COMPUTER BITS

By Les Solomon

Accessories and Software

I SUPPOSE many of you, as I do, keep an eye out for new products that will make your system more powerful or easier to use. The SK8088 cpu board from SKI Electronics is a good example. This is a $329 dual-mode, 16-bit, S-100-bus, board that plugs directly into your present S-100 system and works in conjunction with your 8-bit cpu card.

The 8-bit processor board acts as the bus controller. However, when 16-bit software is loaded into the computer, control passes to the SK8088. To avoid taking away 8-bit software compatibility, the SKI board permits switching back to the 8-bit board when necessary. This is a technique of master/slave operation whereby a system of bus arbitration and semiphores (flags) is used to switch cpu masters between cycles.

To take advantage of the full power of the system arrangement permitted on the IEEE 696 (S-100 bus), the board implements the full 24-bit addressing for a 16M-byte address range. It comes in a 5-MHz standard version, with an 8-MHz upgrade available. You don't have to worry about getting rid of your 8-bit memory either. The SK8088 works well, but slower, with 8-bit memory. However, it takes two bus cycles for a 16-bit transfer.

If you decide to get this board, be aware that it may not work with all so-called S-100 systems. The problem is in the implementation of the bus. In older versions (Altair, Imsai) the bus is defined a great deal differently than in IEEE 696 conventions. In addition, these older machines have ground planes and power rails. So be sure you understand what you have before you buy a board.
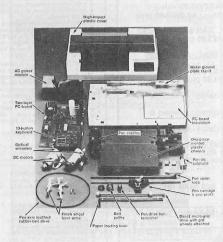
Using RAM Storage. I recently ran across a company doing something I really considered significant with high-speed RAM—using it for storage. The company, Axlon Inc., offers some very unique memory products, including Ramdisk, which is for the Apple or IBM PC and has 320K bytes of 200-ns memory and battery backup. The memory functions like two 35-track floppy-disk drives and is compatible with the necessary operating systems. The company says the price is about the same as a dual floppy drive.

Axlon offers similar products for the Atari, but the memory products are designed to plug into an available cartridge slot. You have the choice of a Ramcram to boost your Atari 400 or 800 to 48K or the Ramdisk for just the Atari 800. This gives you 128K of memory that acts as a high-speed disk drive.

If you are interested in communications, Axlon also has a personal communication terminal. Measuring $1^5/8'' \times 3^9/16'' \times 6^3/4''$ and weighing 11 oz., the handheld unit has a tactile keyboard with 43 functional keys to provide 64 upper-case ASCII characters. The display is a 16-character fluorescent indicator and has a 220-character receive memory that permits scrolling. The terminal, called the Hotline, has a "cool" price of $400.

You have probably noticed the increased interest in semiconductor nonrotating memory ("semidisks"). They increase your system operational throughput without impacting its operational aspects. For example, the Magnolia Invisible Disk that I discussed last month is used in my Zenith 89 laboratory system—especially when performing some system or software tests. We load the software into this very high-speed disk and reduce our overall access time. You do have to be careful, however, with some software that expects everything to be on the lowest defined system diskette, rather than the logged-in disk. Also you have to be certain that your power supply is solid, since a power drop-out will cause you to loose valuable data on the semidisk.

Parts breakdown of Hewlett-Packard's 7470 plotter shows simplicity of design.

The Master Plotter. If you have an extra $1550 and want a sophisticated plotting system, then the HP 7470 is exactly what you are looking for. This unit takes advantage of a new low-cost plotting technique and has a resolution (step size) or 25 μm (1/1000 in.), a repeatability of 100 μm, pen acceleration of 2 Gs, and pen-down and pen-up velocities of 35 and 50 cm/s, respectively. It uses either $8^1/2''$ or 11" paper.

One of the special features of the plotter is the way it senses, picks and replaces its pens. It is aware at all times of which pen to use, where to find it, and where to return it. It can be programmed to select from either of two pen groups at appropriate moments during a plot. The system automatically caps and uncaps the pens to keep the ink from drying out.

The 7470 uses Hewlett-Packard's micro-grip drive system developed last year for large-format printers. It avoids heavy moving arms and paper transport drums and belts. The technique involves moving the paper in one direction (x axis) and the pen in the other (y axis). In this way, the inertia is minimized to include only the mass of the drawing medium and the pen. The microgrip drive consists of two rotating metal grip wheels, which hold each edge of the paper firmly against a hard-rubber pinch wheel.

The microscopic points created in the paper by the wheels are used by the plotter for realigning and maintaining registration to ensure repeatability. This is not found on similar plotters.

The plotter uses an MC6802 microprocessor, has 8K bytes of ROM for storing all the plotting programs (including irregular-shape tables) and interfaces either through the HP-IB bus (IEEE-488) or RS-231C, thus making it universal to virtually any microcomputer currently available.

I haven't had time yet to use the plotter extensively, so a report on how well it works will have to wait till later.

Speaking of Software. With an increasing emphasis on computer communications, it is not surprising that software companies are rapidly getting on the communications bandwagon with many products. Many of them we have covered in the past. Recently, though, we came across some interesting packages developed by IE systems, Inc. to permit micros to speak to mainframes. All the software works with standard protocols and greatly upgrades the state of the microcomputer communications art.

One of these packages is the Bisync-80 group—designed to support synchronous communications between CP/M systems and IBM or similar hosts (any system with bisync protocols). Features include a user configuration module, hardware diagnostics, line trace, error checking, carriage control decoding and flexible EBCDIC/ASCII translation.

Another package, the 80/3780, provides full IBM 2780/3780 emulation on 8080, 8085 and Z80-based systems. This software costs $990. Note that you'll only need this package if you plan to op-

erate in the IBM environment as a Remote Job Entry (RJE) terminal. Typically, this implies short-haul (under 20 miles) communication over dedicated metal or fiber-optic lines at speeds of 9600 baud and above.

More practical from the standpoint of the microcomputer user, are asynchronous (character) communications. IE supports 8080/8085, Z80 or 8088/8086 systems with at least 16K of RAM, one floppy CP/M or MSDOS and an asynchronous serial port (Z80-SIO), 8251, 8250,8274, NEC 7201, TMS 5501, or PMMI-103) for $495.

Asynchronous communications is normally established over ordinary phone lines using modems that transfer data at rates of 110 to 1200 bps. Be aware though that, on dedicated short-haul lines, 19.2K baud is possible.

All of the IE's software is available on diskette preconfigured to your requirements. If you own a host computer such as a VAX, PDP-11 or DEC10 or 20, IE can support your communications needs for these mainframes also at prices from $1940 to $5940.

Interestingly, many of the functions that take place in asynchronous communications can be likened to a disk system. If you think of your communications set-up as being like a diskette, with each device scattered around the tracks (interleaved), you can get an idea of the functions of software that uses polling techniques. Incidentally, this is the technique used in networking software to allocate resources to the network and basically avoid collisions.

Communication Terminals. Because low-cost communication is becoming increasingly important, two companies are offering specialized terminals. Tymshare, through Equipment Products Marketing, has the Scanset Models 410 at $495 and Model 415 for $649. The first requires an external modem but provides automatic log-in, the second includes a built-in modem, automatic dialer, and automatic log-in.

Both models take up one square foot of desk space, have a 9" diagonal screen with 24 lines by 40 or 80 characters, and have limited graphics capability. The terminals were built by the French firm Matra and they use Cermatek modems and filters.

Each terminal has six multi-function keys and permits up to 12 user-defined tasks to be assigned to the programmable keys. The autodialer feature allows dialing up to 36 numbers stored in the terminal's battery-supplied CMOS memory. User menus guide the process and a built-in power lets you know the line status. Unfortunately, Matra uses a small keyboard with flat button keys, making the system almost unusable as a true data-entry terminal.

Offering similar capability but with a full-size keyboard and modular approach is the Zenith Data Systems ZT-1 communication terminal. Priced at $695, the ZT-1 is housed in a keyboard with 63 functions—26 alphabetic, 10 numeric, 4

Zenith ZT-1 communication terminal.

cursor, and special function keys. Like the Scanset, the ZT-1 is Bell-103 compatible. It has a 300-baud modem, plugs into any standard RJ-11C, 12C, or 13C jack, supports pulse dialing, has NTSC composite video (RS-170 compatible) and provides a serial I/O from 110 to 2400 baud. In addition, it has an 8-bit Centronics parallel port for printer support.

Zenith has gone to a great deal of trouble in the firmware to provide single-key dialing, sign-on, and all the necessary communication functions. The user can change the terminal's communication parameters, including word size, parity, and stop bits. Numbers can be added to the 26-slot directory.

More Than a Game. Computer games aren't always games in the truest sense. Two that we recently ran across are Roots/M from Commsoft (665 Maybell Ave., Palo Alto, CA 94306. Tel. 415-493-2184) for $124.95, and Unit Conversion Master from Mako Data Products (1441-B N. Red Gum, Anaheim, CA 92806. Tel. 714-632-8583) for $19.95. Both are written to operate under CP/M and can be used with virtually any terminal.

The Roots-M package is a unique program designed to help you trace your family tree. It comes with an extremely well-written manual with illustrations that not only explains the software but describes genealogy in general.

The software works by using a series of fill-in screens for entering pertinent data—marital and blood relationships,

letters, financial records, travel information—anything you can find out about your ancestors. The program uses this data to generate a pedigree chart, and draws relationships between individuals, how families intertwine, and traces all the vital statistics.

Roots/M is one of the best data-base management systems we have seen, and it is very easy to use. The authors have provided numerous well-planned help messages, and tips on finding out who *you* really are.

The Mako Data Unit conversion Master is primarily designed to work with the Heath H-89 system, and uses its screen attributes to good advantage. What makes this package exciting is that you can enter length, volume, acceleration, mass, etc. in whatever units your originl data is given and then determine the correct conversion to the units of any other system (including cgs). Over 18,000 possible conversions are at your fingertips. The package is not really a game, and it strips away uncertainty when dealing with unfamiliar units or unwieldy data. ◊

The Axlon Ramdisk offers 200-ns access and 320K bytes of storage for Apples and IBM PCs.