

BYTE News . . .

THE S-100 BUS - WHAT IS ITS FUTURE?: Some industry pundits have speculated that the S-100 bus was doomed when integrated machines like the TRS-80, PET, Apple, et al, were introduced. I do not agree with this view.

There are now an estimated 200,000 S-100 systems in operation, and S-100 system sales should continue strong for a number of reasons.

The S-100 bus is not processor dependent. In fact there are presently 8080, Z80, 8085, 6502, 6800, 6809, 9900, 8086, Z8000 and MCP1600 processor boards that plug into the S-100 bus. The 68000, when it becomes available, will surely be adapted for the S-100 bus also.

It allows for extended addressing beyond 64 K bytes of memory. In fact the 16-bit microprocessors on the S-100 bus employ up to 23-bit address words and can access directly up to 2 M bytes of memory. The 8-bit microprocessors can accomplish a similar feat by a bank-switching arrangement. The Institute of Electronic and Electrical Engineers (IEEE) is adopting an S-100 standard, which should eliminate signal and timing problems and encourage sophisticated 16-bit systems.

The S-100 bus has a lot of other goodies such as vectored interrupt, direct memory access (DMA), and master/slave capabilities, which are not possible on the limited bus structures of machines such as the TRS-80, PET, APPLE, etc.

At least 3 new S-100 mainframes have been introduced so far this year. These newer boxes are capable of operating at speeds up to 10 M Hz, have larger power supplies and other features.

Those who wish to have a machine capable of getting the maximum benefits of microprocessors must go the S-100 route. The S-100 bus will thus continue to dominate the serious personal computing area for many years to come.

NEW IMAGE SENSOR USES PHOTODIODE ARRAY: An integrated circuit consisting of a 64 by 64 array of 4096 photodiodes with associated registers and accessing circuitry has been developed for video camera use. The manufacturer, Integrated Photomatrix Inc, Mountainside NJ, claims that it can produce video-quality gray scale images with illumination as low as 60 foot candles. This is 5 to 8 times more sensitive than previous devices. However, the most important feature is that it lends itself to computer processing.

RANDOM NEWS: Atari has received FCC approval for their model 400 and 800 personal computers. This will probably make the FCC less willing to grant the Texas Instruments request for changes in the rules, as the FCC finds that other companies are able to pass current requirements . . . Radio Shack will open 100 Computer Sales Departments in 100 existing stores, in addition to the 50 Radio Shack Computer Centers already in operation . . . Two pioneer personal computer companies have shut their doors and are out of business. They are Processor Technology Company and Xitan Inc (formerly TDL). Their closings are attributed to poor business management, not lack of business.

RANDOM RUMORS: Shugart is about to announce an 8 inch Winchester disk drive for under \$1000. Rumor is that it will be called the Model SA-1000 and will store 5 M bytes. In original equipment manufacturer (OEM) quantities it may sell for as little as \$750 . . . 5¼ inch Winchester-type drives are being investigated by several manufacturers . . . Digital Equipment Corporation's Computer Stores are proving to be a real success. Four stores are already in operation and 6 more are planned to be opened by the year's end. The stores will sell computers in the \$12,000 to \$18,000 range with supplies and accessories aimed at small business users . . . A record 78,843 people attended the National Computer Conference (NCC) held in New York City this past June. This was 22,000 more than last year, which also set a record . . . Sinclair Radionics Ltd, London, England, has demonstrated a flat screen (3 inch) black and white television receiver, the size of a paperback book. They are now looking for financing for the production of the unit. This may be the forerunner of the pocket computer terminal.

PERSONAL COMPUTER TIMESHARE NETWORK INAUGURATED: Telecomputing Corporation of America, McLean Va, has started a Personal Computer Network which may be accessed by home users with terminals or personal computer systems. They have about 2000 programs and data bases on-line for immediate access. Included is the United Press International (UPI) daily news file, airline schedules and real estate listings. Called "The Source", the service will be available in 200 US cities at \$2.75 per hour from 6 PM to 7 AM, weekends and holidays. The rate during normal working hours will be higher.

DYNAMIC MEMORY AND THE "SOFT ERROR": As programmable memory size increases and memory cell size decreases, users are discovering that programmable memory can have *soft errors* as well as *hard errors*. A *hard error* is when a bit or bits in a given memory location is *stuck* high or low. This kind of error is easily found with a memory test and always has the same effect on the processor.

The introduction of very large-scale integration (VLSI) dynamic-memories with very small cell size has introduced soft errors which cause varying symptoms in the running of a program. A *soft error* is defined as a random, nonrecurring, bit change. The occurrence of soft errors appears to be on the increase and standard memory tests do not appear to help in diagnosing the problem.

The integrated circuit (IC) industry is becoming very concerned with the growing problem. Several integrated circuit makers have intensive research going on to discover the sources of the problem. The chief cause appears to be alpha particle radiation produced by the radioactive trace elements in the metal lids which hermetically seal the integrated circuit cavity. Several measures are being adopted by integrated circuit makers including package redesign, processing changes, and recommending that users employ error correction schemes in their memory boards to cope with the problem.

LEAVE THE DRIVING TO THE MICROCOMPUTER: Several automobile makers have research and development programs aimed at developing computer controlled cars. An example is the LISA system now under development by Volkswagen. A small console will be located on the car's dashboard. It will have a small keyboard, graphics and alphanumeric display controlled by a microprocessor. The driver will key in the code for the town he or she wishes to go to. Then as the car passes over sensor cables imbedded in the road, LISA's microcomputer transmits the car's destination to a master computer and receives instructions on the fastest and least congested route. LISA then displays a map showing the driver where to turn. LISA can be extended to control the car's speed from the information received from the master computer and an on-board radar system. Pretty soon, you will get into your car, buckle your seat belt, turn on the ignition and "leave the driving to LISA."

16-BIT MICROPROCESSORS TO DOMINATE THE 1980s: Most industry experts feel that the dominant microprocessor in personal computing and small business applications will be the 16-bit processor. They feel that prices will drop sharply, substantially reducing the price difference between 8-bit and 16-bit microcomputer systems. 8-bit microprocessors are expected to remain strong into the early 1980s because of the strong software base and significantly lower cost. However, the situation is expected to change by the mid-1980s with the 16-bit processor becoming dominant.

1980 should see at least a dozen 8086 and Z8000 processor and memory cards for the S-100 bus. The Motorola 68000 16-bit entry should make its appearance in personal computing systems by late 1980. It is interesting to note that Motorola in designing their new microcomputer development system are introducing a new Polybus which is upgradable to 32-bit service.

NONIMPACT PRINTERS IMPROVING: Considerable research is being devoted to the improvement of nonimpact printers. These efforts should bear fruit within the next 5 years, and will probably result in higher print quality, increased printing speed and greater capabilities. It is expected that quality will improve to produce type quality equal to Selectric and Diablo type printers. Speed will increase dramatically: 12,000 lines per minute will be common. Further, the printers will have multifont and graphics capabilities. Hence, they will simultaneously print the forms and the data, and put in signatures as well. Also, they will be capable of producing half-tone graphics and some even capable of multicolor printing.

LASER DISK MEMORY SYSTEMS IN DEVELOPMENT: At least 3 companies, Sperry Univac, Nippon Electric Co Ltd and Phillips Research Laboratories, are known to be working on laser disk-type data storage systems. Referred to as optical disks, they employ diode-laser recording systems which can record alphanumeric and image data on tellurium coated disks. They will be capable of substantially greater bit density than present magnetic disks.

PASCAL BEING PUSHED: More and more computer manufacturers are jumping on the Pascal bandwagon. Recently, Digital Equipment Corporation, Data General and Texas Instruments introduced packages for their mini and microcomputer systems. Pascal packages have also been introduced for CPM, North Star, Radio Shack TRS-80 and Apple computers.

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MAIL: I receive a large number of letters each month, as a result of this column. If you write to me and wish a response, please include a stamped self-addressed envelope.