

# BBC MASTER 512 & COMPACT

## THE END OF THE LINE

By Roger Cullis

**With an add-on board to run MS-DOS software and an economy-priced 3.5in. disc version, Acorn is keeping alight the last sparks of life in the ageing BBC Micro.**

In its five years of existence, the BBC Micro has found its niche mainly in schools and colleges. It has never had much going for it as a business machine, largely because it has not easily been able to run the CP/M operating system for which most eight-bit business software was written. In an effort to satisfy those users who want to run MS-DOS programs Acorn is providing an 80186-based co-processor board which converts the BBC Master 128 into the Master 512.

The board carries 512K of dynamic RAM and communicates with the base processor by way of the internal Tube connectors on the host computer's motherboard. Digital Research's DOS Plus operating system and the mouse-driven Gem interface, complete with Gem Write and Gem Paint, are also supplied with the board.

The Acorn implementation of DOS Plus has the ability to read and write many different formats. As well as the 800K and 640K Acorn DOS Plus configurations, MS-DOS and various CP/M configurations are provided. There are also utilities for conversion of files between DOS Plus and Acorn DFS and ADFS, and for the allocation of part of the memory as a RAM disc.

An emulator is provided for the IBM keyboard driver, although in some instances the relevant hardware is not present. IBM text and graphics screen modes are also emulated but since they use a virtual screen in the 80186 memory map the Master 512 cannot run any software that makes direct calls to the screen hardware. This means that while well-behaved IBM software will run on the Master 512, certain key packages such as Sidekick and Lotus 1-2-3 will not. Size of memory may also prove a limitation, since DOS Plus carries a larger overhead than MS-DOS or CP/M-86 alone.

There is also a software emulation which permits some Z-80 applications to be run. However, they will be much slower, since the equivalent clock rate is 1.5MHz, rather than 4MHz or 6MHz which are normal with true eight-bit machines. If many CP/M-80 programs are to be run you will still need to add an external Z-80 second processor.

The main criticism of the BBC Micro hitherto has been its high cost. The reason for this is that the computer came with many interfaces — analogue, input, user port, cassette, ROM and disc filing systems, Tube and 1MHz bus — each of which needs several specialist chips to control it. The Master Compact, by contrast, is an economy model targeted at small-business and educational users with more modest requirements. Its most conspicuous innovation is a built-in 3.5in. disc drive.

The machine's beige, black and red livery instantly marks it out as yet another member of the BBC family. In their effort to

### SPECIFICATIONS

MASTER 512. CARD

**CPU:** 80186

**Memory:** 512K RAM

**Display:** IBM screen emulation

**Price:** £399

**Software in price:** DOS Plus

**Available:** now

MASTER COMPACT

**CPU:** 65C12

**Memory:** 128K RAM, 64K ROM

**Mass storage:** one 640K 3.5in. floppy drive

**Display:** optional mono or RGB colour monitor

**Sound:** three channels plus noise

**Price:** £385; with TV modulator

£399; with mono monitor £469; with colour monitor £599

**Software in price:** ABC word-processing tutor, Logotron Logo, View

**Available:** now

**Manufacturer:** Acorn Computers, Cambridge Technopark, 645

Newmarket Road, Cambridge. CBS 8PD. Telephone: (0223) 214411

MASTER 512				
PC VERDICT	POOR	AVERAGE	GOOD	EXCELLENT
	Performance	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Ease of use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Documentation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Value for money	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

An expensive route to the MS-DOS world but worthwhile for Master 128 users.

MASTER COMPACT				
PC VERDICT	POOR	AVERAGE	GOOD	EXCELLENT
	Performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ease of use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Documentation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Value for money	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Of little interest to business users.

keep the price down, Acorn's engineers have cobbled it together from several existing components. The case of the computer itself comes from the Acorn Communicator, while the monitor stand — which also holds the disc drive and power supply — bears a striking resemblance to that of the Olivetti M-19.

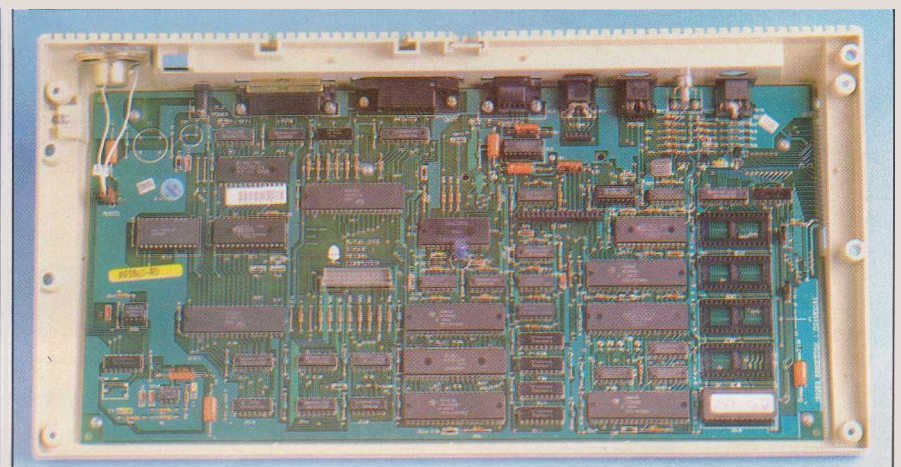
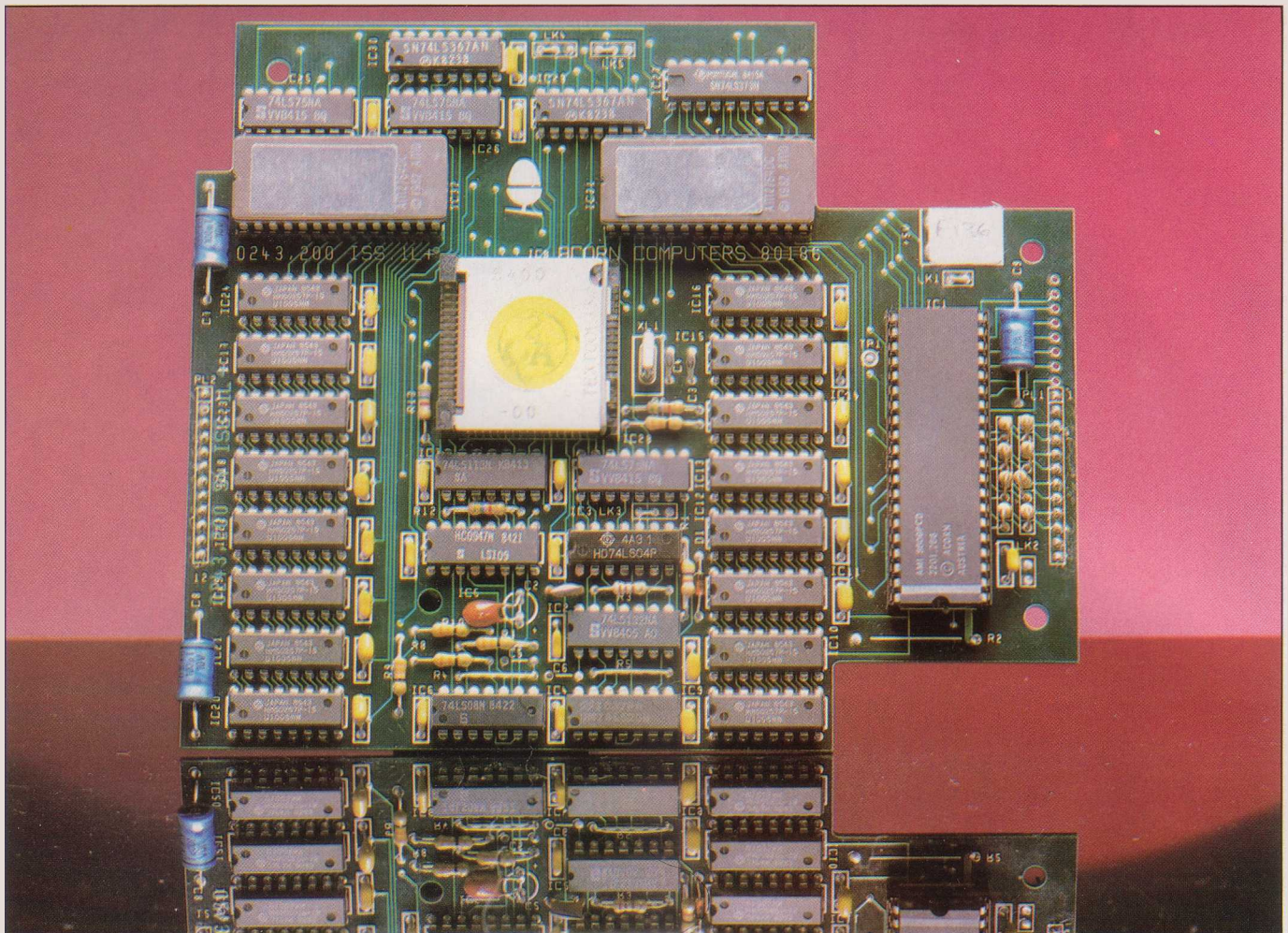
The Master Compact has the barest minimum of I/O facilities: even the RS-232 port is an optional extra. Acorn has decided that

double-density ADFS and 3.5in. discs will be the medium for software distribution in the future. The joystick/mouse interface is now digital and has a nine-pin D-connector which will accept one Atari-compatible joystick or mouse. Further value engineering has gone into the keyboard, which now incorporates membrane switches; nevertheless, the feel is firm and the response is positive.

The motherboard has sockets for the serial interface chips, the operating system and four paged ROMs. Sockets are also provided for a small Econet daughter board. Arranged along the back of the computer are connectors for the big d.c. power input, external floppy discs, printer, joystick, Econet, RS-232, composite video and RGB output. Expansion is catered for by a PCB connector on the right-hand edge of the motherboard.

The keyboard will now support a full eight-bit ASCII character set. To provide for this, the @ symbol is now implemented by Shift-0, and a new Code key is put in the place of the old @. It is likely that this feature will be extended to the entire Master series in due course. The Basic ROM has new coding to provide enhanced speed and accuracy, a factor which makes itself apparent in a 10 percent improvement in the Benchmark performance.

With the change to 3.5in. discs, Acorn



has taken the decision to use spare storage space on the Welcome disc to distribute bundled software, instead of providing it on paged ROMs. The packages are loaded into sideways RAM as they are required. This arrangement provides much greater flexibility and avoids cluttering up the memory map with software which is not needed.

The packages supplied with the computer are Logotron Logo, an elementary WP tutor intended for primary-school children called ABC, and Acornsoft's View; there are also some mouse-driven graphics and desk-top utilities for more advanced users. Acorn's icon-drive front end can be operated by a mouse, joystick or trackball, or by the cursor-key pad.

Top: The 80186 chip of the Master 512 lies in the middle of the board, covered by a heat sink. It connects to the host micro via the Tube.

Above: Compared to the original BBC Master, the Master Compact is compact and sparsely with chips. The computer is supplied with a fairly rudimentary *User Guide* which provides an introduction to the hardware and bundled software, except for Logotron Logo which is described in a separate volume. More advanced users, though, are advised to purchase *Reference Manuals 1* and *2* for the Master series, which are available as options and describe the fundamentals in far greater detail.

## CONCLUSIONS

As a means of running industry-standard 16-bit software the Master 512 is a poor bargain compared to the cheap clones, especially as it does not run IBM-specific programs like Lotus 1-2-3.

But for anyone who already has a Master 128, the 512's ability to run MS-DOS software and its comprehensive disc-conversion facility make it a useful addition.

The Master Compact is only really suited to the school market. Its 3.5in. discs are a robust software medium, and its icon interface is easily understood by children.

Acorn should consider including the full package of Master firmware and the remaining members of the View family on the Welcome disc.