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16 May 1977

TRANSLATIONS ON EASTERN EUROPE

SCIENTIFIC AFFAIRS

No. 544

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TRANSLATIONS ON EASTERN EUROPE

SCIENTIFIC AFFAIRS

No. 544

CONTENTS PAGE

SOVIET INTEGRATED CIRCUITS SOLD IN BULGARIA

Sofia RADIO, TELEVIZIYA, ELEKTRONIKA in Bulgarian Vol 25 No 11, 1976 pp 31-32

[Article by D. Rachev: "Soviet Integrated Circuits"]

[Text] Recently many Soviet integrated circuits have been supplied for radio-parts stores and via departmental channels. Their great diversity prevents rapid familiarization with their functional classification unless the labeling system is known. This labeling reflects the relevant functional class or group, as well as the specific series of circuits, to which each integrated circuit belongs.

Classes show the character of the function performed -- amplifier (Y), oscillator (Г), converters (П). Each class contains within it individual groups conveying the more specialized purpose of the circuit -- sinusoidal amplifiers (YC), logic AND (LA) circuits (И(ЛИ)).

The conventional designation of a series generally contains four symbols, for example, K155. The letter K signifies that this series is intended for wider application (in the mass market, for household purposes). If this letter is absent, the series is suited for more special, official needs. The first digit characterizes the method of manufacture: 1, 5, 7 -- monolithic; 2, 4, 6, 8 -- hybrid; 3 -- other kinds. The last two digits give the serial number of the given series. For example, integrated circuit K2YC241 (series K224) has the following interpretation: consumer-good circuit (k), hybrid method of manufacture (2), sinusoidal signal amplifier (YC), series number 24, serial number in series 1. Sometimes a letter from A to Я is suffixed to a designation to characterize special electrical parameters, their tolerances, boundary conditions etc., differentiation of which is necessitated by inevitable deviations in the manufacturing process.

Integrated circuits of the following series are commonest:

Linear Circuits

K224 -- different stages of radio and TV sets, amplifiers;

K237 -- AM and FM portable and motor-vehicle sets, tape recorders;

K242 -- high-frequency and low-frequency stages of class IV radio receiver;

K101 -- switching of electrical signals;

K118, K122 - set of a-c amplifiers, cascode and differential amplifiers, video amplifiers;

K123 -- low-frequency preamplifiers with 30- to 500-fold amplification and frequency band of 200 Hz to 100 kHz;

K140 -- operational amplifiers;

K153 -- operational amplifiers with high gain factor;

K173 -- low-frequency amplifiers with 20- to 200-fold amplification, frequency band of 30 Hz to 200 kHz, output power of 0.5-1 W;

K119, K128 -- pulse amplifiers, multivibrators, flip-flops, inverters, coincidence circuits etc.;

K218, K228 -- linear amplifiers, comparison circuits, switching and decoding circuits.

Logic Circuits

Soviet industry produces diverse logic integrated circuits beginning with elementary NOR and NAND and ending with whole registers, adders, counters. This diversity encompasses series K104, K106, K113, K114, K121, K133, K147, K155, K172, K201, K202, K204, K205, K215, K217, K243.

The table gives the abbreviated designations of classes and groups included in the general designation of integrated circuits, whereby the functional purpose of the circuit is characterized.

TABLE

A) Клас		D) Група		G) Означение на съчетанието
B) Наименование	C) Означение	E) Наименование	F) Означение	
Усилватели	У 1	Синусоидални	С	УС
	2	За постоянен ток	Т	УТ
	3	Видеоусилватели	Б	УБ
	4	Импулсни	И	УИ
	5	Повторители	Э	УЭ
	6	Други	П	УП
Генератори	Г 7	Синусоидални	С	ГС
	8	Специална форма	Ф	ГФ
Преобразователи	П 9	На честота	С	ПС
	10	На фаза	Ф	ПФ
	11	На форма	М	ПМ
	12	На напрежение	Н	ПН
	13	Кодиращи	К	ПК
	14	Декодиращи	Д	ПД
	15	Други	П	ПП
Модулатори	М 16	Амплитудни	А	МА
	17	Честотни	С	МС
	18	Фазови	Ф	МФ
	19	Импулсни	И	МИ
	20	Други	П	МП
Детектори	Д 21	Амплитудни	А	ДА
	22	Честотни	С	ДС
	23	Фазови	Ф	ДФ
	24	Импулсни	И	ДИ
	25	Други	П	ДП
Тригери	Т 26	С броячен вход	С	ТС
	27	С отделно пускане	Р	ТР
	28	С комбинирано пускане	К	ТК
	29	На Шмит	Ш	ТШ
	30	Динамични	Д	ТД
Електронни ключове	К 31	Транзисторни	Т	КТ
	32	Диодни	Д	КД
	33	Оптоелектронни	Э	КЭ
	34	Други	П	КП
Филтри	Ф 35	Високочестотни	В	ФВ
	36	Нискочестотни	Н	ФН
	37	Лентови	Л	ФЛ
	38	Заграждащи	Г	ФГ
	39	Изглаждащи	С	ФС

[Key on next page]

[Table continued]

Key:

A. Class

B. Name

1. Amplifiers
7. Oscillators
9. Converters
16. Modulators
21. Detectors
26. Flip-flops
31. Electronic switches
35. Filters

C. Designation

D. Group

E. Name

1. Sinusoidal
2. d-c
3. Video amplifiers
4. Pulse amplifiers
5. Repeaters
6. Miscellaneous
7. Sinusoidal
8. Special form
9. Frequency converters
10. Phase converters
11. Shape converters
12. Voltage converters
13. Coding converters
14. Decoding converters
15. Miscellaneous
16. Amplitude modulators
17. Frequency modulators
18. Phase modulators
19. Pulse modulators
20. Miscellaneous
21. Amplitude detectors
22. Frequency detectors
23. Phase detectors
24. Pulse detectors
25. Miscellaneous
26. Complementing flip-flops
27. with individual actuation
28. with combined actuation
29. Schmitt trigger circuits
30. Dynamic flip-flops
31. Transistor
32. Diode
33. Optoelectronic
34. Miscellaneous
35. High-frequency
36. Low-frequency
37. Band filters
38. Band-rejection filters
39. Smoothing filters

F. Designation

G. Designation of combination

TABLE (continued)

A) Клас			D) Група		G) Означение на съчетанието
B) Наименование	C) Означение		E) Наименование	F) Означение	
Закъснителни линии	Ш	1	Схемни	С	ШС
		2	Други	П	ШП
Логически схеми	Л	3	Схеми И	И	ЛИ
		4	Схеми ИЛИ	Л	ЛЛ
		5	Схеми НЕ	Н	ЛН
		6	Схеми И-НЕ/ИЛИ-НЕ	Б	ЛБ
		7	Схеми И-ИЛИ	С	ЛС
		8	Схеми И-ИЛИ-НЕ	Р	ЛР
		9	Други	П	ЛП
Запомнящи устройства	Я	10	На магнитни слоеве	Л	ЯЛ
		11	Матрици	М	ЯМ
		12	Други	П	ЯП
Елементи на аритметически и дискретни устройства	И	13	Регистри	Р	ИР
		14	Суматори	С	ИС
		15	Полусуматори	Л	ИЛ
		16	Броячи	Е	ИЕ
		17	Шифратори	Ш	ИШ
		18	Дешифратори	Д	ИД
		19	Комбинирани	К	ИК
		20	Други	П	ИП
Набори от елементи	Н	21	Резистори	С	НС
		22	Кондензатори	Е	НЕ
		23	Диоди	Д	НД
		24	Транзистори	Т	НТ
		25	Комбинирани	К	НК
Схеми за селекция и сравнение	С	26	Амплитудни	А	СА
		27	Времении	В	СВ
		28	Честотни	С	СС
		29	Фазови	Ф	СФ
Многофункционални схеми	Ж	30	Аналогови	А	ЖА
		31	Импулсни	И	ЖИ
		32	Логически	Л	ЖЛ
		33	Аналогово-импулсни	Е	ЖЕ
		34	Аналогово-логически	В	ЖВ
		35	Импулсно-логически	Г	ЖГ
		36	Аналогово-логическо-импулсни	К	ЖК

[Key on next page]

Key (continued):

A. Class

B. Name

1. Delay lines
3. Logic circuits
10. Storage units
13. Elements of arithmetic and discrete units
21. Sets of elements
26. Selection and comparison circuits
30. Multifunctional circuits

C. Designation

D. Group

E. Name

1. Circuit delay lines
2. Miscellaneous
3. AND circuits
4. OR circuits
5. NOT circuits
6. AND-NOT/OR-NOT circuits
7. AND-OR circuits
8. AND-OR-NOT circuits
9. Miscellaneous
10. Magnetic-layer storage
11. Matrices
12. Miscellaneous
13. Registers
14. Adders
15. Half adders
16. Counters
17. Coders
18. Decoders
19. Combined elements
20. Miscellaneous
21. Resistors
22. Capacitors
23. Diodes
24. Transistors
25. Combined sets
26. Amplitude
27. Time
28. Frequency
29. Phase
30. Analog
31. Pulse
32. Logic
33. Analog-pulse
34. Analog-logic
35. Pulse-logic
36. Analog-logic-pulse

F. Designation

G. Designation of combination

6474
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SEMINAR FOCUSES ON CORRECT USAGE OF AGRICULTURAL CHEMICALS

Prague ZEMEDELSKE NOVINY in Czech 28 Mar 77 p 2

[Article by (hou): "Hygienists Intervene"]

[Text] As experts' calculations prove, more than one fifth of plants produced by agriculture will go to waste. They will be destroyed by plant and animal pests everywhere where no chemicals were used for the protection of plants. Approximately these words were used at the beginning of the statement by Eng O. Ballon of the Kraj Hygiene Station Hradec Kralove at a recent seminar whose topic was "The Problems of Hygiene in Agricultural Large-Scale Production." As the very title reveals this was a rather unusual undertaking--the first of this kind in the East Bohemia Kraj and perhaps in our entire republic. The seminar was organized by the Okres Institute of National Health and the Okres Agricultural Administration at Chrudim.

We had the opportunity to learn many interesting things from the most competent experts and long-time workers in this field. Apart from specific reports dealing, for example, with the possibilities of infection transmitted by animals or effective prevention, some by no means less important questions were discussed such as air and water pollution and so on.

Some findings verified by practice were also put on the agenda. Their common denominator can be formulated approximately as follows: the present stage of the scientific and technological development provides us with a very effective weapon and it depends on us whether we shall manage to use it to our benefit. There exist today a large number of inorganic fertilizers, highly efficient pesticides and herbicides, regulators of nutrients' supply whose importance is difficult to express in terms of money. Nevertheless, if handled by an uninitiated man who has not been professionally training, their effect is not only reduced, but may be even harmful. At best, a wrong application results in the loss of the chemical itself and wasting its effective components. It may, however, result also in a rapid decline in the crops or unpleasant taste and odor of the plant in question, and eventually also in an undesirable change in the structure of nutrients of the respective food item. In the extreme case, it we make a thorough analysis, inexpert care of young plants may bring about a biological activation of toxic substances in the body of the plant.

Year after year, the hygienists are forced to cope with situations arising from undesirable effects of pesticides sprayed from the planes on cultivated plants. Most frequently it is the important dipyridyl derivative known under its commercial name of Reg one which, as a total herbicide, has a wide range of application. We can encounter the opposite effect also, when the parathion preparations are improperly handled. The laboratory tests of a sample of "adversely affected" salad have revealed that the nutritive protein and carbohydrate content as well as Vitamin C were reduced.

We frequently regard the alarmed warnings of hygienists as an unnecessary exaggeration of the respective problem. We overlook, however, the important fact that man is the final link in the food processing chain. He receives nutritive substances, but he can accumulate also undesirable, toxic substances in his body. Not only from food. The by-products of various chemical processes, waste materials from industry and agricultural enterprises released into rivers and by other means freely into the environment continue to cause big damage. The results of many years' research, valuable raw materials, active substances, perfected technology thus become, in the hands of an irresponsible worker, a damaging boomerang. Instead of being useful to the society, they may, when improperly handled, bring more harm than benefit.

The joint meeting of hygienists and agricultural experts paid adequate attention also to the frequently unnecessary occupational diseases of agricultural workers--zoonosis. Every feeder and attendant of cattle, milk cows and calves certainly is familiar with the trichophytosis skin disease which was formerly called herpes. He knows also the principles of prevention. And yet, many people not only contracted this disease, but even became its carriers, although the observance of strict hygiene would have prevented it.

There still exists ignorance about the manifestation of rabies in animals, first stage of which is marked by depression and melancholy. It changes into restlessness which gradually grows into rage, until the last stage, the paralysis, occurs. The treacherousness of an infectious disease--transmitable through bite or scratch even to man--lies precisely in the varying manifestations of this disease mentioned above. Thus occasionally we come across strange situations. One of them was the visit of a sick stag to the outdoor area of a large cow barn where it let itself to be easily caught. Enthusiasm of tourists was evoked when they met a strange fox in the Krkonose mountains. It was so gently that many of the passerby had a picture taken of themselves patting this otherwise shy animal. This charming story, however, was followed by dozens of hours of examination of all those who came into contact with this animal infected by the rabies and who erroneously assumed that they were dealing with an exceptionally tamed specimen.

Hygiene in agriculture does not only mean prevention and the observance of sanitary measures in the place of work. Hygiene covers also the above mentioned handling of chemicals and the protection of the environment in general. We do not have to go far to find examples. It is enough to look around the agricultural buildings and to study the analyses of the drinking water. The defects which appear minor at the first glance can eventually cause big damage in the future. It may involve a faulty liquid manure pit, cracks in the concrete silo pit, imprudent location of large-scale pig feeding stations close to the residential buildings or on hills. The result is a large number of complaints, appeals and penalizations.

Therefore it became a rule that the workers at hygiene stations get regularly acquainted with plans of large-scale agricultural production, are present at the approval of new building permits and justly call for the correction of all shortcomings that could be even indirectly harmful to human health. In our own interest, we should cooperate with them more readily.

10501
CSO: 2402

ROSTER OF CANDIDATES OF SCIENCES PUBLISHED

Budapest MAGYAR TUDOMANY in Hungarian No 3, 1977 pp 235-237

[News from the Committee of Scientific Qualification. New Candidates of Sciences, December 1976]

[Text] The Committee of Scientific Qualification declared

Karoly Akos, candidate of psychological sciences, on the basis of his studies in the field of "Origin of Consciousness and Psychochronography," embodied in theses;

Piroska Anderlik, candidate of medical sciences, on the basis of her dissertation entitled "Consequences of the Factors Affecting the Lymphoid System in Mice Experiments";

Ferenc Bakonyi, candidate of biological sciences, on the basis of his dissertation entitled "Strength Standards of 7 to 18 Year Old Schoolboys and Means of Raising Them in Physical Education Courses";

Tamas Banfi, candidate of economic sciences, on the basis of his dissertation entitled "Foreign-Currency Exchange-Rate Theory and Foreign-Currency Exchange-Rate Policy";

Pal Bencsath, candidate of medical sciences, on the basis of his dissertation entitled "Neural Regulation of the Renal Sodium Voiding";

Sandor Benedek, candidate of philosophical sciences, on the basis of his dissertation entitled "Changes in the Social Structure of the Working Class in the Course of the Building of Developed Socialism";

Ahmed Mohamed Farhan, candidate of economic sciences, on the basis of his dissertation entitled "Some Aspects of the Economic and Social Development of the Popular Democratic Republic of Yemen, With Special Emphasis on Economic Policy and Foreign-Trade Relationships";

Geza Fogarasi, candidate of chemical sciences, on the basis of his dissertation entitled "Investigation of the Molecular Structure of Cyclic Methyloxanes";

Lorand Frater, candidate of medical sciences, on the basis of his dissertation entitled "Cardiac Volume Determination by X-Ray Methods in Clinical Practice";

Jozsef Galambos, candidate of medical sciences, on the basis of his dissertation entitled "The Cubital Tunnel Syndrome and the Dupuytren Contractura";

Hosny Mohamed Gamal El-Din, candidate of agricultural sciences, on the basis of his dissertation entitled "Activity of Cellular Microorganisms in Some Hungarian Soils";

Peter Gaszner, candidate of medical sciences, on the basis of his dissertation entitled "Modified Procedures in the Atropin Coma Therapy";

Pal Golobics, candidate of economic sciences, on the basis of his dissertation entitled "Manufacturing Cooperation Between the People's Republic of Hungary and the Soviet Union as a Primary Factor in the Development of the Hungarian Machine-Manufacturing Industry";

Anna Gulyas, candidate of biological sciences, on the basis of her dissertation entitled "Investigation of Some Features of the Plant Ribosomes";

Gaber Mohamed Hassib, candidate of physical sciences, on the basis of his dissertation entitled "Application of Dielectric Tracers in Random Neutron Dosimetry";

Pal Hencsei, candidate of chemical sciences, on the basis of his dissertation entitled "Investigation of the Molecular Structure of Phenoxysilanes and Phenol Ethers";

Jeno Hirschberg, candidate of medical sciences, on the basis of his dissertation entitled "Investigation of Infantile Sound-Forming Disturbances, Stridor, and Cough Sound, With Special Emphasis on the Diagnostic Evaluation of the Acoustical Analysis";

Eva Ivan, candidate of medical sciences, on the basis of her dissertation entitled "Effectiveness of Chemotherapeutical Drugs in Patients Afflicted With Acute Infections of the Urinary Tract";

Ferenc Joo, candidate of biological sciences, on the basis of his dissertation entitled "The Importance of Some Enzymes in the Regulation of the Permeability of the Cerebral Capillaries";

Mrs Sandor Juhasz Nagy, candidate of medical sciences, on the basis of her dissertation entitled "Application of the Experimental Study of the External Secretion of the Pancreas in the Hygienic Evaluation of Bioactive Substances";

Tibor Kakosy, candidate of medical sciences, on the basis of his dissertation entitled "Data on the Pathogenesis, Clinical Aspects, and Prevention of Circulatory Disorders and Bone-Joint Changes of the Upper Extremity Caused by Local Vibrations";

Istvan Kausz, candidate of medical sciences, on the basis of his dissertation entitled "Consequential Liver-Function Disturbances in Experimental and Clinical Ileus";

Jozsef Kecskes, candidate of medical sciences, on the basis of his dissertation entitled "Some Features of the Acid-Base Balance of Newborn Infants and Factors Affecting It During the First Weeks Following Birth";

Elek Kisida, candidate of medical sciences, on the basis of his dissertation entitled "Clinical and Experimental Study of the Pathophysiology of Vascular Ileuses";

Geza Konczos, candidate of physical sciences, on the basis of his dissertation — defended in the German Democratic Republic — entitled "The Kinetics of Carbon Introduction and Removal in Methane-Hydrogen Mixtures in the Case of Alpha-Iron";

Sandor Kormos, candidate of philosophical sciences, on the basis of his dissertation entitled "Scientific Guidance of Intellectual Culture in Socialism";

Magda Kemenes (Mrs Krasztev), candidate of agricultural sciences, on the basis of her dissertation entitled "Penicillum-Caused Rotting of Apples and Browning of the Skin Under Refrigerated Storage Conditions";

Bela Lantos, candidate of technical sciences, on the basis of his dissertation entitled "Functional Analysis in Management Technology";

Tihamer Lonyai, candidate of medical sciences, on the basis of his dissertation entitled "Theoretical and Practical Aspects of the Implantation of Artificial He rt Valves";

Istvan Lukovics, candidate of biological sciences, on the basis of his dissertation entitled "Search for Quantitative Correlations Among the Molecules Affecting the Nervous System Between Chemical Structure and the Indices of Biological Activity";

Elsayed Fahmy Ali Mashaal, candidate of agricultural sciences, on the basis of his dissertation entitled "Role of the Non-Smutting Reactions in Disease Resistance of Plants";

Gyula Molnar, candidate of medical sciences, on the basis of his dissertation entitled "Radioactive Metal Complexes in Kidney Diagnostics; Measurement of Glomerular Filtration With a Single-Injection Method Using Labeled EDTA";

Maria Nagy, candidate of medical sciences,on the basis of her dissertation entitled "The Method of Bronchus Filling by Bronchoscope in Relaxational Anesthesia and Its Evaluation";

Czo Zong Nam, candidate of physical sciences, on the basis of his dissertation entitled "Studies on He-Cd Laser With Hollow Cathode";

Jozsef Nemeth, candidate of agricultural sciences, on the basis of his dissertation entitled "Possibilities of Developing the Agriculture and Plant Production of Eastern Africa";

Ilona Nikolits, candidate of medical sciences, on the basis of her dissertation entitled "Investigation of Phosphate Ester and Dithiocarbamate Type Compounds in Terms of Their Effect on the Central Nervous System";

Agnes Peter, candidate of medical sciences, on the basis of her dissertation entitled "Liquor-Catological Ramifications of the Intrathecal Methotrexate Therapy";

Tinka Nikolayeva Popova, candidate of economic sciences, on the basis of her dissertation entitled "Use of Macroeconomic Models in the Medium-Range Planning in Hungary";

Mrs Janos Porszasz, candidate of biological sciences, on the basis of her dissertation entitled "Central Modulation of Vasomotor Regulation";

Istvan Preda, candidate of medical sciences, on the basis of his dissertation entitled "Electrical Activity of Hypothermal Hearts and Their Catecholamine Metabolism";

Ferenc Radics, candidate of economic sciences, on the basis of his dissertation entitled "Problems of the Party-Control of Socialist Economy";

El Bialy Abdel Aziz Ibrahim, candidate of agricultural sciences, on the basis of his dissertation entitled "Synthetic Fertilization of Apricot Seedlings in Sand";

Laszlo Romics, candidate of medical sciences, on the basis of his dissertation entitled "Clinical and Pathophysiological Observations in Patients Afflicted With Hyperlipoproteinaemia";

Imre Rozsa, candidate of medical sciences, on the basis of his dissertation entitled "Deep-Vein Thrombosis of the Lower Extremity and Its Consequences";

Klara Rozsa, candidate of philosophical sciences, on the basis of her dissertation entitled "Education of the Working Class, an Intersocietal Factor of Scientific and Technical Progress";

Mohamed Mohamed Ibrahim Sayed Ahmed, candidate of economic sciences, on the basis of his dissertation entitled "Strategy of Market Planning on the Basis of Experiences Gained in Socialist Economy";

Zsuzsa Schaff, candidate of medical sciences, on the basis of her dissertation entitled "Subcellular Structures in Tumors and Autoimmune Syndromes Indicating Viral Infection";

Laszlo Szabo, candidate of agricultural sciences, on the basis of his dissertation entitled "Germinating-Physiological Study of Feed Plants, With Special Emphasis on the Effect of Temperature";

Lenke Szekeres, candidate of medical sciences, on the basis of her dissertation entitled "Investigation of the Fine Structure of Birthmarks With Compound and Intradermal Colorant";

Klara Szemennyei, candidate of medical sciences, on the basis of her dissertation entitled "Comparative Investigation of the Connective-Tissue Fibers of the Lung, With Special Emphasis on Lung Dilatation in Old Age";

Lajos Szita, candidate of chemical sciences, on the basis of his dissertation entitled "Thermodynamic Study of the NaOH-$Al(OH)_3$ hydraglillite-H_2O System";

Kalman Szepesi, candidate of medical sciences, on the basis of his dissertation entitled "Regeneration of the Load-Bearing Ability of the Femur Head in Rabbits After the Experimental Ischaemic Necrosis of the Proximal Femur";

Maria Szogyi, candidate of biological sciences, on the basis of her dissertation entitled "Investigation of the Antibiotic-Membrane Interaction in Bacteria and Artificial Membranes";

Gyula Tamas, candidate of medical sciences, on the basis of his dissertation entitled "Investigation of the Tissue Factors Reducing the Effects of Insulin Antibodies and Insulin, and Their Clinical Significance in Diabetes Mellitus";

Jozsef Toth, candidate of medical sciences, on the basis of his dissertation entitled "Problems of the Transurethral Interventions by Resection";

Zoltan Varkonyi, candidate of biological sciences, on the basis of his dissertation entitled "Light Absorption, Fluorescence, Conformational Changes, and Intermolecular Energy Transfer Processes of Peroxidase";

Lajos Vincze, candidate of philosophical sciences, on the basis of his dissertation entitled "Problems of Imagination Rendering in Film Art"; and

Tayseer Mohamed Ahmed Waly, candidate of agricultural sciences, on the basis of his dissertation entitled "Investigation of the Utilizability and Dynamism of Soil Nitrogen."

2542
CSO: 2502

PERFORMANCE OF RECENTLY INSTALLED R-22 COMPUTER ANALYZED

Budapest SZAMITASTECHNIKA in Hungarian Mar 77 p 3

[Unattributed article: "The First R-22 Has Been Started Up. Favorable Experiences at the ELGAV"]

[Text] The ELGAV (Administration Designing and Computerized Data Processing Enterprise for the Food Industry) performs services for the enterprises in the food industry. It designs the administrative procedures for the enterprises, prepares the instructions and programs required for computer-aided data processing, performs economic and plan-mathematical calculations, and processes the data with computers. In addition, its tasks include the development and introduction of modern administrative and data transmission systems, the organization of the administration of new facilities, the selection of the office equipment needed, and the preparation of the interface programs required.

The enterprise started operations 20 years ago. It first used electromechanical punched-card systems. In 1968 it changed and used small electronic computers. Since 1975, it uses equipment from the Unified Computer System. [ESZR].

The first ESZR computer, a R-20, was started up in the autumn of 1975. The NOTO-OSZV [expansion unknown] installed the equipment. The enterprise had complete program systems at the time the computer was installed; it intended to use the computer for regular data-processing tasks forthwith. The first three months were spent with trial runs; regular work started in 1976. The R-20 computer was somewhat disappointing; it had a malfunction frequency three to four times as high as the computers used earlier. The technical service was slow, especially initially, and inexperienced. The maintenance during the one-year guarantee period eliminated many recurring troubles, and the R-20 became much more useful from the fourth quarter of 1976 onward. Even so, over a one-year period only 52 percent productive use could be had with the equipment operated over three shifts. The comparable percentage for the fourth quarter was 61; this was a great improvement.

The gradual obsolescence of the small computers originally installed in 1968 and the increased needs for computer-technology equipment spurred the enterprise to install a second ESZR computer earlier than initially planned, in early 1977.This was an R-22. Although only two months have elapsed since the receipt of the computer, the impressions about its reliability were favorable and it appears that this is a better computer than the earlier one in technical terms. This was just as well since the computer had to be in service since April and will have to perform approximately 3,000 hours of productive service this year still.

Based on the R-22 computer, the enterprise is designing the comprehensive information system of two major food-industry trusts (the Trust of Poultry Processing Enterprises and the Grain Trust). The first subsystems will be ready for both trusts in 1977, and the full system is scheduled for completion in 1980. In order to illustrate the magnitude of the information system, we may state that the Trust of Poultry Processing Enterprises has 10 provincial branches, and the Grain Trust has 10: the information system must cover both the local and central trust-level data. The central unit of the R-22 will be the core of the data transmission network connecting these 29 branches with the ELGAV. The TA-600 or the TAP 3 (ESZ [Unified Computer] 8503), developed at the Telephone Factory, will operate at the subscriber points of the data transmission system, presently in the simplex mode (although the equipment is also capable of semiduplex mode). This design already ensures more up-to-date information.

In accordance with the plans, the OSZV [National Computer Technology Enterprise] delivered the R-22 computer on 16 December 1976; the checking-out of the instrument started on 20 January 1977.

In addition to running the compatibility tests prescribed in the purchase agreement, the user programs were also run at the ELGAV. All these tests showed that the computer is faster and more dependable than the R-20. User programs have been already run during installation, in the week preceding the acceptance. Thus, comparisons were possible. One such program, written in the COBOL language and handling 70 KB blocks and an assembler program, uses so much of the peripheral units and the channels that running is only possible in a perfect computer. This was the program used in the acceptance testing of the R-20 after the guarantee year was over. For the purpose of comparison, a 33,000-unit data pack was processed on both computers. The time needed in the R-20 was 20 minutes and 01 seconds; in the R-22, 8 minutes and 37 seconds. In addition, in order to plan for the use of the new computer and to estimate the times available for the systems, a comparison was made of the time needed for program translations. The translation time for a PL/1 program consisting of 960 cards was 38 minutes and 50 seconds on the R-20 and 17 minutes and 06 seconds on the R-22. A 430-card program in Assembler language took 6 minutes and 53 seconds on the R-20 and 3 minutes and 17 seconds on the R-22. The time saving was even more impressive in COBOL programs. The translation of a 441-card program took 8 minutes and 07 seconds on the R-20 and 3 minutes and 48 seconds on the R-22. There was no significant difference in efficiency increase in the translation of programs in the individual programming languages. The numerical data indicate the shorter running time of programs consisting primarily of memory use; they were obtained as a result of an execution program of 133 instructions. This program runs 133 Assembler instructions over a specific period of time and counts the number of instructions executed. The number of instructions executed was 11,231 on the R-20, while the R-22 computer executed 70,680 during the same period of time. We have also tabulated the foregoing data.

From the tabulation it can be seen that although the efficiency increase is not in proportion to the memory speed increase, it is still real; the reason is that the same peripheral units are used in the R-22 as in the R-20.

Only a short time has elapsed since startup; but already a favorable impression was gained about the usefulness of the computer. We have no data yet about reliability of operation; however, the fact that the startup time was less than needed for the R-20 augurs well. Two additional factors affect operating reliability. One is that the service performing the guarantee repairs promises response only within 12 hours after a call. Measures are in progress to shorten this time. The other factor is that the spare parts supply is very slow. An improvement is necessary here. It has happened with our R-20 computer that one of the magnetic disk units had to be shut down because of lack of spare parts for more than a year: the part was received only after a waiting time of almost a year after we issued an urgent request. We must note, however, that the computer operated continuously since then.

In principle, the R-20 and the R-22 are compatible with each other. In practice, however, there is a significant difference in the magnetic tape units. Elimination of the difference is troublesome since the parts supply is not too good. First the OSZV advised that the required part is in stock, but now — when we must convert the R-20 tape units — it turned out that they are not in stock after all, and even if they order it at once, delivery is expected only by 1979. The lack of parts makes the use of the two computers difficult. But this problem must be solved if we are to make full use of the advantates of the ESZR family of computers in terms of compatibility also.

	Number of items	R-20	R-22	Efficiency
User program	33,262	20'01"	8'37"	2.32
PL/1 translation	960	38'50"	17'06"	2.27
Assembler translation	650	6'53"	3'17"	2.10
COBOL translation	441	8'07"	3'48"	2.25
Test		11,231	70,680	6.29

The Major Features of the R-22

The R-22 — standard designation ESZ-1022 — is a new member in the family of computers developed within the framework of the Unified Computer System of the socialist countries (ESZR). The new computer is a further developed version of the ESZ 1020 type. The developers utilized the experience gained in the manufacture of the ESZ-1020 and the comments received from its users. They started the manufacture of a modern computer series which is basically designed like the ESZ-1020 but has some modifications which improve the technical parameters and reliability.

The operative memory of the ESZ-1022, depending on the configuration, may be 128, 256, or 512 kbyte; four bytes are selected simultaneously from the memory. In the ESZ-1020, the memory capacity was between 64 and 256 kbytes, and only two bytes could be selected simultaneously. The cycle time of the operative memory is 2 microseconds in either machine.

The arithmetic unit of the new model processes two bytes per cycle, twice as many as its predecessor. Its cycle time is 1 microsecond. The cycle time of the microprogram memory was also reduced to half (0.5 microsecond).

The local memory and the protective memory changed: instead of a ferrite memory, we have one made up of integrated circuit components. The cycle time of both is much shorter.

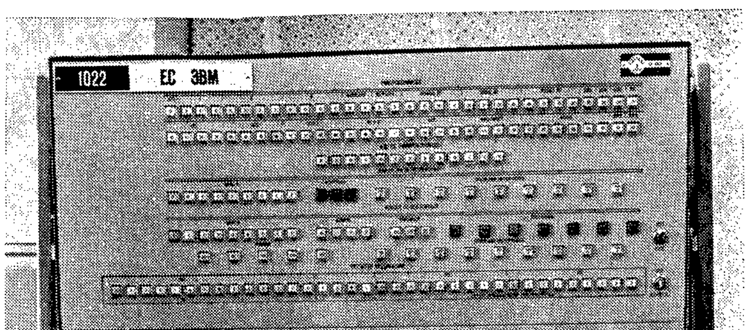
The transmission speed of the multiplex channel increased approximately three-fold. The speed of the selector channel almost doubled; the transmission speed of 500 Kbytes/second permits the connection of a 29-mbyte magnetic-disk memory unit.

The operation execution time decreased to about one-quarter on the average. The peripheral units supplied with the ESZ-1022 are generally the same as those supplied with the ESZ-1020 model.

The new medium-size member of the ESZR family may be used for a variety of purposes in technical and economic data-processing systems, and also offers the possibility of establishing data teleprocessing and multicomputer systems.

If equipped with the ESZ/DOS 1.3. operating system and if in the proper configuration, the computer may also be operated with the ESZ/OS operating system. It is also possible to use the IBM/DOS 26.2 operating system modified for the ESZ computers. The processing system programs permit the use of the ASSEMBLER, FORTRAN-IV, PL/1, RPG, and COBOL programming languages.

A number of ESZ-1022 computers are operating in socialist countries. The reports about their use are unanimously favorable; thus, we are confident that this well-proven computer will meet the needs of the Hungarian users also.



The operator's console in the ESZ-1022

Comparative tabulation of the technical parameters

Designation	ESZ-1020	ESZ-1022
1. Processor		
Word length (bit)	32 (4 byte)	32 (4 byte)
Cycle time	1	1
Control principle	Microprogram	Microprogram
Diagnostics	Microprogram	Microprogram
Operations (number of bytes)	1	2
Code	DKO1, KOI-8	DKO1, KOI-8
Number of instructions	142	144
2. Microprogram memory		
Capacity (words)	8192	8192
Word length	64	64
Cycle time (microseconds)	1	0.5
Construction	Card	Card
3. Operative memory (kbytes)		
Capacity of Block B (kbytes)	64	
Cycle time (microseconds)	2	2
Selection		
time (microseconds)	0.9	0.9
number of bytes	2	4
Protection	Write-read	write-read
4. Local memory		
-Capacity (words)	64 (36 bits)	256 (18 bits)
-Cycle time (microseconds)	2000	250
Construction	Ferrite	Integr.circuit
5. Protective memory		
Capacity (words)	32-128	64-256 (6 bits)
Cycle time (microseconds)	1000	250

[tabulation continued on next page]

[Tabulation continued from preceding page]

Construction	Ferrite	Integr. circuit
6. Multiplex channel		
Number of subchannels	122	128
Transmission speed (kbytes/sec)		
-Multiplex	16	40
-Monopole	100	300
7. Selector channels		
Number	2	2
Transmission speed (lbytes/sec)	300	500
-Number of switchable controls	8	8
Interface	ESZR	ESZR
8. Major operations		
Execution time (microseconds)		
Fixed decimal point addition	33	9
multiplication	348	80
division	398	92
Floating decimal point addition	107	30
multiplication	490/240	120/260
division	399/2059	98/240

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TRENDS IN SEMICONDUCTOR DEVELOPMENT OUTLINED

Warsaw ELEKTRONIKA in Polish Jan 77 pp 7-10

[Article by Andrzej Sowinski: "Trends in the Development of the Semiconductor Industry in Poland"*]

[Text] Today it is not necessary to convince anyone that the development of Poland and its economy is inseparably linked with the growth and modernization of the electronics industry. This process, called electronization, is a characteristic of all highly developed countries.

In realizing the tasks associated with electronization, active elements, which are essential components in all electronic equipment and exert the greatest influence in determining equipment modernity, play an important role. Today these elements are almost exclusively semiconductor devices; their development and production in Poland are the responsibility of the CEMI [expansion unknown] Scientific and Production Center for Semiconductors [NPCP],

In presenting the strategy for developing Poland's semiconductor industry, it is first necessary to present the status as of today.

In 1975 we produced 110 million semiconductor devices of which about 90 percent were planar silicon devices. In 1975 we also produced almost 10 million modern standard- and medium-scale integrated circuits.

During the 1971-1975 period we initiated the large-scale, pilot or laboratory production of 229 new types of semiconductor devices, of which 180 were developed by us and 49 were based on purchased licenses.

In 1971 Poland's semiconductor industry was insignificant on the European scale and was behind similar industries in the other CEMA countries. Today this industry is in the forefront among the socialist countries and is beginning to exert an influence on the European scale. It can be stated

*Based on a paper delivered at the Conference of the Association of Polish Electrical Engineers in Katowice in 1976.

that the foundations for the modern branches of Poland's semiconductor industry, such as microelectronics and optoelectronics, were laid during the 1971-1975 period.

Thus the status of our industry in 1976 differs diametrically from the situation in 1971. Also, our goals today are much more ambitious and more difficult to achieve.

The Specifics of Semiconductor Devices Production

Modern production of semiconductor devices makes it possible to inexpensively and economically manufacture on a mass scale highly reliably components having good technical parameters if automated manufacturing methods are used. For monolithic integrated circuits (IC's) on the order of several hundred thousand units must be manufactured, and for diodes and transistors this amount must be several times greater.

The NPCP, like other producers of semiconductor devices, even large ones, cannot produce all types of diodes, transistors, IC's and so forth used in electronic equipment, but it specializes in selected groups for which there is sufficiently high demand. Other types of semiconductor devices which would be uneconomical to produce are and will continue to be imported. Up to a short time ago, NPCP's primary customer was the consumer electronics industry, manufacturers of radio and TV receivers, tape recorders, record players and so forth. Naturally, this state of affairs was reflected in NPCP's production program. It is only now, with the development of the electronics industry for professional equipment, in particular the computer and telecommunications industries, that demand has increased for semiconductor devices for these applications. This is evident in the substantial production of small- and large-scale monolithic digital integrated circuits.

Present Structure of Semiconductor Devices Production

The most numerous devices represented are diodes and transistors, of which last year there were over 400 types. It should be emphasized that several dozen types of elements are designated for professional use. Monolithic IC's are also mass produced. Analog IC's, of which about 20 types are produced, are designed primarily for consumer electronics, but some of them also can be used successfully in professional equipment. Over 50 types of digital IC's, TTL series 64 and 74, are presently being manufactured.

The required assort of IC's is supplemented with the production of hybrid thick film and thin film microcircuits. A characteristic feature of these devices is the ease with which their construction and technical parameters can be adapted to suit an individual user's needs.

Finally, the production of optoelectronic devices, such as infrared and visible-light light-emitting diodes (LED's), semiconductor digital indicators, [translation unknown], and phototransistors, has begun on a laboratory scale.

Main Development Trends in the Semiconductor Industry

The selection of one group of semiconductor devices over another group is based on domestic needs, the possibility of international cooperation, and the research, development and production capacities of CEMI in the current 5-year period.

The greatest emphasis will be placed on the development of MOS/LSI IC's and optoelectronic devices. This does not mean other types of semiconductor devices, such as analog and digital bipolar monolithic IC's, hybrid microcircuits, diodes and transistors, will not be developed.

Concerning the latter, the demand for discrete elements remains large despite the development of IC's.

The basic assortment groups to be developed during the 1976-1980 period will be a series of semiconductor devices for color and black-and-white TV receivers as well as for tape recorders. This also includes duodiodes for hybrid circuits and variable capacitance diodes. Fast diodes and switching transistors will also be available for professional equipment. It should be emphasized here that the production of new types of discrete semiconductor devices is linked primarily with the color TV development program. From this large assortment of semiconductor IC's, three groups were selected which will be developed extensively; they are:

General purpose IC's'
Bipolar digital IC's;
Digital MOS IC's.

Over the next few years we purposely will not develop and produce our own professional semiconductor analog circuits. We will continue to obtain these circuits for the domestic market by means of special agreements with other CEMA countries, especially with Czechoslovakia and the GDR. Some of these circuits, however, we will develop in their hybrid versions.

During the 1976-1980 period, we want to develop the capability of designing high-quality general purpose electronic equipment based on the latest IC designs. In conjunction with this, we not only would like to produce and improve circuits produced by the leading manufacturers, but we would also like to design our own circuits, circuits that are more suited to the specifics of our own equipment.

In a certain sense, we already have developed our own specialization in the bipolar digital IC group. Since 1973 we have been expanding gradually the extent of development and production of TTL circuits.

By the end of this year we will be producing 20 types of TTL circuits, including nine types of medium-scale integrated circuits. The production of the first three medium-scale integrated circuits is based on our own designs.

We intend to expand this specialization in the production of TTL circuits by increasing the assortment of standard circuits and by gradually introducing into production a series of fast TTL circuits with TTLS Schottky diodes as well as a series of TTLL circuits having low power consumptions.

The assortment of circuits in these series will be so selected by us as to optimally satisfy the needs of the MERA and TELKOM Industrial Associations. At the present time, however, we do not expect to produce our own ECL circuits (at least not till 1979) despite the fact that MERA has announced some interest in these circuits.

Interest is expressed because of the expected demand for ECL circuits in 1980 (on the order of 5 million units encompassing approximately 30 types of circuits).

We note that such a demand volume for these circuits is insufficient to start producing them in Poland. Domestic requirements in this area can and should be satisfied by means of specialized agreements with the other CEMA countries, especially with the USSR where these circuits are produced.

A new chapter in the development of Poland's electronic industry is the initiation of work on the development and initial production of MOS/LSI circuits. Already last year a prototype of the first Polish MOS/LSI circuit was produced, which was the type MCY 7506L 2x100-bite shift register. This circuit, measuring 1.8x1.9 mm, contains 1,206 MOS transitors and four guard circuits.

Last year we initiated the laboratory assembly and testing of calculator circuits and a pilot line of MOS/LSI chips that enable us to conduct development work in this area. This year we expect to master basic technologies, including the technologies of silicon gates and ion implantations; we also expect to produce several models and prototypes of MOS/LSI circuits. We plan to initiate the mass production of MOS/LSI devices in 1977. By 1980 we expect to initiate into production 10 LSI circuits designed especially for computer equipment and tele-electronics equipment. Among other things, it will include a basic assortment of memory devices, including ROMs with a maximum storage capacity of 1,024 bits, dynamic shift registers, including recirculating registers, chips for a simple calculator for the four arithmetic operations, percent calculations, and the calculation of the x^2 and $1/x$ functions and a scientific calculator will also be included.

The growing number and increased complexity of IC types already developed make it necessary to improve design and measurement methods, especially computer methods. In the next 5-year period we will vigorously develop the computer aided design (CAD) method of designing IC's, presently in the initial stages of development, and apply it to all newly designed circuits. This will enable us to start producing microprocessors by the end of the current 5-year period.

We want MOS circuits to become our specialty during the 1977-1980 period just as TTL circuits became our specialty.

In the area of digital IC's, the production of an extensive assortment of bipolar TTL circuits and an extensive assortment of MOS circuits will enable us to:

Satisfy most of the domestic demand for digital IC's;

Create a production profile such that practically all the IC's will be compatible with one another (we are starting production of MOS circuits that are compatible with TTL circuits);

Produce an extensive series of circuits for a particular family and produce them cheaply.

Perhaps it is worthwhile to add here that according to American projections over 90 percent of total digital IC sales in the United States in 1980 will be MOS and TTL circuits.

Presently thin film and thick film circuits can be produced on a mass scale.

Thick film hybrid microcircuits are used extensively in automobiles, for example, in alternator regulators, in programming windshield wiper operations, and in tachometers. Also, a large number of hybrid microcircuits are used as hi-fi power amplifiers (15-100 Watts), and also as specialized circuits in teletransmission and mobile radiocommunications equipment.

Currently, thin film circuits, which are known to be precision components, are being produced in pilot production quantities for professional measuring and computer equipment.

Beginning next year, the mass production on the order of a million units per year will begin.

Optoelectronic components are closely linked with the development of IC's. That is why the decision was made to develop such components in Poland. Results of research and development work conducted in Poland for many years now and the experimental production of these components enable us to do this. In 1980 we expect to produce about 1 million optoelectronic components such as LED's, digital solid-state indicator lights, photodiodes and transoptic devices [transoptory].

By the end of the current 5-year period, electronic equipment designers will have at their disposal several dozen types of LED's (infrared, green, red and yellow), a number of digital displays (red, green and yellow), and a multidigital red display for electronic calculators.

In concluding this review of selected development trends, it should be emphasized that the situation is developing such that in 1980 over 60 percent of the value of NPCP's production will consist of modern microelectronic circuits.

The modernity of these circuits will be exemplified not only by their technical parameters but also by their low production costs, enabling our circuits to compete in world markets. Achieving this last goal will be possible only if high-efficience mass-production methods are used; CEMI is currently devoting a lot of attention to this problem.

This does not mean that our assortment program will be a compilation of the programs of the worldwide producers of semiconductor devices. We will produce only those assortments which will have a demand in excess of 300,000-500,000 units annually for discrete elements and 10,000-20,000 units annually for IC's because such volumes will mean that our production costs will be such that we will be able to compete in world markets. We will obtain the full range of needed assortments by means of international collaboration.

To this end, we are conducting specialization talks with Czechoslovakia, the GDR and Yugoslavia, and to a lesser extent with Bulgaria, Romania and Hungary. For example, we are interested in obtaining from the GDR some types of linear IC's for color TV receivers and high-voltage power transistors for black-and-white TV receivers. And from Czehoslovakia we are interested in obtaining low voltage power transistors and linear IC's for professional equipment.

The rapid development of the semiconductor industry requires that the production of materials snd technological equipment be expanded. It should be mentioned that in the last 5-year period we created a solid base for expanding the production of materials and technological equipment.

Currently, our future is bright--as, for example, in materials for the semiconductor industry. In this current 5-year period we are going to expand the Scientific and Production Center for Semiconductor Materials. We will begin producing a large assortment of silicon monocrystals and silicon wafers having large-diameter (3-inch) epitaxial layers, high-quality chemical compounds, ceramic casings for some types of IC's, power diodes, thristors, as well as other materials and components. It can be said that during this 5-year period production capacities will be created such that the growing demand for the basic assortment of materials and components required by the semiconductor industry will be satisfied.

The development of new technological equipment is being conducted by the Industrial Institute for Electronics and its Experimental Laboratory for Technological Equipment. Many important successes have been achieved by the institute. They have developed a number of high-quality assembly machines, and automatic semiconductor testers and sorters which are just as good as the highly regarded equipment available in foreign markets, and are even better as far as the technical level of analog equipment is concerned. We have a highly experienced cadre, which is evidenced by their good work. However we lack a production implementation base which requires about 1 billion zlotys annually. This is our greatest concern today, the seriousness of which can be illustrated by the following example: The automation and mechanization of basic production processes conducted during the 1971-1975 period, the introduction of new technologies, and the numerous organizational improvements greatly influenced the fact that the amount of production from 1 m^2 of surface increased directly from 7,000 elements in 1971 to 20,000 elements in 1975.

During the last 5-year period pricing policy was one of the more important factors affecting the actual shape of the domestic market for semiconductor devices. The aim of this policy was to stimulate technological progress during the electronization process of the country and to optimally utilize existing production capacities for semiconductor devices. This policy established a two-tier price level for our products. Selling prices for domestic customers were determined on the basis of price lists of the leading Western European manufacturers. On the other hand, for us, producers of semiconductor devices, so-called factory product prices were introduced. These prices were based on the assumption that newly introduced semiconductor devices were supported by the state budget.

Beginning in 1976 the two-tier price system was discontinued because of achieved economic results and the large decrease in production costs. Currently we do not make use of state subsidies and only selling prices exist. In such a system prices are competitive with prices on the European market.

The realization of CEMI's program presented here will lead to further expansion of the semiconductor industry so that in 1980 approximately 270 million diodes and transistors, 38 million bipolar IC's, 1 million LSI/MOS IC's, and 1 million optoelectronic components will be manufactured.

The complex and difficult problems associated with the very extensive introduction of electronics into many areas of the economy require a new approach to their solution. The increasing penetration of electronic technology into those areas of the economy which till now had little in common means that the division between professional equipment and consumer equipment is fading. For example, equipment designed for scientific research and production are considered as professional, requiring higher quality components when compared to less reliable, mass-produced consumer electronic equipment. Presently, for example, automotive electronic equipment should be placed in the professional equipment category because of their high technical requirements, but at the same time the automobile today is a commonly used machine. This phenomenon exerts a distinct effect also on the quality level of semiconductor devices. This is why not too long ago the Center for the Electronization of the National Economy was formed as part of the Industrial Institute for Electronics. One of its main tasks is to investigate, plan and program the direction of applying electronic circuits and components, and also to initiate and coordinate research, organizational and technological tasks and other tasks associated with electronization.

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ROMANIA

BRIEFS

NEW EARTHQUAKE NEAR BUCHAREST--According to the Center for Earth Physics and Seismology in Bucharest, on 20 April at 2316 hours, Romanian seismological stations recorded an earthquake with its epicenter in the vicinity of Bucharest, about 20 km from the city. The depth of the center was about 20 to 25 km. Thus, it was an earthquake of a tectonic nature produced in the earth's crust. The intensity of this earthquake was 3.8 degrees on the Richter scale. The principal shock was followed, an hour later, by a weaker earthquake, registering 3 degrees on the same scale. The occurrence of these earthquakes may be connected with the reactivation of some faults in Cimpia Romana as a result of the strong earthquake in Vrancea on 4 March. The manner in which these two earthquakes were produced shows that seismotectonic activity has begun to be normal and therefore, there is no danger that shocks with an equal or greater intensity will be produced. The earthquake was felt with an intensity of 3 to 4 degrees on the mercalli scale and there were no losses, damage or victims. [Text] [Bucharest SCINTEIA in Romanian 22 Apr 77 p 5]

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