JPRS-EST-91-023
14 NOVEMBER 1991

Foreign Broadcast Information Service 50 ANNIVERSARY 1941 - 1991

JPRS Report

Science & Technology

Europe
Economic Competitiveness

Science & Technology

Europe

Economic Competitiveness

JPRS-EST-91-023

CONTENTS

14 November 1991

WEST EUROPE

S&T POLICY

CORPORATE STRATEGIES

EAST-WEST RELATIONS

EUROPE-ASIA RELATIONS

S&T POLICY

EC'S Research Subsidies, JESSI Seen as Failures

92P6O001 Duesseldorf WIRTSCHAFTSWOCHE in German 6 Sep 91 pp 46-52

[Text] The promotion of research by Brussels has brought forth hardly any marketable products and is disadvantageous to medium-sized companies.

When the Hannen brewery in Moenchengladbach designed an energy-efficient heating unit for its southern building in 1984, oil was scarce and expensive. The European Community then subsidized the innovation of the long-time brewer with nearly 500,000 German marks [DM]. The heater for beer wort was ready almost five years later - and the oil price was again dropping. As a result, the presumed innovation hardly plays a role in the beer industry.

The case of the southern building is typical for EC research policy. The financiers in Brussels who are supposed to aid Europe's companies in the technological competition with Japan do produce a gain of much abstract knowledge, but they rarely achieve marketing successes. And it is particularly the large companies who profit from the almost incomprehensible confusion of EC technological subsidies. Medium-sized companies often are left without anything.

Between 1984 and 1990, the Brussels EC headquarters tripled its support for research to reach a total of DM3 billion per year. In 1991 the amount of subsidies is supposed to rise by another 20 percent.

These funds go into more and more new programs which often overlap. Within the framework of the EUREKA [European Research Coordination Agency] technological initiative alone, the European ministers of research and the EC Commission gave about DM3.6 billion from 1985 to 1990 to make the local computer and electronics companies competitive. At the same time, the EC granted the participants of the ESPRIT II [European Strategic Program for Research and Development in Information Technologies] program another DM3.3 billion from 1987 to 1991—with the same purpose.

These efforts have yielded little. The computer industry of the old continent is declining, the Europeans are hopelessly behind in microelectronics. Renowned companies such as Bull in France, Olivetti in Italy, or Siemens-Nixdorf Informationssysteme AG in Munich are in the red in computer production. The weakened Philips company has sold parts of its computer activities to the Digital Equipment Company (DEC) of the United States.

It is true that the European market for electronic computers is still 70 percent supplied by European products. But almost 60 percent of these products are manufactured by U.S.-owned companies such as IBM, Hewlett-Packard, or DEC. Japanese electronic companies control almost 90 percent of the world market for memory chips, whereas U.S. firms control about 80 percent of the world production of microprocessors.

The research subsidies from Brussels have made little from overseas. Philips has withdrawn from the change in the hegemony production of SRAM's [static random access memory], highly complex memory chips, and ended its participation in the EUREKA program of JESSI [Joint European Submicron Silicon Initiative]. Siemens prefers to develop the next generation of chips with IBM rather than with European partners.

Nevertheless, Brussels continues to subsidize briskly.In the spring, EC research ministers decided that in the third overall program of 1990 to 1994, a total of DM11.7 billion will go to European companies. The lion's share goes to information technology with DM2.9 billion to the ESPRIT research program. But the EC bureaucrats also will spend DM1.8 billion each for telecommunications and materials technology. Finally the EC is deeply involved in the EUREKA initiative, in which 19 European countries are participating.

But while the subsidy machines is operating at full tilt, the results of the previous research programs have not even been evaluated. It is true that about 45 percent of the ESPRIT companies state that they have developed new products with the money, and a fourth of them even claim cost savings. But the EC questionnaire says nothing about commercial successes or gains in the share of the market.

Likewise EUREKA: according to the results of a study of independent experts under the chairman of Wisse Dekker, chairman of the board of Philips, only ten of the roughly 400 projects turned out to be commercially viable. EC research programs have "hardly produced any marketable products", according to Frieder Meyer-Krahmer, head of the Fraunhofer Institute for Systems Technology and Innovation Research (ISI) in Karlsruhe.

The variety of subsides, from EUREKA, the EC, or national programs, leads to overlaps which companies can take advantage of. The HDTV standard for high-definition television is given over DM400 million in EUREKA project number 95. But also RACE, the EC program to develop broadband communications, subsidizes the new television technology under three budget items. One project serves the same participants as EUREKA.

Besides 12 EUREKA projects, laser technology is supported in the EC program of BRITE-EURAM [Industrial Technologies-Advanced Materials Program], which deals generally with new materials. There is also duplication in the promotion of computer-integrated manufacturing (CIM): EUREKA funds in the amount of about DM2.5 billion went into factory automation by the end of 1990; the CIM companies can also seek funds from Brussels since the EC has chosen factory automation as one of the five focal points of the ESPRIT program.

The thicket of subsidies has grown so dense that only experts can see through it. Many business consultants have already specialized in individual EC programs, such as the Arttic Consultants firm in Paris which helps European companies tap ESPRIT funds. Wolfgang Haeussler, a tax advisor in Kempten, has published a volume of information, 3000 pages long, which lists subsidy opportunities of the EC, and also the FRG federal and land governments.

The employees of large-scale research institutes or university institutes have turned out to be the shrewdest experts in the jungle of Brussels research. These scientists get certain research projects "financed 100 percent from outside sources," according to Hans-Gerd Servatius, a partner in the Roland Berger consulting firm.

Though the EC bureaucrats have been successfully accelerating the subsidy race, the results have been meager in terms of identifying technologies of the future. Servatius notes that the Brussels bodies have often "backed the wrong horse." An example is the advanced computer systems with so-called artificial intelligence (AI). Many software companies, large and small, received massive amounts of money from Brussels during the boom period for this supposed miracle technology in the 1980s.

Thus Bense KG in Coesfeld received over DM700,000 from ESPRIT. Along with partners from other EC countries—that is usually a requirement for the most program from Brussels—the software firm developed data bases whose content can be recalled very quickly by AI systems.

The programmers of the small technology firm took six years for the project. Meanwhile even the business manager, Hermann Bense, admits: "A lot of the initial euphoria has disappeared." Under the new name of expert systems, artificial intelligence is now one of the company's sidelines.

The example of numerically-controlled machine tools shows how companies can regain shares of the market without large subsidies by using the right technology. In the 198Os the branch not only maintained its international top position, it also increased the number of its electronics experts by a factor of ten. Gerhard Adler, head of business management for the Diebold Deutschland GmbH in Eschborn, gave credit to the "failure of the German computer industry." A large number of data processing and electronics experts moved to the machine tool industry, which now has mastered microelectronic system control and has held off the Japanese. The current difficulties of the machine tool industry in connection with the economic situation will not change much.

Guenther Vettermann, deputy chief business manager of the Association of German Machine and Installation Construction (VDMA) in Frankfurt, explains that the companies were "scarcely interested" in EC subsidies. Vettermann: "They would have to reveal their know-how to the European competitors."

Moreover, small and medium companies have hardly any chances of participating in EC programs as independent partners. Consultant Haeussler estimates the cost of an ESPRIT application to be about DM40,000. With a success rate of 20 percent, this sum is a "practically insurmountable obstacle" for medium firms, according to Haeussler. In addition, there is the extremely long period of up to two years between the first contact with Brussels up to the final assent from EC headquarters.

How difficult it is for medium-sized companies to obtain money from Brussels was learned by the PSI process control and information systems company in Berlin. Without any large companies in the consortium, "our ESPRIT application was practically doomed from the start, " says sales head Paul Soehnchen. PSI, along with seven partners of similar size, wanted to write computer programs for automated production technology. But the EC rejected the application of the Berlin company, 31O of whose 55O employees are shareholders (nickname in the industry: the EDP [electronic data processing] commune.) The nod was given to groups of companies who "handled themselves better on the Brussels scene," according to the PSI sales leader.

Large companies in particular know how to influence skillfully the Commission's procedures for making grants. It is true that an independent a body of EC experts decides on the individual applications. But the technology planners of big companies often consult with the Commission experts even before the projects are drawn up. Naturally, their bids are especially in keeping with the desires of Brussels.

If the large companies compete in rival consortia for the EC research contracts, it is not unusual for them to join forces before the final decision in order to coordinate their interests better. This happened in the case of the AIM subsidy program for medical computer technology, when two rival groups, including the renowned Draegerwerk in Luebeck, agreed on a consortium in time for the granting of the subsidy.

Numerous large companies have long established their own staffs for the race for the research millions. These staffs specialize entirely in subsidies. Siemens, for example, employs about 20 persons in a separate department to reconnoiter constantly the Brussels subsidy jungle. The Dtitch firm Philips and the French company Thomson have built up similar staffs.

It is a help to the big companies that the EC hardly uses standardized controlling procedure to "professionally examine" the research results, as Heinz Krings, head of the Research and Manufacturing Engineer Department of the Central Association of the Electrical and Electronic Industry (ZVEI) complains.

The subsidized companies often achieve success when they appear on the world market without EC support. For example, the AEG Elektrocom company in Konstanz, a subsidiary of AEG in Frankfurt, participated in an ESPRIT project which was supposed to improve the

ability of mail distribution systems to read letter addresses electronically. The ESPRIT bureaucracy proudly proclaimed that AEG thereby received a contract worth 300 million dollars from the American post office. In fact, the AEG subsidiary, a leader in the world market, has been supplying automatic distribution systems to post office worldwide for decades.

In laser technology too the best companies are subsidized. In this case, the following firms in particular are subsidized: Lambda Physik in Goettingen and Rofin-Sinar Laser GmbH, a Siemens subsidiary in Hamburg. Both firms rank very high in the world market and are nevertheless supported in the EUREKA project of Eurolaser. For Juergen Mueller, an industrial economist at the German Institute for Economic Research (DIW) in Berlin, European industrial policy therefore "benefits mainly the producers with strong lobbies."

However, the competitive firms gain market shares at the expense of foreign firms only when the foreign government remains completely passive in the face of domestic subsidies. If both Europeans and Japanese support their high tech branches, research subsidies soon deteriorate to a "zero-sum game," emphasizes ISI head Meyer-Krahmer. Everything would be better without subsidies, he says.

In any case, it would be more sensible to use the EC funds to improve the public infrastructure in research, such as computer networks between companies and research institutes, according to the renowned ESPRIT expert Gerhard W. Wittkaemper, who teaches political science at the University of Muenster.

Instead of that, the research strategists of the EC Commission, at the instigation of the relevant commissioner, EC Vice President Filippo Maria Pandolfi, are planning to expand further the instruments of industrial policy.

Pandolfi would like most of all to double the ESPRIT budget and would like to see a purely European cooperation in the production of mass memory chips. The research commissioner could even imagine a European chip factory which would be generously supported by the EC—there is talk of more than DM1 billion.

Judging from experience, one must doubt whether it is possible to attain the goal of the present EC subsidies: "to raise the competitiveness of European industry in comparison with the Japanese and Americans."

In any case, Diebold business manager Adler is not alone in his opinion that the current programs "have not fulfilled expectations." The only consolation for the research bureaucrats in Brussels: Many companies, Adler says, "have at least gotten to know each other in the eight years of EC support."

[Box, p 48]

JESSI: Withdrawal of the Giants

The JESSI (Joint European Submicron Silicon Initiative) research project will not bring about the great breakthrough for Europe's high technology industry. The DM8 billion program, part of the EUREKA European technological cooperation program, is supposed to break the predominance of the Japanese in microelectronics. But when the Europeans in 1996, after eight years of research, master the basic technology for the 64 megabit dynamic random access memory chip (DRAM), the Japanese will be already for some time selling products with these superchips. Last year Hitachi was already passing around laboratory samples of this type which can store the collected works of Shakespeare. Soon afterwards, several Japanese companies announced the mass production of the 64 megabit chips as early as the middle of the decade.

Since only the winners of the innovation race will be able to recoup their billions of investments for chip factories, it is doubtful whether after JESSI there will be even one European manufacturer for the 64 megabit memory chip. Therefore the enthusiasm of the Europeans for the chip initiative has already dropped considerably. As of 1992, the original 70 projects will be reduced and distributed among 17 flagships, as they are called in JESSI jargon. The European Community, a co-sponsor with 25 percent of the subsidies, has so far transferred just a third of the promised funds. According to the EC budget, it will remain at this level for the 1992-1994 period.

The companies involved are increasingly turning a cold shoulder to the ambitious European program as well. SGS-Thomson and Philips have to deal with profit problems. The difficulties of Philips have already brought an end to JESSI research in static memory chips (SRAM), for which almost DM400 million were budgeted. The alliance between Siemens and IBM, who will build a chip factory for 16 megabit components, further weakens JESSI, since both giants will presumably reduce their involvement in the research initiative. The French in particular view the transatlantic cooperation as an affront.

There is also irritation from the aggressive takeover policy of the Japanese in Europe. Every time a company is purchased, the Europeans quarrel with each other as to whether the Japanese subsidiary will be allowed to participate. The companies fear an uncontrolled flow of research results to the Far East. When Fujitsu swallowed up ICL, the British subsidiary of the Japanese semiconductor manufacturer was promptly kicked out of three of the five JESSI projects. But the Japanese do not allow themselves to be gotten rid of so quickly. They remain indirectly present in JESSI. For example, Philips continues to cooperate with Matsushita, and NEC has a fifteen percent interest in the Bull company of France.

A total of six countries are now participating in JESSI. Despite the uncertain prospects, German companies are

particularly active in applying for JESSI funds. They were clearly on top in 1992 with 32 percent of the proposals and DM200 million of the costs. The remainder of the roughly lOO participating firms are located in France, Great Britain, Belgium, and the Netherlands.

The Federal Ministry of Research, which grants another 25 percent to the German projects, has delayed payment. The reason is that the budget management under Heinz Riesenhuber is still preliminary. Moreover, the struggle of big industry and universities for subsidies has put Bonn in a tight spot. Too many German JESSI projects have been created. After the end of the planning period, the German share of the projects would be 42 percent. Research minister Heinz Riesenhuber must cut down these projects considerably.

Successes, Continuing Problems of EUREKA Evaluated

92WS0037A Paris MESSAGES in French Sep 91 pp 38-39

[Article by Yves Pus: "First Fruits of EUREKA"; first paragraph is MESSAGES introduction]

[Text] Let enterprises take the lead: With that as a guiding principle, more than 500 projects have been launched in the last five years under the aegis of the EUREKA [European Research Coordination Agency] European research program, an innovative program that gives Europe a chance to be on the cutting edge of progress, especially in HDTV [high-definition television]....

Ambitious was surely the right word to describe the EUREKA European research program when it was launched at France's initiative five years ago. Ambitious, but not presumptuous. Because the project has largely fulfilled its promise. Were he alive today, Archimedes, the scientist of antiquity who made famous that amazed triumphant cry, would stand gaping today at what the program has accomplished.

The 521 designated EUREKA projects make up a roster that Prevert, unlike Archimedes, would never have rejected. From HDTV to the JESSI [Joint European Silicon Semiconductor Initiative] project for electronic components, an airport baggage identification system, a vaccine for meningitis B, a waste water treatment process, and a truck that can be turned into a railroad car, EUREKA has left its imprint on everything. And its eclecticism has helped ensure its success. Because the 2,500 enterprises which to date have become involved with EUREKA—they run the gamut from PME's [small- and medium-sized enterprises] to multinationals—have given the projects now under way an unprecedented broad base in the European industrial landscape.

The essential idea of the EUREKA program can be summed up in one sentence: Let enterprises take the lead. Because statism is obsolete, even in Europe. In the face of worldwide competition, especially from the Japanese, it will take the closest cooperation and coordination between European enterprises and research centers to propel the Old Continent to global preeminence. Whence the idea of establishing a flexible, responsive structure to serve as a bridge between hitherto uncoordinated initiatives. No blind doling out of subsidies. Unlike Community programs based on project tenders and centralized financing, EUREKA's idea has been to promote industrial initiative, using public funds where necessary to supplement the financial contributions made by enterprises themselves.

"Matrimonial Bureau"

Altogether, current projects have mobilized investments of more than 80 billion French francs [Fr], about 30 percent of it from public funds. And though a few gigantic projects, guarded jealously by major industrial groups, have made off with the lion's share (Fr26.5 billion for JESSI, Fr5.2 billion for HDTV), small companies are also widely represented: In 1990, they accounted for 27 percent of the "designations." Nevertheless, this percentage was described as too low in an evaluation presented last June to the conference at The Hague, which brought the 19 member countries[1] of the EUREKA program together to commemorate its fifth anniversary.

Prepared by a Dutch expert, Wisse Dekker, the overall report gave high marks to Eand unbureaucratic" approach, while advocating broader government participation "to encourage manufacturers to identify strategic projects."

But not content with basking in satisfaction (however amply justified) at the program's achievements, Wisse DeUREKA for having "contributed to strengthening the competitiveness of European firms... by accelerating the introduction of new technologies and creating business opportunities." The report also lavished praise on the program's "bottom-up, decentralized kker pointed to several inadequacies. In relations with Community organs, for example. "It is true that relations between the EEC and EUREKA are at present poorly defined," sources at the Ministry of Research in Paris acknowledge. Though Brussels is quite willing to give its blessing to alliances between research teams, the same is not always true when it comes to industrial cooperation. One example of this negative attitude: Alcatel and Fiat had to wait many months to get Community approval for merging some of their activities, while the competition forged blithely ahead. Thus it is urgent to ensure better harmonization between the efforts of EUREKA promoters and the demands of the European Commission.

Another blot on its record: the extra-European liaisons of certain industrial groups, including some of the biggest. In the automobile industry, for example, where cooperation between Renault and Peugeot in the Prometheus "car of the future" project (Fr4 billion) was unhinged by

Renault's conclusion of an alliance with Japan's Mitsubishi via Volvo. A type of behavior that makes some observers fear that the EUREKA "matrimonial bureau," as Jean-Baptiste de Boissiere and Bertrand Warusfel have christened it in a recent book[2], will be reduced to officiating at "unconsummated marriages."

Eastward Opening

To the contrary, however, the accord on HDTV that was concluded (albeit just barely) on 18 June at The Hague demonstrates the effectiveness of the EUREKA program in certain areas. "If EUREKA had not put so much effort into HDTV, we would have a Japanese standard today!" claims Henri Guillaume, secretary general of the program. Granted, many problems—both political and technical—threatened HDTV's viability from the start. The primary apple of discord: introduction of the intermediate D2-Mac [Definition 2 Multiplexed Analog Component] standard, which is supposed to lead to the definitive HD-Mac standard. Two camps gradually emerged during the negotiations. On one side were France, the Netherlands and Germany, advocating more coercion to force the satellite operators to utilize the D2-Mac standard. On the other side were Great Britain, Luxembourg and Spain, anxious to protect operators now using the PAL [Phase Alternation Line] and Secam [Sequential Color and Memory] standards.

By formally adopting the HD-Mac standard as the "future European standard," the 19 EUREKA partners finally succeeded in overcoming their differences. And even though they lacked the authority to legislate standards—a task which belongs to the Community organs—their "Declaration of The Hague" will carry considerable weight in the European audiovisual landscape. At all events, so believes Hubert Curien, France's minister of research: "Now that the 16:9 format is accepted, it means we're going with D2-Mac," a visibly pleased Curien said the day after the accord was signed.

But the future of EUREKA and European science and industry as a whole cannot depend exclusively on the television of the future or a handful of other projects like JESSI and Prometheus. The future of EUREKA rests on a greater Europe, the Europe that General de Gaulle envisioned as extending "from the Atlantic to the Urals." Only such a Europe will be able to hold its own against the American and Japanese economic armadas. Francois Mitterrand—the man who first proposed the EUREKA program, at the 1982 Versailles summit—understands this very clearly. "The creation of the European continent, that is what I hope will be the next stage," he declared in his 18 June speech at The Hague. And that goal is already being translated into action: Out of the 120 new projects[3] adopted at the conference, no less than nine involve the USSR, Hungary, and Yugoslavia.

The "EUREKA method" thus seems to be bearing fruit, even if "the Japanese are still advancing faster than the Europeans," as most conference participants at The Hague admitted. Mixing pragmatism with a rejection of die-hard interventionism, it seems well suited to pulling the Old Continent out of the defeatist mind-set into which it was wont to relapse. But to conclude on that basis that this method could also be applied in the political domain requires a leap... that some are actually prepared to take! Such as Jean-Baptiste de Boissiere, who finds in it "an echo of the idea of European confederation propounded last year in Prague by the president."

Footnotes

1. The 18 founding members (the "Twelve of the EEC plus Austria, Finland, Norway, Sweden, Switzerland, and Turkey), and Ireland, which joined in 1986.

2. "La Nouvelle Frontiere de la Technologie europeene" [The New Frontier of European Technology], Calmann-Levy, 363 pages, Fr140 (see MESSAGES No. 405).

3. Of these 120 projects, France is participating in 28.

EC Companies Consider Network Link-Up

92WS0051F Chichester INTERNATIONAL TELECOMMUNICATIONS INTELLIGENCE in English 30 Sep 91 p 3

[Article: "European Computer Companies To Study Network Link-Up"]

[Text] Later this year, three of the largest European computer companies plan to present a joint proposal to the European Community Commission to establish a "European nervous system" linking computer systems throughout the region.

The companies—Germany's Siemens-Nixdorf Informationssysteme AG, France's Groupe Bull and Italy's Ing. C. Olivetti & Company—recently signed a preliminary agreement to work together on the project, adding that they expect to come to a more formal arrangement over the next few months.

Funding for the project is uncertain, with the EC Commission approving the idea, but as yet, not committing any funds for implementing such a system. Reports suggest that several EC members, including the UK, have opposed financing, arguing that investments should come from national governments, or from the companies themselves.

Other companies reported to be planning to submit proposals include UK-based ICL Ltd, which is owned by Japan's Fujitsu, and International Business Machines Corporation of the United States.

Priorities of ESPRIT Program Noted

91AN0537 Amsterdam COMPUTERWORLD in Dutch 21 Aug 91 pp 7-8

[Article: "ESPRIT Focuses on 'Post-RISC' Microprocessor"]

[Text] An 65 million European currency unit [ECU] budget was allocated to the "Open Microprocessor Initiative" (OMI) within the scope of European Strategic Program for Research and Development in Information Technologies (ESPRIT). The aim of this project is to develop a range of "post-RISC" [Reduced Instruction Set] microprocessors. According to project leader R. Zobel, the importance of OMI should not be underestimated: "At this moment, Europe depends on non-European microprocessors for 80 percent and this percentage could increase to 100 percent over the next few years," he says.

This considerable dependence has a negative effect on the trade balance, on the prices of European microprocessor-based products (the dollar went up 25 percent in a matter of a few weeks), and on the speed at which these products can be launched, because European manufacturers cannot acquire the latest microprocessors as fast as their American counterparts. According to Zobel, "Japan, too, is concerned about its dependence on the United States and is experimenting with several new hardware and software environments. The TRON operating system is just one example.

"In Europe, very little is being done. The Inmos transputer microprocessor is probably the only positive development: As much as 40 percent of the transputer production is exported."

Zobel points out that the 32-bit microprocessor market as a whole grew quite rapidly, but the embedded systems segment is at present growing faster than the traditional segment of PC's and workstations. "It is extremely important that OMI develop products for both segments. In addition, the existing hardware base should be taken into account, which means that applications should be portable. The concept of Virtual Binary Interface is essential in this respect."

According to Zobel, it is too late now to develop products for the 32-bit microprocessor or RISC microprocessor market: "We shall have to concentrate on the post-RISC era."

New Phase of ESPRIT

As far as the ESPRIT program itself is concerned, Jean-Marie Cadiou, director of the program, thinks that all political obstacles have been cleared and that the new phase of ESPRIT will be officially approved next week.

The proposal which is now under discussion (and which is unlikely to be changed) involves a total budget of ECU875 million (about 2,030 million guilders) to be distributed among six research areas: microelectronics (ECU235 million), software development (ECU203 million), computer peripherals (ECU138 million), computer-assisted design and manufacturing (ECU154 million), basic research (ECU80 million), and the development of a European microprocessor (ECU65 million).

Cadiou emphasized the importance of the peripherals project: "At present, considerable progress is made in the area of flat screens. This is a very welcome development, since it was high time for Europe to manifest itself in this market."

It is remarkable that there is hardly any trace of two projects which were announced a few weeks ago with great fanfare: the European Systems and Software Initiative (ESSI) and the European initiative for the development of a supercomputer. In this respect, Director Jean-Marie Cadiou declared that "both projects involve much more than merely research and development and will therefore be the subject of separate negotiations."

Cadiou criticized the European computer industry. "We demand that the consortia of companies submitting requests for R&D subsidies be smaller and more transparent. From now on, the composition of the consortia will be thoroughly examined. We also demand that future users be involved more directly in the different projects, so that users can assess the products in advance. But our main demand is that participating companies commit themselves unambiguously to commercialize the project results. As a matter of fact, we adapted the selection criteria for the approval of proposals in such a way, that each proposal must now contain a commercial operating plan. The European Community will continue to do what it has always done, i.e., create an economically favorable climate for European companies. But it is obvious that the companies themselves must also make an active contribution."

Budgets, Goals of RACE II Program Outlined

91AN0536 Amsterdam COMPUTERWORLD in Dutch 21 Aug 91 pp 7-8

[Article: "One-Quarter of RACE II Budget Allocated To Concrete Application Projects; Emphasis Mainly on Participation by Major Users"]

[Text] The European Parliament officially approved the second and most recent phase of the Research and Development in Advanced Communications Technologies in Europe (RACE) program. In fact, the budget consists of two parts: 490 million European currency units [ECU] (1.137 billion Dutch guilders) for RACE II and ECU380 million (882 billion guilders) for the related "Telematics" program. In both programs, the emphasis is on the active participation by major users in pilot application projects. The goal of RACE, like that of the European Strategic Program for Research and Development in Information Technologies (ESPRIT), is to promote cooperative, precompetitive, and prenormative research. RACE, however, is characterized by a higher

degree of integration and its final objective—to prepare the introduction in Europe of sophisticated communications systems by 1995—is more clearly defined.

In this second stage, the European Commission has more clearly delineated the differences between both programs. "We deliberately tried to separate the research fields of the ESPRIT and RACE programs, in order to avoid funds being requested from both programs for basically the same work. However, a certain overlap is inevitable, e.g., in the field of micro and optoelectronics," says Peter Johnston, planning assistant for RACE. Certain companies, such as Philips and Siemens, develop both computer and telecommunications products and participate in ESPRIT as well as in RACE.

The call for proposals was published last month. Proposals must be submitted by 16 December. The Commission will then assess and select the proposals, so that the new contracts can be assigned before the end of the year and that the actual work can begin in January 1992. This means that RACE is approximately one month ahead of the ESPRIT program.

The main characteristic of phase II will be its strong emphasis on practical experiments in commercial companies. According to Peter Johnston, one-fourth of the overall budget will be spent on pilot application projects, in which large companies will experiment with newly developed communications systems.

"As far as user participation is concerned, we are doing better than ESPRIT. Large companies from different sectors—such as banks, manufacturers, and insurance companies—will participate in practice-based projects which will provide us with a great deal of valuable information on the new systems."

Johnston says that the application projects are also open to smaller companies, but he expects that most of the participants will be large companies: "They will experiment with a generation of products which will be widely commercialized within only a few years. This requires an important in-house expertise, a sense of adventure, and a thorough knowledge of local network and computer-aided design (CAD) technologies. In addition, these projects are far from cheap. It must be observed that only the actual R&D expenses are 50 percent subsidized by the Commission."

The European Parliament did not only approve the RACE program, but also the related "Telematics" program. Telematics has a budget of ECU380 million at its disposal, subdivided into seven research areas: administration (ECU41.3 million), transport (ECU124.4 million), health care (ECU97 million), remote education (ECU54.5 million), libraries (ECU22.5 million), linguistics (ECU22.5 million), and rural areas (ECU14 million).

Legally, Telematics is a separate program, resulting from separate decisions of the Parliament, but in practice it is managed by the same team which is also responsible for RACE. Both programs are therefore very closely related.

"Telematics will be run almost exclusively by users. Naturally, small- and medium-sized companies are also welcome," says Johnston.

RACE II will primarily focus on intelligent networks, mobile personal communications and the combined transmission of data and images.

In addition, a significant part of the budget is allocated to the extension of two research areas which were already dealt with during the first phase: the integration of voice and data and the security aspect.

The companies which participate in RACE II are roughly the same as those participating in the first phase: all PTT's, all manufacturers of telecommunications equipment, several major users, and a number of value-added telecommunications services suppliers. It is likely that some smaller companies specializing in security systems and voice/data integration will also contribute to RACE II.

Two non-European companies, IBM and AT&T, participated in the first phase. Since 1988, when RACE was first launched, the situation has changed in that Japanese telecommunications companies have now also established plants in Europe which have their own research facilities. It is therefore expected that Japanese companies will also participate in the second phase. They are "very welcome," says P. Johnston.

EC Commission Approves Spanish R&D Projects

91WS0539B Brussels XIII MAGAZINE (News Review supplement) in English No 2, 1991 p 21

[Article: "Commission Approves Spanish Technology Programme"]

[Text] The Commission has cleared a Spanish technological action plan comprising seven state subsidy projects with a budget of 450 million European currency units [ECU] covering the period 1991-1993.

The programmes are aimed at funding research and development projects, improving workforce training and research infrastructure, protecting industrial property, and public awareness and information campaigns.

Special emphasis will be placed on the electronics and information technology sectors (Pein III plan), pharmaceuticals (Pharma plan), biotechnology, advanced chemistry and new materials (BQM plan) and basic and processing sectors (SBT plan). Subsidies can cover up to 25% of costs for applied research or development projects and up to 50% of costs for basic industrial research, demands for patents and the definition phases of national and international research.

A maximum of 70% of training costs can qualify for subsidies.

Finland: Universities Experiencing "Brain Drain" of Researchers

92WS0020A Helsinki HELSINGIN SANOMAT in Finnish 24 Aug 91 pp 36-39

[Article by Anu Nousiainen: "Researchers Fleeing the Country"; first paragraph is HELSINGIN SANOMAT introduction]

[Text] After 10 years funds for research are getting to be difficult to obtain again. If the government runs out of money for it, we will once again be threatened with the brain drain that had for a while let up, and the first to leave will be the best of the lot.

The brain drain, or emigration of Finnish research scientists, was at its height in the late 1970's. Exasperated with the lack of funds and positions, young scientists left for the West one after another. Most of them left Finland quietly, but a couple of noisy cases brought the brain drain to the attention of the public.

Many of those who left 20 years ago have never returned. They have been remarkably successful: Cancer researcher Erkki Ruoslahti heads the La Jolla Cancer Institute in California, cytologist Ari Helenius is a professor at Yale University in America, his colleague, Kai Simons, is working at the European Molecular Biolgoy Laboratory in Germany, xylitol researcher Kauko Makinen holds a professorship at the University of Michigan, philosopher Jaakko Hintikka is a professor at Florida State University, and so on and on.

There is a whole flock of Finns in Sweden: Ralf Pettersson heads the Ludwig Institute in Stockholm, which specializes in cancer research, Anssi Saura is a professor of genetics in Uumaja, Henrik Garoff is a professor, and Peter Liljestrom an assistant professor at the Karolinska Institute in Stockholm, Tapio Palva is a professor at Usala Agriculture University,....

Biosciences researchers Kai Simons, Ari Helenius, and Henrik Garoff left for the European Molecular Biology Laboratory (EMBL) in Heidelberg, Germany, in 1975. They had planned to go for only three years and continue their work afterward in Finland. When the time came to return, the situation in their homeland appeared to be hopeless: There was no money.

"Something very serious is happening in Finland. We're beginning to lag even farther behind other countries," Kai Simons expressed concern in HELSINGIN SANOMAT in 1979. He had had enough of the shortage of funds, resigned from the post of professor of biochemistry at the University of Helsinki that he had just obtained, and decided to remain in Germany.

Now, 11 years later, Kai Simons is working at the top of his field. The EMBL is one of the most important cytology research centers in the world.

"Decisions are always reached too late in Finland," Simons said over the phone from his laboratory in Heidelberg.

"The funds become available only when the researcher has alreadyreceived an offer from abroad and signed a contract. Basic research should be international, but it's not a good thing from Finland's standpoint if the best people leave the country.

"The brain drain in the late 1970's was striking. Nevertheless, no one did anything about it.

"It's very hard for me to give up my present post and return. It's too late now," Simons said. He is still a Finnish citizen.

After the gloomy 1970's, the brain drain was a sporadic affair. The most famous instance in the 1980's took place in the early spring of 1986. Prof. Tapio Palva left the University of Helsinki Genetics Institute with his six research associates for Upsala.

Sweden literally bought up these Finnish scientists who were working on plants' tolerance of cold growing conditions. While the University of Helsinki provided cramped quarters and obsolete equipment, Upsala Agriculture University invested nearly 10 million kronor in its research team. The frozen stocks of plants that formed the basis of their research were shipped across the Gulf [of Bothnia] on a Swedish ship.

With the exception of the departure of Palva's team, the 1980's went well in Finland. The government annually increased funding for research. Politicians reassured [the public] and the atmosphere was a favorable one. Young people ventured to become research scientists; they relied on funding.

Their hopes were dashed with cold water last February. The government cut appropriations for the Finnish Academy amounting to 445 million by 15 million markkas. The decision to economize startled scientists. Fifteen million is small change in a national budget of 150 billion markkas, but in the day-to-day reality of the Academy it is the equivalent of the annual salaries of about 65 researchers.

According to Academy estimates, this year's national budget for research is the worst since the 1970's. At the Academy they have calculated that this is the first time that appropriations for research in Finland have grown less than state expenditures on the average. The Academy's own funds have not increased at all.

"The decision to economize may mean that the brain drain problem will be recreated," Academy research director Elisabeth Helander said.

"The national budget has an effect on the atmosphere. It either produces optimism or pessimism. it would be important for us to preserve a positive atmosphere."

The scientific community is nervously awaiting news of the government's budget for next year. The government meets next week to debate the budget. The Finance Ministry has announced that it will try to handle funds for research and product development with greater consideration than for other sectors so that their development can at least to some extent be assured.

"Funding for research must not be by fits and starts; it must be developed steadily. Bouncing funding back and forth in accordance with the economic situation of the moment drives people away from their research careers," Elisabeth Helander said.

Scientific research is a long-term affair. There cannot be interruptions, rather developments in one's field must be unflaggingly followed. A scientist cannot switch to other tasks during a recession while waiting for better times and then go back to being a researcher when things are going well for the state again. An economic recession would be an ideal time to persuade young people to stay in universities to complete their doctoral exams. During good times companies buy young people who want to compete by offering them higher wages. Now, when things are going badly for the economy, the universities would have their chance.

Administered by the Ministry of Education, the Finnish Academy provides funds mainly for basic research. Basic research produces knowledge that can in time be of use in applied research and product development.

The Academy provides funds mainly for basic research in the natural and technological sciences, but research in the humanities and social sciences also depends on it. Many projects supported by the Academy are in preparation for the doctorate.

Aside from the Academy, the Technology Development Center, TEKES, among others, competes for state research funds. TEKES provides twice as much money as the Academy and the bulk of it is allocated to companies for product development.

The government allocated a sum of money that is over a fifth of the Academy's research appropriations to Tekes for space research activities alone this year.

The Academy accounts for less than a tenth of the government's expenditures for research. The government's own research institutes spend over three times as much: The government annually allocates hundreds of millions to the VTT [State Technical Research Center], the Agricultural Research Center, and the Forest Research Institute, for example.

Although funding for basic research increased throughout the 1980's, it clearly lagged behind funding for applied research that benefits industry. Between 1970 and 1987 appropriations for applied research in the technological sciences nearly octupled in the national budget. During the same period appropriations for basic research only doubled.

Finland funds comparatively less research than, for example, Sweden, the United States, France, Great Britain, or Switzerland. In Finland expenditures for research account for a smaller percentage of the gross national product (GNP), less than 2 percent, than in the leading industrial countries. Still trailing behind Finland among the Western countries are Denmark, Canada, and Austria.

The State Science and Technical Board has set itself the goal of 2.7 percent as its share of the GNP by 1997. This will require the government to continuously allocate more money for research. At the same time the quality of research would have to be improved.

It is impossible to say exactly how many Finnish scientists remain abroad. The brain drain is not a problem of quantity, but of quality: Only the best of them are offered the chance to leave.

Why worry about scientists who emigrate? No one was alaarmed when conductor Esa-Pekka Salonen was appointed chief conductor of the Los Angeles Philharmonic. Nor do people feel that she was stolen from us when Karita Mattila gives brilliant performances at the New York Metropolitan or the Vienna State Opera. Finland cheered when ice hockey player Jari Kurri decided to return to the United States from Italy along with Wayne Gretzky.

A researcher who leaves Finland to work abroad is regarded as a traitor. No one speaks of a cultural product when a researcher packs his bags and bacteria cultures and leaves the country. Brain drain [literally: exporting of brains] is an ugly term. It maliciously indicates that brains are a raw material that wealthy countries manage to steal from poor ones. Associated with this is also the fear that something of value—knowledge and know-whow—leaks out along with the scientists.

"The fact that researchers emigrate is to a certain extent inherent in the nature of research. A brain drain is troublesome when great waves [of researchers] or really top people leave the country," Academy research director Elisabeth Helander said.

"It is intellectually troublesome if a country loses its best talents. Another cause for concern is the money. The society suffers financial losses when holders of doctorates, educated at great expense to us, emigrate."

Since science is international, Finns have to go abroad for at least a certain amount of time in order to succeed. National self-sufficiency may be a bigger problem for Finnish science than the harm done by internationalism. Things only go wrong when researchers, frustrated and bitter, leave in the face of necessity.

In Helander's opinion, the nearly nonexistent importation of brains is a bigger problem than the exportation of brains. The scales are seesawing in sharp imbalance: Just the opposite from the situation with Finland's foreign

trade in general, the importing of brains does not even begin to be enough to balance their exporting.

This spring, when Soviet physicist Ludvig Fadeyev accepted a 4-year part-time research professorship at the University of Helsinki, the fact was the occasion for an exceptionally sensational news item. Up to now, it has been extremely difficult to attract foreign scientists to Finland.

The brain drain is not only a question of resources. A researcher's career is uncertain and young people's salaries in particular are low.

A plug [blocking advancement] has formed behind professors and assistant professors: Many research assistant's positions are held by candidates who have defended their doctoral theses, even though a five-year research assistant's post is intended for those who are working on their master's or doctor's theses.

The average age of university research assistants is now between 34 and 38. If the number of posts is not increased, we may expect the rejuvenation operation to go on indefinitely.

In Elisabeth Helander's opinion, a clearcut field for researchers has not been created in Finland. "Mid-level posts are lacking in our universities. Institutes have professors and research assistants, but there are few people between them."

"It's extremely difficult for a researcher to get a permanent position here in Finland. There's no security in a three-year appointment when you're from 40 to 50 years old, have a family to provide for, children and responsibility, and you don't know how things will be three years from now," Helander said.

Passing the doctorate exams ought to be only the beginning of a career as a researcher, but in Finland one defends one's thesis at the age of 36 on the average, nearly 10 years too late. The average age of those who obtain the doctor's degree has only risen during the past 10 to 15 years.

A researcher's profession is just as uncertain as, say, an artist'sprofession. Since there are no positions, hundreds of researchers are employed with the aid of grants or under fixed-term contracts.

There is heavy competition for the Academy's at the most three-year research positions. Fifteen candidates with doctor's degrees may apply for one junior researcher position.

The low level of research assistants' salaries is even lower than that of nurses' salaries, for example. Last year research assistants' average gross salary was about 9,000 markkas.

The State Labor Market Institute has followed the evolution of the nominal wages for 80 positions in the 1980's. Research assistants ranked 77th in the comparison and chief research assistants 79th. Only road-maintenance contractors' wages rose more slowly than their wages.

"Research assistants' salaries are a time bomb. How will universities soon be getting qualified researchers and teachers if their salaries are not even close to being competitive?" Klaus Sundback, the general director of the University Research Assistants and Researchers Association, wondered.

Lecturer Dennis Bamford, a researcher from Jarvenpaa, has stubbornly stayed on in Finland, even though one colleague after another has cleaned out his desk and moved to another country. Bamford heads a 10-man research team at the University of Helsinki Genetics Institute.

He has been working there for 10 years with the aid of Academy funding, 3 years at a time. Now 42, he has received a five-year appointment as head of research at the Biotechnology Institute.

"In a certain sense there can be no social security in science. It is, however, absurd to suppose that young people will start out on a career as a researcher if not even the good results they may produce guarantee their continued employment," Bamford said.

"In science the allocation of funds should be based on qualitative competition. Then the researcher could rely on the fact that, if he is successful in his work, he will receive the money to go on with it."

France, China Plan Increased R&D Cooperation

91WS0540B Paris LE MONDE in French 3 Sep 91 p 30

[Article by Beijing correspondent Francis Deron: "Research Minister Visits Beijing: Mr. Curien Wishes To Intensify Scientific Cooperation Between France and China"; first paragraph is LE MONDE introduction]

[Text] During a visit to Beijing, which began on Thursday 29 August and, on Sunday 1 September, continued in Shangai and the Canton province, Mr. Hubert Curien, the French minister of research and technology, reviewed with Chinese officials the scientific cooperation between the two countries, a cooperation that was reduced to a bare minimum following the 1989 crisis and is now hampered by budget restrictions.

Chinese scientific circles felt somewhat victimized by the 1989 "freeze," and not without reason: Some Parisian departments seemed to have become excessively eager to use retaliation against political repression as a pretext for budget cuts, and they drastically reduced cooperation projects that had maintained a flow of exchanges promoting the opening up of China. Last June, another budget freeze was decided in France,

reducing the budget allocated to China (18 million francs [Fr]) to its 1982 level in constant francs.

Should France resume its scientific cooperation with the People's Republic of China? Mr. Curien strongly believes it should, and his hosts strived to put their best foot forward to help him do so. His counterpart, Mr. Song Jian, had warm praise, naturally devoid of any ideology, for the resumption of these exchanges on a scale "larger than during the eighties." A meeting of the French-Chinese science and technology commission, scheduled to take place before the end of the year, will identify the projects that need completing.

However, Mr. Curien indicated in substance, some refocusing is required to achieve greater "efficiency" and to better ally the joint efforts of basic research and industrial cooperation. The minister also pointed out to his Chinese partners the need to arrive at an agreement on intellectual property, failing which scientific cooperation would be restricted to "second rate" projects, something of which the Chinese now seem to be more aware than in the past.

Agreement With Ocean Institute

The sectors in which the two countries are especially eager to intensify their cooperation include biotechnology and various agriculture-related disciplines, research on the Himalayas, the environment (a recent concern in China) as well as—cautiously on the French side—new materials and submarine acoustics. A cooperation agreement between IFREMER (French Institute for Research on Exploitation of the Ocean) and the Chinese government department of the ocean was signed at the time of Mr. Curien's visit.

At the request of French intellectuals and scientists, Mr. Curien informed the most political of his Chinese partners of the emotion aroused in France by the treatment inflicted in prison on the journalists Wang Juntao and Chen Ziming. Mr. Wu answered that this did not fall with the competence of either minister but, being a clever diplomat, he agreed that, between friends, these things had to be said.

France: 1992 Research Budget Up 7.4 Percent

92WS0005A Paris AFP SCIENCES in French 19 Sep 91 p 1

[Article: "Over 59 Billion Francs for Research Next Year"]

[Text] Paris—A 1992 research budget of 59.1 billion francs [Fr], according to the figures released as of 18 September by the Ministry of Economy, Finance, and the Budget, confirms the primacy the government continues to assign to this sector of the economy.

This total represents a budget increase of 7.4 percent, which the minister, Mr. Hubert Curien, considers satisfactory. Minister Curien is expected to hold a press conference on the budget on 24 September.

Included in this total are Fr51.1 billion for the Civil Research and Development Budget [BCRD]—which "for the first time" will top the Fr50 billion mark—plus Fr4 billion in research subsidies channeled through the European Community budget, and provision for depreciation allowed under the current research tax credit policy (Fr4 billion), according to the Ministry.

The emphasis is on three main overall objecties: a strengthening of public-sector research; increasing the outlay on industrial research; and continuation of the major technological programs (space, aeronautics, and nuclear).

Besides increasing the outlays to research organizations and university research, this budget provides for the creation of 600 additional jobs and 450 allocations to research, and devotes Fr350 million to the enhancement of career opportunities.

Incentive credits for industrial research are increased by 16 percent, while direct subsidies are upped by 10.1 percent. Allocations to major electronics programs, such as HDTV [high-definition television], Eureka, etc, are increased by 16.4 percent, and grants to the PME/PMI [Small- and Medium-Sized Business/Small- and Medium-Sized Industry] sector, via the National Agency for Valorization of Research [ANVAR], by 21.2 percent.

To continue the major technological programs, a total of Fr8.559 billion (up 7.9 percent) is being allocated to the National Center for Space Studies [CNES]. This will enable the continuation of construction work on the Ariane-5 rocket, which is scheduled for completion around 1995 (Fr2.195 billion in 1992); continued allocations to the other two European Space Agency [ESA] programs (Hermes and Columbus, and the earth observation satellites); and funding of the domestic SPOT program.

The Atomic Energy Commission [CEA] general expense budget will be increased by Fr159 million, and the necessary funds provided to support the Airbus A330-340, Falcon 2000, and Arriel 2 helicopter motor aeronautical programs, etc...

French Research Minister Reports Increased Budget for 1992

92WS0036B Paris LE MONDE in French 26 Sep 91 p 16

[Article by Catherine Vincent: "With a Draft Budget Increased by 7 Percent, Research Is Confirmed as a 'Top Priority'"; first paragraph is LE MONDE introduction]

[Text] With a draft budget of 51.1 billion francs [Fr] for 1992, a 7 percent increase over 1991, the civil research

and technological development sector is confirmed as a "top priority" in the allocation of State credits which, as a whole, should increase by a little under 3 percent in 1992 (LE MONDE, 26 July). According to the estimates presented Tuesday, 24 September, by Mr. Hubert Curien, minister of research and technology, 1992 R&D expenditures should represent 2.44 percent of the gross domestic product (GDP), compared with 2.41 percent in 1991. France thus still ranks fourth for its research effort, behind the United States, Germany and Japan.

"By holding the course set in previous budgets, in a difficult international and economic environment, the increase in the BCRD (civilian budget for research and technological development) confirms that research is one of the government's main priorities," Mr. Curien stated. Certainly, the 7-percent increase announced by the ministry for 1992 is in line with the 1989 (7.6 percent) and 1990 (7.1 percent) increases, and with the expected 1991 budget increase (7.3 percent).

However, it disregards the budget guidelines of 10 March 1991, which caused the BCRD to be reduced from Fr48.67 billion to Fr47.7 billion. Actually, based on the 1991 budget, which was cut by nearly Fr1 billion, the actual increase of the 1992 BCRD is 7 percent, but based on last year's initial budget it is only 5 percent.

With 55 percent of it (Fr28 billion) allocated by the Ministry of Research, the budget covers three sectors: Fr27,9 billion are allocated to public institutions and academic research, i.e. an increase of 8.5 percent (+9 percent for current salary and wage expenditures; +5.5 percent for program support and laboratory operation; +9.7 percent for other investment expenditures); Fr17.1 billion (+1.9 percent) for large technological (space, nuclear, aeronautical) programs; and Fr6.1 billion (+15.7 percent) for industrial research.

Fulfilling European Commitments

Thus, intervention credits for industrial research show a considerable increase over 1991 (+9.6 percent). "Despite the fact that companies have increased their efforts by about 10 percent per year, the amounts they spend to finance research expenditures are still inadequate," Mr. Curien indicated.

The reinforcement of incentives, in particular to fulfill "commitments in connection with electronic programs" (high-definition television, European Eureka program) is largely geared to small and mid-size businesses and industries through the National Agency for the Implementation of Research (ANVAR), whose credits were increased by 21 percent, to Fr1.14 billion. This trend is also confirmed by the research tax credit, which is estimated at Fr4.5 billion for 1992 (+9.7 percent) and should benefit 8,800 firms, i.e., 800 more than in 1991.

Space First

By comparison, the increase granted to large technological programs is marked by continuity. Amounting to Fr6.273 billion (Fr6.254 billion in 1991), the budget allocated to the Atomic Energy Commission (CEA) remains the same, with a slight decrease in constant francs. The Fr8.6 billion allocated to the National Center for Space Studies (CNES), computed as closely as possible to cover the domestic and European requirements of the space program, is increased by 8 percent (+13 percent in 1991). The credits allocated to the civil aeronautical industry (Fr2.29 billion; -12.7 percent) essentially provide continued support for current programs (Airbus A.330/340) and for the programs launched in 1991 (Falcon 2000, Ariel-2 helicopter engine).

Of the Fr27.9 billion allocated to public institutions and academic research, the National Center for Scientific Research (CNRS) will receive Fr11.852 billion (+8.1 percent), the National Agronomic Research Institute (INRA) Fr2.908 billion (+9.2 percent), and the National Health and Medical Research Institute (INSERM) Fr2.156 billion (+8.5 percent). In all scientific and technical public institutions, the policy of boosting scientific employment will be continued, with the creation of 600 new jobs, one half for researchers, the other half for engineers, technicians and administrative personnel.

Assessing the evolution of research credits for each main objective during the past four years, Mr. Curien recalled that his budget resources, excluding industrial research, had increased from Fr35.6 billion in 1988 to Fr45 billion in 1992, i.e., an overall increase of 26.3 percent. The main beneficiary was the space program (+56.7 percent), mostly for the development of the Ariane-5 launcher, the new ERS-2 (Earth-observation satellite) and DRTM (telecommunications between the orbital infrastructure and the ground) programs, and the preparatory stage of the European Hermes and Columbus program.

Meanwhile, basic research as a whole, academic research, and large scientific facilities saw their budgets increase by 27.3 percent. Research related to health (+35.8 percent) and agriculture (+31.3 percent) was increased by priority, at the expense of industrial technologies (+5.1 percent) and energy (-8.7 percent).

France: Private Sector R&D Growth Reported for 1989

92WS0002B Paris AFP SCIENCES in French 12 Sep 91 pp 3, 4

[Article: "Eight Percent Growth of Research in Enterprises in 1989"]

[Text] Paris—The volume of expenditures for research and development (R&D) in enterprises rose by 8.1 percent in 1989 over the previous year, reaching 86.6 billion francs [Fr], a communique from the Ministry of Research and Technology indicated on 12 September.

These are the results of a 1990 statistical survey of enterprises and professional organizations. The latter accounted for 60.3 percent of all R&D carried out in France (Fr143.6 billion).

The growth recorded was due in part (1.7 percent) to new enterprises getting involved in R&D, especially as a result of the research tax credit, the communique pointed out.

The 2,654 enterprises and 53 professional organizations which stated that they had been engaged in research activities throughout 1989, had 149,822 full-time employees working in R&D, including 54,352 researchers (4.8 percent more than in 1988) and 95,470 technicians, workers and clerical workers (+ 2 percent). During the same period, the total staff of the enterprises increased by 1.1 percent, the ministry indicated.

Over two-thirds of French R&D was in the electronics, aeronautics, automobile, chemistry and pharmaceutical sectors. The Paris area, whose preponderance is on the wane, still accounts for 56 percent of the national R&D potential of enterprises (compared with 65 percent in 1970), followed by the Rhone-Alps and Provence-Alps-Cote d'Azur regions (with 9 and 6 percent respectively).

The share of experimental research increased, from 64.5 percent in 1988 to 67.5 percent in 1989, whereas basic research (4.5 percent in 1988 and 3.8 percent in 1989) and applied research (31 percent in 1988 and 28.7 percent in 1989) decreased. This survey will be the subject of a detailed report to be published at a later date by the ministry.

France: CNRS Opens Particle Physics Research Center

92WS0006A Paris AFP SCIENCES in French 19 Sep 91 p 11

[Article: "The CNRS [National Center for Scientific Research] Extends Its Training and Research Activities in Marseille"]

[Text] Marseille—On 13 September, in Marseille, as part of its decentralization policy, the CNRS inaugurated a new training center for researchers and laid the foundation stone of the new CPPM building [Center for Particle Physics].

Located on the Luminy campus, where 8,000 researchers and students are already working, the CNRS training department, consisting of three multi-purpose rooms and 30 or so hotel rooms, will be open to French and foreign trainees.

The new building of the Particle Physics Center, also on the Luminy site, will cover 3,500 m^2 and accommodate some 100 researchers by the end of 1992, and another 50 or so in the next four years.

"This laboratory will be the hub of a new effort to redeploy the research potential of our Parisian center," the CNRS director, Mr. Francois Kourilsky, indicated, "and our objective is to make it into a high-energy physics laboratory at international level."

The CPPM is one of the 18 laboratories of the IN2P3 [National Institute of Nuclear and Particle Physics], the CNRS institute in charge of its heavy particle-physics facilities. It is the only IN2P3 unit in the Provence-Alps-Cote d'Azur region.

The laboratory is now participating in four experiments, three on the CERN [European Nuclear Research Center] accelerators—Aleph, CP Lear and Delphi—and one on a reactor at the Bugey nuclear power plant, which is used as a source of antineutrinos. In addition to these experiments, there is a research program designed to generate experiments to be performed on the future Large Hadron Collider (LHC) of the CERN.

German Firms' Participation in EUREKA Projects

92WS0033 Landsberg PRODUKTION in German 29 Aug 91 p 3

[Article by Thomas A. Friedrich, "Smaller Firms Should Be More Involved: Expert Group Provides Interim Evaluation of EUREKA Projects"]

[Text]A good five years after the passing of the European Technology Initiative EUREKA (European Research Coordination Agency) declaration of principle, more than 2,000 firms, research institutes, and technological organizations are cooperating on more than 400 projects between Iceland and Istanbul. According to the most recent reports, German industry is noticeably underrepresented in the fields of robotics and factory automation when compared to France, England, and Italy.

Halfway through the first decade, a seven-member international group of experts, headed by Prof. Wisse Dekker, PhD, chairman of the Philips board of directors, has come to the conclusion that the quality of EUREKA projects is generally good. They add, however, that the percentage of small and middle-sized businesses taking part in the projects leaves as much to be desired as does the dovetailing between EUREKA projects and technological programs of the European Community. In the declaration of principle passed in Hannover on 5 November 1985, the 17 founding states expressed the objective of the initiative as follows: "EUREKA will enable Europe to master and use the technologies important to its future and to increase its productive capacity in important fields." Increased cooperation between businesses and research institutions in the area of high technology should increase the productivity and competitiveness of European industry on the world market, thereby providing the basis for lasting prosperity and employment. At any rate, that is how it looks on paper. In reality, the technological state of affairs between the three competitors—Europe, the United States, and

Japan—appears somewhat different. Dekker declares that EUREKA is on the right path: "The market-orientation of the projects has expedited the introduction of new technologies."

Nonetheless, the group of experts is concerned over the participation of small and middle-sized businesses (KMU). Although approximately 27 percent of these firms took part in EUREKA projects during 1990, the experts regard a much higher KMU participation rate as essential. Reasons cited for this minimal participation include a lack of clarity and limited information about the availability of international partners. According to Prof. Hans-Juergen Warnecke, PhD, of the Fraunhof Association for Production Engineering and Automation, there must be "better information, support facilities to assist firms in the search for suitable partners, and financial support during the project definition phase."

Dr. Heinz Riesenhuber, minister of technology, stated emphatically: "I fully support this suggestion by the group of experts." Of the 281 German firms participating in EUREKA projects, 109 (approximately 39 percent) are small and mid-sized businesses. To encourage even more KMU firms to participate in EUREKA projects, the Federal Ministry of Research & Technology (BMFT) has, since the beginning of 1991, been providing up to 100,000 German marks [DM] per firm in general funding the preliminary phase of EUREKA projects. This is intended to allow firms with no EUREKA project experience to answer critical questions such as those concerning overall project conception, possible division of labor, and the future applications of the project results without straining their pocketbook.

In addition to the above-average participation rate of middle-sized German firms, German partners are also well represented in the approximately 400 currently ongoing technological projects, particularly in the fields of information- and communication technology, environmental technology, and power engineering. Altogether, 281 firms and 221 research institutes are taking part in 161 EUREKA projects, with a total volume of DM7.4 billion. German EUREKA partners have committed DM2.5 billion to these projects, approximately one third of which (exactly DM900 million) is being provided by the BMFT.

If the financial volume of EUREKA projects is broken down according to technological fields, the main focal points of European research and development (R&D) efforts become clear. Of the 369 research projects to which approximately DM15.8 billion was allotted in June 1990, 23 percent were in the field of information technology, 19 percent were in the field of communication technology, and 15.9 percent were in the field of manufacturing engineering. Only 4 percent of these projects were in the field of laser technology, including the 12 projects in which German partners are participating. The Brussels secretariat has just released an updated publication on the field of robotics and industrial automation. As usual, the German group at the European capital was unable to come up with the funds for a German translation. The survey, titled "EUREKA: Robotics in Production Automation," is only available in English. A glance at the figures reveals that German industry is not well represented in EUREKA projects on factory automation, robotic systems, or manufacturing engineering. Of the 62 projects in the fields of robotics and factory automation, France is participating in 51, England in 43, Italy in 42, and Germany, sharing fifth place with Spain, is participating in 32.

France is also leading, with 10, in the participation of national research institutes in these fields, followed by England with nine, and Germany, Italy, and Spain, with eight apiece. German industrial firms and research institutes are even less involved in the overall field of "manufacturing engineering." Germany participated in less than one third (25) of the 80 projects in this field, a field which is critical to the future ability of German industry to compete.

Only in the field of laser technology is German participation above average: eight German firms or research institutions participated in 12 projects. However, whereas Germany is involved in a number of FAMOS Initiative (flexible automated mounting system) application projects, it has held back noticeably from a number of forward looking R&D problem definitions. These include robotics development in textile processing; EUROCIM, an automation project for the manufacture and performance testing of printed circuit boards; and HERCULES, an exploration of the use of robotics for heavy and dangerous construction work. Another example of German nonparticipation is ARIA, the development of an integrated factory for the rapid mounting of hardware in the electronics industry. The list could go on.

The limited German involvement in manufacturing engineering can hardly be blamed on a lack of technical competence on the part of EUREKA partners. Nearly 60 percent of all project participants expect marketable results within five years of beginning of their projects. This is one more reason for Germany to seek European cooperation in robotics and the development of factory automation for the turn of the century more actively than it has up to the present.

On 18 and 19 July in The Hague, the EUREKA conference of ministers released for the first time a review of the projects completed during the last five years. Twenty two firms and four research institutes from Germany had been involved in the 20 projects. Of these, 14 were financed by German industrial firms and research institutes out of their own pockets; only six were publicly financed.

During this period, a method was developed for the identification and exact measurement of noise sources in

motor vehicles. The construction phase is to be dedicated to the reduction of the noise. In addition, a Franco-German-Dutch project brought an absorption heat pump with a heat transformer up to operational readiness. By heating 80° Celsius (C) waste water to 140°C in a steam boiler facility, the project attained a 32 percent operation ratio. In another project, a German-Franco-Austro-Swiss cooperative effort successfully completed a laser application for welding and surface treatment. Individual partnership firms were able to adapt laser technology to fabrication while still in the project phase. The detection of unhealthy gases during tree cutting operations prompted the new EUREKA project "Laser Safety."

Inquiries from eastern Europe and the five new German laender signal a boom for European technological cooperation. Things have changed considerably since the time when East Germany, unlike the other former members of the Council for Mutual Economic Assistance (CMEA), was disinclined to participate in EUREKA. Within one year, the number of project proposals submitted by the new German laender has surpassed that of all other eastern European states, including the Soviet Union. Besides environmental technology, these proposals concentrate primarily on manufacturing engineering and laser technology. The pent-up demand in eastern Germany is tremendous. Given the eastern German commitment to EUREKA projects, the frequent prediction that the region between Rostock and Gera will become a mere extension of the western work-bench seems unlikely to come true.

Bonn Announces Heavy Investment in Eastern German Research

91MI0514 Bonn WISSENSCHAFT WIRTSCHAFT POLITIK in German 21 Aug 91 p 2

[Text] "Breaking new ground in research" is how Federal Minister for Research Dr. Heinz Riesenhuber defines the priorities of the institutes and facilities of the former Academy of Sciences (AdW). According to an interim report entitled "The Eastern Scenario," the BMFT [Federal Ministry of Research and Technology] has just presented in Bonn, the Center for Molecular Medicine at Berlin-Buch, the Potsdam Georesearch Center, and the Environmental Research Center at Leipzig/Halle are among those to be created and expanded.

Environmental research is undoubtedly of the utmost importance in the highly polluted east. In addition to Laipzig/Halle, some 15 other institutes are to concentrate solely on this area, including the institutes of Baltic Sea Research at Warneuende and waterecology and freshwater fisheries in Berlin.

The BMFT views the future with optimism in the light of the report by the Science Council. "It looks as if there will no longer be any difference in standard, in three years' time, between the productivity of modern nonuniversity research in the east and in western industrial countries," believes Riesenhuber, thereby incidentally justifying the massive sums to be invested over that period.

Although only two-thirds of the previous personnel are required for the intended "qualitative leap," there will be jobs for 12,000 employees in publicly-funded research, costing the BMFT alone some 585 million German marks [DM] in 1992. A further 2,000 jobs will be financed by DM400 million a allocation from the University Regeneration Fund, the prime purpose being the integration of scientists into the universities.

Risenhuber has also been successful in seeking additional funding from its cabinet colleague, Employment Minister Dr. Norbet Bluem; the Federal Employment Agency will sponsor some 500 government- funded measures for 2,500 scientists - first aid to cover the period "during which the economy of the new laender will generate little demand for research and development personnel."

Limited financial resources are however only one side of the coin, and other problems remain to be solved. For instance, Riesenhuber, along with universities, intends to vet all future employees for former Stasi membership, and cut old links. He is also holding discussions with the employees concerned about the preponderance of locations in Berlin among the institutes of the former AdW. As so often before, however, shortage of accomodation, in Rostock for example, could prove to be the stumbling-block in the way of the avowed aim of greater mobility.

Max Planck Society Founds Physics Institute in Eastern Germany

92MI0009 Munich MPG SPIEGEL in German 9 Sep 91 pp 15-16

[Text] At its session on 6 June 1991 in Berlin, the senate of the MPG [Max Planck Society] resolved in principle—with reference to the Science Council recommendation of 13 March 1991—to found a Max Planck Institute in Halle, the first in the new federal laender, to work on solid-state physics and electron microscopy. This resolution, which is subject to a guarantee of financing, still requires further elaboration.

The senate of the MPG also resolved at the same session to found three further MPG teams at universities in the new federal laender and in eastern Berlin:

- **MPG Team on Quantum Chemistry at the Brandenburg Regional College [Landeshochschule] in Potsdam, or at Rostock University.**

Head: Dr. Joachim Sauer, head of the Quantum Chemistry team at the Central Institute of Physical Chemistry, Berlin (formerly the GDR Academy of Sciences).

Partner Institute: Max Planck Institute of Solid-State Research in Stuttgart

Outline Description: Dr. Sauer (born in 1949), a chemist, has published pioneering work on the quantum-mechanics treatment of the interaction of molecules on internal surfaces of zeolites, a complex scientific project of wide-ranging practical significance. His team is to clarify elementary chemical processes in which solid materials and their surfaces are involved, using a combination of quantum chemical *ab initio* techniques and computer simulation methods.

- **MPG Team on Theory of Low-Dimension Semiconductors at the Humboldt University, Berlin.**

Head: Dr. Roland Zimmermann, head of the Department of Theoretical Solid-State Physics at the Central Institute of Electron Physics, Berlin (formerly the GDR Academy of Sciences).

Partner Institute: Max Planck Institute of Solid-State Research in Stuttgart.

Outline Description: Dr. Zimmermann (born in 1942), a physicist, has made his name in science with major contributions on nonlinear phenomena, transport properties, and electron-hole fluid models. Among other topics, his MPG team will also be working on the theory of "quantum wires" (unidimensional conduction structures in semiconductors) and polymer chains.

- **MPG Team on CO_2 Chemistry at the University of Jena**

Head: Dr. Eckhard Dinjus of the Technical Chemistry department in the Chemistry Section of Jena University.

Partner Institute: Max Planck Institute of Carbon Research in Muelheim/Ruhr.

Outline Description: Dr. Dinjus (born 1944), a chemist, has published major work in the past 12 years on the topical area of metal-catalytic carbon dioxide coversion. His team is to research the catalysis cycle in the incorporation of CO_2 into organic substrates, and to optimize this process with the intention of making CO_2, which combustion processes give off in large quantities, usable as a component for chemical syntheses.

Germany: Riesenhuber Presents BMFT 1992 Budget

92WS0060A Berlin ING DIGEST in German Oct 91 pp 75-77

[Text] The 1992 budget of the Federal Ministry for Research and Technology (BMFT) amounts to 9.252 billion German marks [DM], according to the government's draft passed by the cabinet on July 10. In the following article, ING DIGEST offers a slightly abridged version of the explanations which Federal Research Minister Dr. Heinz Riesenhuber gave at the presentation of the draft.

More Than DM6 Billion by 1995 for Research in the New Federal Laender

Research in united Germany will improve in quality and scope through the rebuilding and restructuring of research in the new federal laender. For the first time, the 1992 BMFT budget features spending for institutional research in the new federal laender. The BMFT's DM9.252 billion budget for 1992 represents an increase of 9.7 percent over 1991. In addition, there is another DM300 million for research in the new federal laender, funds from the joint project "Upswing—East" which the BMFT will make available for the university renewal program and for industry-oriented research institutions.

Thus, in the BMFT's area of responsibility, a total of DM9.552 billion is available for research and technology in united Germany in 1992. When calculating the growth rate in comparison with the previous year, it must be taken into consideration that DM450 million were available to the BMFT in 1991 for funding institutes of the former Academy of Sciences (Akademie der Wissenschaften, AdW). With this rather modest—in view of the increase in responsibilities—growth rate, it is necessary to take into account that the additional needs of the BMFT for budgetary planning in 1990-1994 in the area of project support, recognized by the Federal Minister of Finance, were cut by DM150 million in 1992, by DM180 million in 1993, and by DM210 million in 1994. In this respect, the research budget is making a contribution to reducing financial aid and similar measures. With regard to the reduction of financial aid and similar measures in the federal budget adopted in February 1991, the BMFT is contributing DM450 million to federal spending cuts in 1992.

The 1992 research budget is a budget of solidarity which requires creativity and clear establishment of priorities as well as utilization of all synergies and cost cutting measures for its implementation. Despite tight funding, it is possible:

- To create a productive research environment in the new federal laender through the establishment of new research institutes in accordance with the recommendations of the Science Council, strengthen scientific research in universities in the new federal laender, as well as help business and institutes there with special programs and funds for research and development projects;
- To use a 12 percent increase to concentrate space research and technology on basic research as well as earth observation with its applications for environmental research. In pending negotiations with European partners in preparation for the ESA [European Space Agency] conference of ministers in November 1991 on the continuation of the ESA long-term program, the federal government will work to see that the development and investment programs of the ESA for manned space flight in the coming years take into account the tight federal budget;

- To continue to play an active role in shaping important future areas, for instance in research on prevention (health, climate research, environment) as well as in the development of central key technologies such as information science, biotechnology, laser research, and materials research;
- To support small and medium-sized businesses in the application of the most modern technologies.

1. Research Environment in the New Federal Laender

In the BMFT's area of responsibility, more than DM1.6 billion will be available for research and development in the new federal laender in 1992. Of this, DM585 million are earmarked for the establishment and development of new research institutes which stem primarily from those institutes of the former AdW given positive evaluations by the Science Council and which, in the future, will be supported jointly by federal and land funds. Of these DM585 million, DM416 million go to the federal share for Blue List institutes (Blaue-Liste-Institute) and national research institutes. In addition, the BMFT is making DM169 million available to the Fraunhofer Society and Max Planck Society for the establishment of institutes, institute departments, or working groups in the new federal laender.

The Science Council's evaluation of the institutes of the former AdW shows that, in over 40 research institutes, it is possible to continue projects which contribute to research areas in the old federal laender or open up new areas for which there is no equivalent in the old federal laender. This is true, for example, for the Center for Molecular Medicine in Berlin-Buch, the Institute for Continental Lithosphere Research in Potsdam, as well as for a number of new institutions of the Fraunhofer and Max-Planck Societies.

This major opportunity for research in united Germany is now being exploited swiftly. The primary goal is to establish structures with long-term suitability. On condition that the federal laender also implement the Science Council's recommendations, there will be 6,400 employment opportunities in the BMFT's area of operations. In addition, the BMFT has taken further initiatives in order to use instruments and funds of the joint project Upswing East for restructuring of the research environment and support of research personnel in the new federal laender: Through the university renewal program, the path into universities will be opened for about 2000 employees from former non-university institutes. Within the framework of job creation measures, 480 projects for about 2500 employees are presently underway in research areas. Thus, in all probability, continued employment will be possible for a total of nearly 11,000 employees of the former AdW (out of 19,000 at the beginning of the year), a respectable result and one which was inconceivable to such an extent some months ago. In 1992, about DM180 million are available from the Federal Minister for Finance and the BMFT as transitional aid for research and development [R&D] projects at research companies.

For support of research in small and medium-sized businesses, the BMFT initiated problem-oriented support programs for companies in the new federal laender back in 1990 (including support for increase in R&D personnel, support for project-related research, model attempts at the formation of technology-oriented businesses, technology centers, and founder's centers). Since these support measures have run very well so far in 1991, funding for this purpose in 1992 was increased by about one third to about DM100 million.

In addition to these measures, R&D in industry and science will be supported to a considerable extent in 1992 by funds from the technical programs of the BMFT. As in the previous year, the emphasis will be in the areas of environment, biotechnology, microelectronics, especially microperipherals, materials research, physical and chemical technology, production engineering, renewable energy, and space research. A total of DM750 million is earmarked for project support in the new federal laender in 1992. This corresponds to about 23 percent of the DM3.3 billion for direct and indirect project support in the old federal laender in 1992.

2. Research and Technology Support for Unified Germany

A complete breakdown of institutional aid in the new federal laender by individual research areas is not yet possible at this time. Allocation to the major research areas was made provisionally. With regard to an initial allocation to technical programs, the following growth rates are obtained for 1992 in comparison with 1991 (united Germany):

- Environment (+28%)
- Biotechnology (+28%)
- Health (+17%)

(a) Support for Technology and Innovation

In the future, the BMFT will also become particularly involved in the area of aid for innovation, especially in the key technologies. The volume of aid for information technology, production engineering, biotechnology, physical technology, laser research, and materials research was doubled from DM841.1 million (1982) to a total of DM1,693.4 million (1992) (without institutional support in the new federal laender). Key technologies owe their significance to their interdisciplinary nature, which gives them considerable influence on the pace of innovation in broad areas of the national economy. The goal of technology policy is, on the one hand, development of the scientific and technological base through incorporation of new themes, such as biosensors, neurobiology, brain research, and nanotechnology, and, on the other hand, support of new technology transfer to businesses.

These goals are supported by the planned development of new research capacities in the new federal laender, like the Institute for Applied Semiconductor Research in Frankfurt/Oder and Berlin, the Institute for Molecular Biology, Cell Biology, and Microbiology, Jena, and others.

(b) Research on Prevention

Problem-oriented research for the solution of urgent future problems in the areas of environment and health as well as for ergonomic workplace design are gaining in importance. Prevention research, including planned research capacities in the new federal laender, such as the Center for Ecological Research or the Biomedical Research Center, shows a disproportionately high growth of 18.8 percent.

In environmental engineering, projects for model rehabilitation of industrial waste sites, sewer systems, and waste management are further developed in 1992. In the new federal laender, sample demonstrations of modern environmental technology using available technical potentials and facilities for the solution of urgent problems, in particular in the areas of water treatment and waste disposal, are in the foreground.

The BMFT has continuously expanded climate research from a few million DM in 1982 to DM142 million in 1992. The goal of research activities is to describe the actual status and possible trends of climate and atmosphere using statistically relevant series of measurements and to provide trend analyses for the future. New BMFT research targets are "climate diagnosis and extreme value statistics" as well as "climatic effect research" which, to begin with, are to determine the consequences of climatic changes on agriculture, coasts, and the Alps.

Because of the high degree of air pollution in the new federal laender, the joint project "Auxiliary Scientific Program for the Rehabilitation of the Atmosphere over the New Federal Laender" begun in 1990, has gained special significance.

With its involvement in health research in the amount of nearly DM400 million, the BMFT creates incentives to take up and to develop new research areas and structures. Central tasks are the expansion of clinical and public health research.

(c) Energy Research

The development and introduction of an environmentally safe energy supply also has a special importance in view of the new federal laender. In the coming years, the Federal Republic of Germany, along with all other industrialized countries, will increasingly be faced with the task of contributing effectively to the limitation and reduction of carbon dioxide.

- In the foreground of support for fossil energy sources are contributions to the development of modern coal-fired power plants and combustion research. Resource development projects are being phased out, so that a reduction of support from DM129.4 million in 1992 to DM105 million in 1995 is planned in this area.
- Germany, together with Japan and the U.S., holds a leading position worldwide in the support of renewable energy sources. Consolidation at the level of DM323 million is planned for 1992.
- The main targets of nuclear energy research in 1992 will again be the further development of safety and waste management for reactor systems. These activities also include projects for the improvement of safety standards for eastern reactors. Spending for nuclear energy research including reactor safety and final disposal of radioactive waste comes to DM586.3 million. Nearly half of the spending in this area goes to funding nuclear waste repositories. About 90 percent of the funds are accounted for by legal regulations, contractual commitments, or government projects, such as support of technical competence with respect to licensing procedures. To a large extent (almost 50 percent), they are handled in major research institutions.

(d) Space

In space research, despite a 12.4 percent increase in 1992, it is now necessary to adapt the future program to tighter funding by the federal budget in the coming years. Thus, continued German involvement in the ESA projects HERMES and COLUMBUS will presumably be possible only with definite reductions. This will require difficult negotiations with the European partner countries before the planned ESA conference of ministers in November 1991. In the pending talks and agreements with science and industry, it is our goal to work out and negotiate a framework for a German space program which will remain fundable and at the same time offer convincing long-term prospects for German space research as well as for space research in Europe.

In accordance with its importance for basic research, earth observation, telecommunications, and research under conditions of weightlessness as well as its general importance for the development and demonstration of the most modern technologies, space research will remain an important focus for BMFT research support. The BMFT budget share for space research, including the programs Atmos and Hyperschall, is just under 20 percent in 1992.

(e) Opportunities and Risks

Future-oriented planning and evaluation of the opportunities and risks of technological change will continue to be in the foreground of BMFT support and dialogue with the humanities and social sciences. Funding for the humanities and social sciences will be increased in the present budget by 8.5 percent to DM121.5 million. Projects for evaluating the consequences of technology now accompany the BMFT's essential project areas. The dialogue on basic ethical issues, for example genome

research, will continue with greater intensity on the international European level.

3. Development According to Type of Support

(a) Institutional Support

Of the research establishments supported by the BMFT, the 13 national research institutes in the old federal laender (GFE) claim the greater part of the funds. The establishment of an all-German research environment requires, in addition, that questions concerning urgent research areas, effects of synergy on research in the new federal laender, and methods of concentration be posed in the GFE. It should be noted that the financial share of the GFE in the BMFT budget increased disproportionately (about 26 percent in 1983, 29.3 percent in 1990).

In the framework of the dialogue begun with the GFE, the BMFT is striving towards a new definition of responsibilities for university research and, in particular, for market-oriented research and development in industry. Major equipment in basic research, important national programs in space research or polar research, and topics in environment and health will also rely on the GFE in the future. In 1992, the BMFT will cover 90 percent of the basic funding of the GFE in the amount of DM2.3 billion; this corresponds nominally to support in the current year. The national research institutes in the old federal laender will not be able to count on an increase in funding over the next two fiscal years. However, new GFE will be added in the new federal laender.

Through the establishment of research institutions in the new federal laender, the importance of institutional research outside the GFE increases in the BMFT budget. Along with the founding of new federal-state institutes, the so-called Blue List, allocations of funds to the Fraunhofer Society from 1991 to 1992 increase by 81.9 percent to DM328 million. This funding will allow the establishment of 19 Fraunhofer Society institutes in the new federal laender in 1992. The funds allocated to the Max Planck Society in 1992 will increase by 5 percent in the old federal laender and by 8.9 percent overall.

(b) Project Support in Trade and Industry

BMFT funding for research in trade and industry was reduced from DM3,245 million to DM1,656 million in the period from 1982 to 1990, which was more than compensated for by the increased involvement of businesses. This reduction of research funds primarily affected projects in larger companies with over DM200 million turnover, which received about DM1.1 billion in 1990 as opposed to DM2.8 billion in 1982. One quarter of this amount goes to contracts for projects in the public interest, for example in the fields of space or transportation and traffic. A total of DM795 million in "contributions" was granted for projects in partnership with large companies (over DM200 million turnover) in 1990. Apart from research on space and prevention, the main emphasis of the funded projects lay in the development of environmentally friendly traffic and transportation systems (DM78 million), the assumption of governmental responsibility in energy research (DM333 million), and the support of key technologies (DM259 million).

In contrast to decreasing funds for projects with large companies, the importance of support for research and development in small and mid-size companies is increasing. With a planned volume of about DM600 million in 1992, more than one third of the BMFT funds for projects in trade and industry will go to small and medium-sized firms. In relation to their own spending for R&D, these firms thus receive more than twice as much as large companies.

Frequently, it is only by concentrating resources that small and medium-sized firms meet the requirements necessary to venture into new technological fields and to develop key technologies in the 90's. Therefore, the incentives to expand research cooperation among small and medium-sized companies will be increasingly important in the coming years.

Research and technology in Germany will gain in diversity, quality, and scope as a result of unification. More than ever, effectiveness, streamlining, and inventiveness will be needed in order to continue actively shaping the future with a view towards Europe '92.

Frauenhofer President on State of German Research

92WS0073A Frankfurt/Main FRANKFURTER ALLGEMEINE in German 21 Oct 91 p 22

[Article by "gl.": "Fraunhofer Concerned About German Research: Institute President Warns Against Spending Reductions"]

[Text] The Fraunhofer Society, one of the largest German research institutions, is concerned about the future of research in Germany. Max Syrbe, president of the society, criticized the intermediate-term Ministry of Research and Technology budget proposed by the federal government. According to Syrbe, the budget does not take into account the considerable challenges posed by the opening in the East and by the shift towards the European Internal Market. Although the research ministry budget was increased by 9.7 percent in 1992, to 9.25 billion German marks [DM], its per capita expenditures, which amounted to DM126 per person in 1990, fell to DM119 per person in 1991, and will fall to DM115 in 1992.

The executive board of the Fraunhofer Society acknowledges the exceptional burdens that the cost of Reunification has placed on the 1991 and 1992 federal budgets. The society is ready to bear its share of the burdens, and its institutes will increase their efforts to break into other areas of the research and development market, namely commercial markets. Nonetheless, Syrbe insists that it is critical that discussions on subsidy reductions do not lead the Ministry of Research and Technology to make

additional cuts in project funding. In his opinion, the funding of research and technology must be regarded as an investment that Germany must make in order remain competitive in the international market. Syrbe states that such expenditures must not be lumped together with general subsidies: "There will be difficult times ahead for the German economy if we do not begin to regard research as an investment in the future rather than as a subsidy."

The Fraunhofer Society attributes the present virtual stagnation of its "Future Developments" branch after years of exceptional growth to "a few delaying moments" in funding by the Ministry for Research and Technology. The output of the Fraunhofer Society, in terms of its outlay, increased by 9.1 percent in 1990, to DM759 million. According to Syrbe, so-called "basic financing" from the state and special funds provides approximately 30 percent of the society's funding. A similar percentage stems from commercial research contracts. This is augmented by funding by the federal government and the laender of public projects, such as communications technology, and by an additional scant 10 percent from other proceeds, such as contributions by the German Research Association and other donors, or payments by the European Community. The EC, however, only pays for half of most projects. The funds for the other half, according to Syrbe, must come from the basic funds. The society is presently negotiating with the EC for full funding of the projects in question.

Basic financing has funded a significantly higher percentage (80 percent) of the expenses of the institutes established in the new laender. Nineteen Fraunhofer facilities have been established in eastern Germany, the majority of them in Saxony. As of early 1991, approximately 900 personnel are reported to be employed at the nine large institutes and 10 smaller branches in the new laender. In 1990, Fraunhofer personnel numbered more than 6,650. Syrbe adds that the Fraunhofer Society currently has approximately 770 members, including large businesses firms.

[Box, p 22]

"Europe is still the world leader in one area: We are far ahead of the United States and Japan in the field of laser technology," reports Max Syrbe, president of the Fraunhofer Society. Syrbe is proud of this, as he feels that he and his institutes have contributed to it. Due to close cooperation with industrial enterprises, German suppliers in this field have the largest share of the world market. Japanese firms are running a "poor second." Because the federal government is "very short of research funds," the Fraunhofer Society is subsidized by North Rhine-Westphalia as well as by some business firms. This is done with an eye towards marketing and trademark rights, in order to ensure that Germany remain the leader in the field of laser technology. The Fraunhofer Society also believes that it has made significant progress in the area of ceramic valves for automobiles. Syrbe states that they can now be supplied in quantities suitable for mass production. Ceramic valves allow more precise timing and, conceivably, much better gas mileage. According to Syrbe, the automobile industry is already working with these valves.

Germany: Progress of Carl Zeiss Jena Reorganization Described

92MI0002 Duesseldorf HANDELSBLATT in German 30 Sep 91 p 19

[Text] Jenoptik Carl Zeiss Jena GmbH will soon cease to exist. As announced by Board Chairman Lothar Spaeth, it has been possible earlier than expected to create the prerequisites for splitting the combine's successor into two companies as decided by the Trust Agency. The companies do not yet exist legally, although they could be operating independently of one another in organizational terms from October onwards.

The mid-June agreement between the Land of Thueringen and the Trust Agency provided that Thuringen would take over all Jenoptik Carl Zeiss Jena GmbH shares. This company would form the foundation for Jenoptik GmbH, which would take in the optoelectronics division and Zeiss Real Estate Investments and form the core of a technology and innovation center. The Thueringen is the sole shareholder, and Spaeth has been appointed chairman of the board.

Carl Zeiss Oberkocher will acquire 51 percent of the shares in the second company, Carl Zeiss Jena GmbH, which encompasses the core business (microscopes, geodetic measurement, precision metrology), and 49 percent will be acquired by the Land of Thueringen through Jenoptik GmbH. It is estimated that the reorganization phase will take four to five years, after which Carl Zeiss Jena GmbH will become a foundation. The Trust Agency and the Land of Thuerigen have thus tied up a package worth 3.6 billion German marks [DM].

Spaeth said that the sacking of 160,000 Zeiss employees at the end of the year was an essential condition for achieving viability. At that time, Jenoptik Carl Zeiss Jena GmbH was reported to be losing DM40 million per month. In contrast, the 27,000-strong operation will have earned just DM200 million in 1991. There was a good chance that the commitment made to the Trust Agency to create 10,200 jobs would be met by the end of 1994.

Carl Zeiss Jena GmbH would then be able to take on 3,000 employees as opposed to the 2,800 planned. According to future board spokesman Michael Hiller, Carl Zeiss Jena GmbH has set itself a DM200 million earnings target for next year. Over 40 firms have been founded and established since the middle of this year, absorbing more than 2,400 employees of the former combine. Contracts will shortly be signed or negotiations are currently under way regarding over 40 companies that will provide jobs for a further 3,000 former Zeiss employees.

Jenoptik GmbH intends to operate in future with 1,700 employees. According to Spaeth, this company will work predominantly in optoelectronics (500-800 employees), lithography (400) and precision instruments (400). Spaeth held out prospects of cooperation with Carl Zeiss Oberochen in this connection.

Further employees could be accommodated in areas towards which Jenoptik intends to move in the future together with industrial partners: environmental technology, environmental reclamation, environmental pollution processing, and biotechnology. Spaeth envisages that in the next few years Jenoptik GmbH could take on a holding function for 15 to 20 companies in which it has stakes.

The former minister-president welcomed the fact that scientific facilities would also be provided accordingly. Jena University is to have a department of physical astronomy, an optoelectronics college is being set up, a Fraunhofer Institute is in the offing, and the Max Planck Society may also be actively involved.

Germany: BMFT Funds Program for Technical Universities

91MI0484 Stuttgart LASER UND OPTOELECTRONIK in German Aug 91 p 12

[Text] The Federal Government and the governments of the laender have agreed on the Renewal Program for Higher Education Establishments and Research in the New Laender (HEP). The five-year program provides for a total of 1.76 billion German marks [DM] in funding, with 75 percent funded by the Federal Government and 25 percent by the new laender. The program includes immediate aid for staff recruitment and investments in colleges, and for creating a productive base in the new laender.

Germany: Robotron Office Machinery Division To Close Down

91MI0500 Bonn DIE WELT in German 31 Aug 91 p 10

[Text] The fate of one of Thuringia's largest and most traditional industries now seems to be definitely sealed: Robert Blum, President of the Board of Robotron Office Machinery AG (BSW), Sommerda, has submitted a proposal to his company's supervisory board to dismiss 4,800 employees as of 30 September. This would in practical terms mean the closure of the largest successor to the Robotron combine.

Instead of the 600 million German mark [DM] revenues for the current year envisaged by Blum's recently replaced predecessor Helmut Auge, BSW is likely to show sales of only DM160 million, DM110 million of which were earned in January. Recently the Trust Agency has had to subsidize the company to the tune of sums running to double figures of millions each month. This sudden closure is nevertheless surprising. Why did the Trust Agency not act earlier and take over from the completely over- stretched management? BSW boss Blum had no comment concerning this question. His predecessor Auge initiated many new developments which had no chance of success given the toughly competitive PC market: A report by the McKinsey management consultancy formed the basis for the unsuccessful initiative.

Blum, a former member of the technical board of AEG-Olympia, who now has responsibility for winding up BSW, hopes to create 1,500 new jobs by setting up a business park. The land of Thuringia has also made appropriate provisions: in addition to the federal project for "improvement of regional economic structure," the land government has agreed to a special regional economic development program.

Germany: BMFT, Berlin Approve Large-Scale Medical Research Center

91P6O286 Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT in German 6 Sep 91 p 8

[Text] The Federal government and the state of Berlin have given their approval for the construction of the first large-scale research center in eastern Germany. This will be of particular significance for German and international medical research. Heidelberg scientist Prof. Detlev Ganten was appointed director of this center for molecular medicine (CMM) that will be built in the facilities of the former GDR central institute in Berlin-Buch. According to the Federal Minister of Research, Heinz Riesenhuber, the environmental research center in Leipzig/Halle and an earth sciences institute in Potsdam are planned as further large-scale research facilities in eastern Germany.

According to Riesenhuber, in the new Berlin research center, which will commence operation on 1 January 1992 with an initial complement of 350 employees, biomedical research and its clinical application will be carried out "as never before possible in either the former Federal Republic or in the former GDR." The solicitation of economic means for individual research projects should make it possible to hire an additional 250 qualified employees. The minister announced that a considerable number of researchers from the former Academy institutes could be integrated into the new center. The Federal government and the state of Berlin are financing the CMM at a ratio of 9 to 1, respectively.

Clinical research will involve itself with the bases for congenital and acquired diseases as well as with developing new means for their diagnosis, therapy and prevention, using the methods of basic research. In the estimation of the organizational committee, by applying modern cellular biology, linkages can be rationally established among groups of diseases such as vascular, immunological and neurological disorders as well as chronic infections and cancer. The novelty in the concept for the

center is that individual diseases would no longer be researched, but rather groups of diseases.

Germany: Juelich Center To Found Technology Transfer Unit

91MI0513 Bonn WISSENSCHAFT WIRTSCHAFT in German 14 Aug 91 p 2

[Text] In February 1992 the go-ahead is expected to be given for the Juelich Technology Center - TZJ for short. Directly adjacent to the Juelich Research Center (KFA), and in an "architectonically attractive environment," young, innovative businesses will convert the Juelich KFA's concentrated knowhow into marketable products.

There is a long history behind the establishment of the TZJ in Juelich. Pioneering research has been carried out here since the KFA was set up in 1956, particular priorities now being research and development in the areas of environmental and biotechnology, materials research and the properties of substances, basic research on applied computer science, health, energy research, nuclear fusion and plasma physics, basic nuclear research, and interdisciplinary analysis and methods.

Such work may have been done to date in splendid isolation, but the new center is designed to foster direct cross-fertilization between research and industry. A major feature of the concept, the initial outline of which has recently been presented, is that the Juelich/Aachen College of Technology, with its research and teaching departments of biotechnology and biomedical, automation, power, and environmental engineering, is also to be involved.

Other notable features are the flexible distribution of its approximately 8,400 m^2 of working space to suit individual requirements, and the policy of tailoring rents according to the means of actual users. Plans to date thus ensure that struggling new firms will enjoy particularly favorable terms.

Dr. Michael Gramm, promoter for industry to the Dueren district and a member of the TZJ GmbH's board of management, expects the new center to give the entire region a boost and to create new opportunities for long-term employment. The need for new jobs seems particularly pressing in this region, as the Juelich KFA itself may well be threatened with cuts in its budget from the Federal Ministry of Research and Technology.

Importance is also attached to the Juelich region's location "in the center of Europe": Peter Radmacher, chief executive of TZJ GmbH, points out optimistically that "we can reach over 50 percent of the population of the EC overnight." There is some justice in this claim, as Juelich enjoys an excellent reputation and benefits from its partnership with the Aachen high-technology region. Each year 2,000 highly-qualified engineers graduate from Aachen College of Technology alone, some of whom, the TZJ rightly hopes, the new center could keep in the region.

Italian R&D Committee Becomes Research Institute

91MI0486 Milan ITALIA OGGI in Italian 3 Sep 91 p 14

[Text] The reorganization of ENEA [National Committee for the Research and Development of Nuclear and Alternative Energies] has begun. The law (25 August 1991, No. 282) modifying ENEA's structure and responsibilities was published in issue 203 of the Official Gazzette on 30 August. The name changes from the National Committee for the Research and Development of Nuclear and Alternative Energies to Agency for New Technologies, Energy and the Environment with the status of research body.

The principal task of research and development of nuclear and alternative energy sources will be substituted by a triple objective of research, development and industrial promotion in the energy, environmental, and technology sectors as well as in the traditional industrial sectors, and agriculture.

For the first three years, ENEA will have 1.7 trillion lire in funding (500, 600, and 600 billion lire per year). Of this, 45 billion will be earmarked for the DISP [Department for Safety and Health Protection], the supervising body for nuclear safety and health protection which will be managed and organized independently.

The composition of the board of directors will also change. It will include a president and nine members, all from outside the agency.

A scientific-technical committee has also been established under the new law and will consist of eight prominent individuals from the technical-scientific sector outside the entity. The committee will be appointed by the Minister of Industry and will have the task of formulating opinions on the organization of ENEA programs and training. The group of experts will remain in office for the same term as the board of directors.

Dutch 1992 Technology Budget Analyzed

91AN0564 Rijswijk POLYTECHNISCH WEEKBLAD in Dutch 19 Sep 91 p 1

[Article: "Technology Under Fire in 1992 National Budget"]

[Excerpts] There were mixed reactions to the technical and scientific sections of the government budget for 1992. The Netherlands Central Organization for Applied Research (TNO) and the Association of Netherlands Companies (VNO) are disappointed over the reduction of technology subsidies, whereas the Technical University (TU) of Eindhoven is pleased with the "positive attention" given to technical universities. The Netherlands Energy Research Center (ECN) discovered new

approaches in the energy section and the Dutch engineers' association (NIRIA) thinks that government is neglecting technical education.

As a result of the "interim budget review," Minister of Economic Affairs Andriessen decided to discontinue the Innovation Stimulation Scheme (INSTIR) as of 1 October 1991. In 1990, INSTIR was still allocated 450.7 million guilders. It will not be replaced by any other scheme. Another innovation is that demonstration projects conducted within the framework of the Technical Development Credit and the Company-Oriented Technology Stimulation Program (PBTS) will henceforth also be assessed on their environmental aspects. It is mainly on account of the PBTS that the Ministry of Economic Affairs is spending more money for technology policy in 1992 than last year: 1002.9 million guilders compared to 978.8 million. However, in the years to come, the total budget will steadily decrease to 865.4 million guilders in 1996.

In a reaction to the budget, Dr. J.H. Parmentier, member of TNO's Board of Directors, says that the government lacks a technology policy strategy. "In the Netherlands, money intended for technology policy is still considered too much as a subsidy instead of as an in-depth investment." The VNO through its spokesman, secretary Dr. P.W.J. de Graaf, also expressed its disappointment about the cuts in the technology budget. "The Dutch Government's technology expenditure was already fairly low," says de Graaf. The Netherlands spent about 2.2 percent of the gross national product on R&D, compared to some 3 percent for the United States, Japan, Germany, Sweden, and Switzerland. The VNO argues that additional attention for EC programs should not be at the expense of Dutch research programs.

The manager of ECN in Petten, Prof. Dr. Eng. H.H. van den Kroonenberg, discovered some new approaches in the energy section of the Economic Affairs budget. This is true for the passage which says that all energy options are debatable, including the importation of power from abroad. The ECN manager thinks that the discontinuation of INSTIR will harm mainly small- and medium-sized companies. All the more so because these companies are turning to INSTIR for their energy and environment investments. [passage omitted]

Environment

In 1992, the Ministry of Housing, Physical Planning, and Environment wishes to implement the "major budgets." This applies to environmental policy, housing, and, especially, to the fourth additional budget for regional planning. Environmental policy focuses mainly on a durable environment, the climate, and waste disposal. Soil improvement is also given much attention: In 1992, soil testing will become compulsory for all industrial sites. As of July 1992, all new cars will have to be equipped with a catalytic converter, and an assessment will be made of all measures taken in agriculture against acidification. In addition, the first products covered by an environmental certificate will become available. Next year, the Innovation-Oriented Research Program Prevention will be launched.

EUREKA Official Assesses Dutch Presidency

92WS0051I Zoetermeer SCIENCE POLICY IN THE NETHERLANDS in English Sep 91 pp 3-5

[Article by Michael van Wissen van Veen and Marcel Wiegman: "One Year of Dutch Eureka [European Research Coordination Agency] Presidency: The Ground Gained; New Projects, New Contacts"; first paragraph is SCIENCE POLICY IN THE NETHERLANDS introduction]

[Text] In June the Netherlands brought its presidency of Eureka to a close with a spectacular laser show on the river Maas in Rotterdam and a ministerial conference in The Hague. We talked to Dr. F.M.L. Heijs, who was attached to the Dutch Eureka secretariat from July 1990 to June 1991, about what had been achieved during the Dutch presidency and what the future holds in store.

'The media gave most coverage to the remarkable agreement on HDTV [high-definition television] (a single standard throughout Europe for the reception of high definition television pictures) and the agreement on the microelectronics programme Jessi [Joint European Submicron Silicon Initiative], but the biggest achievement of the Eureka conference in The Hague was the progress made in relations with Central and Eastern Europe', explains Dr. Heijs. 'The former Eastern Block countries will be able to join Eureka in due course and an action programme has been organised to facilitate the transition to membership. A network of new contacts is being built up, there will be more exchanging of information and a flexible application of the rules of membership.'

Heijs knows what she is talking about, 'Central and Eastern Europe possesses an immense fund of knowledge, on which we can all draw. Because of the lack of equipment and other things, these countries have acquired a mass of theoretical knowledge. The people are inventive in unusual ways. Researchers from the Central and Eastern European countries are doing a lot of good work in the strictly fundamental disciplines which are being diluted in the rest of Europe where research is more application and market-oriented. It is important that human resources be safeguarded and deployed for the benefit of the individual countries and of Europe as a whole.'

Budapest Conference

The two government departments involved in Eureka are the ministries of Economic Affairs and Education and Science. When the work was shared out at the beginning of the Dutch presidency in July 1990, Heijs, who works at the ministry of Education and Science, assumed responsibility for cooperation with Central and

Eastern Europe. It was she who got the Budapest conference off the ground by supervising the input and organisational side. The conference, which was held in May 1991, was a tremendous success. More than 400 delegates from Central and Eastern Europe attended it to discover how Eureka works. As many as 350 project applications from that region have since been received by the Eureka secretariat.

The conference in Budapest was preceded by a pre-information seminar in The Hague on 1 February, which Heijs also helped to organise. 'We invited government officials from Central and Eastern Europe to spend a day talking about Eureka. We wanted to find out whom we should invite to the conference, establish a picture of people's expectations and at the same time let them know what lines we were thinking along. It was all basically a question of how best to organise the Budapest conference, because although some technological fields were discussed, they are obviously not all of equal interest to every country.'

Every country presented a summary of its research and development policy: how research was funded, what its strengths and weaknesses were, what potential there was, and what sort of partners they were looking for, because that is very important for cooperation within Eureka. We looked essentially at the research institutes because this was more likely to produce partners of equal standing than industry which was of course centrally planned. The seminar was attended by representatives of trade and industry departments as well as the research world. Each country had sent an average of three or four people, whom we asked to arrange for a good cross-section of delegates from their country.'

Assessment Team

We asked Dr. Heijs what objectives had been set at the start of the Dutch presidency. 'We had a number of aims', she explained. 'One was to conduct an evaluation, since Eureka would be celebrating its fifth anniversary during our presidency. We wanted to know what impact Eureka had had, and how its current objectives compared with the original aims of the Hanover Declaration. Eureka was of course launched in response to SDI, in order to strengthen Europe's position in relation to the United States and Japan. An independent international committee, headed by Dr. Wisse Dekker of Philips, was appointed to carry out the study. The members of the committee, known as the Eureka Assessment Panel, came from Finland, Germany, France, Britain, Norway and Spain. The committee had actually already been established and approved at the previous ministerial conference in Rome, where a mandate was given for an international panel to evaluate Eureka. The general feeling was that the report should be constructive and forward-looking. A few critical remarks were also made with a view to improving the work Eureka does. The panel distributed questionnaires and conducted interviews with representatives of the countries and individual companies. These served as the basis for its report. The principal recommendations, including the international streamlining of procedures, were approved by the ministerial conference. It is now up to Finland (the Netherlands' successor as president of Eureka-ed.) to incorporate these recommendations in the medium-term plan for Eureka.'

Advantage

'The question is what should be evaluated after five years. The type of projects, the number of projects, how well things are going, what needs to be done next? Not a lot can be achieved of course in only five years, but you can look at how the mechanisms work and what relations with the EC are like, especially regarding the big strategic projects, and comments were made on these points. The panel found, for instance, that the bottom-up structure of Eureka was a flexible one and should be retained. Once a company has a partner, they draw up plans together. The structure is reasonably loose and that is an advantage. Eureka is more accessible than the EC, especially for small countries.

'It is not remarkable that some things, such as financing, are not yet running to schedule. This isn't something you can get off the ground just like that. I think you need to give it more than five years. So the criticisms that have been made are all entirely justified and perfectly understandable given the time span involved. As for the projects themselves, very little can be said about them at this stage. Some are long-term projects, or set up for a three to five year period; these are only just beginning to get under way. So you see, it is difficult to reach any real conclusions about them.

'Another important recommendation is that more attention be paid to the quality of applications. I agree. It is no longer a question of quantity; that stage is past. We have already proved that Eureka works, the number of projects shows that. Now we have to consolidate our efforts and try to attract the bigger projects that are important for Europe as a whole. In other words we have to join forces in infrastructural, strategic projects.'

Heijs says with some satisfaction that the National Project Coordinators (NPCs) had been through the whole project portfolio for each technological field. 'It is a good thing to stop occasionally and take stock'. On the basis of this exercise the NPCs, the national Eureka liaison officers, made a number of recommendations on how to handle projects and their participants. Finland will refer to these in elaborating the recommendations made by the assessment panel.

Criticism

The day after the ministerial conference, reports appeared in the press analysing the results achieved in The Hague. It was claimed that many of the projects would have got off the ground anyway, even without Eureka. Heijs accepts this criticism: 'I think there is some truth in it, especially as regards the large-scale strategic projects like Jessi and HDTV. The interests at

stake are so great that some form of cooperation would have emerged even without Eureka. What people forget, however, is that the Eureka mechanism made cooperation easier. As for the many less conspicuous projects involving smaller companies, Eureka often plays a pivotal role in bringing prospective partners together.

'When it comes down to it, it is the companies who have to get out there and find a partner. The subsidies they receive are not that generous. There's no point in doing it for the money. That is often just an incentive to encourage companies to start working together, because it is often easier to do things alone. The question is whether Eureka makes any difference to international cooperation, and that is the problem. Eureka only makes a difference if cooperative projects are initiated by Eureka itself. But how do you assess just how much difference it does make?'

Interim Assessment

The idea of a provisional Eureka stamp of approval based on an interim assessment is rejected by Heijs. 'I think that the companies should assess themselves. You can't go fixing general criteria for the whole of Europe because it is all about company interests. The fact is that a company has made an agreement with its partner. If you start assessing projects that are under way and conferring some sort of stamp of approval, you are only evaluating a process. Eureka is a means of obtaining a subsidy. It is very difficult to take a project somewhere in Europe and decide whether to award it a provisional stamp of approval. What do you look at, what do you compare it with? What is the aim of such an assessment? Does approval indicate the stage of a project at that particular time, or does it say something about the administrative and organisational cooperation involved?'

Heijs has strong views on the role of the EC in Eureka. 'The EC does not create conditions but it is a very important partner. Just look, for instance, how essential it is for the EC to indicate that it wants a standard for HDTV. We will soon have to start thinking about where Europe is heading with its R&D policy. We already have the EC, the ESA (space travel), CERN (physics) and Eureka. Perhaps we should be looking for a new structure. The advantage of Eureka is its bottom-up flexibility in contrast to the pre-competitive top-down approach of the framework programme. It would make sense to give this some further thought in the future. I think that as well as supporting this line of development, the Netherlands could play a pioneering role in this respect.'

[Box, p 5]

Main Topics of Discussion

From July 1990 to June 1991, the Netherlands was president of Eureka, the forum for technological cooperation between eighteen European countries and the EC. The main topics of discussion during this period were:

*Evaluation of Eureka by the Eureka Assessment Panel. This committee, whose members were from eight different countries, praised the bottom-up structure of Eureka but recommended at the same time that the procedures for handling applications in the Eureka countries should be better coordinated.

*The relationship between Eureka and the Central and Eastern European countries. In May 1991 the first conference on this topic was held in Budapest. Further details about the form cooperation would take were agreed at the ministerial conference held in The Hague on 19 June 1991 to conclude the presidency.

*Large-scale infrastructural projects. Attention was given to HDTV in particular.

*Environmental projects. These now account for over twenty percent of the total number of Eureka projects and approximately thirty percent of all new projects.

Plans for Spanish Technology Park Outlined

92WS0046A Duesseldorf VDI NACHRICHTEN in German 6 Sep 91 p 13

[Article: "Basque Technology Park: The Technopolis of the North"]

[Text] In the heart of the Basque region, at the intersection of the most important major highways, in an area containing five technology centers, two universities, and numerous forward-looking business firms, there is 1,300,000 square meters of land available for the construction of a facility dedicated to innovation.

These 130 hectors, combined with the 20,000 million pesetas [Pta] that is to be invested over the next fifteen years, will make the Basque Technology Park the largest park in northern Spain and the closest to the European technology parks.

The project sponsor is the Association for Industrial Promotion and Restructuring (SPRI). SPRI is subordinate to the Economic Promotion and Development Department of the Ministry for Industry and Trade of the Basque Autonomous Community and the Biscay provincial administration. It is also subordinate to the municipal administration of Zamudio, the town in the province of Biscay in which the park is located.

Only highly innovative, high-tech firms are admitted to the technology park. Accommodations and business premises are leased, with an option to buy after twelve years. Firms that establish branches in the technology park are eligible for financial assistance from the Basque government. They can also take advantage of tax breaks granted by the provincial administration of Biscay.

The technology park will be managed by the public-owned corporation "PARQUE TECHNOLOGICO-TEKNOLOGI ELKARTEGIA [Technology Park]," which was formed in 1985. The shareholders are SPRI, with 75 percent; the Biscay provincial administration,

with 24.96 percent; and the Zamudio municipal administration, with 0.04 percent. The corporation net worth is Pta3,400 million.

The Economic Setting

The Basque region has an infrastructure surpassing any other in Spain, centralized institutions, a public sector committed to economic development, and a degree of financial activity in the private sector which has traditionally served as an example for all Spain. This region is now in a new phase of its long economic history.

The 7,621-km^2 area that comprises the Basque region supports over 2 million inhabitants, descendents of a thousand-year-old people. Over the years, this region has become one of the most important industrial areas in Europe.

The heart of the Basque economy is the industrial sector, which accounts for more than 51 percent of the gross national product (GNP). This is followed by the service sector, the role of which has not yet been fully defined. The service sector accounts for 46 percent of the GNP. Finally, there is the primary sector, which accounts for very little.

Technology centers and universities combine with the commercial, financial, and infrastructural foundation to form the supporting pillars for the activities of the technology park.

The Basque government and an increasing number of commercial firms have joined together to meet the challenge posed by innovation. Basque firms invest nearly Pta20 billion annually in research and development, and employ more than 1,500 engineers.

More than 500 scientists are conducting research in the five state-supervised technology centers in the Basque region. Basque businesses and engineers are involved in some of the most important technological projects in Europe.

The Basque region is preparing for one of the greatest challenges of its recent history. The next several years will see a revolutionary development in the area of public works. Updating the infrastructure will require an investment of approximately Pta400 billion. This enormous sum will go primarily towards rail lines, airports, roads, harbors, and subways.

A new financial sector is also emerging in the Basque region. As the birthplace of many bankers, the region contributed more than any other region in Spain to the financing of the Spanish economy. Today, nearly 150 years later, vitality which has been buried for years is resurfacing. The merger between the Bank of Bilbao and the Bank of Biscay into the country's largest financial institution, the integration of Basque savings institutions, the new stock market, the establishment of savings cooperations, and the creation of new financial arrangements are only some of the signs that a new era has begun for Basque finance.

More than 80,000 young Basques are studying at the two universities, and an additional 80,000 are being trained in microelectronics. Thousands of students are graduating from technical colleges with degrees in automation, robotics engineering, informatics, etc....

The service sector, which has been developing steadily over the past few years, has undergone a remarkable upswing in the Basque region. Nonetheless, it still has a ways to go. In this context, "Perspectivas [Horizons] 2005," a program designed to generate extensive thought on the long-term future of the Basque region, bears mentioning.

An artistic explosion of unprecedented magnitude is taking place in the Basque region. The region has always been very well represented in the various cultural fields. Basques can be proud of the artistic quality of their choirs, and the Basque region has produced world-renown painters, composers, sculptors, and representatives of Spanish literature.

All of the above, combined with green valleys and blue coastlines, makes the Basque region an area well worth both investing and living in.

The Technology Park

This is the setting for the Basque Technology Park. The park is located in the town of Zamudio in the province of Biscay, 12 km from Bilbao, 3 km from Sondika International Airport, 6 km from the nearest freeway access, and 15 km from the largest harbor in Spain. An industrial area of unusual calibre is emerging in the Basque Technology Park, where high-tech businesses are setting up shop.

The Basque Technology Park is divided into several areas, or sections of land, in which large firms, mid-sized firms, offices, research facilities, and central service areas are situated.

The first sector consists of 139,000 m^2, of which 32,000 m^2 is available for construction. The second sector consists of 190,000 m^2, of which 51,000 m^2 is available for construction.

An extensive area has been reserved for future use. Only 25 percent of the land has buildings on it; the remainder consists of roads, open areas, recreation areas, supply facilities, sports facilities, etc....

The first sector contains eight large buildings, three of which belong to the technology park. Accommodations in these buildings are leased out to businesses. The remaining buildings belong to mid-sized and large firms that are particularly active in technological fields.

The second sector consists of five buildings, which provide accommodations for business firms, research centers, and public institutions involved in innovation.

The Buildings and Their Architecture

Hanging structures, synthetic materials, steel coping, surface treatment, and recesses set off by modules are some of the technical methods that were used to make traditional construction designs functional and more original. The 4,500 m^2 "Estrella" [Star] building belongs to the technology park. Its primary function is to house small businesses involved in promising fields. It is a modern, functional, future-oriented, multipurpose building. The center of the building is capable of holding six business firms, and the ground floor is left wide open in order to give the visitor the impression of looking into the future while standing at the entrance to the business firms.

The 2,500 m^2 "Nido" [Nest] building also belongs to the park. It is intended to house business firms that want to reorganize in order to be more active in technological fields. The individual floors are partitioned off, so that each floor contains one to six modules in either direction. Thus, the building has enough room for 20 firms of varying sizes.

The 6,900 m^2 "Barco" [Boat] building contains the central administration and the supply facilities of the technology park. It also has plenty of space for mid-sized firms. The building houses the central reception station for the Basque Technology Park, where information can be obtained on the location of the firms, the products they manufacture, and all the contacts they need for their work. The building also contains conference rooms, rooms for briefing the media, and so forth.

Numerous other buildings, some owned by the park, some owned by individual business firms, constitute the remainder of the technological infrastructure. The "Telepuerto," [Teleport] which the Spanish telephone company is building in the technology park, deserves special mention. The Telepuerto, which will coordinate the Basque telecommunications network, will have a transmission capacity of 2 megabits via satellites with an international coverage.

The Business Firms

Firms from industrial branches as varied as electronics, informatics, computer aided design and manufacturing, quality assurance, telecommunications, and robotics engineering are already established in the Technology Park.

The following organizations will have the first choice of sites within the technology park: business firms or branches of business firms involved in science and development, public or private institutions involved in science and development, utility companies that support industry, high-tech tertiary enterprises, firms that provide services for the technology park, and firms that either produce high-quality technical products or use technology.

The technology park has become the center of high-tech development in the Basque region. The park has also been our region's greatest challenge to date in the area of innovation. The money spent here should put the Basque region on the road to modernity. The Basque Technology Park is crucial to this, and is well on its way to becoming the "Great Technopolis of the North."

[Box, p 13]

Thirty Firms Participating Already

Thirty business firms have already been admitted to the Basque Technology Park. Others will get the "green light" this year, and the waiting list still contains 50 firms to be decided on in 1991.

Of those firms already accepted, several have rented space in the buildings owned by the Technology Park; the remainder have built their own buildings. These firms come from such varied industrial branches as electronics, data processing, computer aided design and manufacture, quality assurance, telecommunications, robotics, etc....

Innovation-oriented firms are preferred, above all those involved in research and development. Such factors as the ability of a firm to work with universities and technology centers; its ability to develop, distribute, and market new application-oriented technologies; and its potential ability to attract other firms will be taken into particular consideration. Other important factors include the growth potential of a firm, the quality of its personnel, and its technical and economic marketability.

Business firms pay the technology park a monthly rent, based on area, for their premises. After twelve years, they may be granted an option to buy. Some firms have been given the opportunity to purchase the real estate on which they are located.

The technology park in turn provides comprehensive services such as telephony and communications, computer systems, data banks, telex, telefax, a secretariat, management support, legal advice, accounting and tax advice, marketing advice, import/export services, financial advice, a cafeteria, public transportation, and maintenance.

Firms that establish branches in the technology park are eligible for financial aid that has been earmarked for this purpose, including subsidies of up to 30 percent of the authorized investment. They can also receive aid from the Basque government and from the Provincial Administration Investment Plan (PAI), and can take advantage of tax breaks granted by the provincial administration of Biscay.

[Box, p 13]

"Telepuerto" - Technology Park Telecommunications Center As Control Terminal For Basque Communications

The Spanish telephone company and SPRI, as majority shareholders of the Basque Technology Park, have agreed to build a communications center to connect the Basque region with the rest of the world via an ultramodern and complex telecommunications center. The Telepuerto is to be located in the Basque Technology Park.

As a result of this initiative, the Basque Autonomous Community will have a telecommunications infrastructure with a transmission capacity of up to two megabits via satellites with international coverage. The actual telecommunications center consists of two clearly divided parts: the control room and the antenna field.

The control room will be located in the new communications center that the Spanish telephone company is to build in the technology park. Via parabolic antennas, it will be connected to satellites belonging to EUTELSAT (European Telecommunications Satellite Organization), INTELSAT (International Telecommunications Satellite Organization), and, once it is in orbit, to the Spanish satellite HISPASAT.

The system is expected to be used for such applications as data communication between computers for the purpose of massive information transfer, electronic document transmission, teleprinting, video conferences, local networking, and tie lines for corporate voice, data, and video networks.

Within two years, a new communications center will also be built in the technology park. The center, which will be located in a 1,400 m^2 building, will be equipped with a digital central telephone exchange, an Ibermic trunk, a toll center, and a video conference room. The conference room will be available to all Basque business firms, and will be capable of interfacing with any video conference room in Spain, Western Europe, the United States, and Japan.

The communication center will be subsidized by the EC program Special Telecommunications Action for Regional Development (STAR). It will provide ultramodern telecommunications service to the Txorierri Valley and Zamudio, the site of the technology park.

In order to complete these projects, the technology park must be equipped with the necessary equipment for connecting into the communications network of the Spanish telephone company. This will require voice, data, and video circuits. In view of the special nature of the businesses that will be located in the technology park, a data distribution highway was designed which consists of two completely different networks. The first is a conventional network with standard voice circuits connected to Ibercom and Iberpac. The second network consists of 7 km of cable with 64 fiber optic lines, the transmission capacity of which is virtually unlimited.

The cost of these projects will be approximately Pta1,800 million. Of this, Pta725 million will go towards the Telepuerto, Pta860 million towards the communications center, and the remainder towards the fiber optic cables and transmission facilities.

The technology park is not only bearing the cost of its internal communication network, it is also providing a 10,000 m^2 piece of land on which the telephone company will build the Telepuerto and the new communications center. The STAR program, for its part, is contributing Pta500 million.

UK: EC Commission Approves Research Funding

92WS0082D Brussels EUROPE in English 7-8 Oct 91 p 13

[Article: "(EU) EC/State Aid: The Commission Approves the Refinancing of Three Basic Industrial Research Schemes"]

[Text] Brussels, 07/10/1991 (AGENCE EUROPE)—The European Commission has approved the refinancing in the United Kingdom of three aid schemes for basic industrial research (which allow for an aid intensity of 40% of eligible costs) compatible with the Community's Framework on aid for research and development. It concerns the refinancing of the following schemes:

— The General Industrial Collaborative Project (GICP) aid scheme for the budgetary years 1990-91 and 1991-92. This scheme is directed at basic industrial research conducted on a collaborative basis by enterprises. The approved budgets will amount to £14.5 million (around Mecu 20 million) for 1990-91 and £22 million (around Mecu 30 million) for 1991-92.

— The Advanced Technology Programme (ATP) aid scheme for the year 1990-91. The approved budget will amount to around Mecu 38.5 million. This scheme is also aimed at basic industrial research but may contain small elements of applied research as well.

— The LINK aid scheme, with a budget of around Mecu 10 million for 1990-91 and around Mecu 35 million for 1991-92. The scheme is aimed at strengthening basic industrial research between industry, universities and research centres.

CORPORATE STRATEGIES

European Computer Industry Weaknesses Analyzed

EC Report Published

91AN0529A Groot-Bijgaarden DE STANDAARD in Dutch 24-25 Aug 91 p 15

[Article by Frederik Marain: "Europe Has Trade Deficit of ECU31 Billion in Information Technology"]

[Text] Brussels—Just as fever is a symptom of disease, is the trade balance an indicator of the condition of a specific industry within a specific region. It is in a bad shape when the trade balance is in the red; it is ailing when the deficit is significant and persistent; and its chances of survival are slim when the huge deficit has the tendency to grow.

The European computer industry is in a state of critical illness. European industry and private consumers together constitute the second largest computer market in the world. Some sources even claim that Europe was the largest market last year. One thing is certain: It is the fastest growing market. Nevertheless, it is the American and Japanese computer companies which benefit from this situation. Their European counterparts are unable to capitalize on their home advantage.

A recent report from the European Commission on the electronics and computer industries displayed some genuine European defeatism. Unfortunately, the report's pessimism is substantiated by abundant figures and comparisons which provide evidence of European industry's inferiority.

The main symptoms and causes are the following:

- *Europe constitutes a vast market for computers and consumer electronics.*

This year, the market is worth well over 175 billion European currency units [ECU] (7,400 billion Belgian francs [BFr]). With an average annual growth of 15.5 percent, the industry reached the maturity level of other industrial sectors during the second half of the eighties. The market continues to grow strongly and it is expected to generate 10 percent of European gross national product by the turn of the century. The European companies in the industry employ some 800,000 people in Europe and another 300,000 outside Europe.

In addition, the strategic importance of the computer industry for the entire economy cannot be sufficiently emphasized.

- *European companies are very strong in some subsectors, but weak or even very weak in others.*

Europe is strong in computer services, software (programs), industrial automation, and telecommunications; in other words, in applications and creative thinking. But the Old Continent is lagging behind as far as basic technology is concerned.

European companies account for only 10 percent of global semiconductor production (chips, the computer's basic component); 15 percent of peripherals production (screens, printers, keyboards, etc.); and 20 percent of the global consumer electronics output. The computer industry in Europe only supplies two-thirds of internal demand.

- *The result of the European lag is a trade deficit of ECU5.6 billion in components, ECU15 billion in computers, and ECU9.6 billion in consumer electronics. The overall deficit amounts to ECU31 billion (BFr1,311 billion).*

So, in many subsectors of the huge European market, European companies must often resign themselves to playing a secondary role. The market is dominated by the Japanese and the Americans. "The Japanese company Fujitsu entered the computer business more recently than the large European companies," observes Davignon [former EC Commissioner and president of the Belgian Societe Generale holding], "but it caught up with them in no time." By taking over the British ICL, Fujitsu became the second computer group in the world.

Causes

The Commission report also outlines the causes for the European stagnancy.

- *Low exchange rates of dollar and yen.*

Together with the strong growth of the European market, this cyclic cause resulted in stiffer competition between the Japanese and the Americans.

- *Fragmentation into national markets.*

European computer companies are champions in their own country. They were lulled for too long by the protection of their national borders and governments. The ECONOMIST calls them "spoilt children, who were unable to look after themselves."

The Commission report observes that not one single European computer company has a truly European corporate image. Olivetti is Italian, Siemens-Nixdorf is German, Philips is Dutch, Bull is French. This is too bad, because it means that any company which is looking for a computer supplier for its European plants might perhaps turn to IBM Europe of DEC Europe rather than to "real" Europeans.

Davignon adds that IBM, as a pioneer and as the biggest company in the industry, had the *de facto* privilege of imposing the standard, first on its huge home market, and then also abroad. "From their small home markets, European companies were never able to develop a standard which would also be accepted in other countries."

- *Shortage of skilled staff.*

In France and Germany together, some 41,OOO engineers graduate every year. In Japan, which has an equivalent population, this number amounts to 80,000 engineers a year.

- *Japanese and American companies can take advantage of European unification, whereas non-European markets are often difficultly accessible for European companies.*

The European Commission says that this is a "political problem." Even Davignon, who is helping Fujitsu to gain

a foothold in Europe through ICL, admits that there is a problem. "But we cannot solve this problem by barring ICL from European research programs henceforth," he says, "since this would take the edge off our most important argument against the inaccessibility of the Japanese market."

- *Ability to think in the long term.*

The Commission admits that this shortcoming is being remedied. The European companies are stepping up their investments in research and development. However, the combined R&D expenditure of the seven major European companies (ECU14 billion (BFr592 billion)) is still far below that of the American top seven (ECU20 billion) and the Japanese top six (ECU22 billion).

A related problem is the limited supply of venture capital in Europe. Some of the American giants from the industry were able to get started thanks to a financier who was willing to share the risk. The Japanese computer companies are often part of a bigger concern which finances their start-up and market penetration costs.

Europe Missed Second Wave

Managing Director Cassoni from Olivetti does not think that the crisis is an exclusively European phenomenon. "What is happening today, is that the traditional computer industry, the historic basis of companies which created the industry, has either disappeared altogether or undergone drastic changes. This is also true for the United States. The European computer crisis is not a European problem, because the European companies are not any different from the older American companies, which are experiencing very much the same difficulties."

"But the fact is that the second wave of computer technologies, which produced, for instance, personal computers, open and nonproprietary systems, and high-performance chips, was ill-accepted by the European industrial system. As a result, European companies, as well as the older American companies which missed the second wave, are dependent on American and Japanese suppliers for their basic technology."

[Graph, p 15]

Consumption (BFr21,500 billion)

U.S.	37 percent
Europe	26 percent
Japan	21 percent
Rest of the world	16 percent

Production

U.S.	36 percent
Japan	30 percent
Europe	20 percent
Rest of the world	14 percent

Trade Balance of Computer Industry (in billion Belgian francs): Growing Deficit

Japan	+2,128 (1986)
	+2,411 (1989)
U.S.	-321 (1986)
	-296 (1989)
Europe	-613 (1986)
	-1,311 (1989)

World consumption of computer and consumer electronics products amounted to more than BFr21,500 billion in 1989. According to this source (calculations of the EC Commission), Europe accounts for more than one-quarter of world demand, whereas its share of world production is only 20 percent. The trend is that Europe's share in demand keeps increasing, while its share in production diminishes, mainly in favor of the Japanese.

Cassoni, Davignon Comment

91AN0529B Groot-Bijgaarden DE STANDAARD in Dutch 24-25 Aug 91 p 15

[Article by Frederik Marain: "Is There a Second Chance for European Computer Industry?—EC Commission, Davignon, and Cassoni Looking for Ways Out of Crisis"]

[Text] Brussels—The name UNIDATA is hidden deep down in the memory of the European computer industry. It was the name of a partnership set up in 1973 among Siemens (Germany), Philips (Netherlands), and CII (France), but which collapsed in 1975 after a dispute over management and after it became clear that the cultures of the three national champions were too different. All subsequent attempts to come to some form of European cooperation were equally unsuccessful. In the meantime, first the Americans and then the Japanese set up organizational structures which did cover the entire European market.

Is it too late to try and set up a pan-European cooperative structure? "Yes, we missed that train," says Etienne Davignon, and all observers in the industry agree with him. "It's a pity, because we had the market." Does this imply that European computer companies must throw in the towel or is there still a second train for them to catch? The European Commission, Etienne Davignon, and Olivetti Managing Director Vittorio Cassoni are looking for ways out of the crisis.

EC: Bull, Siemens, Olivetti Cooperation Detailed

92WS0077D Paris INDUSTRIES ET TECHNIQUES in French 4 Oct 91 p 24

[Article by Yves Ciantar: "First Steps Toward the Europe of Computers"; first paragraph is INDUSTRIES ET TECHNIQUES introduction]

[Text] Bull, Siemens, and Olivetti as partners in a 2.5 billion French francs [Fr] program.

For the first time, the three largest European computer companies have formed a partnership to answer an EC call for bids. Bull, Siemens, and Olivetti thus answered the ENS (European Nervous System) research and development program. Note the absence of the British ICL [International Computers Limited] which was taken over by Fujitsu. Very ambitious, and amounting to Fr2.5 billion over a four-year period, the program will boost research in the field of computer-data exchanges between European states. According to the official gazette of the EC, the goal of ENS is "to study the implementation of trans-European data-processing networks in the fields of health, training, transportation, and administration."

As far as exchanges between administrations are concerned, for instance, the goal is to enable a German customs officer to access Italian customs databases in real time in order to check a Yugoslav truck. Among other things, this will require the development of data-exchange standards. Other projects, such as the creation of a European Minitel, are covered by the call for bids.

The three companies have not yet finalized the terms of their agreement. "Concrete initiatives, task allocation, amount of financing, technical choices, all these will be made public by the end of the year, Siemens Nixdorf announced. "We cannot say whether or not there will be a joint company," the Bull spokesman added.

On the other hand, the companies' work orientations are known. "We shall have to establish a dialogue between data-processing systems in the various countries," people at Bull explained. Today, this is not feasible without going through dedicated-software development stages, which are time-consuming and costly.

The importance attached to the project by the three companies is therefore easy to understand. The project could make it possible to achieve true compatibility among the three manufacturers' machines. The EC's selection of Bull, Siemens, and Olivetti would accelerate developments in this direction at the three companies; it would also give them a significant trump card to face their non-European competitors.

Growth of Europe's Computer Services Sector Reported

91AN0528 Groot-Bijgaarden DE STANDAARD in Dutch 20 Aug 91 p 15

[Article by Frederik Marain: "Computerless Computer Firms Give Europe Worldwide Opportunities"]

[Text] Brussels—During this holiday season, three contracts have been concluded which are indicative of the situation of Europe's information technology industry and also crucial for its future. Two of these agreements illustrate Europe's secondary role in the hardware sector; the third highlights its relative strength in computer services. It seems that there is still hope for the Old Continent. Indeed, the computer services sector, which is dominated by "computerless computer companies," has been performing much better than the hardware manufacturing sector for some time now.

European Information Technology

At the end of July, the Dutch company Philips sold its Information Systems division to the U.S. group Digital. The significance of this is clear: A European company pulls out and a U.S. group expands its market share in the relatively fast growing European computer market. At the beginning of July, the German company Siemens signed a contract with IBM for the joint manufacture of the next generation of memory chips at an IBM plant near Paris. This agreement is possibly the final blow to efforts to establish an "all-European" chip consortium.

On 23 July, the German group Daimler announced a major cooperation and merger agreement with the French firm Cap Gemini Sogeti, the European leader in information technology services. The contract stipulates that Daimler will eventually acquire a majority share of Cap Gemini and that Daimler's computer services division, Debis Systemhaus, will merge with the French group.

This merger will give rise to a new group with a turnover of 73 billion Belgian francs (BFr) and 23,000 employees.

The group will use Daimler's financial contribution to finance takeovers or cooperation agreements in the United States and in the Far East.

Efforts to form a united European front in the computer manufacturing sector have failed. As a result, the remaining European companies are left with gloomy options: being taken over, extensive cooperation with non-European companies, applying for government aid, or disappearing.

What seemed impossible in the hardware sector is apparently being achieved in the services sector. The establishment of a real European group is strategically all the more important as Europe already has a strong foothold in the computer services sector, which is expected to keep growing. The increasing importance of computer services was clearly illustrated at the press conference announcing the cooperation agreement by president Serge Kampf of Cap Gemini: "1990 was a historical turning point: Worldwide turnover in the overall computer sector amounted to $230 billion (BFr8,000 billion) the greater part of which—$170 billion—was produced by the services sector. When I first started in the computer industry 30 years ago, the hardware to services ratio was 90 to 10. Experts agree that this ratio will be reversed within 20 years."

Bricks Are Bricks

According to Roland Van Den Berghe, managing director of Cap Gemini-Belgium, the relative strength of European companies in services and their relative weakness in hardware have the same cause.

"European computer manufacturers have remained too long within the safe protection of their own, national borders, whereas for computer services companies the routine of working locally and in the vicinity of their clients proved to be a major advantage."

Van Den Berghe drew a parallel between the information technology sector and the construction industry. "Computer manufacturers supply the bricks and materials; we are the architects and contractors. Bricks are bricks and to the person building a house it does not really matter where they come from.

"However, a French person with building plans prefers to discuss his requirements with a French architect and a French contractor. This is how Cap Gemini became big in France. Crossborder expansion was achieved through takeovers and cooperation agreements. We became the number one in Great Britain by taking over the British company Hoskyn. Now, through our cooperation with Daimler, we will also hold a leading position in German."

Groups like Cap Gemini are being confronted with increased competition in their field from the computer companies themselves. In a recent article in HARVARD BUSINESS REVIEW, the latter are advised to abandon the manufacture of computers and to become computerless computer companies.

"In the years ahead, real value—and consequently market share and employment—will not be created in equipment manufacturing but in applications development," is the theory put forward by Andrew Rappaport and Shmuel Halevi in the above-mentioned provoking article.

In the meantime, many computer companies will disappear or merge into larger entities. The computer services sector keeps growing, although it is also suffering from growing pains and the pressures of an economic slowdown.

"The sector is going through a phase of consolidation," claims Van Den Berghe. "In recent years, there has been an enormous increase in the number of small firms in the services market. Some of these will inevitably disappear; some will remain either as subcontractors of larger companies or as specialists in a specific subsector.

"The really large projects will be entrusted to 'general contractors' which are organized in an international network enabling them to work for internationally based companies. This is why it was necessary for European companies to broaden their horizons." Van Den Berghe believes that four general contractors will survive. The U.S. group EDS, Arthur Andersen Consulting, CSC, and one European, Cap Gemini.

European Expert Systems Market Analyzed

91AN0516 Paris LA LETTRE DE L'INTELLIGENCE ARTIFICIELLE in French Jul-Aug 91 pp 3-6

[Article summarizing a paper presented by Michael R.W. Dulieu (Sd-Scicon) during the Eleventh International Expert Systems Seminar in Avignon, France: "Expert Systems in Europe: Prospects for 1991-1995"]

[Text] An estimate was made of the financial prospects of the expert systems market for the period 1991-1995; demand was analyzed according to user and application type; the corresponding offer was analyzed by technology and type of supplier; the market development cycle was explained using the Gompertz model; and the current situation was analyzed using data from the period up through the end of 1990. The market figures cover both the products and services available and the changes in their respective market shares. The forecasts relate to the French, German, Italian, and British markets; these markets represent two-thirds of the European market. Aggregates have been calculated for the rest of the market.

On the demand side, the main users have been identified as well as the type of application sought. It has been possible to identify major trends, among which are the trend toward integration and a trend toward meeting current demand rather than pursuing new technological progress. These factors have been analyzed in order to appreciate their impact on the supply side of the market, in particular with regard to the emergence of suppliers specializing in specific market niches.

Toward a General Market Model

It has been noted that the demand for a new type of product or service follows a well-defined pattern. When the product is introduced, demand is strong due to purchases by pioneers. In the computing sector, the first purchasers are often research centers. After a period of evaluation and observation comes the real demand. It has been noted that sometimes this demand never materializes. On occasion demand disappears with the arrival of a new substitute product. The best-known curve for describing this phenomenon is the Gompertz curve, which is S-shaped. This curve shows the four main phases: initial demand, evaluation, maturity, and substitution. What is the position of expert systems on this curve? The very high demand for expert systems experienced in 1984-86 was followed by a slump in 1987-88. Most observers agree that the upturn phase is now beginning.

Forecasting Difficulties

One difficulty encountered in turning the expert systems market into figures is that expert systems are hard to define accurately. A one-workstation system operating on a PC file server developed using an expert system generator can certainly be called an expert system. And

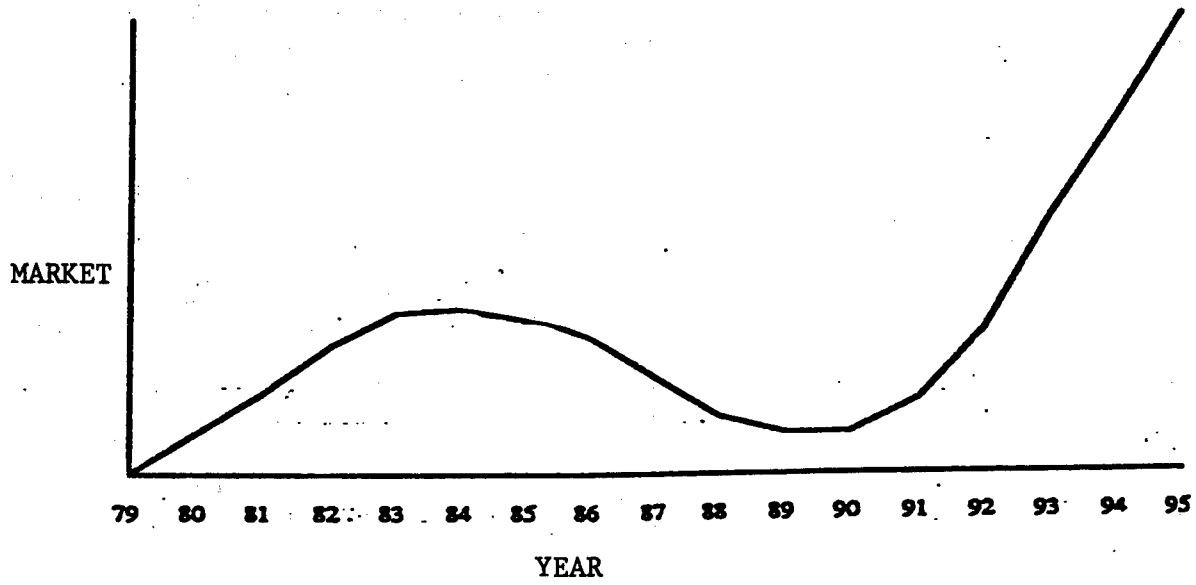

Figure 1. Gompertz curve applied to the expert systems market

what about a generator-developed system and a hypertext integrated with a large database hooked up to a host computer, is that also an expert system? Forecasts cover only those cases where the expert system is an essential element of the whole system, i.e., the integrated system could not work without the expert system. The second difficulty is due to the fact that in the past estimates have always been too optimistic. For example, Table 1 shows forecasts made in 1988; it can be seen that the real market in 1989 was only 82 percent of the anticipated market, while in 1990 this figure was only 79 percent.

Table 1. Market Forecasts (in million ECU)
(France, UK, Germany, Italy)

	1988	1989	1990
1988 forecasts	115	167	235
Real figures	115	138	186

The figures provided here are based on compilations of data available from market research companies, comparisons with factual sources from the past, and the use of corrective factors drawn from experience. No guarantee is given about the accuracy of these figures, as no guarantee could be supplied by the producers of the primary sources. The forecasts for the period 1991-95 are shown in Table 2. Only the French, German, British, and Italian markets have been studied in detail. For the rest of the European market, percentages have been calculated using past ratios. These figures have been checked against data from Sweden, where the market follows those of the four main countries. The figures are aggregates covering the markets for products, services, and equipment. It is possible that there are internal variations in the service market depending on the political or economic options of firms.

Table 2. 1991-1995 Forecasts (in million ECU)
(France, Germany, UK, Italy)

	1990	1991	1992	1995
Services	102	137	182	426
Products	84	117	162	434
Four-country total	186	254	344	860
Total for Europe	282	382	520	1,286

One remarkable point is the continued increase in market share taken up by products, which is expected to reach 50 percent in 1995. In the United States, this share is expected to stand at 70 percent.

Primarily Industrial Demand

The main area of demand will always come from industrial companies, with 25 percent of market share. Then come the financial and administrative sectors. The main applications will relate to consultation systems, error diagnostics, computer-aided design of industrial products, process control, planning, and sequencing.

The technology on offer is developing as follows:

- From expert system generator to intelligent spreadsheets and hybrids with hypertexts;
- From single-station systems to host systems;
- From closed products to modular and open products;
- From AI environments to integration tools;
- From Lisp and Prolog to C and object-oriented languages;
- From dedicated machines to universal workstations.

The main development involves integration and distributed processing of applications on large systems. AI-dedicated machines are being replaced by universal machines. Finally, it should not be forgotten that developments are still being made in PL1 due to the large number of computers produced by a manufacturer using that language.

Table 3 indicates expected changes in the market shares of various categories of suppliers. The main trend in the period until 1995 is toward domination by services companies and difficulties for companies specializing in AI. The market will be characterized by a very strong move toward integrated solutions to the detriment of technological advance. Finally, the arrival of companies that are highly specialized in specific market niches could become a major factor; these companies are often the offshoots of large user groups. It is probable that AI specialists will join forces with these companies to exploit market niches.

Table 3. Services Companies

Type of Company	Market Share 1990	(Value in %) 1995
DP companies	50%	40%
Integrated systems companies	22%	40%
Specialist AI companies	28%	8%
Niche suppliers	—	12%

The main market trend to be seen will be that the predominance of technology will progressively be replaced by an adaptation to demand. The market will grow considerably: It will be dominated by firms capable of offering integrated systems or operating in specialized niches. An entrepreneur wishing to stake a claim in this market should find one of these niches and team up with an ad hoc partner.

France: SNECMA Plans Greater Involvement in Defense R&D To Obtain Funding, Remain Competitive

92WS0044A Paris LE FIGARO in French 1 Oct 91 pp 1-2

[Interview with Louis Gallois, the CEO [chief executive officer] of SNECMA (National Aircraft Engine Research and Manufacturing Company), by Pierre Kerlouegan and Arnaud Rodier: "Ambitious Military Programs Are Needed"; first paragraph is LE FIGARO introduction]

[Text] For Louis Gallois, only Defense Ministry orders can insure the funding of research.

LE FIGARO: Are the budgetary restrictions and uncertainties that are hamstringing the military appropriations bill now likely to compromise SNECMA's development?

Gallois: Seventy-five-percent of our activities involve civil aeronautics, so the impact of these restrictions and uncertainties is highly circumscribed. Nevertheless, military work will represent a quarter of our sales in the coming years, and every major fluctuation in that sector will affect us. Moreover, military products are at the cutting edge of the SNECMA group's research.

Research and development represent 25 percent of our sales, and the military share accounts for nearly half of our expenditures. We currently have 1.6 billion French francs [Fr] invested in military research and development and a bit more in civilian R&D. We are discussing with the Defense Ministry how SNECMA's technical potential can not only be maintained, but strengthened. We are also engaged in preliminary talks with the Ministry of Transport on a civilian technological action program. Aeronautics research is an area where Europe excels, and European funding of research should also be expanded. It is presently very weak.

Industrial Concerns

LE FIGARO: Does that mean that you would like to see large, innovative aeronautics programs, provided with special funding?

Gallois: It seems to me that supersonics could be a large European program. In Brussels we proposed that discussions be gotten underway. We are allied in a consortium that includes Rolls Royce, MTU [Motoren-und Turbinen-Union], and Fiat. It clearly shows our desire to develop European cooperation. But for now, projects of this type are extremely limited.

So, like all our competitors, we need ambitious military programs to keep the company technically top-notch.

LE FIGARO: What are the repercussions today of the poor sales of the Mirage 2000 and the probable freeze of certain French orders for the shop floors that manufacture the plane's engine?

Gallois: We have not in fact yet received the French order planned for 1991, and we don't know how many planes it will involve. The forecasted order was for 24 planes. As for the 1992 orders, they have not yet been decided; we do not have the details on the budget. Twenty-four planes means 27 engines for us, or one year of work at current production levels. Above all, it is desirable that we be informed of the medium-term future. That is why the appropriations package is so important to us.

LE FIGARO: You don't seem very optimistic....

Gallois: It is not up to us to draw up the budget. We express our industrial concerns, but it is up to the government to decide, and up to us to manage the effects of those decisions as best we can.

LE FIGARO: Below what threshold would you consider yourself penalized?

Gallois: We estimate that to keep the M53 engine production line at an economically satisfactory level, we must make two engines a month, or have annual sales of about 24 engines. Moreover, the DGA (General Weapons Delegation) is fully aware of this constraint.

LE FIGARO: Do the uncertainties surrounding Rafale, and especially the possibility that the air force's single-seater version will be dropped, worry you?

Gallois: As far as I know, there is no uncertainty about Rafale's future. The program is moving ahead normally, under excellent technical and financial conditions. We are three months ahead of schedule and still within budget on the engine, the M88.

True, the discussions on the two-seater and single-seater versions interest us, but they do not affect the heart of the operation.

A Contract Is Never Lost

LE FIGARO: But wouldn't the possible discontinuation of the single-seater be a handicap all the same?

Gallois: For us, it makes absolutely no difference, since the same engine is involved. However, it is clearly easier to export the single-seater. It would therefore be necessary to find an economically viable way to develop a single-seater version.

LE FIGARO: So you are feeling neither uncertain nor worried?

Gallois: I have no worries at the present time. Like everyone else, I hear rumors, but if I listen to decision-makers I don't feel there is any uncertainty.

LE FIGARO: You wanted to boost the military share from 25 to 35 percent. Do you think you can succeed?

Gallois: Indeed, we think that the military share should range between between 30 and 35 percent. That level makes it possible to better absorb market fluctuations and better balance research funding. We are the most civil-aeronautics-oriented of the world's four big engine-makers, and that could be a handicap in the long run. Today, 79 percent of the orders in SNECMA's book are from civilian sources. I think that the M88 should allow us to increase the military share around 1998-1999, if the Rafale's export prospects are borne out.

LE FIGARO: Do you think there may be foreign orders for Mirage 2000s any time soon?

Gallois: A contract is never lost until the planes are delivered. There appear to be two possible markets today: Abu Dhabi and Finland. Has even Switzerland made its final choice?

LE FIGARO: If Mirage sales prove to be less than what you expect, what measures will you have to take?

Gallois: That is a touchy topic. We are thinking about it, but we will not make any premature decisions. Other factors enter into determining the future shape of our workload and staff. We are going to cut our staff by 300 this year. We will continue to scale back personnel in 1992 at a rate that has not yet been determined. I would point out that, given the production cycles in the aeronautics industry, there is no direct link between the orders that are or are not placed at the end of 1991 and the effective workload of 1992. In any event, SNECMA's workload will be flat over the next few years, which prompts us to be cautious.

LE FIGARO: Isn't the slump in air transportation also handicapping you?

Gallois: It affects us like it does everyone else. No one has been immune. Overall airplane orders during the first half of the year fell to 125, compared to 450 for the same period last year. The airlines have a number of airplanes available to them on the market—currently 800 of them. They are in a tight financial spot. They are therefore taking their time before ordering. Nonetheless, we were able to maintain, and even strengthen, our market shares during the first few months of 1991, in a mediocre market. We benefited from a substantial rebound by the A340 equipped with the CFM-56, which was ordered by Singpore Airlines, Austrian Airlines, and Northwest. General Motors also launched the big GE90 engine, in which we have a 25-percent stake, with British Airways. Nonetheless, it's true, the market is mediocre, and it's not going to get back on its feet quickly.

LE FIGARO: How are you handling the shock?

Gallois: We are handling it by relentless rigorous management. Moreover, we are coming through it rather better than others, inasmuch as we had digested the drop in military work at a time of strong growth for us in the civil sector. In addition, the CFM-56 program is still extremely powerful. For us, the lack of orders will make itself felt in 1993-94, which gives us time to react and some potential ways of catching up if orders resume at the end of 1992.

Supersonics: With the Japanese

LE FIGARO: SOCHATA and Eram, SNECMA's subsidiaries, are also experiencing problems....

Gallois: Eram is suffering the repercussions of the "Dauphin" orders and Embraer's difficulties in Latin America. Messier-Bugatti and SOCHATA do a lot of work in spare parts and repair, which are two activities that have suffered enormously over the last few months. The airlines, which are having financial problems, have trimmed their orders for spare parts by 35 to 40 percent, and are sending fewer engines in for repair. This does not in any way mean that the planes are less safe, but simply that fewer of them are flying.

LE FIGARO: SEP (European Propellent Company) is also scaling back the number of its jobs...

Gallois: It has been directly affected by the discontinuation of the S45 missile and by some delays in the civilian space programs, Ariane V and Hermes. Yet the staff reductions—248—are modest compared to what the program cutbacks might have brought about automatically. This is particularly so because of certain research contracts that are being arranged with the DGA.

LE FIGARO: Are you afraid that other subsidiaries of the group will be forced to take similar measures?

Gallois: The entire aeronautics industry is now in the process of adjustment. There have been substantial job cutbacks among our main competitors. Pratt, General Electric, and Rolls-Royce have reduced their staff by 10 percent. If we are not yet to that point, it is because we took the military shock before they did.

LE FIGARO: Was it necessary to support the restructuring of FN in Belgium, of which you hold 51 percent of the capital, and within which you must now deal with Pratt and Whitney?

Gallois: FN is certainly not a light burden for SNECMA right now. It is costing us a lot. It is a group with deep-seated problems. We had to reconstitute its capital. This has now practically been accomplished. Pratt and Whitney should acquire 19 percent of the stock, side by side with with the Walloon region, which will have 30 percent of the capital. Internally, a painful but indispensible reform program is underway. But the company is also valuable to SNECMA inasmuch as it gives it a useful European dimension.

The State Will Decide on Opening Up the Capital

LE FIGARO: How is the work on the supersonic engine shaping up?

Gallois: We are working on it with our European partners at a speed that cannot be very high as long as the governments, or Europe, do not give us financial backing. We will not spend much money on the supersonic until there is state support. The Americans have their own program, as do the Japanese. That should not stop us from working with them. Our goal is to prepare ourselves for that by boosting our technical heft. Moreover, my feeling is that the supersonic program will be carried out with Japanese companies, or not at all. Because the market is very largely over there.

LE FIGARO: You still don't have the Fr750-million capital appropriation that you were asking for. Now that the government has opened the door for new shareholders to acquire capital in national companies, are you a candidate?

Gallois: The structure of SNECMA's balance sheet is not bad. The company's net debts, excluding subsidiaries, represent half of our equity capital. So we do not need equity capital simply to improve the appearance of our balance sheet. We need it to limit our financial costs. In this business, where profitibility is very long-term, it is important that financial costs not exceed 2 to 2.5 percent. SNECMA's are at 1.7 percent, but are tending to grow. I have therefore asked my stockholders to support the company's expansion by an equity-capital increase.

As for opening up capital, it should be understood that we are in a very special industry. SNECMA's exteriorized profitibility is low. We are just at equilibrium, while at the same time we have a substantial self-financing capacity of about Fr3 billion a year. We are generating resources, but our research and development needs are so great that we are absorbing everything. Consequently, a shareholder could not invest in SNECMA for short-term profitibility. A pure financial investor, without a long-term vision, will not find what he is looking for in us.

LE FIGARO: What kind of shareholder would you like?

Gallois: If SNECMA's capital were to be opened up, the ideal situation would result in both a capital influx and strong industrial synergies. The range of opportunities is rather limited. You don't enter the airplane-engine business on a whim. However, there are people who could be interested in both Europe and the United States, or elsewhere. There are many ways it could be handled, through the parent company or subsidiaries. When the time comes—and it is the government's decision—proposals will have to be studied with care, without rushing, and with a cool head!

LE FIGARO: Does that mean that you could finish out 1992 without an appropriation and without opening up your capital?

Gallois: I have just told you, it does not depend on us alone. SNECMA would not file for bankruptcy if no new equity capital were provided in 1992. But it is not a situation that I would like to see. To achieve our ambitions, the company must have equity capital to match.

France's Alcatel Reorganizes To Face Telecommunications Market Competition

92MI0007 Duesseldorf HANDELSBLATT in German 10 Oct 91 p 16

[Text] In the future, the French communications corporation Alcatel NV, Amsterdam, intends to present a more unified corporate image than has been the case to date. This was made clear by Board Chairman Pierre Suard at a press conference held at Telecom '91 in Geneva. Alcatel has an 86 percent share in Standard Elektrik Lorenz AG, Stuttgart.

An outward sign of this more markedly corporate-oriented strategy is the choice of group styles. For instance, SEL will have a higher profile as Alcatel SEL, and the new Italian subsidiary will bear the name Alcatel Italia. As reported by Suard, the company will begin operations before the end of this year. Alcatel, whose top management is located in Paris despite the fact that the

company is registered in Amsterdam, signed an agreement with Fiat in October 1990, the main feature of which was acquisition of a majority holding in the Fiat subsidiary, Telettra.

Alcatel is also bringing its previous subsidiary, Alcatel SACE of Milan, into the new corporation. Suard appeared convinced that this step would make Alcatel large enough in Italy to achieve its targets there. In order to enhance the role of the new Italian subsidiary, which has around 18,000 employees, it will take overall control of the transmission systems division from Paris. The Italians and the new U.S. subsidiary, Alcatel Network Systems, which has just been formed from the recently-acquired Rockwell Network Transmission division and the previous American Alcatel operations, will work closely together. Suard pointed out that the companies in Italy and the United States are good examples of the corporation's acquisition strategy, which is based on four principles:

- To seek companies that complement the group for the geographic or technical point of view;
- To identify and nurture the capabilities of each company;
- Local management;
- Only friendly takeovers.

Apart from the acquisitions, Suard is also expecting further spurts of growth for the group, partly as a result of operations in the South Pacific. He is currently expecting an early decision on a major order by the Australian Telecommunications Ministry. Australia is rumored to have decided to adopt the European GSM [Group Special Mobile] mobile radio standard, and the contract is expected to cover delivery of complete GSM networks for the Sydney, Brisbane, and Canberra areas.

Suard also expressed pride that Alcatel has become the leading company in Australia for submarine cable in the past few years and has successfully penetrated the market there for packet-switching systems. The Alcatel chief reported that a consortium led by Alcatel Submarkom had successfully tendered for a cable network to link South-East Asia with Europe and the Near East. He put the value of the project at $600 million.

However, overall Suard expresses pessimism over future growth opportunities for telecommunications manufacturers. He sees expansion opportunities only in certain South Asian countries and in Germany, and with specific products such as radio telephone systems. He is particularly pessimistic as regards increased operations in the USSR, despite the gigantic demand there, because of the notorious financial problems. Alcatel will bide its time in the immediate future, though without losing sight of the market for a moment.

Suard pointed out that Alcatel is represented in the major eastern European countries via partnerships. Alcatel has only three joint ventures in the United States. According to Suard, Alcatel Austria has recently entered into a joint venture with the Hungarian State Railroads, Alcatel holding 60 percent and the railroad company 30 percent. The new company will install the latest signal technology on the rail lines linking Austria and Hungary.

Germany: Siemens-Nixdorf Chairman Evaluates First-Year Problems

92MI0030 Duesseldorf HANDELSBLATT in German 15 Oct 91 p 25

[Text] "Teething troubles will strongly affect" the results of Paderborn-based Siemens Nixdorf Information Systems AG (SNI)'s first business year, 1990-91. In an interview granted to the house journal SNI INLINE, SNI supervisory board chairman and Siemens AG central board member Hermann Franz explained that "high startup costs and restructuring expenses were responsible for the company failing to thrive as quickly as expected, or indeed as quickly as would have been necessary to achieve at least last year's sales."

The figures will be submitted within a few weeks, said Franz. As had become evident over the first few months, the restructuring of the former Nixdorf division and its organizational integration with Siemens' data and information technology (DI) division proved more far-reaching than expected, although it had been known from the beginning that "the merging of two such big companies with such different corporate policies and cultures would be no easy task."

The former Nixdorf Computer AG's last annual sales had amounted to about 5 billion German marks [DM] as against Siemens DI divisions's over DM7 billion. According to Franz, the trend was in the right direction, but there were still a number of problem areas to be addressed with greater determination and solved with the maximum speed. The measures agreed upon in August for the second stage of the integration process, which would cut costs by about DM600 million, would now have to be rigorously implemented. The profitability problems required solution as quickly as possible.

Combining SNI's data processing business with the know-how acquired by Siemens' various branches would give SNI a decisive competitive edge. "Siemens is a major computer supplier, of which SNI must see itself as a part." Franz called on employees to identify with the merged SNI and to forget where they came from. Siemens' large labor market would now be open to all SNI employees, and he failed to understand why, after one and a half years, uniform conditions of employment were still an issue.

Germany: Bosch Group Increases Mobile Communications Revenues

91MI0493 Bonn DIE WELT in German 30 Aug 91 p 12

[Text] Despite some signs of weakness on important foreign markets since the early autumn of last year, in the

first half of 1991 Bosch's Mobile Communications division saw its revenues grow by nearly 15 percent to more than 2.8 billion German marks [DM]. This means that this division, which for the past three years has included Blaupunktwerke GmbH and the Bosch works in Berlin and Wolfenbuettel, contributes around 25 percent to Bosch's total revenues.

These figures were given by the head of division, Heiner Gutberlet, who is also a manager of Robert Bosch GmbH in Stuttgart. According to Gutberlet, the most important spurs to growth in the first half of the year came from the domestic market. There were high growth rates in camcorders, broad band communications, radio engineering, and car radios.

The sharp rise in the number of subscribers to the German Federal Post Office's C-net cellular radio system brought a 26 percent growth in revenues to radio engineering. Bosch is now one of Germany's leading suppliers of mobile telephones with 20 percent of the market. But Bosch is also involved in the D-net digital radiotelephone system, albeit more as a supplier of services. Bosch Telecom Service GmbH sells primarily terminal equipment, including support and service. Above all, radio engineering has taken off through supplying the communications technology for the German Federal Railway's ICE [Intercity Experimental] services.

Although the Bosch subsidiary Blaupunkt (half-yearly turnover DM91,974; exports: 46 percent) also has a presence on the consumer electronics market, sales and marketing manager Detlev Gruhl says that car radios (sales target for 1991: 4 million sets) still top the bill. But the novelties on show at the International Radio Exhibition (IFA) now have little in common with the good old car radio. High tech is the order of the day. Apart from the RDS [relational data system] and TMC traffic information systems, the new ADA (Auto Directional Antenna) receiver system is being presented, which uses four separate antennas to achieve hitherto unattained quality of reception. According to Blaupunkt, this should make disturbances in urban traffic or mountains a thing of the past.

The London RDM 42 promises the motorist not only the best reception automatically but also the sound quality of a CD [compact disc] player - for the first time with integrated output stages for a total of DM1,300. Blaupunkt is paying particular attention to the CD market, which is expected to show growth margins of around 13 percent by 1995. In the realm of video and television, Blaupunkt is also entering the hotly contested broad format market and already, like its competitors, offers the intermediate model towards HDTV [high definition television], the D2-MAC decoder.

Technology alone has long since ceased to be enough to capture a market: sophisticated, even eccentric design is just as important. With its TV-Unda Blaupunkt has come up with a set which will certainly be an acquired taste: it looks more like a lump of rock than a television. In camcorders too, which are the growth market, Blaupunkt has forced standards up. The new CCR-880H, the first compact camcorder in Hi-8 standard, opens up new possibilities to the creative videofilmer. Weighing just 1,000 grams, this lightweight gives sharper pictures than conventional television sets.

Siemens Publishes Mid-Year 1991 Results

91WS0539C Chichester INTERNATIONAL TELECOMMUNICATIONS INTELLIGENCE in English 5 Aug 91 pp 25-26

[Text] Siemens' business volume expanded strongly during the period October 1st, 1990 to June 30th, 1991, mainly as a result of numerous large orders and the inclusion of newly-acquired companies. New orders rose 20 per cent, with the major proportion of the growth being accounted for by German domestic business. In the most recent three months period, international orders also picked up. Newly consolidated companies accounted for eight per cent of the growth in orders. Worldwide sales increased 12 per cent and net income after taxes seven per cent.

Siemens (Siemens AG and its consolidated companies) booked new orders of 61.3 German marks [DM] (previous year: DM51.0) billion during the period, an increase of 20 per cent. Of this total, eight percentage points were due to newly consolidated companies, mainly Siemens Nixdorf Informationssysteme AG (SNI) and the activities acquired from Plessey. Growth in Germany was strong (31 per cent), due both to newly-acquired businesses and, above all, to orders from the new German states (DM2.4 billion).

Despite having a lower growth rate than in prior years, international business still expanded by 13 per cent on a year-to-year comparison, but 30 per cent during the last three months. Large-scale orders stimulated above-average growth for the Transportation (39 per cent), Public Communication Networks (33 per cent) and Power Engineering (27 per cent) Groups.

By contrast, business in standard products was weaker. Despite a depressed climate in the computer sector, Siemens Nixdorf Informationssysteme (SNI) recorded orders of DM9.0 billion, four per cent more than a year earlier.

Sales rose 12 per cent from DM45.3 to DM51.0 billion, with German and international operations contributing equal shares of this growth. Due to the traditionally long lead times in the systems business, the high level of new orders booked this year will only affect the sales volume over a longer period. Developments varied very strongly among the operating groups. While sales of Components and Automation Systems stagnated and Automotive Systems, Drives and Standard Products recorded only marginal growth rates, sales of the Transportation Systems, Industrial and Building Systems, and Public Communication Networks Groups increased by over 20 per

cent each. At SNI, nine-month sales trailed behind new orders, despite satisfactory third quarter figures.

The number of employees at 30th June, 1991 was just under 407,000, or 9 per cent more than at 30th September, 1990. This growth resulted primarily from the inclusion of newly acquired companies. Other factors had only a marginal effect on employment levels. Reductions in the workforce and some short-time work was necessary in a few areas which were affected by recessionary trends. Personnel costs rose 15 per cent to DM22.9 billion.

Capital spending was down by one-third on the comparable year-to-year period, decreasing from DM5.3 billion to DM3.6 billion. This reduction was due exclusively to the lower amount spent on acquisitions. Capital expenditures on fixed assets rose slightly.

Net income after taxes increased seven per cent, from DM1,136 million to DM1,214 million.

Siemens AG - Interim Report for the Period October 1st, 1990 to June 30th, 1991 (DM000m)

	1 Oct, 89 to 30 Jun, 90	1 Oct, 90 to 30 Jun, 91	% Change
New orders			
Domestic business	20.8	27.2	20
Overseas business	30.2	34.1	13
Total orders	51.0	61.3	20
Sales			
Domestic	20.2	22.8	12
Overseas	25.1	28.2	13
Total sales	45.3	51.0	12
Employees			
Domestic operations	230k	246k	7
International	143k	161k	13
Total	373k	407k	9
Employment costs	19.8	22.9	15
Capital expenditure	5.3	3.6	-33
Net income	1.136	1.214	7

Norway: Rising Exports of Information Technology

92WS0024A Oslo AFTENPOSTEN in Norwegian 13 Sep 91 p 21

[Article by Lars Ditlev Hansen: "Norwegian IT Exports Rise"; first paragraph is AFTENPOSTEN introduction]

[Text] The approximately 130 Norwegian companies in the information technology (IT) area export company-developed IT products worth over 5 billion kroner. Exports are rising but the number of employees is declining.

Until the downturn in 1988, Norsk Data was the flagship and engine of the Norwegian information technology industry, forging ahead internationally. This is no longer the case. Nevertheless the Norwegian IT industry is still expanding, but it is the small and medium-sized firms that dominate the field and they do best in special niches. Norwegian IT firms are even world leaders in some areas—in marine technology and internal communications, for example.

Norwegian exports of company-developed information technology products are increasing slowly but surely—despite constant structural changes and the decline of some companies that has occurred in both domestic and foreign industries. In the first half of this year the IT sector's exports increased by 300 million to 2.7 billion kroner, according to the Information Technology Industry Association (ITF, affiliated with the National Association of Technology Firms), which has figures that cover most of the Norwegian IT industry.

More Exports

Last year IT firms exported 54 percent of their total sales of 9.9 billion kroner. Exports have risen steadily over a number of years despite the fact that total sales fell from 11.5 billion kroner in 1988 to 9.5 billion kroner in 1989.

"If we correct for the structural change that has occurred in Norway as well as in Europe, I feel the nucleus of the Norwegian IT industry is definitely moving upward," says ITF chairman Kjell H. Husby of Stentofon.

"Many medium-sized firms represent the most important part of the branch and they have managed to steadily increase their exports," he says.

Fewer Employees

Although sales have risen in the past year the number of employees in this industry continued to decline. ITF's statistics recorded 11,500 employees last year—900 fewer than the year before and 3,000 fewer than in 1988.

"This is perhaps the Norwegian industry that is most exposed to competition and there has been a considerable increase in productivity in recent years," says director Jorn Sperstad of ITF.

Niche Emphasis

The big flagship and engine is missing in the IT branch but Husby says he can see several smaller ships and engines in their respective niches instead.

"There has been a stronger focusing on the problems and what has happened to Norsk Data in Skullerud and Alcatel STK in Okern," says Sperstad.

He says people often forget the many medium-sized firms that have developed within their areas during the whole postwar period and the high-tech companies and complexes that have grown up in Vestfold, for example, or that have evolved as spinoffs of the Society for Industrial and Technical Research [SINTEF] complex in Trondheim.

Five concerns are a major factor in the Norwegian IT industry: Alcatel STK, Electrical Bureau, Inc. [EB], Ericsson, Philips Norge and Siemens. Foreign-owned giants, but even so they are developing Norwegian technology in Norway, Sperstad points out.

In addition to these concerns there are 125 relatively medium-sized and smaller firms among which Tandberg Data, Autronica, EB Nera, Norsk Defense Technology, Norsk Data, Norcontrol, Simrad and Stentofon are the best-known. Many, though not all of them, are growing nicely.

The five concerns are a big factor on the domestic market, thanks to big contracts with the Telecommunications Administration and the armed forces. The medium-sized Norwegian IT companies account for 75 percent of all Norwegian IT exports, according to Sperstad.

"Many of the medium-sized firms that are doing well today emerged in a period when it was easier to obtain net capital than it is today and have been through at least one crisis," says Sperstad.

Concentration on niche products is ITF chairman Husby's slogan for the Norwegian IT industry today as well as in the future. Now the emphasis is being placed on achieving good cooperation with Norwegian customers and public departments with regard to more state development contracts for the IT industry. He regards this as necessary in order to create a good domestic market that can form the basis for a wider global market strategy. This may be a very difficult task because the industry has not had very good experiences when it comes to getting support for state development contracts.

"Norway must maintain a national competence edge in the IT sector, which is the most vigorous growth area in the world," says Husby.

"But the country is at the bottom of the western world in the use of state development contracts. Our business policy does not put enough emphasis on industry and there is a need for concrete measures that contribute to development and industrial growth. An entirely different industrial attitude is required in Norway," says Husby, who has this ambition for the Norwegian IT industry:

"I want us to sell 10 'screws' outside the country for each 'screw' we sell here."

Norwegian IT Industry

Information technology (IT) covers areas such as electronics, computers, telecommunications, and software.

The Norwegian information technology industry consists of approximately 130 companies that sell company-developed IT products.

Over half of Norwegian IT products are exported; computers are the largest export group, closely followed by telecommunications equipment and professional electronics—primarily marine and industrial electronics.

The table below shows developments in the information technology industry in the last three years (according to figures from the Information Technology Industry Association):

	1988	1989	1990
Sales	11.0 billion	9.5 billion	9.9 billion
Exports	4.9 billion	5.1 billion	5.3 billion
Number of employees	14,500	12,400	11,500

Philips Half-Year Results Reported

91AN0530 Amsterdam COMPUTABLE in Dutch 9 Aug 91 p 10

[Article by Paula van de Riet: "PC's Hold Consumer Products Division Profits Down; Philips' Recovery Is Proceeding Successfully"]

[Text] Eindhoven—Philips' recovery is proceeding more successfully than initially expected. The layoff program is ahead of schedule and profits are developing reasonably well. Only the results of the consumer products division are much worse than last year's, which is probably due to a large extent to the loss-making PC division.

During the first half of 1991, profits reached 687 million guilders, including 365 million from the sale of Philips' stake in Whirlpool. In 1990, mid-year net profits minus extraordinary items were only 53 million guilders. This year, turnover amounted to 26 billion guilders, i.e., 1 percent less than last year.

This was revealed last week during the presentation of Philips' half-year results. H. Appelo, a member of the board, announced that the results were "encouraging, nothing more." Philips' top financial manager said that he wanted to "damp" the optimism about the 1991 results. "Yes, we are likely to make a profit this year, but that is the most positive statement I am willing to make," he said after repeated questions about the prospects for this year.

Appelo attributed the relatively high profit figures to the accelerated departure of personnel. At this moment, Philips employs only 255,800 people. As many as 18,300 employees have left Philips since the beginning of the

year, 4,400 of these in the Netherlands. Appelo expects the staffing level to drop to about 233,000 by the end of the year. One and a half years ago, there were still 300,000 people on the payroll.

The most striking fact was the disappointing result of the Consumer Products Division, which usually performs very well. This division accounts for 45 percent of Philips' turnover. Its half-year trading results dropped from 825 million guilders in 1990 to 489 million this year. According to Appelo, an all-out price war is going on in this sector. In addition, the division supposedly also suffers from the fact that this is a dull year, without any major events such as the Olympic Games or the Soccer World Championship.

Late last year, however, the heavily losing PC department was transferred from Information Systems to Consumer Products. The question arises as to whether this still losing PC branch is not, to a great extent, responsible for the division's downturn. Appelo was reluctant to give exact figures about the PC department's situation, but he let it be known that the results during the first half of this year improved by 100 million guilders.

Somewhat later, another spokesman admitted that since PC's were the main cause of the Information Systems Division's deficit last year, it will inevitably have a negative effect on this year's results of the Consumer Products Division. At present, this division is said to be performing better because of new products such as the Pro series, which is said to be well received. "Thanks to the new approach, business has improved a great deal," said the spokesman.

At present, the Professional Products and Systems (PPS) Division is sailing with the wind, especially the Medical Systems branch, which is performing "outstandingly," as Appelo put it. The Communications Systems branch was also mentioned as one of the great profit makers, while Information Systems was said to be doing well. The division as a whole generated 251 million guilders in profits, compared to a loss of 111 million guilders last year. The number of deliveries by the PPS Division went up by 4.1 percent.

So far, Appelo refused to reveal the price at which Information Systems will be sold to Digital in October, despite heavy speculations that it will range between 300 and 500 million guilders. "I am not bothering to quote a price," said Appelo.

The Components Division's turnover dropped by 100 million guilders, but it succeeded in turning a 59-million loss during the first half of last year into a 231-million profit this year. This improvement is due to the reorganization of the production of semiconductors. Philips' oldest division, Lighting, is still in the doldrums. During the first half of this year, trading results dropped from 327 million to 261 million guilders. Appelo did not seem very upset about this: "Lighting will certainly recover, the division is clearly moving in the right direction," he said.

Philips Presents 10-Year Strategic Business Plan

92WS0082J Chichester INTERNATIONAL TELECOMMUNICATIONS INTELLIGENCE in English 7 Oct 91 pp 4-5

[Article: "Philips Says Intelligence To Move Out of the Central Office Switch"]

[Text] Network intelligence and easy, mobile, access to new forms of wideband networks are the keys to success in telecommunications markets over the next decade according to Wim Huisman, Chairman of Philips Communications Systems [PCS] Division. He explains that liberalisation and deregulation have stimulated competition among public telecommunications operators (PTOs) as well as co-operation. And that means that the ex-PTTs [Post, Telegraph, and Telecommunications administrations] will need to offer more and better value-added services to compete for revenues.

That scenario places emphasis on wireless and cordless infrastructure and user terminals, broadband optical fibre synchronous digital hierarchy (SDH) transmission systems, advanced customer premises equipment and "intelligence" platforms. Significantly absent from the list are what Heinz Thielmann, Managing Director of Philips Cable Transmission and Network Access product division calls "the big switches".

Indeed, Philips' strategic business plan for the next 10 years of telecommunications marketing hinges around their absence. Whether this is as a result of careful product planning and detailed, objective, market research or force of circumstance following the collapse of Philips' partnership with AT&T is not a matter for open discussion.

Huisman and his team of six product division managing directors are convinced that they face the next decade with a range of products and a plan that will push the company nearer the top of the international league. Overall, the PCS is a net contributor to Philips' staggering profits turn around in 1991. Huisman says the division hit profits towards the end of 1990 and is increasing its earning steadily. He claims sales of around £3 billion enough to rank his operation eighth among the world's telecommunications companies, he said. A feature is a high expenditure on Research and Development "more than 10 per cent—but less than 20 per cent" of sales, and built into that equation is the fact that 70 per cent of PCS sales derived from that are less than three years old.

Francois Leraillez, Huisman's Vice Chairman takes up the story: "Something new is happening in telecommunications which is bringing new players into the market," he told ITI [Intervention Technique Informatique]. "Large central switches are becoming less important. As a result, networks are becoming less structured around central switching nodes, and are being replaced more dependent on a combination of intelligence and transmission." He says that this observation holds for both

public and private networks. "The differentiation between systems and equipment used by private networks and public networks is getting less and less," he asserts.

"The force behind this is the appearance of new services. There are three dimensions. Data, Mobility and Wideband demand which together will stretch the abilities of service providers during the next decade," Leraillez said. But PTOs and private network operators alike find it difficult to keep abreast of developments in these areas.

"If you look at the way in which network operators have responded to this pressure it is by adopting ad hoc solutions and they have sought out new suppliers," Leraillez avers. In particular, he believes the operators need suppliers and equipment that can be adapted quickly enough to keep abreast of the demands of their users. And that alone is enough to keep the big switches out in the cold. "They take too long to change," Leraillez claims. "Typically, it may take three or four years to rewrite, test and debug the huge software programmes they need."

His answer is the separation of the functions of signalling and control from the traffic transport within a network. That way, intelligence can be added by means of smaller and more flexible "platforms" which combine switching capabilities with data base and processing. "In the future, the different service dimensions are to be added from the outside by means of dedicated servers."

He sets out to prove his philosophy by demonstrating how this market has developed in the last decade. While, overall, it has continued to grow, his graph shows that sales of switching systems have flattened dramatically in the last few years as the more advanced nations have completed their digitalisation plans. The products that Philips has opted to emphasise however, show a steady upward curve on his charts. "Growth is coming from that type of business on which we are focusing—Philips has a growth of nine per cent in these fields," he claims, adding, "in the new telecommunications environment, the traditional market leaders may not remain so—the profile of the next generation of market leaders will be those focusing on the supply of equipment for value-added services such as radio, data OPE. There will also be a high volume terminal dimension close to consumer electronics where lifestyle imaging will be important."

Heinz Thielmann takes up the theme: "What we mean is that the plain ordinary telephone function will remain in the switches but network intelligence will move out of the switches into dedicated solutions. Therefore we see the growth of investments in the future mainly in the area of new services, service switching, network management plus trunk transmission," Philips' public telecommunications operations are focussing around subscribers' access area, he told ITI. "This covers all kinds of data communications, data access networks, rural telephony, fibre-to-the-home, cable TV, including broadband HDTV [high-definition television] transmission, and ISDN [integrated services digital network].

"In the trunk transmission we are moving from the piesiochronous systems to synchronous systems (SDH), including cross connect systems and management functions and using both optical fibre and microwave transmission systems. And in the area of network management and switching systems we are focusing around those things that allow the network operators to run their system in the most efficient way.

"In the access area we will have more and more combination of voice, data, text and image. This needs new interfacing here. This means broadband or bandwidth on demand for the subscriber which calls for intelligent remote access nodes before the switching systems. In the trunk network, besides the switches we are seeing more and more cross connect systems and SDH systems which utilise bandwidth on demand for leased line networks or flexible configuration of networks just by passing the big switches."

Thielmann claims that Philips is currently market leader for Synchronous Digital Hierarchy (SDH) systems. "We have contracts in six countries, field trials running in several more," he states, and boasts, "from all our contacts with public telecommunications operators, we know we are the most advanced in this technology. Our objective is to keep this time window and to build an international position in this area."

Another area where Thielmann claims a lead for Philips is in intelligent networks connected to the big switches. "This product is a service switch which has all the functions of a normal 64Kbit or ISDN switch, but has a database system which makes it possible for operators to create new services. They allow management functions—but the key point is that they are outside the big switches."

The big problem the PTOs have with big switches is if they ask for new features. They have to wait three or four years until all the big software packages are changed in the big switches. 'The Philips solution provides another way—where PTOs can add features to their networks in half a year or one year with less complexity in software," claims Thielmann.

Apart from telecommunications, Philips as a group is perhaps better known for consumer electronic products—a sector in which it reckons to be the third largest in the world. A measure of the new order at Philips is the application of its consumer marketing and production experience to what is rapidly becoming the big boom market in Europe—mobile communications, or in Philips terminology, Mobile Automatic Telephone Services (MATS). Here Heinz Plannschmidt, Managing Director for the Public Radio Communications division is more concerned with his channels to market than the technology. "What is important for us is that the means of distribution will change rapidly in the next four to five

years. At the moment 80 per cent of all cellular telephones are sold through specialised dealers," he said. By 1994 that proportion will be down to 40 per cent with car makers selling 20 per cent. "But the biggest proportion will go through retail outlets," he believes—and Philips is very well placed to use its retail outlets and expertise.

The main reason is the anticipated miniaturisation of portable telephones. Plannschmidt asserts that by the year 2000 more than 80 per cent of mobile phones sold in Europe will have a physical volume of less than 150 cubic centimetres. They are also likely to be moved to market in very high numbers—he estimates that for Europe as a whole to achieve the same level of penetration as Norway, more than 25 million portable phones will need to be sold. Both factors mean that they will be regarded as consumer electronic commodity products to be handled by retail stores.

The background to that is that personal telephones—with less than 150cc volume will be around by end of the decade and will account for over 80 per cent of sales—and they will need different distribution channels—as a consumer electronics item sold through retail outlets.

Group claims 11 orders for GSM [group special mobile] digital cellular networks on its books: In Finland, two in Germany, Sweden, Belgium, Switzerland, Austria, Italy, Portugal, France and Cameroon.

Private mobile radio systems are the province of Dieter Siegelberg head of Cambridge, UK-based Radio Communications Division providing trunked radio and radio paging systems. But here too, the world is turning digital, and Siegelberg says that his microelectronics design centre at Cambridge is preparing to design circuits for the new European Digital Short Range Radio standard "as soon as the standard is fixed". In the meantime, he is happy to chalk up successes with trunked systems—the division has just installed a £37 million system in Indonesia, Siegelberg says.

Also contemplating wireless technology is David Kynaston, Managing Director of the Business Communications Division. In May (see ITI Issue 294), Kynaston's group launched its first pan-European digital PABX system, the Sopho-S. Now the question in his mind is whether its customers need cordless attachments. Kynaston told ITI that in office telecommunications Philips is heavily committed to the European DECT [Digital European Cordless Telecommunications] standard. However he concedes that this is a technology best suited to corporate "inter-office" communications—where users of cordless PBX [private branch exchange] extensions have a multistorey office block or wide area site to roam in. The Sopho-S is designed for organisations needing less than 50 lines and they are more likely to be concerned with "intra-office" links. Accordingly, Kynaston feels that CT-2 technology may be adequate.

To find out, he plans to demonstrate a CT-2 equipped Sopho-S system to potential buyers over the next week or two. He stresses that the demonstration will be no more than that. "We plan to present the concept of a small cordless keysystem," he told ITI. Maybe we'll market it as an option if there is a demand."

He added though that should the CT-2-based system come to market, he has no intention of manufacturing CT-2 sets at Philips. "I'll buy them in," he said. A enigmatic smile is the response to a query as to whether he intends to continue making CT-2 phones under contract to Shaye Communications.

Switzerland: Ascom Research in Telecommunications, Microelectronics

92WS0092A Munich HIGHTECH in German Nov 91 pp 42-45

[Article by Andreas Beuthner: "Potentials on the Other Side of the Critical Mass"]

[Text] With a cleverly laid out research offensive, the Ascom Company of Switzerland hopes to confront the technological challenges of tomorrow. Telecommunications and microelectronics are the fields to be emphasized.

With the fervor of a newly appointed university docent, Professor Hansjoerg Mey, director of Bern University's Institute of Informatics and Applied Mathematics and top researcher at Ascom Tech AG, still conducts his seemingly endless discussions of complicated differential equations with his students. On the other hand, when asked about his industrial employer in Bern, the research manager comes right to the point. "We shall be leading players in selected fields of technology," he proclaims with self-confidence.

Such optimistic statements from the ranks of Ascom are by no means all that frequent. On the contrary! When the present director of Ascom Holding AG, Leonardo Vannotti, who took over the helm last year, the company for industrial research and technology of the leading Swiss telecommunications enterprise was not at all in sterling condition. Restructuring plans had already targeted the end of independent company research. Instead of wild economy measures, however, he brought a man on board, who unsparingly concentrated on the initiatives of a centrally operated R&D (research and development) staff.

At every opportunity the agile research protagonist refers to the roll of his tone-setting R&D crew, which does not develop its visions in the market morass of day-to-day business. For example, the research laboratory at Solothurn does not just work on the bases of neuronal nets or simply generate complex algorithms for data protection. Assistant laboratory head Dieter Profos and original thinker Franz Raible, together with a handful of associates, are working on future projects that seem absolutely futuristic. We are creating communications landscapes," product manager Raible muses, "which integrate man, technology, time, money, and environment into one system." A multimedia cockpit, which will

make today's office work places ripe for the museum, is already displayed on the creative duo's drawing board.

Such innovations from the research department's idea kitchen have in the meantime become recognized throughout the company. For the technological safety of the entire enterprise, one of the basic research policy principles of newly formed Ascom states, a "well founded and future-looking scientific base is absolutely necessary." With 115 workers, four laboratories, and a yearly budget of 21 million Swiss francs, the newly equipped research department now has "a critical mass" at its disposal, department head Karl Heinrich von Grote is happy to report.

In the sights of Ascom research is the active field of wideband communications, which, with 60 percent of layouts, constitutes the most intense investment in the entire Holding company. Three departments are occupied with the physical and systems theoretical aspect of digital signal transmission. From network management through interface standardizing right up to optoelectronic components and wideband links, researchers at Ascom Tech are searching for sound approaches. "Meanwhile, in close cooperation with licenser Ericsson, we have achieved recognized competence in object-oriented program languages," Max Goeldi, director of public switching systems, reports with pride.

In another field of technology as well, in which intensive work is being carried out throughout Europe, the Swiss have once again switched course at the right time.

Likewise, network specialists in the central laboratory in Bern are doing delicate, high-pressure work on an asynchronous transfer modus process (ATM) to facilitate multimedia communications, video, graphics, language and data transfer on a wideband ISDN.

ATM is not just one of the largest draft horses of future wideband technology on which telecommunication nets rely. Project manager Beat Keller is convinced that "the entire telecommunications field will be revolutionized on the basis of this transfer system." The process involves packaging incoming digital signals of various origins in handy data packets, which subsequently race through a single fiber glass line at 155 megabits per second. Each signal cell contains a header line with appropriate addressing to convey the information packet via virtual channels through the entire net.

The recent coup of the Swiss postal service PTT [Post, Telegraph, and Telecommunications administrations] proves that Ascom research and its ATM involvement are yielding their first victories. Even though Switzerland is neither an EC member nor does it enjoy the rank of a full member in the EC technology program RACE (Research and Development in Advanced Communications Technologies for Europe), Basel has been chosen to be the site for the construction of an ATM demonstrator, which is scheduled to go into operation in 1993. "We have won out over four EC countries," R&D head Mey beams. It is no wonder that Ascom manager Martin Potts just recently assumed a position on the RACE management committee in Brussels.

But it is not just in the Europe-wide ATM race that Swiss researchers have had their foot on the accelerator. In the basement of R&D headquarters in Bern a small development team leads in precise laser welding of fiber glass. "Because positional accuracies in the micron range must be achieved, only a few fiber specialists are able to do it," physicist Beat Luescher explains.

One door further down, optoelectric switches and modulators are on the test stand. In costly testing procedures, information specialists are shedding light on the standards jungle of transfer nets. With its specification of test methods for ATM nets and systems, Ascom teams have in the meantime taken the lead not just in a RACE project (Parasol), but have also made strategic alliances with the major industries. Thus, for example, the Swiss, in cooperation with Philips and General Electric of the U.K., are developing a so-called very high speed optical loop capable of transferring at a data rate of not less than 2.4 gigabits per second.

Specialists also consider the FDDI fiber glass net (fiber digital data interface), developed by Ascom's U.S. affiliate, US Tech Inc. of Florida, a probable major breakthrough. With the U.S. Timeplex Inc. in Woodcliff (turnover $250 million dollars), in which there was recently a majority takeover, Ascom Tech of Bern now feels strong enough to take the lead in this narrowly specialized technology in the FDDI market, which receives scant attention in Europe.

Perhaps somewhat less prestigious, but in no way less energy-laden is the Ascom semiconductor plant in Bevaix. The silicon smithies deliver not only the decisive impulse for network components and ATM chips, but also have already celebrated triumphs in the miniaturization of pressure, acceleration, and temperature sensors, in customer-specific switches (Asics), transducers, and oscillators.

The showpiece in Rene Hartmann's (aka Mister Asic) house are the filigree high frequency filters made of silicon oxide or lithium niobate. The microscopically small filters are incorporated in so-called surface acoustic wave (SAW) technology. "In this way we push the power consumption to a minimum," Hartmann revealed.

Juerg Abt also has a taste for outstanding technological achievements. This top manager holds sway in the services automation field, the second most important supporting branch of Ascom, Holding. To be sure, the specialist for money-handling, magnetic- and chip-card machines, and interactive information systems cannot show a real research moneymaker. But neither will he dispense with proposals from the R&D laboratories in strategic product planning: "Knowledge barriers are the best product protection," Abt states, "they cannot be copied easily by competitors."

Ascom research laboratories are located in Baden, Bern, Hombrechtikon, and Solothurn in Switzerland; and Deerfield Beach in Florida, U.S. Ascom development departments are located in Baden, Bern, Bevaix, Guemmlinger near Bern, Hombrechtikon, and Zuerich in Switzerland; Frankfurt/Main and Stuttgart Teningen in Wuerttemberg, Germany; Bonneville and Valence in France; Milano in Italy; Arnheim in The Netherlands; Goeteburg in Sweden; and in Shelton, Connecticut, and Woodcliff, NY, in the U.S.

Ascom Holding has invested the following resources in the R&D field: The total number of Ascom employees is 16,100, of which 65 percent are in Switzerland and 30 percent are in the EC; 1,700 are in the R&D fields, and 115 are in company research (95 percent are scientific workers). Ascom's yearly turnover is 2,960 million Swiss francs; 245 million Swiss francs are for R&D expenditures, and 21 million francs are for company research. Of the turnover, 8.3 percent is in R&D expenditures; 15.2 million francs is R&D expenditure per Ascom worker; 144 million francs is R&D expenditure per Ascom R&D worker; and 183 million francs expenditure per company research worker.

Ascom research projects range from wideband chips to money dispensers. In wideband technology, Ascom is involved in the development of optoelectronic chips, switches, wideband links and networks, protocol standards for asynchronous transfer modus, net structures and chip design. In radio engineering, Ascom is involved in the study of channel properties, access and modulation processes in cellular mobile radio; the development of a digital communication system in the railroad industry; and synchronization possibilities for satellite links. In data protection, Ascom designs system concepts for block encoders in fast data nets. In information science, Ascom develops software tools for voice recognition in neuronal nets, expert and configuration systems. In microelectronics, Ascom develops intelligent sensors, actuators and receiving units, techniques for voice recognition for digital hearing devices. Ascom also researches passive and active telemetric processes for wireless transmission of measurement data.

Swiss Pharmaceutical Giant Ciba-Geigy To Decentralize

92WS0059B Paris LE MONDE in French 15 Oct 91 p 26

[Article: "Ciba-Geigy: A Different Culture and Inadequate Results"]

[Text] The Swiss group Ciba-Geigy, one of the world's largest manufacturer of chemicals used to cure and care for men and plants, announced in-depth changes in its strategy; this will cause it to decentralize at all levels in order to "boost innovation" and improve its results and its development. "We were like a supertanker, heavy, clumsy, and secretive. We must turn into a fleet of ships sufficiently independent to adjust to an open world in full mutation," the chairman of the board of Ciba-Geigy France, Mr. Hans Philippi, stated in particular. Power decentralization, challenge to traditional hierarchies, independence of subsidiaries, full visibility within the group and from the outside, the venerable Basel company is about to dedicate itself to another culture. As the group announced an increase of 10 percent in its cash flow and 4 percent in its sales, Mr. Philippi pronounced these results inadequate. He believes that the group must radically change its philosophy and its strategy to improve its productivity. To increase its working capital, the French subsidiary will issue 400 to 700 million francs' worth of commercial paper.

EAST-WEST RELATIONS

East European Research Ministers Meet in Germany

92WS0005C Paris AFP SCIENCES in French 19 Sep 91 pp 10-11

[Article: "First Meeting of East European Research Ministers"]

[Text] Bonn—Meeting for the first time, in Bonn, on 12 September, the research ministers of the East European countries expressed their countries' desire to work together with the European Community on research.

During this summit meeting, the German research minister, Mr. Heinz Riesenhuber, pledged Germany's support to his counterparts from Poland, Czechoslovakia, Hungary, Bulgaria, and Romania. The Latvian minister of advanced studies and a high-ranking representative of the USSR State Committee for Research and Technology also took part in the discussions.

Mr. Riesenhuber stated that he is currently preparing a researcher-exchange program that is to be implemented beginning in 1992. He also announced that he would support the creating of scholarships to be granted specifically to East European researchers. These grants could be used, for example, for periods of training at the European Particle Physics Laboratory (CERN) in Geneva, or at the European Molecular Biology Conference [EMBC] in Heidelberg.

The German minister also advocated a meeting of specialists in the field of nuclear reactor safety. Such a meeting could address questions on Soviet-built nuclear reactors. There are 52 of these reactors in the different East European countries, and 32 are currently being built.

Germany further proposed the organizing of another meeting of experts on "access by the East European countries to the German research network." Its longer-term objective would be to enable these countries to rapidly consult the international data banks.

Bonn is also offering its know-how, on an advisory basis, to countries interested in constructing model technological centers. The German research minister prides himself on the experience he has acquired in this field, after having initiated the projects for 15 technological centers in the former RDA [German Democratic Republic].

At the conclusion of this summit meeting, the ministers referred to their desire to participate in European research organizations. For example, they pointed out, the East European countries could already be working on certain Eureka and [Cooperation in Science and Technology] projects. It is to be expected that, in the very near future, they will be able to become full-fledged members of institutions like the CERN, in which Poland already takes part. The integration of several countries in COST is already at a very advanced stage.

Poland, EC Cooperate in Information Technology, Telecommunications

91AN0534 Brussels XIII MAGAZINE in French Jul 91 pp 14-15

[Article by Stephan Sberro: "The Other Europe: Poland Develops Close Cooperation With EC"]

[Text] "Both sides are now embarking on a period of training," said A. Ksiezny, director of international affairs at Poland's PTT [Post, Telegraph, and Telecommunications] Ministry, when questioned about relations between his country and the EC in the sphere of telecommunications and information technology. Poland is banking on the Community to help it catch up in the telecommunications sector, which will be a major underpinning of Poland's changeover to a market economy. Poland is seeking support from two major sources. First, the PHARE (Poland-Hungary: Assistance To Restructure the Economy) economic assistance program and, over the longer haul, the EC-Poland association agreement, which is currently under negotiation. Poland is taking as its model the European Commission's Green Paper on the development of telecommunications.

Among the telecommunications sectors in the East European countries, Poland's is the most dilapidated. But Polish authorities were also the quickest to understand the nature and importance of the challenge before them. The components required for rapid progress are nearly all in place, in part thanks to EC support. Today, only 3.1 million Poles, or 8 percent of the population, have a telephone. That means there are only 7 phones for every 100 inhabitants, which is less than Romania, where 17 out of 100 have a phone. The Community's average is 37 per 100. Some 2.3 million Poles are on the telephone waiting list and the average wait is a staggering 13 years. Poland's facsimile system, which is linked to the telephone network, is also in critical shape. However, the telex system and the information technology industry are in better shape. Poland has four radio stations and two television channels. The Polish Government has already gone a long way to enacting the necessary institutional and regulatory reforms as well as creating the environment that would attract ample investment and generate revenue in the telecommunications sector.

At the start of 1991, a new law was passed in Poland that split the telecommunications sector in half: the postal service, which for the time being will remain in the public sector, and telecommunications, which will be privatized along the lines of the UK model. Two state agencies were also created to regulate telecommunications and to assign and manage radio frequencies. In addition, Poland is currently developing an investment and modernization strategy for the telecommunications sector. The Polish Ministry of Communications intends to invest nearly 13 billion European currency units [ECU] in the network over the next 10 years and plans to install 2 million lines by 1995. That will bring the number of telephones in Poland to 13 per 100. The development of Poland's telecommunications sector will be the key to cultivating closer ties between Poland's economy and the EC and must therefore not be conducted in isolation. Poland is modeling its strategy on the EC's telecommunications Green Paper and has been admitted to the European Conference of Postal and Telecommunications Administrations (CEPT). It hopes to become a member of more specialized bodies such as the European Telecommunications Standards Institute (ETSI) and CEN/CENELEC (European Standards Committee/European Committee for Electrotechnical Standardization). Similar efforts are being deployed in the radio broadcasting sector.

Poland is not so far behind and will have an easier time catching up in the information technology industry. The number of microcomputers used by professionals is estimated at 100,000 and it is assumed that Poland is about 2 years behind the West in this sector. There are about 2,000 minicomputers in Poland, suggesting that it is 15 to 20 years behind the most advanced European countries, but Poland is at least 25 years behind in large computer systems.

However, the situation in computing is not as bad as in the telecommunications sector. Moreover, Polish companies could decide to go straight for the accelerated introduction of microcomputing, rather than investing in mainframes on which the cost of the same operation can be up to 100 times higher. This would allow Polish enterprises to skip a generation of data processing and fast-forward to today's micros. But they will nonetheless have to plan their development carefully. Purchases are still conducted in a disorderly fashion. Software, the weak link in Poland's information technology chain, is another area that will have to be given priority attention. There are currently only 100 Polish companies specializing in this vital area. IBM is negotiating a lucrative contract with the Polish Government for the supply of hardware and software to the tune of $8 million, in exchange for services such as demonstrations and training centers.

In assessing Poland's situation and its aspirations, it becomes clear that it will need help to carry out its far-reaching modernization plan. The EC has already pledged its support, either under its PHARE program or through the five-year EC-Poland bilateral trade and cooperation pact signed in 1989. There is also a third source of cooperation that was set up specifically for Poland in the farming sector. The free food aid supplied by the member states led to the allocation of counterpart funds equivalent to ECU60 million, which will be used to revitalize the farming sector and rural zones. Polish authorities realized that improving the telecommunications network would advance considerably efforts in the farm sector and they put these funds to work on a broad project concerning rural telecommunications, with help from the PHARE program. The sum of ECU6 million has so far been devoted to the program.

In 1991 cooperation will move into a higher gear. The member states have put together their strategy for telecommunications aid to the East European countries. They intend to help them adopt new laws modeled on EC laws. The two new Polish companies—the PTT and the privatized telecommunications firm—will be able to apply to the EC for assistance in a number of areas. These would include the setting up of strategic planning offices, managing telecommunications and devising plans for commercial operations, participation in EC standards, the application of international standards, and, lastly, planning and modernizing their telecommunications networks.

Once these broad outlines have been defined, the member states will then be able to spell out the support arrangements on offer to their East and Central European partners. They are already taking part in the Tempus university exchange program and are deriving benefit from the EC's training schemes. Polish authorities would also like to participate in research projects under the Cooperation in Scientific and Technical Research (COST) program. In support of its ambitions, Poland has a number of strong points, such as a market of some 40 million relatively prosperous consumers, a qualified and inexpensive pool of manpower, and experience in certain front-line technologies. Contrary to what is happening in Hungary, European industrialists are in a strong market position and several companies, such as CIT Alcatel, SESA-Alcatel, Siemens and Kabsch, have already signed agreements to set up joint ventures with Polish businesses.

But, say the Poles, South Korea is already contending for a place in the sun and both Japan and the United States are showing more aggressive interest than the Europeans. EC industrialists—and their Polish counterparts—will have to adapt to their new partners and help them integrate, develop, and benefit from a market with an estimated value of $20 billion.

CNES Plans Third Franco-Soviet Mission

91WS0534B Paris AFP SCIENCES in French 29 Aug 91 p 5

[Article: "Franco-Soviet Space Programs Continue as Usual"]

[Text] Paris—The terrestrial upheavals in the USSR seem not to have had any impact yet in space, and "ongoing Franco-Soviet space programs continue as usual," AFP was told on 26 August by a spokesman for the National Center for Space Studies (CNES). "We have not yet seen any breaches of contract or personnel changes among our interlocutors," he said.

Another indicator of the current stability in Franco-Soviet space cooperation: The meetings of the two countries' experts planned for 24-25 September in Paris are still on track. "We have received confirmation that the composition of the Soviet delegation was unchanged," CNES noted.

"It is possible changes will be discussed at that time, but for now all that is premature," said the spokesman for CNES, which has been cooperating with Soviet organizations for 25 years: since 1966 with the Intercosmos Council of the Academy of Sciences, and since 1985 with "Glavcosmos"—the Soviet equivalent of CNES—and with industrial enterprises in the space sector.

In exactly one year, in August 1992, A third Franco-Soviet flight is scheduled for launch, to follow Jean-Louis Chretien's flights (25 June-2 July 1982 and again 26 November-21 December 1988) on the Salyut-7 and Mir space stations.

Two French cosmonauts from CNES, Michel Tognini and Jean-Pierre Haignere, have been in training at Star City (near Moscow) since the first of the year for 1992's 14-day mission, which will be called "Antares."

For the first time, the new flight was negotiated on a cooperative and commercial basis: France will pay for its cosmonaut's voyage aboard the Mir and for the scientific experiments that will be performed. The "space ticket" will cost some 72 million French francs [Fr]... "In the current situation, the fact that France has become a paying customer of the USSR gives it more leverage than when the venture was just a cooperation project," the CNES spokesman said.

So far, however, space cooperation between the two countries has been very good: Last July, CNES and Glavcosmos signed a 10-year accord for fabrication of materials under microgravity conditions; two years earlier, when Mikhail Gorbachev came to France, he had signed a protocol which envisioned, among other things, a 10-year cooperation plan in manned flight.

CNRS To Initiate Soviet Researcher Exchange

92WS0005B Paris AFP SCIENCES in French 19 Sep 91 p 8

[Article: "An Antenna From CNRS to Moscow's Academy of Sciences"]

[Text] Paris—The National Center for Scientific Research [CNRS] is planning to institute a new relationship with the USSR's Academy of Sciences, that will "facilitate the exchange of information, advice, and aid in the setting up of representative joint scientific programs," according to the latest issue of the French research center's bimonthly publication CNRS-INFO.

The publication points out that although the CNRS and the USSR have had cooperative ties for several years, their cooperation is increasingly turning toward well-defined sectors of common interest.

From this viewpoint, the CNRS has initiated a series of International Scientific Cooperation Programs [PICS], ranging from oceanology to particle physics, and including molecular biology and mathematics:

- SPASIBA (Scientific Program on Arctic and Siberian Aquatorium), with the Institute of Oceanology in Moscow;
- Study of Fundamental Interactions at Intermediate Energy Levels, with the JINR Institute's Department of Nuclear Physics, in Doubna;
- GAMS-NA, search for glueball and mesons in central collisions of hadrons, with the IHEP, Protvino;
- Aminoacyl t-RNA synthetases of higher eukaryotes, with the Institute of Molecular Biology, Moscow;
- Modulation of the expression of eukaryote genes by antisense and antigen oligonucleotides, with the Institute of Molecular Biology, Moscow.

The agreement now covers 80 researcher-months. Owing to the twinning of the laboratories, sizable groups of Soviet researchers have been able to come to France. In theoretical physics, the French Ecole Normale Superieure's Physics Department and Moscow's Landau Institute have been twinned; in mathematics, the University of Paris VI's Theoretical Physics and High-Energy Laboratory, the Universite d'Orsay's Mathematics Department, and Leningrad's Steklov Institute; and in the life sciences, the Strasbourg Institute of Molecular and Cellular Biology and the Research Center on Proteins, Pouchino.

According to CNRS-INFO: "The aim is to provide to Soviet researchers the opportunity to work in Western laboratories without having to emigrate. The CNRS is especially interested in avoiding a dismemberment of scientific teams in the USSR and elsewhere in the countries of Eastern Europe, and, for this reason, is not encouraging a brain drain."

This initiative by the CNRS requires a sizable financial outlay, inasmuch as the extending of an appropriate welcome to its fellow high-level researchers is essential to the success of the undertaking. In 1990, CNRS-INFO adds, the coming of some 20 scientists required an outlay of Fr6 million, shared by the CNRS, the Ministry of Research and Technology, and the Interministerial Cooperation Mission for Central and Eastern Europe [MICECO].

French, Czech Nuclear Power Plants Sign Cooperation Agreement

92WS0006B Paris AFP SCIENCES in French 19 Sep 91 p 41

[Article: "Twinning a French and a Czechoslovak Nuclear Power Plants"]

[Text] Paris—Two nuclear power plants (one French, at Nogent-sur-Seine (Aube), and one Czechoslovak, at Jaslovske Bohunice) have signed a twinning protocol which, among other things, will enable them to trade experiments and to make a French engineer available to the Czechoslovak plant, a communique from EDF [French Electricity Company] indicated on 12 September.

The agreement was signed, for France, by Mr. Jean-Michel Fauve, EDF director of international affairs and, for Czechoslovakia, by Mr. Rudolf Kvetan, general manager of the Slovak electricity production and transportation company, Slovenske Energeticke Podniky. This protocol, EDF indicated, was organized in close cooperation with WANO (the World Association of Nuclear Operators) which "initiated a program to improve safety in East European power plants."

The Jaslovske Bohunice power plant consists of four Soviet-designed units (VVER) of 440 megawatt each, which were set into service from 1978 to 1985; it produces 50 percent of the country's electricity. It is located in Slovakia, 100 km northeast of Vienna.

MEC-2, MOM, Italian-Hungarian Joint Venture in Electronics Signed

92WS0016B Budapest FIGYELO in Hungarian 5 Sep 91 p 5

[Article: "Hungarian-Italian Mixed Enterprise in Zalaegerszeg"]

[Text] An association and syndication contract for a Hungarian-Italian mixed enterprise was signed at the MOM [Hungarian Optical Works] Instrument Industry Company in Zalaegerszeg concerning the formation of MEC-2 MOM Electronics, Ltd. According to the contracts the Hungarian electronics firm and the SNC electronics, firm in Udine will share half and half in the 50 million forint base capital of the company. To get started the company will assemble electronic parts for IBM and Olivetti computers and will manufacture eyeglasses. According to the plans, they will produce 200,000 pair of the latter next year, largely for Italian export. The new mixed enterprise is located in the

assembly hall of the Zalaegerszeg factory or, more precisely, in a part of it which has been sectioned off. Beginning in September some of the new workers will master in Udine what is needed for the new activity.

Maxwell Fund, Muszertechnika Partnership Announced

92WS0043B Budapest COMPUTERWORLD/ SZAMITASTECHNIKA in Hungarian 12 Sep 91 p 1

[Article by Sandor Mester: "Maxwell Also Invests in Muszertechnika"]

[Text] At a press conference held in Budapest on 3 September at the Forum Hotel, it was announced that the Maxwell Central and East European Partnership (Maxwell Fund) had acquired a share in the Muszertechnika [Instrument Technology] Joint Stock Company. Thus one of the leading undertakings of the Hungarian computer technology and telecommunications industry has, similar to Kontrax, accepted among its share holders the Maxwell Fund which deals with investments in the areas of the press, telecommunications, and the pharmaceutical industry.

Gabor Szeles, president of the company, said that his firm had increased its stock capital and had offered the surplus thus created to the Maxwell Fund. Answering questions he also provided details; the 118 million forint shares package had found a customer for 10 million dollars—6.5 to seven times the nominal value. In this way the foreign investor gets an 11.5 percent share in the Hungarian undertaking.

The Maxwell Fund got an option to organize institutional investors up to an additional 18.5 percent in the event of a possible later capital increase (naturally at the rate of exchange valid at the time the future deal is concluded), which means—as the contract between the two firms also stipulates—that the foreign interest in the company can increase to at most 30 percent. Mr. Szeles emphasized that his firm will not come under foreign control, and he felt it necessary to note also that the Maxwell investment in Kontrax, also 10 million dollars, led to acquisition of a 30 percent share in the first step.

The press conference gave an occasion for Mr. Szeles to outline his ideas about the plans of Muszertechnika. He said that a restructuring of the firm is under way; Muszertechnika Holding is being formed, and the MT undertakings performing various activities will join this as independent firms. For example, under this holding will be, among others, the plant manufacturing digital telephone exchanges, in which Ericsson has a 50 percent interest, MT-Telecom, which installs local telephone networks, MT-Computer, operating in the area of computer technology, and the undertaking which makes scoreboard displays.

Answering a question of our journal the president of the Muszertechnika Company said that in the near future the significance within his firm of the computer technology branch will decrease—due to the limited nature of the Hungarian computer technology market. Citing a foreign source he said that at present Muszertechnika has a 30 percent share in the Hungarian PC market, which can be increased to 40 percent at the most. The overwhelming part of the 15-20 billion forint turnover planned for next year—four to five times the 4 billion in receipts expected this year—will come from activity in the area of telecommunications.

Hungary: Siemens, Telefongyar Joint Venture Analyzed

92WS0056B Budapest FIGYELO in Hungarian 3 Oct 91 p 11

[Article by Zoltan Meixner: "Tales of Kaufmann, the Dualism of Siemens"]

[Text] Siemens-Telefongyar Ltd. was formed on the first of September with a base capital of 2.5 billion forints. If the plans of the German electronics giant are realized, there soon may develop a high tech plant, still rare in our country, in the place of the late large state enterprise.

On the basis of its turnover, Siemens stands fifth in the list of the world's largest electronics industrial enterprises; it is third in the list of telecommunications firms. So it is no wonder that every tenth telephone subscriber in the world—in 93 countries—uses some sort of Siemens equipment for voice, data, text or picture transmission, among other things via the so-called ISDN [integrated services digital network] systems, which integrate all the accomplishments of telecommunications technology, including mobile cellular telephone networks. According to the plans, the giant enterprise will manufacture in Hungary also the flexible EWSD electronic switching systems which can work as smaller rural exchanges as well as in giant urban centrals and which can serve as a basis for the above mentioned ISDN networks.

"Previously the biggest problem in Hungary in the transmission technology and switching technology industry was that large capacities, completely parallel to one another, were in operation. Everyone made and sold everything. Then, due to the change in political climate, the COCOM prescriptions eased, import was liberalized as well, and Hungarian needs increasingly approached the world level. As a result, the domestic market quickly, if not entirely unexpectedly, collapsed, as did the CEMA market, for different reasons. Then the Westerners discovered that Hungary could no longer play the role of bridge between East and West, because it was no more difficult to reach the Eastern markets from Germany, let us say, than it was from here. It also became clear that there was no hope of building a Japanese or American bridgehead, because the world market for this branch of industry was not at all liberalized. As a result non-European firms could hardly prosper in Europe. From this one could already suspect that if the Telefongyar

[Telephone Factory] wanted to survive it would have to find a professional partner among the largest world firms, prospering even over the long term, which would be inclined to encourage local manufacture, which had capital strength, and which was European as well. The selection was not very large," said Dr Gabor Beke-Martos, director general.

Other circumstances also motivated the marriage of Siemens and the Telefongyar. It was clear to the German firm that it needed a local producing enterprise to conquer the Hungarian market. (Incidentally, Siemens already had a mixed enterprise in Hungary, Siscontact.) Since long cooperation tied it to the Telefongyar the selection was obvious. Especially because in addition to (or despite of?) the economic difficulties of the Telefongyar, it had amassed significant production experience and expertise in switching and transmission technology. And there were reasons rooted in tradition, for the Hungarian enterprise was founded in 1876, and this could have a very good effect on the market together with the 1847 founding date for Siemens. Obviously the decision to found the firm was strengthened by the fact that the joint entry of Siemens and the Telefongyar in the tender put out for the development of telecommunications took second place. That is, in principle, for five years, two undertakings will supply switching technology equipment to the Hungarian manufacturers of telecommunications systems, and one of these will be Siemens-Telefongyar Ltd.

"The past year, during which the founding discussions took place, was sufficient for Siemens to survey the strengths and weaknesses of the enterprise, participate in preparation of the tender bid, prepare in principle the position of the new firm in the Siemens empire and help to work out an appropriate privatization proposal," as the director general described the events of the recent past. But the transformation of the Telefongyar began somewhat earlier. New leaders took over the enterprise in January 1990, people whose primary task was to manage the crisis. At that time it was obvious that the operability of the enterprise could not be maintained without a swift structural transformation, which in turn could not be imagined without a privatization of the firm. At that time 4,200 people worked in the Telefongyar at various sites. Of these they closed the Kiskoros factory in September 1990 and, along with this, they decreased personnel by 15 percent that year. By the end of the year the new management had prepared a transformation concept, which naturally took into consideration also the presumed needs of Siemens. One of the most important of these was that the new enterprise should operate only in Budapest. As a result the Nagykata plant was made independent—today it is an independent state enterprise—and the Satoraljujhely plant was transferred to another enterprise which is capable of giving work to the workers there. The plant in Bugyi was closed and the site sold. By the end of the slimming down the Telefongyar had 1,200 employees. And this is how many will work at the newly founded corporation.

The planned increase in base capital at the old-new undertaking, with a base capital of 2.5 billion forints, and the purchase of shares resulted in a majority share for Siemens. "We must build a Siemens factory here on the Telefongyar foundations," said Gabor Beke-Martos. Naturally this also means that the organization had to be transformed according to the requirements of the German multinational. First of all there had to be a break with the typical solutions in socialist large industry where research and development take place in an enterprise organization which works in a holding fashion and technological development is done entirely isolated from production, which hindered real and effective product development, which is so important in this branch of industry. In other words, the production processes were entirely subordinated to economic considerations while the production and technical units were subordinated to the economic bureaucracy of the enterprise.

"We broke the omnipotence of the economic administration. That it was the way it was earlier is no wonder, for then, when the plan fundamentally influenced the profitability of enterprises, the role of these units was overvalued unrealistically. Just as much as it was undervalued in, let us say, the 1950's," the director general explained. As a result, the Siemens model used at the corporation today brings the two sides into balance so that they operate within the frameworks of a market economy. A completely dual organization works here today in which every single leader—whether in sales, production or marketing—has his own so-called "kaufmann" (we have not yet found a Hungarian word for this position) who is responsible for the economicalness of the given activity. Both decide, and decide together, about how to solve a given task. At the top the "kaufmann"s have their director as do, for example, those in sales. "There are four of us in the directorate. In addition to me there are the 'kaufmann' director, the technical director, and a leader responsible for sales, who is also one of the directors of Siemens Ltd. (Budapest). At this level also the decisions are made jointly," the director general explained.

In addition, today, there is usually a Hungarian-Austrian pair working at every level. But the leadership of Siemens would like it if within a foreseeable time Hungarian experts were to take over most of the functions. In general the leaders of the earlier organizational units are old experts of the Telefongyar, while Siemens' own people have been assigned to the new tasks and to reforming the old. In the past two years the leadership staff at the Telefongyar had been fundamentally changed anyway. The top leadership is entirely new, and more than half of the department chiefs are also new. "Today the earlier seven level decision system has only three levels, and we finally put an end to the situation where a person could fill a main department chief position at the Telefongyar with only an eighth grade education. But since both Siemens and the Telefongyar are (or were) large organizations, and thus had many unregulated contacts, we had to see to it that the weak links dropped

out. In plain language, we had to find responsible people for responsible positions. But since the cuts were very drastic and since we also got a number of experts from our Austrian partner, we did not have to seek outsiders for the posts becoming vacant. Anyway, we had experts who were not being 'exploited' enough. The insiders could be compared with one another, and it was not too difficult to select new leaders," Gabor Beke-Martos explained.

Very concrete tasks have been proposed for Siemens-Telefongyar Ltd., until it becomes an undertaking which meets the Siemens standard. (In any case, producing enterprises of the division of the German multinational which deal with telecommunications technology are working in more than 40 countries.) The Hungarian plant must participate in adaptation of Siemens equipment for use in Hungary. The new technology must be adapted to the already functioning systems—often very obsolete. This means that for a time yet the old technology and the really peak technology will be forced to live together in communications technology (in this case in regard to switching and transmission technology). Naturally there may be other special Hungarian requirements as well to which the Siemens equipment will have to be adapted. Within and beyond the borders of telecommunications there will have to be software developments, naturally suiting Hungarian needs, among others for foreign orders.

Very significant retraining and further training programs will have to be carried out if the expert staff of the corporation is to be made suitable for carrying out these tasks. Some of the developmental experts have already finished the first Siemens study courses. Next will be intensive language training. As they say at the firm, it is no longer enough to know kitchen German, nor is it enough to know technical German, one must learn to speak "Siemens." Communication difficulties could fundamentally slow the Siemenization of the undertaking, make difficult the activity of the Siemens advisers, product development might not progress fast enough, and so forth. Which, of course, could lead to an inability to increase effectiveness, and if they remain expensive and if they are not better than the competition in regard to the technical level, then they will not be able to increase their share of the Hungarian market. Because now this latter is what is basically expected of them. In any event the leaders of the undertaking are confident, which is quite understandable with a powerful multinational firm behind them.

Hungary: Semilab Profiled, Link to EUREKA Program Described

92WS0056A Budapest MAGYAR ELEKTRONIKA in Hungarian Aug 91 p 77

[Article by B. L.: "Semilab Participating in EUREKA Program"]

[Text] Hungary has been honored by the fact that the EUREKA [European Research Coordination Agency] program will holds its congress in Budapest between 1 and 3 May 1991 [as published]. On this occasion we tried to find out who, in Hungary, has already joined this vast European research and development program. And so we came to Foti ut, to the Semilab Company. Since I was not acquainted with this firm I first asked Gyorgy Ferenczi, director general of the Semilab Company, to describe his undertaking.

"Semilab was formed officially in December 1988 as a joint stock company with a base capital of 42 million forints. The largest of the founders is a German firm, GeMeTec. The Hungarian participants include 16 founding workers, Innofinance and the Technical Physics Research Institute (MFKI). Since then the number of workers has increased, and a large part of them are researchers."

The goal in creating the company was to make economical use of the knowledge and developmental achievements which the members of the company already had. Since the founders had come from the MFKI, where they dealt with semiconductor technology testing procedures, they make use of this information in the company too. The activity consists partly of contract testing, partly doing research on order and partly marketing the instruments developed. This year they plan on taking in 80-100 million forints.

"The equipment we started with, which we had developed at that time, is the deep level spectrometer. This is already being used in 25 countries," Gyorgy Ferenczi said. They have sold more than 300 of these and even today it is one of their most successful products. (In 1988 the creators of it received the State Prize.)

The other thing they developed themselves is the life expectancy scanner. This tests for contaminants in semiconductor materials but its chief virtue is that it can make the measurements without making contact. Another important feature is that this device can be used as a quality control device in the manufacture of semiconductor devices, monitoring during manufacture. The equipment can be placed directly in the clean room. Marketing of it has just begun and it can count on great interest due to its novelty and versatility.

At present they are working on development of two other devices. One is an electrochemical profile testing instrument, which is very important equipment for the semiconductor industry. The Semilab device can test for doping distribution in very thin layers with extraordinarily fine—1 nanometer—resolution. There is no other method which can be used for very shallow doping layers with which the location of the p-n junction on them can be determined. Thus this satisfies a fundamental testing need and this, presumably, means a very real market.

The fourth device is a microwave deep level spectrometer. This is a further development of the earlier device, making possible the testing of thin epitaxial layers. The

measurement principle has been proven already and development of the device has now begun.

In addition to their own developments, they also purchased a license thus purchasing one of the basic patents of Oxford University. This still is only a theory; they will develop the instrument together with the Microelectronics Research Institute of the KFKI [Central Physics Research Institute]. On the basis of the patent they will make an optical testing instrument suitable for indicating crystal faults of very small size. Serious firms, such as Siemens, Wacker, Monsanto, etc., are interested in it.

A very interesting feature of the activity of Semilab is that they are working in an environment which in practice has no need of the equipment developed by them, as there is no semiconductor microelectronics in Hungary today. And they did not sell the patent—as is commonly done in Hungary—but are selling finished equipment into which—naturally—they build high level developmental expertise. "The value of a piece of equipment, according to the commerical director of Philips, is determined by how much they earn by increasing output. If they earn a lot by increasing output by 1-2 percent then we can sell the equipment as expensively as we like," Mr. Ferenczi observed.

They are linked into the EUREKA program through the OMFB [National Technical Development Committee]. Cooperating with Portugese, Italian, and Spanish partners they are working on a materials testing theme which fits their profile. "We wanted to do this in order to link with our activity into the research being done inside the Common Market," said Gyorgy Ferenczi, describing the ideology. "EUREKA was the only such point of entry; JESSI [Joint European Submicron Silicon Initiative], for example, was strictly closed at the end of 1989."

They looked into the OMIKK [National Technical Information Center and Library] databases to see what sort of EUREKA programs there were, they wrote letters to a number of theme leaders, and they selected one out of those who responded. They began the work in 1990 with the support of the OMFB and they performed the desired measurements for the Portugese consortium. In February of this year they signed a consortium contract on the basis of which the Portugese-Italian-Spanish-Hungarian cooperation came into being.

"The essence of the development is that we will be affected by all the results which can be defended by industrial law wherever in the consortium they are achieved. And we perform the qualifying measurements free of charge for our partners. Naturally the right to sell the products which are manufactured—the solar elements and particle detectors—belongs to the partners."

This does not involve material support. There is only national financing in the EUREKA program. The market is the essential standard; nowhere do national developmental funds provide more than 50 percent of the costs. The obvious profit to Semilab will be that—hopefully—the partner firms will need their testing equipment. "But that is not the essential thing," Mr. Ferenczi said, "rather it is that on the basis of the experience we will be able to develop testing equipment which we can sell throughout the world."

EUROPE-ASIA RELATIONS

EC Investigates Diskette Dumping

91AN0540 Amsterdam COMPUTERWORLD in Dutch 7 Aug 91 p 4

[Article: "Suspected Dumping of 3.5-Inch Diskettes Investigated by the EC—Price Rises Expected"]

[Text] The European Commission is beginning an enquiry into the suspected dumping of 3.5-inch diskettes on the European market by Japanese, Korean, and Chinese manufacturers. If the complaint is upheld, an antidumping charge will be levied and prices will rise.

The complaint has been laid by Diskma, an *ad hoc* lobbying group consisting of five European manufacturers: Balteadisk and Computers Supports (Italy), Rhone Poulenc (France), Boeder (Germany), and Sentinel Computer (Belgium).

According to Diskma, some Far East producers' 3.5-inch diskettes are cheaper in Europe than in their land of origin and prices are being systematically halved in an attempt to gain market shares as quickly as possible.

The importation of 3.5-inch disks rose between 1988 and 1990 from 79 million to 230 million units. The market share of the Japanese, Koreans, and Chinese rose from 31 to 44 percent. In the same period, one European company went bankrupt (suspected to be the British concern Euromagnetics), while the others were confronted either with lower profits or a loss.

Tony Neven, managing director of Sentinel Computer, says that "for double-density 3.5-inch diskettes the absolute bottom price has been reached, because even Far East manufacturers are unable to go any further," and he is afraid that "the same scenario is going to be repeated with high-density disks."

According to Neven, for most European companies in this line of business the antidumping procedures are a matter of life or death. "You can already see that companies are very reluctant to make new investments, because with such low prices the pay-back period is so long. Some companies are no longer investing anything at all."

Sentinel, with 220 employees, had a turnover of 6.5 million guilders last year. The company was originally a joint venture with an American concern, but last year the Neven family obtained control of all the shares. The fully Belgian owned company is involved only with the production of 5.25-inch and 3.5-inch diskettes.

"We are still profitable because we can keep our overhead costs low. But because we do not have a budget big enough for promotion, some distribution outlets are closed to us. We cannot place our products in the big department stores because the large chains only take those brands which are heavily advertised. Our rivals—BASF, TDK, and 3M—rarely or never advertise their diskettes, but they do have general promotion campaigns."

In the meantime the European Commission is making use of a new antiabsorption clause in its antidumping action against Korean and Japanese CD players.

This antiabsorption clause is intended to prevent exporting manufacturers absorbing financial consequences of an antidumping levy.

Last year the European Commission placed an antidumping levy on all the major Japanese manufacturers of CD players—Funai, Kenwood, Marantz, Matsushita, Pioneer, Sansui, Sanyo, Sony, and Teac. In addition, the Korean manufacturers Goldstar, Samsung, and Haitai were included.

This antidumping investigation—with an antiabsorption clause—came into being following a request from three European CD manufacturers. Bang & Olufsen, Philips, and Grundig wanted to have it because "prices to the importers were not being raised to conform to the antidumping levy."

France, China To Resume S&T Cooperation

92WS0002A Paris AFP SCIENCES in French 12 Sep 91 pp 1, 2

[Article: "Revival of French-Chinese Scientific and Technical Cooperation"]

[Text] Paris—Environment, biology, applied mathematics and oceanology, such are the main fields in which France and China intend to increase their scientific and technical cooperation, a communique of the Ministry of Research and Technology dated 5 September, reviewing Mr. Hubert Curien's recent visit to Beijing, Shanghai and Canton, indicated.

According to the communique, the conversations started during this trip, from 29 August to 3 September, marked "the revival of the scientific and technical cooperation that had been affected by the freeze of bilateral relations" after the Tien-An-Men Square massacre.

During his trip to China, undertaken "on the initiative of Mr. Song Jian, chairman of the State Commission on Sciences and Technology," Mr. Curien expressed the wish to see cooperation "increase not just by volume, but also in its efficiency," and he and his Chinese partners considered, "from this point of view, the question of protecting research results."

"Without a satisfactory agreement on intellectual property, the cooperation themes selected will be second rate, and this is not at all what we wish," the French minister stated, alluding to the agreement on this point recently signed by Beijing and Washington.

The first concrete evidence of the new climate was the signature, on 29 August, of a cooperation agreement between the French Institute for Research on the Exploitation of the Ocean (IFREMER) and the Chinese State Bureau of the Sea, in the presence of both ministers.

The renewable five-year agreement "covers the fields of oceanology, marine technologies, marine environment, satellite-data processing, marine biotechnologies, living and mineral resources, and the law of the sea. It sanctions the cooperation activities and numerous exchanges that have taken place between the two organizations since 1985" as well as the cooperation with the oceanographic institutes supervised by the Chinese Academy of Sciences.

As an immediate concrete result of the agreement, a joint oceanographic campaign in the Bohai Sea (northern Sea of China) will take place already this month, with a Chinese ship and the cooperation of the Bordeaux University.

Mr. Curien also met with the Chinese minister of water, with whom he discussed all of China's problems related to water resources and waste water processing. In this respect, the collaboration between the French group Lyonnaise des Eaux and the Qin Hua university was said to be exemplary.

In addition to Mr. Pierre Papon, the IFREMER chief executive officer, Mr. Curien was accompanied by officials from the Bureau of Geological and Mining Exploration (BRGM), the National Agronomic Research Institute (INRA), which has a long history of cooperation with China, and the National Institute for Research on Data Processing and Automation (INRIA), with which the Chinese Academy of Sciences wants to develop new cooperation themes.

Taiwan's DTK To Set Up Computer Production Plants in Europe

91AN0561 Paris ELECTRONIQUE INTERNATIONAL HEBDO in French 19 Sep 91 p 9

[Article by Jacques Marouani: "DTK Extends Its Operations to Europe"]

[Text] The Taiwanese company DTK Computer, which manufactures PC compatibles, motherboards, and extension cards, has decided to resort to drastic measures to carve out a niche for itself in Europe. Two production plants, one in France and the other in Germany, will open at the beginning of October. Furthermore, following Paris, Munich, Duesseldorf, and Vienna, offices will be set up in Great Britain, Spain, Italy, and Scandinavia during the next three years. "We are continuing to invest in Europe because it is the largest market in the world," is the assessment of Larry

Wu, general manager of DTK Computer Europe. The Taiwanese company forecasts that it will achieve 45 percent of its turnover in Europe, as against 35 percent in the United States and 20 percent in the rest of the world, once its infrastructure is well established on our continent. "Our European sales should double next year, since our investment will also increase twofold," states Larry Wu.

Some $35 million (around 200 million French francs) in 1991, $70 million in 1992: This is the short-term aim of DTK Computer in Europe. The company has now become accustomed to such rapid growth. Barely 10 years after its creation, it is now one of the biggest manufacturers of cards and PC's. With a worldwide sales figure of $190 million in 1990 (60 percent from cards and 40 percent from systems), which should increase to $275 million in 1991, and after-tax profits nearing 5 percent of its turnover, DTK Computer is number two in Taiwan, behind Acer.

The two European plants will be built according to the same specifications: 1,000 m^2 in floor space and a workforce of 40 to 50. They will make it possible to manufacture and test 100 systems per day in each plant. Cards produced using traditional technology (components inserted into a printed circuit) will be manufactured later on, i.e., two or three years from now. It should be noted that a production plant for surface mounted component (SMC) cards will also be set up in Europe, but the manufacturing site has not yet been determined.

Capture 7 Percent of the Market

"Our strategy is to copy and adapt the Taiwanese model so that we can transpose it into the French market," indicates Alain Tiquet, general manager of DTK Computer France. Like each of the European subsidiaries, the French company's capital will soon be $1 million. Officially founded in September 1990, it sorted out its basic structure in April 1991.

Worldwide, DTK Computer manufactures 90,000 to 100,000 extension cards and 80,000 motherboards per month, and it has a production capacity of 120,000 units. The company is not lacking in ambition, even though its management acknowledges that it will take several years to get onto an even footing with Acer. A more accessible aim, which should, however, take at least three years, would be to win a market share of 7 percent in Europe. Moreover, "DTK should be listed on the Taipei stock market by 1992 or 1993," confides Duke Liao, chairman of DTK Computer. The company could also expand through acquisitions on our continent, at least if it copies the Taiwanese model in this respect when implementing its European strategy. In 1988 it took over a Taiwanese company, Hongwen Computer.

German-Japanese ISDN Network, Quality Assurance Methods Examined

92WS0030A Duesseldorf VDI NACHRICHTEN in German 23 Aug 91 p 13

[Article by Markus Schnurpfeil: "TUV Tests Using the German-Japanese ISDN Connection"]

[Text] The Technical Inspectorate [TUV]) of the Rhineland is a presence on international markets. For example, it has new branches in Asia, like its largest company clients. In the future, ISDN (integrated services digital network) will connect these foreign offices more tightly to the headquarters in Cologne. Primarily, however, the digital communications line will serve as the transmission medium for a completely new testing method.

The Technical Inspectorate of the Rhineland is blazing new territory in quality assurance with the Teletest project

The Japanese market is as attractive as it is difficult to penetrate. The engineers of the Technical Inspectorate of the Rhineland know this from hard experience. The TUV headquarters in Cologne has maintained an office in the Japanese capitol of Tokyo for more than ten years. There are also branches in eight other Asian countries such as Korea, Taiwan, Hong Kong, and Indonesia.

Ralf Wilde is the managing director of the "TUV Rhineland Asia Group." He describes the main task of the TUV branch in Japan like this, "We support German companies in the Japanese market." The testing company from the Rhineland may issue approval symbols and quality-control approvals for the Japanese market. In fact, they offer this service with the blessing of the Japanese ministries. "In this way, we can test the products of German manufacturers in many cases while they are still in Germany," says Wilde, explaining the special service.

In the other direction, German companies contract with the TUV engineers for the acceptance of Japanese products, sometimes for OEM (original equipment manufacturer) business. According to Wilde, "With the new product liability law and the European directives for the approaching EC domestic market, we see ourselves as an important interface. We serve between German manufacturers, vendors and consumers on the one hand, and Asian importers on the other."

The "TUV Rhineland Japan Ltd." now has about 600 clients in the land of the rising sun. Telecommunications using the ISDN digital communications network is making the services provided by the testing company even more attractive for most of these regular customers. Telecom Testing, or Teletest for short, is the name of this trend-setting method. The TUV engineers designed it with the support of the Tokyo office of the German Federal Post Office (DBP) Telekom. Says TUV manager Wilde, "Teletest makes testing possible directly from our

branches into the laboratories of the manufacturers." The most important prerequisite for the concept is the Electronic Test Certificate, a special software module, and the ISDN network of the German companies and the INSnet 64 of the Japanese telecommunications companies.

Until now, the TUV test ran roughly according to the following pattern, for example, with a Japanese automobile manufacturer. In the beginning, the manufacturer and the tester discuss particular features of the test, usually over the telephone. Then, the TUV engineer travels to the customer to accept the equipment in question in the laboratory of the customer. Then the engineer prepares his report. Using a special part may require a TUV expert to fly in from Germany.

This is completely different using Teletest. The TUV tester and the client technicians check off the individual features of the Electronic Test Certificate, a type of digital checklist, in a remote conversation. In doing this, the laboratory personnel of the client handle most of the checklist by themselves. After finishing the test, the data—equipment descriptions and measured values—are transmitted to the control room of the TUV. The technical report can automatically incorporate these data.

In addition to the data flow, a display channel is connected. With this channel, the TUV tester can influence the current test. "The display channel is important for providing personal contact with the client and to control the course of the test precisely," explains Wilde. Willi Kappes is an ISDN specialist for the DBP Telekom. He played a major role in implementing Teletest. Noting the good quality of image transmission in the digital communications network, he says, "The Japanese communications technicians have achieved impressive results. They connect several ISDN channels together providing high transmission rates. They can even transmit good-quality moving pictures on these channels."

Now, TUV testers and client technicians clarify any open questions on a picture-phone. According to Wilde, "If necessary, mobile video cameras make detailed pictures of the object under test. ISDN then carries these images." Simple personal computers connect to the cameras via a port. They serve as the communications terminals at both ends. As the Teletest project progresses, ISDN fax will transmit circuit diagrams and other documents.

ISDN communications are not limited to the development of TUV tests within Japan. According to Wilde, "It is also possible to set up an ISDN connection between the client's laboratory and the German testing agency for equipment safety. Or a connection between the TUV office in Tokyo and the headquarters in Cologne." With this, the expert need no longer fly to the Far East. Instead, he simply seats himself in front of the Teletest equipment. The international digital pathway usually runs via undersea cables. However, satellites also can serve as the medium.

"An ISDN connection costs about 360 German marks per hour," calculates the Telekom employee Kappes. This is a considerable savings compared to expensive travel costs.

In addition to cost reduction, the Teletest system has other advantages. The TUV engineer Wilde lists these. "Primarily, we can, of course, handle jobs much faster. In addition, the expansion of our range of services plays a decisive role." For example, it is possible to capture all test actions during ISDN communications onto image data media and to archive them.

In addition, the TUV Rhineland strategists are considering shifting some of their consulting services—primarily the actual testing—to image communication via ISDN. Wilde says, "We want to provide our clients with more effective support for new developments and changes using the new Teletest Advisor range of services."

The starting gun for Teletest will sound in September of this year. Then, the TUV people will run the first tests of digital communication between the headquarters in Cologne and the Tokyo branch. Next, in October, the Canon company, among others, will join the project as a significant TUV client. The system will link in eight other partners in the first half of next year. "After testing in Japan, we will introduce the Teletest procedure into the other Asian subsidiaries of TUV Rhineland," explains Wilde. He states it clearly, "Whatever works in Asia also can work to advantage in Germany."

Philips, Sony Cooperate on Laser Minidisk

92WS0059A Paris LE MONDE in French 11 Oct 91 p 25

[Article by Andre Dessot: "World Giants of Consumer Electronics, Philips and Sony Agree to Introduce the Digital Cassette and the Laser Minidisk"]

[Text] The world giants of consumer electronics, the Dutch Philips and the Japanese Sony, will not confront each other in the digital-sound arena. Already allied in the compact-disk field, they have decided to extend their cooperation agreement to their latest products, the digital compact cassette (DCC) developed by the Eindhoven company, and the rerecordable compact minidisk (MD), a brilliant concept of the Tokyo company; both hi-fi products, especially the DCC, have an extremely promising future. Philips thus promised its partner that, jointly with it, it would license patents on minidisk technology to hardware and software companies, so as to promote the launching of this new audio recording medium in the fall of 1992. In exchange, Sony will cooperate with Philips to introduce the DCC smoothly next spring.

Common sense has won once again. But it seems that Philips will benefit most from the operation. A modified version of the compact disk introduced in 1983, the minidisk, as such, should find it harder to establish itself on the market. On the other hand, just like the compact disk made the LP record obsolete, the DCC will eventually bring about the pure and simple demise of the magnetic-tape cassette, now 26 years old. The DCC's major asset is that the machine will be able to play the older cassettes. Meanwhile, the two groups congratulated each other. Already, 59 international firms have agreed to support the DCC, including the Japanese Matsushita, Sharp, and Sanyo, as well as music publishers such as Polygram, EMI, Warner, MCA, and Bertelsmann. Sony is the 60th.

NTIS
ATTN PROCESS 103

5285 PORT ROYAL RD
SPRINGFIELD VA 22161

Foreign Broadcast Information Service (FBIS) and Joint Publications Research Service (JPRS) publications contain political, military, economic, environmental, and sociological news, commentary, and other information, as well as scientific and technical data and reports. All information has been obtained from foreign radio and television broadcasts, news agency transmissions, newspapers, books, and periodicals. Items generally are processed from the first or best available sources. It should not be inferred that they have been disseminated only in the medium, in the language, or to the area indicated. Items from foreign language sources are translated; those from English-language sources are transcribed. Except for excluding certain diacritics, FBIS renders personal and place-names in accordance with the romanization systems approved for U.S. Government publications by the U.S. Board of Geographic Names.

Headlines, editorial reports, and material enclosed in brackets [ ] are supplied by FBIS/JPRS. Processing indicators such as [Text] or [Excerpts] in the first line of each item indicate how the information was processed from the original. Unfamiliar names rendered phonetically are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear from the original source but have been supplied as appropriate to the context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by the source. Passages in boldface or italics are as published.

SUBSCRIPTION/PROCUREMENT INFORMATION

The FBIS DAILY REPORT contains current news and information and is published Monday through Friday in eight volumes: China, East Europe, Soviet Union, East Asia, Near East & South Asia, Sub-Saharan Africa, Latin America, and West Europe. Supplements to the DAILY REPORTs may also be available periodically and will be distributed to regular DAILY REPORT subscribers. JPRS publications, which include approximately 50 regional, worldwide, and topical reports, generally contain less time-sensitive information and are published periodically.

Current DAILY REPORTs and JPRS publications are listed in *Government Reports Announcements* issued semimonthly by the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, Virginia 22161 and the *Monthly Catalog of U.S. Government Publications* issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

The public may subscribe to either hardcover or microfiche versions of the DAILY REPORTs and JPRS publications through NTIS at the above address or by calling (703) 487-4630. Subscription rates will be provided by NTIS upon request. Subscriptions are available outside the United States from NTIS or appointed foreign dealers. New subscribers should expect a 30-day delay in receipt of the first issue.

U.S. Government offices may obtain subscriptions to the DAILY REPORTs or JPRS publications (hardcover or microfiche) at no charge through their sponsoring organizations. For additional information or assistance, call FBIS, (202) 338-6735,or write to P.O. Box 2604, Washington, D.C. 20013. Department of Defense consumers are required to submit requests through appropriate command validation channels to DIA, RTS-2C, Washington, D.C. 20301. (Telephone: (202) 373-3771, Autovon: 243-3771.)

Back issues or single copies of the DAILY REPORTs and JPRS publications are not available. Both the DAILY REPORTs and the JPRS publications are on file for public reference at the Library of Congress and at many Federal Depository Libraries. Reference copies may also be seen at many public and university libraries throughout the United States.