JPRS 83620

6 June 1983

East Europe Report

SCIENTIFIC AFFAIRS

No. 779

FBIS FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service, Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semi-monthly by the National Technical Information Service, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

JPRS 83620

6 June 1983

East Europe Report

SCIENTIFIC AFFAIRS

No. 779

FBIS FOREIGN BROADCAST INFORMATION SERVICE

JPRS REPORTS

Japan Report
Korean Affairs Report
Southeast Asia Report
Mongolia Report

Near East/South Asia Report
Sub-Saharan Africa Report
West Europe Report
West Europe Report: Science and Technology
Latin America Report

USSR

Political and Sociological Affairs
Problems of the Far East
Science and Technology Policy
Sociological Studies
Translations from KOMMUNIST
USA: Economics, Politics, Ideology
World Economy and International Relations
Agriculture
Construction and Related Industries
Consumer Goods and Domestic Trade
Economic Affairs
Energy
Human Resources
International Economic Relations
Transportation

Physics and Mathmetics
Space
Space Biology and Aerospace Medicine
Military Affairs
Chemistry
Cybernetics, Computers and Automation Technology
Earth Sciences
Electronics and Electrical Engineering
Engineering and Equipment
Machine Tools and Metal-Working Equipment
Life Sciences: Biomedical and Behavioral Sciences
Life Sciences: Effects of Nonionizing Electromagnetic Radiation
Materials Science and Metallurgy
Meteorology and Hydrology

EASTERN EUROPE

Political, Sociological and Military Affairs
Scientific Affairs

Economic and Industrial Affairs

CHINA

Political, Sociological and Military Affairs
Economic Affairs
Science and Technology

RED FLAG
Agriculture
Plant and Installation Data

WORLDWIDE

Telecommunications Policy, Research and Development
Nuclear Development and Proliferation

Environmental Quality
Epidemiology

FBIS DAILY REPORT

China
Soviet Union
South Asia
Asia and Pacific

Eastern Europe
Western Europe
Latin America
Middle East and Africa

To order, see inside front cover

JPRS 83620

6 June 1983

EAST EUROPE REPORT

SCIENTIFIC AFFAIRS

No. 779

CONTENTS

ROBOTS, COMPUTERS USING U.S. PATENTS SOLD TO GDR, USSR

Paris ZERO UN INFORMATIQUE HEBDO in French 25 Apr 83 p 61

[Article by Josep Rajman: "One Billion Dollars for Bulgarian Data-Processing Exports"]

[Text] It was after World War II that Bulgaria began production of typewriters (Maritsa), calculators (Elka), cash registers and other office machines, in which projects for electronic components were later incorporated. After the creation of the committee representing the various countries in the CEMA for the production of data-processing equipment in 1969, and the planning of the Ryad project, Bulgaria launched production in collaboration with other Eastern countries, mainly the Soviet Union, but also such other countries as Japan, Italy, Germany, and, of course, France.

Peripheral computers and other office machines are produced at 14 factories. Between 1970 and 1979, production was multiplied by 23, and each year, the exports in this sector bring in more than $1 billion. Exports and related services are entirely in the hands of the centralized Isotimpex administration. Foreign sales are made, of course, to the CEMA-member nations, but also to Austria, Germany, Italy, Great Britain, France, the United States, India and Turkey.

Since 1979, Bulgaria has produced industrial robots, making use of Japanese experience and American patents for the purpose. These products are then marketed by the hundreds in the GDR, Czechoslovakia, and the Soviet Union.

The greater part of the Bulgarian equipment, the main items of which we have listed below, are compatible with IBM products. The prefix ES [Unified System] means that the product has been tested and included in the Unified System catalogue.

Central Units

Model ES 1035 is the most recent system in the ES 2 series, which roughly corresponds in power to the range of the IBM 370. The Bulgarian ES 1020 and ES 1022 systems are roughly the equivalent of an IBM 360. The ES 1036 computer offers a central memory with a capacity of up to four Mo, as well as a potential memory of 16 Mo. A wide range of peripherals can be connected to it, including the ES 7267 disc unit with a capacity of 200 Mo.

The Isot 1016 C minicomputer, based on the ES 2104 C microprocessor (central memory with a capacity of 28 to 128 Ko), with real time and time-sharing potential, was exhibited for the first time at Interbiro 1982 in Zagreb.

The Isot 10260 microcomputer has an RAM memory of 19 Ko and a ROM memory of 12 Ko. It is a modular terminal which can accommodate up to four terminals. It is based on the CM 601 microprocessor (the equivalent of the motorola MC 6800).

The Estel is a teleprocessing monitor which can be connected to all of the Ryad program computers, from the Bulgarian model ES 1022 to the top of the Soviet ES 1050 range.

The ES 9003 is a data acquisition system to which from four to 16 terminals with 1,000 character screens can be linked.

The Isot 102 C is a word-processing machine with a central memory of 48 Ko with a 1920-character screen. It can also be connected to a printer and a 400 Ko diskette unit.

Peripherals

The Isot 5007 C magnetic tape unit offers a density of 32 or 63 bits per millimeter and operates at a speed of 2 meters per second. It is designed for use with mini- or microcomputers for the acquisition, storage or transfer of numerical data (transfer speed of 63 or 126 Kbps).

The ES 5074 and ES 5088 diskette units record only on one side. They have capacities of up to 400 and 109 Ko, respectively, and are compatible with the Shugart SA 800 and SA 400, as well as the Scotch 7040 (744) disks.

All Disk Units Are Compatible With IBM Equipment

Bulgarian Model	ES 5053	ES 5261	ES 5269	ES 5266	ES 5267
IBM Equivalent	IBM 1311	2314	5440	3330	3330-11
Capacity (in Mo)	7.25	29/58	2.45/5	100	200
Number of Plates	6/10	11/20	1/2	12/20	12/20
Number of 8-bit bytes per inch	1,100	2,200	2,200	4,400	4,400

5157
CSO: 3519/474

OFFICIAL SPEAKS ON RESEARCH WORK AT MICROBIOLOGY INSTITUTE

Sofia VECHERNI NOVINI in Bulgarian 16 Apr 83 p 6

[Interview with Candidate of Chemical Sciences Engr Kostadin Ganchev, deputy director of Microbiology Institute, Bulgarian Academy of Sciences, by Banya Bizheva of VECHERNI NOVINI, date and place not specified: "Microbiology and Intensification"]

[Text] Valuable Biotechnological Products with Great Economic Effect

Original Development Work by Bulgarian Microbiologists

Exploitation Problem

Production of Enzymes

In recent years a concept has gained wide acceptance. It is biotechnology. Statistics show that 80 percent of its achievements are made by microbiologists. What is the contribution of Bulgarian microbiologists in this respect and to the solution of certain urgent problems? Our representative visited Candidate of Chemical Sciences Engr Kostadin Ganchev, deputy director of the Microbiology Institute of the Bulgarian Academy of Sciences.

[Question] Comrade Ganchev, what are the basic directions in the work of the Microbiology Institute?

[Answer] In 1979 at the national conference held in Sofia, Comrade Todor Zhivkov, after making a detailed critical analysis of our institute's work, defined some of the basic directions of our work. First, it must become a scientific bulwark of industrial microbiology. And second, the advanced achievements in this field must be more and more successfully studied, transferred and adapted. World trends in microbiology are also directions in the work of our institute. They are oriented towards the key problems of feeding mankind, providing health services, protecting the environment and, not least, developing new energy sources.

[Question] In recent years biotechnology has been first in development as compared with other sectors of our economy. What part have the microbiologists of the BAN [Bulgarian Academy of Sciences] institute had in this process?

[Answer] Yes, indeed. For some time now, biotechnology has been developing intensively as a result of the achievements of certain fundamental sciences. Our institute has made a number of achievements involving the production of biologically active substances. For example, in 1982 we developed a technique for the production of gibberellic acid. This is a biostimulator that is used in plant growing. This preparation was tested in grape and tomato production for 3 years. We achieved high results. The grape yield was increased from 15 to 30 percent and the ripening time was shortened by 80 days. In addition, a seedless grape with up to 25 percent greater sugar content was obtained. On the basis of these data, the economic effect alone from the areas planted to dessert-type grapes has been estimated at over 3 million leva annually. This preparation was also tested in the production of hothouse and early field tomatoes. The yield was increased 45 percent and the economic effect amounted to 3.5 million leva. But to our great surprise and regret, the leadership of NAPS [National Agroindustrial Union] still is not inclined towards the employment of this product in agriculture. There are no problems in organizing the production of gibberellic acid and one needs do nothing but place an order with the plant in Peshtera. Moreover, this product can, according to worldwide information, be used to raise many other crops.

[Question] What achievement of the institute would you single out as most significant?

[Answer] For the first time in world practice, a staff under the direction of Corresponding Member Aleksandur Toshkov, Senior Science Associate Mekhmed Shebanov and Prof Stoyko Nedyalkov has created an original preparation for use against (varoatoz) [possibly varoatosis], a problem worldwide in beekeeping practice, and has developed an original method for using it. I should like to explain this disease briefly. It is caused by an acarus (species of tick), which destroys bee families on a mass scale. The preparation is given in the form of sugar syrups and enters the bees' lymph in a concentration safe for them but dangerous for the acarus. Tests over many years and the model introduction of it in 1982 have shown that it improves the overall state of health of the bees in 98-99 percent of the cases of the destructive parasite that causes the disease. It has been established that the preparation is absolutely harmless for bees and that the content thereof in bee products is in safe residual concentrations. On the basis of these results we drew up documents, approved by Farmakhim, and presented them to the drug commission of the Veterinary Medicine NPO [Scientific Production Trust]. But up to this moment the Veterinary Medicine NPO has not considered them. I just want to point out that an effect of about 1 million leva was obtained from the use of this preparation last year and that of similar preparations hitherto used ours is the cheapest.

[Question] The Microbiology Institute runs the coordination program for the production and use of enzyme preparations in various sectors of the national economy. Other than as directors, do you participate in any way in the fulfillment of these programs?

[Answer] Our institute participates in the development of techniques for the production of a number of enzymes with important practical applications. Our staff developed and introduced in 1982 a technique for the production of

glucoamylase concentrate, an enzyme which right up till now is imported for the production of glucose from starch. With this preparation the processes are intensified and, at the same time, material and energy inputs are reduced. We are working on the production of thermostable alpha-amylase, an enzyme which is used in the so-called first enzyme block for the full processing of corn products. We are conducting experiments on the production of an interesting enzyme which converts glucose to glucose-fructose syrups. They are about 1.7 times sweeter than ordinary sugar and will find application in the food industry as sweeteners. We have had great success in converting milk into cheese with an enzyme created under the guidance of Prof Lyubomir Nachev. Production of this enzyme will begin this year at Economic Chemical Combine in Botevgrad.

[Question] A preparation with antiviral action was invented in January 1983. The Microbiology Institute took part in its development. What would you like to say about it?

[Answer] I want to begin with the fact that about 5 million man-hours are lost annually because of influenza. A very urgent problem for our country and the world. The antiviral preparation was created by the staff of the Pharmaceutical Faculty of the Medical Academy and was tested at our institute. Its antiflu spectrum of action is very great, with low toxicity. Its production will begin after it is tested under clinical conditions. In this area we are working on a broad front. Jointly with the Antibiotics Institute in Razgrad, we are developing a new form of drug to control women's reproductive processes. The preparation was tested at the Human Physiology Institute under the guidance of Prof Veselin Petkov and shows very good results. We are testing as well some other preparations with antifungal and hormonelike action, also jointly with the Antibiotics Institute at Razgrad.

6474
CSO: 2202/12

STAGNATING DEMAND FOR ROBOTS NOTED ; CURE PROPOSED

[Editorial Report] AU291156--Bratislava PRAVDA in Slovak on 28 April 1983 on page 1 carries a 1,700-word leading article by Jan Pirc, leading secretary of the East Slovak CPSL Regional Committee, entitled "Let Us Not Let Up in the Embarked Upon Robotization."

Pirc says that because the increase in employment by 150,000 people in the current 5-year plan (compared with 280,000 people in the 1976-1980 period) will not suffice to meet the Czechoslovak industry's manpower needs, the introduction of robots and automatic handling machines [manipulatory] will be necessary. The East Slovak party organization is said to be devoting systematic attention to their development. In cooperation with the respective ministries, in 1980 it introduced serial manufacture of robots and automatic handling machines in the Vihorlat enterprise in Snina and in the Industrial Automation Works [ZPA] in Presov, and currently it is supervising the construction of a new robot production plant in the ZPA Presov enterprise and the construction of a large production hall for accessory hydraulic equipment in the Barejov Heavy Engineering Works. Other producers of robots and automatic handling machines reportedly include the Heavy Engineering Works in Kosice and Detva, the SEZ Horice plant, the Bratislava Automobile Works and the Strojsmalt plant in Medzev.

Pirc says: "We might say that the first stage of developing and manufacturing this complex technology is behind us. Yet there is a second stage, equally complicated, which will probably demand of our regional party committee even greater support and assistance than the previous one. Although today it is no longer necessary to convince anyone of the importance of this production for our national economy because the robotization of industry has become the program of the Seventh and of the Eighth 5-Year plans (which is in the stage of preparation) and is in the focus of attention of ministers' councils, the sectors' target programs and of CEMA's standing work groups and sections, nevertheless, the initially rapid development of robotization has begun to slow down in the last few months, owing to the production enterprises' lack of interest in robots. Their directors justify their lack of interest, above all, by arguing that the robots and automatic handling machines are too expensive and that they are still machines of a handling rather than of a production nature. In short, when facing the decision whether to buy a robot or a lathe, they opt for the lathe or some other machine tool. I personally am afraid that their attitude will not change even when the producers offer them,

for example, a welding robot--a machine which has an immediate impact on labor productivity. Even then they will find it too expensive."

According to Pirc, the present high prices of CSSR-manufactured robots are a result of the expensive components and represent only a temporary problem. Cooperation with other socialist countries should not only speed up the introduction of robots but should also make them cheaper.

Nevertheless, it would be wrong to sit with one's arms folded and wait for the prices to come down. Such an "ostrichlike behavior" would only "damage our national economy and delay the planned robotization of industry," Pirc says. Therefore, he recommends that Czechoslovakia follow the example of the USSR where the State Committee for Science and Technology, the State Planning Committee and the Ministry of Finance proposed that all savings resulting from the application of robots should be used for social funds, especially the enterprises' development fund. During his visit last year to East Slovakia G. I. Markov, deputy chairman of the USSR Council of Ministers and chairman of the USSR State Committee for Science and Technology, reportedly confided to Pirc that immediately after this measure became effective "the interest in using robots increased because the organization now realizes that this will not only reduce the labor intensiveness but at the same time increase the social fund."

Pirc says: "Today we lack more and more palpably a similar preferential treatment [for robot users] because, on the one hand, unsaleable robots and automatic handling machines keep accumulating while, on the other hand, we suffer from a shortage of manpower. Correctly set material incentives in the embarked-upon stage of robotization must simply pave the way ahead. Otherwise we will consciously slow down the planned onset of the scientific-technical revolution."

In conclusion, Pirc stresses that--although "effective economic levers" for speeding up the robotization of the Czechoslovak industry have not as yet been found--the East Slovak regional party organization will continue to strive to ensure that designated workplaces in the region install the planned number of industrial robots and automatic handling machines.

CSO: 2402/50

BRIEFS

CSSR-USSR COMPUTER TRADE--Between 1981 and 1985 the Soviets will export to the CSSR computer technology worth Kcs 2.84 billion. The Czech exports of computer technology to the USSR will amount to Kcs 5.68 billion. Until the end of 1983 Czechoslovakia imports from the USSR will mainly consist of the EC 1033 computers, as well as delivery of first three EC 1045 computer systems. By 1985 a higher number of EC 1045 computers will be delivered. The EC 1033 computers will be manufactured in Kazan, USSR, until the end of 1983. It production is being surpassed by the EC 1045 computer. Most of Czechoslovakia's computer technology exports come from the ZAVT [Automation and Computer Technology Plants], such as photoelectric puhch tapes and discs, card punch units Aritma, digigraphs, electronic keyboards, plotters and other types of computer hardware. [Prague VYBER INFORMACI Z ORGANIZACNI A VYPOCENTNI TECHNIKY in Czech No 1, 83 p 36]

NEW SATELLITE HARDWARE PREPARED--Czechoslovakia has been successfully developing small-size satellites which will continue the space research initiated by the first Czechoslovak satellite Magion. The new subsatellites from the Geophysical and Astronomical Institute, CSAV [Czechoslovak Academy of Sciences], together with the Soviet Prognoz satellites will collect new data on near interplanetary space. Czech astronomers have been preparing new equipment for the space station Salyut 7. The electrophotometry apparatus FO-2 and the lense for X-ray telescope R 7 - 4 M belong to the most elaborate experimental equipment prepared by Czecholsovak science for space research. Another unique contribution is the blood sample set used by astronauts in weightlessness. [Prague LIDOVA DEMOKRACIE in Czech 19 May 83 p 4]

CSO: 2402/51

COMPUTER, MICROELECTRONICS DEVELOPMENT OUTLINED

Call for Digital Microelectronics

Warsaw RZECZPOSPOLITA in Polish 20 Mar 83 p 4

[Interview with Dr of Engineering Bronislaw Piwowar, chief director of the Institute of Mathematical Machines in Warsaw by Jozef Sniecinski: "In the Direction of Microelectronics--Our Hope is in Digital Technology"]

[Text] Computerization is becoming one of the main sources of civilizing, scientific and economic progress on earth. An interview with the chief director of the Institute of Mathematical Machines in Warsaw, Dr Eng Bronislaw Piwowar, makes reference to the state of computer technology in Poland.

[Question] The Institute of Mathematical Machines [IMM], which you have directed for only a short time, was once an oasis of talent and applied ideas. From a scientific center of the Polish Academy of Sciences in the 1960's, the center was transformed into a scientific research institute, becoming an industrial facility. For the first years of its operation, the IMM yielded such applications as: the DW-3 printer, known even outside the country, a computer drum memory in the software area and many others. For several years now, something not very good has been going on; as far as we know, there has not been a single application at the industrial level.

[Answer] Yes, that is true. For about 5 or 6 years, the institute has not made any serious contribution to the Polish computer industry. Drum memories were the last success; they were applied to multiserial production and were successfully exported to the GDR. Equally successful was the institute's DW-3 printer, which you have already mentioned. Even after many modifications, it is still being manufactured as before. Until 1982, the institute's personnel lived, above all, from the government problem fund; that is, from the state coffers. This problem touched on computer systems of automation and measurements. The institute received money for this research. Another financial source was the small contracts with various institutes and factories, which, I will say frankly, did not always result in a contribution, in association with which their economic strength was relatively not great.

[Question] Consequently, what ways out do you see? Will the Polish computer and microelectronics industry recover?

[Answer] I think that I will answer your question in a twofold fashion. I think that we should concern ourselves with industrial computer science; that is, to conduct such scientific research, which will have a chance for industrial application. Irrespective thereof, yet somewhat related to it, we should equally turn our thoughts to export production, inasmuch as this is a rather expensive and capital-intensive industry which will go nowhere without export. Otherwise, it would be necessary to eliminate this industry.

[Question] But isn't there some other way to work with microelectronic technology than just in industry?

[Answer] Oh, yes. Sir, this is the crux of the matter. There was once a proposal that "Poland" microelectronics ought to serve electronics equipment of general use. This was a serious mistake. All leading electronics firms in the world are concentrating on the processing and production of difficult subassemblies for the computer industry in their scientific-technical and economic policy despite the technical requirements. They make the assumption that if they succeed in producing and applying these subassemblies, they will somehow realize automatically a supply of microelectronics for general usage equipment. Digital technology does not enter into electronics equipment. It is used in the telecommunications of fourth generation televisions, built with programmed microprocessors and the like. In other words, all electronics equipment will evolve in the direction of digital technology application, microprocessors and memory. Therefore, Polish industry ought to concern itself with digital microelectronics. And returning to your question on an expensive way out, I think that it is necessary to break the erroneous rule once and for all that either we get a license from the West or it is nothing. That would be the main reason for the degradation of our electronics industry. I especially insist that we propose and introduce our own processes. After all, we have many industrial engineers. And finally, the last issue is the close relation and cooperation with the Soviet microelectronics industry, which can boast a series of very successful microprocessors.

[Question] That is to say that you are once again returning to licensing?

[Answer] Not so much to licensing as to scientific-technological cooperation. One flowline for microprocessor production costs 10-15 million dollars. And we have no chance of purchasing it. But within the International Commission for Computer Affairs of CEMA, there is a special agency which handles technical equipment. I think that Poland should have its own aktiv there.

[Question] Participation in such a commission will not relieve us of the need, however, for possessing the money for research development in Poland. Where do you plan, as the institute's director, to get this money?

[Answer] I will get this money from industry. More than 70 percent of this year's contracts are industrial contracts. Presently, we are at the stage of applying a microprocessor system for design assistance. This is a method which serves to mobilize microcomputers. We intend to export them and make

money this way. We will also apply two types of memory, operating on the basis of a contract, to the Warsaw Microcomputer Factory. This will bring in some more money. Someone could ask, where we will get the subassemblies. We will import them from the Soviet Union.

[Question] Where do you get the money for basic research? There has not been a single microprocessor for so many years. We are 10-15 years behind in the field of microelectronics. As a matter of fact, efforts are commissioned by the factories; it is their trade.

[Answer] You are dead wrong. I do not at all think that the processing of certain equipment for factory use is a trade. If I work out a laser printer, then that is an applied scientific-research effort and not a primitive trade. Industrial computer factories turn to the institute for complex processes--production technology together with the entire instrumentation--and we do this.

[Question] Does bankruptcy threaten you this year?

[Answer] If this threatened me, then I would submit my resignation today. I had a complete plan for the institute for this year already in December of last year.

Series Production of Microcomputers

Olsztyn GAZETA OLSZTYNSKA in Polish 3 Mar 83 p 4

[Article by PAP: "Serial Production Touches Microcomputers"]

[Text] The Krakow Factory of Measuring Devices announced the beginning of serial production of high quality microcomputers on the 2nd of this month. They are considerably smaller than the popular "Odra"; they can be used in the administration of an enterprise and in the control of production and technical processes. The first minicomputers have already been bought by the Wola Steel Mill, the Transportation Equipment Plant in Mielec and the "Predom-Lucznik" in Radom. The Krakow factory will produce 250 units of the microcomputers by the end of the year. Subassemblies from the Soviet Union, Bulgaria and Hungary have been installed in them. The coercive announcement by the U.S. not to import the computers has not had any influence on the class of microcomputers, but has permitted an economization of more than 200,000 dollars.

National Statistical Computer System

Warsaw WIADOMOSCI STATYSTYCZNE in Polish No 1, Jan 83 pp 40-44

[Article by Master Engineer Stanislaw Jaskolski of the Administration for Mechanization and Automation of Statistical Studies: "Trends in Raising the Efficiency of the Data Processing System"]

[Text] Published in July 1981, "Trends of Economic Reform" defined the functions of the Main Statistical Office (GUS) as the national center of socio-economic information, which accumulates and processes both statistical and prognostic information. They also pointed to a requirement to arrange the excessively extensive and disintegrated departmental information system and to define properly the scope and type of information which economic units are required to provide central and local agencies. From the above statements, and also because of fundamental changes in the central administration (a different role for ministries, particularly in relation to state enterprises) and a new manual on state statistics, it has resulted that:

--the GUS will prepare a considerable number of so-called departmental reports, being simultaneously required to supply suitable information to economic and departmental units;

--requirements, which are difficult to determine at the top and which are changing over time, of an enlarged group of consumers of statistical information need to focus considerably greater attention on safeguarding the capacity to adapt state statistical computerized information to these changes. This is especially important during the current economic difficulties with the increasing demand for urgent information which is collected in the monthly and quarterly cycle.

The need to strengthen local state statistical agencies results from the first of the above statements (together with computerized cells). It is difficult to imagine that GUS had the role of "national center for socio-economic information" at only one central level.

The second statement results in the need to introduce essential and qualitative changes in the methods of unit data collection and transmission, in the designing of computerized-information systems and in providing access to information for consumers, notwithstanding the considerably more extensive than ever application of the newest achievements in computer science to shorten process times and improve their quality.

The implementation of data processing in the GUS computer science center in 1983 will take place under particularly difficult conditions. It needs to be frankly stated that all statistical data processing will not be decisively modernized in the next 3-4 years in order to achieve the chance to react considerably more quickly to changes in consumers' requirements and also to facilitate their access to the stores of statistical information by using the data banks together with teleprocessing. Under these conditions, we have to search particularly energetically for all reserves in raising the efficiency of organizing data circulation and processing.

Current Conditions for Implementing Computer Efforts in State Statistics

Almost all statistical reports processed in the network of UGS computer centers (OE and OI) [electronics and computerized-information centers] come

through the provincial statistical offices. As a result of the statistical processing plan for 1982, the following number of reports move through the Provincial Office for Statistics (WUS):

Reports	Number of Report Types	Number of Reports in '000s
General	152	7,700
Monthly	31	3,722
Quarterly	31	993
Semiannual	13	589
Annual	77	2,396

The documentation circulation, into which source materials (reports), files on magnetic tapes and tabular messages are entered, is differentiated. This differentiation results from the size of the processed file, the degree of difficulty of data control and the processing time-limit. The organizational equivalent of this differentiation are two methods of processing, adopted into the network of GUS computer centers:

--centralized processing, consisting of the allocation of the entirety of the efforts to one center (which processes both the design and software),

--decentralized processing, where the design center processes solely the file tables, concentrating on the processing of the remaining functions (the preparation of carriers, control of provincial files and provincial tables) for the other centers.

Two variants become evident beyond this: the realization of the entirety of the task exclusively on the basis of computer centers [OE GUS] and the realization that they are growing significantly in a totally decentralized way. This realization initiates the utilization of all centers in the GUS network; i.e., the equal utilization of the minicomputers of the OI [computerized-information centers] of the WUS.

The circulation of materials (documentation, reports, printouts with mistakes, magnetic tapes and tabular messages) is graphically presented in schematics 1 and 2.

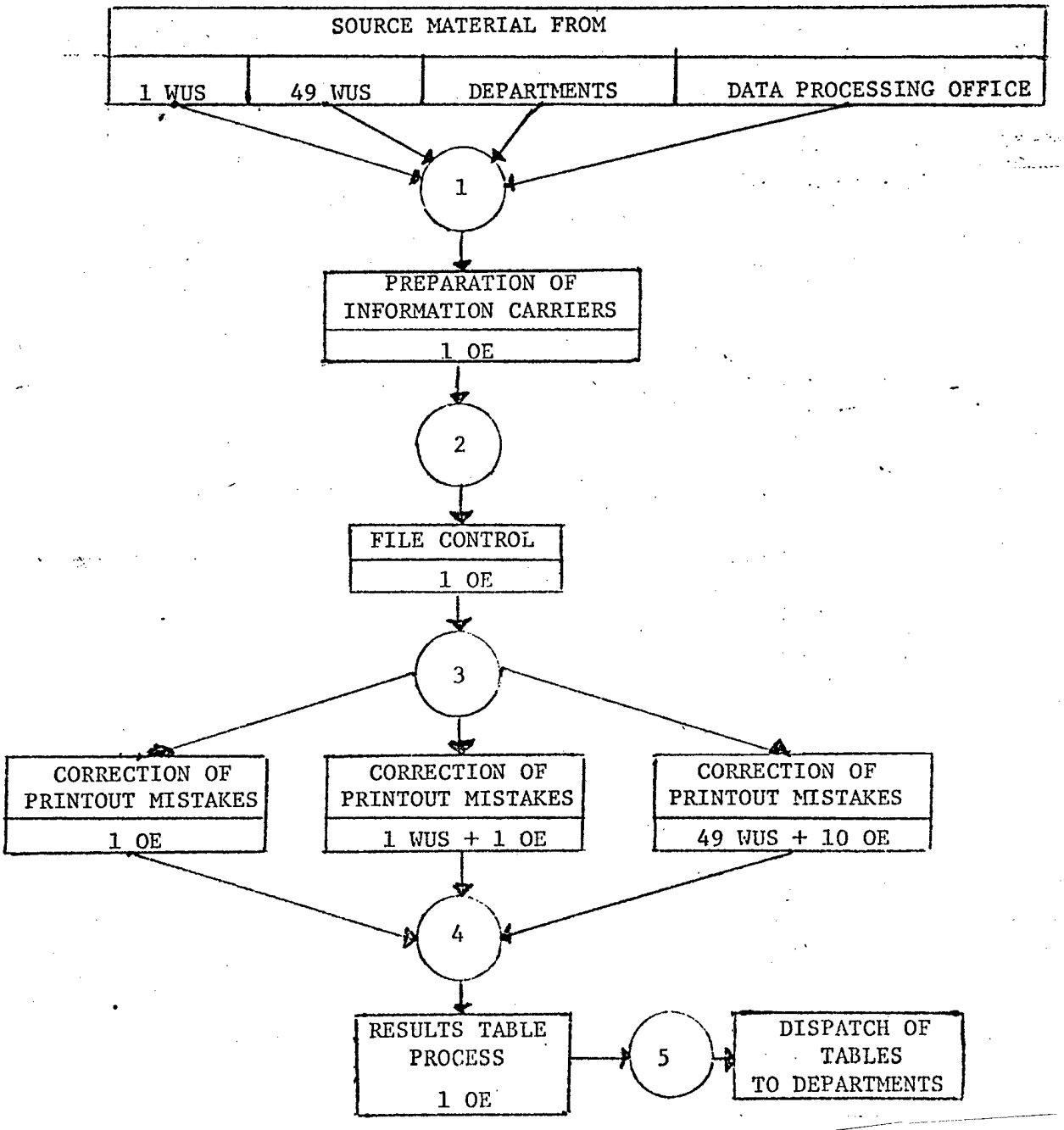
The merits and shortcomings of both methods are as follows:

Decentralization is supported by the creation of files near the place of run-off of the reports (the creation of information carriers, file control and the correction of erroneous printouts). This would permit the rapid control of the file by the WUS (there, where the WUS is equipped with minicomputers or where there is an OE [electronics center]).

The arguments against decentralization are of two kinds:

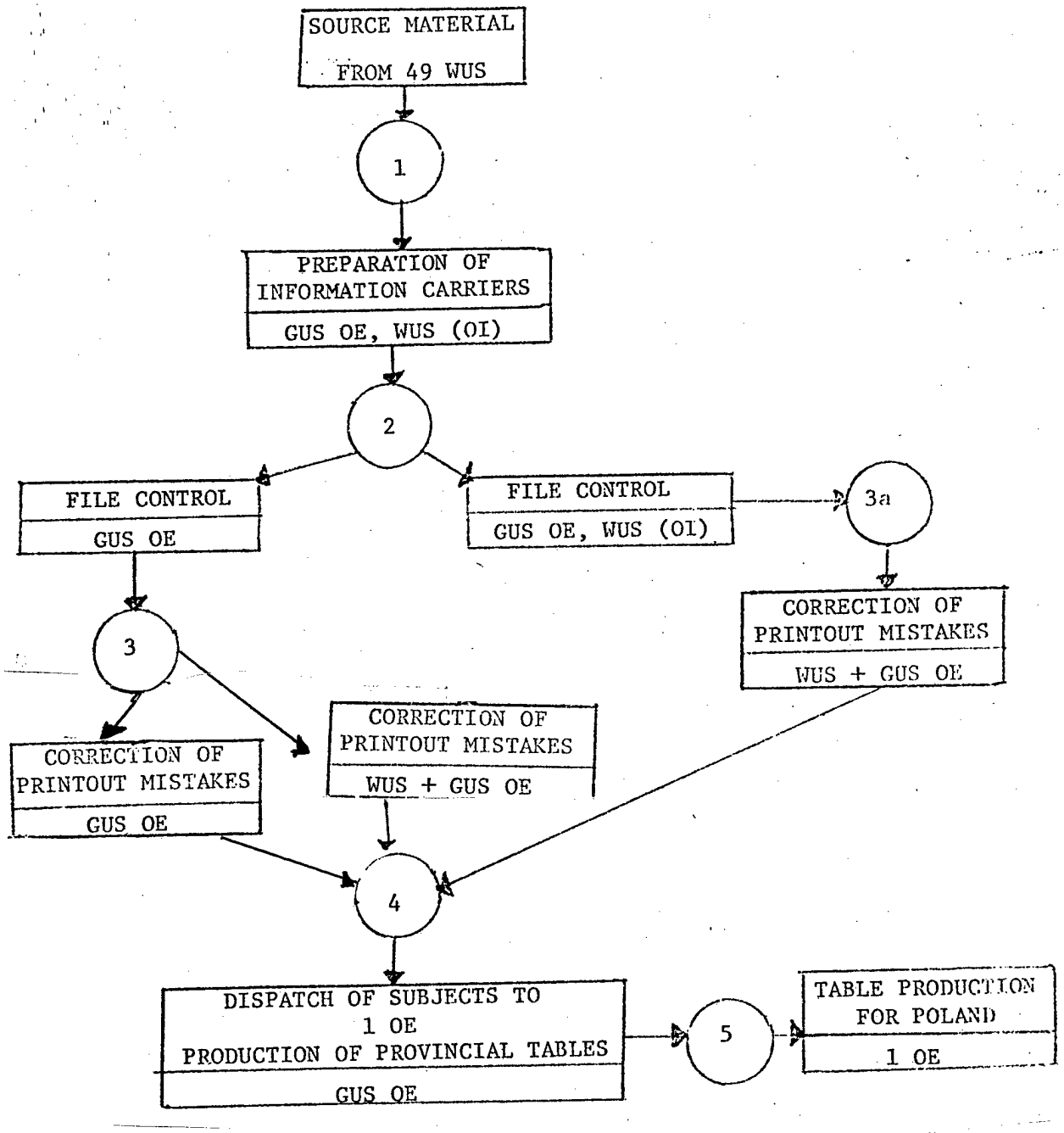
a) the arrangements of central systems in the majority of cases are directed to the requirements of the WUS and would have to make changes consisting of:

THE CIRCULATION OF MATERIALS
FOR CENTRALLY PROCESSED SUBJECTS



SCHEMATIC 1

THE CIRCULATION OF MATERIALS
FOR DECENTRALLY PROCESSED SUBJECTS
(WITH WUS OI PARTICIPATION)



SCHEMATIC 2

--the introduction of control tables, which research completeness on the provincial level, of other elements, which allow the protection of such control,

--the introduction of provincial tables into the systems, which would secure the requirements of the WUS.

b) organizational matters:

--an increase in the number of implemented systems in the GUS OEs and WUS OIs causes the accumulation of efforts in technical and control actions. The problem thus arises of enlarging the appointment of services, mentioned above,

--a deepening of the difficulty of duplicating a considerable number of documents--with a shortage of duplicating equipment in the centers and the significant increase in the expenditure of paper for utilized documentation,

--the expenditure and "migration" of a very large number of magnetic tapes.

There is a network of computer centers (GUS OEs and WUS IOs) to service the provincial statistical centers and the GUS. The layout of the centers' network is uneven throughout the country and their technical equipment is characterized by a lack of standardization in machinery.

The technical equipment of 38 centers has the following types of equipment:

--10 centers equipped with the Odra 1305 computer and Mera 9150 minicomputer

--12 centers equipped with the Mera 9150 minicomputer

--6 centers equipped with the Cellatron minicomputer

--9 centers equipped with the Mira 306 minicomputer

--1 center equipped with the Mera 9150 minicomputer and the Log Abax (Data Processing Office [ZTS] in Warsaw).

DIAGRAM OF PROVINCIAL STATISTICAL OFFICES SERVED BY GUS ELECTRONICS CENTERS

PROVINCES WITHOUT ELECTRONICS AND COMPUTER CENTERS: _____

LOCATIONS OF GUS ELECTRONICS CENTERS: ⓞ

(According to Their State in 1988)

Up to the present, 13 WUS's do not have any center, either OE or OI, at their location; these are the following provincial offices for statistics [WUS]:

Zamosc
Tarnobrzeg
Chelm
Biala Podlaska
Siedlce
Suwalki
Gorzow Wielkopolski
Lomza
Ostrolek
Plock
Piotrkow Trybunalski
Torun
Leszno

The layout of the centers and their technical equipment characterize and simultaneously force specific territorial systems to serve the WUS. The need for constant communications is very much a part of these systems, as well as the input and dispatch of various materials from the WUS to the centers and from the centers to the WUS or GUS.

The current technical base of the GUS, irrespective of the fact that it has remained for recent years partly incomplete, is extremely inadequate both because of the amount of the equipment and because of the equipment's quality and newness. Although machines, installed in GUS computer centers, are utilized more effectively than in many other centers, difficulties still occur in data processing and in the holding to indispensable time-limits. This limits processed information and leads to the incomplete utilization of the existing data base.

Among other things, the state of equipment at the GUS electronics center in Warsaw hinders the proper performance of its tasks and is the reason for the application of obsolete methods to statistical data processing; it particularly impedes the development of very modern computerized-information systems, especially data banks, and also hinders in allowing departments and selected external users in offices to have direct access to information files. It also has to be stressed that great equipment failure causes difficulties in the processing organization. Beyond this, obsolete equipment impedes the creation of new information archives and the easy selected access to the files.

The shortage of centers in all provinces and the technical equipping of existing centers, inadequate for their needs, causes fundamental difficulties with the centralized organization of statistical research and the development of data transmission.

Trends and Conditions for Improving Statistical Data Processing

Under new economic conditions, the state computerized-information section for statistics must presently process considerably more material, shorten the time-limits for studies and apply new methods and technology in order to permit a more rapid reaction to the changing requirements the consumers of statistical information. The issue is how to achieve these goals under conditions of very great investment constraints, practically without imports from the capitalist countries and with significant problems in personnel. To these problems belong:

--equipping all WUS with indispensable hardware,

--standardizing WUS equipment,

--continuing proper course and workshop schooling,

--applying data transmission based on nationwide equipment, foremost in the links between OEs and OIs,

--increasing the dispatch efficiency of materials from OIs to OEs and back in the traditional way,

--modernizing OE equipment, supplementing the configuration of computers.

Beyond the mentioned actions, there is a number of other possibilities, the implementation of which will raise to a considerable degree the efficiency of processing statistical data.

For this purpose, a special analysis was conducted of the reasons for the failure to keep processing time-limits and the resulting errors, taking into consideration the course of statistical studies done in the fourth quarter of 1982, in order to prepare on this basis the proposals regarding the improvement in efficiency of data processing in 1983.

The results of this analysis show that difficulties in adhering to the time-limits and in transfering correctly the completed tables occurred at all stages of collecting, transfering and processing.

Here we have to mention:

--inaccurate system arrangement,

--errors in programing,

--unpunctual flow and poor quality of reports,

--equipment failures,

--errors in the preparation of carriers,

--great difficulty in material dispatching,

--disagreements in provincial and summary table results,

--difficulties in setting material completeness.

In considering the above facts, it is necessary to focus greater attention on the problems of:

--planning the entire process of collecting, controlling and processing results,

--decentralizing further the processes to bring together the preparation of carriers and control of files to reports collection locations and to better satisfy WUS requirements,

--designing and programing processes,

--disciplining technologically and organizationally the entire network of computer centers.

Later, the basic trends of current actions will be briefly discussed. These refer to the following problems:

designing and programing,

processing organization and technology,

the development of a technical base and the application of new technology.

Scope of Designing and Programing

1. Include the designer in the detailed efforts already at the analysis stage of statistical research, which should have favorable influence on the designing of contents forms. Presently, the approval form being used is far from real requirements and often leads to a formal confirmation of the form makeup with the requirements contained in Decision No 8 of the GUS president of 31 May 1976.

2. It is necessary to aim for the maximum utilization of all technical resources in the network in preparing the systems, especially processed in a decentralized manner. This puts added responsibility on the system designer.

3. As the opportunity arises, it is necessary to aim for the further specialization of the centers in the design of specific topical groups (demography, industry, etc).

4. Evaluate the most important projects with random control of projects selected by chance.

5. Evaluate whether all designer-programatic efforts have been implemented; also evaluate the total processing cycle for selected systems with the participation of employees and technological services.

6. Universally use standardized designer-programatic and technological documentation.

Processing Organization and Technology

1. Further decentralize larger processes. The pros and cons of decentralized data processing are generally known. In making a decision on the decentralization of processes under current conditions, it is chiefly necessary to consider the requirements of the provincial statistical offices, focusing attention also on the executive opportunities of GUS OEs and WUS OIs, especially regarding the chance to prepare machine information carriers and the opportunity to clear totally the data files of errors.

2. It is necessary to apply maximum control and achieve 100 percent control of prepared carriers in the programs of preparing machine information carriers.

3. Shorten certain processes of the processing cycle through the limitation of the number of printouts with errors, which are sent to the WUS. The dispatch of only one printout to the WUS will result in the remaining printouts being explained at the GUS OEs.

4. The renewed control of files transmitted on magnetic tapes from WUS OI's to GUS OEs inasmuch as:

--it it not always possible to exercise complete control over minicomputers,

--files have to be controlled in accordance with the arrangements of the branch department in the preparation of tables for Poland.

5. The treatment of basic cases of provincial tables, prepared by WUS OIs on minicomputers, with incomplete control of the file as preliminary data. The adoption of such an arrangement allows:

--the earliest preparation of tables for WUS requirements than for all-Polish tables,

--the production of additional tables by WUS OI's which were not envisioned in the orders of the departments.

6. The close compliance of technological discipline, especially in:

--the absolute compliance in controlling the several stages of utilized documentation sent out by the designers to the departments of technology,

--excluding from any interpretation the data contained in source documents,

--the introduction of the requirement to explain with the system designer in technological departments all contradictions observed in utilized documentation or any other doubts which result during the system's implementation,

--the introduction of absolutely binding principles for dispatching through the system designer all kinds of information to all GUS centers, after having been informed by at least one center of a question of doubt referring to the new system (verbal explanations have to be confirmed by the designer in writing),

--the supervision that messages controlling processing efforts follow the correct route in the centers, quickly reach the interested organizational cells of the center and are analyzed before advancing them to the processing stage in relation to messages refering to the implementation of systems,

--the supervision that in newly applied systems, implemented in a decentralized manner, the repeated control of files, received from all computer centers in the center, which is processing all-Polish tables, be taken into consideration.

Development of a Technical Base and the Application of New Technologies

Despite the basic difficulties in acquiring new and better equipment, which would facilitate the execution of a qualitative change in data processing and access to the results, the continuation of developmental efforts in the areas listed below are envisioned.

1. Standardization of Equipment and the Development of WUS Computerized Centers

By 1985 inclusively, the standardization of the basic equipment of WUS computerized centers is planned; namely, the replacement of worn-out and systematically not well-fitting minicomputers, Celetrons and Meras 306, by multipositional data recorders.

Beginning in 1984, 3-4 operator positions and 1 character printer are to be installed in the offices for statistics in the remaining provinces. This equipment, by using a special minicomputer, will be linked for data transmission to recorders of the Mera 9150 operating in provincial offices for statistics or in GUS electronics centers adjoining the WUS. This will allow them to use the Mera 9150 system, installed in the GUS OEs or WUS OEs, in such a manner as if they had their own computer center. And in this case, the WUS in Lomza will be able to use the machines of the Mera 9150 in Bialymstok, while the WUS in Chelm and Zamosc will be able to use the Mera 9150 in the GUS OE and WUS in Lublin. This will allow the avoidance of bringing source materials to the OE or OI locations.

All provincial offices for statistics should be equipped thus by 1985 with the multipositional data recorders of the Mera 9150 or with devices permitting the direct remote access to these recorders.

2. Development of Data Transmission

There is a need to transmit data between electronics centers and also between electronics centers and provincial offices for statistics in processing statistical data, especially for all-Polish efforts. This transmission is currently realized by using regular or rail mail. This method of data transmission causes a considerable lengthening of the processing cycle and introduces a factor of uncertainty vis-a-vis the punctuality of data receipt.

In this situation, the Administration for Mechanization and Automatization of Statistical Processes decided to successfully introduce data transmissions between GUS computer centers beginning in 1982. It is planned to initiate in 1982 data transmission links for Warsaw-Bialystok and Radom-Kielce. By 1985, it is planned to initiate data transmission between all GUS OE's and certain WUS and GUS OE's. This should accelerate considerably and make more efficient the transmission of data files between computer centers.

Because of these executed measures, the effective speed of transmission and the analyses of the amounts of files, transmitted between the WUS in Bialystok

and the GUS OE in Warsaw, and the transmission of basic files from the WUS in Bialystok (about 60 million characters annually) will take 200 hours during the year, which means an average transmission taime of about 15-20 hours for 1 month.

The realization of data transmission is conditioned by the chance of purchasing a series of devices, made nationally, which complement both WUS OI's and GUS OE's. The most important devices are: communications controllers and line printers for the Mera 9150, modems 2400 and multiplexes for the Odra 1305 computer.

3. Development of GUS Electronics Centers

The adaptability of GUS electronics centers to increased tasks will, above all, move in the direction of complementing the utilized configurations of the Odra 1305 computers and, especially,:

--in equipping the operational memory with a capacity of a minimum of 128,000 words,

--in installing disc memories with a unite capactity of a minimum of 30 MB,

--in installing data transmission multiplexes,

--in installing CRT monitors and equipment of particular computer aggregates in the proper number of line printers.

Beyond this, an exchange is planned in 1983 and 1984 of already worn-out central units of the Odra 1305 in the GUS OE's in Katowice, Radom and Warsaw and the installation of a new Odra 1305 computer in the Olsztyn WUS.

4. Development of the GUS Electronics Center in Warsaw

The computer equipment, which presently makes up the GUS OE in Warsaw, not only has no chance of progressing data processing methods, but also creates a serious threat to the further use of old systems. This is caused by the system's obsolete equipment and its great deceptiveness.

The conclusion was drawn from a series of analyses of Warsaw's GUS OE requirements and the possibility of safeguarding them that it is not possible in the present situation to equip this center with computers, which give it greater opportunities to qualitatively change the methods and organization of data processing.

Focusing, however, attention on the need to support the further use of the data processing system from foreign trade and financial statistics, the requirement arises to install the newest, unfailing and best software computer of medium size (compatible with machines currently on hand) in Warsaw's GUS OE in 1983 but no later than 1984.

5. Other Developmental Processes

In 1978-1980, technical and utilization tests were conducted on the use of the Mera 9150 system as a terminal for remote processing with the Odra 1305 computer. General use of this operational procedure would allow access to the computer at the WUS, which do not have such a computer at their locations. This operational procedure is, in fact, applied to the usage at the WUS in Sieradz, which can use the computer at the GUS OE in Lodz. The general introduction of this operational procedure and cooperation between the OE and OI will be possible after equipping all GUS OEs with operating memories with a capacity of not less than 128,000 words, disc memories with greater unit capacity, type ICL scanners (imported from the capitalist countries) and Mera 9150 systems with communications equipment and line printers.

Successful experimental operations have also been conducted and applied to the use of Mera 100 appliances to increase the efficiency of statistical information which requires small and medium mechanization and the recording of data on a magnetic carrier (cassettes with magnetic tape). For this goal, a special symbolic language has been developed which increases the efficiency of the programing process. In certain centers, this language has been successfully introduced. Cassette tape can be used for data transmission to the Odra 1305 computer installed in the GUS OEs. The first results of technical and usage tests, conducted in the Wroclaw GUS OE with the cooperation of the WUS in Jelena Gora, Legnica and Walbrzych, will become available this year still.

12247
CSO: 2602/16

END