(Continued from page 35)

The power supply, located at the rear of the enclosure, is vertically mounted and surrounded by a cardboard shield. Although we couldn't be certain, it appeared to be a switching supply, rather than of linear design. This would improve overall heat characteristics of the system.

The main circuit board for the computer is mounted along the bottom and supports the CPU, memory, and interface electronics. Surprisingly, no shielding was evident for any of the active elements, and it appeared that the memory chips are directly below the deflection yoke of the CRT.

Located on the back panel are four DB-25-type connectors for the disk drives, the keyboard, the printer, and one marked "communication." These are RS-232 connectors and follow the standard layout. The keyboard and printer connections are 8-bit parallel. Interconnects are handled using RG-8U cable with full shielding and AMP connectors with screw lockdowns. In addition to the connectors, there is a system RESET switch.

The display/processor tips the scale at 30 lb and measures 13"x14"x15". The keyboard assembly weighs 10 lb and measures 4"x10"x20". Add 10 lb more for the 5.25" disk assembly and 48 lb more if you choose the 8" system.

Interestingly, although the 820 is designed to work with both 5.25" and 8" drives attached, on the system tested, only one or the other could be used, as no daisy-chaining of the drives was permissible.

Evaluation. The system we reviewed consisted of the display processor, keyboard, dual 5.25" drives, and Model 630 printer.

When power was turned on, we were greeted with a message asking us to enter an *A* for boot, or *T* for typewriter. Tapping the *T* turns the 820 into a very expensive typewriter, with everything entered via the keyboard output to the printer (if attached). If the *A* is entered without having put in a diskette, the system generates an error message and stops. To continue requires system RESET or POWER OFF/ON.

For our evaluation, we used CP/M and the word-processing package, a special optimized version of MicroPro's WordStar. On booting, we were taken directly into the first menu screen of about 12 lines that guide us through the various attributes of the word-processing system.

When we booted the system and were put into the word processor, we noticed that the display features white characters on a black background with *no* highlighting. All the menus in Word-Star were displayed with number selections, with no highlighting distinguishing the various attributes. We found this disconcerting since we feel highlighting is a prime feature for user-oriented systems, and is so used in other WordStar applications.

Another difficulty we encountered was that the Xerox version of WordStar is designed differently in that the menus and methods of choosing a feature are redefined from conventional WordStar. This can be a problem if you are familiar with WordStar since it means virtually relearning the commands. However, due to the depth of the menus and the amount of explanation (which, incidentally, is greatly amplified compared to conventional WordStar), with the use of the HELP key, relearning takes only a few minutes.

To test how well everything functioned in terms of speed, we entered a document consisting of four pages of text on a 50-column line (about 3,000 characters). We found that the arrowed keys used for moving the cursor did not function within the word processor. However, as usual, control keys are used to move around the document. The majority of the keys responded slowly, making it possible to type ahead of the system. Typing at 60 wpm, we found that characters were being dropped.

Saving and restoring the document to and from disk took almost a full minute. This time isn't unusual considering that 5.25" disks are fairly slow in transfer. To find out how quickly the system responded, we entered the SPOOL mode to print the document and do further editing at the same time. Typically, the disk system will SPOOL out the document to the printer until interrupted by disk access requirements or by the processor when performing movement of text in memory. Usually no interrupt takes place until end-of-line is reached and a carriage return or line feed is inserted, with little or no degradation on the output or screen input.

We ended up slowing down our typing since the system appeared not to be able to keep up, dropping characters. This signaled to us that the keyboard buffer was apparently too small, thus allowing overflow and causing an interrupt in timing problem.

What we did like about the system was the use of menus throughout. Since no cooling fans are used, the system is quiet and we found that it ran fairly cool without extra ventilation.

We believe that the system we reviewed was not really representative of the product. This is primarily because the display/processor appeared to be a kludge to provide store owners with something to demonstrate. There were no indications that the system met FCC, RFI, or EMI requirements, and based on the internal layout, we're reasonably sure it wouldn't pass because no shielding was in evidence.

Furthermore, the keyboard was sloppy, with the keys slow in responding. We felt that, possibly, the debounce technique used took too much time, thus producing the lateness on entered characters. The latter can cause the operator to get ahead of the computer.

What we would have liked to see Xerox do is integrate the slimline flop-

pies in the display cabinet, produce a slimline keyboard much like the IBM Personal Computer, and provide full-screen attributes of varying display intensities. In addition, we object to the necessity of buying the operating system separately. We felt that this should be an integral part of the system, and included in the basic price.

Documentation. The documentation that is currently available consists of an operator's manual for CP/M and instructions on how to connect everything. We thought we would see some great insight here, but Xerox is simply providing a reprint of Digital Research's CP/M manuals. We liked the section on the printer and disk drives, though, and felt that they showed what is probably coming.

In addition to the system manual, there is a user's manual for the word processor. This is a small, illustrated book that takes you through all the features of the word processor. The manual is well-written. Due to poor reproduction, key formats for showing you what to do are almost unreadable, but all the material is there.

Reportedly, manuals for BASIC, COBOL, SuperCalc, and other software products are in the making, and should reflect more attention to detail.

Conclusion. The Xerox 820 is a machine geared to the office environment and, therefore, should not be equated with systems designed for graphics or software development. Although the machine, as reviewed, doesn't rate highly with us—unless it is for use in an Ethernet or communications environment with access to a host computer—we expect the next generation to offer more features and to take care of the various problems we encountered.

According to sources close to Xerox, you can probably expect enhancements such as the 8086 16-bit microprocessor, a 5.25" Winchester, and a raft of application software products in the near future. In addition, you will probably see the 8087 math processor and the 80130 communication processor incorporated by midyear.

As you read this, the 820 is being delivered with the Z-80, MBASIC, Sorcim's SuperCalc, and other systems software. Currently, many of the Computerland stores are gearing up to offer a host of CP/M-compatible software on the machine, and most-important—full services. The latter is a big plus in the machine's favor.

So we by no means put the 820 down for the count, but expect that it will not be a major entity in the desktop world until the new enhancements are implemented.—*Carl Warren*

COMPUTER BITS

By Carl Warren

Exciting Episode Travels Well

SHOULD you be looking for a small computing system that fits on your desktop or can be packed up on a moment's notice, you might well consider the Episode from Epic Computer Corp. (9181 Cheseapeake Dr., San Diego, CA 92123. Tel 714-569-0440).

This exciting little machine uses a single-board Z-80A 4-MHz microprocessor with 64K bytes of RAM to create a standalone single-user workstation with built-in floppies, communication ports, and diagnostic (ROM-based) software. All you add is your favorite terminal and printer.

The compact unit takes up approximately the same desk space as a legal-sized tablet, weighs 15 lb and has a fold-up carrying handle. In addition, the Episode will work with literally any CRT and printer by virtue of a fully configured version of Digital Research's CP/M operating system.

The Episode is made easy to use by the manufacturer's unique software system called Supervyz. This software package allows the user to command the computer via a series of menus, thus precluding any knowledge of CP/M.

The console I/O is handled via an RS-232C port capable of 9600 baud (available on request). In addition, an auxiliary serial port can be configured so the Episode serves either as a computer or an intelligent terminal.

An integrated real-time clock provides the date and time and it is supported by battery backup. Further enhancing the system is a 16-bit interruptable timer, 8-position configuration sense switch, console discretionary reset, type-ahead feature (supported by interrupt-driven console input), low-voltage switching power supply, and a card cage for system expansion.

In addition, the Episode has a monitor program in ROM. When the system is first turned on, the monitor copies itself into programmable memory, initializes the I/O, signs on, performs a memory test, and then boots from the disk drive.

The monitor offers bootstrap functions to load the operating system, and the ability to display memory between two given addresses in hexadecimal with the ASCII equivalent to the right of each line. You can also go to a specific address and execute a program, query an input or output port, set the console output to a serial port, read a hex file, display, alter, or test memory.

The system's eight sense switches are used for sensing parity on the modem/printer port, the CP/M list-device assignment, and setting the density of the integrated floppy-disk drives.

The Episode comes with case, dual floppy drives, single-board computer, 2K ROM memory (expandable to 8K), 64K RAM memory, Supervyz, CP/M, dual programmable serial ports, and parallel printer port. It is priced at ($3445 with 1.5M bytes of disk storage, $2995 for 800K-byte disk drives, and $2550 for 400K-byte drives. Future options include an integrated modem, 5.25-in. Winchester disk, and multiple serial I/O. All options are slated for availability later this quarter. As of this writing, no pricing has been announced.

As indicated, Epic also supplies the Supervyz software package that makes Digital Research's CP/M and MP/M user friendly. The package accomplishes this with a series of menus that act as a preprocessor to CP/M or MP/M commands by employing the functions found in the O/S but handling them as command lines transparent to the user.
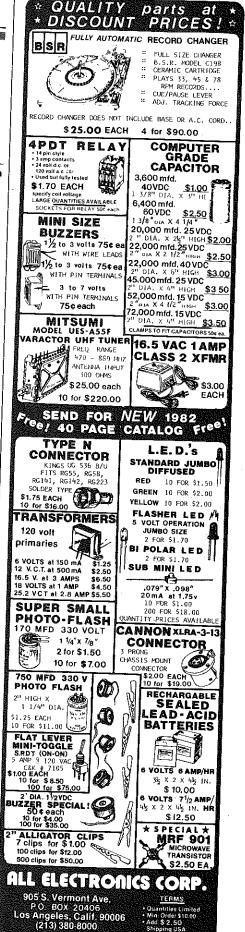
Users are greeted with a series of self-prompting, easily understood menus designed to interface directly to the installed applications. In addition, the powerful control system allows the user commands intrinsic to the O/S by specifying them as menu items.

For turnkey systems, Supervyz can come up when the system is first turned on, thus eliminating the necessity of the user's needing to know the proper boot procedures.

Besides supporting applications, Supervyz provides a time-of-day facility that interacts to the system's real-time clock. This utility is available by a simple menu entry. A computer-aided instruction technique, using tiny PILOT leads the user through the various formats required to establish a menu and all the desired help messages.
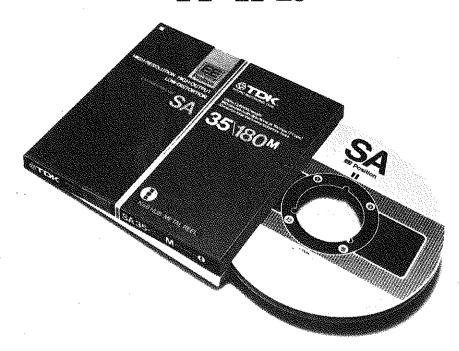
Because Supervyz uses a command line function for setting up commands to the O/S, multiple commands can be imbedded in one menu call. This feature makes it possible to perform batch-type tasks with a single entry.

Moreover, the package permits interfacing to a variety of terminals and printers and can be used to put the system in a typewriter mode. Since the Console Command Processor of CP/M or MP/M has been modified, all disks are logged in on entering the Supervyz

program. This feature avoids irritating BDOS errors. Furthermore, once booted, there is no need to have a disk resident in the system, since Supervyz makes itself memory resident with full CP/M functionality.

The basic package delivered on an 8-in. IBM-compatible single-density diskette includes Supervys the interactive manager, Super CCP and extended console command processor, Menus Def and interactive menu builder, Help and interactive program tutor, and Install S, a configuration program.

Supervyz requires a Z-80- or 8080-compatible microprocessor, at least 40K bytes of RAM, CP/M 2.x or MP/M 1.1 or 2.0 operating systems, and at least 20K bytes of available disk space. There is no limit on the number of menus that can be nested, each menu can contain up to 10 functions with a description length of 32 characters and a command line length up to 64 characters with 4 parameter requests. Pricing is $99 for diskette and user manual.

Looking for a New Terminal? Then you'll want to contact Emulog/Phaser (48881 Kato Rd., Freemont, CA 94538. Tel. 415-490-1290) about the Alpha Star. This operator-oriented terminal includes sculptured matte finish key caps, palm comfort areas on the detached keyboard, green-phosphor tilting screen with a diffusing nonreflective bezel, and contrast and brightness controls on the front panel.

The 18-lb unit displays upper- and lower-case characters with true descenders in an 80-character by 24-line format. Cursor controls permit insert and deletion of lines or characters. In addition, the terminal employs ANSI defined control and escape sequences for reduced intensity, reverse video, and foreground/background generation for specialized data entry.

The terminal's logic board is located behind the main CRT housing for ease of access and to isolate it from high voltage. The logic board includes a programmable printer port, and an RS-232C or current-loop port.

The thin, detachable, Selectric-style keyboard sports a numeric keypad and three programmable function keys. Interfacing and display characteristics of the Alpha Star are easily changed via EPROM—either user created or customized by the manufacturer. This chameleon-like characteristic of the terminal makes it possible to emulate a number of others. Pricing for the terminal is $465.

For those interested in Lear Siegler products, there is the Model ADM 21 video-display terminal. This new terminal uses Z-80 microprocessor power to provide plenty of intelligence for applications that need a low-cost smart terminal for time sharing or data-entry chores. The microprocessor control furnishes a full editing capability, including screen-oriented features such as clear screen, erase line (or page), and charac-

ter insert/delete. Furthermore, you can highlight data fields and text with reduced intensity, reverse video, blink, blank, and underline.

In addition, the terminal features a nonglare 12-in. CRT that displays 7 by 9 dot-matrix characters with lower-case descenders in 24 lines. The characters occupy a 9 by 11 dot character cell. Thus when you underline a character, the underline appears in the ninth line and doesn't interfere with descenders or reverse video on the next line.

The terminal accepts data and text via an 87-key board with auto-repeat. For special functions, you can use the numeric keypad, cursor-control, edit and function-mode keys along with line/page send keys. A self-test mode is included for quick diagnostics.

A combined I/O port handles both communications and a printer as two separate RS-232 ports. Communications over the port can take place at 10 distinct baud rates from 75 to 19.2K baud.

Available options include a 32-character answerback capability, current-loop communications, line graphics, and international character sets. Price: $695. (Lear Siegler Inc., Data Products Div., 714 N. Brookhurst St., Anaheim, CA 92803. Tel. 714-774-1010. Or your local computer store.)

Those who tinker with micro systems have probably run into situations where supposedly compatible RS-232 serial devices do not work correctly with a specific system. The difficulty is usually some incompatibility with the I/O lines.

Well, Fordham Computer Inc., (300 El Pueblo, Scotts Valley, CA 95066. Tel. 408-438-6650) has solved this problem with its RS-232C DB25 Pin Reconfiguration Adapter.

This classy little unit allows almost any serial I/O device to mate with a computer by re-routing the RS-232 signals, thus eliminating the task of fabricating special cables.

The PRA consists of a circuit board with slide matrix switches and a male DB25 connector on one end and a female connector on the other. In most applications, this configuration will match available cables. To achieve the proper interface, merely slide the switches to the proper position.

Although the $59.95 price tag may seem steep, the PRA is as important as your test-bench VOM.

Apple Temperature. To adapt your Apple for temperature data acquisition, Strawberry Tree Computers has introduced its Dual Thermometer system.

The Dual Thermometer interface for the Apple II microcomputer system is a combination of an interface card, two 10-foot cables with temperature probes, and sophisticated software to handle your temperature/data requirements. The temperature acquisition system can store temperature data and time on a disk at intervals you specify for later recall, or it can print the data immediately. In addition, an alarm can be set to intervals from once every 10 minutes to once a year.

The accompanying software permits tailoring the Apple display to your specific needs. Such information as time, temperature, maximum and minimum temperatures, and alarm information for the two probes can be displayed.

Moreover, the software will support up to seven Dual Thermometer cards with a total of 14 probes (two per interface), with the screen displaying data for each probe. The data can be displayed in Fahrenheit, Celcius, or Kelvin, along with a 12- or 24-hour clock.

The Dual Thermometer card plugs into any Apple II peripheral slot with 48K RAM, Applesoft BASIC, and at least one disk drive. The program is written in Applesoft BASIC for specialized applications.

Although the Dual Thermometer can be used for home temperature control applications, it offers accuracy, repeatability, range, and response time that make it ideal for industrial applications.

In addition, the Dual Thermometer's probe cables can be extended up to 500 feet using AWG #18 cable without sacrificing accuracy or response time.

Dual Thermometer is available for $260 including interface card, two 10-foot cables with probes, and disk software. (Strawberry Tree Computers, 949 Cascade Dr., Sunnyvale, CA 94087. Tel. 408-736-3083.) ◇