Foreign Broadcast Information Service

S&T CENTER

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Science and Technology Perspectives

DEVELOPMENTS

Superconductivity

(Hungary) The Ministry of Industry has concluded a 13-million-forint R&D contract with Lorand Eotvos University for the development of commercially applicable superconductivity technologies (not further identified). (For previous reporting on this university's superconductivity R&D, see PERSPECTIVES Vol. 2, No. 9 p 7.) The Department of Natural Sciences at Lajos Kossuth University in Debrecen also will participate in the contract. In a related development, Hungary's National Technical Development Committee has allocated 6 million forints in "emergency funding" for superconductivity R&D, with 4 million going to the Central Physics Research Institute and 2 million going to Lorand Eotvos University. (Budapest COMPUTERWORLD/SZAMITASTECHNIKA No. 17, 26 Aug 87) Sari P. X6342

(France) The National Telecommunications Research Center (CNET) has manufactured a ceramic material with zero resistance below 73K and a sudden fall in resistance at 95K. The chemical composition of the substance is YBa2CuO9. CNET has also synthesized a dense, X-ray-pure ceramic having beginning and end transition temperatures of 93K and 88K and exhibiting the Meissner effect. (Paris FTS—FRENCH TECHNOLOGY SURVEY Sep 87) Antwerp Unit/Sharon W. X6340

..... *Continued on Page 1*

FEATURED IN THIS ISSUE:

Military Technology

The Madrid Eureka Conference

Announcement

JPRS will soon present a new S&T report, entitled SCIENCE & TECHNOLOGY/FOREIGN DATA BASES, devoted exclusively to information compiled by FBIS Antwerp and Milan Units from foreign commercial data bases. The initial report will be a follow-on to the **Eureka** *coverage in this issue of PERSPECTIVES. Future issues of this report will address not only single topics but a broad range of S&T concerns.*

REPORTS

New Publications

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

(France) As an inducement to lower Ariane production costs, Arianespace President Charles Bigot has offered French contractors a greater management role in the Arianespace organization and has ordered fifty Ariane 4 launchers. Bigot argues that cost reductions will increase Ariane's competitiveness in the international launch market. Fifty satellite launches are booked "over the next several years," with a total value of $2.5 billion. Bigot also announced that the payloads for the two remaining 1987 Ariane 3 launches will be the FRG's direct broadcast satellite, France's Telecom 1c, and the US GTE Spacenet/Geostar telecommunications satellite. The first launch of the Ariane 4 is projected for February 1988, with the heavy-lift Ariane 5 slated for launch in 1995. (Paris LE MONDE 17 Sep/9 Oct 87; Duesseldorf HANDELSBLATT 23 Sep 87) Arlene A. X6344

(Hungary) The Hungarian Academy of Sciences and the National Technical Development Committee (OMFB) have initiated a space technology program and have assisted the Central Physics Research Institute (KFKI) in establishing a space technology laboratory. Other program participants include the Budapest Technical University, which is developing satellite equipment for determining wave particle interactions and electron density in the ionosphere and magnetosphere, and the Heavy Industry Technical University (in Miskolc), which is conducting research on materials processing in space, including new methods of casting. The five-year program has a budget of 140 million forints (105 million forints having been allocated by the Academy of Sciences and the KFKI, with the remainder coming from the OMFB). (Budapest UJ IMPULZUS No. 18, 5 Sep 87) Sari P. X6342

Artificial Intelligence

(Japan) In order to promote the widespread use of ESP, a Prolog-based language developed by ICOT (the Institute for Next Generation Computer Technology), the Ministry of International Trade and Industry, in cooperation with eleven private firms, will establish the CESP Open Systems Research Institute by year's end. With a five-year budget of five billion yen (70 percent from the Key Technology Center, 30 percent from industry), the Institute will improve ESP and create software to enable ESP programs to run on UNIX workstations. (Currently, ESP programs run only on the MELCOM PSI/II.) (Tokyo NIHON KOGYO SHIMBUN 18 Sep 87) Andy R. X6341

Microelectronics

(Hungary) The Microelectronics Enterprise (MEV), whose chip manufacturing plant was destroyed by fire last year, has set up a new production line that will double the enterprise's previous capacity to fabricate diodes and other types of transistors, according to MEV director Bela Balogh. MEV will also give priority to the establishment of chip mounting and test

facilities. In addition, Balogh announced the establishment of the joint Hungarian-Soviet Intermos Microelectronics Limited Liability Company, which will fabricate integrated circuits. To be built in Budapest, the production facility will be a 50-50 financial collaboration, with the Soviets receiving half the plant's output. (Budapest NEPSZAVA 10 Sep 87) Sari P. X6342

(Netherlands) R&D in submicron CMOS technology for the Philips-Siemens Megaproject has led Philips to design its own optical wafer stepper. A license to market the device, which is the key element in an IC production line, has been granted to a German joint venture firm, the ASM Lithography Company. (Paris L'USINE NOUVELLE 17 Sep 87) Antwerp Unit/Sharon W. X6340

(France) The National Telecommunications Research Center (CNET) has produced an organometallic vapor-phase epitaxy reactor capable of producing epitaxial layers with highly uniform composition. The intended application for this reactor is growth of binary, tertiary, and quaternary III/V semiconductors on two-inch-diameter substrates. The new reactor features easy loading and unloading suitable for industrial-scale production. Studies are under way to adapt the reactor for three-inch-diameter substrates and to grow epitaxial layers on several different substrates simultaneously. (Paris FTS—FRENCH TECHNOLOGY SURVEY Sep 87) Antwerp Unit/Sharon W. X6340

(Japan) Matsushita's Semiconductor Research Center and a group under Professor Tatsuo Higuchi at Tohoku University have produced a highly parallel, signed, base four, 32X32 multiplier which physically represents a number's magnitude as a multiple of a 30-microamp-unit current and its sign as the current's direction. Using 0.5 watts of power, the 30.2 mm^2, PMOS/CMOS circuit has an execution time of 59 nanoseconds (including conversion back to base two). (Tokyo TRIGGER Sep 87) Andy R. X6341

(GDR) The Zeiss Combine and the East Berlin "Elektro-Apparate-Werke (EAW) recently announced advances in integrated circuit design and production. A new production line at Zeiss will manufacture 256 Kbit memory circuits combining 600,000 transistor functions per chip and intended for 16- and 32-bit computers. EAW has begun manufacturing automated equipment for the design of microcomputer controls and associated software. The GDR microelectronics sector reportedly has 120,000 employees. (Duesseldorf HANDELSBLATT 7 Oct 87) Eva L. X6339

Supercomputers

(France) Access to the Cray-2 supercomputer recently installed in the Center for Vector Calculus for Research (C2vR) at the Ecole Polytechnique in Palaiseau, near Paris, will be divided among the Ecole Polytechnique, the CNRS (French National Scientific Research Center), the Ministry of National Education, the national weather service, and six other unnamed institutes. In addition, 12 other facilities (not identified) are linked to the Cray 2 through dedicated lines that transmit several million bits of data per second. Satellite links are also being tested. (Leinfelden-Echterdingen DIE COMPUTER ZEITUNG 16 Sep 87) Eva L. X6339

(Spain) The Spanish aircraft manufacturer CASA has installed a Cray supercomputer at its Division of Projects and Systems in Madrid. Slated to go into service early next year, the computer will be used primarily for flight simulation and airframe studies in support of CASA's contract work on Airbus and the Eurofighter. (Madrid EL PAIS 19 Sep 87)* Rosa M. X6287

USSR: CHEMICAL WEAPON DISPOSAL

Key Points: In August, the Soviets announced that they are constructing a plant at Chapayevsk for the destruction of chemical weapons. Shortly afterward, they invited an international delegation from the Geneva Disarmament Conference to the Chemical Warfare Facility in Shikhany. The Soviets are using these facilities as showpieces to improve their bargaining position at the Geneva negotiations. In the process, however, a number of details about their CW technology never before seen in the open press have surfaced in recent issues of PRAVDA, IZVESTIYA, KOMSOMOLSKAYA PRAVDA, and SOTSIALISTICHESKAYA INDUSTRIYA.

Chemical Weapons Destruction Facility at Chapayevsk

General Secretary Mikhail Gorbachev announced in April 1987 that the USSR has begun constructing a plant for destroying chemical weapons just outside Chapayevsk in a small village called Zavolzhye in the Kuybyshevskaya Oblast. Minister of Foreign Affairs Eduard Shevardnadze reiterated that announcement on 6 August at the Geneva Disarmament Conference, and descriptions of the plant followed in articles in PRAVDA and IZVESTIYA on 18 September. Construction began in August 1986, according to PRAVDA, or in January 1987, according to IZVESTIYA, but both state that work is now fully under way, and highly specialized processing equipment is already arriving. Colonel Vyacheslav Konstantinovich Solovyev, head of the enterprise, and General-Colonel Vladimir Karpovich Pikalov, Commander of the Chemical Troops of the USSR Ministry of Defense, have emphasized the high priority of the project in terms of time and quality.

The enterprise was developed by planning-and-design organizations of the Ministries of Defense and the Chemical Industry and will comprise several buildings. Metal structures of the plant's main shop have already been built. Next to it will be a warehouse and storage facility for receiving weapons to be destroyed, a unit for combusting solid and liquid wastes, a power plant with compressor and pump stations, and a firefighting station. An engineering building which will house the entire electronic system for controlling the technological process will be built farther away, according to Solovyev.

Soviet scientists and specialists in the fields of organic, inorganic, analytical, and other areas of chemistry have developed a unique technology for destroying the weapons, based on physical and chemical processes. Toxic agents will be transformed into common acids and salts. The transformation will be irreversible, and it will be impossible to use the products to produce new CW agents, according to Pikalov. Domestically produced automation and robotics will be used in the industrial process. The Soviets claim that a built-in double back-up system and a triple direct-monitoring system will provide a high level of plant safety, supported by the latest instrumentation and computer technology. The system will control everything happening to a weapon from its arrival at the warehouse to the time it is destroyed. Sensitive instruments will monitor the weapon through the destruction process, detect any deviation in the process, and warn of toxic leaks.

The Chemical Troops of the Ministry of Defense will carry out weapons destruction under the supervision of Col. Solovyev. Solovyev mentioned three lieutenants working under him: Andrey Dosuzhkov, Aleksey Vikulin, and Vyacheslav Smirnov, who are 1987 graduates of the Tambovskoye and Kostromskoye Higher Military Command Schools for Chemical Defense. They each studied decontamination techniques at Block 4 of the Chernobyl Nuclear Power Plant for a month as part of their field training, according to both PRAVDA and IZVESTIYA. The Soviets believe that their experience with the Chernobyl accident makes them the most qualified to prevent or deal with any future nuclear or chemical disaster. Only a few highly qualified engineers and technicians will work in the actual plant since most of the operation will be automated.

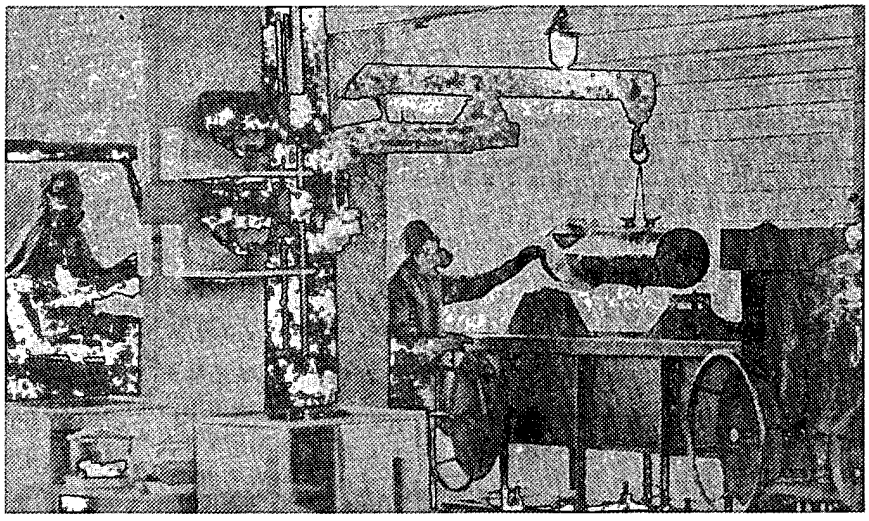
The Chapayevsk Plant is being built as part of a Soviet effort to showcase their resource and technology investment in the destruction of chemical weapons. IZVESTIYA also expressed the hope that by building and publicizing this facility and by allowing visitors to tour the USSR Chemical Warfare Facility in Shikhany, the USSR would improve the outlook for negotiations at the Geneva Disarmament Conference. According to IZVESTIYA, after all chemical weapons are destroyed, the facility will be converted to the production of chemicals for civilian use.

Chemical Warfare Facility at Shikhany

On 3 October an international delegation of more than 100 representatives of 45 countries participating in the Geneva Conference for Banning Chemical Weapons plus a number of observers arrived at the Shikhany Chemical Warfare Facility on the Volga River to view chemical weapons used by the USSR Armed Forces and Soviet technology for destroying them, according to PRAVDA, KOMSOMOLSKAYA PRAVDA, AND SOTSIALISTICHESKAYA INDUSTRIYA. General-Major Robert Fedorovich Razuvanov, formerly with the Chemical Service of the Pacific Fleet, directs the Shikhany facility.

Subordinate to the Chemical Troops Administration of the USSR Ministry of Defense, Shikhany was created to solve large-scale problems of equipping CW forces. The facility is divided into laboratory and technical, administrative, industrial, storage, and residential zones. It has its own test area, where the chemical weapons were displayed. "Every type of Soviet equipment for delivering chemical ammunition was shown," including primary components of tactical missiles, aerial bombs, tube and rocket artillery, hand grenades, and aircraft, according to PRAVDA. Nineteen standard models were represented. Figures and formulas, weapon specifications, and characteristics of toxic agents were displayed on stands. According to Pikalov in PRAVDA, however, "certain modifications which are essentially similar from the standpoint of design and contents" were not shown. Pikalov, who addressed the delegation, reminded them that Gorbachev announced in April 1987 that the USSR has ceased chemical weapons production, that production of mustard gas, Lewisite, phosgene, and cyanogen chloride ammunition was halted much earlier than in the US, that Warsaw Pact countries have not conducted "exercises on working out the problems of using chemical weapons" in recent years, and that the USSR has supplied no chemical weapons to other countries.

A 5 October article in PRAVDA highlighted a demonstration at Shikhany of the Soviets' new "mobile chemical weapons destruction complex" in which a USSR 250 kg aerial bomb containing the highly toxic nerve gas sarin was destroyed. The complex consists of an automated chemical laboratory, a disarming chamber, a neutralization reactor, an automatic feed apparatus for supplying degassed



Specialists preparing a chemical weapon for destruction at the Shikhany mobile destruction complex.

Ministry of Defense expert General-Lieutenant Anatoliy Demyanovich Kuntsevich, who briefed the delegation, stated that this was the first time a multinational viewing of chemical weapons had been conducted, according to PRAVDA, KOMSOMOLSKAYA PRAVDA, and SOTSIALISTICHESKAYA INDUSTRIYA. He attacked the US Senate for rescinding an amendment which would have banned the production of binary chemical weapons, claiming that the creation of such weapons would open the way for new types of CW agents to be produced in the chemical, herbicide, and pharmaceutical industries.

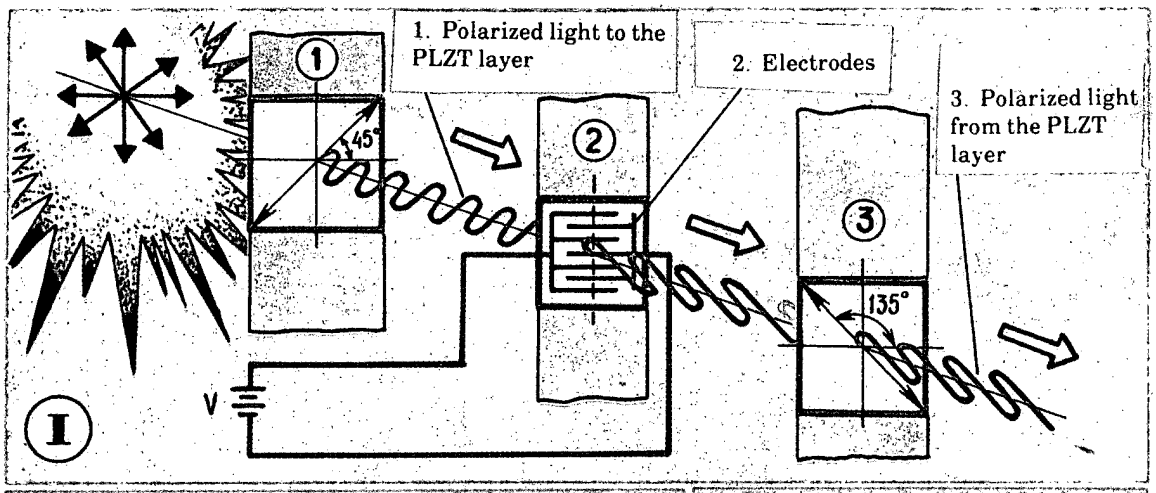
V. Karpov, Chief of the Arms Control and Disarmament Problems Department of the USSR Ministry of Foreign Affairs, said that the gesture of opening Shikhany to foreign visitors may lead to "eventual trips by Soviet experts to the US and countries possessing such weapons," according to PRAVDA.

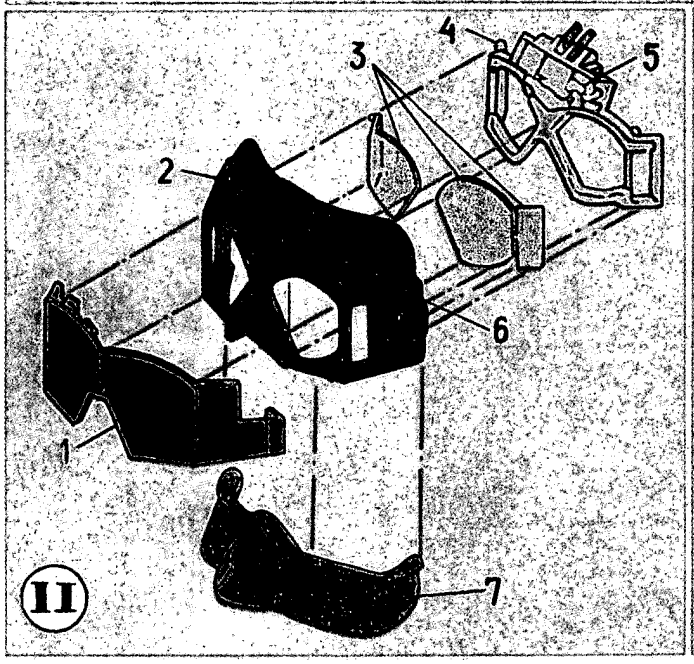
Kris P. X6322

USSR: CERAMIC FILTER AGAINST BLINDING LIGHT

Key Points: The Soviets have expressed interest in US development of filters designed to protect combat flight crews from the effects of blinding light. Particular attention has been focused on the potential of indirect protective systems based on optically transparent ferroelectric PLZT (lead, lanthanum, zirconium, titanium) ceramics, according to an article by A. Pavlov in TEKHNIKA I VOORUZHENIYA (No. 8, 87).

Soviet experts believe that present filters intended to protect flight crews from blinding light are ineffective because of the slow response time. Quoting a US Air Force statement to the effect that "the limit of time permissible for short-term blindness of a pilot making a banked turn must not exceed five seconds," the Soviets note that these filters inhibit the pilot's ability to visually control the aircraft because they fail to return to transparency quickly enough.





I. Basic schematic of the operation of a PLZT-ceramic electro-optical damper. Light radiation passes through the two crossed polarizers (1, 3), the planes of the polarization of which are located at right angles relative to each other. The working element (a layer) of PLZT-ceramic (2) is placed between the polarizers. An electric current is fed to this.
The light radiation of a nuclear explosion causes the activation of the system's electronic control circuit. As a result the current is interrupted and the plane of the PLZT layer's polarization is reversed. This causes the light emitted from the ceramic layer to be impeded by the polarizer (3).

II. Variant of a protective system based on PLZT-ceramics: 1--protective covering (used for transport); 2--plastic case; 3--ceramic optical elements; 4--frame; 5--electronic control circuit; 6--test button; 7--shield for protecting the lower part of the face.

According to Pavlov, there are two systems that will provide greater protection: direct and indirect dynamic filtering. Response time (the time required for a system to react to a light flash) in direct dynamic systems ranges from 50 to 150 microseconds. Opacity ranges from 0.4 to 0.1 in the open or undamped state (in which 40 to 80 percent of the light penetrates) to 4.0 (in which 0.01 percent of the light penetrates). Transition time to the original level of transparency ranges from one to five seconds.

Indirect dynamic systems transform incoming light into an electronic signal that can be impeded by a pulse filter. There are three types of indirect dynamic systems: injector, photochromic, and electro-optical. The injector may use a diluted graphite suspension or oleic acid nitrate as the damper. Photochromic systems require some 150 microseconds for activation and two to three seconds to return to transparency. Pavlov concludes that an electro-optical system using a transparent layer of PLZT ceramic provides the most effective protection against blinding light. This system has the potential to reduce the intensity of a light flash by a factor of 3,000 within 150 microseconds. The degree to which the light is filtered is automatically regulated by photodiodes. The diagram above presents a Soviet description of a PLZT-ceramic protective system.

Pavlov, however, observes that none of these systems is completely adequate and recommends that they be used in combination to enable a pilot to see both the outside environment and his control panel.

Greg L. X6363

FRANCE: VHSIC PRODUCTION, APPLICATIONS

Key Points: Intended to parallel the US VHSIC (very high-speed integrated circuits) program, the French CITGV project, launched in 1983, has started production of signal-processing circuits for next-generation guided missiles, radars, and jamming-resistant battlefield radio sets. By the end of this year, the French plan to reduce circuit feature size from 2 microns to 1.25 microns in order to increase circuit speed and facilitate integration, according to ELECTRONIQUE INDUSTRIELLE (Sep 87). (For previous reporting on CITGV, see PERSPECTIVES Vol. 2, No. 1 p 10)

Having set a goal of developing digital signal-processing VHSICs for specific military systems, France's CITGV (the French acronym for VHSIC) program approached the task of circuit design by first discussing signal processing requirements with military equipment manufacturers. This has resulted in the creation of memory cells (circuits) adaptable to any manufacturer requirement.

At present, CITGV consists of three industrial subprograms: GETS (Signal Processing Study Group); CCRC (CMOS Components for Radio Communications); and GTTS (Signal Processing Working Group).

The main objective of GETS, initiated in early 1985, is to produce signal processing circuits for the French MICA (Intercept and Air Combat Missile), scheduled to go into service in 1993. Other applications include proximity fuses, small radars, and jamming equipment. While GETS cells are currently being produced in 2-micron technology (referring to chip feature width) using techniques developed by the Thomson subsidiary Mostek, 1.25-micron technology will be commercially available in 1989. (See table below for circuit specifications.) The prime contractors for the project are ESD (Electronique Serge Dassault) and its partners CSEE (Signals and Electrical Enterprises Company), CETIA (Center for the Study of Technologies for the Ventilation Industries), and TRT (Radio and Telephonic Communications).

A joint project of Thomson's Telecommunications division and TRT, CCRC is geared to the production of circuits for fourth-generation, jamming-resistant battlefield radio sets. Other applications in avionics and battlefield IFF (identification friend or foe) are also in the research stage at Thomson's subsidiaries Cimsa-Sintra and LMT (Telephone Equipment). Using computer-aided design, CCRC has developed a library of 30 cells in 2-micron technology, 20 of which are now operational. These cells will be converted to 1.25-micron technology by the end of 1987 while sets of 10 and 15 cells, designed directly in 1.25-micron technology, will go into production in late 1987 and early 1988 respectively.

Comparison of GETS and CCRC circuits in 1.25-micron technology

	GETS	CCRC
Operating frequency	*20-50 MHz*	*25-30 MHz*
Number of gates	*20,000-60,000*	*20,000-50,000*
Surface area of circuit	*less than 80mm²*	*less than 100mm²*
Circuit power consumption	*1-3 W*	*less than 500 mW*
Propagation time per gate (time required for point-to-point transmission of binary information within a system)	*1-2 nanoseconds (ns)*	*several ns*

Started in early 1982, the GTTS subprogram has focused on bipolar technology to produce two families of Schottky Transistor Logic circuits in 2-micron technology. Intended for radar applications, one family named "Moustic" integrates four different circuits in SIMD (single instruction, multiple data) architecture and has a processing power of 320 MFlops (million floating point operations per second). No specific applications were indicated for the second family (unnamed), which combines seven different circuits to perform Fast Fourier Transform (FFT) calculations in 5.12 milliseconds (FFT calculations can be used in spectral analysis). Although no time frame was indicated, GTTS circuits are also scheduled for production in 1.25-micron technology.

The high-yield production of 20,000-gate circuits with no defects has been a highlight of the CITGV program, according to GTTS chief Claude Legendre, who estimates the French now lag behind the US program by only two to three years.

Eva L. X6339

WEST EUROPE: RESULTS OF EUREKA CONFERENCE

Key Points: Two decisions made at the Eureka ministerial conference held in Madrid on 14 and 15 September will open Eureka to participation by East Bloc countries and admit 58 new projects totalling ECU709 million into the Eureka program. The issue of attracting bank and venture capital funding also dominated the conference, according to September reporting in HANDELSBLATT, LE MONDE, and NRC HANDELSBLAD.

Previously limited to participation by its 19 West European member countries, Eureka now has "guidelines" (not further detailed) that were ratified in Madrid to allow involvement by the East Bloc and other non-member countries, including the US. Notably, Yugoslavia and Hungary will be admitted to the Eurotrac (environmental technology) and Cosine (computer communications) projects started in 1985. However, export controls reportedly will be placed on sensitive technology.

Another highlight of the Madrid conference was the approval of 58 new projects, bringing the total number of Eureka projects to 165 and the budget to ECU4 billion. Reflecting a shift in funding priorities from information technology to factory automation and lasers, the new R&D efforts include:

Computer integrated manufacturing and robotics: ECU242 million, 21 projects

Laser technology: ECU128 million, 6 projects

Information technology: ECU62 million, 9 projects

Telecommunications technology: ECU55 million, 2 projects

Biotechnology: ECU27 million, 11 projects

New materials: ECU10 million, 2 projects.

France is participating in 23 of the new projects, the FRG and Italy each in 17, and the Netherlands in 13. (For details on specific programs, see the EUREKA PROJECT SURVEY on the next page.)

Faced with increased funding requirements needed to convert about 90% of Eureka's projects from the precompetitive stage to the commercial stage, Eureka ministers also debated methods of attracting private funding from banks and venture capital firms. Two proposals, slated for discussion at a special June 1988 meeting in Copenhagen, include the formation of an insurance fund to cover the financial risks engendered by highly advanced, novel R&D and the creation of special tax breaks for private financial institutions that support Eureka projects. Member governments are seeking to reduce their funding levels, which now account for approximately 40 percent of each individual project.

Eva L. X6339

EC REPORT: EUREKA PROJECT SURVEY

Based on a European Community press release of 17 September 1987, the following survey presents a description of Eureka projects given the highest priority at the Madrid conference. Eureka projects are initiated by private industry and submitted to the Eureka Council of Ministers for funding approval.

TECHNOLOGY AND PROJECT TITLE	DESCRIPTIVE
FACTORY AUTOMATION	
FAMOS	Comprising six subprograms totalling ECU96.80 million, FAMOS aims to develop flexible workshops and computer-integrated manufacturing systems for the production of engine parts, electronic components, and telecommunications equipment. Countries involved: UK, FRG, France, Italy, Spain, Belgium, Sweden.
Intelligent Automated Inspection and Analysis of Integrated Circuits	Switzerland and France are involved in this ECU14.90 million project to develop an expert system for automated inspection and testing of customized ICs.
LASERS	
Eurolaser	The industrial application of high power lasers and the design of multikilowatt excimer and solid state lasers are the goals of this ECU81.70 million project. Countries involved: Austria, Denmark, France, FRG, Italy, Spain, UK, Greece, Netherlands, Sweden.
10 kW CO2 Laser Modules and Related Systems	This ECU28 million project seeks to boost the efficiency of manufacturing systems that use high power lasers. Countries involved: Belgium, Austria, Italy, Spain.
Laser Work Station for Surface Treatment	Italy and the FRG will conduct research in this ECU18 million project to study new optical systems for laser beams.
UNDERWATER ROBOTS	
Advanced Underwater Robots for Underwater Working/Inspection and Long Range Autonomous Missions	The design and production of a tethered, semi-autonomous working and inspection robot and an autonomous surveying robot are the goals of this ECU50 million project. Countries involved: UK, Italy, Denmark.
AVIATION	
Eurofar (European Future Advanced Rotorcraft)	ECU46 million has been allocated for the development of an aircraft featuring tilting rotors mounted at the wing tips to provide a vertical takeoff and landing capability and high cruising speeds. Countries involved: FRG, Italy, France, UK.

Antwerp Unit/Eva L. X6339

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.

NEW PUBLICATIONS

PRC: THE CHINESE NUCLEAR INDUSTRY

The recently published 3-volume book entitled CHINA'S NUCLEAR INDUSTRY is the first comprehensive PRC study of that country's independent R&D in such fields as atomic- and hydrogen-bomb technology and nuclear-powered submarine development. The work also details the organization of the nuclear power industry. It relies heavily on previously unpublished archival records and transcript material dating from the inception of the PRC nuclear industry and continuing to the present.

The book is organized as follows:

Volume 1: The establishment and development of the PRC's nuclear industry.

Volumes 2/3: The organizational makeup of the nuclear industry presented by department and areas of technical expertise.

Translated excerpts on topics such as atomic bomb technology, nuclear submarine development, isotope separation, and reactor construction will appear in a special issue of the JPRS REPORT: SCIENCE & TECHNOLOGY/CHINA.

For advance copies, contact Parker H. X6336.

USSR: BIOELECTRONICS RESEARCH

The July-August issue of BIOTEKHNOLOGIYA contains the review article "Biotechnology and New Materials for Electronics" by R. I. Gilmanshin and P. I. Lazarev from the Scientific Research Computation Center of the USSR Academy of Sciences in Pushchino. The article covers various topics in molecular electronics research, including Langmuir-Blodgett film applications, biosensors employing enzymes, antibodies, or ion-selective electrodes, applications of photosensitive bioorganic materials such as bacteriorhodopsin, and use of organic materials with electronic properties. The authors discuss some advantages of organic molecules compared to traditional semiconductor materials and the problems in developing molecular electronic systems. They stress that biotechnology can serve as a source of new materials for molecular electronics by creating molecules with the necessary architecture to be used in such systems.

A translation of the review will appear in SCIENCE & TECHNOLOGY/USSR: LIFE SCIENCES.

Marilyn B. X6330

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

MAX PLANCK INSTITUTE ENGAGED IN NEURAL COMPUTER R&D

Article describes the efforts of a Max Planck research team in Garching, funded by a BMFT grant, to develop neural computers. (Munich HIGHTECH Sep-Oct 87)

FUNDING, OBJECTIVES OF EUROLASER PROJECT DETAILED

Article gives the definition-phase cost estimate for this project, begun in 1985 under the leadership of FIAR, for development of industrial lasers. (Turin MEDIA DUEMILA Sep 87)

FIAT-POLAND FINAL AGREEMENT ON JOINT AUTO PRODUCTION

Article describes the funding, timeframe, and other contractual terms connected with FIAT's possible production of a medium-sized automobile in Poland. (Milan ITALIA OGGI 10 Sep 87)

FRG INTENSIFIES GaAs R&D FOR MICROELECTRONICS

Article reports on the increased BMFT support for GaAs research to Fraunhofer and Max Planck Associations, Siemens, Wacker Chemitronic, and Telefunken. (Munich HIGHTECH Sep-Oct 87)

TECHNICAL SPECIFICATIONS OF ARIANE V HM 60 VULCAIN ENGINE

Using detailed schematic diagrams, SEP (European Propulsion Company) scientists outline the operation of the Vulcain engine (designed for the Ariane V), including its hydraulic, thrust chamber, turbopump, and gas generator subsystems. (Paris L'AERONAUTIQUE ET L'ASTRONAUTIQUE No. 2-3, 87) (Published in JPRS-ELS-87-050, 16 Oct 87, pp 10-26)

DISCUSSION OF FRANCE'S SCIENCE-MILITARY CONNECTION

Interview with Paul-Ivan de Saint Germain, director of the Center for Advanced Studies at the Ministry of Defense, on the DRET (Directorate of Research Studies and Techniques) and the relation between the scientific community and military weapons development programs. (Paris LA RECHERCHE Oct 87)

FRANCE'S RESEARCH MINISTER ON R&D FUNDING

Interview with Research Minister Jacques Valade concerning the new 1988 R&D budget. (Paris L'USINE NOUVELLE 1 Oct 87)

FRENCH SUPERCOMPUTER PROJECTS OVERVIEWED

Evaluation of France's current supercomputer projects: ISIS (Bull), MARIE (CIMSA-SINTRA), and Marianne (parallel architecture using 16 MARIE machines). (Paris LE MONDE INFORMATIQUE 7 Sep 87)

WEST EUROPE REPORT

ITALY, FRANCE SIGN AGREEMENT ON HELIOS PARTICIPATION

Article discusses the recently signed memorandum of understanding concerning Italy's 14 percent participation in the development of the French Helios military satellite. (Milan IL SOLE 24 ORE 24 Sep 87)