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East Europe Report

SCIENCE AND TECHNOLOGY

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EAST EUROPE REPORT

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CZECHOSLOVAKIA

NEW BIOLOGY CENTER OPENED

Prague RUDE PRAVO in Czech 14 May 85 p 1

[Article: "South Bohemia Biological Center of the Czechoslovak Academy of Sciences Opened"]

[Excerpts] Ceske Budejovice -- The opening of the first stage of the building of the South Bohemia Biological Center of the CSAV [Czechoslovak Academy of Sciences] took place in Ceske Budejovice on Monday. Lubomir Strougal, CSSR premier, accompanied by Josef Havlin, secretary of the CPCZ Central Committee, and Miroslav Slavik, chief secretary of the South Bohemia Regional Committee of the CPCZ, took part in the ceremonies.

The building of the CSAV's South Bohemia Biological Center, which includes the institutes of environmental ecology, experimental botany, entomology and parasitology, represents an important task of the program "Main Directions in the Development and Implementation of Czechoslovak Science" by which the CSAV responded to the decisions of the 16th CPCZ Congress. Its purpose is to organize an integrated association of CSAV institutes focusing on agricultural and environmental research, which will enable to fulfill even the most demanding tasks by means of efficient methods. It is encouraging that in a relatively short period individual institutes were able to report with pride their achievements resulting from specific agreements on cooperation with several enterprises and institutions in the South Bohemia kraj, for example, in introducing a method for biological protection of hothouse plants and fruit-producing orchards against vermin, a method for prevention and liquidation of timber destroyed by bark beetle and weevil, etc.

The construction of the new facility which began in 1980 is divided into three stages. In the first stage the employees of the Surface Construction Company in Ceske Budejovice erected the buildings of the Institute of Entomology and Prasitology, the facilities for joint laboratories and technical facilities. In the following stages which are scheduled for completion in 1991 the Institute for Experimental Botany, the zoology building, the computer center and other buildings will be constructed.

At the conclusion of his visit the premier of the federal government discussed with experts from individual institutes the results of scientific advances, their prompt practical implementation in our production and the prospects

for the fulfillment of the stipulated goal-oriented programs of basic research. Comrade Strougal stressed among other things the importance of sciences and technology in the life of our society and the pivotal place of biology in the further development of our means of production, particularly in agriculture, forestry, environmental protection and national health services. Furthermore, he discussed the tasks of the scientific and technological sectors in the Eighth 5-Year Plan when the fulfillment [of those tasks] will be vitally important for every sector of our national economy. He expressed appreciation to those who participated in the construction of the biological center, voiced his conviction that our scientists would take advantage of the opportunities open to them in this material base, and wished them every success in their future endeavors.

9004
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CZECHOSLOVAKIA

ENVIRONMENT DEGRADATION STUDIED

Prague RUDE PRAVO in Czech 15 May 85 p 5

[Article by Jaroslav Michalek: "In Harmony with the Laws of Nature"]

[Text] Our country is among those whose environment has been adversely affected by rapid development of production, rising economic output and increasing population density. Industrial and housing construction frequently takes over even very fertile land; the processes of production pollute the air, water and the soil and unfavorably affect all human environment.

Not only our industrial production but also our agriculture and forest economy have contributed to that situation because chemicalization involves certain risks in conjunction with the need of an overall growth of the crop and wood production. The R&D base of the ministries of agriculture, forestry and water economy is dealing precisely with the problems generated by the program for intensification of our agricultural production and forest economy, as confirmed, among other things, by the 24th session of the Czechoslovak Agricultural Academy, which focused on analyses of problems stemming from the tasks of our agriculture, forest and water economy in the biosphere.

Prof Eng Dusan Zachar, ScDr, chairman of the central committee of the CSAV for environmental protection and a corresponding member of the CSAV and SAR [Slovak Academy of Sciences], reported in his keynote speech, among other things, that increasingly large amounts of agrochemicals have to be applied mainly because the acreage of cultivated land has been decreasing. That is a worldwide phenomenon, however, in our country it is one of the crucial problems which force our agriculture to do everything possible in the effort to increase the productivity and the yield of our cultivated lands. Higher doses of fertilizers helped increase the average crop production dramatically -- from about Kcs 32.5 billion in the Third 5-Year Plan to the projected Kcs 46 billion in the current 5-year plan -- but the amounts of pesticides and their share in the increased production have risen even more. On the other hand, some adverse effects have been noted in the development of the stability of soil regimes and processes.

They are caused mainly by underfertilization of the soil with organic manure and insufficient maintenance of the topsoil. The overwhelmingly one-sided

increase of the yield of our lands, achieved by means of the fertilizers, has produced a number of untoward results, particularly a deteriorating quality of the soil, which has been further aggravated in many areas by the fallout of acid and toxic industrial by-products. All that has reduced the effectiveness of the fertilizers in terms of higher crop yield, increased the pollution of surface and underground waters and impaired the quality of bioproducts.

In this context Prof Dusan Zachar stressed that the elution and wash-out of agrochemicals are narrowly linked with water erosion of the soil, which -- together with wind erosion -- represents one of the most harmful effects for our agriculture. The losses caused by the erosion of the soil are cutting down our gross crop production by nearly 15 percent. If we include additional losses stemming from seasonal damages to cultures and soil, the agrochemicals washed off from our fields, the deteriorating quality of our crops, the mud-choked reservoirs and ponds, the damaged hydrotechnical and other facilities, the sum total of the losses in this sector is quite considerable. Measures to counteract erosion in our agriculture and forest and water economy would preserve values which expressed in figures correspond to about Kcs 10 billion annually.

Prof Dusan Zachar emphasized, "This is so much more important because other ecological ramifications stemming from erosion cannot be expressed in figures." He stressed that for that very reason erosion -- a process of destruction, destabilization and degradation in the biosphere -- must be cut down to an acceptable level by every means possible.

Naturally, these problems are not the only ones in relation to agricultural production and environment which must be dealt with systematically and without any undue delay. Our agriculturists, foresters and employees of water economy must further anticipate the adverse effects of toxic atomspheric substances and introduce measures to mitigate their impact and to decontaminate areas impaired by pollution. Furthermore, methods for the protection of the living nature, must be improved -- above all, in agriculture, forest and water economy and especially on vast areas of protected lands. Moreover, it is desirable to improve methods for stabilization of forest ecosystems and to implement the principles of the function of an integrated forest economy.

As the session of the CSAZ [Czechoslovak Agricultural Academy] noted, this and other related tasks, whose purpose is to reverse the negative development in the biosphere, may be fulfilled only if comprehensive programs are implemented. Our agriculture and forest and water economies are capable of alleviating the harmful effects of industry and can reduce the adverse effects of their own production and operations. Nevertheless, to achieve those goals, the management of the process in the biosphere must be systematically upgraded on scientific foundations. In the future the CSAZ, in cooperation with other organizations, intends to play one of the most important roles in that particular area. It is motivated by the necessity to create favorable conditions not only for the survival of biological species but also for a harmonious development of our socialist society.

9004
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IMPORTANT PLANT PROTECTIVE AGENT SOLD TO MULTINATIONAL ENTERPRISE

Budapest NEPSZABADSAG in Hungarian 6 Jun 85 p 6

[Article by Gabor Pal Peto: "New Crop Protection Materials From Basic Research; Multinational Enterprise Buys Hungarian License"]

[Text] A group of Hungarian researchers and developers recently achieved a rare success--a powerful and successful multinational enterprise which counts as a leading firm in this field and which turns 450 million dollars per year to research and development bought its patent pertaining to a new type of plant protective agent.

At the request of the inventors we are not publishing the name of the purchasing firm for trade policy reasons. It is more worth while to describe the route which led to this event.

Antichemical Chemical

It is a commonplace that corn is today one of the most important cultivated crops, so it is very important to protect it against harmful weeds. Because of the shortage of manpower this can be done today only by chemical means, with crop protection chemicals, the so called herbicides. There is a series of such chemicals which, however, have a great disadvantage in addition to their utility--they can harm the corn itself, to differing degrees depending on type.

Materials known collectively as antidotes can be mixed in small quantities with the corn herbicides during manufacture to prevent this harmful effect.

The idea of mixing antidotes with the corn herbicides was born at the beginning of the 1970's. A large enterprise in the United States which was the first to put these mixed herbicides on the market immediately put an extensive group of such mixtures under the protection of a patent and thus won a virtual monopoly, and thus dictated the prices. Naturally this created a demand to replace the foreign preparations with domestic antidotes. So the Hungarian researchers began to look for new antidotes.

Many considered the task hopeless. An English scientist, a leader in the area, wrote in a prestigious international professional journal in 1983 that it was

impossible to produce new types outside the antidotes patented by the Americans.

In reality the route taken by one of the internationally famous institutes of the Hungarian Academy of Sciences, the Central Chemical Research Institute (KKKI), and a chemical industry enterprise, the Nitrochemistry Industrial Site, was completely original and surprising.

The starting point was what we call basic research, research which is aimed at nothing other than the discovery of the phenomena and laws of nature.

Reaction and Structure

There was in the KKKI a research group, not a large number of people, which was then called the isotope reaction mechanism group. The subject of their investigations was what sort of interdependency there was between the reaction ability--the tendency to enter into chemical processes--of organic (carbon) compounds and the structure of the molecules. It is true that this basic research was being done on compounds which were either significant in industry or which played an important role in life processes.

This basic research area is important and interesting. The researchers of the KKKI published many scientific works about their results and gave numerous talks, even abroad and at international congresses. Two of them prepared the studies needed to win candidate's degree in chemical science on this theme.

When the material resources which could be turned to research decreased in the mid-1970's and every research site was encouraged to do research work for industry or agriculture, on commission and in part at their expense--research, naturally, which could be used in practice as soon as possible--they began to look for such possibilities in the KKKI also. Thus the idea arose that this reaction research might be productive from the viewpoint of antidote research, and this could mean a new strategy.

On first hearing this sounds rather surprising. To understand it one must know what the strategy generally used in crop protection research is. It is called analog synthesis--they try to produce materials with a molecular structure similar to compounds which have proven effective. This strategy is used around the world in antidote research as well and virtually everyone was convinced of its correctness, indeed of its uniquely correct nature.

Despite the small number of people involved, even today it consists of only ten college graduates, the KKKI research group headed by Dr Ferenc Dutka--now leader of the crop protection materials research department--made a breakthrough achievement in a relatively short time, in cooperation, later, with the researchers of Nitrochemistry.

Their basic idea seems very simple, so simple that no one dared think of it. They attributed the antidote effect not to a single element of the molecular structure but rather to the chemical reaction ability determined by the entire structure, to something they had collected very much information about in their research--in the course of their basic research.

Starting from this hypothesis they studied the chemical process (reaction) by virtue of which the known and effective antidotes had their effect. The next step of the research was to produce compounds which had a reaction ability in such processes.

They could solve the design of such molecules only on the basis of the information they had obtained in their former basic research. The significance of this was quickly recognized and the chief authorities guiding research judged it worthy of support. In the mid-1970's they received significant material support from the Hungarian Academy of Sciences and from the National Technical Development Committee. In 1981 the research theme was included among the themes supported within the framework of the national medium-range research and development plan. The researchers of the KKKI and of Nitrochemistry got the task of producing a new type of antidote and developing the manufacturing technology for it by the end of 1985.

Of course, they had to solve many other tasks in addition to designing and producing the molecules.

However, they over-fulfilled the plan--a rather rare phenomenon in itself. By the end of 1981 they had recognized an entirely new group of compounds with an antidote effect which could be patented. A large number of these compounds could be produced from intermediaries available to the Hungarian chemical industry, and they could be exported.

They proved the effectiveness of the compounds not only in laboratory tests but also in greenhouse and open field experiments. The latter were conducted in 1982, 1983 and 1984 by workers at the Keszthely Agricultural Science University and at the Grain Production Research Institute (Szeged) with great care and devotion and with a readiness to help and to cooperate which has been praised by the researchers. Nitrochemistry, the system patron of the theme, undertook manufacture.

177 So Far

A Hungarian patent covering 177 compounds has been granted already. Obtaining foreign patents--in Western Europe and in the United States--which takes longer than it does here is under way, but the prospects are promising. In any case what was mentioned in the introduction tells much, that a multinational enterprise leading in this area has purchased the patent making successful use of this new strategy.

Obviously the research and development are not over yet, if only because more and more new strains of corn are being adopted here and elsewhere and the crop protection materials, and the antidotes, are strain specific, that is, different chemicals are needed for different strains. But even if we cannot call the production of these a negligible task, still the research thus far has brought a breakthrough.

The 12-member research group--6 researchers from the KKKI and 6 from Nitrochemistry--which created the patent still face quite a few tasks. But the route followed, the method of research and thinking, the linking of basic research to practice, are instructive and might be followed in many other, more distant research areas as well.

8984
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PHYSICS RESEARCH INSTITUTE CONTINUES WORK ON ACCELERATORS

Budapest MUSZAKI ELET in Hungarian 13 Apr 85 p 6

[Article by Laszlo Egyed: "The KFKI Linear Accelerator is 15 Years Old: The 'All-Knowing' Hair".]

[Text] Design and construction of the accelerator put into operation at the Central Physics Research Institute (KFKI) on 12 March 1970 began at the end of the 1960's. The equipment which is still in operation can accelerate protons, deuterons, alpha particles and ions of a few light elements in the 0.8-5 MeV range. Even later very intensive work was done on the equipment which worked night and day in the first 10 years providing measurement data. It has provided more than 50,000 measurement hours in the 15 years--for purposes of comparison, an automobile runs 3,000-5,000 hours in its entire lifetime.

Even in the 1950's they began to deal with design and construction of accelerators at the KFKI. The first 1 MeV accelerator operated for nearly a decade and in the meantime several smaller similar devices were made. Indeed, they began to design a 4 MeV accelerator at the beginning of the 1950's. At that time, however, the possibilities for Hungarian researchers were very limited; they did not have sufficient literature on this, they could hardly organize any study trips to learn about such equipment and Hungarian industry was unsuitable for making such a product, which then counted as peak technology. Consequently the EG-2 accelerator was not ready until 1963. It operated until 1969 for about 12,000 active hours. In the meantime the equipment had become both technically and conceptually obsolete. They then designed and built the already mentioned and still operating equipment. Naturally, the question might arise as to what new information such a small energy accelerator can provide, when the large ones are already measuring energy in GeV's and TeV's. But the very large accelerators have an entirely different task; they are studying the deepest structure of matter, for example the internal structure of protons and neutrons. But one can study the structure and various physical characteristics of atomic nuclei with such small accelerators. Certainly it is not likely that spectacular achievements will be attained in these studies. For this reason those dealing with basic research using the KFKI accelerator have gradually "defected" and have turned to applied research. Most recently 95 percent of the studies have been directed at this.

The great majority of these studies have been in the area of so-called material sciences. A significant place within this is occupied by those studies which are linked to the microelectronics program, studying the quality of semiconductors, determining the location of contaminants and examining lattice structures. Plasma physics studies are connected with the chief trend of energetics research, where they model certain processes which will take place in a future fusion reactor with the aid of the accelerated particle beam. For example, the mutual effects of the so-called plasma wall can be modeled in this way. The wall of the magnetic container--containing the high-temperature plasma--is bombarded with such particles and in the course of this one can observe the changes taking place in the material, the blistering of the wall, or the shell scaling, what one might call "peeling".

In the last decade biological studies have begun at the Central Physics Research Institute as well, and the accelerator has been used by biophysicists. For example, they have developed a method with the aid of which one can very quickly determine the protein content of grain seeds--primarily corn. But the experiments had a negative result--the protein content of the corns selected did not differ much from the unselected controls.

There has been an extensive study of the trace element composition of human hair. These studies began at Atomki in Debrecen and their purpose was to seek an interdependence between the composition of trace elements and certain diseases. The KFKI has joined in these studies too.

Human hair contains some of practially every element and the composition is extraordinarily characteristic of an individual person. Thus, for example, in many places they use hair composition, in addition to fingerprints, in criminal investigations for identification purposes. In addition, harmful materials entering the organism from the environment appear immediately in the hair, so hair examination could be of great use in environmental protection. It can be demonstrated, for example, that substantially more lead can be found in the hair of urban people than in those who live far from cities. They are doing such studies at the KFKI and with the aid of them one can study, for example, who has been affected and to what extent after harmful materials have entered the environment, and on the basis of the speed of growth of the hair one can calculate when it happened.

Hungary is participating in various of the Interkozmos space programs and is developing instruments for them. These instruments must be able to withstand the high radiation level in space. For example, the semiconductor devices in them must not fail due to radiation. One can study this "radiation resistance" with the accelerator. For example, they tested the Pille instrument from this viewpoint before it was sent up. The Hungarian instruments on the Venus probes sent up to meet with Halley's Comet passed this test; indeed, the Tunde radiometer was calibrated with the aid of the accelerator.

This accelerator has become outmoded both technically and conceptually in the past 15 years and the fact that it continues to function at all is thanks to the maintenance and modernizing work of the operators, which is done with great effort. But since a modern accelerator is extraordinarily important for the material sciences research--representing the highest priority main trend--

KFKI plans to buy a modern, small size American accelerator device in the next 5-year plan period. Linked with the 600 KeV heavy ion accelerator now being completed this will constitute a device unique within the socialist camp.

8984
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HUNGARY

CSEPEL IMPROVES ON JAPANESE ROBOTS

Budapest MUSZAKI ELET in Hungarian 25 May 85 p 3

[Article by Jozsef Marton: "Somebody Did Something: Heavy Duty Industrial Robots from Csepel"]

[Text] On 20 March 1980 there was an agreement in the Machine Industry Standing Committee of CEMA on the joint development of industrial robots. As one of the Hungarian contributions to this the Iron and Steel Foundry of the Csepel Works undertook to prepare a technical plan for heavy duty industrial robots suitable for foundry tasks. They did this in the hope that someone would undertake to make them and that the heavy duty robot born from this initiative would satisfy their needs. For a while, unfortunately, no one did anything in Hungary or in any other CEMA member country....

A favorable turn came about through cooperation between the Csepel Works and the Japanese Daido Steel Company, which has a similar profile. In the 1970's Daido Steel had purchased a license to manufacture robots of the American Verstran type. On the basis of the information obtained in this way they developed several special and more general purpose robots--primarily for metallurgical, hot plant tasks. So it was not by chance that the idea arose of buying the license to manufacture robot types already developed by the Japanese and of selling them to a large part of the world.

The Custom Machine Factory of the Csepel Works undertook to manufacture the robots. On the basis of a survey done in the factories of the Csepel Works together with the license sellers and taking into consideration the previous applications experiences of the Japanese they selected robotization of a forging line in the Iron Works of the Csepel Works as a reference task.

In 1983 the OMFB [National Technical Development Committee] and the IpM [Ministry of Industry] signed a contract with the Csepel enterprises involved to support the introduction of manufacture and the creation of a reference system.

Two basic types are being made in the Custom Machine Factory within the framework of the introduction of manufacture on the basis of the license purchase. The ATR-HS series is a version with cylindrical coordinate kinematics, in 30 and 100 kilogram load types. It can be used primarily to

move parts, serve machines, and for pallet tasks. The ATR-HD series is a robot family with articulated kinematics using the pantograph principle. This entirely independent Japanese development is manufactured in 50, 100, 200, 500 and 1,000 kilogram load versions for applications areas similar to the foregoing. The latter can be used not only as an industrial robot but also as a manually controlled manipulator. They first made a 200 kilogram load type in the course of the introduction of manufacture. Other Hungarian enterprises are cooperating in this introduction. For example, Danuvia is introducing the hydraulic system to operate the robot and VILATI [Institute of Electrical Automation] is working on the electronic controls.

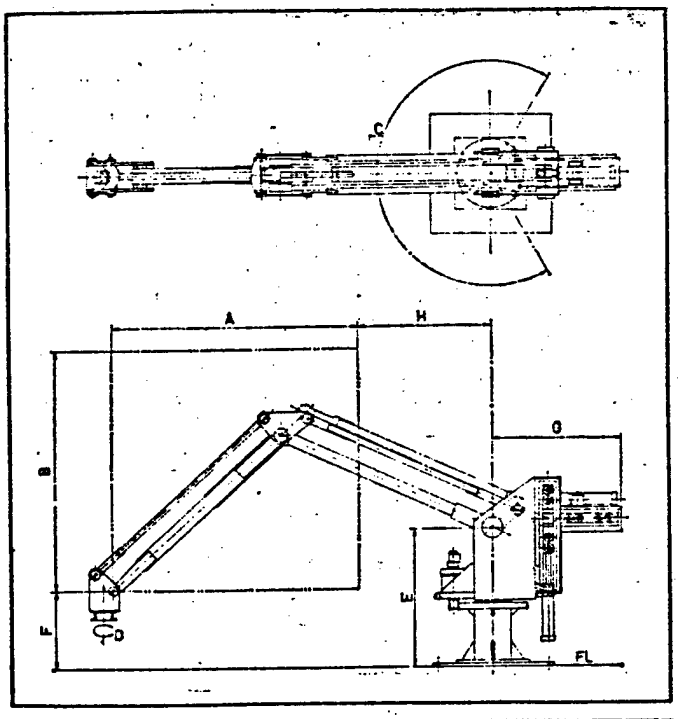
In the reference system an HS-100 robot and an HD-200 robot--with auxiliary equipment also made here--serve a forging line. The first robot moves the heated piece between the work site dies of the forging press--each tool usually has three such dies--and places it on a conveyor belt which takes the piece into the work area of the second robot. The task of the second robot is to serve the trimming-punching machine.

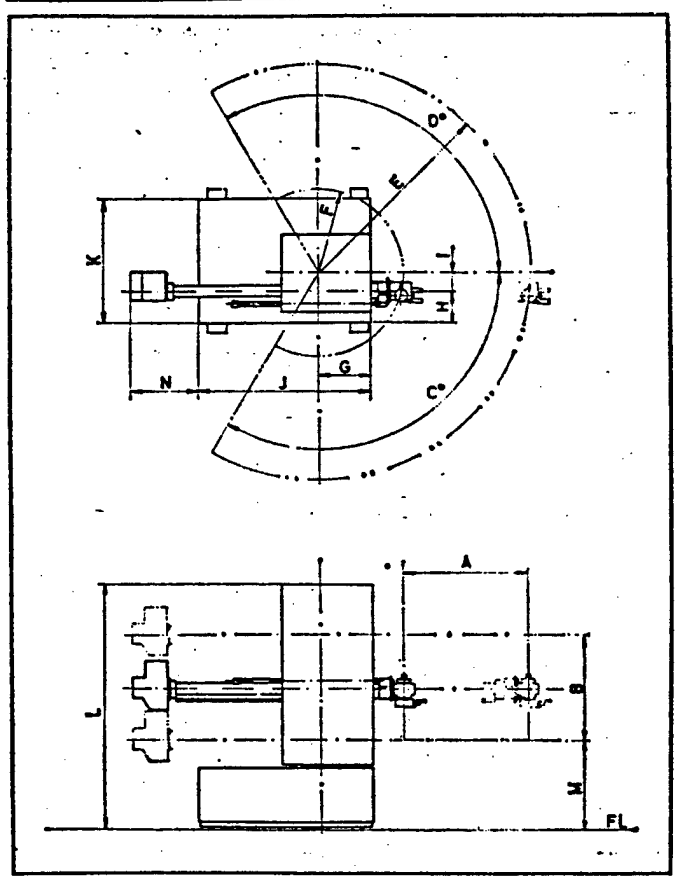
The Custom Machine Factory put the robotized system into operation in honor of April Fourth with the cooperation of workers from the Iron Works and the Japanese shippers. The system is a good illustration of the abilities of these robots and offers an example for solving other similar manufacturing automation tasks.

Further development of the robots began simultaneously with the introduction of manufacture. Experts from the Budapest Technical University and from the Computer Technology and Automation Research Institute, among others, are taking part in this. Their goal is to increase the dexterity and intelligence of the robot with controls and various sensors (touch, vision) and to develop manual controls with which the operator of the robot can sense through a small control arm the load at the end of the arm doing the work.

DRAWING CAPTION [diagram on following page]

Chief measurements and movement ranges of the robot types manufactured by the Custom Machine Factory of the Csepel Works (HD, HS).





8984
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SOFTWARE EXPORTS STUDIED

Budapest MAGYAR HIRLAP in Hungarian 4 May 85 p 6

[Article by Kristof G. Kocsis: "Software Competition, SZAMALK and the SZKI Weigh It Soberly: A Small Undertaking Does Not Pay; Extra Burdens on GMK Not Advantageous for Export"]

[Text] In one of our recent articles the director of a respected domestic software house, Comporgan, complained that dozens of his best export programmers were turning their backs on the firm for the sake of the two to threefold income that could be earned in a GMK [economic work association]. But the complete picture includes the fact that there are a number of domestic software producing enterprises working for customers abroad and the appearance of the small undertakings has not caused such shocks elsewhere.

For example, the Computer Technology Coordination Institute (SZKI) exports programs worth 80-90 million forints per year, and 1.2 million West German marks of know-how and program export make up a significant proportion of the nearly 2 billion trade of the Computer Technology Applications Enterprise (SZAMALK). Of course it is not denied at any of the firms that the appearance of the small organizations has really created a challenge to which the worst reaction was to try to take some sort of action against them. According to the signs they have been able, thus far, to exploit the greater flexibility of the GMK's at the SZKI and its subsidiary enterprises and at the SZAMALK, but where they did not try to coexist with the smaller competitors the programmers soon asked for their work books.

It Can Pay

A computer program is a curious commodity. The demand for them did not decrease even in the years of the recession. Indeed, even today the experts speak openly of a "software crisis," by which they mean a growth in the software appetite of computers which are swiftly getting cheaper and thus spreading more and more, and this means a relative over-valuation of programs. So if a programmer has succeeded in winning a name for himself abroad he need not fear that he will be without work if he founds a GMK.

And yet, he can sell his product in this way at a very bad rate of exchange and not having sufficient capital one can think in a GMK only of hourly rate

contracts promising smaller profit. A state software house can take risks, can develop programs for years without an order, for the sale of a finished product brings more plentiful profit. For example, 24-26 million forints of the 90 million forints in export sales receipts in 1984 at the SCIL, the Computer Technology and Informatics Subsidiary of the SZKI, came from sale of finished products of this type.

Or take, for example, the SOFTORG program package. Since 1980 the SZAMALK and the SZKI have been developing this system, consisting of 7 parts,jointly--with about 10 programmers each. Program development of similar magnitude cannot be found even in Western Europe today but when it is finished, according to the experts, it will yield at least twice what has been invested in it.

There is no doubt that measured by national economic standards the larger receipts which can be obtained by sale of complete projects or finished products are a good bit more desirable than having the programmers squander their talent with what is essentially intellectual jobwork. At the same time we cannot expect from an experienced programmer aware of his own value that he will give up a more respectable income out of altruistic considerations.

Even within the framework of present wage regulation an enterprise has few possibilities to recognize even approximately in the incomes of its workers the work of the programmers which is so profitable and brings in foreign exchange.

Legal Protection

But even so the task is not impossible. For example, roughly one third of the 120 workers of the SZKI subsidiary SCIL are also members of the VGMK [enterprise economic work association]. Thus their income approaches that of those working in independent small undertakings and they do not have to give up the greater security offered by a large enterprise either. And why is the VGMK good for the SCIL? Above the legal norm--165 hours per month--for work done abroad on behalf of the enterprise the time spent in the VGMK is "net" income, because they do not have to pay separately for travel, housing and per diem. They pay more than half of the extra income obtained in this way directly to the members of the VGMK and, what is no less important for the enterprise, they can account for this sum as a cost and not as wages. It also creates a favorable opportunity for recognizing outstanding performance that copyright now protects the programs so the enterprise can pay royalties for the creative work embodied in the software.

At the SZAMALK also they recognized the manpower retaining possibility hiding in the VGMK, and in addition they introduced so-called profit sharing contracts. If a programming solution--for example, optimizing material cutting or minimizing stockpiles for a customer--brings a profit which can be measured directly then the preparer of the program gets a share of it. Those doing such work could get from 1,000 to 30,000 forints in extra income in this way last year and there was one who could pocket 60,000 forints, which did not burden the enterprise wage fund.

But when looking at the state software houses the manpower drawing effect of the small undertakings is only one of the dangers. It is at least as dangerous that they may face in them competitors who will work more quickly and more cheaply.

"An enterprise has to fear the competition of the GMK's only if the competition is interpreted on a prestige basis and not on an economic basis," said Dr Mrs Istvan Veisz, office chief at the SZAMALK. "The greater capital strength, the security offered the customer and the broader services of the large enterprise can be opposed to the flexibility of the small organization. So a serious firm is proceeding correctly if it conducts a selective competition, if it enters the ring only where and when it can make use of its advantages! One cannot imagine effective innovation within the GMK framework and a small organization cannot offer a customer a choice among the hardware devices needed to solve the task. Those working in the small organizations are well acquainted with these advantages so the SZAMALK employs a number of outside GMK's in the event of a temporary capacity shortage or to solve smaller tasks which are not economical for a large enterprise...."

Well, probably the little tasks multiplying in the shadow of these large orders are those with which the contact between the large enterprise and the small organization might pay off best in the long run. Software experts say that demand for individual programs on the foreign market may appear more and more quickly, but it can disappear just as quickly too. And a large enterprise is less suitable for following such quickly changing market demand--doubtless because of the greater inertia.

They Do Not Sign Contracts

"The name of the SZKI has a good ring abroad," added Dr Imre Margitics, deputy director of the SCIL, "so in this way the GMK can get on markets in our colors which it could hardly think of aiming at otherwise. The guarantee of the SZKI is advantageous for the foreign customers and it is good for us if our partner is not forced to look for another programmer, so we do not run the risk of his leaving the SZKI later."

"To what extent do the GMK's have a share in the profit deriving from this latter advantage--a most respectable one?"

"Often they have a full share in it. Thus far, in most of these cases, we have not insisted on a profit for ourselves; all the receipts, except for the 3-5 percent commission of the foreign trade enterprise and our costs, go into the pocket of the small undertaking contracting with us. The profit to the SCIL--and, naturally, to the national economy as well--is that we can increase our export with these deals. And in the past this was accompanied by a wage preference."

"And it ended at the beginning of this year when the regulators were modified."

"This will have no disturbing consequences for the SZKI--at least from the viewpoint of our signed contracts with the small undertakings--because the

value produced in the GMK's does not make up even 10 percent of the trade. It is certain, however, that we will not make such zero profit deals with a GMK this year. According to our calculations this, combined with the greater tax burdens of the GMK's themselves and the 10 percent special tax to be paid for employing them, will result in a situation where it will not pay a small undertaking to export through the SZKI. They will take up domestic work instead. All this will cause the loss of quite a few deals which bring in foreign exchange."

This can hardly be in the interest of anyone, because we have been repeating often enough that our brain power is the treasure we can sell best and it brings the greatest profit. Any cooperation between large enterprises and small organizations zeroing in on this should be encouraged more.

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ES 1034, ES 1032 COMPUTERS COMPARED

Budapest SZAMITASTECHNIKA in Hungarian Mar 85 p 4

[Article by Tibor Nanassy: "A Comparison of the ES 1034 and 1032 Computers"]

[Text] In the years 1986-1990 one can expect the use in larger numbers of the ES 1034 computer manufactured by the Polish ELWRO and already for sale in Czechoslovakia.

The ES 1034 contains an ES 2134 central unit, fundamentally modernized from the logical and technical viewpoints, and a broad assortment of local and remote peripherals; it belongs to the ESR-3 series and thus is software compatible with the computers belonging to this series, that is, with the ES 1056, the ES 1061 and the ES 1066. The same is true of the ESR-1 and ESR-2 series computers.

The operational principles characteristic of the ESR-2 series computers are realized in the ES 1034, with the exception of the hardware necessary for the two processor mode, and the functions performed by the ES 1032 are expanded by the following:

--virtual memory management,
--block multiplex channels,
--floating point arithmetic (double precision, 128 bit),
--additional system and user instructions,
--byte-oriented operations,
--trace tracking,
--recording of program events,
--time clock,
--time clock comparator,
--processor time measuring clock,
--expanded interrupt system.

In addition to all this it realizes some of the functions characteristic of the ESR-3 series computers, including the following:

--protection of smallest addresses,
--common segments,
--MVCIN user instruction,

--TPROT, IPTE and CLRCH instructions,
--VMA hardware support for the VM/ESR-P operating system.

A channel-channel adapter providing expanded functions can be built into the ES 2134 also; this makes possible the development of multiple computer systems.

Compared to the ES 1032 the ES 2134 is provided with a check, error correction and diagnostic system. The technical solution of the ES 2134 represents a significant step forward compared to the ES 1032 and results in a very great improvement in technical and economic parameters thanks to a radical increase in reliability and efficiency.

The characteristics of the ES 2134 are:

--a semiconductor operational memory of 1-4 M bytes (expandable to 16 M bytes) with single bit error correction and two bit error detection circuits made of 16 K RAM circuits;

--an 8 K x 80 bit capacity semiconductor microprogram store made up of 4 K PROM circuits;

--200 W output impulse power units;

--simplified and optimized logic circuits made up of about 2,600 TTL SSI/MSI or TTLS SSI integrated circuits;

--a standardized 19-inch modular design cabinet into which the computer and automatic equipment are built.

The maximum channel number is 8 channels. The throughput speed of the channels has been increased by 50 percent compared to the ES 1032, the average time between repairs has been increased 10 times and the power requirement has been reduced to one fifth. It consists entirely of socialist parts. Our comparison table contains the parameters of the ES 2032 and the ES 2134.

Parameter	Unit	ES 2032	ES 2134
Processing speed according to the following mixes	1000 ops/sec		
G I		208	300
G III E		286	420
G III D		192	270
GPO WU II		171	250
Operational memory capacity	M bytes/s		
minimum		1/4	1
standard		1/2	2
maximum		1	4 (max. 16)
Number of channels BYMPX + SEL/BLMPX	each		
standard		1 + 3	1 + 3
maximum		1 + 3	2 + 6
Maximal I/O transmission speed	M bytes/s	2.5	4.5
Max. speed of BYMPX channel	M bytes/s	0.04/0.1	0.1/0.25
Max. speed of SEL/BLMPX channel	M bytes/s	1	1.5
Cycle time of processor	ns	330	250
Technology used			
logic unit		TTL SSI/MSI	TTL SSI/MSI TTLS SSI
operational memory		ferrite	RAM 16 K MOS
microprogram store		ferrite	PROM 4 K TTLS
Number of integrated circuits (processor plus 4 channels)	each	2,000	2,600
Number of cards (processor plus 4 channels)	each	44	32
Number of cabinets (proc.+ 4 chan.+ 2 M bytes mem.)	each	8	1
Power requirement (as above)	kW	19	3.5
MTBF (as above)	hours	40	500

The local and remote peripherals of the ES 1034 are:

--100, 200 or 317 M byte disks--ES 5067.02, ES 5067, ES 5063 (Bulgarian);

--1,600 or 6,250 bpi tapes--ES 5002.02 (Polish), ES 5027 (Bulgarian);

--local picture screen units with 1,920 character or over 3,000 character capacity, with printers ES 7917/ES 7914 (Polish);

--local color, semigraphic picture screen units SM-7215 (Polish);

--ES 7033M (DW 401) line printer (Polish);

--graphic fast laser printer ES 7230 (GDR);

--floppy disk units ES 5075 (Czechoslovak);

--pneumatic card reader ES 6019 (Soviet);

--graphic I/O subsystem ES 7908 (Soviet);

--floppy disk data preprocessor PSPD-90 (Polish);

--punch card data preprocessor ES 9080 (Czechoslovak);

--remote data processor with AK-2 channel adapter, with type 2 or 3 scanner, with 256 K byte semiconductor store, with impulse power units, with floppy disk background store and with a maximum of 48,000 b/s speed line handling, ES 8371.01 M (Polish);

--remote picture screen units with a capacity of 1,920 characters and over 3,000 characters, with printers, ES 7917/ES 7915/ES 7914;

--conversational terminal ES 8575/M (Polish);

--programmable, conversational terminal ES 8579 (Polish);

--programmable terminal ES 8542 (Polish);

--remote data preparation station PSPD-90;

--industrial terminal subsystem SM 9401 (Polish);

--bank terminal subsystem MST 8000 (Polish).

The ES 1034 has the DMES, OLTSEP and OLTEP test systems and a diagnostic system to localize DTLU errors for the ES 2134. The operating system is the OS 6.1/SVS (custom virtual memory management) or the VM-P (system controlling multi-access virtual machines).

The VM-P makes it possible for those operating DOS 2.2, OS 5.0 or OS/VS1-7 systems to switch to the OS 6.1 (SVS) system or later to OS7. The OS/VS 1.7,

which operates with the VM-P (P means the Polish version of VM), makes it possible to develop remote processing systems with the aid of VTAM or TCAM-10 access methods and with use of the NCP network control program.

The program packages for the ES 1034 also contain the PLI-OPT and the ADA.

The SKOT terminal management system and the virtual version of the HADES hierarchical database management system are under development and these will be built into the OS 6.1 system.

The new version of the NCP network control program handles the AK-2 channel adapter, the type 3 scanner and the SDLC terminals in the remote data processing processor; it works with the VTAM and the TCAM-10 access methods.

The NCP will be further developed up to 1990 and it will handle multidomain networks and remote data processing processors.

The ES 1034 is sold by the ELWRO Foreign Trade Enterprise. The goals of the firm include sale of the ES 1034 in Hungary as soon as possible, which, naturally, must be in harmony with the realistic goals of domestic market policy.

In the event of sales here the SZAMALK [Computer Technology Applications Enterprise] will be marketing the system and--until a certain volume of sales is reached--Polish experts staying at the Budapest office of ELWRO will provide technical services--in accordance with the method proven in the case of ODRA computers.

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SOCIALIST COUNTRIES' PRODUCTION OF MICROCOMPUTERS IN 1984

Budapest SZAMITASTECHNIKA in Hungarian Apr 85 pp 8, 9

[Article by Dr Peter Broczko: "Microcomputer Manufacture of Socialist Countries in 1984: The Year of the 16 Bit Microcomputers"]

[Text] Even as summarized in our table one can make an exciting study of the mini and microcomputers of the socialist countries which appeared in 1984. With the following comparative analysis we try to make the table easier to review and interpret.

Bulgaria

Only a few 16-bit machines had been prepared by the end of 1983, and all were compatible with the DEC machines. This trend continued in 1984; the IZOT 1039 was made using the Soviet K1801BM2 microprocessor. But the most striking novelty was the assortment--an excessively rich one--of machines compatible with the IBM PC. The Technical Cybernetics and Robotics Institute of the Bulgarian Academy of Sciences developed the IMKO-4 and the MIC 16A family; the latter comes in three versions, a portable, one with floppy disk storage and one with storage using the Winchester principle. It must be noted that the portable MIC 16A--together with the Cuban LTEL/2M machine--is the first 16-bit portable microcomputer of the socialist countries. (In the 8-bit category the Transmic-8 is still the only portable microcomputer.) The Sofia factory of the IZOT Association came out with two models--the 1036 normal version and an expanded version designated the 1037 corresponding to the XT--the first and still the only such computer in the socialist countries. The Pravec 16 completes the list; as its name indicates it is a product of the Pravec Computer Factory.

The K1810NV86 Soviet microprocessor of the IZOT 1030 machine, representing the third trend of the Bulgarian 16-bit machines, is the functional equivalent of the Intel 8086. Manufacture, up to the beginning of 1984, of the SM-601, the functional equivalent of the Motorola 6800 microprocessor, determined the trend for Bulgarian 8-bit microcomputers, thus they form a wholly homogeneous computer park. But in this way they deviated from the direction chosen by the other socialist countries because, outside of Bulgaria, machines based on the Motorola 6800 are manufactured only in Hungary among the socialist countries, in a very small series. It was no longer possible to postpone a

microelectronics base switch in the vigorously developed and basically export-oriented Bulgarian microcomputer industry. The IZOT 1031 appeared in January 1984 and the microprocessor for it is the equivalent, manufactured in the GDR, of the 8-bit Z80 microprocessor, which is increasingly used in the socialist countries and is one of the most popular in the world. The machine, which can be operated with an operating system compatible with CP/M, is the smallest member of a three member computer family. Its two larger "brothers" are the already mentioned IZOT 1036 and 1037. The first Bulgarian home computer, the Pravec 8D, appeared in 1984 at the Pravec Computer Factory. This is the functional equivalent of the English Oric-2, and thus, among the dozen machines of the socialist countries in the smaller capacity home computer category, it is still the only one which is compatible with some Western type. The Pravec 8B and the Pravec 8M, modernized versions of the Pravec-82, retained their Apple II compatibility. The largest capacity Pravec machine is the already mentioned Pravec 16. Only two representatives of the traditional, Motorola 6800 compatible line appeared in 1984. These were the IZOT 1029 and the IZOT 1035, which correspond functionally to the IZOT 1001 and the IZOT 1003 which appeared in 1980; only their external design is new.

Czechoslovakia

There was no real progress in the area of microcomputer model assortment or model characteristics. Concentrating now on manufacture, they are trying to make the developmental achievements of earlier years pay off, to make the microcomputers accessible to purchasers. The first Czechoslovak 16-bit microcomputer was introduced in 1984, the SMEP PP 04. This desktop machine is a continuation of the DEC line which is traditional in Czechoslovakia and it has outstanding color handling and graphics possibilities. Of the 8-bit machines the SMEP family planned for large series, in order to ensure manufacturing capacity, seems to have the best prospects. The SMEP PP 02 and the SMEP PP 03 belong in the category of professional microcomputers. An interesting aspect of the latter is that the Tekst 01 office small computer is based on it. The smallest member of the SMEP family is made primarily for schools but it can also be obtained as a home computer. The IQ 151 also belongs in this category; 500 of these were sold in 1984 and 1,500 of them will be sold this year, primarily to secondary schools.

Poland

Small undertakings have given an impetus in the microcomputer manufacture of this country in a difficult economic situation. It is a local peculiarity that small undertakings can be established in combination with foreigners too and the Western internal partner is significant primarily from the viewpoint of microelectronics parts supply. Of the 8-bit machines we should mention the RTDS-8 which was shown in 1984 at almost every socialist international fair. One could also see the Neptun 184 and the ELWRO 500, which appeared in December 1983. The AC 825 is the product of the Ameprod small undertaking, which has a foreign partner, and it is the only microcomputer in Poland delivered with Winchester principle stores. Ameprod is also assembling the ZX81. The other representative in the home computer category is a machine called the Meritum which was introduced this spring in Leipzig.

Hungary

Manufacture and development of the Proper-16A, the first IBM PC compatible machine of the socialist countries, continued. As a result of development they introduced the Proper-16W with a Winchester principle store. The sensations of spring 1984 included an IBM PC compatible machine designed by Videoton, the VT-16. The first domestic microcomputers based on the Motorola 68000 appeared in 1984, also the first among the socialist countries, soon followed by four different models. Three of these were developed by small undertakings and of these the Transmic-16 is the first and still the only Hungarian 16-bit portable microcomputer, which could be seen for the first time by the general public at the 1984 Orgtechnik exhibit. The first Hungarian Z8000 based machines appeared at the end of the year and the VM 02 was the pioneer among them. It is a common characteristic of the new 8-bit machines that, disregarding a few exceptions, they are based on the Z80 or on the equivalent manufactured in the GDR under the name of the U880. Worthy of mention for its forward looking philosophy is the Multi Center, which makes possible the development of a cheap local net and to which a maximum of 8 terminals can be connected. The X family is concentrated on data collection at the site where the data arise, and a network independent, portable data recorder, the MOBI-X, has been developed as well. The data are collected into an exchangeable operational memory. The first 3,000 unit series of the Primo, which appeared in 1984 in the home computer category, was completed by the end of the year. Videoton introduced a home computer, the Viedoton TV-Computer, series manufacture of which will begin this year. 1984 was unambiguously the year of a broad assortment of 16-bit machines. The new 8-bit models either belong in the home computer category or are intended to satisfy some special or new need.

German Democratic Republic

They introduced the first 16-bit machine in the spring, made with the U8000, the functional equivalent of the Z8000 microprocessor, which is manufactured in the GDR. The peak product of the year in the GDR among the 8-bit professional machines was the Robotron 1715 bookkeeping and accounting machine, the operating system of which is compatible with CP/M. The 5510 graphics system can also be expected to be popular in the socialist countries. The first GDR home computer appeared in 1984 also, in two models. The Z9001 is a product of the Robotron Combine; the HC 900 is a product of the Muhlhausen Microelectronics Factory which competes with it and which up to now has manufactured only electronic calculators.

Romania

In the spring they introduced the 16-bit M 216, based on the Intel 8086, which works with a version of the ISIS operating system adapted under the name SFDX. Since the machine is made by the largest Romanian computer factory, the ICE-FELIX, large volume manufacture can be imagined. 1984 did not bring any models of great significance among the 8-bit machines; local developments resulted only in three machines planned for small volume manufacture.

Soviet Union

The Iskra 250, compatible with the IBM PC, appeared in the middle of the year and is expected to be the most significant of the 16-bit Soviet machines. A new Soviet machine category appeared among the 8-bit types--the home computer. The Agat, compatible with the Apple II and intended for large series manufacture and broad distribution, is outstanding and the Soviet microelectronics base for it makes these plans realistic. In addition to these Moscow initiatives, home computers based on the Soviet equivalent of the Intel 8080 appeared throughout the country, for example in Leningrad and Riga.

*

In sum we can state that in 1984 every socialist country manufactured a 16-bit microcomputer. Especially striking was the increase in the number of models compatible with the IBM PC, from one in the preceding year to 13. The microelectronics base for the 16-bit microcomputers of socialist manufacture is partly Soviet or GDR and partly of Western origin. The chief type among the operating systems is UNIX. The utility of the large capacity, professional microcomputers in this category is fundamentally limited by the complete shortage of Winchester principle stores, which is caused primarily by the delay in starting manufacture of them. Among the 8-bit machines, the SM-50/40 performance category professional microcomputers working with the CP/M operating system and planned for large series manufacture appeared in every socialist country, primarily in 1983 but up to the beginning of 1984. For the time being, unfortunately, the more modern Z80 is in the minority in the microelectronics element base for them.

*

We have used the following abbreviations or designations in our accompanying table:

MH is number of work stations. T indicates a multiple work station system where we do not have precise data. For microprocessor types we have indicated the functional analog in parentheses. We have given the memory size in K bytes as follows: operational memory minimum-maximum/read only memory minimum-maximum. We have abbreviated the program languages with initial letters, thus A is Assembler, B is BASIC, C is COBOL, F is FORTRAN and P is Pascal. The prices have only an orientation character.

Key to Table:

1. Model
2. Manufacturing firm
3. Microprocessor type
4. Memory (K bytes)
5. Work stations
6. Operating system
7. Program languages
8. Price
9. Bulgaria
10. Czechoslovakia
11. Poland
12. Hungary
13. GDR
14. Romania
15. Soviet Union

Note: In the operating systems column (6) the Hungarian words used are:

16. Raktari = Warehouse
17. Jelenletnyilv. = Recording presence
18. Folyamatiranyitas = Process control
19. Sajat = Their own
20. Adatrogzitesi = Data recording
21. Kepfeldolgozo = Image processing
22. Fejleszto = Development
23. Konyveloi = Bookkeeping

Note: In the program languages column (7) the Hungarian words used are:

24. Alt. celu = General purpose
25. Szovegszerk. = Text editor
19. Sajat = Their own
26 Nyelv = Language
27. Tobb = Several

	(1) Típus	(2) Gyártó cég	(3) Mikroproc. típusa	Bit	(4) Tároló (kbájt)	(5) MH.	(6) Operációs rendszer	(7) Program-nyelvek	(8) Ár
(9) Bulgária	IMKO3	Pravec	SZM 600 (R6502)	8	64/8	1	Apple–II komp.	B; P	5e leva
	IMKO4	Pravec	8088	16	256–512/16	1	MS–DOS; CP/M–86	A; B; F; P	
	IZOT 1029	IZOT Szófia	SZM 601 (M6800)	8	32	1	raktári (16)	IZOT 1003 komp.	
	IZOT 1030	IZOT Szófia	K1810VM86	16	192–1024	1	MS–DOS; CP/M–86	Intelec–III komp.	
	IZOT 1031	IZOT Szófia	U 880 (Z80)	8	64	1	UMCO (CP/M)	A; B	
	IZOT 1035	IZOT Szófia	SZM 601 (M6800)	8	32	1	Jelenlétnyilv. (17)	IZOT 1001 komp.	
	IZOT 1036	IZOT Szófia	8088	16	64–256/40	1	MS–DOS	IBM PC komp.	
	IZOT 1037	IZOT Szófia	8088	16	64–640/64	1	MS–DOS	IBM PC XT komp.	
	IZOT 1039	IZOT Szófia	K1801VM2	16	64–512	1	RT–11 komp.	PDP komp.	
	MIC 16A	Robotkai Int. Szófia	8088	16	64–256/40	1	MS–DOS	IBM PC komp.	
	Pravec 16	Pravec	18038	16	64–256/40	1	MS–DOS	IBM PC komp.	
	Pravec 8B	Pravec	SZM 600 (R6502)	8	64	1	Pravec (CP/M)	Apple–II komp.	
	Pravec 8D	Pravec	U 880 (Z80)	8	16	1	ORIC–2 komp.	A; B; F; P; PILOT	
	Pravec 8M	Pravec	SZM 600 (R6502)	8	64	1	Pravec (CP/M)	Apple–II komp.	
	SZM 1504	IZOT Szófia	nincs	16		T	VAX 11/780 komp.	ált. célú (24)	

	(1)	(2)	(3)		(4)	(5)	(6)	(7)	(8)
Csehszlovákia (19)	IQ151	ZPA Novy Bor	MHB 8080 (8090)	8	32–64/8	1	monitor	A; B	20e korona
	MARS/ SZM 53–10	ZPA Cakovice	MHB 8080 (8080)	8		T	folyamat-irányítás		
	MV5 810	Tesla Kolin	MHB 8C90 (8080)	8	4–48/4–16	1	Intelec-megf.		
	PMD 85	Tesla Piestany	MHB 8090 (8080)	8	48/12	1	HP 85 komp.	A; B	11e
	SMEP PP 02	VUVT Zilina	MHB 8C90 (8090)	8	40–64/8	1	monitor	A; B; C	60e
	SMEP PP 03	VUVT Zilina	MHB 8080 (8080)	8	64/8	1	Mikros (CP/M)	A; B; C; F	130e
	SMEP PP 04	ZVT Banska Bystrica		16	256	T	Fobos; DOS–RV	B; F	
	SMEP SP 01	VUVT Zilina	MHB 8080 (8080)	8	32/8	1	monitor	A; B	29e
	SZM 1505 52/12	ZVT Nemestovo	nincs	16		T	VAX 11/780 komp.	ált. célú (24)	
	TEKST01/ SZM 6915	Aritma Praha	MHB 8080 (8080)	8	64/8	1	Mikros (CP/M)	A; B; C; F	150e
Lengyelország (11)	AC 825	Ameprod	U 880 (Z80)	8	48	1	CP/M 2.2	A; B	
	COM PAN	MERA–ELZAB	MCY 7880 (8090)	8	64	1	CP/M 2.2; ISIS	A; B; F; P; FORTH	
	CS 80	COMPUTEX	U 880 (Z80)	8	64	1	CP/M 1.4	A; B	
	IMP 85	IMPOL II	8085A	8	64	1	CP/M 1.4	A; B; C; F	
	Meritum	MERA–ELZAB	U 880 (Z80)	8	18/12	1	TRS 80–1 komp.	A; B	30e Ft
	MK 4501/2	MERA–KFAP	8085	8	64	1	CP/M 1.4 (IMP–85 komp.)	A; B; F	
	MSA 80	UNITRA SZCZYTNO	MCY 7880 (8080)	8	64–512/12			B; ASM–80; PLM–80	
	Neptun 184	PRAC. EL. MED.	Rockwell 6502	8	32	1	saját (19)	A; B	
	RTDS 8	MERA–ELZAB	8085	8	16/8	1	CP/M komp.	A; B; FORTH	
	ZX81 Polski	Ameprod	U 880 (Z80)	8	1–64/8	1	monitor	A; B	100e zloty

	(1)	(2)	(3)		(4)	(5)	(6)	(7)	(8)
Magyarország (12)	Agrinfo 100	Lignifer	U 880 (Z80)	8	64	1	Agrinfo (CP/M komp.)	A; B; F	500e Ft
	Aircomp–64	Bescoop–Personal GT	U 880 (Z80)	8	64/16	1	PGT–DOS (CP/M komp.)	A; B	250e
	Alfa–X	Datakoord	Z80	8	16/12	1	adatrögzítési (20)	A	45e
Magyarország (12)	AX–II	Alk. Ifj. Egy.	Rockwell 6502	8	48–256/ . .	5	Apple–II komp. CP/M	A; B; C; F. P	105e
	BÜRO–X	Datakoord	Z80	8	64/12	1	VP/M (CP/M)	szövegszerk. (25)	175e
	COMP–X	Datakoord	Z80	8	64/12	1	VP/M (CP/M)	A; B; P	175e
	CTX 80	Computext	Z80	8	64/8	1	MSYS (CP/M)	A; B; F; P	350e
	IPT 002	Triton gmk	Z80	8	16–64/8	1	monitor	A; B	19.9e
	Minimod	Medicor	U 880 (Z80)	8	32–64/32	1	MSYS (CP/M komp.)	A; B	410e
	MOBI–X	Datakoord	8085	8	2	1	adatrögzítési	A	19e
	Multi Center	Műszertechn. gmk	Z80	8	256	8	MP/M	A; B; F; P	600–1600e
	NEZ 215	MTA KFKI		8	64/8	1			
	Primo	Microkey iKft.	U 880 (Z80)	8	16–48/16	1	monitor	A; B	15–24e
	Procem 16	SZKI		16	1024–4096	16	RSX–11	B; F	
	Professor	Comproject gmk	M68000	16	256–16384/ 16–32	T	UNIX; OASIS; CP/M–68K	A; B; P; C	3000e
	Prolocon D2	Vilati	8085	8	64/24	1	folyamatszab. (18)	TRANSIT–85 +saját (19)	80e
	Proper–16W/ESZ 1833	SZKI	8088	16	32/48	1	Propos–16	B; F; P	900e
	SAMDS	MMG	8085	8	64	1	FDOS (CP/M komp.)	A; B; P; PLM	450e
	TM 16	Műszertechn. gmk	M68000	16	256–1024	8	TRSDOS; MSYS; CP/M–68K	A; B; F; P	1400e
	Transmic 16	Műszertechn. gmk	M68000	16	256–1024/ .	8	CP/M–68K	A; B; F; P C nyelv (26)	800e
	TRDS	Kontakta	8085	8	64	1	TRDS; IFDS; CP/M	A; B;	500e
	TV Computer	Videoton	U 880 (Z80)	8	32–64/8	1	monitor	A; B	16e
	VM 02	MTA SZTAKI	U 8001 (Z8001)	16	128–256	1	képfeldolgozó (21)		
	Volán	Volán Elektronika	Z80	8	64	1	adatrögzítési		
	VT 16	Videoton	8088+Z80	16	256	1	CP/M; CP/M–86	A; B; C; F; P	599e
	VT 32	Videoton	M68000	16	512–2048	T	SOS (UNIX)	A; B; F; P	

	(1)	(2)	(3)		(4)	(5)	(6)	(7)	(8)
NDK (13)	16 bites	Robotron	U 8000 (Z8000)	16	32/2	1	fejlesztő	A; B	
	A 5510	Robotron	U 880 (Z80)	8	64	1	CP/M	grafikai	
	HC 900	Microel. Mühlhausen	U 880 (Z80)	8	32/8	1	monitor	A; B	1,5–2e márka
	R 1715	Robotron	U 880 (Z80)	8	64/8	1	CP/M	A; B; P; PLM	
	Z 9001	Robotron	U 880 (Z80)	8	16/12	1	monitor	A; B	1,5–2e
Románia (14)	DAF 2015	Feper	8080	8		1	terminál		
	M216	ICE–Felix	8086; 8080	16	128–1024/32	1	SFDX (ISIS); CP/M	A; B; F; P	
	Prae 1000	Cluj	8080	8		1	monitor		
	Prim XX	IPA	8080	8			folyamatirányítási		
Szovjetunió (15)	Agat		K588VS2+ K588VU2	8		1	CP/M	A; B; F; P	3e rubel
	DVK–2M			8	64	T			
	Elektronika 100–25	VUM Kijev		16	256	T	PDP komp.	több	
	Elektronika BK 0010	Moszkva	KR580IK80A	8	16–32	1	monitor	A; B	0,8–2e
	Elektronika DZ 28	Szvetlana Leningrád	KR580IK80A	8	16–32	1	monitor	A; B	0,8–2e
	Elektronika 79	VUM Kijev		16		T	fejlesztő	több (27)	
	Elektronika ...	VUM Kijev		16	4096	T	PDP–11/23 PLUS komp.	több	
	Elektronika 60–1	VUM Kijev		16	256–1024	T	PDP–11/23 komp.	B	
	Iszkra 2106		KR580IK80A	8	4–16	1	könyvelői (23)		
	Iszkra 250		K1810NV86	16	64–256/40	1	MS–DOS	IBM PC komp.	
	Iszkra 555		K589IK02	16	32/4	1	könyvelői		
	Neva 501	Leningrád	KR580IK80A	8	4–32/4	1	könyvelői		
	SZM 1210						DOS RV		
	SZM 1410			16		T	PDP–11 komp.		
	SZM 1420			16	4096	T	Rafos; Fobos	több	
	SZM 1600			16	64	1	DIAMS; DOS–RV	több	
	V 7		MCY 7846 (8048)	8	16/8	1	monitor	B	
	VEF Mikro 1021	VEF Riga	KR580IK80A	8	16–64	1	monitor	A; B	0,8–2e

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ES 1055 M AS PART OF THE VIDEOTON NETWORK SYSTEM

Budapest SZAMITASTECHNIKA in Hungarian Apr 85 pp 1, 4

[Article by A. K.: "ES 1055M in the VNS Net: Being Realized in the OKKFT"]

[Text] With high quality services and realized on an ESR [Uniform Computer Technology System] and domestic device base, the enterprise production guidance system being developed at Videoton is the largest in size. The on-line system containing a large computer and being realized with a distributed database and network is being financed from central resources within the framework of the program titled Research and Development on Computer Technology Systems, a part of the National Medium-Range Research and Development Plan (OKKFT). Work on the computer network base of the VNS (Videoton Network System) will continue this year.

The VNS is an organic part of the enterprise information system and of the complete reconstruction of the Videoton production guidance system. At present one can find six ES 1010M nodal computers in the network built up among the sites located at a distance from one another. There are five data processing computers in the network. An important recent event was the switch from the ES 1012 machines to the ES 1011 machines. There are two each of these in Szekesfehervar and Budapest and one in Tab.

Insertion of an ES 1055M large computer system into the net means substantial progress. (This was the result of joint developmental work with the SZAMALK [Computer Technology Applications Enterprise].) According to the program this will be completed in the middle of the year. Enterprise-level demanding tasks (need calculations, production scheduling) will run on the large ESR machine. By April 45 VDT type terminals will be connected to the net which operates on good quality leased Postal lines. The large system will not only facilitate access; at the time of the switch they will develop the existing software systems further so that they can handle changes quickly. It will thus be possible for production guidance to react more flexibly to the effects of the environment. Any organizational unit in the net will be able to make use of the ES 1055 as need arises. Because of the characteristics of the data transmission lines the databases on the large computer will be updated every 24 hours, outside of peak use times.

The system software on the ES 1055 makes possible virtual machine management. All the programs (about 1,000) written for it with the aid of an earlier computer system simulation program of Videoton can be used in the new system without rewriting. Additional system software tools are the OS/VSI operating system, the IDMS database manager, the SHADOW II remote data processing monitor and program development tools (GUTS).

In 1985 an additional ES 1011 machine will be linked into the net at each of two sites and preparations are being made to put an ES 1011 into operation at an additional factory unit. Then there will be a computer which can be linked into the net at every site of Videoton. By the end of 1985 or beginning of 1986 there will be 100-120 terminals in the net, which is planned to have 15 nodes in its final version. In the next plan period the network will be controlled by new net control system software which they are developing themselves. With this, and simultaneously with the appearance of new subsystems, it will be necessary to standardize access procedures (for example, there is need for a uniform menu system).

So development of the distributed production guidance system built for the Videoton net--as an industrial enterprise model system--is approaching its final phase. In the meantime the developmental experts have acquired experiences which can be used elsewhere as well. Here are a few of the most important:

--A network data processing mode requires attitudes and methods which differ from earlier ones--from planning to everyday operation;

--Building from the top down is most useful in planning the project; building from the bottom up is most useful in realization (the small computer subsystems were born first);

--A consistent implementation of the system attitude is an especially great task in executing such a complex program;

--An outside software system development enterprise with appropriate experience and expertise can offer effective aid in the event of very tight time limits.

The following factors can be considered of great significance in realizing the program:

--The computer network came into being in accordance with uniform principles;

--The computers are domestic and ESR products; the magnetic disk background store capacity of the large machine is 2,400 M bytes;

--The applications software (warehouse inventory, commercial information system, product registry and design documentation, system to record shipping orders, system handling technological documentation) was developed domestically;

--The network resources can be distributed among the functional units of Videoton in accordance with their circumscribed tasks;

--Making use of the resources, the functional units can solve their own tasks independently, communicating with the other units;

--The subsystems can be introduced elsewhere as well; Videoton can distribute the applications software together with the computers.

The network system will be developed further from 1986 to 1990. Based on additional technical possibilities (local network) they plan to automate office work at the enterprise. This means that a multiple level network will be developed and they must solve the linkage of different types of networks. The planned new network control software will make it possible to abandon separate communications processors and link different types of terminals into the net. The modern remote data processing system may serve as a basis for a further development and spread of integrated manufacturing systems, linking them to the higher levels of the enterprise guidance system.

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ES 1045 AT DANUBIAN IRON WORKS

Budapest SZAMITASTECHNIKA in Hungarian Mar 85 p 1

[Article by Attila Kovacs: "ES 1045 at Danubian Iron Works: The Largest ESR System in Industry"]

[Text] The computer technology development which began at the Danubian Iron Works 10 years ago and which has been followed in a deliberate and planned way since has reached a significant station. In January of this year they successfully placed into operation the Soviet ES 1045 computer system. Conditions for production guidance and for creating a database serving the entire enterprise were established with use of the largest domestic industrial enterprise ESR [Uniform Computer Technology System] system. The modern conversational data processing realized with the aid of outlying terminals further increases operativeness and economic efficiency in production and provides constant and direct access for leaders and at the plant level alike. It aids a more flexible adjustment to the quickly changing, ramified user needs and significantly accelerates the ability of the enterprise to react to external factors.

The capacity of the central unit of the ES 1045 is 4 M bytes, with two block multiplex and four byte multiplex channels. Four ES 5066 Soviet disk drive units, with a capacity of 100 M bytes each, are connected to the magnetic disk control unit. Using units from the already existing systems (ES 1040 and ES 1035) the hardware configuration has been supplemented with the following units: four 60 M byte (BASF) drives through a separate disk control; four ES 5017 magnetic tape drive units (with control); two ES 7033 (Polish) line printers; an ES 8371 Tele-JS multiplexer (three VT52104 so-called leader terminals are connected to this in the first step); and an ES 7912 group display control unit (at present three ES 7917 so-called developmental purpose terminals are connected to this). The large system is located in the same room with the ES 1035 computer so that they can function as background computers for each other.

ELORG, which put the ES 1045 into operation, regards it as a reference system.

The following basic software aids efficient operation: an OS/VSI based operating system; an IDMS 5.5 version database management system; a SHADOW II remote data processing monitor (virtual access mode); and a GUTS

conversational program development system. The ES 1045 will gradually take over from the batch processing ES 1035 all the contract management work of the enterprise, raising it to a higher level. "Live" operation of a real time manufacture tracking system for the steel works was realized in the first quarter of the year, by linking the ES 1045 and the earlier acquired two processor SM-52 computer, with six VT52104 terminals connected to the SM-52, and with continual updating of the files. Following this the contract record keeping system will be gradually placed on a database basis. Remote data processing and the building of the database are being realized within the framework of the so-called Acelinform [Steelinform] joint association in cooperation with the MTA SZTAKI [Computer Technology and Automation Research Institute of the Hungarian Academy of Sciences] and the NME KFFK [expansion unknown] in Dunaujvaros.

We believe that with its new resources the Danubian Iron Works will be able to adjust to a greater degree to the changing internal and external economic conditions. The experience and expertise acquired thus far and the experts who have been summoned--and who, it is hoped, will be available in sufficient numbers in a short time--are a guarantee of this.

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INTERNATIONAL CONTACTS OF IRON INDUSTRY RESEARCH INSTITUTE

Budapest MUSZAKI ELET in Hungarian 13 Apr 85 p 7

[Article by Zsuzsa Ban: "From Institute to Entrepreneur: Buying and Selling Licenses"]

[Text] Since January 1984 the research and development base of Hungarian metallurgy, VASKUT [Iron Industry Research Institute], has been operating as an independent enterprise. The institute has a respected international reputation and provides a production value of 500 million. It is no accident that it is profitable as an enterprise--it has developed close contacts with its domestic and foreign partners.

We talked with Gabor Szonyi, deputy chief engineer for technological development at the largest partner of VASKUT, the Lenin Metallurgical Works.

"For a long time we have worked with magnificent harmony with the experts of VASKUT and both of us continue to profit from the cooperation. The essential human factor in this friendship was the onetime director Professor Vero. He trained an entire generation of metallurgical experts and thus the members of this generation understand one another even from half words. The common theoretical base is very important in research and development. Formerly the LKM [Lenin Metallurgical Works] regularly gave commissions to VASKUT to work out research and development themes. And the people in Budapest also participated in developing applications techniques. Several years ago we signed a cooperation contract which is not limited to this or that theme but rather represents regular consultation, advice and expert work in very many questions. For example, a powder injection system was part of the national medium-range research program. The LKM has successfully treated several tens of thousands of tons of steel with the jointly designed equipment which is suitable for the treatment of steels and guarantees exceptional quality. Together with VASKUT and the Debrecen Rolling Bearing Factory we are studying the life expectancy of ball bearing steels. And we have entered into a new large undertaking also--we want to create a steel consulting service. A computerized databank could substantially facilitate the management of the enterprises."

"A Canadian firm is interested in procedures and equipment jointly developed with the LKM," we had learned at the Fehervar Street center of VASKUT from

chief engineer Dr Illes Kocso and from Kalman Heredi, chief of the marketing department. They have already received a commission to rework the plans in accordance with American standards. "According to the plans the Canadian entrepreneur will promote the Hungarian process in the United States and Brazil. The activity of the institute had long ago outgrown scientific research and development in the narrower sense. At first the experimental manufacture satisfied the needs of the Hungarian instrument industry, communications engineering and electronics only with small series, but then the volumes became larger and larger. In one decade we became a strong medium enterprise; relying on significant technical-scientific expertise we were capable of developing--and manufacturing--our quality product families. It is characteristic of the constant renewal that each year 20-25 percent of our products are the result of new development. Our products represent significant material value--the 500 workers of VASKUT produce a production value of more than half a billion forints--a decade ago this did not reach even 50 million. The profit is more than 10 percent of the production value.

"A situational advantage makes possible the achievements of VASKUT, which exceed the industry average. As a research institute we maintained close contacts with foreign enterprises and institutes. We cooperated with the best in the profession in more than 100 research themes--for example, with Yercontrillet, which unites the Swedish metallurgical machine manufacturers, with the American U.S. Steel and with the KHD, the largest ore mining and metallurgical enterprise of the FRG. We worked with the Austrian Voest-Alpine firm in research on desulfurizing materials. All this means that we know the newest achievements and what know-how, license or equipment to buy to develop our own technology.

"About 25 percent of our sales receipts comes from sale and foreign introduction of licenses and know-how. We market our processes in such a way as to undertake the foreign introduction as well, right up until the experimental manufacture reaches the level guaranteed by us. In cooperation with the Energy Management Institute we developed the cement analysis device that determines the amount of free calcium oxide which was purchased by the KHD in the FRG. And they are not just using it in their own factory but rather--as a significant exporter to developed countries--they are offering their manufacturing lines on third markets, supplemented with our equipment. Using the process to analyse fly ash, slag and cement and with the equipment being made on the basis of a Hungarian patent, one can determine in 8 minutes, instead of 28 days, for what purpose one can use the material freshly issuing from the furnace. We have sold to the French firm of Hermann Moritz the license for a fast analysis device for metallurgical slag, operating on the thermometric principle.

"Three years ago we purchased the Swiss know-how and equipment for large scale manufacture of samarium cobalt magnetic parts. We can already produce such special magnets under laboratory conditions.

"In essence this Swiss know-how is a sort of powder metallurgy. With it we are preparing to manufacture alnico-ticonal powder metallurgy magnets as well. Indeed, we can also make small magnets which cannot be made in a practical way by casting, which is a significant step forward in domestic microelectronics

parts manufacture. I might give another example. We purchased from the British Oxygen Company the know-how for a plasma cutting process which is already being used successfully in the LKM, in the Chipping Machine Factory in Jaszbereny and in the Danube Iron Works."

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RARE EARTH METAL MAGNETS AT IRON INDUSTRY RESEARCH INSTITUTE

Budapest SZAMITASTECHNIKA in Hungarian Mar 85 p 14

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

[Text] Manufacture of valuable, rare earth metal cobalt magnets has begun at the Iron Industry Research Institute. Up to now the material, called Rekoma, which is used primarily in the instruments industry could be obtained only from import. Hereafter, thanks to a new technology, it will be produced from domestic sources and VASKUT [the Iron Industry Research Institute] recently signed an agreement to export a significant volume of Rekoma to Switzerland, through a foreign trade intermediary. The most important property of Rekoma is that it develops extraordinarily great magnetic force even in small quantities. It is used primarily in miniaturized measuring instruments and in computers but it also has a significant role in watch manufacture. VASKUT developed domestic production of it--on the basis of a license purchased from the Swiss firm Brown Bowery Co.--in cooperation with Videoton, the Ganz Instrument Works and the Instrument Industry Enterprise. Since then the domestic manufacturers not only are able to produce the product according to the license but also--as a result of further research--have developed a material with a magnetic force 20-30 percent greater than the original. It is in part thanks to this that the Western firm which sold the license has itself proposed to purchase the material. With domestic production of Rekoma it will be possible to save import worth about 15-20 million forints per year. According to the agreements there are prospects for export receipts of more than 3 million forints as well.

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