JPRS-ESA-85-021

21 June 1985

East Europe Report

SCIENCE AND TECHNOLOGY

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CZECHOSLOVAKIA

TREATMENT OF RADIOACTIVE WASTE DISCUSSED

Prague RUDE PRAVO in Czech 23 Apr 85 p 3

[Text] Thirty years ago the Nuclear Research Institute in Rez near Prague was assigned the task to oversee the peaceful use of atomic energy. It has brought together experts who are trying to find ways and means to dispose of radioactive waste.

If you mention the name of Jiri Napravnik, everybody here knows whom you mean. As a chemist-technologist he left the Spolana in Neratovice to tackle the mystery of a new field; as a matter of fact, he became one of its co-founders in our country. However, the department which now bears the name of Research of Technology for Neutralization of Radioactive Waste and whose head at this time is university lecturer Lee Nauman was composed at its inception of three dedicated souls. Naturally, that cannot be compared with its present conditions -- now it employs 24 experts, not to mention additional specialists from other fields in this institute who are dealing with the same problem.

The department's beginnings seem to be wrapped in romance and etched in memory. Jiri Napravnik goes back to its history: "I have no doubts about our efforts which at that time involved careful assessment of extensive new data, yet I have to chuckle when I recall, for example, how our first Czechoslovak standard for disposal of such waste was set ..."

It distresses him so much more that some enterprises and institutes are unwilling to meet research halfway. They have their own plans; they can neither see nor hear that even [the institute] in Rez cannot succeed without their help. Jiri Napravnik is sent to meet precisely such partners. His very surname [Napravnik = one who repairs] may have predestined him for that. When paperwork, seals and signatures are ineffective and when orders and agitation are futile, he goes out to negotiate. He has a rare gift of winning others over for a good cause. He thoughtfully explains, offers proof and convinces. The other, "defeated" party concludes the discussion: "Well, we understand -- we shall see what can be done." However, in his enthusiasm Comrade Napravnik finds some excuses for such unpleasantness or rather, obstacles to more flexible practical implementation of research. After all, the effort is well worth the trouble. His lively attitude is trying to find the truth about atoms; it has won him and his team the Antonin Zapotocky Award this year, because in a short time they improved the case-hardening method designated for processing and storing waste of low

radioactivity, produced in nuclear power plants operating with light-water reactors.

Radioactive waste in the form of highly saturated solutions used to be encased in stainless steel containers of great dimensions. Apart from the fact that they occupied far too much space in storage areas around nuclear plants, the risk of environmental pollution could not be completely eliminated.

Well, how about converting the liquid into a solid phase? [Napravnik's team] devised a technological method called calcination whereby the toxic waste is converted into granules and then mixed with water and concrete; thus solidified in concrete, it is deposited in storage areas. At the same time, the volume of the stored mass is reduced to one-half its size; the costs of the construction and maintenance of such "dumps" were cut down. By the same token, calcination is suitable for other methods of waste disposal as well.

Wishing to see as soon as possible better technology operating in the power plant, the institute, with the assistance of the chair of chemical and food-industry engineering at the Czech Institute of Technology in Prague and the Kralovo Pole Machine Works in Brno, expanded their capacities and produced for that purpose an electronically controlled line at the same time. The equipment has recently undergone a trial run in the nuclear power plant in Jaslovske Bohunice.

How simple is the sound of words written in orderly lines! The drama taking place in the hearts of those who dedicated part of their inquisitive nature to the study of new phenomena is not ended. And precisely that quality gives many experts the appearance of uncertain age. Like Jiri Napravnik, they look youthful forever.

9004
CSO: 2400/383

CZECHOSLOVAKIA

INFORMATION ON INVENTIONS

Bratislava PRAVDA in Slovak 11 Apr 85 p 4

[Text] Invention means an original solution of a technical problem which the inventor seizes, as the saying does, with both hands. However, now and then it happens that we may regard a solution as original; the certificate of authorship is issued for it, but in fact it is a solution the world has known for years. The problem here is a sluggish flow of information. The Bureau for Inventions and Discoveries in Prague is receiving only basic bibliographic data from its automated system of bibliographic annotations (ASBA) which is designated as the first generation of computer services. The sorted-out list of inventions includes their titles, the names of their authors and the state [of origin] which are recorded either on magnetic tape, microfiche or paper printout. None of those methods is perfect because important graphic representations of the new solution are not included. They may be projected on the screen of terminals which are characteristic for the second generation of computer services. In our country their use is more an exception than a rule. R&D in the world is advancing rapidly. Experts in the field of computer services have already introduced inventions of the third generation. Data on inventions are transferred on the computer. Complete texts are entered in the memory of the computer by the electronic writing technique. The user can project any of its parts on the terminal screen. Thus far it is the only known method for obtaining accurate and complete data on inventions which can stop in advance solutions of a problem that has already been resolved in the world.

9004
CSO: 2400/383

GERMAN DEMOCRATIC REPUBLIC

INSTITUTE DIRECTOR CALLS FOR CLOSER COOPERATION WITH INDUSTRY

East Berlin SPECTRUM in German Vol 16, No 3, 1985 p 10

[Article by Prof Dr Johannes Barthel, director, GDR Academy of Sciences Central Institute for Solid-State Physics and Materials Research: "On Technology: Research and Application"]

> [Text] The contemporary relevance of technological research is undisputed. It penetrates into scientific areas, promotes them and is in turn equally enriched by them. Our two authors from the Central Institute for Nutrition and the Central Institute for Solid-State Physics and Materials Research take up the "spectrum" discussion of our January issue.

Proud of Being Out in Front, and Then What?

Materials science rests on the three pillars: the description of texture and structure, its characterization and its properties. The penetration of these foundations in terms of the natural sciences, discipline and methodology supplies the theoretical and experimental apparatus of materials research and is its indispensable basic prerequisite. The exploration of the relations existing between description, structure and properties yields the natural scientific basic knowledge which permits the creation of new and improved technologies and approaches to materials engineering problems. By this means there is created a basis for identifying new problems and development tendencies and also for recognizing limitations scientifically. If these investigations, whose principal goals relate to national economic needs, fail nevertheless to occupy this foreground of research into the fundamental questions of technology in the sense of this discussion (in other words with regard to actualities of materials science and process technology) there exists the danger that patentable new engineering solutions may not arise as promptly as they should. During a "review" one must often discover that others were quicker to recognize technological importance and that others have secured results through fundamental patents and in consequence that one's own working field has been restricted. Then pride in having obtained front-line results gives way to bitter disappointment in the exploitation of these results. Also, one obtains a clearer appreciation of pioneering results when one recognizes the possibilities for practical realization. Therefore, from our point of view there can

be for an academic institute in the area of materials research no "either this or that choice" but rather there must be an attitude of "both this and that." At the same time one must not overlook the limitations of the academic institute. Despite growing understanding on the part of colleagues in the academic sphere there is still not sufficient appreciation of the technical and economic conditions of industrial production and of the market. The primary concern of industry's research and development is and remains technological exploitation and practical conversion on an industrial scale. Cooperation between the academy and industry already at an early stage in the exploitation of fundamental results and at an early stage in the derivation of new technological approaches essentially determines total effectiveness. Stable partnerships are a prerequisite for this efficient division of labor resting as it does upon mutual confidence in one's partner's competence. The optimal proportion of the size of the working collective in the academy of science's institute to that in industry depends upon the particular task and in a given case it may be that at a specific phase of development the center of gravity lies in the academy of sciences. One must resolutely oppose tendencies to attempt a complete shifting of the task toward the academy of sciences.

Now a closing word on the subject of the relationship between research and the solution of problems in materials engineering and process engineering. In general one should seek a balanced relationship so that innovations arising from fundamental research have an opportunity to adapt themselves to all engineering and economic requirements. New technologies, such as, for example, fast freezing, laser technology, thin-film processes, require that the possibilities which they open up in terms of fundamental and new complex materials should be fully utilized and converted into practical applications. The simple application of these new processes to newly created approaches in materials engineering can have and in many cases will have national economic effects. Nevertheless, such simple applications will not fully plumb these new processes in their full potentialities and can result in erroneous decisions. Naturally, it must always be borne in mind that new procedures are realizable only by means of investments. It is wise for each one of us at as early a stage as possible to estimate the possibilities existing for investments and to involve ourselves in reaching decisions. The size of the required investment determines the urgency of the question. In extreme cases, such as, for example, that of metallurgy, the investment issue is the fundamental question.

8008
CSO: 2302/73

NEW METAL COATING METHOD DEVELOPED

Halle FREIHEIT in German 29 Mar 85 p 8

[Article by Tilo Scholze: "Hard Coatings Look Like Gold and Are Worth Gold--Researchers of the Pumps and Compressors Combine Investigate New Processes of Coating Deposition"]

[Text] As is well known in addition to the effects of corrosion the national economy annually suffers high losses from wear. The consequence is a reduction in working life and reduced reliability of structural parts and tools. In the most recent past therefore great efforts have been initiated through suitable measures to improve the wear behavior of services exposed to wear stresses.

An especially promising approach which has been developed in the leading industrial countries of the world has been the technology of so-called thin-film coating. Especially important has been the deposition of hard materials in a vacuum in accordance with the CVD process--chemical vapor deposition, and in further developments according to the PVD process--physical vapor deposition.

A Thin Layer Is Produced in a Vacuum

While the former process takes place at temperatures around 1,000° C (up to now) in the more recent process the temperatures range between 300° and 500° C. This is a circumstance which makes the process particularly interesting in machine construction. For this opens up the opportunity to also apply coatings to structural components or to tools which are incapable of tolerating a temperature stress around 1,000° C because of their previous heat treatment but which can tolerate a temperature of 500° C.

In the PVD process one is dealing with an ion-supported vapor deposition in vacuum in which the substrate (the structural component to be coated) is exposed during the entire coating process to a flow of highly energetic ions. In the course of this operation the substrate holds a negative charge as opposed to a plasma which has been generated in an inert gaseous atmosphere or reaction-gas atmosphere. The gas argon is employed for ionization of the plasma.

Titanium (Ti) is employed as a coating material. It is vaporized and through the introduction of nitrogen N_2 it reacts into titanium nitride (TiN) which is deposited by condensation on the substrate. The layers have a gold appearance and the layer thicknesses, depending upon the application, lie between 2 and 5 µm and obtain high levels of hardness (about twice as high as nitrited layers).

With a view toward making use of this process in the construction of pumps and compressors its utility is being investigated in the Scientific-Technical Center of the Pumps and Compressors VEB Combine. For this purpose there is available a TiN coating facility--the TINA 900--of the VEB High-Vacuum Company, Dresden. The focal point of the investigations in this instance is the application of surfaces to pumps and compressor components in order to improve wear behavior. In addition, tools are surfaced to improve their useful life and thereby increasing utility and/or reducing manufacturing times.

Collective of Researchers Enters Unexplored Territory

The task which has been assigned to the collective to this end provides that these investigations shall be carried out not only for the Pumps and Compressors Combine but also at the behest of the minister concerned with the entire industrial branch within the purview of the Ministry for Heavy Machinery and Construction.

This is an ambitious goal because internationally there exist no known instances of the application of film deposition techniques to functioning structural components.

Service Lives Become Substantially Longer

Because of the good wear behavior of the gold-colored titanium nitride films, for example, twist drills and tap drills attain substantially longer service lives.

Depending upon the mode of use these increases range between 200 and 400 percent. In addition, there is the advantage that the lesser tendency of these layers to adhere to the conventional ferrous material to be machined and the associated frictional values have positive effects on the machine tools themselves and upon the tool itself. Also, improvements in service life are introduced by supplementary coating of turnover tables. First in-house investigations, conducted in factories, confirm this trend. Thus, for example, the service life of cutting tables has been increased to 400 percent. Numerous investigations with other tools support this result.

It is already apparent that this technology continues to offer further possibilities. Thus new ideas are already emerging for the continued investigation of this process, with a real possibility being the introduction of different gases to obtain new and different properties.

8008
CSO: 2302/73

HUNGARY

WORK IN IMMUNOLOGY DESCRIBED

Budapest MAGYAR HIRLAP in Hungarian 25 Apr 85 p 8

[Interview with Dr Gyozo Petranyi, doctor of medical science and first secretary of the Immunological Society, by Istvan Palugyai: "The Battle of Cancer Cells and Biomolecules"]

> [Excerpts] The most significant domestic scientific event of the week was the international immunological congress which was attended by at least 300 participants from about 25 countries from four continents to confer about natural materials influencing the functioning of the defensive system of the human organism and about their use in medicine. On this occasion I looked up Dr Gyozo Petranyi, doctor of medical science and first secretary of the Immunological Society, which organized the congress.

[Question] How do we stand with this work here at home?

[Answer] Maximum praise should go to the EGIS pharmaceutical factory which, with the aid of the National Hematology and Blood Transfusion Institute and the microbiological faculty of the Szeged Medical Science University, was the first to establish in our country a biotechnology pharmaceutical industry plant in which they are experimenting with interferon and interleukin-2, among other things. At the God research station of the ELTE [Lorand Eotvos Science University], under the leadership of Academician Janos Gergely, president of the present congress, they are doing research on monoclonal antibodies and the Gedeon Richter Pharmaceutical Factory is dealing with synthetic material of the thymus. It was a warning, however, that the large pharmaceutical factories have "taken over" a number of the world-famous researchers present at the congress so that they can do targeted basic research for them. Insofar as domestic industry does not make closer contact with theoretical experts it may fall behind in the strengthening competition. But if it aims at developing of materials for which clinical testing can be organized as quickly as possible and which bring profit most quickly, it may remain economical. For this reason great interest accompanied one of the sessions of the congress, titled "From Research Laboratory to Marketing", at which theoretical and factory experts exchanged experiences.

8984
CSO: 2502/45

NATIONAL EXHIBITS AT MIPEL '85

Budapest MAGYAR HIRLAP in Hungarian 19 Apr 85 p 8

[Unsigned article: "MIPEL '85 Closes Its Gates; A Robot for the Nuclear Power Plant"]

[Excerpts] MIPEL '85, the International Industrial Electronics Exhibit, held for the seventh time, closes its gates today.

Domestic enterprises displayed a few of their significant achievements for the visitors. We looked up three stands very worthy of attention. The Mechanical Works exhibited electrolytic and phase-shifting capacitors--in addition to their already well known nice line telephones. The firm's manufacture of electrolytic capacitors goes back a quarter century. Each year 25 million units leave their manufacturing lines and this activity accounts for 200-240 million forints of their production value of 2 billion forints.

They manufacture 100-120 million forints' worth of phase-shifting capacitors each year, on the basis of a General Elektrolic license. As representatives of the factory said, in Hungary today about 400 megawatts of electric energy is lost each year due to the bad "phase factor" which could be saved by broad use of the phase-shifting capacitors. This value is just about equal to the output of a complete nuclear power plant block.

And since we are talking about the nuclear power plant, the star of the United Electric Machine Factory is the fuel cassette reloading equipment which they created together with the Computer Technology and Automation Research Institute of the Hungarian Academy of Sciences and Ganz-Mavag. It is worth noting that within the framework of CEMA nuclear power plant integration, Hungary has specialized in delivering automated machines. As part of this they developed a modern, microprocessor controlled version of the automatic remote controlled equipment which is indispensable when loading or exchanging nuclear power plant fuel elements. The first will start at Paks in September, but there will be a shipment to the GDR this year also. According to the plans of those at the factory they will ship three complete machines to the CEMA market each year from 1986 to 1990, but there is also a need for four or five of the control systems in the Soviet Union. Since the system is essentially a very intelligent robot--operating along seven axes--the experience acquired with the development of it will pay off later in the manufacture of simpler

industrial robots which can be manufactured in larger series and thus will be cheaper (the Paks control system costs 42 million forints).

The Electronic Measurement Devices Factory is preparing for a profile change within the framework of the electronics program, we were told at the stand of the firm. At present, out of receipts of more than one billion forints, only 20 percent is represented by technological measurement equipment for the microelectronics industry--IC testing, semiconductor characteristics depicting, logic or signal analyzing equipment and so forth. They want to increase this ratio to 60 percent by 1990. Among the devices exhibited in a modest base area the one worthy of mention first is a semiconductor characteristics depicting device. Depending on complexity these sell for 300,000-600,000 forints and embody about ten patents. They have been sold already on the Finnish and Italian markets. All this serves as a basis for the hopes of people at the factory that in the future they will be able to sell greater numbers than at present of electronic measurement devices on the capitalist market also.

8984
CSO: 2502/45

NEUMANN SOCIETY MEETING, AWARDS PRESENTATION

Budapest SZAMITASTECHNIKA in Hungarian Feb 85 p 1

[Article : "1984 General Meeting of the Neumann Society"]

[Text] In accordance with tradition the NJSZT [Janos Neumann Computer Science Society] held its general meeting on 21 November in the congress hall of the MTA [Hungarian Academy of Sciences]. Tibor Vamos, president, Lenard Pal, chairman of the OMFB [National Technical Development Committee], Lajos Henczi, deputy first secretary of the MTESZ [Federation of Technical and Scientific Associations], Stefan Neuschi, president of the Slovak Cybernetics Society, Gyozo Kovacs, first secretary, and Janos Szelezsan and Gyorgy Vasvari, deputy first secretaries, took part in the presidium.

Tibor Vamos--in his opening words--emphasized the significance of the General Meeting and praised the role of Lenard Pal, giving the central lecture, in the development of domestic computer technology: "He has been the nurse and caretaker of Hungarian computer technology since its birth, whether as leader of the KFKI [Central Physics Research Institute] which started the creation of Hungarian computer technology equipment or in the OMFB or as director of this program in the Academy."

Tibor Vamos talked about the approaching re-election of officers and about those tasks which would fall on the leadership of the Society after the general meeting next year.

In his talk titled "Science, Technology and Us" Lenard Pal spoke about technical development and our science policy in a realistic, analytical way free of empty phrases. His lecture will be a useful guide in our economic and social work.

Stefan Neuschl praised with warm words the cooperation developing between the Neumann Society and the Slovak Cybernetics Society and the educational work our Society is doing among the youth in the name of socializing computer technology.

A detailed written report, handed to the participants, was prepared about the work of the period since the last general meeting. In addition, every participant in the General Meeting received a Society Yearbook reporting on the years 1982-1983.

First Secretary's Report

In his first secretary's report Gyozo Kovacs said that what the Society is doing and intends to do next year to spread computer technology will be useful in social public life as well. The Society is working on the implementation of a constantly developing program which speaks to a respectable portion of the inhabitants of the country. Thus far the NJSZT has undertaken the organization of further training and exchange of experiences in the área of Hungarian computer technology, the propagation of certain products, acquainting Hungarian experts with modern foreign achievements and popularizing domestic achievements abroad. In general these activities take place within special department or regional organizational frameworks. By conducting and strengthening this activity and specializing it to a certain degree, every special department has taken a part in that process which is trying to bring computer technology to people who are not computer technology experts.

Comments

In the course of contributing comments Janos Kiefer summarized the recommendations presented at the TAF [remote data processing] conference in Salgotarjan in November, recommendations prepared in the form of a submission by the Computer Center Leadership Special Department for a session of the Managing Presidium. The latter will submit this to the leadership of the MTESZ for the purpose of indicating to the appropriate government organs the problems with remote data processing in Hungary.

Ervin Szucs asked the General Meeting to support the cause of school robots.

Karoly Almas reported on the active, substantive work of the Systems Organization and Special Data Processing Department, emphasizing the role of the Society in giving its opinion even in the preparatory phase on essential professional proposals and decrees.

Gyorgy Appel recommended formation of a student special department.

Karoly Snekszer spoke of the legal member organization of county organizations and the problems of arranging study courses. In addition, he asked the presidium to deal with the question of better material and moral recognition of the work of secondary school teachers leading the computer technology clubs.

Dittrich Diebel and Rezso Barabasi described the problems and achievements of the HCC [Home Computer Club]. The amateur movement within the Society now counts about 1,000 members and is divided into sections according to the most widespread computer types.

Antal Munnich proposed that at least two candidates be put up for the responsible NJSZT leadership posts at the time of the elections next year.

In their response the president and first secretary agreed with the comments and stated that the proposals made would be discussed at a meeting of the presidium. The membership will be informed about the decisions.

Decorations

The Neumann and Kalmar prizes for this year were then distributed. In awarding the prizes this year the Prize Committee making the recommendation and the National Presidium making the decision paid special attention to activity carried out and results achieved in the area of computer technology education.

The Neumann medal was received by: Sandor Farago, deputy director general of the SZAMALK [Computer Technology Applications Enterprise], for his work in the area of organizing domestic computer technology education; Dr Zoltan Marton, economic director of the Videoton Electronics Enterprise, on the basis of his work in domestic computer technology development and manufacture and in the NJSZT; Dr Gyorgy Paris, director of the Science Organization and Data Processing Institute, for his work in the area of organizing domestic computer technology education; and Dr Tibor Pongracz, deputy director of the Financial Affairs Computer Technology Institute, on the basis of his work in domestic computer technology applications development and in the NJSZT.

The Kalmar prize was received by: Dr Gyorgy Appel, a leading official of the Capital Pedagogic Institute, and Janos Kohegyi, a group leader in the Computer Technology Faculty of the TTK [technical science school] of the Lorand Eotvos Science University, for teaching computer technology, organizing such teaching, and spreading computer technology culture among the student youth; Edit Toth (Mrs Santha), a scientific worker at the SZKI [Computer Technology Coordination Institute], for her achievements in the area of computer science; and Ferenc Soos, assistant professor in the Computer Technology Faculty of the Mathematics Institute of the Heavy Industry Technical University, Miskolc, for spreading computer technology culture among the student youth and his work in the area of education.

In conclusion Janos Szelezsan read the names of those NJSZT activists who received a monetary reward in modest recognition of their work for the Society in 1984.

8984
CSO: 2502/43

UPDATING OF ES SERIES II COMPLETED

Budapest SZAMITASTECHNIKA in Hungarian Feb 85 p 4

[Article by Dr Zoltan Szabo: "Modernizing the Models of ESR Series II"]

[Text] Modernization of the computers of the ESR [Uniform Computer System] second series is nearing completion in the socialist countries. Development of the Czechoslovak ES 1026 was completed in 1982; this represented a 20-30-percent increase in performance compared to the ES 1025 and expanded operating memory to half an M byte. We finished development of the Hungarian ES 1016 model in 1983 (see the detailed description in the March 1984 issue of SZAMITASTECHNIKA). Development of the Soviet-Bulgarian ES 1036 model was completed in the spring of last year and development of the GDR developed 1056 was completed in the fall. Development of the Soviet ES 1046 and ES 1066 models will be completed this year, and with this the modernization of the ESR second series will be completed.

In what follows we will describe in detail the technical parameters and applications possibilities of the ES 1036 and ES 1066 models.

ES 1036

The ES 1036 computer can operate in computer networks, in automated guidance systems and in autonomous computer centers. It is suitable for solving a broad range of scientific-technical, economic and special tasks in the autonomous operational mode or in information processing systems.

Chief Operating Characteristics of ES 1036

The ES 1036 operates in a heated machine room under normal climatic conditions. The power of the computer does not exceed 40 KVA. The maximum space required in the machine room is 56 square meters. Its performance has been increased significantly compared to the ES 1035:

	ES 1035	ES 1036	
Gibson-III E	200,000	496,000	operations per second
Gibson-III D	126,000	303,000	operations per second
GPO-WU-II	123,000	306,000	operations per second

The instruction system of the ES 1036 corresponds to the universal instruction set of the ES third series. The capacity of operating memory is 2 M bytes, expandable to a maximum of 4 M bytes. The capacity of the microprogram store is 128 K bytes. The hardware and software tools of the computer make possible use of a 16 M byte virtual memory.

Its central unit contains one byte-multiplex and four block-multiplex channels. The total throughput of the channels is 4.5 M bytes per second (multiplex channel, in byte-multiplex mode 50 K bytes per second, in monopole burst operation mode 320 K bytes per second, and 1,500 K bytes per second on each block-multiplex channel).

ES 1036 centralunitand operator consolehave these reliability indexes:

--Mean operating time between two failures (MTBF) is 1,500 hours;

--Mean operating time between two errors, 150 hours.

The logic circuits of the element base of the ES 1036 processor are based on the Soviet 500, 155 and 131 series microcircuits and the memory circuits are based on LSI circuits integrated at the 16 K bit per capsule level.

The computer provides execution of the following chief functions: multiprogram operating mode, local and batched processing, and service of near or distant peripherals via data transmission channels.

ES 1066

The ES 1066 universal electronic computer is the highest performance model of the Uniform Computer System at present. The high performance, the large capacity operating memory, the fast throughput of the I/O system, the possibility of connecting many types of ESR peripherals and the efficient operating system combine to make possible the creation of computer systems satisfying various user needs using the ES 1066 computer. The system can be used especially efficiently for the following tasks:

--complex scientific-technical computations where a large volume of information must be processed with special precision and reliability;

--solving information-logic tasks requiring interaction with a large database;

--modeling complicated processes presuming high processor speed and an external interrupt system and for real-time control;

--automated design of complex objects with developed machinegraphic devices;

--solving remote processing tasks requiring efficient distribution of computer resources and a conversational operating mode in the case of a large number of subscriber stations;

--in computer networks.

The chief technical data for the ES 1066 computer are:

--maximum capacity of computer, 12.5 million operations per second;
--according to Gibson-III, minimum of 5 million operations per second;
--according to GPO-WU-II, minimum of 2 million operations per second.

The capacity of the operating memory is 8-16 M bytes. The number of I/O channels is 12; maximum throughput is 18 M bytes per second.

Amongthebasic properties of the ES 1066 computer itshouldbementioned that:

--It has the best performance/price coefficient of the presently existing general purpose ES models.

--It is fully program compatible with every ES model and can be connected to any ESR peripheral having a standard I/O connector.

--It is outstanding among other models for its compactness. The central unit (processor, operating memory and I/O processor) is placed in 2-3 standard cabinets.

--Its operating system is the ES/OS 7. The OS 7 gives the same efficiency in conversational and batched processing. A microprogram supports the control program functions.

--It can be operated at various levels of a multi-computer system.

The central unit of the computer consists of the following parts:

--Central Processor (ES 2366)

This provides arithmetic and logical information processing, operating memory management and control of the entire computing task. Five-level simultaneous instruction execution has been organized in the processor, which makes it possible to execute brief operations in one cycle (80 ns). The processor is microprogram controlled. The capacity of the microprogram store is 128 K bytes.

--Operating Memory

This has a capacity of 8 M bytes in the basic configuration, is built into the processor, and contains eight independently addressable 1 M byte blocks; in the 8 M byte configuration the memory is made of LSI circuits with 16 K bit per capsule capacity, but in the 16 M byte memory configuration they use LSI's with a capacity of 64 K bits per capsule.

--I/O Processor (ES 2666)

This consists of two processors controlling functionally independent channel groups. Both processors contain one byte-multiplex and three block-multiplex channels with a 1 byte I/O connector and two block-multiplex channels with a 2

byte connector. The channel control processor contains a microprogram store with a capacity of 8 K words.

--Control Console (ES 1566)

This carries out all the functions needed to operate the computer and for engineering service. The control console has two service processors, a selector channel equipped with a standard connector and an ES 7927 picture screen connecting adapter. The independent peripherals of the control console are: one ES 5080 magnetic disk store and one ES 7934 printer.

The software for the ES 1066 computer consists of system program tools, test programs and service programs.

The computer uses the PL/I, COBOL, FORTRAN, PASCAL and ASSEMBLER languages.

The diagram shows the general configuration of a system based on the ES 1066 computer and the time of realization.

Key to Diagram

The diagram shows the ES 2366 central unit and the ES 2666 I/O processor running under ESR OS 7; the central unit can be connected to the central unit of another ES 1066 via direct control lines; the I/O processor can be connected to the channels of another ES 1066 via the channel adapter.

The channels of the I/O processor lead to six types of peripherals or to control units (for magnetic disk and magnetic tape stores) which can be shared with another ES 1066 computer.

The magnetic disk stores for 1984 (200 M byte) are the ES 5580+, ES 5680, and ES 5080; the magnetic disk stores for 1986 (317/634 M byte) are the ES 5563.01, ES 5663.01, ES 5063.01 and ES 5065.01.

The magnetic tape stores for 1984 (63/32 bits/mm) are the ES 5525.03 and ES 5025.03; those for 1986 (63/246 bits/mm) are the ES 5527.01, ES 5527, ES 5027.01 and ES 5027.

The printers for 1984 are the ES 7036, ES 7038 and ES 7040; those for 1986 are the ES 7046 and ES 7231 (laser).

The punch card I/O's for 1984 are the ES 6019M and ES 7018. (No punch card I/O's are listed for 1986.)

The displays for 1984 are the ES 7920.01/02 and ES 7970; the display for 1986 is the ES 7990.

The computer graphics for 1984 are the ES 7905 display, the ES 7051M, ES 7052M, ES 7053M or special orders. Those for 1986 are the ES 7980 or special orders.

No special processors are listed for 1984. The special processors for 1986 are the macroconveyor ES 2701, the matrix ES 2700, the text editor ES 2702, the high level language interpreter ES 2680 and special orders.

The final peripheral shown is the TAF [Remote Data Processing] processor which connects via a network to subscriber stations. The 1984 listing here is for multiplexers ES 8401, ES 8402 and ES 8403, with access via general TAM [Teleprocessing Access Method] or BTAM [Basic Telecommunications Access Method]. The 1986 listing here is for TAF processors ES 8703 and ES 8705 with access via general system TAM or VTAM [Virtual Telecommunications Access Method].

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GOTHENBURG UNIVERSITY TIME SHARING SYSTEM FOR HUNGARY

Budapest SZAMITASTECHNIKA in Hungarian Feb 85 p 7

[Article by Andras Gyulai, Computer Technology Applications Enterprise: "GUTS, A New OS Based Conversational Program Development System in Hungary"]

[Text] ETSS and ICCF conversational systems operating under DOS/VS or VS(E) worked with more or less satisfactory efficiency but users operating the OS operating systems did not find satisfactory conversational systems in the IBM assortment. Only the CRJE could be operated under OS/MFT and VS1, and this had very poor program development possibilities. Both CRJE and TSO work under MVT and SVS, but operation and use of the TSO with the domestic relatively small ESR [Uniform Computer System] configurations clashes with the running of batched processing and under domestic conditions the TSO response times are extraordinarily long. Another factor is that users are oriented from the smaller systems (for example, the ES 1022) toward the "larger" ones (for example, the ES 1035 and ES 1045), so it is essential that they should be able to use the same conversational program development system in all OS operating systems and that this system provide the most developed services possible.

Taking all this into consideration we acquired the GUTS [Gothenburg University Time-Sharing System] conversational program development system. The KSH-SZAFA [Computer Technology Applications Development Fund of the Central Statistics Office] provided a loan, for 2 years, for the financing of the purchase. The SZAMALK [Computer Technology Applications Enterprise] won the right to distribute the system in Hungary in an open competition in 1982.

Operating Environment

The GUTS can be operated with OS or ESR/MFT, MVT, VS1, VS2 and MVS operating systems with IBM 360/370 hardware or ESR equipment compatible with the IBM hardware. Every type of magnetic disk unit from 7.25 M bytes to 300 M bytes can be used. Use of both typewriter and picture screen terminals is permitted, but different GUTS possibilities can be used on the different types of terminals.

Its Chief Functions

The GUTS offers perhaps the broadest variety in the area of text editing programs. In addition to the traditional, line editing possibilities--in which one can make corrections in only one line at a time--there is also a possibility for full-screen editing. The created and corrected texts--the GUTS files--are stored in a library which GUTS manages itself, which has a chained line organization, thus the location of erased sentences can be used for new ones immediately, there is no need for compression, and the library has to be reorganized only if it is actually physically filled. The GUTS system uses the conversational mode, which means that the activity requested by the user begins immediately, and in the majority of cases it is even completed before the next request can be made. The user accesses the GUTS system through a terminal, he types in the various commands from the terminal and the responses are sent to the terminal. Programs can be initiated directly from the terminal and they can continue the conversation with the terminal operator while they run. This so-called conversational program running possibility is one of the most important properties of the GUTS. The programs run in the conversational mode can be system programs (service programs or interpreter programs) or programs written by the user--finished programs or those under development.

Another large part of the command set of GUTS serves solution of development tasks. With the aid of these commands we can create user GUTS files, change them, list them, or re-edit them. The conversational running can be very effective, but in many cases it is not necessary for the user to be in contact with his program while it is running. In such a case the GUTS terminal can be used as a data terminal; that is, a regularly compiled job can be sent to the operating system exactly as if the terminal were a card reading device. The job thus sent is inserted in the waiting line and after it is called and run the user at the terminal receives notice of this fact, can list the result of the job on the terminal or, if necessary, can prepare a paper copy of it. If he then switches to the split picture screen mode and pages through the run list on the lower part of the screen he can conveniently correct the source text appearing on the upper part of the screen. This, however, is terminal dependent.

Thus the GUTS functions embrace three large areas (the grouping is arbitrary, another division is possible as well):

--creation and maintenance of user files,
--program running in the conversational mode, and
--program running in the batched mode.

The commands issued by the user can be listed in two groups: simple or compiled commands or, to put it differently, command procedures. Usually the user does not notice the difference between the two types of commands, because their formal form coincides, at most the execution time of the procedures is somewhat longer. The possibility of preparing command procedures makes possible the development of a convenient user environment because every GUTS user can supplement the original command set with new commands (procedures) which are best adapted to his own tasks.

The names of the GUTS files can have at most eight characters, but to ensure that there is no ambiguity a so-called prefix, of at most eight characters, belongs to every name; in general the prefix is a code identifying the user creating the file.

Authorization, Data Protection

In order for a user to be able to work in the GUTS he must have a user identifier. In the course of issuing this the operators of the system not only enter the identifier in the appropriate GUTS component but also assign various properties or attributes to the user. The most important of these is the value of maximal authorization. This value can fall between zero and fifteen, and it sets the sphere of GUTS commands and tasks which the user can use. The higher the authorization a person gets the broader the assortment of commands he can give. Issuing a value of 15 is equivalent to the sphere of authority of the OS operator. Additional user possibilities are:

--conversational running,
--batched running through GUTS, and
--use of a password.

Multiple levels of data protection have been realized in the GUTS. In general the user himself decides whether to use a password or not, but he can change the password at any time and in this case the system rejects a sign-on with a faulty password. Various protection systems apply to GUTS files. When creating a file one can protect for writing, reading or initiation as a procedure. In all three cases the protection key is a number between one and 32,767. The protection consists of the fact that access of a given type to the protected files is possible only if you know the key. The three keys have different "strength", the sequence is as follows: execution > reading > writing. That is, files protected against writing can be read freely, but can be changed only if you know the writing key; files protected against reading and writing can be read if you know the writing key but cannot be changed if you know the reading key.

Protection of OS data files is divided into two levels:

--every request affecting an OS file goes through the mechanism of OS passage time and password protection;

--the GUTS users can write (with conversational running or GUTS command) only into those OS files which meet certain conditions by name.

The questions of authorization and data protection are closely linked with one another; in the event of higher authorization the data protection restrictions generally decrease.

Service Program Package

A service program package is an organic part of the system. This can be divided into two parts: GUTS service programs and OS service programs.

The GUTS service programs include all the auxiliary programs which are absolutely necessary to operate the GUTS. These include the file formatting, file saving, file reloading and file editing programs, and use of the GUTS can be made completely reliable through them.

The other part of the service programs is not linked directly to the GUTS (although a large number of them can be run in the conversational mode too); use of them not only facilitates the work of the OS users but also the work of the OS system programmers. The package includes an assembler tracking program, a universal line file copying program, memory sorting and comparing programs, programs to handle partitional files, and disk and tape management programs. An outstanding part of the package is a program called WATERLOO SCRIPT with which we can create complete documentation. The program itself handles line make-up, page arrangement, and editing of addresses, subaddresses, table of contents and index; the user has only to provide the raw text.

The GUTS can be installed in every computer center where the following conditions for operation are provided:

--at least 500 K internal memory (the GUTS core runs with 192 K),
--sufficient disk capacity,
--a terminal network (IBM 3270, 2741 or corresponding ESR equipment or teletype and deckwriter type terminals),
--some sort of OS operating system together with the spooling system belonging to it.

Installation is preceded by a consultation. Then after the pre-generation phase, installation takes 4-8 hours depending on the computer type and operating system. Following this the SZAMALK conducts two days of GUTS instruction at the site of installation.

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MORE FAVORABLE DUTIES FOR PERSONAL COMPUTERS

Budapest SZAMITASTECHNIKA in Hungarian Feb 85 p 10

[Article by Attila Kovacs: "Private Use PC's; More Favorable Duties"]

[Text] A change in the customs regulations pertaining to certain computer technology devices brought in by tourists or arriving in the country as gifts went into effect on 1 December 1984. A preferential rate of duty applies to personal computers up to 64 K bytes capacity and to auxiliary and part units which can be connected to them, to appurtenances and parts, including magnetic disks (empty or programmed) and to programmed cassettes, if they are brought in for one's own use or as a gift to Hungarian citizens with a permanent domestic residence. The following table shows the magnitude of the duty:

	Value of Duty to be Paid		For Own Use	
	To 6,000 forints	Over 6,000 forints	To 6,000 forints	Over 6,000 forints
Tourist	0%	30%	0%	15%

In the case of bringing in goods under 6,000 forints there is no duty to be paid only if the traveller does not bring in other goods.

Gifts:

	Size of Duty to be Paid	For Own Use
To 2,000 forints	0%	% forints
2,001-3,000 forints	750 forints	375 forints
3,001-4,000 forints	1,100 forints	550 forints
4,001-5,000 forints	1,600 forints	800 forints
Over 5,000 forints	45%	22.5%

In both cases the goods given preferential duty treatment can be disposed of within 5 years of this treatment only after paying the total of the duty dispensed with.

In January there was a further reduction in the values constituting the basis for duties on personal computers, peripherals and other computer technology

devices. In the following table we have shown for purposes of orientation the latest values constituting the basis for duties in regard to a few devices.

Type of Device	Value Constituting Basis of Duty, in forints
Computers	
Commodore VC64*	27,000
Commodore VC20	14,000
Commodore CBM710*	150,000
Commodore SX 64*	120,000
Sinclair ZX81 (1K)	7,000
Sinclair-Spectrum (48K)	23,000
Atari 1200 (64K)*	50,000
TRS-80 (64K)*	40,000
	38,000
Printers	
Alphacom 32	10,000
ZX Printer	8,000
Seikosha GP100A*	30,000
Seikosha GP100VC*	34,000
Seikosha GP-700A*	60,000
MCS801 (color)*	60,000
Epson RK-80*	40,000
Epson FK-80*	58,000
Epson FX*	80,000
Commodore VC1525*	30,000
Other peripherals	
Commodore CBM 8250 dual floppy*	150,000
Commodore CBM 8050 dual floppy*	170,000
ZX Microdrive*	10,000
ZX memory expansion (16K)	4,000
ZX memory expansion (32K)	7,000
ZX memory expansion (64K)	9,000
Light pen	6,000
VC memory expansion (16K)	8,000
VC1530 Datasette	5,000
Accessories	
ZX printer paper (5 rolls)	2,000
5 1/4 inch floppy disk (each)	200
Microdrive cartridge	500
Software	
Easy Calc, Forth 64, Master	10,000
BASIC, CP/M, Text64, Easy Script	8,000
Datamat, Textamat, Diskonett, Supergraphic 64, Pascal 64	4,000

* Values above 25,000 forints can be brought in with a foreign exchange permit from the Hungarian National Bank.

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KIYEV COMPUTERS DESCRIBED

Budapest SZAMITASTECHNIKA in Hungarian Feb 85 p 10

[Article by U. M. Rilskiy, APN: "Kiyev Computers"]

[Text] The Elektronmash production association in Kiyev, bearing the name of Lenin, is one of the leading enterprises of Soviet electronic machine manufacture and the supplier of the SM computer family. Elektronmash developed and strengthened on the basis of a technology designed in the Cybernetics Institute of the Ukrainian Academy of Sciences. The computers in the Dnepr and Mir series have significantly expanded the assortment of Soviet computers.

When the experts of the socialist countries set about the joint development of a family of small computers, this factory became an active participant in the work. The cooperation is developing successfully, and this applies to both export and the exchange of technical principles and innovations. For example, partners in the cooperation get from Kiyev small computer systems which contain subassemblies obtained from Bulgaria, Hungary, the GDR, Poland and other countries.

Deliveries to the Hungarian People's Republic represent one fifth of the total export program of the association. Elektronmash has received the Gold Mercury Prize for its wholesale contribution to the development of international trade and for the export of outstanding quality products.

One third of the gross production is manufactured taking into consideration the individual desires of the customers. The systems differ from one another in their spatial arrangement and peripherals.

This year the factory began series manufacture of the new SM-1420 computer, representing the second phase in the small computer family, thus realizing in full measure the conversion to the production of specialized systems with the newest peripherals and computer equipment ("man-machine" dialog).

The new model is the joint creation of Elektronmash and a Moscow institute dealing with electronic process control machines.

By the end of the century, indeed, perhaps even earlier, they will set up completely automated machine manufacturing plants in which robots will replace

humans in performing every hard and work demanding operation. Elektronmash will be such a plant. By the end of 1986 they will have placed 400 robots and manipulators into operation. For example, in the shop making printed circuits robots and manipulators already do all the basic operations.

In one of the assembly shops they are testing an automatic device for adjusting microcircuits. This will replace 15 assemblers and--unlike humans--it will work without error. Another work of the designers, the Kodiak system, checks the reliability of products.

The final assembly area is one of the sections with the most responsibility. Highly trained experts work here. Here they assemble the computers to be shipped to Hungary. Like other computer systems, these too include Hungarian displays and printers. The products coming from Hungary are highly valued (Videoton is the chief Hungarian partner of Elektronmash).

A number of people from Kiyev work in Budapest today. And guests from Hungary arrive in Kiyev for practice and study.

Elektronmash is the largest training center for Soviet and foreign experts who must work with the Kiyev computers. Several hundred experts are trained each year in the training center of the enterprise.

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RAILWAYS RENOVATING COMPUTER SYSTEM

Budapest SZAMITASTECHNIKA in Hungarian Feb 85 p 14

[Unsigned note in "News Mosaic, Monthly Chronicle"]

[Text] During the Seventh 5-Year Plan the MAV [Hungarian State Railways] will renovate its computer system based in Budapest. Simultaneous with acquisition of new machines it intends to develop a transmission and processing network wich is already effective in its beginning and which can be gradually expanded. Research and technical development are being directed to those jobs which will lay the foundation for the theoretical and practical realization of a transport control system and aid the smooth replacement of the present computers with those planned for 1986. They must still decide what sort of computer network to develop and what sort of programs to use to satisfy the demands posed by the transport control system. The MAV is conducting the experiments within the framework of the development of the system for the Budapest-Hegyeshalom line and it is probable that the experiments will be concluded by the end of 1985.

The research and the investment are being carried on the basis of their own resources with the support of the Ministry of Transportation and the National Technical Development Committee.

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PLAN VARIANTS PROGRAM MARKETED

Budapest SZAMITASTECHNIKA in Hungarian Feb 85 p 14

[Unsigned note in "News Mosaic, Monthly Chronicle" section]

[Text] Experts of SZAMREND [Joint Enterprise for Marketing Computer Systems] have developed a program to prepare plan variants, to perform calculations connected with enterprise profitability, taxation and wage regulation under the new regulatory conditions. The program is being marketed by the Novotrade Company. The program, which can be run on a Commodore 64 personal computer, makes it possible for enterprise leaders to prepare a number of plan variants in a short time. Use of the program is simple and with its help even experts who do not understand computer technology can easily perform economic calculations.

The program was prepared at the same time as the publication of the decrees connected with changes in regulators and about 30 of the programs have been sold already. About 5,000 Commodore 64 personal computers are in operation in Hungary. Those enterprise leaders who do not have such a machine can perform their calculations on the spot in the sample room of Novotrade. In addition to the program aiding planning, Novotrade will later offer software with which enterprise management can be followed continuously. Thus the economic situation of the enterprise can be compared day by day with the plan prepared earlier.

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