Rickey likes soccer, lizards, hot fudge sundaes, skateboards and microscopes. He can't decide if he'd rather be Franco Harris, Bobby Fischer or Jonas Salk.

When his Dad brought home the Intel SDK-80 microcomputer systems kit, Rickey helped him put it together. It took only four hours. Everything was there. The 8080 CPU, RAM, PROM, programmable, I/O, a printed circuit board with all those capacitors and resistors and the other things that go with it. The best part was the instruction manuals. Every step was clearly explained. It was easy. The programming part looked especially interesting. So simple. Just imagine talking to a computer.

The big thrill came on Saturday when they went to his Dad's office to use a terminal. When they connected the SDK-80 to the teletypewriter they got a printout. That was exciting. Within an hour they were talking to the computer, then inventing games. They stayed all day.

Now Rickey is building a microcomputer of his own. He may be the first kid on his block with his own computer. Thanks to a $250 low interest loan from his Dad.

If you're interested in being the first on your block to have a microcomputer, contact your local Intel distributor or neighborhood computer store. Or order by telephone and charge it to your Master Charge or BankAmericard. Phone 800-538-9373, in California call 800-672-3516.

Microcomputers. First from the beginning.
Now Ricky goes to the Byte Shop

Ricky goes to the Byte Shop for advice, support, education and to expand the use of his personal computer with hardware and software. Shopping for a computer at the Byte Shop is almost as much fun as building one.

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813 N. Scottsdale Road (602) 894-1129
California
Berkeley
1558 University Avenue (415) 845-6366
Campbell
2559 S. Bascom Avenue (408) 377-4645
Citrus Heights
6041 Greenback Lane (916) 726-2557
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16588 Hawthorne Blvd (310) 371-2421
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Palo Alto
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2705 Thousand Oaks Blvd (805) 497-9595

Workshop Report:

MICRO-9

Richard H. Eckhouse Jr.
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Birds-of-a-feather sessions and a small workshop flavor were the dominant features of Micro-9, the Ninth Annual Microprogramming Workshop, held September 27-29 in New Orleans. Sponsored by ACM SIGMICRO and the IEEE Computer Society, this year’s workshop drew 113.

Following introductory remarks by workshop chairman Bruce D. Shriver, the first round of formal presentations began with the general problems of microprogramming and continued on to specific architectures. The first workshop sessions followed with discussions of host architectures (Bill Lidinsky moderating), graphics support in firmware (Neil Johnson moderating), and operating system support (Joel Herbsman moderating). All three discussion sessions included a high degree of participation from the audience.

The first workshop session, “Host Architectures,” centered around a discussion of current and future machines. The discussion on current machines covered the full spectrum from microprogrammed microcomputers to whole systems for microprogramming. The discussion of future machines included mainly small scale machines for specialized support.

The “special” session’s topic was “Graphics Support via Firmware.” This session covered a wide range of topics, all focused on graphics support via firmware, and was characterized by a high degree of interaction among the panelists (industry representatives). Topics presented and discussed were: hardware features conducive to unconventional microprogrammed graphics support, microprogrammed control of display functions, graphic routine implementation for a microprocessor assembly language, IBM 2840 emulation, and high speed cache memory microcomputer alternatives to microprogramming.

There were several notable benefits provided by the informal workshop environment: A microprocessor manufacturer was able to gather good input on needed features for graphics support. Several panelists made concrete redesign and enhancement suggestions for another panelist’s machine. Mainframe manufacturers and independent suppliers were able to gather enough information on each other’s technology to fuel their competitive analysis profiles for some time to come.

The working session, “Operating Systems via Firmware,” began with a brief general discussion on classes of systems functions and system architectures applicable for encoding in firmware. Both formal and informal presentations followed. John K. Ahlstrom began the presentations with a discussion on implementation of operating system assists to the Burrough’s B5000 hardware and B1700 firmware architectures. Arthur G. Olbert described the VM/370 assist features of the extended Control Program Support, utilized in the IBM 370, models 138 and 148. This discussion also covered the concepts of hypervisors and Virtual Machine Monitors.

Rahul Cattergy discussed the approach used in the BCC500, a multiprocessor architecture, to allocate systems support and user program support features among the component processors. Joel L. Herbsman, the moderator, presented a brief discussion on the QM/1 architecture, followed by an analysis of the development of the microprogrammed Task Control Program. The final presentation, made by this author, was of a paper previously published in the SIGMICRO Newsletter titled “Operating Systems Enhancement Through Microprogramming.” I reported that our current research indicates that the encoding of some operating systems functions in firmware, for real time applications, appears to indicate a practical performance gain, but these functions must be chosen carefully.

The second day’s session schedule was like that of the first day. The formal papers from the morning session were used to establish the back-