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Table:

U 84C00
U 880

Family
 Family
 CPU
 25mA
 200mA
 PIO
 5mA
 100mA
 CTC
 7mA
 120mA
 SIO
 15mA
 130mA

U 5200
 12000
 U 1500/20
 13000
 U 5301
 40000
 U 1600
 100000
 U 5302

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70000

Headline: CEMA Microelectronics Products Displayed at Leipzig Fair

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H.-J. Hill, H. Weiss]

FULL TEXT OF ARTICLE:

1. [Report on the Leipzig Spring Trade Fair 1989 by H. Hemke, H.-J. Hill, H. Weiss]
2. [Excerpt] The first part of our report from the Leipzig Spring Fair 1989 (LFM '89) in MP 7/1989 was devoted to the fair's theme of 'Flexible Automation' and to mini- and microprocessors. The second part will deal with the exhibits of computer peripherals, PC applications and networks, components, and software.
3. Peripherals
4. An indispensable requirement for Computer Aided Design (CAD) is graphic design capability, which is usually achieved by means of plotters. The new A3 Plotter K 6416, produced by the collective combine Robotron, has a resolution of 0.01mm and a drawing speed of 300mm/s. Technical drawings can be produced with standard boundaries and title blocks using expanded margins. The drawings can be produced on white paper as well as on transparent paper or foils in eight line widths or colors. The data buffer has 14 Kbytes.
5. The Polish firm Z.M.P. Mera Poltik Lodz offered the A4 Plotter MDG-1 with a medium drawing speed of 63mm/s and a resolution of 0.2mm. Its compact construction (300 x 190 x 85 mm³ reset) makes it very suitable for office installation. Centronics and V.24 are available as interfaces. It has four pins and can produce both text and graphics.
6. The Erika electronic S 6007 typewriter by Robotron, also introduced for the first time at the LFM '89, can be used as a printer. Its advantage over the precursor model Erika S 6006 lies in the fact that its print wheel has been placed in a cassette to accelerate replacement; changing the ribbon was also greatly facilitated. Instead of the typical 3-interface module, the S 6007 possesses only one unimodule, which contains the Centronics, Commodore, and V.24 interfaces. Print wheels with IBM, Schneider, Commodore, and typewriter character sets are also available. The operating modes of the individual interfaces can be modified with DIL

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(dual-in-line)-switches present in the unimodule.

7. PC Applications and networks with PCs

8. The development of computer technology has caused the demand for computer linkage to rise, with the emphasis less on the transfer of data than on joint usage of large amounts of data. The most common computer networks today are still the LANs (Local Area Network). Robotron was represented at the LFM '89 this time with the new LAN EC-NET. It is constructed from ROLANET 1 components and is used exclusively as a link to the personal computer EC 1834. The program package EC-NET with the operating system DCP 3.30 serves the worldwide NETBIOS interface. It includes such functions as sending, receiving, and storing data and offers diskettes, dictionaries, and printers for joint usage in the LAN. Access to the network is via programs such as dBase III Plus and ARIADNE, via computer languages such as C and T-PASCAL, and via DCP commands such as DIR and COPY.

9. In addition, Robotron presented new applications for the SCOM-LAN. Alongside programs for literature research and joint databank usage, it demonstrated linkage with digital radio link technology. The digital radio link devices PCM 10-300/400/800 are used in order to transmit data over long distances and difficult terrain features. They can link individual remote SCOM-LAN users as well as several LANs. The distance between two radio link stations can be as much as 50 km. A transmission path contains 10 channels with a transmission speed of up to 64 Kbits per second. If the number of data stations to be linked exceeds 10, data multiplexers are inserted, which combine several data signals of medium bit rates (0.6 to 9.6 Kbits per second) to one signal of 48 or 64 Kbits.

10. The Hungarian firm Videoton made its 20th appearance in Leipzig. It presented, among other things, a method of integrating an EC 1834 into a NOVELL-LAN. The ARC-NET (with a transmission speed of 2.5 Mbit/s) or the Ethernet (10M bit/s) were offered as associated hardware. The 32 bit microprocessor VT 180 was used as the server. LAN-users can be the VT 110, the VT 160 or other XT- or AT-compatible computers. The network software is compatible with the Novell Advanced Netware 286 or the Novell System Fault Tolerant Netware 286. It contains functions such as controlled access to joint data, systems for directory backups and file identification tables, parallel treatment of magnetic disks, as well as continuous checks and error messages. Linkage with the Ethernet network of the VT 32 and the R 11 can be achieved using gateway data transmission.

11. In our report from the Budapest Trade Fair 1988 (see MP 10/88) we showed how an A 7150 can be equipped to act as a teleprinter. The Hungarian firm Triton developed the necessary connecting pin board

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and software package Gepard-16, which were demonstrated at the LFM '89 at the Robotron and Triton booths. With the Telex-PC, individual telex users in the national and international telex network can be reached through a dial system. In addition, and without interfering with these services, it permits the processing of, for example, routine office tasks.

12. Components

13. --Microprocessor circuits The microprocessor system U 80600 is the second 16-Bit system after the U 8000 produced by the collective combine Mikroelektronik Erfur. Its proposed 20 components will make it possible to develop a new generation of personal computers and control systems (for example, ICA 720). The four new types (sic) of this system first shown at the spring trade fair are the central processing unit (CPU), the bus controller, the DRAM controller, and the error detection and correction (EDC) circuit.

14. The CUP U 80601, which is downward compatible to the K 1810 WM86 (USSR) will run at a maximum of 16 MHz. Its main improvements are the two addressing modes, real and protected, and its complete storage protection as a requirement for multitasking. The U 80606 bus controller decodes the status signals of the CPU and then produces the corresponding read and write commands for the bus of the computer. The DRAM controller U 80610 facilitates the formatting of dynamic memories, which can consist of 16, 64, or 256 Kbits. It controls an address space of a maximum of 2 Mbytes and is suitable for driving Dual-Port RAMS. In conjunction with the EDC U 80608, it allows for the detection and correction of errors as well as the simple formatting of large memory arrays. These four circuits of the U 80600 system were already thoroughly presented in MP 5/1989.

15. Alongside the still dominant NMOS technology, CMOS technology is becoming increasingly prevalent in microelectronics. The classic advantages of NMOS technology--larger scale integration, higher speed, lower price-- are being counterbalanced with the further development of CMOS technology. The U 84C00 family of microprocessors from Mikroelektronik Erfurt is the first 8-Bit CMOS family produced by the GDR. The following circuits were on display in Leipzig: CPU U 84C00, PIO U 84C20, CTC U 84C30, and SIO U 84C40 with clock times of 2.5 MHz (U 84C00 DC02) and 4 MHz (U 84C00 DC04). All circuits of this family are software- and hardware-compatible with the U 880 family and have the advantages of less current consumption and higher reliability. The following table shows a comparison of current usage (at 4 MHz):

16. To further decrease current consumption, the circuits of the U 84C00 system can power down when no computer activity is necessary.

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Activation of this mode is controlled by a clock generator/controller (CGC).

17. The U 84C00 system will be presented in detail in an upcoming issue.

18. The collective combine Mikroelektronik Botevgrad (VR Bulgarian) offered the 16-Bit microprocessor system SM 688 for the first time in Leipzig. It is compatible with Intel System 8088. The switching circuits CPU SM 688, DRAM Controller SM 637, Floppy Controller SM 609, and Hard Disk Controller SM 610 were exhibited, among others.

19. Surface mountable devices (SMDs) are becoming more widespread internationally because they occupy less space. Mikroelektronik Erfurt has responded to this trend with the 8-Bit one-chip computers U 883 and U 886, as well as the 64 Kbit DRAM U 2164 and the windowless 32 Kbit EPROM U 2632 as SMDs.

20. --ASICs Parallel to traditional devices in SMD design, the space requirement of entire circuits can be reduced much more effectively by using application-specific integrated circuits (ASICs)--which in turn can be SMDs. The Carl Zeiss JENA collective combine has been offering two different ASIC types for a year, the CMOS Gate Array System U 5200 and the standard cellular circuit U 1500/20 (the U 1500 differs from the U 1520 only in the number of wiring levels). The Gate Arrays on prefabricated silicon dices require that the number and position of the functional elements and chip surfaces and pin numbers be constant, in return for which they can be obtained more quickly and at less cost. The standard cellular circuits, on the other hand, allow a varying number and position of standard cells and differing chip surfaces and pin numbers. The further developments of the U 5200 and U 1500/20 systems now presented are the Gate Array System U 5300 or the Standard Cellular System U 1600. The development of the integration scale of these ASIC types is due to the number of transistors on a chip.

21. Both systems include inverters (with and without driver activity), basic gates (such as NAND, NOR, XOR, XAND, and combinatorial linkages), half and full adders, JK and D master-slave flipflops, as well as many input and output levels with and without D flipflops or Schmitt-trigger/Tristate action. The gate delay time in both systems is a maximum of 1.6 ns, with which a U 1600 achieves a clock frequency of 25 MHz; its static current absorption is less than 400 μ A. The clock frequencies of the U 5300 depend on the type of Master. The Masters U 5301 and U 5302 can have clock frequencies of 40 or 30 MHz; their static current absorption is less than 200 μ A. Zeiss is offering a design system called Archimedes for the gate arrays (see also part 1 of our LFM report as well as MP 6/1989, p.

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168). The design system ENSIC is available for standard cells.

22. --storage circuits It is known that the collective combine Carl Zeiss JENA is directing major efforts toward developing dynamic and static RAM circuits. Whereas the 256-Kbit DRAM U 61256 in a 1.5- gmm CMOS technology was premiered at the LFM '88, at this year's spring trade fair the 1-Mbit DRAM U 61000 in a 1- gmm CMOS technology was already available for presentation. Both circuits will belong to the standard equipment of modern personal computers and workstations. The U 61000 was exhibited with an 18-channel DIL duroplastic casing, but can also be delivered in a ceramic casing. It will be available with access times of 100 and 120 ns (U 61256:80, 100, 120 and 150 ns). Its input and output are TTL- and CMOS-compatible. It currently has a structure of 1 M x 1 Bit and can work in 11 different operation and refresh modes. The U 61000 is compatible with comparable international types such as the TC 511000 (Toshiba) and the HYB 511000 (Siemens). In issue 10/89, this circuit will be presented in further detail.

23. In order to construct large storage arrays that occupy minimum space, the collective combine Keramische Werke Hermsdorf has begun to mount 256-Kbit chips as well as 1-Mbit chips on ceramic substrates, which result in circuits with 4 Mbit storage capacity. The 4737 contains 16 chips of the U 61256 circuit, which each form a ceramic base condenser and together form a memory of 256K x 16 bits. The 4737 has a 34-channel DIL casing (row spacing: 37.5 mm; height: 5 mm; pinrastrer: 2.5 mm) and is offered only with an access time of 150 ns. Another model of this circuit is the 4743 with a storage structure of 512K x 8 bits. The 4742 circuit in a 25-channel SIL-structure, on the other hand, is constructed of 4 chips of the U 61000 1-Mbit RAM (also each with a condenser). This provides a storage capacity of 1 M x 4 bits.

24. Memory circuits were also exhibited at the booth of the collective combine Mikroelektronik Botevgrad: the 64-Kbit DRAM SM 8164 (structure: 64 K x 1 bit; technology: NMOS; access times: 150 and 200 ns), the 4-Kbit SRAM SM 8514 (1 K x 4 bit; CMOS; 200, 300, and 450 ns), and the 64-Kbit EPROM SM 7764 (8 K x 8 bit; NMOS; 450 ns).

25. Software

26. To demonstrate Robotron's 8- and 16-bit technology, Robotron Berlin exhibited the Portable Economic Software System POESY. It performs the functions of cost accounting, wage and salary calculation, basic resource, investment, and materiel calculation, performance and benefit analysis, and calculation results. All the elements of this system can be installed individually or combined

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with one or all other components. This is to ensure simple management through an easily surveyed program structure, a menu-driven selection of program parts, error determination, etc.. POESY will be steadily developed and improved and adapted to new technology. It is offered for the 8-bit PC 1715 with the SCP operating system, the A 7100 with the SCP 1700, and the 16-bit A 7150 PCs and EC 1834 with DCP; in the absence of a hard disk, work can be accelerated with the support of a RAM disk.

27. Robotron also demonstrated possible applications of the EC 1834 in Arabic and Chinese text editing. The AL-BAYAN system with the DCP operating system allows Latin and Arabic characters to be edited, manipulated, configured, and printed within one text. In the arabic editing mode the individual characters are written on the screen from right to left, as is customary. Either English or Arabic can be chosen to drive the menu. The ALBAYAN system also has numerous functions for comprehensive text manipulation and configuration.

28. With the Chi-Easy system, Chinese characters can be input to the PCs using the operating system MS-DOS. In order to input the desired character a specially coded character pattern is used and a reading pin is passed over the character as in normal writing. However, a maximum of 5 to 6 strokes is necessary for the 6,763 characters contained in the character set, because after each new stroke 8 of the most common characters containing those strokes are displayed, selected and written on the screen. In 85 percent of the cases, the desired character is found after the second stroke. The texts can also be output to a printer.

29. With a knowledge-based development of problem-specific software using the X...System, programs in various target program languages can be written, including already existing program libraries. By modifying or exchanging the installed knowledge base, the system can be adapted very easily to the most diverse tasks. The software developer is provided with a modern and effective means for developing computer-based software, and the end user is provided with extremely flexible application software and with a convenient and efficient tool for software documentation and maintenance. With the X...System, the user can work in the program development mode and the programmer can work in the editing mode. Work is facilitated by numerous service functions, such as the graphic representation of program structures and the superimposition of verbal and graphic help and control functions using window technology. The X...System was developed by the Academy of Sciences of the GDR and to date has been successfully installed in the following packages: Xamba (production of programs for microscope image evaluation), Xfortran (production of programs for evaluating pictures of the human heart), and Xdbase as an intelligent databank interface.

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30. As in previous Leipzig trade fairs, software solutions were also exhibited at Karl Marx University during the 1989 spring trade fair that were developed in the framework of scientific and student research work.

31. The Technical Electronic Section of **Wilhelm Pieck University** Rostock was represented with the comForth programming system, which offers a portable and interactive environment for developing process-oriented software in Forth.

32. In addition to the base system, the 2.xx version of the comForth system contains components that can be added later, such as a program collection for data types, number inputs, etc., headerless help definitions for modular-oriented programming, and screen and keyboard adaptations. A Wordstar-compatible editor, assembler, and debugger are also offered, as well as additional specific functions of the respective operating systems. The comForth system is to be offered immediately for CP/M (Z 80 and 8086) and MS-DOS (8086). Add-ons, such as a numerical package (flow comma and matrix operations), the multi-task system for process automation tasks, and the Cross-Compiler are being developed and are already available for some processors.

33. The menu-driven statistics package PSYSTAT for 16-Bit PCs using MS-DOS was shown by Karl Marx University Leipzig; a somewhat stripped-down version of the package is to be available for the A 7100 as of September 1989. Immediate application through a conversation-oriented operating method is to be made possible without any special prior knowledge of computer technology. The program is characterized as much by its comprehensive help menus aimed at possible user operations, constant data on the actual statistical process, and the instantaneous operation of the computer, as it is by the lack of diversity in the statistical processes of given add-on possibilities through user algorithms, and a graphic data presentation. Only a few of the possible statistical algorithms are mentioned here, such as variance, variance width, ranking, frequencies, percentage ranks, histograms, multiple linear regression with up to 50 influencing variables and graphic output of function and point cloud, as well as several processes for factor, cluster, and discriminant analysis.

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