MEMOTECH MTX500 HITS THE STREETS

With impressive hardware and software features, the new £275 MTX500 from Memotech looks a winner. And we run it against its nearest rival, the BBC B.

Memotech's first computer, the MTX 500, has been eagerly awaited for a number of reasons. The company's high-profile advertising campaign has been titillating potential buyers for many months, and on paper at any rate, the specifications have presented the £275 machine as the only direct rival to the BBC Micro.

The best illustration of Memotech's serious intentions is the physical design of its new baby. Many home computers sell on little more than purposeful styling, and there is no doubt that the MTX has the most impressive appearance of any home machine. With a 12-key numeric pad and eight vertically-stacked function keys, only its relative thickness distinguishes it from the detachable keyboard of a top-flight 16-bit business micro.

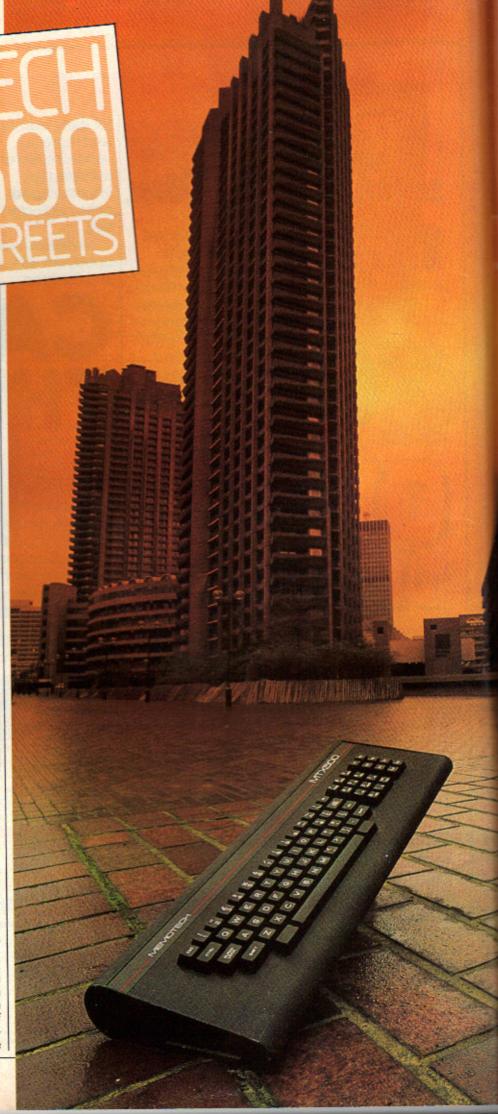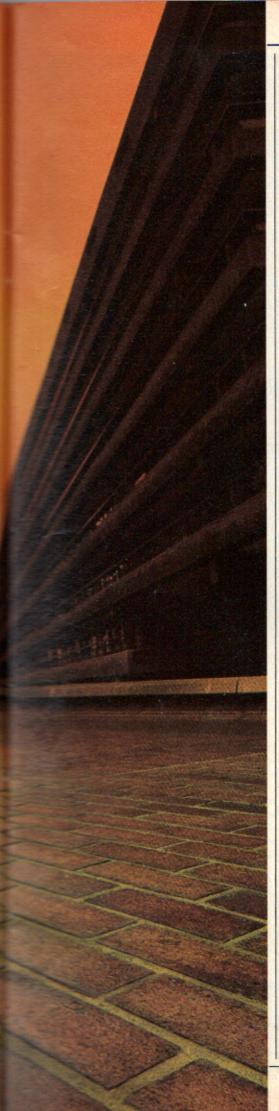> **Any computer which aspires to more than toy status must offer plenty of facilities for interfacing**

The quality of the external design extends to the power supply. Although this is regrettably of the external type, it is extremely neat and equipped with the necessities that some manufacturers regard as uneconomic extras (such as a switch and a reasonable length of lead).

Any computer which aspires to more than toy status must offer plenty of facilities for interfacing, and here the MTX strikes the middle ground between the inadequacy of the average home micro and the embarrassment of riches offered by the BBC machine.

Along the back edge of the smart black alloy case we first find a pair of 9-pin D-type joystick ports. Wisely, Memotech has wired these to the same specification that Atari and Commodore use, so any of the wide range of Atari-compatible joysticks may be used. Next in line there are

two jack plug sockets which make up the cassette interface (no provision is made for cassette motor control), a Centronics parallel printer interface, a UHF TV outlet and the power supply socket.

Two more unusual interfaces are an outlet for composite video monitors (definitely a good idea for any sort of prolonged serious use, from spreadsheet planning to programming), and a jack socket marked HI-FI. This enables the user to pipe the machine's sound facilities through suitable sound equipment, should the TV set prove insufficiently noisy (or, of course, when a 'mute' monitor is in use).

Two RS232 interfaces can be fitted, but Memotech has not seen fit to make even one of these standard equipment. We feel that few people in the MTX market will be able to do without them for long. The round-up of holes and protrusions ends at the left hand side of the case where a Sinclair-style edge connector shyly lurks.

The quality and design of the keyboard is an important generator of first impressions.

Give any journalist a new computer and the first thing he will do is start typing on it. The quality and design of the keyboard is an important generator of first impressions, so it was disconcerting to find a few small but significant flies clogging the ointment. After a lot of experimental bashing by various people in the office, all agree that *something* was not quite right. One of our freelance contributors put his finger on it, realising that the key travel seemed rather restricted. This defect has also been noted with the Camputers Lynx and the Electron, so the MTX is not alone. Still, in the cost-cutting home micro market all these keyboards are infinitely preferable to a cheap rubber-key job, so no quibbles!

Fortunately for Memotech, the one serious problem with the keyboard should be relatively easy to fix. On each side of the space bar the attentive reader will have noticed two innocent-looking unmarked keys. Pressing one of these has no effect, but when both are down at the same time the effect is to reset the entire system. Make no mistake, a really brutal reset is sometimes necessary when a faulty machine code routine runs out of control, but if such a feature is provided, it should be tamed by requiring the depression of a tiny little recessed button right round the back of the keyboard where no one can touch it by mistake.

Making the simultaneous depression of two keys trigger the reset is not good enough when those two keys are of normal shape and size, normal spring weight, *and* right in the busiest area of the keyboard. Apple had to learn this lesson the hard way with the II — the IIe has been made more idiot-proof. We re-learnt it the hard way when our test programs and data were blown away on a number of occasions. As a very minimum, double-

strength return springs should be fitted to these keys, and MTX owners would be well advised to consider the old Apple trick of taking the plastic caps off these keys so that they are less prone to accidental use.

Internally, the Memotech is reasonably conventional. It uses the Zilog Z80A processor in preference to that other mainstay of the personal computer scene, the 6502. The advantage of this chip for machine code programmers is the excellent instruction set which enables the Z80 programmer to get away with just a few instructions where many would be necessary on the 6502. Lights, music and action are handled by a pair of familiar Texas Instruments video and sound processors, and the programmer has 32K of RAM available. Unusually, there is no memory penalty for the use of high resolution graphics as the video processor has its own complement of separate RAM (16K). Internal upgrades of RAM are due to be available shortly.

It is unusual for any home computer to be supplied with more than one programming language, and Basic is normally the supplier's choice. Most popular machines have a variety of programming languages available as extras, some supplied on cassette, and some in ROM, but as far as we know the Memotech is unique in having Basic, Noddy and a Z80 assembler all built-in from the start.

The Basic is of rather variable quality. Those familiar with Microsoft's trusty interpreter will find MTX Basic reasonably easy to comprehend, but for a micro which sets out to challenge the BBC, MTX Basic lacks some fairly fundamental features. Line renumbering is not available, there are no definable functions or procedures, and an ON ERROR branch would have been nice.

The worst error messages we have encountered on anything since the ZX81.

We also found the interpreter extremely finicky about which spaces are and aren't allowed. But the main complaint about MTX Basic is its error messages. As the table shows, these are the worst we have encountered on any computer since the ZX81, and they let down the Memotech's ultra-modern,

PHOTOGRAPHS BY RICK CORDELL

advanced image very badly indeed.

On the positive side, Memotech has implemented full support for the machine's excellent sound and graphics facilities in Basic, something that many other manufacturers (notably Commodore) fail to do. Arcade gamers will enjoy experimenting with a wide range of sprite creation and handling commands, while backgrounds can be plotted with the usual Line and Circle commands. These are supplemented by a set of turtle-type graphics commands which call on many features of the Logo educational graphics language.

If all this leaves you confused, the upshot is that graphics are very easy to create and manipulate, even for beginners.

Editing Basic programs is another curiously old-fashioned feature. Instead of the screen editor you might expect, the MTX uses a line editor which is invoked by the command EDIT X where X is the appropriate line number.

The assembler is easily entered from Basic so that listings can include a mix of Basic and assembly language, and a

NODDY COMMANDS

B BRANCH
I IF
G GOTO

E ENTER
A ADVANCE
R RETURN
S STACK

P PAUSE
L LIST
O OFF
D DISPLAY

ERROR MESSAGES

Params
Incorrect or wrong number of parameters for a function or command.
Mistake
A
Dot outside virtual screen.
SE.A
Screen type not in type table.

SE.B
Invalid ESC sequence.
SE.C
Command not valid for this device.
SE.D
Switch to absent Virtual Screen.
SE.E.
Invalid UDG/UDG type.
Symbol?
A symbol is missing, such as "=", "TO", "THEN", ","
Not numeric
A number is expected.
Not a string
A string is expected.
Boolean?
A truth value is expected.
Mismatch
An illegal relationship between different types of values.
BK
Break in tape LOAD or SAVE.
No data
No data for READ or No page for NODDY.

Overflow
Number too big.
Div /0
Out of range
Number is not in a valid range.

No space
To define an array
To expand a program
To assign a string to a character array
To perform a large operation.

Subscript
A subscript is out of range or there are too many.
Gosub
Too many GOSUBS (more than 34).
Undefined
A variable is being used before it exists.
Array exists
An array has already been defined.
No FOR
A next has been encountered without a matching FOR.

machine code monitor aids the diagnosis of faulty machine code sections.

The Memotech's other language, Noddy, is designed specifically for beginners. It is a simple language, with only eight commands (see table) which handle text to make question-and-answer programming very simple. We will be returning to this feature for a full evaluation in a future issue, but meanwhile it seems to be an ideal way of introducing newcomers to the logic required for successful programming while avoiding the detailed syntactical requirements of Basic.

SPECIFICATIONS

Memotech MTX 500

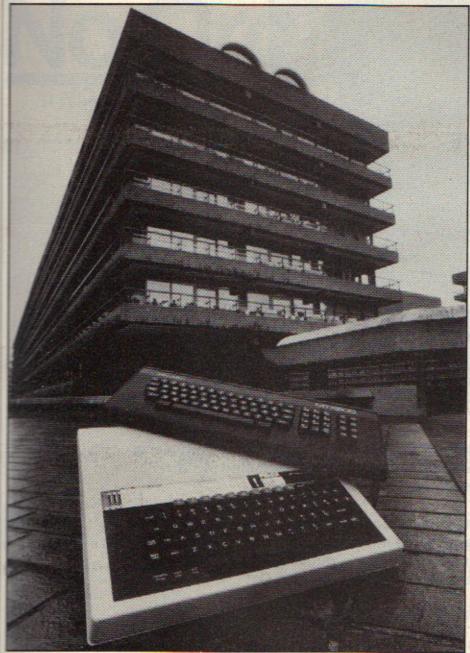|	
Price:	£275
Use:	Home
RAM:	32K
Colour:	Yes
Language:	Basic, Noddy
Interface:	Serial
Supplier:	Memotech Ltd, 0993 2977

MTX500 VERSUS BBC B

Ever since its introduction almost two years ago, Acorn's BBC Micro has generally been recognised as the best home micro around but many people have realised that £400 is an awful lot to pay for an essentially home micro. So, if you don't require such comprehensive facilities as the BBC offers straight away, is there a viable and cheaper alternative?

From first impressions at least, the MTX 500 is such an alternative. With an equivalent graphics resolution to the BBC, which is important to a surprisingly large proportion of the micro buying public, the Memotech immediately offers the games and graphic design programmers a great deal more at a lower price.

The BBC does not support sprites, and the ultra-high resolution modes on this computer use up a disproportionate amount of the machine's RAM. For instance, in Mode 0, where the resolution

(that is, the number of dots available) is 640 × 256, a whole 20K chunk of user memory is devoted entirely to the production and maintenance of this display. On the MTX 500, however, video (screen) RAM is entirely separate to processor RAM, and so this problem simply does not arise.

The sprites on the Memotech have no equivalent on the BBC, and games writers should find the provision of these delightful objects a great boon. By simply defining the shape and colour of each sprite, the direction(s) in which you want it to move, the speed and the sprite level it is on, the programmer finds himself with a million (OK, 32) space invaders ready for the zapping.

Of course, computers are not all graphics and sound, games and obliteration. There is also the generally overlooked aspect of 'user-friendliness',

which means is it simple to use and does it tell you what you've done wrong? In the case of the BBC the answers are yes and yes, very much so — Acorn has not scrimped at all on this front and the machine is a delight to use.

Memotech, however, assumes that everyone is already an exceptional programmer well versed in computer-speak as, frankly, the error reports are pretty meaningless. During extended periods of use, we found that the only sensible way of ensuring that a programming session progressed with at least relative ease was to photocopy the relevant pages from the Memotech manual and sellotape them to the bench. A bad error, Memotech. Likewise, the BBC's fairly excellent screen editing facilities are liable to cause Memotech a lot of embarrassment in comparative reviews like this, as its own system is very hard to get to grips with.

As far as programmers' aids go, both machines offer in-built assemblers for their respective machine codes, but the BBC's (especially in Acorn's new Basic 2 ROM) is rather more advanced and certainly a lot easier to use. This is rather a pity, as the Z80 clip contained within the MTX is so much more powerful than the BBC's 6502.

However, one thing that the BBC sadly lacks in this department is a monitor or disassembler, which is one of the MTX's scoring points. On entering this monitor, the Memotech displays a standard Z80 front panel screen, with the registers and their contents displayed along with sequential memory locations. All of these can be easily altered, and any machine code programmer will love this facet of the machine.

Both computers can have the current language ROM paged out and a new one paged in.

As for higher level languages, Acorn Basic owes a great deal to more structured languages, particularly BCPL (Procedures, Repeat-Until loops, in-direction operators) and is without doubt the best example of the language currently available. Memotech Basic is certainly worthy, with its extended commands for sound and graphics, but if we accept the apparent philosophy that the machine is a programmer's friend, then why provide Basic at all? Both computers can have the current language ROM paged out and a new one paged in, so that by simple commands the user has access to a wide variety of environments.

Naturally, the BBC has been on the street long enough now to have a reasonable complement of 'sideways' ROMs, as they have become known. In fact, the ROM-based languages available for this machine include Basic, BCPL, Forth, Pascal and a version of Logo. It is rumoured that Acornsoft intends to supplement this range very soon. Memotech, meanwhile, can offer Noddy and Logo (see main review), with Hisoft Pascal coming very soon.

This leaves us with interfaces. The BBC is famed for being equipped to talk to almost everything, with five ports underneath the machine (including the famous 'Tube'), and an RS423, cassette, RGB, composite video, Econet and television outlets on the back. The Memotech is at the moment unable to compete with this plethora of communication devices, with ony a Centronics port, joystick port, cassette and TV as standard. However, it is £125 cheaper, and the extra interfaces should be available at a later date.

In conclusion, then, the BBC remains the machine of machines, but for more specialised tasks such as machine code development or graphic design, the Memotech fills a gap that even Acorn forgot. ∎

THE FINSBURY BENCHMARK

For the purpose of bench testing — i.e. comparing the speed of different machines by running identical programs through them — Which Micro? has tested both micros with a series of eight Basic routines.

TEST 1 — This is a very simple routine in which the machine is essentially asked to count from 1 to 10,000.

TEST 2, 3 and 4 — These tests gradually introduced well-used functions and state-ments to involve loops, numeric calculations, plus variables and constants.

TEST 5, 6 and 7 — At this stage of the tests sub-routine calls are introduced as well as introducing the dimension statement to test how long specifying memory requirement takes. Arrays are also tested.

TEST 8 — On this final test the routines to perform such things as logarithims and sines are put through their paces.

Table 1: Benchmark speed tests — time in seconds

	BM1	BM2	BM3	BM4	BM5	BM6	BM7	BM8
MTX-500	11.4	4.6	11.1	11.0	13.6	23.7	43.6	44.5
BBC B	7.2	3.4	8.2	9.1	9.5	14.7	21.1	48.3