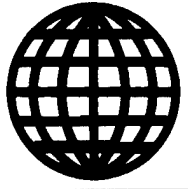


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ECONOMIC COMPETITIVENESS

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Science & Technology

Europe

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SCIENCE & TECHNOLOGY POLICY

Germany's CDU, SPD Differ on Research Policy

Riesenhuber Defends Ministry

92P60130 Duesseldorf HANDELSBLATT in German
18 Feb 92 p 3

[Text] Federal Minister of Research Heinz Riesenhuber is concerned about the competitiveness of German industry. In the united Germany, the share of all research expenditures by companies and scientific institutes has dropped to 2.8 percent of the gross national product in 1991. In 1990 the share was still 2.9 percent, or equal to that of the Japanese, who have since increased their percentage. "A gap must not arise here," said Riesenhuber in a conversation with HANDELSBLATT.

He decisively rejected the idea of the state's setting goals for companies in their research activities, as recently suggested by, for example, Volkswagen chairman Daniel Goeudevert. Such demands were mainly raised by parts of the plant construction and microelectronic sectors, explained the CDU politician, in fields where German companies had fallen behind. The machine tool industry and the chemical industry did not call for a "new industrial policy" modeled after the Japanese Ministry of International Trade & Industry (MITI), he said. "In that way we would jeopardize the dynamics and structures which have made us world market leaders in many products."

MITI Strategies are not Ideal for Europe

Riesenhuber rejected the idea of adopting in Europe in a wholesale manner MITI and its state-set goals. The much-admired planning agency is only one element in the complex economic culture upon which Japan has built its outstanding role, he said.

There is no conclusive evidence that MITI's strategies can furnish a model for Europe, even if politicians in some neighboring countries believe this. "For us it is a matter of understanding, not copying."

However, state action is justified in "cross-section areas."

This is particularly true where the state must provide for infrastructure and norms, he said. As an example he gave new communication technologies. If the state telecommunications company Telekom did not lay the necessary lines, no industry for terminals would develop.

Research Ministry Welcomes Cooperation Between Siemens and IBM

Moreover, Riesenhuber defended the involvement of the Ministry of Research (BMFT) in the European microelectronics program JESSI. This state involvement was aimed at keeping markets open, he said. For microchips, for example, a monopoly by Japanese suppliers was

threatening. If western companies did not take decisive countermeasures, including cooperative measures, soon the situation for microchips would be like the market for video recorders, Riesenhuber said. The Japanese have a market share of more than 90 percent. It must not happen that more and more markets are dominated by a few suppliers, he said.

The Minister of Research welcomed the fact that Siemens and the American computer manufacturer IBM have joined forces to develop the 64 megabit chip outside of the JESSI program. This gives western industry the chance of bringing on the market the electronic component of the latest generation at the same time as the Japanese, he said. Riesenhuber would be pleased if the consortium would manufacture in Germany, but he rejected paying special subsidies so that there would be a manufacturing site in the new laender. There is no possibility for this in the research budget, he said, and Siemens and IBM must keep to the already existing basic conditions. There are many forms of support in eastern Germany, and in western Germany, there is, for example at the IBM plant in Sinderfingen, a staff which has experience in the production of microchips.

Riesenhuber rejected the criticism that he allegedly supports mainly profitable large companies such as Siemens and Daimler-Benz and neglects small and medium-sized enterprises. Since the CDU/CSU and FDP took over the government in 1982, the BMFT has lowered the subsidies for projects in big companies by 60 percent to DM1.1 billion annually. In the same period, the support for smaller companies has increased by over 60 percent to DM570 million per year. For every mark spent in research, the medium-sized companies get nine pfennige from the state, whereas the big companies only get three pfennige, Riesenhuber said.

Support to large companies is not given to make the rich even richer. The amounts are too small for that, he said. "They do not power the engine, but only help steer the car." The money serves to establish an alliance between research institutes and small, medium and large companies at home and abroad. "Thus we create a critical mass of knowledge which enables us to keep up in the competition." In such an alliance, big companies cannot be excluded. That would only weaken cooperation, according to Riesenhuber.

In a few days, Riesenhuber intends to discuss with EC Research Commissioner Filippo Pandolfi his latest initiative for a rearrangement of European research subsidies. According to Riesenhuber, the EC research budget should be increased to ECU10 billion, which is about DM20 billion. Roughly 60 percent of the funds should be spent for application-oriented, premarket research support, such as information and telecommunications technology.

In the national research budget, the projects funds for nuclear energy research must be increased, said Riesenhuber. These funds amounted to more than DM1.4 billion in 1982 and have meanwhile dropped to about DM250 million. The largest part of this amount is devoted to research in reactor safety. In view of the decrepit nuclear reactors in eastern Europe, such projects are becoming more and more important. In Germany, old nuclear power plants will soon have to be replaced by new ones, he said. Otherwise the FRG will not achieve its ambitious goal of lowering the emission of the greenhouse gas carbon dioxide by 30 percent by the year 2005.

SPD's Roth Hits Policies

92P60130 Duesseldorf *HANDELSBLATT* in German
20 Feb 92 p 4

[Text] The economic spokesman of the SPD caucus, Wolfgang Roth, accused Minister of Research Heinz Riesenhuber (CDU) of supporting mainly technology of yesterday, with his expensive nuclear energy and space projects.

Rather, the federal government, together with companies, trade unions and the scientific community, should determine the basic lines of research and technology policy which the FRG should concentrate on. In this context, environmental technology, along with energy saving and alternative energy, is a field in which German firms can withstand the Japanese challenge, Roth said. The SPD politician pointed to the example of Japan, where the government and private industry is working together "closely and without inhibitions." "The separation between private and government responsibility is obsolete." In particular, this way would speed up the decisions on public and private investments. One step would be the abolition of the "sequential" approval process by the authorities here, each of whom in turn process an investment project for six weeks to three months.

Furthermore, there must be changes to the law on property, which leads to further delays of six to eight years, according to Roth. Finally, "those bearing responsibility" must finally be ready to assume actual responsibility for investment decisions, instead of trying to push this responsibility on others.

As examples, Roth mentioned the rapid train line between Mannheim and Stuttgart which took 20 years to build, and the "funereal discussion" on the new rail connection between Cologne and Frankfurt.

Roth urged German companies to do as the Japanese, to "attack directly the markets which have the best competitors." Therefore one must be present in Japan not only through exports, but also through production. In this connection the SPD politician praised the DIHT (German Industry and Trade Association) President Hans Peter Stihl, who has achieved with his saws a 30 percent share of the market in Japan. Moreover, direct

investments abroad neither indicate weakness in Germany as a business site nor do they export jobs abroad. The trade unions too must think again on their positions, Roth said.

ESPRIT III To Focus on Marketable Technologies

92AN0151 Paris *ELECTRONIQUE INTERNATIONALE*
HEBDO in French 12 Dec 91 p 6

[Article by Michel Heurteaux: "ESPRIT : Toward a More Market-Oriented Strategy"]

[Text] The year 1992 will have to be the one for reorienting ESPRIT [European Strategic Program for Research and Development in Information Technologies]. The objective is to provide massive support for those technologies which are key to European competitiveness.

The third phase of the EC Framework Program for Research and Development, covering the 1990-1994 period, could result in significant changes to the ESPRIT program in the months to come. During the annual ESPRIT conference, which was held last week in Brussels, the question of a revision of the European strategy was at the center of discussions.

This is a debate whose time has come and which is in line with all current thought on the objectives of EC research, at the very moment when the computer science and electronics industries of the Old World are passing through a severe recession. Conceived initially as a framework to support long-term projects and as an instrument to implement a certain kind of industrial policy, ESPRIT will have to be treated as a much more dynamic factor, in step with the market. Anyway, that was the demand of a number of European electronics manufacturers.

According to EC Commissioner for Research and Science Filippo Maria Pandolfi, the current crisis in this sector requires revising the prevailing doctrine with respect to R&D. At any stage of reason, "1992 will be a crucial year"; Europe will have to make the decisions required for sustaining and developing the impetus given to the program. The third phase will be given new impetus through an endowment of 41 billion French francs (Fr) over four years; a little more than 40 percent is devoted to the ESPRIT and RACE [Research and Development in Advanced Communications for Europe] programs.

There remains but to make an additional effort, reckons Filippo Maria Pandolfi. The share of the EC R&D budget, which is actually some 3.5 percent of the total EC budget, will have to increase to 6 percent by 1997. Another crucial objective is the preparation for the fourth phase which, pursuant to the wishes of the EC Commissioner [Pandolfi] as well as to those of computer technology manufacturers, will have to focus on a few

key technologies which are essential to the competitiveness of European industry. Seemingly well-placed are semiconductors, information technologies, and software. In the latter field, the Brussels Commission is contemplating creating a European Software Institute, a project initiated by Bull, Siemens, and Olivetti.

Belgian R&D Policy Criticized

92AN0173 *Antwerp DE FINANCIËLE-
EKONOMISCHE TIJD* in Dutch 20 Dec 91 p 3

[Article: "Focus Research and RUG [State University of Ghent] Also Complain: Discontent Among Researchers About Science Policy Increases"]

[Text] Brussels (BELGA)—Discontent in the Flemish academic world over Flemish science policy is increasing. The vice rector of the Catholic University of Leuven [KUL] raised the alarm earlier and over the last few days, the State University of Ghent [RUG] and Focus Research, the independent association of university researchers, also raised their voices in complaint.

On the occasion of the announcement of the IWONL's [Institute for the Encouragement of Scientific Research] doctoral grants yesterday, Focus Research criticized the worrying development of the research policy in Flanders.

Points which were stressed include the totally inadequate IWONL budget for doctoral grants, the resulting redundancies and staff reductions in a number of research institutes, the fact that Ph.D. students who are "not among the winners" are forced to continue their research relying on their unemployment benefit as sole "grant."

Actions

To bring about a change in the current situation, they are appealing to scientists and the technical and administrative staff of all Flemish universities to take firm action.

Focus Research criticizes, for example, the fact that two out of three (216 of the 319) applications for an IWONL grant are in vain. Inquiries at several laboratories reveal that many of those who fail present very good references. All these candidates will begin their research in September and will consequently work three months without remuneration.

However, successful first-year students are far from certain that they will be awarded grants for the following years. An average of 25 percent of the candidates in the second and third year do not receive an extension of their grants. In the fourth year this increases to 56 percent of applications. In the case of the latter group in particular, insufficient competency can hardly be the reason for not obtaining a grant.

IWONL's fourth year was introduced this year and the budget was increased from 202 million to 206 million Belgian francs. The young researchers claim that the

increase barely covers the index adjustment and is definitely not enough to finance a fourth year.

The conclusion according to Focus is clear: The IWONL budget is absolutely inadequate and, as a result, the slightest mistake during public defense of the thesis may have dramatic consequences for the candidate.

Nuclear Physics

Furthermore, Professor Heyde of the Laboratory for Nuclear Physics of the State University of Ghent announced that the continuation of the lab is threatened "by a short-sighted policy based on cuts."

Due to cuts in funds, new equipment for high-level research will not be purchased and, in addition, three members of the administrative and technical staff and two positions for researchers who are preparing their doctoral theses will be lost, according to Heyde.

Since the 1960s, the Laboratory for Nuclear Physics has become one of the major centers for nuclear physics research—nationally and internationally. Some 50 staff work there and foreign research teams, including those from the German universities of Giessen and Stuttgart and from Spain and Italy, also carry out experiments.

It is Heyde's opinion that the cuts will jeopardize pioneering research, for instance, in the field of bone cancer prevention which is being carried out in collaboration with the university hospital. In particular the projects using two electron accelerators offering unique opportunities for experimenting may have to stop prematurely.

Interim Report on German CIM Program Issued

92MI0246 *Bonn TECHNOLOGIE-NACHRICHTEN
MANAGEMENT-INFORMATIONEN*, 17 Jan 92 p 2-3

[Text] The BMFT [Federal Ministry of Research and Technology] has granted about 583 million German marks [DM] for 1988 to 1992 in funding for the manufacturing engineering sector in order to increase productivity and develop the international competitive strength of the German manufacturing engineering industry. The offer has been very positively received by the industry, which is also making a substantial financial contribution to the projects.

In view of the importance of computer-integrated manufacturing [CIM] systems for industrial expansion in the new federal laender, the BMFT has begun indirect-specific funding for the introduction of CIM aimed at enterprises in the new federal laender. With effect from 1 January 1992, an extra DM100 million will be made available for this purpose over a four-year period, a further substantial increase on the previous sum.

In addition to modern manufacturing and assembly technology, the use of information technology has also

become an important factor in optimizing the production process as a whole. With the program about two-thirds of the way through, the interim report already shows some remarkable results:

Computer-Integrated Manufacturing (CIM)

- **Wide-impact CIM technology transfer (CIM-TT):** In order to speed up the conversion of the theory and experience-based knowledge of research institutes specializing in CIM into industrial application, particularly in small and medium-sized enterprises [SME's], CIM-TT [technology transfer] centers were set up at 21 locations, including five in the new federal laender (Chemnitz, Dresden, Magdberg, Suhl, and Wismar). In addition to many individual consultations, 12,000 people have taken part in nearly 600 seminars and made use of the information provided by the CIM-TT centers. The BMFT has allocated DM82 million until the end of 1992 for the development and operation of the CIM-TT centers, including DM19 million for the centers in the new German laender.
- **Standardization in the CIM Sector:**

CIM thrives on the interplay between many different manufacturing engineering components and facilities, from the design stage through machine tools to dispatch of the goods. Standardization is, therefore, a particularly important factor.

In order to create a sound scientific basis, a special CIM working party comprising about 13 research institutes was set up with BMFT funds and in close cooperation with the DIN [German Standards Institute]. Technical participation in international standardization bodies greatly benefitted, as is also reflected in the leading role taken in several international CIM standardization activities. The BMFT is spending about DM20 million on this work (1988-1992).

- **Indirect-Specific Funding:**

Development work for the in-house application of CIM in manufacturing engineering enterprises (e.g. machine tool manufacturers) is being funded. These enterprises play a key role in the productivity of the industry as a whole. Moreover, they are heavily export-oriented and fall predominantly within the medium-sized enterprise category. A simplified application and grant system makes it easier for small and medium-sized enterprises to gain access to the funding.

A total of 1,785 applications for funding were received. The grant phase was completed in July 1989, after the DM300 million earmarked for this purpose had been allocated. A total of 1,232 enterprises are receiving funding; at least 92 percent have fewer than 1,000 employees. Since then, 350 projects have been completed.

A survey revealed that, as a result of the BMFT funding, more than 90 percent of the recipients of grants were encouraged to introduce CIM or are implementing it much sooner and with much more extensive preparation.

New Manufacturing and Assembly Technologies

New manufacturing technologies are required to increase the productivity of machining and processing processes, to process new materials economically, or to achieve new and better products as a result of much higher precision. The development work required for this is very expensive and entails a high degree of risk, and it requires collaboration between various specialist disciplines. The measures focus on metal-forming manufacturing processes such as precision forging and cog-wheel milling with an accuracy that requires no finishing. Other areas include manufacturing processes for composite materials (e.g. for bicycle frames), high-performance ceramics (e.g. for engine valves or seals in the sanitary engineering sector), and high-precision metal-cutting.

At present there are five national joint projects in progress with nearly 100 participants (including about 50 SME's and 28 institutes and involving BMFT funding for about DM36 million through 1992). Thanks to the spirit of cooperation of the participants from the old laender, who had defined and commenced these new projects before unification, 27 participants from the new laender have been included in these current projects. A further DM5.9 million has been made available accordingly for the period up to the end of 1992.

Assembly is the area of industrial production with the greatest potential for modernization. In many industrial sectors, assembly accounts for between 20 to 50 percent of production costs, and the upward trend continues. As yet, the degree of assembly automation is still low. The competitiveness of European industry is determined to a significant extent by the speed with which these assembly problems can be overcome.

As part of the EUREKA initiative, 17 countries have come together to collaborate under the general topic of "flexible automated assembly systems" (FAMOS). Nine projects with German participation and BMFT funding are currently in progress, in which 33 companies and institutes from Germany alone are taking part—about half the enterprises taking part are SME's. The foreign participants come from France, Italy, Austria, the Netherlands, Great Britain, Switzerland, Greece, and Turkey. The total cost of these projects is more than DM200 million. The German participants are being funded by the BMFT to the tune of about DM43 million.

In addition, 15 more joint projects from the preceding manufacturing engineering program, funded by grants amounting to about DM47 million, were completed between 1988 and 1992.

Further Measures

The BMFT gave a DM14.3 million grant to the DFG (German Research Association) for 1988 and 1989 to promote basic research. Consequently, the three DFG priority programs on process data processing in manufacturing engineering, diagnostic systems for machines and plants, and planning and control procedures for production processes were started earlier and implemented on the necessary scale.

In one pilot project on the use of CAD (computer-aided design) systems in metal processing, important experience was gained and more than 800 employees from metal processing companies were familiarized with the use of modern computer technology. The BMFT provided DM1.7 million for this project.

As a technology impact assessment project funded with a DM4.2 million grant, an effectiveness analysis of the indirect-specific funding of CIM application is being carried out, including an examination of the efficiency and results of these funding measures and the correlation between the introduction of CIM and industrial organization, workloads, and skills. Initial results show that the introduction of CIM is efficient only if the sole emphasis is not on the technical aspects and if the organization of management and labor is geared towards the use of CIM right from the outset.

The results were set out in more than 20 interim and final presentations with more than 1,000 participants, and in a large number of technical papers. Participation in five major trade fairs (METAV '88, EMO '89, the Hannover Industrie '90 fair, METAV '90, and the Hannover Industrie '91 fair) served the same purpose. From 1988 to 1992 about DM23.3 million were spent on these presentations and the work of the project leader.

German Participation in EC BRITTE/EURAM Program Analyzed

92MI0249 Bonn *TECHNOLOGIE-NACHRICHTEN MANAGEMENT INFORMATIONEN in German* 17 Jan 92 pp 17-18

[Text] Now that the second assessment stage in the EC research and development program on "Manufacturing Technologies and Advanced Materials" has been completed, the results of German institutions' responses to both invitations to bid are available. The program runs from 1989 to 1992 and has a budget totaling just 1 billion German marks [DM]. This R&D program is designed to use cross-border collaboration to contribute towards modernizing European industry and competitiveness in these two key technologies on the international market. The program is open to applications from all industrial companies, research institutes, universities, and other organizations; projects submitted must involve innovative research and development and be at a pre-competitive stage. Participation by small and medium-sized enterprises in these European joint projects is a primary target for funding.

A total of 370 joint projects have been accepted for funding under the two invitations to bid. Germany is involved in 204 of the projects funded, so 55 percent of all projects have at least one German partner. Around DM200 million of the available funding is thus expected to be allocated to Germany. The relative distribution between industry, universities, etc. of funding applied for is shown in Table 1. It will be clear from a comparison of the distribution of funding between the first and second rounds that the proportion of funding accruing to small and medium-sized enterprises has increased by around 4 percent from the first to the second round; the proportion of funding allocated to universities has also significantly increased. These results show that small and medium-sized enterprises are increasingly viewing this European program as important and that German universities are regarded as important partners for joint projects.

Relative Percentage Distribution of Funding Among Institutions in the Federal Republic of Germany

	First Round 1989	Second Round 1991
Industry (> 500 employees)	54	44
Universities	18	28
Industry (SME's)	16	20
Research institutes	12	8

Table 2 shows how the funds requested for the German projects to be funded are distributed across the various technical disciplines. It also shows an increase in funding for materials and manufacturing processes from the first round to the second.

Relative Percentage Distribution of Funding Per Technical Discipline

	First Round 1989	Second Round 1991
Materials	27	32
Design	28	18
Manufacturing Engineering	18	20
Manufacturing Processes	27	30

It is also interesting to compare the incidence of collaboration between German partners and those from other EC and EFTA states (Table 3 [not shown]), the basis for comparison being projects funded under the first and second rounds. An interesting trend emerges, with Germany's most frequent project partners in both the first and second rounds, from Britain and France.

In the second round, however, Italy has moved into third place. Another satisfying aspect is the significantly increased frequency of collaboration with firms and research establishments in the smaller member states.

The new program on "Industrial and Materials Technologies," for which bids are now being invited, is a successor to BRITE/EURAM, and covers the additional areas of raw materials and recycling.

Further information can be obtained from the Materials and Raw Materials Project Manager at the Juelich Research Center GmbH P.O. Box 19 13, 5170 Juelich: tel. 024361/61-4890.

Riesenhuber on Future of Research in East Germany

92WS0290A Berlin ING DIGEST in German Jan 92 pp 16-18

[Interview with Dr. Heinz Riesenhuber, Federal Minister of Research and Technology, by Dietrich Goerke; place not specified: "Eastern Enterprises Need Strong Research"]

[Text] The decline of research potential in the enterprises and institutions of the new German laender has been an ongoing problem over the past year. Signs of the tense atmosphere range from bitter debate to lawsuits brought before the Federal Constitutional Court. More and more, the quality of experts from eastern Germany is being called into question. ING DIGEST asked Dr. Heinz Riesenhuber, federal minister of research and technology, for his opinion.

[ING DIGEST] Mr. Minister, now that you have had considerable experience with eastern German research, how would you assess its quality?

[RIESENHUBER] Originally, many people believed that research and technology in the new German laender—i.e., the former German Democratic Republic—were simply bad. That is obviously not the case. The evaluations by the Scientific Council yielded surprising and in some cases remarkably good results. This was the case, for example, in mathematics and information technology. Even where the various fields of physics were concerned, we were advised to hire 70 percent or more of the eastern German scientists for the institutes that are to be reestablished.

[ING DIGEST] So eastern German research should be continued?

[RIESENHUBER] During this transition period, it is particularly crucial that we do not abandon market-oriented research. Competent groups must be retained and allowed to get up to speed. As far as mid-term—and especially long-term—planning is concerned, eastern German enterprises must under no circumstances become an extended workbench for the old German laender. Rather, they must grow strong and independent in such areas as marketing, production, and above all research. We cannot afford to squander resources available to us in the new German laender.

[ING DIGEST] How do you define the term market-oriented research?

[RIESENHUBER] Basically, it includes everything leading either to products to be marketed or to production processes. The old combines had centralized a large portion of their research in individual institutes. These are now the source of many of the new research firms. These firms actually concentrate on nothing but research and, above all, development, the objective of which is not scientific publication, but product improvement.

[ING DIGEST] Your ministry, as INGENIEUR-MAGAZIN has repeatedly reported, has contributed to research assistance. What are your plans for 1992?

[RIESENHUBER] 750 million German marks [DM] have been allotted for projects in the new German laender in 1992. This does not include the funds for the basic financing of groups such as the successor institutes of the Academy of Sciences. Proportionately, there are more Fraunhofer Institutes in the new laender than in the old laender.

Finally, the Federal Ministry of Research & Technology (BMFT) 1992 budget contains DM300 million that has been allotted to its Eastern German Recovery Program. This money will fund the University Restoration Program, with which we hope to help research groups make the transition into the universities. It is also the source of grants to Max Planck Institutes and the Blue List Facilities, which receive equal funding from the laender and the federal government, as well as of funds for research firms and market-oriented research—particularly that which is conducted in cooperation with firms and institutes of the old German laender. In summary, the BMFT will make DM1.6 billion available to the new German laender.

[ING DIGEST] Do the research funds also contribute to the founding of new establishments?

[RIESENHUBER] We have created an infrastructure of 15 technology centers, and some laender are using these as a model for additional facilities. These provide advice and information on subjects ranging from tax laws to market research and market-oriented product development for individuals interested in creating new establishments.

In addition, we have reinstated our successful program for establishing technology-oriented firms, a program which had been discontinued in the old German laender, in the new German laender. The extensive applications indicate that those interested in establishing such firms have made willing use of the program, both in the past and in the present.

Finally, there is the DJEU [expansion not provided] Program, with which we want to make venture capital available to young, newly established enterprises. Thus we have met the financial requirements for the various

conditions under which enterprises are established. Success naturally depends above all on the rapid development of a good, market-oriented strategy.

[ING DIGEST] How extensively is small business involved in this?

[RIESENHUBER] In some cases as much as 100 percent, namely where newly established enterprises are concerned. But small businessmen are actually just beginning to emerge. The first wave of small businesses consisted primarily of service enterprises.

I hope that the number of small businesses increases along two avenues: the establishment of new enterprises and the continuation of groups from old combines—i.e., research companies—and from institutes of the old Academy of Sciences.

[ING DIGEST] What about the qualification of people for these tasks?

[RIESENHUBER] This, of course, is a problem: The scientists did not always have complete access to international literature, and certainly not to international conferences. And it goes without saying that they did not always have state-of-the-art equipment, and therefore require further training.

Now, however, eastern German scientists have access to the German Research Network and to international data banks. Central courses have been organized in order to ensure optimal use of these data banks. The engineering associations and other professional associations are also providing assistance in this area.

[ING DIGEST] Are enterprise personnel familiar with the procedure for applying for research and development funding?

[RIESENHUBER] The information has been widely distributed. Thousands of copies of a promotion booklet, originally intended for the old German laender, were issued. This booklet included extensive and simplified instructions targeted at scientists or businessmen, because these are the people who have had no experience in dealing with our financial aid bureaucracy.

Management courses helpful for running institutes are being organized in conjunction with the Fraunhofer Society. Finally, the professional associations are a good source of information. For the past 10 years we have had central technology advice centers at all industrial and commercial professional associations as well as at some trade associations, and we are continuing this on a trial basis in the new German laender. These facilities are also seeing increasing use.

Germany: Karlsruhe Center Presents 1992 Program Budget

92MI0295 Bonn *TECHNOLOGIE-NACHRICHTEN MANAGEMENT-INFORMATIONEN in German*
29 Jan 92 pp 6-7

[Text] The Karlsruhe Nuclear Research Center (KfK) has just presented its program budget for 1992, containing its medium-term work and financial schedule for the period 1992-1995. Under the broad heading "Research into Environment-Friendly Advanced Technologies," it focuses on three areas: "environment," "energy," and "microsystems engineering and basic research," which are to be given more or less equal weight in the medium term, with special attention to interdisciplinary research and development, i.e., collaboration between networks of scientists working in various areas. Further details of the three main areas are as follows:

Environmental Research

Development work will cover low-pollution and low-waste processes, including the application of the results of previous pioneering work on domestic waste incineration to the disposal of special waste. The underlying objective is to arrive at a new concept in environmental technology whereby less waste is produced and/or undesirable byproducts are recycled close to source. This is urgently needed by the public agencies concerned, which currently have almost no means at their disposal for effectively controlling the nature and scale of waste incidence. As a contribution to improving public provisions, research will focus closely on public needs, such as those faced by the land-level development corporations, and explore the possibility of setting national waste and pollutant avoidance standards.

In addition to these developments, basic research will be carried out into energy and substance conversion in the environment. These studies of pollutant exchange and interaction in the atmosphere, together with aerosol research, form part of the major research establishments' Joint Climate Research Project, a major component of this long-term program being worksharing with universities.

Energy Research

The Nuclear Research Center is working on aspects of nuclear fission that are in the public interest to solve: Reactor safety work aims to enhance the future prospects of this source of energy, which is indispensable worldwide, by achieving constant improvements in nuclear safety.

Research into nuclear waste disposal concentrates on radioactive waste treatment and safe disposal methods, and particularly on the direct permanent disposal of spent fuel elements and the decommissioning of obsolete nuclear facilities.

The Nuclear Research Center's work on nuclear fusion reactor technology is a major contribution to the European nuclear fusion development program. Solving these technical problems is crucial to the future of this energy source, which could be available from the middle of the next century, in terms of feasibility, economic viability, environmental compatibility, and political acceptance.

Research into superconductivity, particularly the development of technically viable high-temperature superconductors, constitutes a major contribution to non-nuclear power engineering. New applications are conceivable, particularly for electricity supplies.

Microsystems Engineering and Basic Research

The creation of the new microsystems engineering research division has brought together a range of topics that will make it possible to define new goals for the previous major areas of solid-state and materials research and handling technology. One of the bases is the LIGA [lithography and electroplating] process, whereby three-dimensional micrometric components can be reproduced and manufactured with high precision. The development of suitable materials and the integration of information processing, process control, and handling technology will open up totally new applications for this process, bringing about a technological revolution, especially in industrial production engineering, and also in medical technology.

Basic scientific research links the Nuclear Research Center with the science faculties of various universities, and has proved successful in fostering new generations of scientists. Current research focuses on neutron physics experiments, some on quite a large scale, and on investigating aspects of astrophysics.

In addition to its research and development program, the Nuclear Research Center's success record over more than 10 years in promoting technology transfer to medium-sized and small industrial enterprises should be noted. Whereas in major projects entire technology packages are developed in close collaboration with industry to achieve specific research policy objectives, what is involved here is the industrial exploitation of results that are incidental to major projects and are not further pursued within that context. The topics involved in technology transfer thus range right across the Nuclear Research Center's broad spectrum of knowledge and know-how.

The 4,200 employees of the Research Center, which was founded in 1956, make it Germany's largest scientific and engineering research establishment; 90 percent of its funding comes from the federal government, the remaining 10 percent is contributed by the land of Baden-Wuerttemberg. Its present budget totals around 720 million German marks [DM], a figure that includes funding that it passes on in the form of membership fees, for instance to the Laue-Langevin Institute in Grenoble, project sponsorships, and special financing for a total of

DM65 million. After deduction of its own earnings of around DM132 million, public expenditure on the KfK totals DM588 million.

A new component of the present medium-term budgetary and research schedule is the amount of funding from other quarters, which will drastically increase in the future to compensate for the reduction in basic financing from the federal budget. In 1992, 19 percent of research funding will be allocated to environmental research, 47 percent to energy research, and 34 percent to microengineering and basic research.

France Launches Industrial Test Center

92WS0300B Paris ROBOTS in French 10 Jan 92 pp 4,5

[Article entitled: "ADEPA Inaugurates Its Center for the Integration of Manufacturing Industries"]

[Text] The Computer Integrated Manufacturing Agency (ADEPA) has inaugurated its Center for the Integration of European Manufacturing Industries (CIME) in Montrouge. The Center combines several technical platforms—design, production management, manufacturing methods, and others—that communicate among themselves and model the operation of an integrated mini-company. The object of the center is to allow manufacturers to conduct full-scale studies and tests of their CIM systems. The Ministry of Industry, the Ministry of Research, equipment manufacturers, and Ile de France together invested 16.5 million French francs [Fr] in the center. The Ministry of Industry's share was 56 percent.

The president of the republic announced earlier that he would propose the launch in 1992 of a big, strategic "factories of the future" project to EUREKA's other member countries. The Ministry of Industry, government authorities, and France's EUREKA secretariat are thus preparing the first international contacts on the topic. The EUREKA project is a continuation of the programs to support CIM that cost France Fr800 million in 1991. It was within the framework of those programs that ADEPA devised CIME, which hopes to be future-oriented and a spur to action. There are other centers for the demonstration of new technologies in France that are called CIM. They do not compare, however, to ADEPA'S CIME, which models a complete and purely industrial system. The others are essentially dedicated to the type of business or field of expertise of the organizations that created them. Some of them are oriented to CAD or CAM, for instance, in universities, or to flexible factories in technical centers, or to communication systems such as local networks. That difference is what makes ADEPA'S CIME both distinctive and original.

Furthermore, the agency is expected to name a new president soon. ADEPA has been without one ever since the sudden accidental death of Michel Barba this summer. The general director of Citroen, Xavier Karcher, was solicited for the job at one point, but declined in order to devote himself to the "chevron" company. Several candidates are in the running and the

nomination of a new president is said to be imminent. ADEPA (Francoise Nove Josserand, communications officer)—13-17 rue Perier, 92120 Montrouge cedex. Telephone: (1) 46.57.12.70.

EC Approves German, Italian Government R&D Aid

92WS0352A Brussels EUROPE in English 17 Jan 92
pp 11-12

[Article: "The Commission Approves Aid for Research in Italy (Very High Tension Energy Distribution) and Germany (To Assist SMES)]

[Text] Brussels, 16 Jan 92 (AGENCE EUROPE)—The European Commission has approved two state aid schemes in the field of research in Italy and Germany, as follows.

1) Italy. Aid scheme aimed at assisting research by ENEL, a state enterprise responsible for electricity production and distribution, for the preparation of a system for the transformation and distribution of high-tension energy. The public financial intervention will be made in the framework of the "Fondo per la ricerca applicata," the refinancing of which was approved by the Commission on 19 April 1990. The aid, which consists of an interest-rate subsidy and a cash premium and which will cover 45 percent of basic research and 55 percent of applied research and development, totals ECU12.6 million out of a total investment of ECU50 million. Applying Article 92.3.C of the EEC Treaty and its supporting arrangements for state aid for research and development (R&D), the Commission has decided that the Italian aid supports technological progress without altering the conditions of trade between the member states in a way that could be harmful to the common interest.

2) Federal Republic of Germany. Loans with interest-rate subsidies to assist enterprises with annual turnover of less than ECU24.4 million annually. Applied research and development activities will be assisted by means of subsidized loans from banks acting for the Kreditanstalt für Wiederaufbau (KfW). A total of ECU977 million has been earmarked for this purpose for the period from 1992 to 1997.

In addition, the federal government and the KfW will provide guarantees for these loans, covering 50 percent of the risk in western Germany and 75 percent in the new Laender. In its assessment of this regime, the Commission evaluated aid intensity at 11.5 percent for firms in western Germany and 16.5 percent in ex-GDR. It considered that the scheme is compatible with Article 92.3c EEC, given that it promotes the development of research activities and meets Community framework modalities for State aid to R&D.

EC Drafting Fourth R&D Framework Program

92WS0352D Brussels EUROPE in English 22 Jan 92
p 9

[Article: "The Commission Will Soon Present Its Guidelines for Future Community Research Policy—Preparation of the Draft Fourth Framework Programme"]

[Text] Brussels, 21 Jan 92 (AGENCE EUROPE)—The European Commission's preparation of guidelines for future Community research policy as regards the fourth framework programme, given the new challenges which have recently emerged in this area in regard to decision-making (creation of the European Economic Area, the changes in eastern and central Europe, industrial policy, etc.), is moving in the direction of speeding up the procedural upstream of ministerial decisions. Indeed, the decisions taken at the Maastricht Summit may make the inter-institutional procedure longer on both future framework programmes and specific programmes. Commission Vice-President Mr. Pandolfi plans to hasten the presentation of these communications and concrete proposals in order to prevent any delay.

The Commissioner in charge of research policy—who will outline his ideas at the meeting of the Scientific and Technical Research Committee (CREST) on Thursday in Brussels—expects to present a Commission paper to the Council in February outlining the strategy and guidelines of the Community's future research policy and, in March, a package of documents and concrete proposals for implementing this policy. The idea has also been launched to organize an inter-institutional three-way dialogue (Commission, European Parliament, Council). Furthermore, a preliminary ministerial policy debate was already held at the Research Council on 28 October 1991, a debate in which several conclusions were drawn by the Presidency. In particular, the Ministers agreed that Community R&D policy will have to be considered, *inter alia*, as an instrument allowing the acceleration of structural changes. In its document on industrial policy dated October 1990, the Commission proposed a new approach aimed at completing pre-competitive programmes with a "second generation" in the area of R&D more likely to reflect market needs. This new approach, concluded the Dutch Presidency, will not fail to lead to financial consequences and to affect the relationship between Community research and EUREKA (see EUROPE of 30 October 1991, page 13).

Based on this new outlook advocated by the Commission itself, the latter is expected to approve in March a package of documents including:

- a paper on the final assessment of the second Community Scientific and Technical Research Framework Programme;
- a proposal on the possible revision of the third framework programme; it should be recalled that out of the 15 specific programmes belonging to this framework programme, 12 have already been

approved and implemented and the three remaining specific programmes (human resources, volarisation and dissemination of findings—VALUE—and the Joint Research Centre) are expected to be ratified very shortly and without any major problems;

- the proposal for the fourth framework programme;
- proposals for each of the specific programmes which will give concrete effect to this fourth framework programme. This latter point will notably constitute a remarkable innovation as an acceleration of decision-making procedures because up to now specific programmes have normally been the subject of presentations to the Council during ministerial debate on the major orientations of the framework programmes.

Officially, the Council has not yet expressed a position on this new strategy that Mr. Pandolfi plans to inaugurate primarily because of the repercussions of Maastricht on the decision-making process. But some delegations consider it to be very ambitious and would like agreement to first be reached on the main guidelines of what is to be done before entering into debate on the detailed specific programmes. The problem also merits study in regard to the financial perspectives which theoretically should reflect the same level of expenditure as fixed for the fourth framework programme.

BRITE/EURAM Work Program Outlined

92WS0352G London INTERFACE EUROPE in English Jan 92 pp 7-10

[Text]

BRITE EURAM

Industrial and Materials Technologies—BRITE/EURAM II. In our last issue we reported the EC Council of Ministers' adoption of BRITE/EURAM II (budget MECU666.3). After some delays in agreeing upon a work programme, the Commission has now issued two calls for proposals, one covering (a) BRITE/EURAM II in general, and the other (b) specifically concerned with Aeronautics.

(a) In connection with the general call, covering the programme as a whole, the Commission has published an outline work programme as follows:

MATERIALS

Area I: *Materials—raw materials.* This area is subdivided into five sections.

- 1) *Raw materials:* Research will include: Exploration technology; mining technology; and mineral processing.
- 2) *Recycling:* Recycling and recovery of industrial waste including non-ferrous metals; recycling, recovery and re-use of advanced materials.
- 3) *Structural materials:* Metals and metal matrix composites; ceramics, ceramic matrix composites and advanced glasses; polymers and polymer matrix composites.

4) *Functional materials for magnetic, superconducting, optical, electrical and biomaterial applications:* magnetic materials; high temperature superconducting materials; optical materials; [as printed] biomaterials.

5) *Mass commodity materials:* packaging materials; new construction industry materials.

DESIGN AND MANUFACTURING

Area II: *Design and Manufacturing.* This area is divided into three sections.

1) *Design of products and processes:* Research work will include: innovative design tools and techniques; design methodologies for complex, components; maintainability and reliability.

2) *Manufacturing:* Tools, techniques and systems for high quality manufacturing techniques for industrial use of advanced materials; integrated approach to chemical and process engineering.

3) *Engineering and management strategies for the whole product life cycle;* design integrating strategies; engineering; human factors in engineering and manufacturing management.

Proposals must relate to the topics mentioned above. Each project must include at least two contractors in two different member states. The EC will pay up to 50 p.c. of the total costs and in the case of universities and similar institutions up to 100 p.c. of the additional costs.

An important innovation is that proposals can be made which are complementary around one specific object and cover different technologies of the programme. These will be known as targeted research actions. An example given in a previous draft work plan was coordinated research on the production of an 'environmentally friendly vehicle'.

The deadline for applications is 3 Apr 92. (See OJ C 333 of 24 Dec 91). Details of the call for proposals may be obtained from: Ref. BRITE/EURAM II Call for Proposals (Areas 1 and 2) CEC DG XII Directorate C, Rue Montoyer 75, B-1040 Brussels. Tel: Brussels 235 2345. Fax 235 8046.

AERONAUTICS

(b) Aeronautics. The Commission states that ... "the objectives of the programme are to improve the competitiveness of the European aeronautical technological base and to contribute to the basic knowledge required to allow actions to be taken to minimise environmental impact and enhance safety and efficiency of aircraft operations."

To this end, the aeronautics research of BRITE/EURAM II programme (Area 3) has a work programme for its research. This is divided into six sections:

A) 3.1 *Environment Related Technologies*

Research under this heading will focus on reducing aircraft noise, both externally and internally. It will also aim to reduce the emission of pollutants from combustion systems.

Objectives (a) Improvement of aero-acoustic prediction codes in relation to advanced propellers, rotary wings and unducted propfans; and experiments on noise reduction techniques; (b) Investigation of interior cabin noise and how to reduce it; and (c) Pollution reduction in aero-engines; improved models for the behaviour of advanced gas turbine fuel preparation and combustion systems and; basic test rigs for providing validation data.

Research Tasks

3.1.1 *Advanced Propellers, Propfans and Helicopter Rotors.* Improved aero-acoustic codes for the prediction of noise generation of unducted propulsors including interactions with aircraft wings, fuselage, etc.; validation of improved prediction codes by wind tunnel and/or flight tests; flight procedures and active control technologies; projects on advanced propellers and/or propfans and/or advanced helicopter rotors.

3.1.2 *Aircraft Interior Noise.* Research on noise reduction techniques taking account of constraints of weight and volume applicable to aircraft. ... "The goal for aircraft with rotary wing, advanced propeller or propfan propulsion being cabin interior noise levels not worse than those in jet passenger aircraft of the same generation."

3.1.3 *Low Emission Aeroengine Combustor Technology.* Fuel preparation and development... "of realistic combustor hardware to permit reliable extrapolation to conditions expected in future engines; development and validation of improved combustor computer models and identification of effective methods of pollution reduction."

AIRCRAFT OPERATION

B) 3.2 *Technologies of Aircraft Operations*

Objectives. These include development of: theoretical models and practical techniques for realising more robust aircraft structures; continuous health and usage monitoring in aeronautical systems; advanced non-linear techniques for gross deformation of aircraft structures and investigation of improved crash-resistant structures; and a more efficient aircraft-to-ATC system interface.

Research Tasks. These match the above objectives, and also include: 'Aircraft Crashworthiness' and 'Aircraft Fire Risk Control'.

AERODYNAMICS

C) 3.3 *Aerodynamics and Aerothermodynamics*

Objectives. (a) More efficient techniques for flow modeling, standardisation of validated software for flow visualisation; and development of aerodynamic

optimum design methods; (b) Laminar flow technology applicable to subsonic airliner wings; extension of the technique to turbofan powerplants and other components; (c) Prediction methods for aerodynamic and acoustic interference between powerplant and airframe and between helicopter rotor and fuselage; (d) Theoretical models of loss effects and methods of performance optimisation in highly loaded aeroturbomachinery components; and (e) Acquisition and validation of data for improved models of turbulent shear layers in relation to aircraft.

Research Tasks. These follow the above objectives in more detail, and include special reference to: 'Aerothermodynamics of Aeroengine Compressors' and 'Turbulence Modeling'.

D) 3.4 *Aeronautical Structures and Manufacturing Technologies*

Objective. The objective is the development of structural design techniques and concepts required for the realisation of cost-effective designs of various types of pressurised fuselage structures.

Research Tasks. These include comparative studies on fuselage design, considering the use of light alloys, carbon-epoxy composites and metal laminates.

AVIONICS

E) 3.5 *Avionic System Technologies*

Objectives. (a) Development of techniques for realisation of modular, high performance, high integrity information processing systems; (b) Development of techniques for application of solid state and optical sensing, display and communication devices to airborne sensing, monitoring and control systems; and (c) Man-machine interaction in the flight deck and techniques for analysis and optimisation of overall pilot and aircraft performance.

Research Tasks. These are listed under three headings: 'Airborne Digital Systems', 'Airborne Data Acquisition, Processing and Transmission', and 'Flight Decks'. The last gives special mention to advanced concepts for helicopter cockpits.

F) 3.6 *Mechanical, Utility and Actuation Technologies*

Objectives. (a) Improvement of landing gear performance and passenger comfort through advanced control concepts and smart technologies; (b) Reduction of the dependence of aircraft systems on engine bleed air supplies (air conditioning, de-icing, etc.); (c) Reduction of size and weight and improvement of reliability and performance of aircraft fuel control systems by a total systems approach, new materials, adaptive control, and integration of engine and aircraft systems; and (d) Incorporation of electronic processing within actuator devices

to ease integration with fly-by-wire and fly-by-light concepts and to take maximum advantage of new magnetic materials and packaging techniques to allow the use of alternative power supplies.

Research Tasks. These closely follow the above objectives.

The rules and conditions for making the proposals are the same as for Areas 1 and 2 above, with similar provisions on cost sharing.

See OJ C 333 of 24 Dec 91. The deadline for applications is 6 Mar 92. Details of the Aeronautics call for proposals may be obtained from: CEC, DG XII-H, Aeronautics Group, MO 75 6/22, 200 rue de la Loi, B-1049 Brussels. Tel: Brussels 235 0807. Fax 235 0656.

CORPORATE STRATEGIES

Successful European Electronics Firms Listed

92AN0139 Paris *ELECTRONIQUE INTERNATIONALE*
HEBDO in French 5 Dec 91 p 6

[Article by Michel Heurteaux: "European Electronics Also Has Its Heros"]

[Text] The best performers in terms of profit or annual sales figure are not necessarily the giants in the electronics sector. Among the growth-stars are found some small and medium-sized industries and, surprisingly, a host of British companies.

Under the current circumstances, gloomy at best, some European companies manage, despite everything, to work their way out of a ticklish situation and even to record a sustained level of operations and rising profits. Even better, some of them generated double-digit growth figures over the past few years. A study carried out by the Brussels-based Expertronics Limited office has drawn up a list of 25 electronics companies whose annual sales figure has increased, on an average, by more than 12 percent annually since 1986.

Among the 25 growth-stars are found, it should be noted, 10 British companies, but only three French ones—Alcatel, Merlin Gerin, and Telemecanique—and two German companies. The leader of the group, the British company Peek, is specializing in electronic road traffic control systems and has recently purchased the Traffic Control Division of Philips. Beyond any shadow of a doubt, Peek carried off the prize with an annual sales growth rate of 97 percent between 1986 and 1990. In second and third place come two other British companies, Psion and Control Techniques, which recorded an annual sales growth rate in excess of 50 percent. Of the first 25 companies in the rankings, 10 have achieved profits representing more than 10 percent of their annual sales figure. The best performer was the English company Bowthorpe (connector technology, electronic components) with pretax profits equaling almost 19 percent of sales, followed by the Italian company Telettra with

15.3 percent. Another criterion used to measure the competitiveness of the European champions was annual sales per employee. The Dutch company Tulip Computer came in first with a score of 1.95 million French francs [Fr] for the 1990 fiscal year.

Generally, Rather Low Investment Expenditures

Moreover, the Expertronics study brings to light interesting points about the investment strategies of these companies. As a general rule, these expenditures appear low, particularly with respect to R&D, where the average investment/sales ratio barely exceeds 6 percent. It is the same for industrial investment: For 1990, the first 25 in the rankings set aside, on the average, less than 7 percent of annual sales figure. Another peculiarity is the very high level of debt; in fact, last year their net debt/equity ratio almost exceeded 40 percent.

Taken as a whole, the performance of these companies leads one to think about the resources utilized to achieve these results. The analysis underscores specific strategies: growth through acquisitions; strong concentration on a few growth niches; formation of alliances; entering into joint ventures; embarking upon new activities, and a consistent emphasis on exports.

The study under consideration also contributes some other answers through a comparison of the 25 best-performing European and American firms in the electronics sector. In their approaches, their management, as well as in their strategies, they are markedly different. The first difference is the growth rate of the American champions, which is notably higher than that of their European competitors. The last in the American rankings, EMC, a computer peripheral equipment manufacturer, has recorded an annual sales increase of nearly 40 percent since 1986. The first 16 in the rankings, as opposed to only three in Europe, saw their annual growth exceed 50 percent.

Although the U.S. companies are smaller in size than their European equivalents, they do better in terms of annual sales per employee. This is mainly due to their higher level of specialization along with, in the majority of cases, a basic business around which are concentrated their investment, marketing, and R&D efforts. There are other differences: They achieve higher increases in productivity and they make higher profits. However, the European companies regain the lead in the field of exports. The American computer manufacturers appearing in these rankings have attained less than 50 percent of their annual sales figure abroad during 1990, whereas our European champions have secured 65 percent of their sales through exports.

[Box, p 6]

Recipes For Rapid Growth

Some of the European enterprises present in these rankings have attained record growth rates. By what means? During the past four years, the majority followed a

strategy of external growth, notably through acquisitions and partnership agreements. However, the study has also shown the importance of high-quality management, and supervisory personnel, and the need for having a

relatively high investment rate. Other "recipes" for rapid growth include systematic cost reduction, capital increases, and, above all, development of new products based on the latest technology.

Table. European Electronics : The "Stars" of Growth

Companies	Annual Growth Rate over the Past 5 Years	1990 Sales in Millions of DM (1 DM = Fr3.65)	Exports/Total Sales (%)	Pre-tax Profits/Total Sales (%)	R&D/Sales (%)
1. Peck (UK)	96.9	202	66.0	13.6	5.6
2. Psion (UK)	58.3	90	34.9	1.7	7.0
3. Control Techniques (UK)	57.4	159	58.9	13.3	3.6
4. Tulip (Netherlands)	42.1	345	47.0	7.0	N.A.
5. Telemetrix (UK)	41.1	197	67.8	5.9	3.8
6. Asea Brown Boveri (Switzerland)	38.8	43,045	96.0	4.1	7.2
7. Valtronic (Switzerland)	37.0	66	67.0	2.6	10
8. Telettra (Italy)	32.4	2,308	49.0	15.5	8.5
9. Menvier Swain (UK)	32.2	136	35.0	10.5	1.3
10. Gambro (Sweden)	27.9	1,175	97.7	9.4	5.2
11. Pharos (Sweden)	27.3	696	93.1	5.4	N.A.
12. Alcatel (France)	26.7	27,564	71.0	7.2	7.4
13. Barco (Belgium)	25.4	508	83.0	4.9	10
14. Siebe (UK)	21.7	4,230	89.2	10.7	3.7
15. Vinten (UK)	21.2	183	78.9	13.5	3.4
16. Merlin Gerin (France)	20.2	5,400	53.3	7.7	7
17. Austria Mikro Syst. (Austria)	17.3	88	97.0	5.7	13
18. Nokia (Finland)	16.5	9,377	70.0	3.2	5.3
19. Italtel (Italy)	15.5	3,172	3.1	12.3	11.7
20. Vogt (Germany)	14.1	122	41.3	2.7	5.0
21. Bowthorpe (UK)	13.7	694	72.6	18.7	2.8
22. Eurotherm (UK)	13.4	470	71.3	8.0	5.6
23. Racal (UK)	12.7	5,955	50.0	10.7	4.6
24. Linotype (Germany)	12.5	806	72.4	14.1	9.4
25. Telemecanique (France)	12.2	2,961	52.9	9.9	7.5
Moyenne	29.4	4,398	65.0	8.7	6.5

Source: Expertronics Limited, November 1991

[caption] With 10 companies among the [European] top 25, the British electronics industry is the unchallenged winner of the trophy for the best-performing companies in terms of sales growth figures.

Alcatel Subsidiary To Focus on Telecommunications

92WS0305A Paris L'USINE NOUVELLE in French
9 Jan 92 p 14

[Article by Jean-Pierre Jolivet: "Alcatel Abandoning Production of Fax Machines"; first paragraph is L'USINE NOUVELLE introduction]

[Text] Prices have plunged and profits have eroded, and research and development costs are too heavy. So the group prefers to focus on telecommunications.

The watchword at Alcatel Business Systems is realism. This subsidiary of the number one in telecommunications, which handles the group's business communications systems activities, and accounts for annual revenues of 16 billion francs[Fr], has abandoned the development and production of the next generation of fax machines. "The accelerated rate of the drop in prices and the erosion of profit margins have dissuaded us from investing in a future line of fax machines," says Frederic Pinot, general manager of Alcatel Business Systems. Nevertheless, the group, which is actively seeking new suppliers, intends to stay in this market—in which it holds an 18 percent share in France—by continuing to market this type of equipment.

Like many manufacturers, Alcatel Business Systems—which grosses Fr400 million annually in this sector—is having to cope with a tight market. The fax machine is becoming a general consumer product, making very-high-volume production indispensable. Only significant market shares and a worldwide approach have enabled the Japanese and Koreans to extricate themselves without loss. With a production of 100,000 machines by its Alsatian plant at Woerth, and despite good market positions in France and Germany, Alcatel Business Systems is wide of the mark.

The more so in that the marketing of these machines necessitates a strengthening of traditional distribution networks. New outlets for bottom-of-the-line products are making their advent. The result is a severe erosion of profit margins. Alcatel Business Systems has not succeeded in reducing production costs, and this has further aggravated the situation. The value added by the manufacture of a fax machine is dependent now on the cost of components, which are becoming increasingly integrated (ASIC's [application-specific integrated circuit(s)]), and on the cost of research and development, which is becoming very heavy. Alcatel Business Systems has signed technological agreements with SAGEM [French] Company for General Applications of Electricity and Engineering], for its latest line of fax machines, launched last September, and with Hewlett-Packard in the domain of laser printing.

The decision to halt the development and production of fax machines reflects the intent of the group headed by Pierre Suard to focus on its basic specialty, namely,

telecommunications. Since the advent of Hughes Garin as president, there has been much rethinking of strategies.

To begin with, the idea of selling the company's business in terminals produced by its Consumer Products Division (Minitel terminals, telephone terminals, answering machines, wireless telephones) to TCE [Thomson Consumer Electronics] was finally rejected. "With 7 million telephone sets sold worldwide, we have market shares that enable us to hang in. And in order to sell PABX's [private automatic branch exchange(s)] to business, we must also offer terminals," says Frederic Pinot. The prototypes of videophones, telephone sets equipped with liquid crystal displays [LCD's], and other Minitel terminals of the future, unveiled at the Telecom 91 show in Geneva last October, attest to the group's ambitions in this domain.

As for the group's mail room facilities business the case is not the same, and Alcatel NV has recently put it up for sale. Although it holds the number two market position worldwide, after the U.S.'s Pitney Bowes, the French group is abandoning a profitable activity. Research and development costs, however, are rising incessantly.

Alcatel Business Systems's 2.4-percent profit margin is half that of the group's other subsidiaries, and the need for Alcatel Business Systems to pull its performance up to par with them in 1992 is urgent.

Bull's Market Position Summarized

92WS0305B Paris L'USINE NOUVELLE in French
9 Jan 92 p 15

[Article by Patrick Levy: "Bull: A Coveted Pool of Resources"; first paragraph is L'USINE NOUVELLE introduction]

[Text] The French group has sold and services the third largest number of computer systems sold and installed in Europe. It also has a know-how in networks and, through Zenith, in portable microcomputers. It is putting this array of assets up front in negotiations with the Americans in an attempt to rescue the French computer industry.

But what is it that could motivate a big computer group on the other side of the Atlantic to sign an agreement with Bull? Unquestionably, it is Bull's solid position in the realm of small-, medium-, and large-scale systems, with, at each of these levels, the third largest number of computers sold and installed in Europe. It is the kind of asset that made Wang attractive in the eyes of IBM. Under the terms of an agreement signed by them last summer, Wang became purely and simply a distributor of IBM's products. Bull's solid implantation signifies for its partner a privileged access to several tens of thousands of clients, many of whom are very big and are situated in a region of the world whose growth potential

is far greater than that of the United States, to say nothing of the markets yet to be discovered in eastern Europe.

Assets Are Many...

As of now, in western Europe, Bull ranks third behind IBM and Siemens in mainframe installations and behind IBM and Digital Equipment in intermediate distribution frame and minicomputer systems.

The French group posits a number of arguments, mainly technological. The first of these is its mastery of the particularly difficult technique of developing Unix multiprocessor systems. These very powerful machines are suited to the installation of departmental type systems, for which there is a growing demand.

Another Bull asset is its sizable investment in distributed processing software meeting OSI [Open Systems Interface] standards, including the development of software for connecting these systems with the IBM environment. This know-how could enhance the partnership package being offered by the French group. And Zenith capabilities in the portable microcomputer sector are a far from negligible asset.

Like Bull's agreement with the Japanese NEC company, which owns 4.7 percent of Bull's capital stock, the agreement it would sign with a new partner would have to include a similar reciprocity clause. The French distribute the Japanese firm's DOS 9000 mainframes, with sales averaging around 2 billion francs[Fr] annually, and in exchange, NEC uses certain Bull software developments for its own needs.

But why does Bull so urgently need a partnership?

"Its Unix market position is still weak," says Jane Doorly, an analyst with Dataquest in London. It is credited with only 4 percent of the market, versus 13 percent for Hewlett-Packard, for example. Surprised by the sudden growth in the demand—on the part of the French government administrations as well—for this data processing standard, Bull was unable to react fast enough. In this crisis-ridden sector, the Unix market represents one of the rare islands of prosperity. "We need to very quickly upgrade our market offering," says Alain Couderc, Bull's manager of distributed data processing. Adoption by Bull of a RISC [Reduced Instruction Set Computer] technology would be the quickest way to do this, provided it is accompanied by an industrial partnership and a research and development partnership. "A newcomer to the realm of RISC processors must be prepared to shell out at least \$1 billion to enter the race," says Robert Aydabirian, general manager of Hewlett-Packard France. Such an alliance would enable the partnership to split the sizable investments involved and would help impose its technical solution as the standard. The objective is to gradually replace proprietary machines with standard systems.

The problems faced by the computer industry's "national champion" are not only technical. More than ever, Bull needs fresh cash. Its ratio of debt to net worth is 19, and its financing charges represent 3.2 percent of revenue. It would need an injection of around Fr15 billion to clean up its balance sheet. It also needs an additional Fr11 billion over a four-year period to pursue its distributed systems architecture [DSA] project to a successful conclusion, which is essential if Bull is to weather the second half of the decade in good shape.

For budgetary reasons, and because the Brussels Commission would frown on any aid exceeding the normal bounds of a shareholder's commitment, commitments of this magnitude are beyond the possibilities of the French state. In 1989, NEC served as guarantor enabling Bull to obtain the loans it needed for the acquisition of Honeywell's computer division. Last summer, it took a lot of coaxing to get NEC to convert its stake in the capital stock of Bull HN (ex-Honeywell Information Systems) into shares of the parent company CMB.

...But Sales Are in Slight Decline

Be it France Telecom, IBM, Hewlett-Packard, or Digital Equipment, a certain apprehensiveness being manifested by the potential financial partners being sounded out by the government is understandable. Even though it may seem to be faring less disastrously than many others, Bull is not escaping the crisis. Its revenue as of the end of October 1991 was down 2 percent below that of the first 10 months of 1990.

An imperative, however: The group's financial report must be wrapped up very quickly. On 15 January, in Brussels, the Commission on Competition must decide on the subsidies the government proposes to grant this year. At stake are Fr2 billion covering a capital grant and research credits that Bull needs for its DCM [Distributed Computing Model] program.

Arianespace CEO Discusses Future Prospects

92WS0322B Paris AFP SCIENCES in French
16 Jan 92 pp 7, 8

[Article: "Arianespace: Outlook Good for 1992"]

[Text] Paris—1991 was a "very good vintage year," for Arianespace, and "prospects for 1992 should be good," if we maintain, "as we certainly shall, the reliability, operational quality, and credibility of the launch services furnished by the European Ariane rockets," versus the competition, said Arianespace's CEO, Mr. Charles Bigot, on 15 January.

Mr. Bigot disclosed that Arianespace's revenue was around 6 billion francs[Fr] in 1991 and that, despite the setting up of reserves totaling Fr1 billion, and the out-payment of dividends as in preceding years, its profit was slightly higher than that of the year before (Fr130 million).

During 1991, Arianespace orbited 11 satellites via eight launches. It signed contracts with two new clients—Mexico and Thailand—and fully expects to add Indonesia and other Southeast Asia clients to the list of 32 satellite-operating clients with which it now does business.

As of 17 December, the company had signed a total of 97 satellite launch contracts, 45 of which in Europe and 52 in the international market and large-scale exports, with 33 remaining to be put in orbit for a total of Fr14.1 billion (\$2.5 billion). In 48 launches since 24 December 1979, the European rocket has known only five failures, but has been able to preserve its share of the market, and has launched 80 percent of the world's telecommunications satellites.

"The different models of Ariane-4 have been launched 20 times in three years, posting a 100 percent rate of fulfillment and rewarding financial results. It is a considerable success, but Ariane-4 will become less competitive around 1993-1994. This is why I hope nothing intervenes to delay the development of Ariane-5, which is scheduled to effect its first lift-off in December 1995. I am sure that, from the technical standpoint, and despite the accidental polymerization of a batch of powder associated with one of the boosters, in December, which should have no effect on the timetable, all that is necessary will be done to meet this date. On the other hand, I would not want to see Ariane-5 brought into question again, for whatever reason, under an overall plan for the future of the European space effort. I say this as an operator."

In this regard, Mr. Bigot posited the need of a more powerful Ariane-5, a logical sequel to the design studies on the first model that are already under way at the CNES [National Center for Space Studies]. "With the Arianes, Europe had a stroke of genius and now operates the world's most proven space transport system. But this calls for continuity. As of the year 2000, we will need to present an Ariane-5-Mark-2," he added.

Arianespace's CEO stated that Ariane's 49th flight had been delayed 25 days, to around 25 February, to await one of the satellites that the rocket is to loft, the Japanese Superbird-B, together with the third Arabsat satellite. With the advent this year of a more powerful Ariane third stage, the H-10, burning 10 or 11 tons of liquid hydrogen and liquid oxygen in lieu of seven, the rocket will be able to launch up to 4.4 tons into geostationary orbit. One of Ariane-4's advantages over the competition will thus be its ability to launch two satellites at a time, hence reduce launch costs, "a commercial advantage in a tight and relatively stable market."

Mr. Bigot stressed the need for European governments to enforce the "Ariane preference clause" with respect to the launching of satellites built in Europe, that for the past 20 years has been implicit in the general rule of consistency in Europe's entry into space. Arianespace is a European firm, whose shareholders are European.

Rather than the instituting a "Buy European Act," Mr. Bigot prefers to see the formal enactment of the "Ariane preference clause." "I am not asking for exclusivity, or priority," he says, "but for just a little common sense."

Arianespace's CEO sees General Dynamics' Atlas-Centaur as Ariane's most formidable competitor, "even though it still has a long ways to go." He does not expect to see the Atlas-II-AS in operation by 1993. China, on the other hand, with its Long March line of rockets, "should not be underestimated. Over the long haul, it is credible and is very quietly and cautiously making its way." China "has not yet mastered all the necessary technologies, and finds itself at about what was our Ariane-1 level 10 or 12 years ago." As for the Japanese rockets, the engineers who are developing them "are very competent," but Mr. Bigot does not expect competition from them before the second half of the decade. "I would rather not comment on the Soviet rockets because of the vast uncertainty that reigns there," he concluded.

SEP CEO Discusses 1991 Financial Results

92WS0322C Paris AFP SCIENCES in French
16 Jan 92 pp 9, 10

[Article: "SEP: Consolidated Revenue of Fr4.65 Billion, 248 Jobs Eliminated in 1991"]

[Text] Paris—The European Propellant Company [SEP] last year posted a "slightly higher" revenue of 4.5 billion francs[Fr] (Fr4.47 billion in 1990) and a consolidated revenue of approximately Fr4.65 billion (versus Fr4.6 in 1990), said its CEO, Mr. Jean Sollier, in Paris on 14 January.

The company is one of the SNECMA [National Aircraft Engine Research and Manufacturing Company] group, and specializes in the development and production of Ariane-rocket, missile, and satellite propulsion systems. Preliminary figures indicate 1991 net earnings of Fr80-Fr90 million (versus Fr150 million in 1990).

The SEP's CEO pointed out that 1991 was marked by the layoff of 248 of its 4,000 employees, owing to the halting of the S-45 nuclear-tipped ballistic missile development program, decided by the government in July of last year. The reduction in staff will continue through 1992 and the first quarter of 1993 and will include, in particular, 140 "age-related measures," negotiated departures, and training leaves of absence, Mr. Sollier said.

"In 1992," he stressed, "our revenue is expected to be somewhat less than last year's, and we must continue our effort to adapt, to find new market outlets, even as we strive to hold on to those we now have. Insofar as concerns the future Ariane 5 rocket, we feel we can count on 1995 as the objective."

As regards the other space projects, Mr. Sollier was somewhat more reserved. Optimistic as well as pessimistic commentaries have followed the recent Munich conference, at which the large-scale European projects,

including the Ariane-5-Hermes complex, the Columbus module, and the DRS [Data Relay Satellite]—were examined, said the SEP's CEO. "As for myself," he said, "I am convinced that no definitive conclusion can be drawn from Munich alone. Not until 1993 will the real impact of the decisions made there be known. Until then, we will proceed as though..."

Referring to the PREPHA [research and technology program on advanced hypersonic propulsion] program, Mr. Sollier remarked that the "group of five"—ONERA [National Office for Aerospace Studies and Research], SNECMA, Aerospatiale, Dassault, and SEP—have now entered into the first year of this study, for which Fr100 million have been appropriated and the purpose of which is to design, within four years, a hypersonic engine to power the planes of the years 2020-2030.

EAST-WEST RELATIONS

German Universities Aid Bulgarian Technical University

92MI0229 Bonn WISSENSCHAFT WIRTSCHAFT POLITIK 8 Jan 92 p 6

[Text] The Faculty of German Engineering and Business Management Training has been in operation at Sofia Technical University since this winter semester. Bulgarian Prime Minister Popov and representatives of the German Academic Exchange Service attended its opening recently.

Thirty students will be able to enroll each year for a course in mechanical engineering with greater use of electronics and computer engineering, the curriculum for which is modeled on that of Karlsruhe University and which lasts four and a half years. Every year, 25 Bulgarian graduates will have the opportunity to complete a two-year post-graduate course in business management based on the Technical University of Braunschweig course. During their training, all students will have the opportunity to gain several weeks' practical experience in German firms.

Almost all the teaching will be done by Bulgarian lecturers who have spent several months studying and undertaking research in Karlsruhe (24 lecturers) or Braunschweig (15 lecturers) since October 1990. The Sofia Technical University has erected a new building to house the German faculty. The first-year business management course has been running since last autumn; a pre-university year in mechanical engineering has begun, in which the selected students will complete a course that will enable them to start their studies this year with a qualification equivalent to the German Abitur [high school certificate].

Mercedes-Benz in Joint Venture With Czech Firm

92WS0305C Paris L'USINE NOUVELLE in French 9 Jan 92 p 34

[Article: "Mercedes-Benz Wins Out Over RVI"]

[Text] After Volkswagen and Siemens, it is now Mercedes-Benz's turn to set up operations in Czechoslovakia, which it is doing by way of a joint venture with Avia, to the detriment of its French competitor, RVI [Renault Industrial Vehicles]. The German firm is expected to own a 31 percent stake in the capital stock of the new mixed [semi-publicly-traded, semi nationalized] company. The company will manufacture light utility vehicles and medium-sized trucks bearing the Mercedes trademark. By 1995, through massive investments, Mercedes-Benz expects to have acquired a majority stake in the company. This agreement is but an initial stage in Mercedes-Benz's strategy, which is aimed at eventually taking control of the entire Czech industrial vehicles industry. Negotiations are already under way with the manufacturer of Liaz heavy trucks.

Hungary: Government Encourages Western R&D Involvement

92WS0309A Budapest FIGYELO in Hungarian 12 Dec 91 p 4

[Article E. Zs.: "Expanding Research Cooperation"]

[Text] From the viewpoint of scientific research and technological development, Hungary continues to lag at the end of the line in Europe. Opening the Western gates only made our backwardness more obvious. Despite this, special institutes are being abolished, the number of researchers decreased drastically in recent years and the sum spent on R&D has dropped from 3.5 percent of the GDP to 1.65 percent.

It is vital for the economy that the country move from the periphery toward the center of international technical progress. The slogan sounds familiar; the official press was filled even two to three decades ago with the need to join in the scientific and technical revolution. Among other things it is thanks to this that there are more than 60 intergovernment agreements—signed with developing countries—within the framework of which virtually nothing has been done since. The National Technical Development Committee [OMFB]—as recently announced—is now working to support really worthwhile and profitable scientific cooperation, independent of political considerations and abandoning the two day representative conferences.

The orientation is unambiguously toward western Europe and overseas. A number of multilateral agreements have been born within a year in this relationship, thanks to active governmental work. Among the more important it is worth mentioning participation in the framework programs of the European Community, winning full membership in the Cooperation for Scientific and Technical Research (COST) and the cooperation agreement signed with the European Agency (ESA). Quantitative expansion is not so much characteristic of the bilateral intergovernment contacts—although such an agreement was signed just this year with Israel, for

example—but rather the existing contacts are being made more intensive and operational.

It is a new development that in general the OMFB does not organize concrete research cooperation, rather it only coordinates initiatives coming from below. At present about 180 projects are running within the framework of bilateral cooperation, including some which earlier figured on the prohibited list. An innovative law being prepared by the OMFB may give new impetus to both domestic research and international cooperation. It is hoped that this law will create a suitable framework for R&D activity.

Alcatel Austria, Hiradastechnika Digital Switchboard Plant Opens

*92WS0309B Budapest FIGYELO in Hungarian
12 Dec 91 p 5*

[Unattributed article: "Assembly of Digital Telephone Switchboards"]

[Text] AHT Hiradastechnikai Kft. [AHT Communications Engineering Ltd.] has begun assembly of the Alcatel digital telephone subexchanges. This joint venture of Alcatel Austria and the Hiradastechnika Joint Stock Company conducts manufacturing activity and commercial, technical, installation and maintenance activity, about half and half, at its site which is about 1,000 square meters in size. The owners have invested more than 30 million forints thus far in the tool inventory and in training the technical staff.

the Hungarian Hiradastechnika Joint Stock Company and one of the largest firms in the world manufacturing business communications systems created AHT Hiradastechnikai Kft. last year. They have already doubled the initial base capital, although the Hungarian partner did not take part in this. It does have an option to do so, however, up to March of next year. After that option runs out Alcatel Austria will continue to be the majority owner of the enterprise with 53 percent.

In 1991 AHT did more business than planned—300 million forints' worth. The orders received for 1992 promise further growth. This will make realistic the idea that AHT will have about a 25 percent share in the Hungarian market for business communications.

EUROPE-ASIA RELATIONS

EC Biotechnology Center Opened in Beijing

*92WS0352K Brussels EBIS—EUROPEAN BIOTECHNOLOGY INFORMATION SERVICE
in English Dec 91 pp 15-16*

[Text]

CEBC = China-EC Biotechnology Centre

On November 1, 1991, the China-EC Biotechnology Centre (CEBC) was officially inaugurated in Beijing by

Mrs. Zhu Lilan, Vice-President of the State Science and Technology Commission (SSTC) of China and Professor P. Fasella, Director-General for Science, Research and Development at the Commission of the European Communities (CEC).

The establishment of the CEBC was decided upon in July 1986 by both Mr. Song Jian, State Councillor and President of the SSTC and Mr. Jacques Delors, President of the CEC.

The main aim of the CEBC is to promote scientific and technological cooperation between research institutes of the People's Republic of China and research institutes of member states of the European Communities in the field of biotechnology applied to medicine and agriculture.

To Expand and Improve Cooperative Links With Europe

The CEBC will act as a communication/relay centre serving the scientific communities of both parties to establish, expand or improve cooperative links in these areas. European research centres, publications and other organisations active in biotechnology, and wishing to be made known, to Chinese scientific institutes, are invited to contact the Commission for this purpose (via CUBE—see back page).

The CEBC will also preselect, coordinate and manage all biotechnology-related joint China-EC research activities, i.e., joint scientific research projects, post-doctoral fellowships and workshops.

The CEBC is jointly financed and managed by the China National Centre for Biotechnology Development (CNCBD) of the SSTC and by the Directorate-General for Science, Research and Development of the CEC.

For more information on the CEBC and its activities, please contact either Dr. Yonghui Lui, Director of the CEBC and CNCBD, or, Mr. Luc Vandebon, Co-director of the CEBC and Counsellor for Science and Technology of the Delegation of the CEC in Beijing.

Toshiba To Market Dedicated Circuits via Siemens

*92AN0140 Paris ELECTRONIQUE INTERNATIONALE
HEBDO in French 5 Dec 91 p 9*

[Article by Françoise Grosvalet: "Toshiba No Longer Intends To Manufacture in Europe"]

[Text] After selecting Motorola for DRAM's [dynamic random access memories], Toshiba has chosen Siemens to market its application-specific circuits.

Listed by Dataquest as practically on an equal footing with NEC [Nippon Electronics Company] at the top of

the list of semiconductor manufacturers, with an annual sales figure of 700 billion Japanese yen (approximately 29.4 billion French francs) for the 1990 fiscal year (740-billion-yen forecast for the 1991 fiscal year), Toshiba, which remains the number one worldwide for DRAM's, must ultimately be one of the rare Japanese semiconductor manufacturers not engaged in direct marketing in Europe. Because of economies of scale and despite the European regulations requiring manufacturing in Europe in order to avoid being taxed, the Japanese company has in fact decided not to establish its own semiconductor wafer manufacturing unit here, at least for the time being. But even so, as the director of the French subsidiary, Bernard Grandval, explained, in order to have products "made in Europe," they have decided to sign partnership agreements with manufacturers already producing in Europe. Following the agreement with Motorola for DRAM's, the Japanese company has recently joined forces with Siemens for marketing its application-specific circuits. These circuits will be assembled, like the DRAM's, in the Brunswick plant. There is nothing astonishing in this; as with Motorola, Toshiba's association with Siemens did not begin yesterday. The two companies jointly developed a technology which enabled "Siemens to enter the DRAM market"; thus, the technologies manufactured by Siemens are compatible with those developed by the Japanese company. Furthermore, the two companies have recently signed a development and second-source agreement for RISC [reduced instruction set computer] microprocessors based on a MIPS [million instructions per second] architecture.

Objective: 5 Percent of the French Semiconductor Market

Application-specific circuits represent approximately 15 percent of Toshiba's annual sales figure in semiconductors; in France, they are in second place just behind memories. In France, according to Bernard Grandval, Toshiba is ranked by Dataquest as number six ahead of NEC, with a little less than 4 percent of the market (the goal is to reach 5 percent by 1995). In Europe, it is number seven, just behind NEC, with an annual sales figure of \$520 million.

According to Toshiba CEO Joichi Aoi, semiconductors are one of the three sectors considered strategic by the group. The other two sectors on which the group intends to expend a large portion of its efforts are portable computers and office systems and liquid crystal displays (LCD's). Toshiba's LCD sales represented 26 billion yen for the 1990 fiscal year; they are expected to exceed 30 billion yen by the end of March 1992. The new active-matrix displays with 5.9 inches and 10.4 inches in diameter (produced within the framework of the company jointly-owned with IBM) may well account for 40 percent of sales. The strategic importance of LCD's for Toshiba can be judged by the level of investment granted to this sector, i.e., more than 28 billion yen during the last three years (Toshiba invested 310 billion yen in semiconductors during this same period); 60 billion are

planned for 1991-1993 (100 billion for semiconductors in 1991, i.e., 25 percent less than in 1990).

Nissan Expands Auto Production Facilities in England

92WS0287A Duesseldorf HANDELSBLATT in German 20 Jan 92 p 15

[Text] HANDELSBLATT, Sa./So, 18/19 January 1992
yes LONDON—Commencing in 1993, Nissan of Japan wants to expand its automobile production capacity in Great Britain by more than one-third to 300,000 units. To this end, it has made new investments totaling 200 million British pounds (580 million DM). European suppliers will also benefit from this.

As a result of this expansion, which will create 600 additional jobs in the northeastern English town of Sunderland, Nissan's total investments in England now totals 900 million pounds—the greatest amount any Japanese company has ever invested in Europe. To this point, Toyota, with its 840 million-pound investment in its automobile and engine plants in Derby and Deeside, had occupied the top spot.

Following Ford and Rover, Nissan now moves up to the third largest automobile producer in the United Kingdom, where 4,600 workers are now employed in Nissan enterprises. The planned increase in Nissan automobile production now exceeds 200,000 units, which was the goal announced in the early 1980s, and can be certain to raise fears of Japanese "transplants" in many continental European auto producers. As a consequence of this expansion, the yearly production capacity of Japanese firms (Nissan, Toyota, and Honda) in Great Britain will increase to 700,000 units in the next five years. That figure already represents 6 percent of the entire European automobile market.

According to data released by SMMT, the automobile producers' association, British automobile production in 1991 dropped by 4.53 percent to just 1.24 million units, reaching the lowest production level since 1988. Of these, 124,000 units alone were produced by Nissan, which exports about 90 percent of the total. The British balance of trade has benefitted from these exports to the tune of 680 million pounds. In the opinion of industry observers, automobile production in Great Britain could reach 2 million units by the end of the decade, with the Japanese producers taking almost exclusive credit for the growth.

For 1993, Nissan points to an output of 270,000 vehicles—more than twice the number produced in 1991. Production plans call for 175,000 units in 1992, since Nissan wants to begin production of the "Micra" model to add to its "Primera" model. In 1991, 112,000 Primers were exported from Great Britain to continental Europe. Of these, 40,000 went to the German market alone.

Of the planned 200 million-pound investment, 150 million pounds are to be spent in expanding Nissan's own plants in Sunderland. The remaining 50 million pounds are earmarked for the expansion of press plant capacities for body parts in Nissan Yamato Engineering—a joint enterprise 80 percent of which belongs to

Nissan. Automobile supplier companies, like the Bosch plant in South Wales, will benefit from the expansion plans. In 1993, Nissan intends to invest 850 million pounds (or twice the amount so invested in 1991) in its 195 European supplier companies. The lion's share of this amount will benefit 122 British companies.