# Archimedes

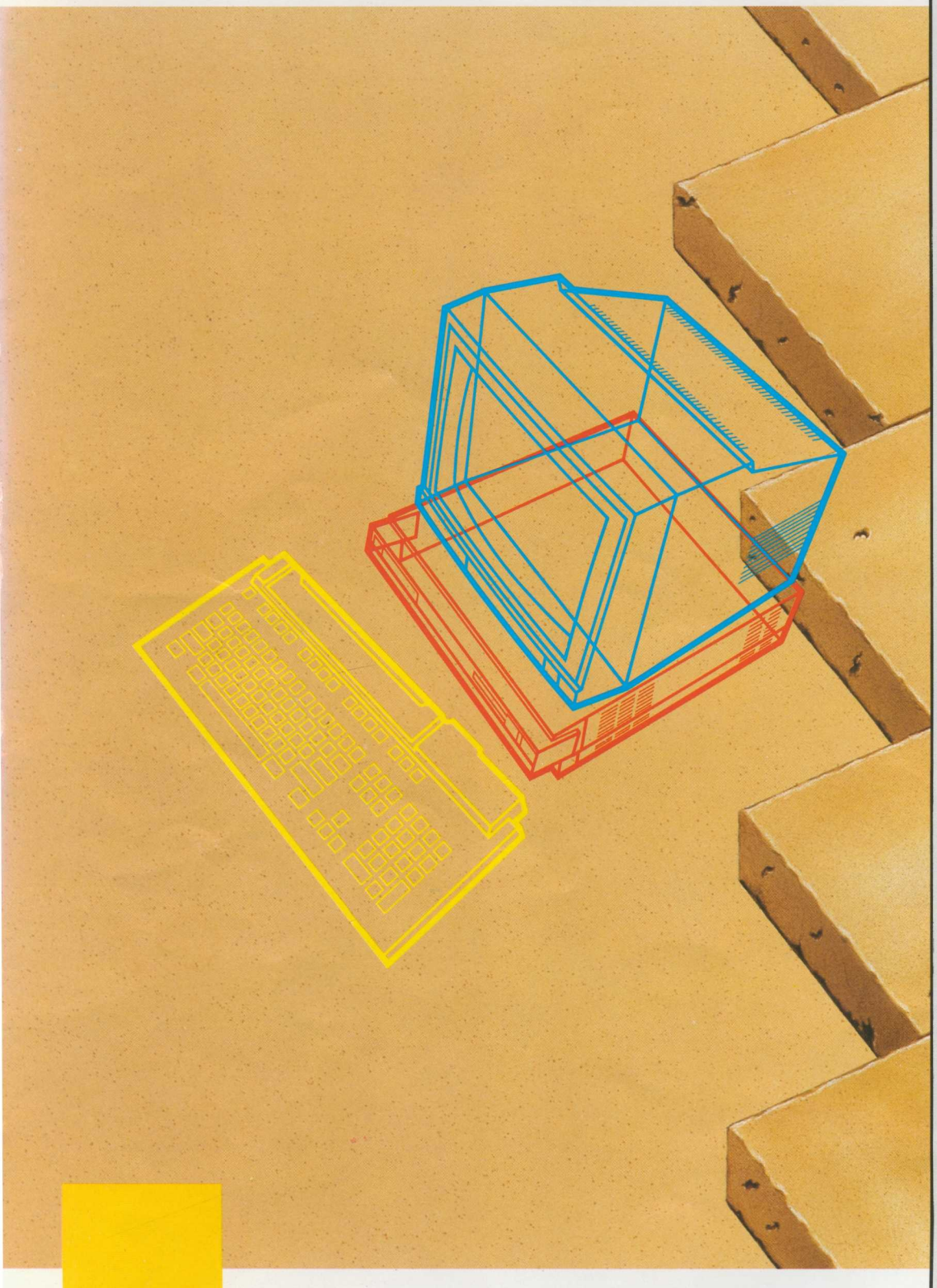
# HIGH PERFORMANCE COMPUTER SYSTEMS

"A clear winner"
HOME/SMALL BUSINESS MICROCOMPUTER OF THE YEAR

BRITISH BROADCASTING CORPORATION

Acorn
The choice of experience.

# ARCHIMEDES



## 32 BIT RISC TECHNOLOGY

Acorn is proud to announce a real breakthrough in computer technology; the ARCHIMEDES High Performance Computer Systems, the fastest micros in the world today.

The speed and power delivered by the ARCHIMEDES systems are the result of three years of intensive activity at Acorn's advanced research and development centre in Cambridge.

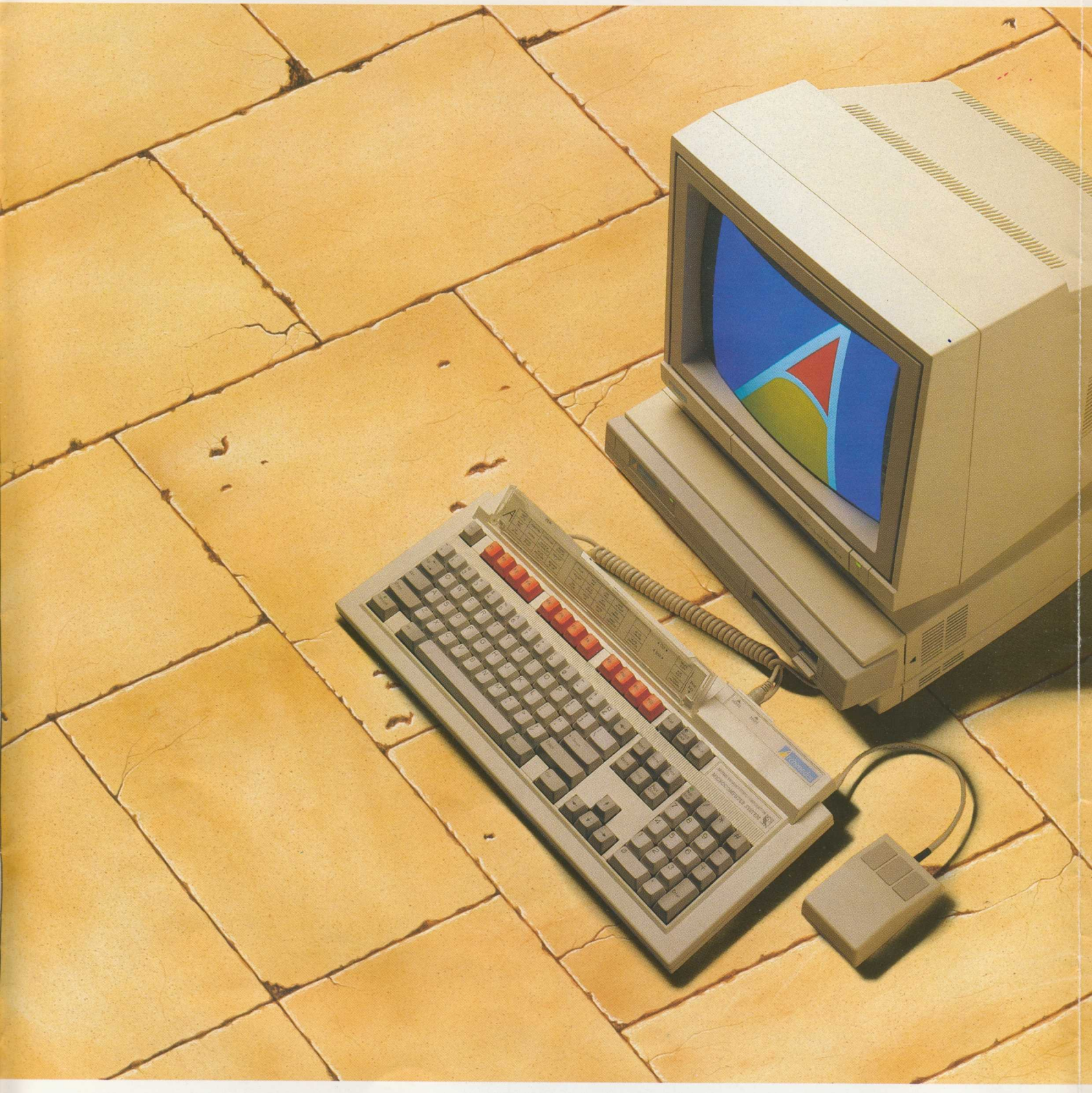
So why was this advance necessary?

The motivation to develop a totally new processor stemmed from both a market and a technological need. An affordable new system was required: a system for the 1990s as radical as the British Broadcasting Corporation Micro has been in the 1980s.

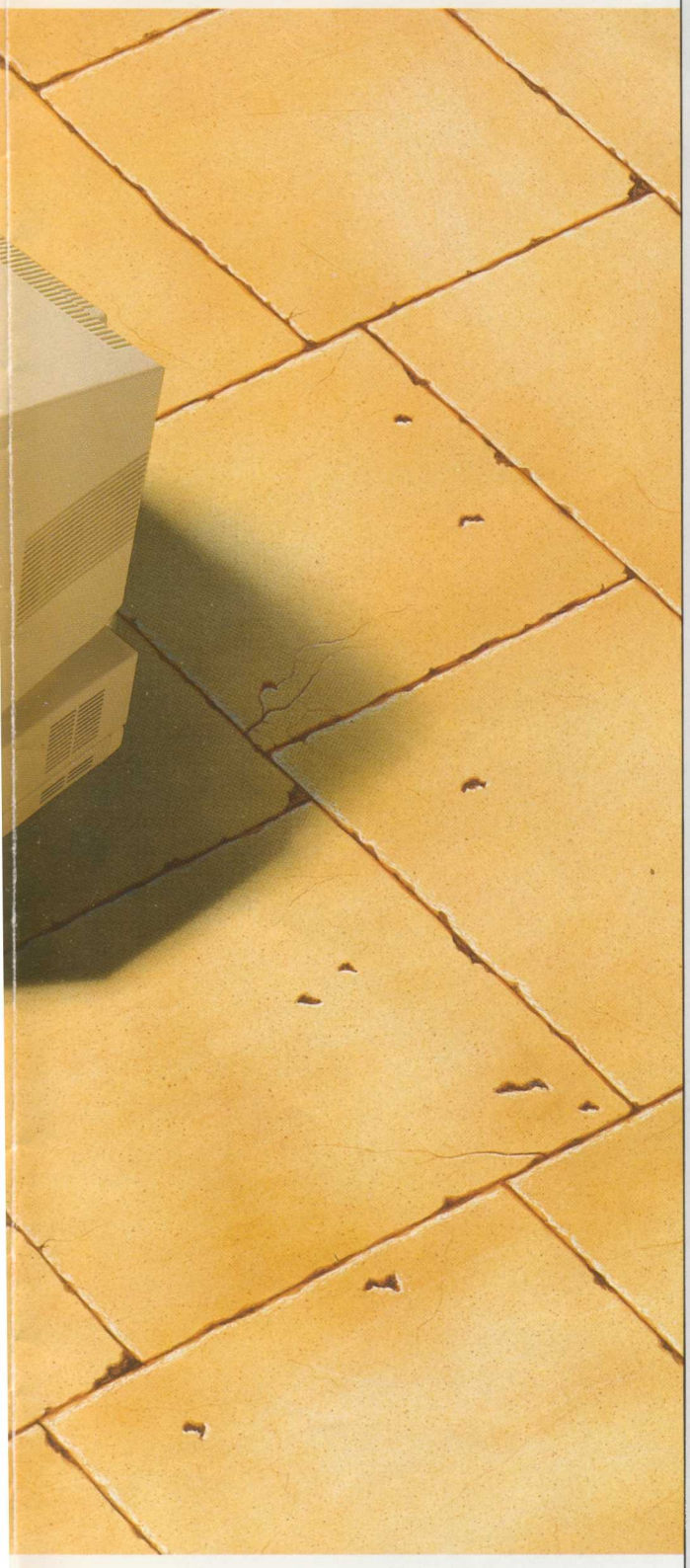
Our interest in RISC grew from the realisation that custom chip technology offered an opportunity to develop computers to out-smart traditional micros.

At the heart of the new technology lies the 32 bit Acorn RISC chip, a new type of processor capable of executing 4 mips (million instructions per second). In fact in our research and development laboratories up to 18 mips (peak) have been achieved on Acorn RISC processors.

# HIGH PERFORMANCE



# COMPUTER SYSTEMS



## THE SYSTEMS

The ARCHIMEDES High Performance Computer Systems represent a considerable lead in performance, but how has this performance been put to use in the range of products?

The ARCHIMEDES range includes the 300 Series and the more sophisticated 400 Series.

All machines have features in common:

- 32 bit RISC technology;
- ergonomically styled in a 3 box presentation;
- 'IBM enhanced' style keyboard with 3 button mouse;
- British Broadcasting Corporation Micro style operating system (ARTHUR);
- BBC BASIC V;
- interfaces: printer, serial, monitor, stereo sound;
- ECONET plug-in option;
- a variety of podules can be fitted.

### THE 300 SERIES

The 300 Series, identified by its red function keys, consists of two models, ARCHIMEDES 305 with 0.5 Mbyte of RAM and ARCHIMEDES 310 with 1 Mbyte of RAM. These machines are the latest generation of British Broadcasting Corporation Micros. They offer, at low cost, all the basic features with expansion capabilities. Both machines have a 512 Kbyte ROM and a 1Mbyte (unformatted) $3\frac{1}{2}$" disc drive.

*The above screen has been digitised using equipment available from Millipede.*

### THE 400 SERIES

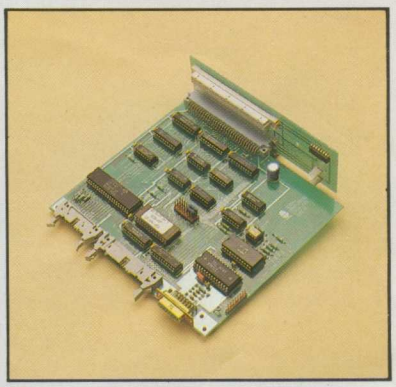
The more powerful 400 Series offers considerably increased expansion capabilities. These machines are the new range of Acorn Computers.

The ARCHIMEDES 410 has 1 Mbyte of RAM; 1 Mbyte (unformatted) $3\frac{1}{2}$" disc drive; a hardware floating point unit option; a co-processor bus; a hard disc controller; a four socket back plane; 512 Kbytes of ROM.
At the top of the range is ARCHIMEDES 440. This machine possesses all the features of the 410 as standard, with the adoption of 4 Mbytes of RAM and a 20 Mbyte hard disc.

ARCHIMEDES is an open system and its flexibility is achieved by fitting any of the following podules (peripheral modules) via a back plane:

- hard disc controller (300 Series only);
- ROM extension board;
- MIDI music interface;
- MS-DOS co-processor;
- SCSI;
- hardware floating point unit;
- Ethernet podule.

Third party suppliers will be meeting other user requirements.



- Back plane with podule fitted.

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THE 1987 BRITISH MICROCOMPUTING AWARDS

Archimedes 300 Series

HOME/SMALL BUSINESS MICROCOMPUTER OF THE YEAR

# THE ARCHIMEDES HIGH PERFORMANCE COMPUTER SYSTEMS

## THE NAME

In a world of claims, counter claims and even more claims, Acorn is proud to announce a real breakthrough in computer technology; the ARCHIMEDES High Performance Computer Systems, the fastest* micros in the world today.

The ARCHIMEDES systems reflect a combination of education, technology, science and innovation, fitting, we believe, for a product that presents to the world a dramatic increase in computing performance.

Legend has it that the scholar Archimedes, on discovering his famous principle, ran through the streets crying 'Eureka'. After three years of intensive work at our research and development centre in Cambridge we know exactly how he felt.

## THE NEED

The British Broadcasting Corporation Microcomputer, launched in 1981, was a phenomenal success. Since then, nearly a million British Broadcasting Corporation Micros have been sold and a huge user base established.

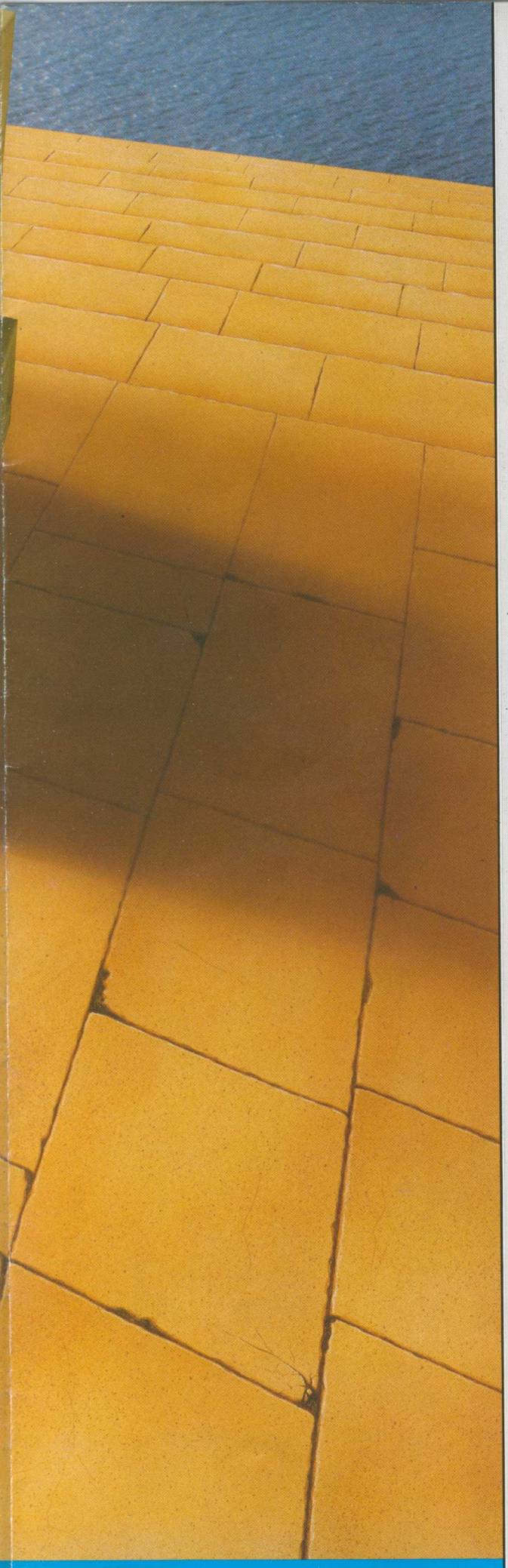
It became clear that there was a need to produce an affordable generation of computers for the 1990s as radical as the British Broadcasting Corporation Micro has been in the 1980s.

## THE POWER

- ARTHUR, a new version of the British Broadcasting Corporation machine operating system.
- Power to deliver 6502 and MS-DOS emulation and high level languages such as C and FORTRAN.
- Power to run programs in BBC BASIC V (an extended version of BBC BASIC) that outperform those in machine code on most rival machines.
- In line with the importance Acorn attaches to networking, ARCHIMEDES machines can be used on the ECONET Network (with other British


Archimedes
RGB Colour Monitor
Archimedes
MICROCOMPUTER SYSTEM

# Archimedes



familiar environment.

- The most visible demonstration of speed and power is reflected in the graphics: realistic animation with superb shadow and three dimensional effects. Up to 256 colours can be displayed at one time selected from a palette of 4096.
- The audio capability is astounding. Eight voice digital stereo sound provides considerable scope for musical composition.

## AND SPEED

At the heart of the new technology lies the 32 bit RISC chip, a completely new type of processor developed by Acorn. The benchmark tables below illustrate the superiority of ARCHIMEDES over competitive machines.

**New Personal Computer World magazine benchmarks for interpreted BASIC**

| Machine | Language | Intmath | Realmath | Triglog | Textscrn | Grafscrn | Store |
|---|---|---|---|---|---|---|---|
| 300 Series: | BBC Basic | 0.26 | 0.28 | 1.02 | 4.2 | 6.5 | 6.5 |
| RM VX 386 | GW Basic | 0.89 | 1.05 | 8.09 | 35.9 | 4.85 | * |
| IBM Model 30 | Basic | 2.6 | 3.4 | 25.4 | 36.3 | 14.2 | 13.6 |
| IBM Model 50 | Basic | 1.4 | 2.04 | 12.5 | 28.0 | 7.93 | 10.7 |
| IBM PC | BasicA | 6.2 | 8.2 | 47.0 | 100.0 | 49.0 | * |
| Amiga 2000 | Amiga Basic | 1.7 | 2.7 | 6.7 | 150.3 | 25.0 | 32.7 |
| Olivetti M28 | Basic | 2.1 | 2.0 | 15.0 | 33.6 | 11.6 | * |
| Atari ST | ST Basic | 1.5 | 3.5 | 7.9 | 44.8 | 92.7 | 56.0 |
| Master 128 | BBC Basic | 2.5 | 4.3 | 43.0 | 14.2 | 22.0 | 38.6 |
| Compaq 386 | GW Basic | 1.0 | 0.96 | 3.85 | 25.5 | 4.8 | * |

**Notes:** 300 Series figures are Acorn measurements of BBC BASIC in RAM using PCW algorithms. All other figures are taken from PCW reports.

*Not available for floppy drives.

**Sieve of Eratosthenes for interpreted BASIC**

| Machine | Language | Speed |
|---|---|---|
| 300 Series: | BBC Basic | 8.4 |
| Compaq 386 | Compaq Basic | 21 |
| Atari 1040ST | ST Basic | 85 |
| Amiga 1000 | Amiga Basic | 66 |
| IBM PC/AT 8 MHz | GW Basic | 61 |

**Note:** 300 Series figures are Acorn measurements of BBC BASIC in RAM using Byte Magazine programs. The program does one iteration of prime numbers up to 7000. All other figures are taken from Byte reports.

**Compiler Tests**

| | | |
|---|---|---|
| Dhrystone (version 1.1 test): (C to proposed ANSI standard) | 300 Series | 4560/Sec |

*The ARCHIMEDES High Performance Computer Systems, the fastest in their class to date.

Acorn

The choice of experience.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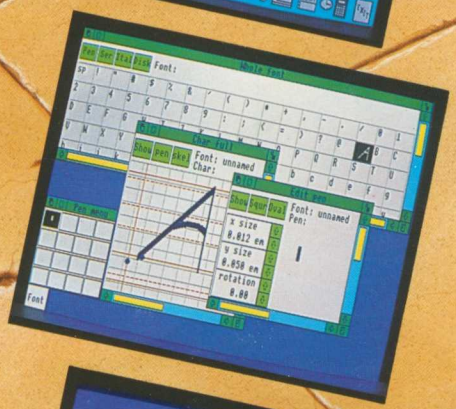
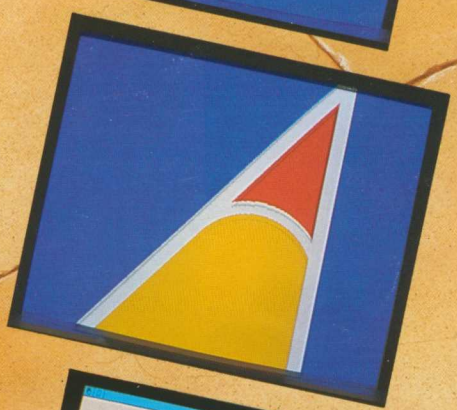
# SOFTWARE

The Welcome Disc presents a range of applications as an introduction to one of the most powerful developments in the computer world today.

- The Desk Top Manager, with calculator, note pad and clock.



- The Font Designer gives infinite flexibility in the creation of font styles.



- Discover the world of graphics with the easy-to-use Painting Program.

- The Music Program serves as an introduction to the ARCHIMEDES powerful sound capabilities.

## SOFTWARE

ARCHIMEDES systems use the ARTHUR operating system, a new version of the British Broadcasting Corporation Micro operating system. BBC BASIC widely regarded as the best BASIC in the world is replaced by a new extended version, BBC BASIC V. With these facilities, we have created a bridge to existing systems enabling users of current British Broadcasting Corporation Microcomputers to feel instantly at home.

The speed and power of ARCHIMEDES allow the programmer to exploit RISC architecture effectively with a range of high level languages for scientific, engineering and business applications.

In addition to BBC BASIC V, Acornsoft's development languages include C, ISO-Pascal, FORTRAN, Lisp and Prolog. The Acornsoft Software Developer's Toolbox provides utilities to simplify program development and debugging; while an extensive Software Developer's Debug Tool facilitates high level language development in C, Pascal or FORTRAN.

All ARCHIMEDES Systems have a floating point emulator as standard. On the 400 Series, complex mathematical calculations can be further enhanced by the addition of a floating point unit (FPU).

The ARCHIMEDES software applications catalogue features many software titles which take advantage of the ARCHIMEDES processing power.

# SPECIFICATIONS

## CPU

ARM (Acorn RISC Machine)
Clock frequency 4/8 MHz

## RAM

| 300 Series: | 400 Series: |
|---|---|
| 305-0.5 Mbyte | 410-1.0 Mbyte |
| 310-1.0 Mbyte | 440-4.0 Mbytes |

Separate CMOS battery backed RAM: 240 bytes, plus 16 for battery backed real time clock.

## ROM

512 Kbytes (subject to change)

Contents:
Machine operating system (ARTHUR); BBC BASIC V; Advanced Disc Filing System (ADFS); Advanced Net Filing System (ANFS); BASIC Editor; Desk Top Manager; character sets: ISO 8859, Latin 1-4, Greek. (Arabic version under development).
(subject to change)

## DISPLAY

European standard rate (15,625KHz/50Hz non-interlaced)

18 screen modes:

| text | graphics resolution | number of colours |
|---|---|---|
| 20 × 32 | 160 × 256 | 4, 16, 256 |
| 40 × 32 | 320 × 256 | 2, 4, 16, 256 |
| 80 × 32 | 640 × 256 | 2, 4, 16, 256 |
| 132 × 32 | text only | 16 |
| 40 × 25 | text only | 2 |
| 40 × 25 | Teletext | 16 |
| 80 × 25 | text only | 2, 4, 16 |
| 132 × 25 | text only | 16 |

High scan rate: for use with monitors such as the NEC Multisync.

3 screen modes:

| text | graphics resolution | number of colours |
|---|---|---|
| 80 × 64 | 640 × 512 | 2, 4, 16 |

Outputs: analogue RGB + sync; 9 pin D-type socket; monochrome composite video; phono socket.

## SOUND

2 channel stereo with 7 stereo positions and 8 voices; one internal loudspeaker; 3.5mm stereo jack for use with 32 ohm stereo headphones or amplifier.

## DISC DRIVES

All machines fitted with one 1 Mbyte (unformatted) 3½" drive. An additional 3½" disc or 20 Mbyte hard disc may be added internally. The 300 Series also requires a hard disc controller podule and back plane when fitting a hard disc.

## SERIAL INTERFACE

RS 423 75-19200 baud software selectable; independent Rx/Tx baud rate selectable; 9 pin D-type plug.

## PARALLEL PRINTER INTERFACE

8 bit Centronics compatible; 25 pin D-type socket.

## KEYBOARD AND MOUSE

103 key 'enhanced PC' style; two-key roll-over with programmable auto-repeat rate; detachable via 6 pin miniature circular connector; mouse input, 3 button mouse included, via 9 pin miniature circular connector; adjustable function key card holder.

## SOFTWARE ON WELCOME DISC

Welcome Suite—Painting Program, Font Designer, Music Program; tutorials; utilities; 6502 Emulator; floating point emulator; choice of fonts.
Documentation: Welcome Guide and User Guide.

## EXPANSION PORT

300 Series:
64 way DIN 41612 connector on main PCB; designed to accept 2 socket optional back plane card.

400 Series:
fitted with back plane card; three 64 way and one 96 way DIN 41612 connectors; provision for co-processor podules e.g. FPU.

## ECONET

All machines may be upgraded to work with the ECONET Local Area Network by the addition of an internal plug-in module.

## POWER INPUT

198 to 264V AC (50Hz)

## DIMENSIONS

Computer unit: width: 362mm; depth: 406mm; height: 97mm (excluding feet).

Keyboard unit: width: 485mm; depth: 205mm; height: 46mm (excluding feet).

## MONITORS

Colour (Where purchased)
14" screen. Medium resolution: 0.42mm dot pitch. Power input: 230±15% (50/60Hz). Powered from IEC 320 outlet on computer unit. SCART input connector for video. Lead supplied. Dimensions: width: 320mm; depth: 350mm; height: 387mm. (Monitor specification may vary.)

Monochrome (Where purchased)
12" screen. Resolution: 850 lines minimum. Power input: 216-264 VAC (50Hz). Powered from IEC 320 outlet on computer unit. Phono input connector for video. Lead supplied. Dimensions: width: 305mm; depth: 303mm; height: 280mm. (Monitor specification may vary.)

## PODULES

**I/O***

(Input/Output interface to support many existing BBC applications.)

Double width. Provides user port, 1 MHz bus and A-D port, similar to those provided on the Master 128 including the connector types. Previous Master 128 operating system calls are in general supported.

**ROM***

Single width. Provides five 32 pin sockets for a range of ROM/EPROM types. The unit can be upgraded to take RAM as an alternative to ROM/EPROM, with an additional two S RAM sockets This can be battery backed.

**MIDI*** (Musical Instrument Digital Interface)

This is an upgrade to the I/O podule, contained within the I/O podule's double width. The MIDI standard interface is supported. An EPROM upgrade to the I/O podule is provided to enable operating system level control of the MIDI ports.

**MS-DOS***

Double width co-processor unit running MS-DOS.

Further podules are under development by Acorn and third parties.

* (Where purchased)

## UPGRADES

**RAM**

Two kits will be available to upgrade the model 305 0.5 Mbyte RAM to 1.0 Mbyte, and the model 410 1.0 Mbyte RAM to 4.0 Mbytes.

**FLOPPY DISC**

A second internal floppy disc drive complete with cable and replacement front panel.†

**HARD DISC**

An internal 20 Mbyte hard disc as an alternative to a second floppy drive. The upgrade for the 300 Series will also include a hard disc controller podule (single width).†

† (Dealer fitting only)



APP 118 SECOND EDITION JULY 1987



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The choice of experience.