

Memotech MTX-512



In the hard-edged business of micro-computer journalism, you have to be prepared to make sacrifices, and to make them on a moment's notice. That is what being a professional is all about.

That is why I unhesitatingly sprang to the fore the moment the assignment came my way: a reconnaissance trip to London to look at the new MTX-512 from Memotech.

A tough job, but then, somebody had to do it.

In these very pages, we have repeatedly told you of the invasion of the micro-redcoats—told you that the British were coming, in no uncertain terms. We recently told you about the BBC Acorn and the ACT Apricot. We also previewed the Sinclair QL-10.

Now Memotech, which began as a Sinclair hardware peripheral manufacturer, has entered the fray with its own micro—the MTX-512.

And it is no mere clone or warmed-over CP/M machine. It is a sleek, sexy contender with some very unique features. If you have scanned the field of under \$1000 machines and come up dissatisfied, the MTX-512 is assuredly worth a look.



HARDWARE EVALUATION

John J. Anderson

Aston-Martin of Micros?

I usually leave the styling superlatives to sister publications, such as *Car and Driver* and *Stereo Review*, but in this case shall make a happy exception. The MTX-512 is a real looker. It is a computer capable of looking as "at home" in your living room as your stereo does. And if it were an automobile, it would invite comparison to an Aston. Both are machines to stop you dead in your tracks, asking with a silly smile, "hey, what's that?"

The MTX-512 resides within a jet black, brushed aluminum case. It is long, and low: 19 inches from stem to stern, yet only 8 inches across and a mere 2.2 inches high.

Touch the anodized case, and you can feel quality. Remember metal? That's the stuff they used to use a lot more of, before plastic came along. It gives the MTX-512

a bit of weight, which keeps it sure-footed on its rubber feet. What a pleasurable contrast to high-impact styrene.

One good-looking machine, to say the least. Feels good, too, like slamming the door on an XJ6.

Built for Performance

Though I will admit that things seem to be moving in the direction I'm about to describe, computers have not as yet assumed the mechanized role of sex symbol—as the automobile has somehow managed to do. Most people still care more about what a computer can do than how it looks. (Still, I imagine most people would be satisfied with a micro, as they would with a mate, that scored highly on both accounts.) You most certainly would not buy a car based purely on its looks. Nor would you buy a computer that way, right?

Pretty Is as Pretty Does

I am happy to report that the MTX-512 begs comparison with Asters and Jaguars for its performance as well as its looks. For beneath its beautiful skin, there resides a powerful, unique, and versatile design,

in some respects grounded firmly in proven tradition, and in other respects, truly innovative.

Consider the case of the casing. That metal casing serves as more than mere status symbol, in contrast to the impact styrene covers of the Commodore 64 and Atari. It performs three important functions simultaneously. It obviously protects the innards of the machine. It acts also as a heat sink, draining off damaging component temperature extremes, and it serves as a Faraday cage, completely sealing off RFI (radio frequency interference) that can cause static for and with nearby radio listeners, and even impair the video quality of the computer's own output. The MTX-512 is one machine that sailed through FCC approval procedures with flying colors—the first time around.

Kitten on the Keys

Form follows function, example 2: let your fingers do the walking down the 79-key, full-stroke, sculptured keyboard. Tap them down to feel how really good keyboard touch should feel. Check the layout. Not true Electric-style, unfortunately, (apostrophe not on the right but on the shifted 7, a la Apple II and C-64), but very nearly so. The numeric keypad is standard, with directional arrow keys overlaid upon them. Eight programmable function keys are on the far right of the top panel. Used in conjunction with the Shift key, another set of eight functions becomes available. The F and J keys are recessed for easy fingertip location and homing. On either side of the spacebar are two unmarked reset keys. Both must be depressed simultaneously to trigger a cold start. All alphanumeric keys offer full autorepeat.

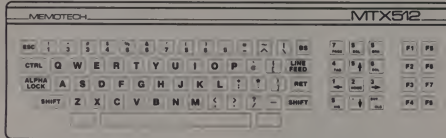
A keyboard diagram is reproduced here as Figure 1.

Under the Hood

Okay, stop salivating on the upholstery. Get ready to fasten your seatbelt and we'll take it for a test drive. But first, let's take a quick look under the hood.

The processor for the MTX-512 is the ured and true Z80. Sure, you could argue that the Z80 is past its prime, but you surely can't argue very long about its shortcomings in comparison with other 8-bit

Figure 1.



HARDWARE PROFILE



Product: Memotech MTX-512
Type: Desktop microcomputer
CPU: 8-bit Z80 at 4MHz
RAM: 64K standard, expandable to 512K.

Keyboard: 79 keys, full-stroke

Text Resolution: 40 x 24

Graphics Resolution: 256 x 192

Color/Sound: 16 colors, 3 tone channels, 1 pink noise channel

Ports: Cassette, joystick (2) parallel printer, ROM cartridge. Serial ports optional.

Performance: Very good

Documentation: Fair

Price: \$595

Summary: An excellent learning machine, built with an emphasis on quality. With a low-cost disk drive, could be an extremely versatile system.

Manufacturer:
 Memotech Corporation
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 Needham, MA 02194
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CPUs. Memotech chose to go with a chip that has a productive and respected past—as well as future. The Z80 can do it all; it can perform quickly and address a good-sized chunk of RAM directly. It also raises the possibility (spectre?) of CP/M compatibility. And the Z80A inside the 512 operates at 4MHz. Radar detector is strictly optional.

Included in the \$595 base sticker price is 64K RAM, expandable to 512K (hence the model moniker MTX-512). Add to this another 16K RAM standard dedicated solely to screen memory. The video circuitry includes its own processor to handle video housekeeping.

Alive, Alive I/O

Also included as base-sticker standard are the following ports: variable rate cassette port (to 2400 baud), two digital joystick ports using industry standard (Atari) configuration, Centronics standard parallel printer port, ROM cartridge port, and uncommitted parallel port.

Available as an option is a communications board which carries two completely independent RS-232C interfaces (to 19,200 baud) and a disk drive bus. As mentioned above, RAM memory is optionally expandable to 512K. RAM can be added in increments of 32, 64, 128, or 256K.

ROM on Board

In addition to RAM for the main processor and screen display, the MTX-512 contains 24K of ROM with some really neat goodies packed inside. These include MTX Basic, "Noddy," a simple, Pilot-like text-handling language, an assembler/disassembler, and ground-breaking "Front Panel" program that allows all three languages to interact in concert. We shall examine this software in a bit more detail up ahead.

ROM expansion can take place internal to the MTX, or through the ROM cartridge slot, to a maximum of 72K. That would imply quite a smart machine indeed.

Does Windows, Too

The screen specs of the MTX machine are as impressive as its physical look. Separate outputs are offered on the back panel for monitor and TV (with internal RF modulator). Graphics resolution is 256 x 192 pixels in 16 colors. Text resolution is a standard 40 x 24 characters in a unique and pleasing font.

In addition to conventionally bit-mapped modes, the MTX-512 offers 32 user-definable sprites—which are controllable through high-level Basic commands. This means that sprites and sprite movement can be defined straightforwardly from Basic without recourse to cryptic POKE commands.

The MTX also has a unique and powerful windowing feature: eight user-definable "virtual screens"—controlled through special Basic commands—are available. The result is Basic-programmable text or graphics windows with remarkable ease of control.

Hi-fidelity sound is pumped through the RCA phono plug output on the rear of the MTX unit. Four channels are available—three independent tone generators,

and a "pink noise" channel for percussion and sound effects. Alternatively, sound is also routed through RF for output on a standard television set.

Powering Up

Let's start her up and take her around the block.

There is no power switch on the MTX-512 itself; rather, we find an illuminated rocker switch on the matching external power supply used to turn the computer on and off. Flip it on, and we have ignition.

Upon power-up, we are in MTX Basic. This dialect is very much like Microsoft Basic, with a large number of added special graphics, sound, and window commands (see Figure 2).

Noddy is a text manipulation language that reminds me a bit of Logo, and even more of Pilot. Noddy is British slang for "simple," and that it is. Using Noddy, even a child can master sophisticated branching capabilities. The language provides a tremendously easy-to-use method of programming the computer to display information or ask questions, then branch to a new screen based on the response to the old one. Available Noddy program commands appear here as Figure 3.

Here another unique facet of the MTX architecture becomes apparent. Basic and Noddy are completely interactive, allowing screens to be named, constructed, incorporated into a tree structure, and then called from Basic programs. On exit from Noddy to Basic, all Noddy screens and programs are left intact. In situations where branching text screens are needed, Noddy is the way to effect them—and Noddy can effect them seamlessly from within Basic programs.

Also onboard ROM chips and accessible from power-up is a powerful Z80 assembler/disassembler. Source and object code occupy the same space in memory, allowing very compact storage of large assembly language programs. As with Noddy, MTX Basic can also interact fully with this module as well. As a result, machine code programs may be included within a Basic program and assembled as the program is run—there is no need to define fixed areas for the machine code to reside—and no USR addresses to calculate or miscalculate.

The Front Panel Display acts as a dramatic machine language tutorial and has helped as far gone an assemblerphobe as me overcome fear of the stack. The name comes from a time when computer keyboards had yet to be perfected, when programming took place across banks of lights and toggle switches on the front panels of the behemoth ancestors of today's micros.

The MTX front panel is an interactive program which allows manipulation of the contents of memory and Z80 registers.

Command Words — MTX BASIC

ADJSPR	DIM	LPRINT	REM
ARC	DRAW	MSVPR	RESTORE
ASSEM	OSI	NEW	RETURN
ATTR	EDIT	NEXT	ROM
AUTO	EDITOR	NODDY	RUN
BAUD	ELSE	NODE	SAVE
CIRCLE	FOR	ON	SBUF
CLEAR	GENPAT	OUT	SOUND
CLOCK	GOSUB	PANEL	SPRITE
CLS	GOTO	PAPER	STEP
CODE	IF	PAUSE	STOP
COLOUR	INK	PHI	THEN
CONT	INPUT	PLOD	TO
CRVS	LET	PLOT	VERIFY
CSR	LINE	POKE	VIEW
CTLSPR	LIST	PRINT	VS
DATA	LLIST	RAND	
	LOAD	READ	

Figure 2.

NODDY COMMANDS

BRANCH ENTER PAUSE
IF ADVANCE LIST
GOTO RETURN OFF
STACK DISPLAY

When working in NODDY you can

- 1) create a page by giving it a title of your choice.
- 2) type DIR to see what pages already exist.

3) look at a page already in the Directory by typing its title

NODDY also allows you to construct PROGRAM PAGES using the commands listed above, to manipulate and display text interactively

Figure 3.

FRONT PANEL DISPLAY Commands

B followed by Y (i.e. BASIC, then Y/N) returns user to BASIC
C clears the List screen
D displays memory in hexadecimal
G (go) runs a block of code defined by the user
I cycles the display between ASCII characters or machine code values currently in memory
L lists memory contents from a given hex address
L lists memory contents from current Program Counter address
M moves a block of memory to a given address
R alters contents of a given Register
S single steps through code from current Program Counter address
T as above but treats Calls as one instruction
X displays alternate Register set
= moves Register cursor
- moves memory display cursor backwards
< enter > moves memory display cursor forwards
! moves display up
! moves display down
< brk > stops a program and displays register contents

Figure 4.

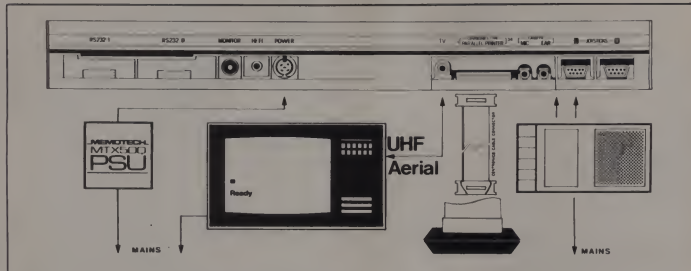
It is useful for tracing the internal interactions of the computer while a simple program runs. In fact I could recommend no better way to master beginning Z80 assembly instructions.

The program is also obviously a big help in debugging machine code programs. It displays the contents of all registers and command pointers during program execution. Figure 4 presents the commands available from the front panel.

"Tired" Analogy Strikes Again

Earlier I compared the MTX to British luxury/performance cars to underscore its appointments and quality construction. It turns out the comparison is especially fitting when describing the screen editor of the machine as well.

Americans have gotten as used to full-screen editing as they have to driving on the right-hand side of the road. Want to make a change? Use the cursor keys to



The rear of the MTX-512, with peripheral hook-up diagram.

move the cursor over the offending code, make the change, then press Return. As far as we Yanks are concerned, that is the way to make an alteration.

Well when you first sit in front of an MTX-512, you may get the feeling that the steering wheel is on the wrong side of the computer. The screen editor is powerful, but it just doesn't work the way you expect it to. First of all, editing takes place within a four-line virtual screen at the bottom of the display. To change a line, retype its number to bring it into the editing window. Then you can make the change.

At first, you may find the effort of mastering the MTX editor a bit of a chore (and at times a bit scary—like the first time you drive on the left-hand side of the road). With a little practice, however, you will overcome the urge to move the cursor straight up out of the editing window to make changes at the top of the screen.

The MTX editor does effect immediate syntax checking, and positions the cursor at the offending character in the rejected line for easy alteration.

All Basic and Noddy language commands can be abbreviated during entry and editing, and will appear in non-tokenized form when listed. Basic lines can be entered in upper- or lowercase with commands listing in uppercase. Extra spaces will automatically be trimmed off upon listing as well.

Ringin' Up the MTX-512

The MTX is undeniably engineered to compete head-to-head with the Acorn in the field of education. The Acorn is a big seller in Britain and is sanctioned by the BBC, which is influential not only in the U.K. but in many places worldwide. The Acorn hence has quite a head start on the 512 on this account. (As an aside, we are very disappointed to report that no Acorn

has of this writing appeared at the lab for exhaustive evaluation. U.S. entry of the machine has been delayed for a half-year now).

The MTX competes favorably with the Acorn, however, as a heavy-duty education machine, and if Memotech can effect distribution in this country before its rival, it may get a chance to cut ahead in the development of a U.S. beachhead.

The MTX competes favorably with the Acorn as a heavy-duty education machine.

One facet of the MTX-512 that is sure to interest educators is the "Oxford Ring" node software, which may be used inexpensively to link up to 255 MTX units together. The software can pass all manner of programs, mail, and data among all members of the ring. A hard disk unit can complement the ring and be accessed by slave as well as master units connected to it.

In a classroom situation, this kind of network can improve the quantity and quality of learning by allowing one instructor to teach one concept while allowing all students immediate interaction with the concept being taught. This contrasts markedly with a group of computers all running free and unattended by an instructor.

I saw the Oxford Ring in action in no less fitting a locale than Oxford itself and

can report with confidence that it really works. This is more than I can say for the BBC Acorn, which claims networking capability but has so far not delivered on the promise, at least in front of American witnesses.

Of even greater interest to educators will be the cost of the node system—\$20 per computer. That is quite a bit less than any other working node system I have seen.

Breakneck Benchmark

I myself am not a big believer in benchmarks, and so feel compelled whenever I invoke them to preface things with some sort of disclaimer. Remember, folks, no one statistical method reliably tells you which computer is better than another. You must decide that for yourself.

I can report without qualification, however, that the David H. Ahl Quickie Benchmark is as fair and simple a micro benchmark test as I have seen. We have used the program to compile benchmarks on everything from the Sinclair ZX81 to the Cray 1. Despite a distrust of benchmarks, I have gotten into the habit of running this one on every micro I evaluate for *Creative Computing*.

The MTX-512 fared quite well indeed on its go-round with the test, coming in at 46 seconds, with an accuracy of 0.000252962112 and a sum random of 6.9. (No benchmark feature appears in this issue, but details on the test can be found in past and upcoming issues.) This was well ahead of the Epson QX-10, TRS-80 Model 4, Atari 400 and 800, Commodore 64, and TI 99/4A, though it is slower and slightly less accurate than the BBC Acorn. In all, a very respectable showing.

(Remember, as the benchmark runs from Basic, we are measuring the speed of Basic as well as processor speed in conducting these tests.)

Color	Monochrome
White	Flash
Red	Underline
Green	Background
Blue	Bright Up
Yellow	Reverse
Magenta	
Cyan	

Figure 5.

The Toaster Oven

Two external mass storage devices will soon be made available for the MTX-512. They both reside in handsome, coordinated cases which I quickly dubbed "the toaster oven" not because they get hot, but because of their unique look. (Though the units do get lukewarm, you'll be wasting time trying to do English muffins in them.) The chassis is exactly as long as the keyboard unit, and again, is made of extruded brushed black aluminum (or aluminum, if you're a Tory). A monitor can very conveniently perch atop a toaster oven, at a comfortable and readable height.

The disk-based systems come in two flavors: dual 5 1/4" floppy, and floppy/Winchester hard disk. "Silicon disk" boards are also available to simulate instantaneous access disk drives. A little more about that appears up ahead.

In addition to the storage devices themselves, the toaster oven sports an internal card cage which accommodates a computer expansion board (standard), a color 80-column board with RGB output (standard), up to four "silicon disk" memory boards (optional), and battery back-up (optional). Also available from this chassis is an additional parallel port for further bus expansion.

The CP/M Connection

With both the FDX floppy version toaster oven and the HDX Winchester version toaster oven, the CP/M operating system is used. A CP/M 2.2 disk comes standard with every unit. More FDX units can be hooked together to create a multidrive CP/M system.

With the advent of CP/M on the MTX system, reams of tried, tested, and terrific software become available. And running CP/M on the MTX is not like running it on any other system. The screen display is truly superlative.

Toasted RGB with Buffer

Try 80 columns by 24 lines in seven colors on for size, with two 96 element character sets, each sporting true, easy-to-read descenders. RGB graphics mode offers 160 x 96 pixel resolution and teletext compatibility. Want to talk speed? Screen update takes place at an average of 25,000 baud. That means an entire text screen can change in about the time it takes an IBM PC to scroll a single line.

Then there is the fact that the MTX-512 automatically turns monochrome software into color software (see Figure 5). It translates special character modes into color changes, which are much easier to recognize and work with. Once you have had a chance to run CP/M on a Memotech, it will be hard to return to any conventional CP/M system.

Slipping in Silicon Disks

Each Memotech silicon disk is a quarter or one megabyte fast-access RAM board, capable of emulating CP/M drives 0 to 13. Four such boards may be mounted within the HDX or FDX toaster oven chassis, providing from one to four megabytes per card frame. However, the silicon disk controllers can supervise four logical drives of up to 8 megabytes each—giving a maximum silicon storage of 32Mb.

Silicon storage is superior to floppy and hard disk storage. It is up to five times

faster than a Winchester disk, and 50 times faster than a floppy. It reduces disk wear and swaps, and enhances disk reliability. And the cost of silicon storage continues to drop.

Picture it: a 512K color CP/M machine, with 160 megabytes of floppy, hard disk, and silicon storage! Probably enough to handle the NORAD system—and in seven colors yet.

Print About the Printer

We were impressed from stem to stern by the MTX-512 and its companion units, the FDX and HDX. Then we got a look at the companion printer, the DMX-80. This unit, OEM Panasonic, is perfectly matched to its master. It is turned out in jet black Memotech livery, with a brushed texture, and has the Memotech red pin-stripe across it as does the MTX-512. The machines make a handsome pair. The DMX-80 is an Epson work-alike and



Assembling power supplies for the U.S. version of the MTX-512.



Dick Govatsky, U.S. marketing director for Memotech, shows off the brains of the operation.



A 24-hour burn-in is standard along the assembly process. When the computer comes out of the box, it will work.



DMX-80, high quality at low-cost, in MTX-512 livery.

produces a typeface nearly identical to that of the MX-80 (Figure 6). While it is no speed demon, it is tolerably fast, quiet, and easy to use. Parallel interface cabling is trivial.

And that's not all. The real news about the DMX-80 is that it costs a mere \$400.

BCDFGHIJKLMNOPQRSTUVWXYZ
 # \$ % & ' () * + , - . / 0 1 2 3 4 5 6 7 8 9
 s t u v w x y z [\] ^ _ ! " # \$ % & ' () *
 d e f g h i j k l m n o p q r s t u v w x y z
 E F G H I J K L M N O P Q R S T U V W X Y Z I
 ! " # \$ % & ' () * + , - . / 0 1 2 3 4 5 6
 p q r s t u v w x y z [\] ^ _ ! " # \$ % &
 a b c d e f g h i j k l m n o p q r s t u v w
 R S T U V W X Y Z [\] ^ _ ' a b c d e f g h
 C D E F G H I J K L M N O P Q R S T U V W X Y
 4 5 6 7 8 9 ; < = > ? @ A B C D E F G H I J
 % & ' () * + , - . / 0 1 2 3 4 5 6 7 8 9 ;

Figure 6.

and comes with a one-year guarantee on everything. That is an unprecedented value. When you look at, touch, and operate the printer, it becomes clear that it is built durably and for keeps, and Memotech is willing to bet a year on its

quality. Congratulations, Memotech, on a savvy choice of printer.

The Downside

Well the superlatives have sure been pouring in for the MTX-512 for the past 3000 words or so. The MTX system has once again shown the flair the British have when it comes to designing microcomputers. If you will allow a generalization, it seems they excel in putting together teams of talented individuals—and achieving uncompromised results. I am sure that Memotech is quite proud of its new baby.

What is there, then, to complain about? Well really only a few items, though a couple of those items are of more than passing significance.

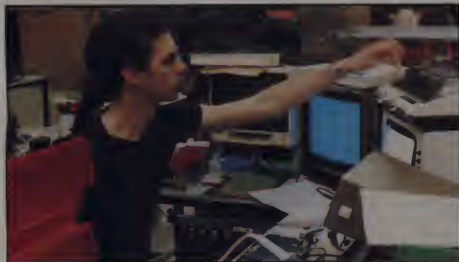
Foremost on my list of caveats is the lack of an inexpensive disk drive system controllable from Basic. As it stands, the MTX-512 is a cassette-based system, and the only redress is a \$1300 dual drive system running under CP/M. This is definitely a problem.

Cassette-based storage may be an acceptable proposition to the British hobbyist, but I do not think it will be acceptable in the long-term to the kind of American customer to whom the MTX-512 will appeal. When I was in London, I urged the brass at Memotech to rethink the situation. I guess they agreed, as negotiations are now in progress to OEM a moderately-priced drive from Indus, which will provide random access storage from Basic. (The Indus drive wasn't a tough one for me to think of or to suggest—it is already jet black, with a brushed texture, and already exudes quality, as befits any Memotech product. At the same time, it commonly retails for \$420—a far cry from investment in the \$1300 FDx toaster oven. It is very affordable to the hobbyist.)

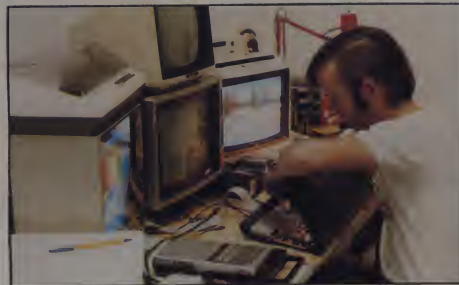
As to if and when this eventuality will come to pass, that is a sticky one to call. Creating the controller board and drivers should not be such a tough task. However, MTX Basic as it stands has no hooks to anything other than serial-access cassette, and a ROM software revamp could cause additional delays. We shall wait and see.

In fairness, I should report that cassette transfer on the Memotech seems relatively fast and relatively reliable. Audio data "squeal" is routed to the TV speaker to confirm data transfer as with the Atari (but unfortunately not the C-64). Baud rate is selectable to 2400, twice as fast as the Model 100 and more than twice as fast as most other cassette systems.

I admit my unreasonable prejudice, based in large part on traumatic experiences in my past. The problem with cassette systems is that they use cassettes, that's all. I was therefore disappointed to have to use cassettes with the MTX-512. It felt a bit like having an opportunity to drive a



Testing circuitry all along the line assures a quality-controlled product.



Testing video output for proper alignment and signal adjustment.

lag—but only up and down the driveway. I couldn't make it to the street.

Another facet of the mass storage snafu is that no FDx was made available to us for evaluation. I saw about a half dozen working units when I was in Oxford, but the U.S. production line had not begun in earnest at the time of this writing. As a result, I can speak definitively only of the MTX itself and the DMX-80 printer—not of the toaster oven. Though I'm sure the FDx will live up to its specs, Memotech did not take advantage of the opportunity to prove it to me.

My other reservations are more nit-picky. The Return key is too small, and I found myself hitting Line Feed all too often by mistake. Maybe I'm a klutz, but I'm also used to Return keys designed for klutzes.

I'm not also so sure about the reset configuration. It seems to me too easy to

rest your palms on the machine in such a way as to invoke a cold start, conceivably wiping away a great deal of work (a stroke-inducing phenomenon with which I am all too familiar—if there is a way to screw

For the price, the MTX-512 is a beauty —inside and out.

up hours of work, I will always find it). Though it is a novel approach, I think I would prefer the more conventional recessed back panel reset button.

The documentation, while nearly com-

plete and well-indexed, is rather perfunctory in places. The irony is that here we are with all these wonderful Basic commands to control virtual screens, but without the kind of documentation that really might prepare us to use them in a practical way. I felt the same lack when it came to sprite graphics, sound, drawing, and color commands. The style is uneven. Upon introducing a topic, the documentation treats you like an utter novice (as it should). Then, two pages later, it reads like a college programmer's text. The inconsistency is disconcerting.

The Kicker

If Memotech can straighten out the mass storage situation, it will have in the MTX a very strong contender in the U.S. market. The other criticisms I have made of the unit pale in contrast to its myriad capabilities. The task for Memotech is to

Grabber Grabs Me

There I was on a tour of Memotech in Oxford, on a foggy day in mid-February. I had been up most of the night before and was feeling less than 100 percent, as we say in New York. We hadn't eaten any lunch and had been on our feet for about five hours. And yet I could hardly contain my enthusiasm for the demonstration.

There in front of me was the most incredible video frame grabber I had ever seen. A couple of fellows were aiming a video camera around the room, and it was difficult to believe that the picture they created on the video screen was not analog, but *digital*.

It was stored in RAM memory just like a spreadsheet or this article. And yet, it was nearly photographic in quality and detail. It was all I could do to keep my mouth shut when they aimed the thing at me.

They froze an image of my face, then showed what they could do with the digitized image. They divide the screen into four windows, each with the original portrait inside it. They changed its colors, enhanced the contrast between its colors, rotated, moved, and superimposed images of the portrait on other images.

There have been hi-res frame grabbers before, and there will be more in the future. But the Memotech hi-res image processor represents a breakthrough in performance for the price. Sure, it's pricey—about \$14,000 at the current rate of exchange for the pound sterling. But capability of this quality cost three times as much before Memotech came on the scene.



Members of the hush-hush, ultra-secret hi-res team, cueing up a shot.

The demonstration was so impressive, I had to stop thinking about the good old MTX-512 until I had seen everything it



The author, in nearly photographic-quality hi-res. Note how well jet-lag has been depicted digitally.

could do. All I can say is "wow." And as memory prices continue to drop, it is not inconceivable that this technology will become affordable to the hobbyist.

When it does, the now clear line between "computer graphics" and "video" will be destroyed forever. It will be impossible to tell what comes from a laser disc and what from RAM. Gone will be the days when computer generated pictures could be identified by their lack of resolution, or "computerish" look. And a new vista will open for the user within microcomputer art.

The frame grabber device is a clear example of the research and development brilliance currently populating Memotech, and which is assiduously guarded by the company (hence no names shall appear here). Fellows, you know who you are. You should be very proud. Keep it up!

—JJA

make the MTX-512 truly available in the States, so that those of you who are interested can go give it a look, the way I suggested at the top of this piece.

Memotech must also get the machine into the hands of U.S. software houses. I never criticize a new machine for lack of software. But a year from now, the MTX must be supported by the best of U.S. houses, if the hardware is to survive. The British software I saw is, for the most part, a pace behind our own.

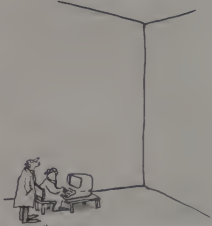
Memotech has announced a ROM cart word processor, *New Word*, based on *WordStar*. We did not receive an evaluation copy, but it seemed to work quite well during demos in London. Remember, as it stands, you will be using cassette storage with the package.

American software firms Infocom and MicroProse have announced that they will support the MTX-512. Other companies are expected to follow once the MTX begins to move a bit in this country.

Obviously then, distribution is no trivial concern for imports such as this one. We have watched a number of innovative British machines fall by the wayside in this country not because of competition, but for lack of adequate marketing channels. We have heard potential buyers and software developers tell us they could not find a machine, could not contact manufacturers at numbers we provided, and that when they did manage to get through to someone, the response was unaring, uncoordinated, and unsure.

We trust that this will not be the case with Memotech, which already has some experience with the U.S. market. And in this extremely important distribution effort, we wish Memotech the greatest success. Like Kate Bush and Bill Nelson, this British import is deserving of a niche on our shores. For the price, the MTX-512 is a beauty—inside and out.

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