

# COMPUTER BITS

By Carl Warren

## Training Tools and System Add-Ons

**I**F you're interested in learning more about digital electronics, you might consider the E&L Instruments Inc. LD-1 Pencil Box Logic Designer.

The Pencil Box sports such features as 2 pulsers, 8 LED readouts, 8 logic switches, and an E&L SK-10 solderless breadboarding socket.

Power to the unit is supplied via four 1.5-V C cells or you can purchase an optional ac adapter. The Pencil Box is available as a kit for \$86 as part number 325-4301 or assembled for \$114., part 325-1301 from E&L Instruments, 61 First St., Derby, CT 06418.

The unit weighs 1 lb, 6 oz and measures 10" x 7.5" x 2.5", making it small enough to carry in a briefcase. The onboard 1-kHz clock is user variable with an external capacitor and permits a logic 1 at 3.25 V or a logic 0 output at 0.25 V, both at 10 mA.

The pulsers are fully debounced push-buttons with logic true and complementary outputs with a logic 1 output current being 400  $\mu$ A at 2.4V and a logic 0 current 16 mA at 0.4V.

The 8 LEDs serve as output ports or monitors and are driven by two 4-bit latches with separate enables. These can be used in concert with a microprocessor to serve as bit indicators of addresses or data depending on how you implement the design.

The basic kit takes about 2 hours to build and check out. Everything is mounted on a single, well-marked circuit board, and all that is necessary is to follow the instruction manual.

Further enhancing the Pencil Box are a set of books—Technibooks I and II, *Logic and Memory Experiments Using TTL Integrated Circuits* by Dr. Peter R. Rony. These books guide you through basic digital designs and are chock full of experiments.

The Pencil Box, coupled with the books, make excellent items to add to your bag of tricks if you're teaching a basic digital design course. The nice thing is that it won't cost you or your students an arm and a leg to get going. Moreover, the Pencil Box can serve as an excellent design station for those quickie designs you may be working on, where you have to check out a circuit.

**For that system** you already have, you might want to add a printer. A couple that you should consider, are from C.Itoh Electronics, 5301 Beethoven St., Los Angeles, CA 90066.

Since dot-matrix printers provide a great deal of capability, including near-

letter quality printing, take a look at the Model 8500. This \$775 printer is in C. Itoh's Prowriter series and sports 80-column capability at 100 cps, single and bidirectional printing, compressed- or double-width character sizes and the ability to do proportional spacing.

In addition you can have friction or tractor feed at the flip of a switch. The unit comes with parallel and serial interfaces that are dip-switch configurable.

We checked this printer out under some fairly hard printing conditions and found that it performed well. Furthermore, compared to similar printers, we found that the 8500 was very quiet mechanically.

The 8500 is also very easy to configure. We set it up for 1200-baud serial operation and the only difficulty we had was understanding the manual. Although very complete, it is a little confusing since C. Itoh forgot to spell out the exact location of the baud-rate switches as opposed to the function switches.

In configuring, you can set up the desired protocol, DC1, DC2, ACK/NAK, the busy and the default signals.

We especially liked being able to plug the 8500 into the parallel printer port on either the Atari 800 or TRS-80 Model III and get it to work without special drivers. We also were surprised at the wide array of character sets available. And the printer attaches directly to the RS-232 output of a Microterm ACT 1A terminal and sends escape codes to get any desired function including reverse line feed, an italics-like print set, and full-raster-style graphics.

Should you be using an Apple with a serial or parallel interface, you can do a screen dump to the printer by setting graphics mode and control-Q in the command mode. Whatever resides in high memory will be dumped to the printer.

And for that unique networking or multiuser application, the 8500 can be daisy-chained (up to four printers) with each printer having its own unique address. You don't have to have special software to use this function, only be sure to send the proper escape sequence to toggle the desired printer. Although we weren't able to daisy-chain a group of printers, we were able to toggle the select line of a single printer in both a parallel or serial operation.

As capable as the 8500 is, you might elect to have a fully-formed character printer on your system. C. Itoh has also introduced a new line of daisy wheels Models F10-40/55. The F10-40 runs at 40 cps, handles 136 columns in pica pitch, and 163 columns in elite; the F10-55 runs at 55 cps and sports the same column-handling capability.

Both daisy wheels have print spacing of 1/120-in. and a line feed spacing of 1/48-in. The F10-40, which we had under test, has a slower carriage return than the F10-55, taking 900 ms versus 500. In addition, the F10-40 will accept only a single color cartridge and will handle an original plus 2 copies, the F10-55 handles an original plus 5 copies.

Other differences include: the F10-40 will operate at a maximum data rate of 2400 bps while the F10-55 will operate at 9600 bps. Both units use XON/XOFF, or ETX/ACK protocol, and can be configured, via dip switches or software control, to emulate virtually any other daisy wheel printer available.

We found that with the F10-40, we were able to emulate a NEC Spinwriter and Diablo Model 630 merely by setting the dip switches. We also found that the throughput equaled a Qume Sprint III, and that, while using Wordstar in the spooling mode, the printer was not requiring a handshake all that frequently. The reason was that the model we reviewed had the optional 2K buffer rather than a 136-character one-line buffer. This appears to make a world of difference when in a spooling mode.

The unit we tested used a friction feed which, surprisingly, clamped the paper well enough so continuous forms could be used. We printed well over 100 pages without losing registration which speaks well of the mechanism. You can, however, obtain a tractor feed or an automatic BDT 160 single-sheet feed.

The manufacturer's suggested retail prices for the F10-40/55 range from about \$1300 to \$1500.

(Continued on page 40)

C. Itoh Pro/Writer  
Series 8500



(Continued from page 38)

**For That Total System Approach** to communications, there is Computer Development Inc., 6700 SW 105th, Beaverton, OR 97005, with the Microcom system. The Microcom employs a Zenith Z-89 as the basic building block, but incorporates a built-in smart modem. This modem employs firmware protocol and error-checking control. Furthermore, it operates at either 300 or 1200 baud, and sports auto answer and dial functionality. Coupled with the Term software package, the user has the ability to send Image-formatted documents, hook into remotes systems, stand as a remote system, or serve in a Local Area Network environment. This latter function permits up to 2000 ft between repeaters, can support up to 255 stations and will operate at 56K baud on a single coax line.

Currently, the Microcom is priced at under \$6000 for a 64K byte system, with Digital Research's CP/M operating system, Image, and Term, modem, and dual 5.25-in. single-density floppy disk drives. In addition, CDI is offering 5M-byte hard-disk add-on bringing the price up to about \$10,000.

CDI is presently unbundling the software and modem. Prices for the individual products are: Image wordprocessor, \$495; Forms, a specialized forms generator, for \$295; the Term communication package, \$295. The modem should be available soon for under \$600 (single unit). All the software packages, should be available in most computer stores, or through local distributors. You'll need to contact CDI directly for specifics on who has the products.

The Image wordprocessor permits the use of graphics in the generated text. Furthermore, the graphics can be printed on a daisy-wheel printer. Currently, CDI offers drivers for the NEC Spinwriter and will later provide drivers for most daisy wheels.

If you're planning on getting the IBM personal computer, you can expect Image software for it by mid year, and by NCC time in June, Zenith is expected to introduce the Z-100 system that uses the 8088, the MSDOS operating system (the same one used on the IBM machine), and CP/M-86. In addition, the new machine is expected to give you the option of color graphics as well as full-featured monochrome. And CDI is expected to offer Image software with elements that support the new machines unique display attributes.

### Looking for a Tape-to-disk Driver?

Then drop a note to E. Mark Mears at Cheerhart Cleaners, 122 Woodman Dr., Dayton, OH 45431. He has developed a tape/disk system for the Meca Alpha-I tape system and Meca disk drives using MDOS. This driver integrates the disk drives into the Alpha Microsoft extended BASIC, thus giving you the best of both worlds.

The table printed here is a list of the commands used, and apparently Mr. Mears is offering the software free to any user of the Meca Alpha-I system.

**A Controller Update.** This past December, we reviewed the double-density controller from Magnolia Microsystems. We incorrectly told you that you couldn't change the density of the drives under software control. We were only partly correct.

You can't change the density of the 5.25-in. standard Heath drives, but you can change the 8-in. from single to double or vice versa. You do this by using

the SET command. A typical command would look like: SET D:DD. On entering, the CRT will respond that the drive is now set for double density. Unfortunately, however, the controller won't sense the density of the diskette on insertion; you must supply this information. We think this is a slight shortcoming based on the reliability of the controller. Ours has been in use for over 8-months with no failures. ◇

### MECA ALPHA-I COMMAND TABLE

/MDOS BASIC -- DISK (↑) AND TAPE COMMANDS

\*LOAD NN↑ TO \*LOAD NNNNN↑

\*LOAD NNNNN↑ AAAA OR \*LOAD NNNNN↑ :X AAAA

\*LOAD NNNNN :X AAAA NOT \*LOAD NNNNN AAAA (TAPE).

SHOULD NOT LOAD ASSY PROG THAT WILL OVERLAY (BASIC AREA) BUT THEY CAN BE FORCE-LOADED IN HIGH MEMORY.

CLOAD "NNNN↑ TO CLOAD "NNNNNN↑ NOT CLOAD "NNNN↑ AAAA

CLOAD "NNNN :X OR CLOAD "NNNN↑ :X (TAPE OR DISK)

FNAME MUST HAVE 4/5 CHARACTERS.

CLOAD "NNNN :X + TAPE PROG ADDED TO END OF CURR PROGRAM.

CLOAD "NNNN↑ + DISK PROG ADDED TO END OF CURR PROGRAM.

FOR DISK, DRIVE CONTROL CAN BE 'REM\* DIRE :DX' IN PROGRAM PRIOR TO MERGING PROGRAMS. CHAINING PROGRAMS IS THE SAME.

CLOAD "XR NNNNN↑ :X IS RECOMENDED OVER CLOAD "XR NNNNN↑

CSAVE "XR NNNNN↑ :X WILL PROMPT AND WAIT FOR CR

FOR ARRAY FILES, THE VARIABLE MUST HAVE BEEN 'DIM'ED PRIOR TO ARRAY CLOAD.

FOR CSAVE'S AND CSAVE ARRAY'S TO DISK, THE DISK WILL BE MOUNTED (IF NOT CURRENT DR) AND OPERATOR PROMPT WILL WAIT FOR CR. IF ANY KEY ENTERED, FILING IS SKIPEID. THIS K/B INPUT (STOPPING) CAN BE SKIPEID BY THE AF1C CHANGE LISTED BELOW.

PROMPT = NNNNN AAAA BBBB OK F = CR ?  
ANY INPUT BUT CR WILL ABORT FILING

\*DIRE :0 OR \*DIRE :1 ARE THE SAME (TAPE).

\*DIRE :D WILL READ CURRENT DIR IN OS.

\*DIRE :D1 WILL FORCE DISK READ OF THAT DIR.

REM\* DIRE :D1 - IS VALID BASIC COMMAND.

OVER-RIDE OPTION. 'S', 'Q' AND DIRECTORY ERRORS CAN BE OVERIDEN. THE NATURE OF THE ERROR WILL CONTROL THE SUCESS OF THIS.

AF1C - 44828 - 35	NO DISK SAVE OPTION	30	NORMAL
B6BC - 46732 - 195	NO DISK DIR UPDATE	205	NORMAL
48D7 - 18647 - 201	NO TAPE DIR UPDATE	200	NORMAL
4517 - 17687 - 51	NO WIN IN TAPE DIR	102	NORMAL
BEFC - 48892 - 122	NO WIN IN DISK DIR	191	NORMAL
ARE0 - 44000 -	HOLDS LAST OS ERROR CODE		
B001 - 45057 -	HOLDS # OF FILES IN DISK DIR		
3R39 - 15161 -	HOLDS # OF FILES IN TAPE DIR	#0	
3971 - 14705 -	HOLDS # OF FILES IN TAPE DIR	#1	