-Westphalia, which help launch technologically-oriented SMEs by providing them with office space and other facilities. These centres are often the venue for ZENIT's Information Days and events, which focus on both upstream (getting involved in RTD projects) and downstream (exploiting project results) issues.

ZENIT also holds an Information Day for each major Call for Propo-

sals. Apart from the presentations on the Specific Programme and the current Call for Proposals, the VRC presents a company which has already been involved in an R&D project within the programme. The company's experience in both the research itself and its subsequent exploitation is examined, giving the Information Day participants valuable advice and practical experience.

Other events include Technology Transfer Days, four of which are planned for 1994, and a number of

Thematic Workshops. "The lesson we learnt in 1993 was that Technology Transfer Days have to be kept small," Mr. Wolfmeyer explains. "Each company and each project is different, so it's very difficult to please a large number of people in one day. The thematic workshops, on the other hand, bring together the participants in different projects within one technical area. The idea is to help them exchange their experiences and technologies, as well as study how to exploit their results." ●●●



ZENIT and CORDIS at Hannover Messe

More than 6,000 companies and organisations from 60 countries displayed their products and services at the Hannover Messe, the world's largest industrial fair, on 20-27 April.

Demonstrations of CORDIS online, the upcoming Windows-compatible CORDIS interface ('WATCH CORDIS') and CORDIS on CD-ROM were presented at two different stands:

- The European Commission stand, which also featured rep-

representatives from DG II, DG XIII, Eurostat and the European Foundation for the Improvement of Living and Working Conditions;

- The Niedersächsische Wirtschaftsministerium stand, in cooperation with the Niedersächsische Agentur für Technologietransfer und Innovation GmbH (NATI), the Lower Saxony agency responsible for technology transfer which serves as a branch of ZENIT.

Advertising for Partners

ZENIT runs similar events at trade fairs, promoting a number of research results to help form exploitation partnerships. There are also technology business planning seminars (see issue 2/94), short training programmes on VALUE and CORDIS for SMEs in the Technology Centres, and full-day seminars on CORDIS for

students in European affairs, who will one day become multipliers for the VRC's activities. "We use CORDIS on-line a great deal ourselves," Mr. Wolfmeyer notes, "and our training courses, where we use the CD-ROM system, have been a great success. CORDIS empowers European companies to quickly and efficiently find the answers they need for themselves, so we

always stress its usefulness."

One of the more unique of ZENIT's many dissemination tools is the small weekly advertisement they place in VDI Nachrichten, the largest engineering-based newspaper in Germany. Placed in the 'EuroNews' page since the middle of last year, the advertisement promotes the exploitation of a specific research result each week.

"We place the advertisement to find partners for marketing, prototype development and pilot users," Mr. Wolfmeyer concludes. "We typically receive anything from 5 to 15 enquiries from each advertisement, so the number of initial contacts generated between companies in this fashion is very significant. The first partnerships resulting from these advertisements are already under way." □

► INFORMATION SOURCES

Tracking Down 'Grey Literature'

Many RTD-oriented publications are not readily available through normal channels, slowing the transfer of important scientific or technical knowledge. SIGLE, a pan-European database and document delivery system launched with EC support in 1980, provides the key.

The wealth of information found in publications such as scientific reports, doctoral dissertations and conference proceedings - known collectively as 'grey literature' - is often difficult to identify and obtain. This is usually because the research institutes, universities, authorities and firms which publish them see no need to distribute or publicise their research results widely.

However, ever-increasing global competition is fuelling the need to transfer scientific knowledge developed in one country to scientists and industries throughout Europe. Grey literature is often the key to this knowledge transfer. Unfortunately, Europe has been weak in database publishing, particularly relating to grey literature, compared with its international competitors. The United States, for example, has long had databases such as those of the National Technical Information Service (NTIS) for technology reports and the UMI for dissertations.

The System for Information on Grey Literature in Europe (SIGLE) was formed to tackle this problem in Europe in 1980, two years after a seminar organised by the European Commission in York (UK). Operated by a network of national information or document supply centres active



in collecting and promoting grey literature, SIGLE is an on-line, pan-European electronic database and document delivery system.

SIGLE was funded by the European Commission until 1985, when the members formed the European Association for Grey Literature Exploitation (EAGLE). EAGLE is now self-supporting and growing fast, with members and national SIGLE centres throughout Europe (1).

A Growing Network

In October 1993 the SIGLE database contained 336,650 records, with around 40,000 new records being added each year. Pure and applied sciences were the first subjects to be covered, with economics, social sciences and humanities added in 1984.

A typical SIGLE record contains the document's title (with an English translation if necessary), plus

information on the author(s), the source, the document's length and where it can be obtained. Subject search is possible through 246 subject category codes. In addition, some 15% of the records contain 'added keywords' to clarify the document title, and EAGLE is researching the possibility of adding more.

SIGLE's descriptive cataloguing rules are based on those of the International Nuclear Information System (INIS), and the subject classification scheme is a modified version of that endorsed by the Committee on Scientific and Technical Information (COSATI) of the US Federal Council for Science and Technology.

All the documents listed in the SIGLE database can be obtained from or through the national centre which originally entered the record. Various ways of receiving copies exist, such as through national and international interlibrary loan networks.

International Links

One of EAGLE's overarching aims - to foster international cooperation in grey literature distribution - was reflected by their co-

sponsorship of the First International Conference on Grey Literature, held last December in Amsterdam. Other sponsors included the Japan Information Centre of Science and Technology and the American NTIS.

The conference reinforced the growing recognition of the importance of grey literature, as well as underlining the need for more international, even intercontinental, cooperation in the field. However, the conference also raised a number of questions, ranging from the scientific 'quality' of grey literature to the way it is used. Further research is necessary, but in the meantime EAGLE will continue to improve SIGLE's comprehensiveness and subject access, as well as develop new products. □

(1) EAGLE's members are Belgium, France, Germany, Italy, Luxembourg, the Netherlands, Spain and the UK. The Czech Republic and Hungary are also planning to join.

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► CONFERENCE

Environmental Technology '94'



The European Commission stand at ET'94: taking EC project results to the market.

The VALUE and SPRINT programmes worked side by side at the recent Environmental Technology Exhibition in Birmingham (UK) on the 22-24 March, illustrating the growing synergy between the two programmes.

Around 9,000 visitors attended the exhibition, which featured a major stand from the European Commission. Apart from general information presenting VALUE (CORDIS, Publications, the VRC Network and Valorisation projects) and SPRINT, the EC stand featured around 10 'Technology Offers'.

Each Offer is a result of an EC-supported RTD project, which were shown at the exhibition thanks to Valorisation grants. They included systems for measuring surface tension (profiled in issue 1/94), analysing the mercury content of flue gas, and filtering pol-

luting gases, liquids and solids from air.

VALUE will be demonstrating other research results at the following exhibitions:

- **Stockholm International Technical Trade Fair**, 17-22 October, 1994. Innovations in the chemical, wood and construction industries. Contact: Mr M Leipold, VALUE. Fax: +352 4301 34129.
- **Portugal Metal Exhibition**, Porto, 2-6 November, 1994. Innovations in metallurgy and the metals industry. Contact: Mr M Leipold, VALUE. Fax: +352 4301 34129.
- **On-Line Exhibition**, London, 8-10 December, 1994. CORDIS, publications on EC research. Contact: Mr Bernd Niessen, VALUE. Fax: +352 4301 34989.

VRC AGENDA Events Calendar on CORDIS

The VRC Network's 'Calendar of Events', listing upcoming Technology Transfer Days and other events at VRCs around Europe, is now available on CORDIS, as follows:

- log on to ECHO and access the Common Command Language (CCL) prompt (choose '90 - Other Commands' from the Main Menu, and then '4 - CCL Mode');
- load the RTD-News database (type 'Base News');
- to see the VRC Calendar for all of Europe, type 'Info Calendar';
- to see the VRC Calendar for any EU or EFTA country, type 'info X', where X is the country.

In addition, a paper version, sorted either by date or by VRC, can be obtained through the post:

- send a fax to Marinella Sardo on: +352 4301 34009.

Lastly, of course, you can contact your local VRC(s) for more information on their planned activities.

Transferring Space

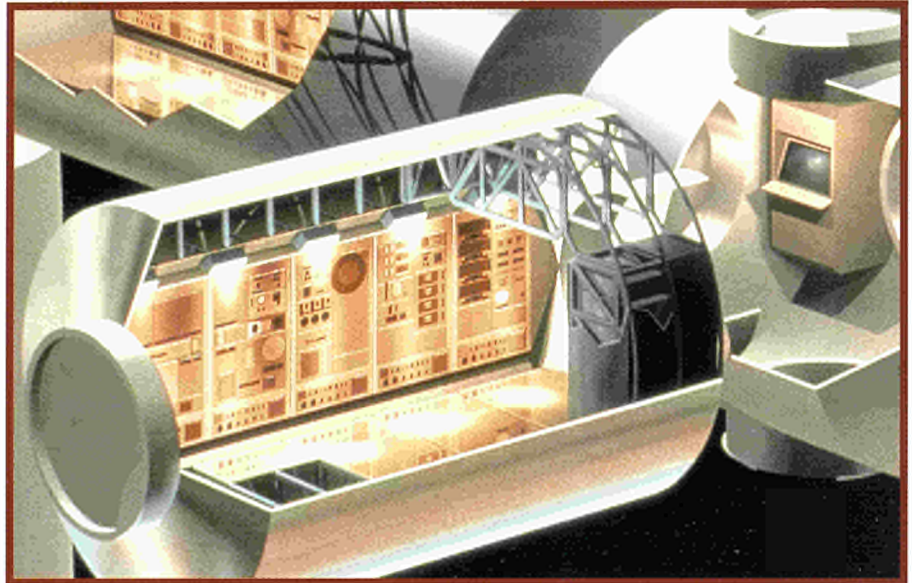
Europe is one of the world leaders in space technology. Behind the glamorous achievements that appear in the media, however, there is a much wider range of highly advanced technologies under constant development. Both the EC and the European Space Agency (ESA) are helping to transfer these technologies between the space and non-space sectors, and to promote synergies between the various European R&D programmes.

The technologies developed in the European space programme are some of the most advanced in the world. However the space programme's prime requirement is not for the lowest cost or even the most advanced technological solutions, but rather for the most viable ones.

For this reason, these technological developments are more than simply innovative in nature - they are also highly reliable in the extreme conditions found during launch and in space, and are often optimised in terms of volume, mass and power consumption. Space technologies represent therefore a potential source of innovation for many non-space industrial sectors, while the expanding range of space applications represents many new opportunities for European hi-tech firms.

Funding for space programmes is coming under increased pressure, owing to the combined influence of its reduced political priorities since the end of the Cold War, the global economic downturn and increased world competition. Synergies are being more and more sought between space and non-space technology development programmes. This new priority is understandable - if the diffusion of results and techniques is properly conducted it can become a genuine catalyst for cutting-edge industrial innovation in almost every industrial sector.

Not that ESA's impact on European industry is not already significant. A study by the Bureau d'Economie Théorique et Appliquée of the Université Louis Pasteur in Strasbourg (1) shows quite clearly that ESA's programmes stimulate industrial activity in a number of interrelated ways - technological, commercial and organisational. The study concluded that 100 ECU worth of contracts placed with the European space industry by ESA produces the equivalent of 320 ECU in economic spin-offs. Encouraging further technology



Artist Impression: ESA

ESA's Columbus Attached Pressurised Module, part of the International Space Station.

transfers will increase this already significant impact on European industrial competitiveness.

Promoting Synergy

The EC's Third Framework Programme included very little direct funding for space technology research, and did not include any synergies between the EC's Specific RTD Programmes and ESA's programmes. This lack of co-ordinated know-how and technology transfer between the space and non-space sectors is not surprising, considering the very recent maturing of space applications and the emergence of new operational and commercial activities.

Nevertheless, there are a number of sectors in space technology which overlap with the more 'down to earth' industrial sectors covered by the Specific Programmes. Recent studies commissioned by the European Commission's Space Office (DG XII/D-4) have recommended that this overlap be more properly and consistently exploited, within the bounds

of the principle of subsidiarity.

According to the European Commission's Communication on Space (2): "In the earlier phase of Europe's space effort, the space agencies had an essential, almost exclusive role, since the main aim was to establish a technological and industrial capability - a 'technology-push' activity. The European space programme must now move progressively towards a 'demand-pull' approach to integrate space activities into the broader socio-economic fabric of Europe."

To ensure the increasing success and relevance of the European space effort, there is a need for a broader approach in order to encourage:

- The orientation of space applications programmes according to objectives defined outside the space sector;
- The emergence of public or private customers who will fund operational systems;
- The development of technological synergy between space and non-space programmes.

Technologies

Bringing Technologies Down to Earth

The scope for technology transfer is potentially very wide (see Figure 1). As in all technology transfers, there is often a delay between the transfer of the technology and its successful (or unsuccessful) integration. Very often, integrating a new technology will also require a change in management structures.

A specific technology or know-how may require an adaptation or feasibility study. These technical studies may reveal the need for financial and/or engineering solutions for the successful acquisition and integration of a technology. For this reason, the SPRINT programme's "Technology Performance Financing" scheme (see Dossier article, issue 2/94), which aims at reducing the risk of industrial innovation by linking payment for new technologies to the results obtained, is particularly relevant.

In addition, the dissemination and valorisation of European space technologies

could be improved through the launch of suitable networks, or by enhancing existing ones. The European Commission, through its SPRINT and VALUE programmes, has the ability to highlight good network practices from its many years of experience in pan-European technology transfer schemes.

Spacelink Europe

ESA has its own technology transfer programme to bring the panoply of technologies developed for space projects back to earth - the Spacelink Europe Consortium. Formed in October 1991 after the ESA selected four private technology transfer brokers in France, Italy, Germany and the United Kingdom (see Box, page 13), the 2.6 MECU network exists to identify technologies developed in space industries and market them to non-space sectors.

These four organisations seek exploitation partners for these technologies through a network of brokers throughout

ESA contributing countries. They have already made more than 260 inter-company introductions, the majority transnational. At any given time more than 100 continuing contacts between space and non-space companies are being actively furthered.

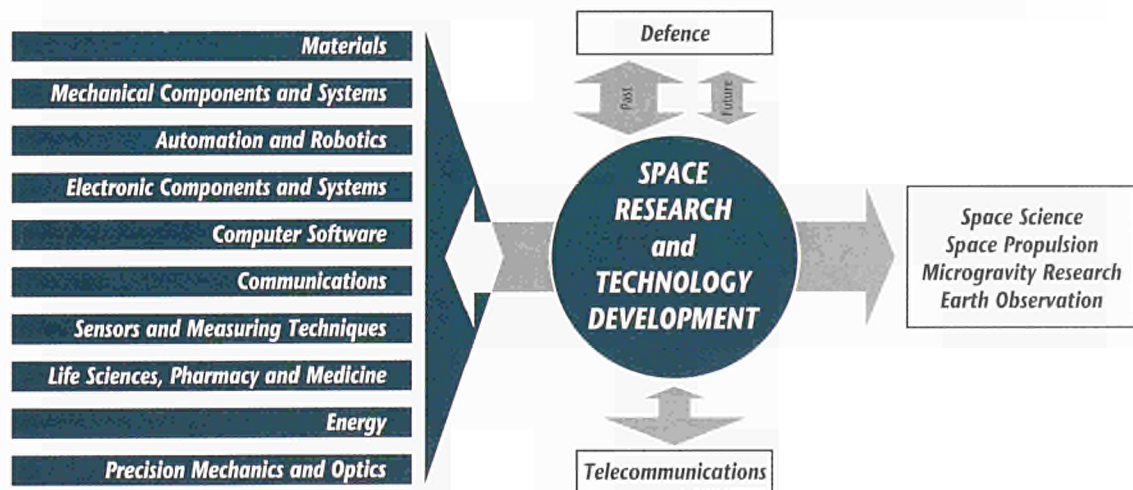
The consortium uses a variety of transfer methodologies, giving the companies receiving the technologies a number of options, such as taking out licences or getting involved in collaborative development projects.

They have already scored a number of successful technology transfers, mainly in the software and medical fields. All four companies are also members of the European Association of Contract Research Organisations, which is partially supported by the SPRINT Programme (see Dossier, issue 2/94).

Spacelink Europe produces two publications, both of which are free:

■ Transferable European Space Technologies (T.E.S.T.). Each edition ●●●

Technology Transfer Possibilities



This figure illustrates the transfer of technologies between space and non-space industries. The arrows indicate technology transfers, showing, for example, that there are some sectors (e.g. space science and propulsion) where there are no significant transfers to non-space sectors, and others where the

relationship is lopsided (telecommunications).

In this field, however, these relationships can change rapidly. Microgravity research, for example, is progressing quickly, and the numerous possible transfers it could yield will be getting a serious boost with the International Space

Station planned to orbit the Earth in a few years.

The diagram is, of course, a simplification. In the power and energy conversion sector, for example, battery technologies are transferred to, rather than from, the space sector, while solar cell technologies flow in the opposite direction.

●●● contains brief descriptions of a few dozen 'ready to transfer' technologies developed within the ESA's R&D programmes. Edition 4 has just been published, bringing the total number of technologies described to over 200. In addition, editions 1 and 2 are already available on CORDIS RTD-Results, with edition 3 to be added shortly and edition 4 later this year (search SDE=ESA or search the ORG field for the Spacelink Europe members).

■ **Technology from Space**, a 28-page compilation of some of the Spacelink Consortium's earlier successes in transferring space technologies to terrestrial applications, as well as earlier spinoffs.

Launching Technologies into Space

Of course, technology transfer works both ways. Many European companies are developing technologies which are becoming more and more necessary in space, particularly in the fields of information and communication technologies, advanced materials and robotics.

Historically, whenever a space programme required a particular technology



Photo: ESA/NASA

ESA's Eureka orbital microgravity laboratory being launched from the US Shuttle on 31 July, 1992. It was retrieved in June 1993.

for space applications it was developed from scratch, without referring to the rest of industry to see whether appropriate technologies already existed. Today, however, there is a greater awareness that many useful technologies already exist, ready to be adapted to the harsh environment and strict working con-

straints of space. Such developments serve as a useful technological challenge to the companies concerned, involving as they do the requirements of miniaturisation, low weight and power consumption, high reliability and so on.

This is particularly apparent in the fields of telecommunications, Earth

The European Space Agency

The European Space Agency (ESA) was born in 1975 from the merger of two European space organisations which were originally created in 1962. Its budget (2,532 MECU in 1994) is provided by its 13 Member States (1), and is composed of a mandatory part, calculated as a function of each Member's gross national product, and an optional part, which varies according to their research priorities.

As an R&D agency dedicated to developing technologies for the exclusively peaceful exploitation of space, ESA is not involved in the commercial exploitation of its technologies. After developing the Ariane rocket system, for example, ESA transferred the technology to Arianespace, a private company formed to commercialise launch systems. In turn, Arianespace has launched its own R&D programme, and has become a globally competitive launch service provider.

ESA systematically applies the principle of "fair industrial return", which ensures that each Member Country receives a fair share of the financial return and technol-



ESA's Member States, Establishments, Launch Base (Kourou, French Guiana) and Offices (Brussels and Washington).

ogical spin-offs resulting from the programmes. These programmes include:

- The Scientific Programme: missions such as the Ulysses probe to the solar poles (launched in 1990) and the planned Huygens probe, to be dropped onto Saturn's moon Triton as part of a NASA/ESA joint mission to the ringed planet;
- Earth Observation, including the continuation of ESA's highly successful series of ERS (European Remote Sensing) satellites, the first of which was launched in 1991;
- Telecommunications, building on the

significant successes of ESA's first application programme, the Orbital Test Satellite, which was launched in 1978 and was finally 'pensioned off' in 1991;

- Manned Spaceflight and Microgravity Research, involving both extensive international collaboration in the International Space Station, to be built in orbit later this decade, and totally European missions like Eureka ('European Retrievable Carrier'), an entirely automated orbital microgravity laboratory with a 1 tonne payload.

(1) The EU Member States, with the exception of Greece, Portugal and Luxembourg, plus Switzerland, Austria, Norway and Sweden. Finland is an associate member and will join in January 1995, while there is also a cooperation agreement with Canada.

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Image: ESA

observations and satellite navigation systems. These are not specifically 'space technologies' - they are *applications* of space. In these areas, space development projects are not 'technology push' activities, they are 'technology integrators', combining a number of different technical disciplines to create space-specific systems. They are also in areas covered by the EC's Specific Programmes.

An EC study (3) was commissioned recently to examine the possibility of sharing generic technology developments in these programmes with the space sector. The final report shows that there are in fact already a number of EC RTD projects which are developing space-related technologies, although they are also relevant to non-space industries. As expected, they are practically all in the ESPRIT (Information Technology), RACE (Communications) and BRITE-EURAM (Materials) programmes.

However, this will probably change once the Fourth Framework Programme for 1994-1998 gets underway. The upcoming Environment Specific Programme includes an 'Earth Observation' action line, to be allocated 100 MECU. The projects under this line will develop a European Centre for Earth Observation, a number of software tools for analysing Earth observation data and some space instruments.

This will undoubtedly involve more EC-ESA collaboration, which is becoming more and more concrete in this field through the EC's Joint Research Centre (JRC), which has an Institute devoted to the subject - the Institute for Remote Sensing Applications (IRSA). □

(1) *The Indirect Economic Effects of the European Space Agency's Programmes*. April 1991, ESA BR-63, ISBN 92-9092-031-9.

(2) COM (92) 360 final.

(3) *Prospective Assessment of Generic Technologies for the Space Sector*. ETES 40.

C o n t a c t

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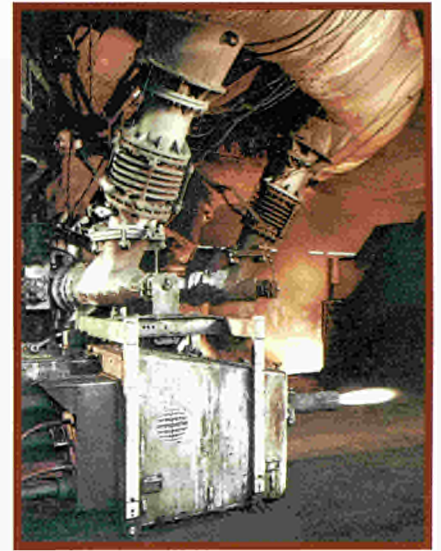
ARC PLASMA BURNER

This piece of hardware was originally developed for the space programme by French company Aérospatiale, with funding from the European Commission (DG XVII - Energy). A VALUE project was then granted to adapt the technology to superheating the air for blast furnaces and cupola furnaces, as the system can heat gases to temperatures in excess of 10,000°C.

The new technology - patented by Aérospatiale in France and with worldwide protection already applied for - represents a step forward from previous systems. Ceramics, metals or thermoplastics can be fed into the device and sprayed out as a plasma for material deposition/coatings of uniformly high quality using lower current densities, which reduces electrode wear. Much larger surface areas can be covered in one sweep, making 'paintbrush' applications possible. It can also be used as an advanced plasma welding device.

Following the VALUE project, the tech-

nology is now used for ferro-manganese and iron production, and also in the manufacturing of motor casings. Other industrial sectors to be increasingly concerned with this type of equipment are metallurgy, chemical processing and the destruction of wastes.



Spacelink Europe



Technology Transfer case studies from Spacelink Europe.

Spacelink Europe members can be contacted at the following addresses:

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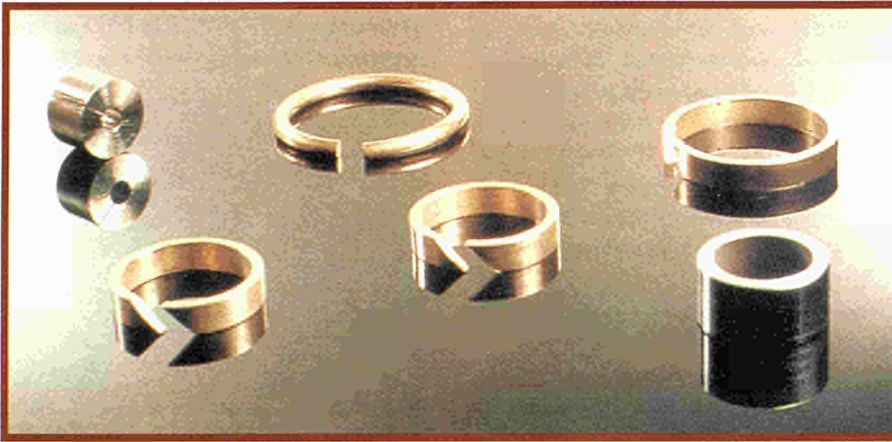
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In addition, there are Spacelink Europe Correspondents in the other ESA Member Countries.

(1) Novespace also produces 'Mutations', its own technology transfer magazine, in French and English.

1. SHAPE MEMORY ALLOYS



Shape memory alloys (SMAs) are metals that can undergo a mechanical transformation and then, by being heated, recover their initial shape. This phenomenon is one of the remarkable thermo-mechanical properties of the 'reversible martensitic-type structural transformation.

Using their special properties, SMA devices can perform the functions of switches, actuators, valves and other devices, where the activation of devices by temperature change is desirable.

Shape change is predictable and reproducible to fine tolerances, and considerable savings over conventional devices in the areas of weight, complexity and need for power supplies can be made.

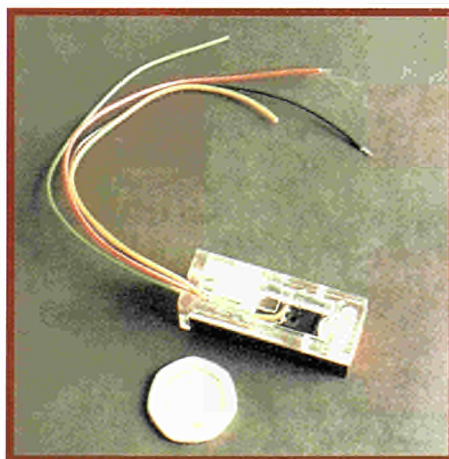
SMA devices have already been produced and tested in a variety of applications. SMAs have potential applications in fire detectors, cooling and heating systems or any situation where heat change can be used to trigger a mechanical action.

2. MINIATURE PUMP SYSTEM

Research into equipment design to support orbiting space laboratory microgravity experiments has led to the development of a range of miniature pumps for the accurate delivery of small quantities of liquids at low delivery rates over relatively long periods.

The pumps, powered by small electric motors and typically less than 5cm long, work on a development of the peristaltic principle. The new design has the advantage of both compactness and simplicity of design. These features allow the pumps to be produced relatively cheaply in cartridge form (with or without battery provision) and, for example, to be integrated as the non-disposable element in an otherwise disposable self-contained, continuous drug dispensing device.

Peristaltic pumps have potential application in pharmaceutical or medical situations where the measured transfer of small quantities of liquids over a period of time is required, such as in controlled biochemical experiments or in implantable medication pumps (e.g. for insulin).



3. SEALED CUP WITH FILLING, STORAGE AND WASHING DEVICE

Designed for use in microgravity, this closed, sealed cup can be used for drinking simply by pinching the end fitting with the lips - tilting the cup is not necessary.

It consists of two separable parts: the top, with its check valve, and the throw-away bottom part for containing the freeze-dried drink. This bottom part is moulded in its empty shape so that when it is filled it applies a constant pressure to the liquid. When the end fitting is pinched, the liquid is expelled from the cup.



For freeze-dried drinks, a cabinet is provided for refilling the cup. This cabinet is also used for stowing replacements and cleaning the mouthpiece. The cup comes in a simplified version for drinks that are not freeze-dried. An all-in-one throw-away piece has been constructed to simplify use and reduce the production cost.

This cup may be of use to a variety of groups, for example the:

- handicapped;
- bed-ridden;
- children and aged;
- any other people who cannot use their hands or tilt their head back to drink, or whose activities require the use of a sealed cup.

4. MINIATURE REAL-TIME RADIATION DOSIMETER (RADFET)

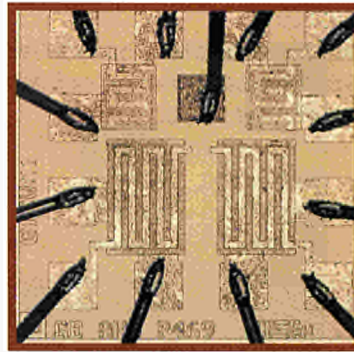
A RADFET is a real-time integrating dosimeter for measuring ionising radiation. RADFETs respond to gamma rays, hard and soft x-rays and nuclear ●●●

●●● particles. The basic dosimeter unit consists of a very small chip-based detector (or close-spaced array of detectors at, say, 0.1 mm pitch) connected remotely to an electronic reader, which can be controlled by a microprocessor. The read-out process is non-destructive and no high voltages are required.

The advantages of the RADFET system over conventional dosimeters are:

- Extremely small, rugged sensor chip;
- Real-time read-out to remote instrumentation or microprocessor;
- Only low voltages required;
- Very wide dynamic range in dose;
- Low power requirements;
- Low cost.

RADFETS can be adapted for applications in a number of fields:



■ Medical: RADFETS may be used in arrays mounted externally on a patient to monitor variations in received x- or gamma-ray dose over a critical body area. Alternatively, a modified RADFET chip may be mounted in an insertable catheter

for highly accurate monitoring of radiation therapy doses for cancer treatment.

This capability for real-time, localised, accurate recording of radiation doses offers significant improvements in both safety and effectiveness for this important treatment method. The sensor head can be disposed of after use on one patient.

- Nuclear: RADFETS can be applied to low-power remote dosimetry systems for 'hot' areas, as well as in personnel dosimeters, particularly where continuous monitoring is required.
- Other: Wherever ionising radiation requires monitoring, such as in food sterilisation, industrial radiography, high-energy physics and radiation hardness testing environments for electronic equipment.

5. LINKED DATA ACCESS SYSTEM (LINDAS)

An architectural design for a Pilot Distributed System for ESIS (European Space Information System) has been developed for ESA's ESRIN site.

The project will provide for quick and co-ordinated access to 6 of the major space databases across Europe, providing scientists in the space community not only with the capability to undertake a simultaneous co-ordinated search on selected topics of the databases, but also with an administrative, conferencing and newsletter service throughout the network, and the facility for data exchange between archives.

Although computer database linking is

not new, the LINDAS concept uses common software and hardware configurations, which allows much more than basic linking. Enhanced user service in a range of applications will provide a significant improvement in the speed and cost of system implementation.

Many computer-based data archives have grown up over recent years in support of individual scientific, medical or commercial institutions. As national and international ties strengthen throughout all these fields, and with the appearance of greatly improved communication systems, there is an increasing need for linking and enabling co-ordinated access

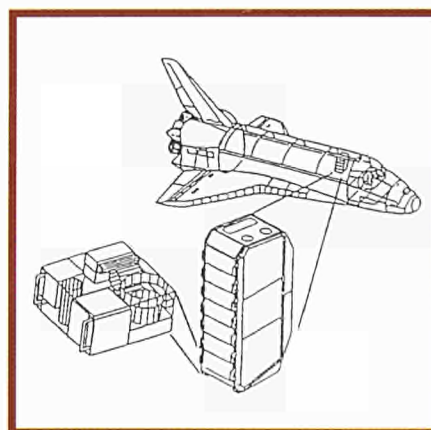
to archives covering interrelated subjects. The modularity and portability of the LINDAS concept will greatly facilitate this process.



6. CARGO BAY LOADING SOFTWARE (CAECAL)

CAECAL is a computer software tool developed originally for the optimum allocation of payloads in the cargo bays of spacecraft. It is PC-based and can typically provide good load optimisation for 50 objects in about four minutes, although the programme is interactive and can run longer for better matching.

It uses a specially developed technique (Structured Multi-attribute Optimisation) which is oriented to the solution of large-scale optimisation problems. As well as geometric consid-



erations, object mass data is taken into account to keep to any overall centre of gravity constraints if necessary.

CAECAL could generally solve a large-scale optimisation problem where a number of objects have to be allocated in a finite volume by satisfying given constraints (inertial, thermal, visual, etc.). Applications could be found wherever objects must be physically packed, such as in aircraft, ships and luggage containers, as well as in design situations (e.g. component packing in equipment).

► **SCIENCE PARKS**

A Regional Emphasis

SPRINT IN BRIEF

SPRINT (Strategic Programme for Innovation and Technology transfer) is an EC Programme designed to improve Europe's ability to innovate and transfer technology, both between business sectors and between Europe's different regions. It is an innovative and experimental programme composed of a number of actions and initiatives, and was covered extensively in edition 2/94.

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Recognition of the importance and effectiveness of regional and local innovation systems is growing, with recent SPRINT initiatives in the field attracting significant responses.

While it is well understood that the development and implementation of innovative products and processes requires access to external resources, the picture of the innovation process itself is changing. Technological development is no longer seen as an in-house linear process, but more as the result of the interaction between different players - firms, technology transfer infrastructures and individuals.

This leads to the idea that every company is part of a more or less structured network, where different partners offer various types of innovation-supporting resources and services. Several empirical studies have shown that firms are able to develop a competitive advantage on the basis of cooperation opportunities brought by their proximity with different partners, be they other firms, research centres, consulting services or other organisations.

As a result of such studies and several successful experiments in this field (e.g. Prato district, Sophia

Antipolis), regional authorities are building regional innovation infrastructures through which firms can access a large set of technical services. Many new organisations have been established by a wide range of sponsors (regional authorities, central government, universities, research and technical organisations), the main rationale being to capitalise on the 'proximity effect'.

There are three main reasons why the regional dimension is important to technology-based SMEs and other innovative firms:

- SMEs do not usually have sufficient internal resources to integrate new technologies and innovate. Not only do they need easier access to a set of external resources and support services, they also frequently require an external spur to alert them to available opportunities;

- These support services can be best provided in close proximity to their target enterprises: technology transfer can not only be done through licenses or the appropriation of research results.

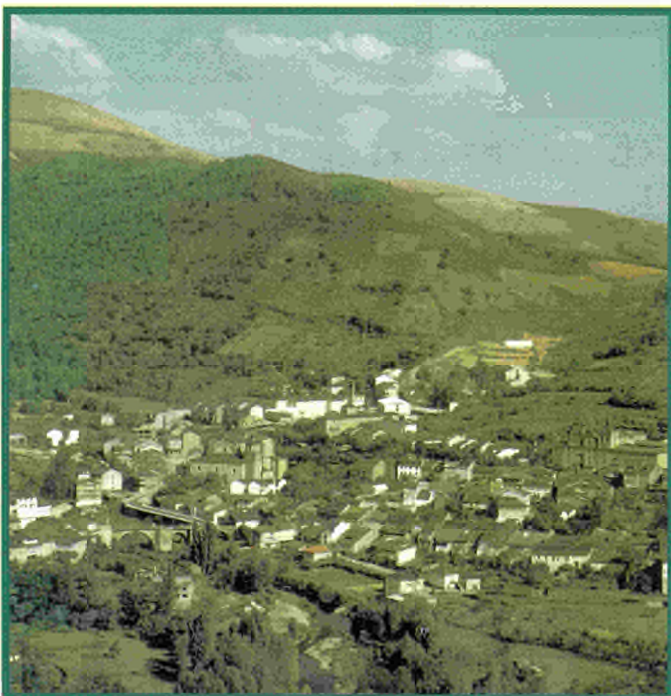
The literature on innovation emphasises the importance of the learning process - direct personal contacts through training, learning by doing and through interaction, etc. Therefore support services must be developed on a regional/local basis.

- The more successful regional innovation systems demonstrate that the provided services must consist of appropriate and relevant information and advice, without being over-general or over-elaborate.

RITT: A Regional Focus

Five months ago SPRINT launched a new Call for Proposals within the framework of its Science Park consultancy scheme (see issue 1/94). Under one of the three strands of the scheme - the Regional Innovation and Technology Transfer audits initiative (RITT) - the European Commission provides financial support (between 50 and 75% of the cost) to local or regional governments and/or development organisations wishing to set up a transnational team of experts to review the design, impact and effectiveness of technology diffusion organisations at the regional level. Under the Regional Innovation and Technology Transfer audits initiative (RITT), one of the three strands of the scheme, the European Commission provides financial support (between 50 and 75% of the cost) to local or regional governments and/or development organisations wishing to set up a transnational team of experts to review the design, impact and effectiveness of technology diffusion organisations at the regional level. Strategies aimed at increasing the degree of professionalism of the innovation support infrastructure are also encouraged and supported. This first Call for Proposals for RITT has been very successful in generating a large number of applications. Some 50 proposals have been received from 10 Member States plus 3 Scandinavian EEA countries. Around 25 of these will be selected to carry out the consultancy work. □

León Science Park, Spain: The SPRINT Science Park Consultancy Scheme reinforces regional and local innovation systems.



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► REVIEW CONFERENCE

Technology Transfer in Europe

'Technology Transfer Practice in Europe - Experiences of the Last 10 Years and Developments to the Year 2000' was held directly after the Hannover Messe, on 28-29 April.

Held to mark the 10th anniversary of TII - The European Association for the Transfer of Technology, Innovation and Industrial Information - and the operational launch of the SPRINT Programme, the conference attracted 300 participants from 29 different countries.

The plenary sessions included presentations on global trends in technology transfer, European innovation support policies, the needs of industry, priorities for public policy and more. The two half-days of parallel sessions were on the following themes:

- Research-Industry Technology Transfer;



The SPRINT-TII Conference in Hannover.

- Regional Technology Transfer and Innovation Support Strategies;
- Consultancy Support Strategies;
- Eastern and Central Europe;
- New Technology-Based Firms.

The first volume of the conference workbook, containing 36 of the papers presented in these parallel sessions and totalling more than 600 pages, is already

available. The 200-page post-conference Volume II, to be published in early July, will feature the plenary session papers and English translations of all papers presented in French. Orders for both Volumes may be placed directly with TII (40 ECU for TII Members and 60 ECU for non-members for both volumes).

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► EIMS

Studying European Innovation

Four publications from the European Innovation Monitoring System (EIMS) have recently been published.

The 1994 workplan of the EIMS was detailed in last issue's Dossier on SPRINT. Since then, however, the results of four studies have been published:

- 'Innovation activities and industrial structure: analysing R&D in a cooperative context': This study argues that the usual measure of R&D performance - the R&D/output ratio, sometimes referred to as the R&D intensity - can be misleading, and it explores a more nuanced approach to analysing R&D intensities in a transnational context.

From a policy point of view, a clear lesson is that one needs to be very careful in making inter-country comparisons with science and technology data, since a low RTD-intensity may simply reflect

differences in industrial structures.

- 'Innovation structures and performance in Nordic manufacturing industry': Based on firm-level databases of innovative activity in Nordic manufacturing industry, this study presents, using new innovation output indicators, a picture of innovation which is more detailed than that which can be pictured by the more 'traditional' indicators of technological development (R&D expenditure and patents).

- 'Investment, innovation and competitiveness: sectoral performance within the triad': This report uses two newly developed OECD databases to examine sectoral performance over the last two decades for the USA, Japan, Canada and nine European countries. Performance is evaluated by con-

structing nearly a dozen indicators which cover four broad areas of economic activity and which correspond to features affected by industrial and technology policy.

A convergence has occurred in economic performance between the countries of the triad on aggregate, but large differences remain at the sectoral level. Some differences are becoming more pronounced, and some EU sectors are falling behind.

- 'Patterns of innovation in Italian industry': Investigates the relationships between industrial structure and innovation patterns on the basis of an empirical study of Italian industry. An expanded set of links between structural and technological variables is analysed, considering in particular the role

played by investment as a form of innovative activity and as a determinant of industrial structure.

The main message is that the main innovation-related problems which occur within a country or region are structure-dependent, and that this is vitally important to policy. For instance, there is no point in having a technology policy designed for science-based industry in an economy dominated by supplier firms.

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► INTER-FIRM TECHNOLOGY TRANSFER

'C-Networks' in 1994

At the recent Technology Transfer Review Conference in Hannover (see preceding page), Commission services and members of SPRINT's 'C-Networks' met to discuss the networks' operation.



The advanced medical drill developed by STATICE Santé in France and transferred to Austrian hospitals via the SPRINT C622 network.

SPRINT's inter-firm technology transfer networks, or C-Networks, connect Technology Brokers from various Member States to bring a 'transnational' element to their work.

Thanks to the C-Networks, brokers can meet their fellow network members from other countries to exchange profiles of their client companies - technology-based firms who can and want to transfer technologies with other companies. In this way most of the benefits of face to face company meetings are gained, without the cost.

A number of these brokers also act as technology consultants, providing a more complete service covering the whole process of technology transfer, from the acquisition of the hardware to its

successful integration within the firm. This role applies more specifically to private brokers who charge fees, or receive royalties from their client companies for their work.

However, private consultants and brokers are not the only type of C-Network members. There are also public organisations - such as Chambres de Commerce, Regional Technology Advisory Centres, etc. - who are funded to a certain extent by regional or local government to support the companies in their region. Finally, there are university/industry liaison officers, who have the task of disseminating university research results to industry.

There are now 37 networks currently operational, involving some 200 partners (90 regional quasi-

public partners, 90 private consultants and 20 university liaison offices). Many of these companies and organisations met at the conference to review the past ten years of operation and draw conclusions from the mid-term evaluation of the C-Networks, delivered in September last year. The evaluation's results and recommendations were explained and welcomed positively by the contractors.

It appears that public or regional networks will be increasingly associated with 'technology transfer campaigns', which generally lead to Technology Transfer Days. Networks involving private members will continue to aim at securing technology transfer contracts, with 'payment by result' possibly becoming more widespread.

C622: Micro-Technology Network

SPRINT encourages network members to create parallel initiatives for promoting technology transfer and diffusion. A concrete example is the 3rd International Technology Partner Search meetings (ITPS'94), formally called JETT (Journées Européennes de Transfert de Technologie) an initiative which was launched by one of the partners in the C622 network, which focuses on micro-technology.

The event will be held on 20-21 October in Neuchâtel, Switzerland. Its aim is to promote contacts and technology transfers between firms in Europe, and in particular Swit-

zerland, as well as to and from companies from North America and Asia. The previous two events of the kind were very successful, with a large number of attendees and partner link-ups. Although there are no restrictions as to the fields of activities of the participants, the emphasis is on micro-technology and the medical and environment sectors.

The same network was behind the transfer of an innovative surgical drill from its inventor, French company STATICE Santé, to a medical equipment distribution company in Austria. The drill is especially suited for cranial surgery on children and can also be used easily 'in the field', thanks to its high precision, low weight (1.2 kg),

excellent control features and self-contained power supply, which makes external power sources unnecessary.

By the time the local SPRINT network member circulated descriptions of this technology throughout the network, the drill was already in production and on the market, and what STATICE Santé needed was a distribution agreement. Another member, the Technische Unternehmensberatung in Austria, contacted a range of Austrian medical distributors, one of which signed an agreement with STATICE Santé to supply a number of Austrian hospitals with the new drill.

According to Claire de Filippis of STATICE Santé, "Being a small

company, it is doubtful that we could have developed such an agreement with a foreign distribution company so easily, particularly one as far away as Austria. Being able to market across Europe in this way is certainly an advantage. □

C o n t a c t

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■ For ITPS'94: **Mr. O Barrelet,** CENTREDOC,
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► NEW INITIATIVE

Technology Transfer Fellowships

SPRINT is launching an experimental network connecting European organisations implementing national schemes for student / researcher placement. The 'European angle' will lead to more effective technology transfer and training for young scientists.

The new programme consists in granting a number of fellowships to young scientists or engineers to accompany a technology being transferred to an SME in another country. The recipients of the fellowships will come from the organisation where the transferred technology was originally developed, so they can train the staff of the receiving SME to make the best possible use of the new equipment. Fellowships will last an average period of 9 months, with the SPRINT Programme contributing towards both the fellowships themselves and programme management.

The programme builds on a number of schemes, developed by national and regional governments throughout Europe, to improve industrial competitiveness by helping companies innovate by form-

ing partnerships with research institutions. Through these partnerships, technological knowledge generated by research and scholarship is transferred to companies where it is used to develop and improve products and processes.

These arrangements differ in detail, but several of the more successful schemes are based on the concept that technology transfer is most effective when the recipients are given a thorough understanding of the practicalities of application. Such schemes achieve this by using young graduates as the agents of technology transfer. They implement R&D projects in companies under the joint supervision of the research institute and the enterprise receiving the technology. As an added bonus, these schemes are also highly useful in training young researchers in the needs and

priorities of technology-based firms.

Connecting National Schemes

Each scheme already has a large existing client base of companies, research institutions and graduates, who, by definition, are actively involved in innovation and technology transfer. Therefore the SPRINT Programme's new initiative will add a European dimension to these existing national schemes, rather than creating a completely new pan-European network. In this way the new initiative will benefit from both the accumulated experience of the managers of the existing schemes and the fact that these schemes have been designed to take account of local circumstances, which differ from

country to country. The network is not a "closed shop", as illustrated by the fact that 20% of the fellowships can be awarded to graduates from independent firms and universities, which are not part of any national scheme.

To begin with, the new network will link four existing national schemes (in Denmark, France, Ireland and the UK). In addition, Spain and Norway currently have observer status, and may join the initiative later. Potential members must be similar national, or, eventually, regional initiatives.

C o n t a c t

■ **Robin Miège,**
DG XIII, Luxembourg,
■ **Daniel Routier,**
SPRINT TAU.

► JOINT RESEARCH CENTRE

Developing the Regional Science Base

THE JRC IN BRIEF

The Joint Research Centre is a European scientific and technical research centre established by the EC. The five research sites in Belgium, Germany, Italy, the Netherlands and Spain house the Institutes for Reference Materials and Measurements, Transuranium Elements, Advanced Materials, Systems Engineering and Informatics, Safety Technology, Remote Sensing Applications, Prospective Technological Studies, and the Environment Institute.

A new type of project has been launched by the Joint Research Centre (JRC) and the Region of Sicily. The multidisciplinary pilot scheme is designed both to develop an integrated environmental management plan and to transfer the JRC's research and technological expertise to the island.

Sicily's administration considers scientific research and technological innovation as essential aspects of the island's development. In fact, their Socio-Economic Plan, published a few years ago, includes subprogrammes for both Research, Development and Innovation and Utilisation of Human Resources.

Both aspects are addressed by a new project, signed on April 27 by Franco Martino, President of the Region, and Jean-Pierre Contzen, Director-General of the JRC, in Taormina, Sicily. The project stems from original proposals made by four of the JRC's Institutes: the Institute for Systems Engineering and Informatics (ISEI), the Environment Institute (EI), the Institute for Remote Sensing Applications (IRSA) and the Institute for Safety Technology (IST).

The four Institutes examined the priorities and requirements expressed in the Sicily Region's multifund operational programme, which translates the guidelines set out in the European support framework for Sicily into concrete pro-

grammes. They then defined 20 project proposals, depending on each Institute's expertise and Sicily's requirements.

These proposals included both research and training projects, fulfilling the dual purpose of developing a strategic environmental management system and improving the research and technological resources of the entire region. The proposals ranged from studying atmospheric pollution in urban areas to reinforcing structures against earthquakes.

JRC-University Collaboration

In consultation with the JRC, the Sicily Region then took these ideas and adapted them to their needs, combining eleven of the proposals together to form six modular projects:

- A. Management of Water Resources;
- B. Air Pollution in Urban and Industrial Centres;
- C. Soil Pollution and Erosion;
- D. Reliability and Safety of Chemical and Petrochemical Plants;

E. Conservation of Cultural Heritage and Major Public Works;

F. Trace Element Reference Values for Inhabitants of the Sicilian Region.

In each project, apart from supplying the technology it has developed as the European Union's research organisation, the JRC will work as a research partner with the Universities of Palermo, Messina and Catania, as well as coordinating and integrating the scientific results.

This will ensure that synergies develop between the scientific partners and that the results are exploited 'on the ground'. All six projects are designed to maximise the transfer of technology and methodology to the Sicilian universities and, when the projects are completed, to leave efficient environmental management systems and instruments on the island.

In Project A, for example, which is developing a system for managing the island's water resources, three JRC Institutes (ISEI, EI and IRSA) will help implement the modules relating to watercourse classification and monitoring, as well as develop a computerised decision-support system.

This latter system will, once given a set of criteria, produce reports on integrated environmental management, and 'wrap up' the research results from the other modules.

The overall budget of the programme is 22.6 MECU, provided by both Sicily (40%) and the European Regional Development Fund (60%). Around 6.8 MECU is allocated to the JRC, with the rest being split evenly between the Universities. □

Contact

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Jean-Pierre Contzen
(left) and Franco
Martino (centre) at the
project launch.



► TELEMATICS

Demonstrating New Markets

The MITRE project has developed a number of ways to help companies implement telematics systems, ranging from customised business plans to prototype workstations.

Telematics systems can bring together information and communication technologies designed specifically to help people work from outside the office, whether it be at home, in a hotel or anywhere else. Telematics technology shows great potential to enhance, in social, economic and cultural terms, the lives of geographically remote and/or disabled people, as well as provide a much needed boost to Europe's less developed regions, particularly those affected by Common Agricultural Policy reforms. Post-industrial and inner-city areas can also benefit significantly.

The European Commission launched the ORA Programme (see box) to develop this potential. One of the projects under ORA - MITRE - began work in January 1992 to demonstrate that there is a market for the relocation of wealth away from city centres using telematics on an economically significant scale.

Focusing on the Market

"MITRE stands for Market Implementation of Teleworking in Rural Environments," explains Chris Moller, the project leader from the Home Office Partnership (HOP), a small consultancy based in Cambridge, UK. "The key word is 'Market'. When we began, the labour and technology-supply issues of telematics were already being worked on, but the actual teleworking market was practically unknown."

According to HOP, this market should be significant. "Large scale, location-independent working, particularly for high value-added infor-



Photo: OUTSET

mation processing work, brings major cost savings," says Mr. Moller. "Less centralised worksites mean lower costs. The employees are happier, so there's lower staff turnover and higher productivity, and the actual quality of information processing work is higher, as is the greater flexibility to meet customer demand."

This business-oriented approach is reflected in MITRE's participants list, which features four types of partners:

- Telematics Specialists: HOP, Empirica, Horsens Polytechnic, the University College Cork and the Irish National Microelectronics Applications Centre (MAC) were the original partners, and carried out the research work;

- 'Demand Side' User Groups: a wide range of employers were brought into the project to examine whether telematics systems offered them any benefits, includ-

ing the UK Benefits Agency, Nationwide Building Society, the Salvation Army and Mercury Communications Ltd, the UK's second national telecommunications network provider.

- 'Supply Side' User Groups: these included OUTSET, a charity promoting employment opportunities for disabled and disadvantaged groups, another charity supporting blind people and a local authority with a large ex-coalmining workforce.

- Telecommunications Companies: Apart from Mercury Communications, which participated primarily as an employer, GPT Business Systems Ltd (the major UK telecom equipment manufacturer) and Telecom Eireann (the Irish national telephone network operator) were recruited to bring a detailed knowledge of telecom networks and terminal equipment.

"The user organisations ●●●

By enabling people to work from home, telematics can help tap the potential of disabled people and those living far from city centres.

●●● brought vertical integration to the collaboration," continues Mr. Moller. "One user organisation described its interest in teleworking as a means to combine employee and business benefits, as well as moving its services closer to the customer. It would have been difficult to show the economic viability of widespread teleworking without them. However, first we concentrated on more basic research - establishing the state of the art in teleworking."

Technology Assessment

The telematics specialists spread the net as wide as possible, examining what types of organisations had already implemented teleworking and what the results had been. From that they developed a model to evaluate teleworking's impact on any given organisation, as well as a 'taxonomy of teleworking', showing the many forms the

technology takes.

They found that the business structures that supported teleworking activities varied significantly, depending on the individuals in the scheme. The forms of telework that showed greatest economic promise were highlighted for further work. "Specifically", says Mr. Moller, "working at home, or telecommuting, was identified as being most suitable for intelligent, self-motivated people in professional jobs, interspersed with frequent meetings with their peers at any convenient location. In contrast, more humble jobs were found to benefit substantially from being done in small teams in offices close to home."

In order to ensure that people remote from the main office had comparable access to paper-based information, a need was identified for a remote document access system. To address this, MAC developed the MITRE Tele-

workstation, now in prototype form.

"The next stage involved identifying those organisations that might benefit by taking advantage of communications technology, so we approached the user organisations," explains Mr. Moller. "Each of them joined the project with specific questions in mind - the UK Benefits Agency, for example, wanted to validate the decentralisation of their information processing operations, simultaneously reducing their employees' commuting time and moving their services closer to their customers. What each employer got from the project, however, was much more than an answer to a specific question. Instead, it was a business plan pointing the way forward to a whole new organisational culture, where labour flexibility improves both company balance sheets and employee satisfaction. As a result, many of these organisations have launched their own

internal development projects to explore the possibilities further. The positive impact is unquestionable."

Business Plans

Perhaps the most significant result of the MITRE project, however, is the set of generic business plans, each developed for different teleworking scenarios. There is one to suit the many different needs identified by the user organisations, such as the multi-client neighbourhood office, the satellite office, telecommuting and the distributed office.

Several of these developments showed great promise, and are being developed in new projects, with assistance from the European Commission:

■ **COBRA:** Establishing the state of the art in business process re-engineering, of which teleworking will play an important part;

■ **COMBAT:** Setting up a central marketing organisation for a network of 'third party information processing service providers' (telephone-based helpline operators, order processors, etc);

■ **EVONET:** 'European Virtual Office Network': establishing a pan-European support structure to enable people to work anywhere in Europe as efficiently as they do at their desk. Such a system would enable organisations to set up sales networks on a 'variable cost' basis, without having to invest in salesrooms, office space or other expensive up-front costs.

■ **RECITE:** Developing a workable telematic infrastructure for construction companies who have won contracts outside their normal geographical area.

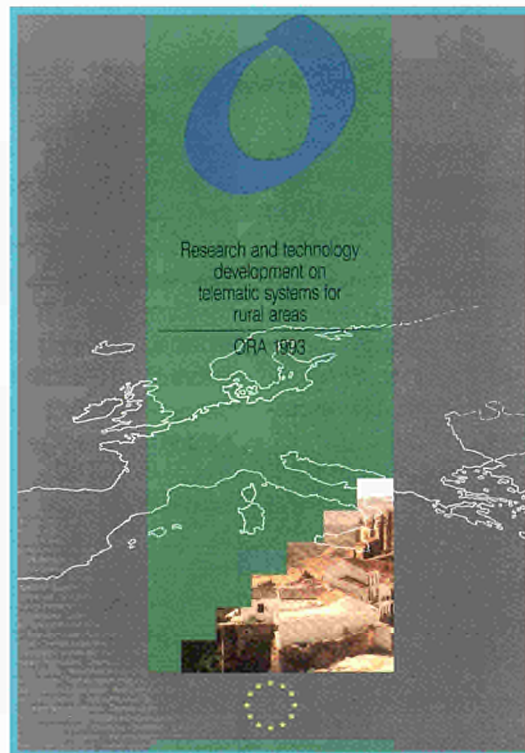
The findings of the MITRE project were published at a conference held in Cambridge in November 1993. The proceedings are available from HOP.

ORA: Opportunities for Rural Areas

Area 7 of "Telematic Systems of General Interest" (1990-1994). Has close links with certain projects in Area 2 (Telematics for Transport) and Area 4 (Flexible and Distance Learning), as well as with other Programmes involving rural area initiatives.

Aims:

- to develop a better understanding of the common needs and opportunities for telematic services, and of their impact on rural life;
- to establish a common understanding of network configuration requirements and options and of the requirements for telematic services;
- to prepare the way for the harmonised planning and introduction of telematic service infrastructures in rural areas.



ORA 1993: RTD on Telematic Systems for Rural Areas, includes programme overview, project summaries, key achievements, participating organisations and priorities for future R&D. Catalogue No: CD-77-92-255-EN-C.

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► CONFERENCES

EUROPEAN RESEARCH CONFERENCES: 1994 PROGRAMME

This short brochure lists the 40 conferences, many supported by the Human Capital and Mobility Programme, organised by the European Science Foundation, CNRS (the Jacques Monod Conferences), INSERM (the Philippe Laudat Conferences) and the European Mechanics Society (the EUROMECH Colloquia).

Subjects range from quantum optics to physical metallurgy. Some grants are available for young researchers, particularly from less favoured regions of Europe.

Contact: Josip Hendekovic, ESF.

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UNIVERSITY-ENTERPRISE INFORMATION SYSTEMS

15-16 September, 1994, Graz (Austria)

With the exchange of information between universities and enterprises becoming increasingly important, this conference, sponsored by the EC's COMETT programme, will:

- Identify what information universities and enterprises need regarding R&D and technology transfer;
- Present information systems and their potential for use in a European network;
- Exchange experience in computerised and conventional university-enterprise information management;
- Outline future aspects and trends.

Participants are expected to include information managers and brokers, patent agents and the developers of information hardware, software and services.

Contact: Franz Holzer, Industrial Liaison & Continuing Education,

Tel: +43 316 873 8395; Fax: +43 316 873 8397; Email: holzer@ausseinstitut.tu-graz.ac.at

HUMAN HEALTH AND ENVIRONMENT 25-30 September 1994, Parma (Italy)

Focuses on the development and use of biomarkers for risk assessment and management. There will also be workshops examining issues relevant to the use of biomarkers in biological monitoring and health surveillance of groups exposed to environmental pollutants.

This International Symposium will stimulate interdisciplinary exchanges between those involved in different areas of Occupational and Environmental Toxicology and Epidemiology who share a common interest in human health in the workplace and general environment.

Contact: C. Nolan, Environment Programme, Brussels,

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LIBRARY NETWORKING IN EUROPE 12-14 October 1994, Brussels (Belgium)

Organized by EFLC (European Foundation for Library Cooperation) with the support of the EC's LIBRARIES Programme, the conference is designed to help libraries make the best use of networks and other technical developments, and to share experiences in this field at a European level.

After a presentation from the LIBRARIES programme, some 30 experts will present their experiences in the areas of electronic publishing, new bibliographic services, OSI standards and multimedia. The LIBRARIES Programme will also present a 'Project Review', highlighting the impact and spin-offs from the programme and outlining the next Action Plan for libraries.

Contact: Ellen Pedersen, DG XIII/E-3,

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► COURSES

ENERGY SAVING IN BUILDINGS 3-7 October 1994, JRC, Ispra (Italy)

A course on the "Application of System Identification in Energy Saving in Building", run by the JRC Institute for Systems Engineering and Informatics, is intended for those involved in research and applications of thermal analysis of buildings and building components.

Participants will have the chance to present Case Studies and contributions to be discussed in the form of a workshop. The course will include:

- presentations of different modelling approaches to building energy flows;
- basic concepts of identification methods;
- various identification techniques used today;
- practical applications and measurement problems.

Contact: J J Bloem, JRC-Ispra,

Fax: +39 332 78 99 92.



The JRC site in Ispra, Northern Italy.

BRITE-EURAM II WORKSHOPS

The EC's Specific Programme for Industrial Technologies and Advanced Materials is running several workshops over the coming months:



GIFA, METEC '94 and THERMPROCESS '94

15-22 June 1994, Düsseldorf (Germany)

Contact: A Schweflinghaus,

Tel: +49 211 456 04 36;

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8th CIMTEC: INTERNATIONAL CONFERENCES ON MODERN MATERIALS AND TECHNOLOGIES

29 June - 4 July 1994,

Florence (Italy)

Contact: M P Vincenzini,

Tel: +39 546 66 41 43;

Fax: +39 546 66 41 38.

11th EUROPEAN CONFERENCE ON BIOMATERIALS

10-14 September, 1994,

Pisa (Italy)

Contact: Professor P Giusti,

Tel: +39 50 51 11 11;

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PLASMA SURFACE ENGINEERING '94

19-20 September 1994,

Garmisch-Partenkirchen

(Germany)

Contact: Professor Stals,

Tel: +32 11 26 88 26;

Fax: +32 11 26 88 99.

POLLUTEC '94 EXHIBITION

19-20 October 1994,

Lyon (France)

Contact: CNISF,

Tel: +33 1 47 13 66 88;

Fax: +33 1 47 89 82 50.

• HUMAN RESOURCES & TRAINING

Le Magazine.



The first issue of this large format, English-language magazine from the Task Force Human Resources, Education, Training and Youth has been published, replacing the various newsletters that accompanied the first generation of European programmes in this area.

Contact: Information Service, Task Force Human Resources, Rue Joseph II 37, 1049 Brussels, Fax: +32 2 295 0138.

• INFORMATION & COMMUNICATION TECHNOLOGIES

■ ICT Information Sources

Produced by DG XIII to assist users of Information and Communication Technologies (ICT) in their relations with the relevant Commission services, the Guide is updated and distributed at regular intervals. It provides an overview of the major sources of information on ICT policies and programmes, as well as a list of committees and working groups where

user interests are represented.

Contact: Michaela Wright, DG XIII-7, Fax: +32 2 296 9037

■ RACE 1994

Presents the achievements of the Communications Technologies (RACE) Programme until the end of 1993 and describes the activities planned for 1994. Covers project extensions and the new projects resulting from the additional call for proposals made in 1993, as well as descriptions of the programme's four 'concepts' (implementation, engineering, verification and collaboration).

The impact of the Programme's results to date is also presented, as are individual project summaries and detailed information on individual RACE II projects.

Contact: RACE Central Office, Tel: +32 2 296 3415; Fax: +32 2 295 0654.

■ Library Systems In Europe: A Directory and Guide

Produced by the LIBRARIES Programme and available from TSPL Ltd for £50, this guide aims to provide objective, quality information on library systems in use throughout the EU. Each entry provides:

- A functional outline, including a general overview and descriptions of all the main functions of library computer systems, cataloguing, circulation control, acquisitions, serials control and inter-library loans;

- Information provided by the supplier: language support, hardware and operating system, software, future developments, support and training, price, and the number of customers by country and type of

library.

Contact: TSPL Ltd, UK, Tel: +44 71 251 5522; Fax: +44 71 251 8318.

• INTERNATIONAL INNOVATION

'Six Countries' Programme

A new brochure and the first edition of a new bi-annual newsletter are now available from the Six Countries Programme, which includes 9 European countries and Canada. The Programme provides an international network and forum between experts and practitioners engaged in research on innovation and related public policies. There are currently almost 40 conference and workshop reports available.

Contact: Jeanine van der Voort, Six Countries Programme, Fax: +31 15 56 48 01.

• FOURTH FRAMEWORK PROGRAMME

Proceedings: ANRT Forum Debate

The forum and debate on the Fourth Framework Programme, held in Paris last November by the French Association Nationale de la Recherche Technique (ANRT), brought together representatives from a wide range of organisations and interest groups to discuss the future of RTD, particularly industrial research, in Europe. Presentations and open discussions covered the objectives and priorities of the Fourth Framework Programme and the issues it faces. Speakers included senior representatives of ANRT, the

NOTE

If specific contact information for obtaining a publication is not supplied, refer to the 'Quick Reference Guide' (ITT issue 1/94). Publications are free unless otherwise stated.

European Commission, the European Parliament's Commission for Energy, Research and Technology (CERT), the European Committee for Standardisation (CEN) and the Joint Research Centre (JRC).

Contact: ANRT, Service Europe, Tel: +33 1 47 04 47 57; Fax: +33 1 47 04 25 20.

► STOP PRESS

□ May 5: the European Parliament adopted twelve Specific Programmes: Telematics; Advanced communications technologies and services; Information technologies; Industrial and materials technologies; Measurement and testing; Marine sciences and technologies; Agriculture and fisheries; Non-nuclear energy; Non-nuclear research activities of the JRC; Targeted socio-economic research; Cooperation with third countries and international organisations; Stimulation of the training and the mobility of researchers. The first Calls for Proposals may therefore be as early as September 15.

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