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10 September 1987
Vol. 2, No. 13

Science and Technology Perspectives

DEVELOPMENTS

Superconductivity

(USSR) Researchers led by I. Novikov of the USSR Academy of Sciences' A.A. Baykov Institute of Metallurgy claim to have transformed a brittle, high-temperature superconducting ceramic (not further identified) into a flexible, multistrand cable with a critical temperature of 103K. Reportedly the first Soviet high-temperature electrical superconductor ready for industrial application, the cable will be series produced by equipment being developed at a special design office at the Baykov Institute. (Moscow PRAVDA 24 Jun 87) John H. X2728

(Japan) NTT (Nippon Telephone & Telegraph) has developed a 0.7-micron superconducting thin film capable of carrying a current of 1.8 million amps per square centimeter at 77K. The yttrium-barium-copper oxide was formed by deposition on a strontium monocrystal substrate using high-frequency sputtering. NTT researchers expect to create a compound with a capacity of 10 million amps per square centimeter. (Tokyo NIKKAN KOGYO SHIMBUN 1 Jul 87) Junko A. X2726

(Cuba) The Institute of Materials and Reagents for Electronics (IMRE) of the University of Havana has produced its first ceramic superconductor. Cooled with liquid nitrogen, the yttrium-barium-copper oxide ceramic (not further identified) registered a critical temperature of 77K. (Havana GRANMA 18 Jun 87) Amy R. X2823/Arlene A. X2519

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PERSPECTIVES selections are based solely on foreign press, books and journals, or radio and television broadcasts. Some of the materials used in this publication will appear as abstracts or translations in FBIS serial reports. Comments and queries regarding this publication may be directed to the Managing Editor (Craig M [redacted] or to individuals at the numbers listed with items.

STAT

DEVELOPMENTS

DEVELOPMENTS highlights worldwide S&T events reported in the foreign media. Items followed by an asterisk will be published by FBIS. The contributor's name and telephone number are provided.

Aerospace

(Japan) The National Space Development Agency and the National Aerospace Lab have initiated a three-year program to develop lightweight materials for construction of the Hope spaceplane, scheduled for launch in 1996 or 1997. R&D will focus on carbon fiber reinforced aluminum-silicon carbide, carbon fiber in resins, and technology for stretching titanium alloy to a thinness of 20 to 30 microns. Several billion yen will be invested and R&D will be contracted out to Mitsubishi, Kawasaki, Ishikawajima Harima, Fuji, and Nissan Auto. (Tokyo NIKKEI SANGYO SHIMBUN 16 Jun 87) Junko A. X2726

Communications

(Hungary/Syria) Hungary's TKI (Telecommunications Research Institute) has installed multichannel transmitting equipment for INTERCSAT (International Communications Satellite) at the Sadnaya ground station in Syria. Part of the Soviet Intersputnik satellite network, INTERCSAT was developed by TKI at the direction of its Soviet counterpart, NIIR. Hungarian engineers at Sadnaya will use the equipment in establishing a Moscow-Damascus telephone link. (Budapest NEPSZAVA 25 Jul 87)* Sari P. X2907

Laser Gyroscopes

(France) SFENA (French Company for Air Navigation Equipment) is currently flight testing a laser gyroscope inertial guidance system that has an accuracy of .8 nm/hr. SFENA has already demonstrated the ruggedness of its laser gyro inertial guidance platforms in qualification tests of similar systems for the Ariane 4. These units are now in production. SAGEM (Company for General Applications of Electricity and Mechanics) announced that for the first time in Europe a laser gyroscope inertial guidance system on a combat aircraft achieved an accuracy of better than 1 nm/hr CEP (circle of equal probability) after a four-minute self-alignment. (Paris AIR & COSMOS 18 Jul 87) Sharon W. X2519

Laser Media

(USSR) A team led by K.V. Grigoryev is researching recombinational emission reactions in inert gases containing tritium (T_2) or mercury vapor to determine their effectiveness as atomic sources of optical photons for in lasers. The chemists found that a radioactive T_2/Xe medium serves as both the energy supplier and the luminophore. Their conclusions

about the influence of weak electric fields on radioluminescence stimulated by ^{238}Pu alpha-particles in Hg/Ar, Kr, or Xe media will enable them to develop frequency-amplitude modulated radioluminescent emitters. (Leningrad ZHURNAL PRIKLADNOY KHIMII Nov 86) Kris. P. X2898

Electronics

(Hungary/USSR) Hungary's Videoton Electronics Enterprise is manufacturing basic alphanumeric video terminals for customizing and marketing in London, Duesseldorf, and Helsinki where some 1,500 units were sold from 1985 through 1986. Sales to the USSR of terminals built to Soviet specifications amount to 4,000-5,000 units annually. Videoton, in cooperation with the Automation Institute of Kiev and the Soviet Yuzhmorgeologiya, is also developing components for a satellite navigation system for ships as well as an image processor and modular TV system that will be used to survey the ocean floor for iron and manganese deposits. (Budapest FIGYELO No. 27, 2 Jul 87; Budapest UJ IMPULZUS No. 13, 27 Jun 87) Sari P. X2907

Microelectronics

(Japan) MITI's Electrotechnical Lab (ETL) and Sumitomo will start construction of the Rainbow-2 synchrotron in January 1988. Employing ETL-developed electron ring and superconducting technology, Rainbow-2 will have a diameter of only four meters, significantly smaller than today's 10-meter synchrotrons. It will be used to fabricate next-generation VLSI circuits, including 16-megabit DRAMs. Construction completion is scheduled for October 1988. (Tokyo NIHON KEIZAI SHIMBUN 21 Jun 87) Andy R. X2726

(France) Soame, a small French electronics company, has patented a new procedure to attach surface-mounted components (SMC) by simple wave soldering. The new procedure consists of using capillary action to guide a liquid tin-lead mixture into holes drilled in the printed circuit board where contact is made with the SMC legs as the wave passes. This technique generates no loose solder and allows both sides of the printed circuit board to be used. An advantage of this double-sided technology is that more rugged components can be placed on the side over which the solder wave actually passes while the other side, where temperatures are lower, can accommodate the more heat-sensitive ICs. (Paris L'USINE NOUVELLE 2 Jul 87) Antwerp Unit/Sharon W. X2519

EAST EUROPE: EFFORTS TO CLOSE TECHNOLOGY GAP

Key Points: Through the Comprehensive Program for Scientific and Technical Progress up to the Year 2000 (S&T 2000), CEMA has mounted programmatic initiatives toward closing the technology gap with the West in several key technology fields. In addition to CEMA cooperative projects, individual East Bloc countries are engaged in national R&D programs, bilateral efforts with other CEMA partners, and international joint ventures, according to an official West German study.

S&T 2000

Adopted in December 1985, S&T 2000 is aimed at bolstering intra-CEMA and foreign ties through R&D contracts, product organization, and new forms of specialization and cooperation, according to a December 1986 study by Henrik Bischof of the Department of Foreign Affairs and GDR Research of the Friedrich Ebert Foundation in Bonn. CEMA officials, who regard S&T 2000 as a significant change in the forms and methods of East Bloc scientific cooperation, have directed the program's efforts at a coordinated "research-technology-production-sales" cycle in five key technology fields: electronics, automation, nuclear energy, new materials, and biotechnology. The objective of this and other East Bloc programs is to close the technological gap with the West, develop new industrial structures, and acquire shares in foreign markets.

Conducted under the auspices of the USSR (which chairs the five key-technology working groups and supervises, at the institute level, the program's 93 individual projects), S&T 2000 allows CEMA members to conclude development and manufacturing agreements with East Bloc companies and create international consortia for specific R&D tasks. According to the study, the five primary themes of this program reflect CEMA concern over accelerating technological development in the West and its recognition of the economic benefits to be derived from an increasingly sophisticated R&D capability. These factors figure prominently in the computer sector where the S&T 2000 program provides for expenditures of 115 billion rubles from 1986 to 1990 for mass production of 8- and 16-bit computers. In factory automation, CEMA officials claim that introduction of 200,000 industrial robots by 1990 could reduce the manual labor involved in existing manufacturing processes by three to five times and result in a one-third reduction in the required labor force.

A similar impetus has been given to biotechnology, particularly in the agriculture and foodstuffs industries. Savings in forage grain consumption and increases in meat production are expected as a result of the development and use of microbiological forage yeast and new prophylactic, diagnostic, and therapeutic methods in stock raising.

Bilateral/National Programs

Equally ambitious plans are reflected in the various bilateral and national R&D programs that have been adopted in recent years, particularly by the USSR, the GDR, and Hungary. The study notes that the Soviet-Hungarian scientific cooperation program is "especially advanced" and has among its principal objectives the development of 26 new technological processes for production of chemical reagents and fabrication of LSI chips and integrated circuits. Soviet and GDR researchers, working within the framework of a 1984 cooperative agreement, have designed digital imaging equipment and are continuing development of specialized manufacturing equipment for VLSI circuits, passive components, optical fibers, and optoelectronic devices.

The GDR has mounted an aggressive S&T campaign to introduce key technologies as rapidly as possible, particularly in the microelectronics sector. The GDR has made massive investments in this area in an effort to eliminate dependence on Western-manufactured computer components. The GDR

claims that the technical level of its microelectronics lags behind international standards by only 5 years. A principal GDR microelectronics effort during the 1986-90 Five-Year Plan will be the series production of a 1-megabit memory chip.

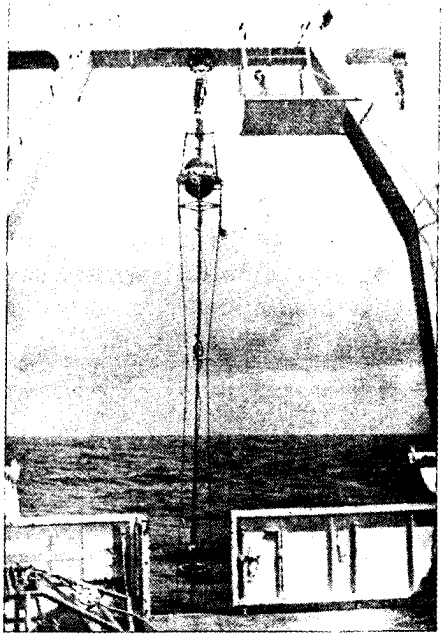
Hungarian S&T efforts have been slowed by bureaucratic resistance to technological change and by the failure of economic reforms to spark technological innovation in Hungarian companies, according to the study. As a result, funding levels for basic research continue to lag behind those of other East Bloc countries. Hungarian press reports reflect the government's inability to mobilize the country's high-tech industries. In the computer field, however, Hungary continues to maintain close cooperation with Western computer firms such as Siemens, Apricot, and IBM and produces nearly a full line of computer components (including software) through domestic programs or under foreign license. Since the early 1980s, large numbers of Western microcomputers have been introduced into the industrial and home markets. At present, more than 30,000 PCs and 200 mainframes are used by business and industry.

Milan Unit/Sharon W. X2519

USSR: OCEAN ACOUSTIC RESEARCH

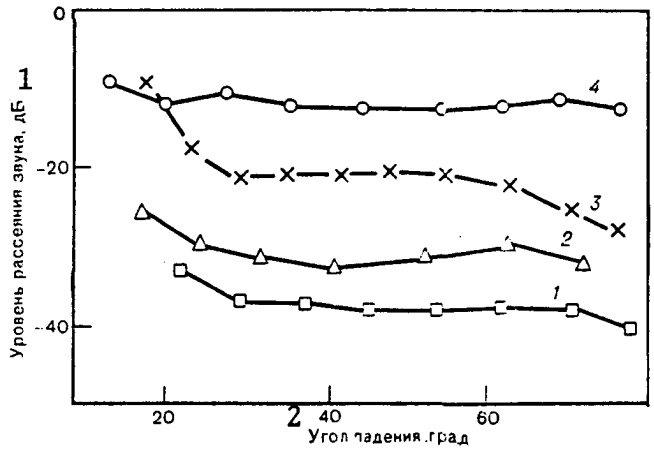
Key Points: From January to May 1986, Soviet scientists on the research vessel "Academician Mstislav Keldysh" employed hydroacoustic equipment to locate manganese nodules on the ocean floor, according to Yu. Yu. Zhitkovskiy in VESTNIK AKADEMII NAUK SSSR (May 87).

Aided by hydroacoustic units called "surveyors," Soviet scientists constructed maps of ferromanganese nodule concentrations in a relatively unstudied area of the Indian Ocean. The surveyor units consist of side-looking sonars (produced by the USSR Academy of Sciences' Oceanology Institute imeni P.P. Shirshov and the Academy's Institute of Radio Engineering and Electronics), devices to form linear-frequency modulated signals, and signal-processing units based on the Elektronika-60 microcomputer. The units are equipped with cameras (made by the Southern Marine Geology Scientific Production Association) that photograph the bottom before and after the acoustic measurements are made. A satellite navigation system and shipboard radar helped scientists to accurately map manganese nodules on the ocean bottom.



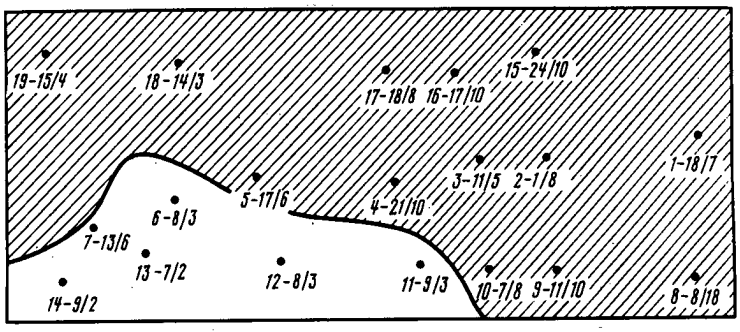
Deepwater "Surveyor" unit

The surveyor provided data on sound scattering in an area containing manganese nodules. These data were used to construct the following graph showing the angular relationships of sound scattering at 2 kHz (1), 4 kHz (2), 8 kHz (3), and 16 kHz (4).



Key: 1) Sound scattering in decibels
2) Angle of incidence in degrees

According to another Zhitovskiy report published in November 1986, Soviet scientists used sonar units and an Okean-0.25 dredge to obtain data on the percentage of the sea floor covered by manganese nodules, the distance between the nodules, and their density and size distribution. The graph below shows the comparison of data from the sonar and the Okean-0.25 dredge. Station numbers are to the left of the dots; density of the nodule deposit (kg/m2) and average nodule diameter (cm) are indicated by the number to the right of the dots. Strong acoustic scattering is represented by the lined area; moderate scattering is represented by the clear area.



Beverly C. X2723

USSR: LASER MATERIALS R&D—GAS LASER MEDIA

Key Points: Press reports indicate that intensive research efforts have resulted in improvement of Soviet solid state laser components. (For the first article in this series, see PERSPECTIVES Vol. 2, No. 12 pp 6-7.) Over the past 10 months, Soviet journals have described concerted research on gas media for gasdynamic, chemical, electric-discharge, and photodissociation lasers.

Soviet physical chemists are working to improve gas laser design by developing more effective supersonic nozzles for expanding media flow in gasdynamic lasers and by perfecting models of the hydrodynamic processes that occur in these lasers. Soviet research has also focused on improving the intensity coefficients and recombination reactions for chemical lasers, creating electric-discharge CO-CO_2 lasers which emit at several wavelengths simultaneously, and refining the measurement of dissociation and recombination reaction rates, which are key to photodissociation laser development.

Gasdynamic Lasers

A group of physical chemists led by I. P. Kirmusov at an unspecified institute is testing various supersonic nozzles to determine the optimum shape for expanding H_2 and HCl media flow in a gasdynamic laser. They found that the shape of the supersonic part of the nozzle has a significant influence on the inversion characteristics of the media. After testing tapered, "characteristic" (continuous flow nozzles of minimum length), "exponential" (continuously expanding nozzles with contours described by an exponential function), and "specially configured" (having a double expansion and containing an extended canal of fixed cross section) nozzles, the researchers concluded that the specially configured nozzle guarantees the best distribution of HCl molecules and predict that it would be best for distributing other diatomic molecules, according to KHIMICHESKAYA FIZIKA (Mar 87).

Other work on gasdynamic lasers is being conducted by A. I. Osipov and A. V. Uvarov at Moscow State University, according to KHIMICHESKAYA FIZIKA (Mar 87). They are attempting to characterize hydrodynamic processes in gas laser active media by studying the nonlinear propagation of sound waves in an oscillating nonequilibrium gas. Their research has demonstrated that such propagation can be accompanied by an intensification of sound and that over time, the amplitude of the waves achieves a finite value. The data allowed Osipov and Uvarov to derive a system of nonlinear equations which describes further evolution of the vibrations.

Chemical Lasers

Several articles on Soviet chemical laser research describe advances in increasing laser intensity coefficients and in characterizing molecule excited states. At the Institute of Chemical Physics (IKhF) in Moscow, a team led by A. P. Margolin has doubled and even quadrupled the intensity coefficient of an HF laser by using double (rather than single) quantum transitions of the molecule, thereby increasing the frequency of the output radiation 30 percent, according to KHIMICHESKAYA FIZIKA (Nov 86).

By observing stationary inversion in the transition of the minute structure of the Cl atom in ICl/Ar media during constant-flow and high-frequency discharge, A. I. Chichinin and L. N. Krasnoperov at the Institute of Chemical Kinetics and Combustion of the Siberian Branch of the USSR Academy of Sciences (Novosibirsk) hope to develop a laser which achieves population inversion at a low operating level, according to KHIMICHESKAYA FIZIKA (Mar 87). They measured an intensity coefficient of 0.1 percent for a 1-meter-long cuvette in both constant-flow and high-frequency discharge and assert that this coefficient can be more than doubled.

A team led by V. V. Datsyuk at Kiev State University and the Institute of Semiconductors (Kiev) is studying chemiluminescent recombination reactions as a means of developing powerful photochemical and chemical lasers in the visible spectrum. The team developed formulas to describe the quantum efficiency of spontaneous and stimulated emission and determined rate constants for recombination reactions, according to KHIMICHESKAYA FIZIKA (Mar 87)

Electric-Discharge Lasers

A team of physical chemists led by A. D. Belykh at an unspecified institute is developing an electric-discharge laser which emits at several wavelengths simultaneously. Specifically, they are studying simultaneous dependent discharge at wavelengths of 10.6 and 5.5 micrometers, based on vibrational-rotational transitions of CO and CO_2. The researchers varied concentrations of the molecules in $CO:N_2:He:CO_2$ media as well as the energy input and measured the resulting intensity coefficients. They found that by increasing the energy input, a maximum intensity coefficient was achieved at 0.65 J/cm^3, after which higher N_2 and CO energy levels were not repopulated. They also discovered that if they replaced part of the N concentration with CO in the media, the intensity of the CO_2 molecules doubled, and that if they increased the CO_2 concentration, the intensity dropped sharply, according to DOKLADY AKADEMII NAUK SSSR (Dec 86).

Photodissociation Lasers

Research is being conducted on photodissociation lasers at three Soviet chemical institutes. A group of chemists at IKhF led by I. S. Zaslonko has determined rate constants for the thermal dissociation of CF_3I and the recombination of $CF_3 + I$ in the presence of shock waves for potential use in powerful photodissociation lasers, according to KHIMICHESKAYA FIZIKA (Jan 87).

G. A. Skorobogatov and others at the NII of Chemistry at Leningrad State University have developed a method for measuring rate constants for the recombination of i-C_3F7 radicals with themselves and with excited I atoms. The method involves measuring the overlapping relaxations of the molecules after they have been irradiated by a powerful laser impulse, according to KINETIKA I KATALIZ (Sep-Oct 86).

At the Institute of the Chemistry of Silicates imeni I. V. Grebenshchikov, USSR Academy of Sciences (Leningrad), V. Yu. Zalesskiy is researching the slow recombination of I atoms in an argon medium. His modeled data are qualitative, and the rate constants he has developed can be used to approximate recombination rates, which are useful in developing photodissociation lasers, according to KHIMICHESKAYA FIZIKA (Mar 87).

Kris P. X2898

REPORTS

REPORTS surveys science and technology trends as detailed in articles, books, and journals. It also includes summaries and listings of articles and books which may serve as potential sources for future research. Conference proceedings will occasionally be presented in this section.

JAPAN: SIXTH-GENERATION COMPUTER PROTOTYPE

Takeshi Yamakawa of Kumamoto University, in cooperation with the Omron Tateishi Electronics Company, has developed the prototype of a sixth-generation computer, which differs from previous computer generations in its capacity to directly process imprecise linguistic input. The computer, which was demonstrated in late July at the Second International Congress of the International Fuzzy Systems Association (IFSA) held in Tokyo, is based on a new type of computer logic called "fuzzy logic." In contrast to conventional computer logic which represents data in a binary system, fuzzy logic presents data as "grades of membership" (fractional truth-values) ranging from 0.0 to 1.0.

Capable of 10 million fuzzy inferences per second, the new computer consists of a fuzzy memory program, a set of inference engines, a max-block, a defuzzifier (demodulator), and a control unit.

The central features of the prototype are emitter-coupled fuzzy logic (ECFL) gates, which have an operating speed of less than 10 billionths of a second, and truncation gates that truncate the membership function, allowing the inference engines to perform their min-max operations.

The new computer converts linguistic information into an analog voltage range between zero and five volts on the data bus. The storage of linguistic information, however, is done with binary code using a binary random access memory (RAM) to limit external electrical interference.

Don P. X2726

USSR: FIRST REPORTS NOTED OF AIDS-RELATED COMPLEX

Four cases of AIDS-related complex (ARC) are described in the Soviet scientific journal IMMUNOLOGIYA (May-Jun 87). Until recently, Soviet journals have published a number of review articles on AIDS (acquired immunodeficiency syndrome) based on Western data, but this represents the first detailed description of ARC cases in the Soviet Union.

ARC is a disease caused by the human immunodeficiency virus (HIV) but which is not full-blown AIDS. It is frequently a precursor to AIDS. The authors define ARC as a condition in which at least two clinical symptoms and two laboratory indicators of AIDS (for example, decreased T-helper cell count) are present. The patient may have moderate opportunistic infection but Kaposi's sarcoma is absent.

The descriptions of the four ARC cases include the patient's age, symptoms, and immunological parameters. All patients are hospitalized at the clinic of the USSR Ministry of Health's Institute of Immunology and are undergoing regular medical check-ups. Four different enzyme immunoassay diagnostic tests (Organon, Abbott, Pasteur Diagnostica, and "Peptoscreen", which is a Soviet test system developed at the USSR Ministry of Health's Institute of Immunology) were used to detect antibodies to HIV. All results were confirmed using the Western blot method.

The patients' symptoms include generalized weakness, weight loss of up to 10 kilograms (22 lbs), night sweats, and fever. All patients showed a decreased number of T-helper cells and were HIV antibody-positive. Three patients showed a decreased T-helper/T-suppressor cell ratio. One patient showed antibodies to cytomegalovirus, hepatitis B virus, and Epstein-Barr virus and two patients showed antibodies only to Epstein-Barr virus. One patient was diagnosed as having Kaposi's sarcoma. This patient was diagnosed as having ARC, despite the original definition of ARC excluding Kaposi's sarcoma. An anomalous pH-labile alpha-interferon was detected in this patient's blood.

Marilyn B. X2723

PREVIEWS

PREVIEWS is an annotated list of selected science and technology items being translated by FBIS. The list may also contain previously published items of wide consumer interest.

SCIENCE & TECHNOLOGY/EUROPE & LATIN AMERICA

IAE CONFIRMS 1988 CERTIFICATION DATE FOR V2500 ENGINE

Article describes the bench-testing program for International Aero Engines' V2500, the design changes made to solve problems in the high-pressure compressor, and expected certification, delivery, and service dates. (Paris AIR & COSMOS 27 Jun 87)

BRAZIL PLANS PROGRAM OF SATELLITES, LAUNCHERS

The article gives an overview of the satellites, launchers, and launch site to be built in cooperation with the European Space Agency, the French CNES, and the FRG's DFVLR. Illustrations included. (Paris AIR & COSMOS 13 Jun 87)

BELGIUM'S IMEC MICROELECTRONICS RESEARCH LABORATORY

The article reviews the joint venture's manufacturing facility and activities, the methods, materials, and equipment used. (Brussels DE STANDAARD 8 May 87)

FRG: SUPRENUM MASSIVELY PARALLEL SUPERCOMPUTER PROGRAM

The article reviews the design decisions made and performance results obtained in the SUPRENUM as well as its planned uses and total cost for hardware and software. A fully functional model will be delivered next spring and follow-ons are planned. (Bonn RHEINISCHE MERKUR 3 Jul 87)

EC 5-YEAR RESEARCH FUNDING MUCH LOWER THAN HOPED

Article reports that EC ministers have confirmed funding for the community's five-year research program and the individual R&D projects it incorporates. The funding granted is far less than the amount originally requested. (Milan IL SOLE 24 ORE 16 Jul 87)

EUROPEAN PLANS FOR TRANSONIC WIND TUNNEL DESCRIBED

The article describes the DM500 million European project to develop a transonic wind tunnel as a means of meeting and surpassing US competition in this sector. The FRG, France, Britain, and the Netherlands are participants, with primary roles being played by FRG companies Dornier and Interatom. (Wuerzburg HIGHTECH No. 3, Jul-Aug 87)

FRG FIRM DEVELOPMENT OF CAD, CIM TECHNOLOGY PROFILED

Article profiles the CAD/CAM and CIM applications and research of the FRG machine tool company, MAHO AG, which has extensive worldwide operations (West Europe, CEMA, and the Far East). MAHO's joint development of CIM software with the Prime company and its CAD/CAM research with other international factory automation firms are outlined. (Wuerzburg HIGHTECH No. 3, Jul-Aug 87)

RIESENHUBER COMMENTS ON FRG AEROSPACE REORGANIZATION

Article presents interview with FRG research minister Heinz Riesenhuber as well as general discussion of the structural problems facing the FRG aerospace industry. (Wuerzburg HIGHTECH No. 3 Jul-Aug 87)

DORNIER PRESENTS 'NEW FUSELAGE TECHNOLOGY' PROGRAM

Article presents the latest developments in Dornier's "New Fuselage Technology" program for commercial aircraft, which began in 1985 with subsidies from the BMFT. Article focuses on the use of fiber composites for primary fuselage structures. (Friedrichshafen DORNIER POST No. 2, 87)

EC ESPRIT II INITIATIVE TO PROMOTE BASIC RESEARCH

The article describes the second phase of ESPRIT, which is scheduled to include ECU50 million funding to promote European basic research to be conducted using US and Japanese methodology. Technologies of strategic interest are opto- and low-temperature electronics, AI, machine vision, robotics, and man/machine interaction. (Brussels EEC PRESS RELEASE 23 Jun 87)

EUROPEAN X-RAY MICROLITHOGRAPHY RESEARCH ADVANCING

The article describes the achievements and difficulties of microlithography research in Europe using the BESSY-COSY synchrotron. (Paris LA RECHERCHE Jul-Aug 87)

BULL'S FULLY AUTOMATED PRODUCTION FACILITY DESCRIBED

The article describes Bull-Transac's Villeneuve-d'Ascq automated ASIC (Application-Specific Integrated Circuit) production line as a model flexible CIM plant. (Paris ZERO UN INFORMATIQUE 29 Jun 87)

NEW FRG SUPERCONDUCTIVITY RECORD ANNOUNCED

The article describes the latest achievements of FRG R&D in the area of superconductivity. A new record was established at -148°C, according to an official announcement on 12 March. Research is currently being conducted to improve this record to -40°C. Research subsidies have been increased to DM6.5 million in 1987. (Bonn TECHNOLOGIE NACHRICHTEN-MANAGEMENT INFORMATIONEN 20 Jul 87)

GMD RESEARCH ACTIVITIES DESCRIBED

The article summarizes the 1986 research activities of the GMD (Society for Mathematics and Data Processing) and describes current concerns, among which is a joint project with the Nuclear Research Center in Juelich and the German Electron Synchrotron (DESY) in Hamburg to develop parallel supercomputers and establish a prototype laboratory. (Bonn TECHNOLOGIE NACHRICHTEN-MANAGEMENT INFORMATIONEN 20 Jul 87)

WEST EUROPE

DORNIER DEVELOPS BATTLEFIELD RECONNAISSANCE SYSTEM

Article describes development of PRIAMOS, a mobile reconnaissance and detection system for target location and identification. The PRIAMOS system comprises a Remotely Piloted Vehicle (RPV) with MTI (Moving Target Indicator) radar, and ground-based position measuring radar, pilot control station, and telemetry/telecommand station. (Friedrichshafen DORNIER POST No. 2, 87)