**Memory Expansion Port**

With a suitable adaptor, the Ace can also make use of Sinclair ZX81 expansion packs

FORTH Language

Two 4 Kbyte EPROMs have been used to hold the language. ROMs have to be ordered by the thousand, so EPROMs are used for smaller production quantities. The top of each EPROM has a protective covering, otherwise any ultraviolet light would erase the contents

User Port

Suitable for a printer or other device

Clock

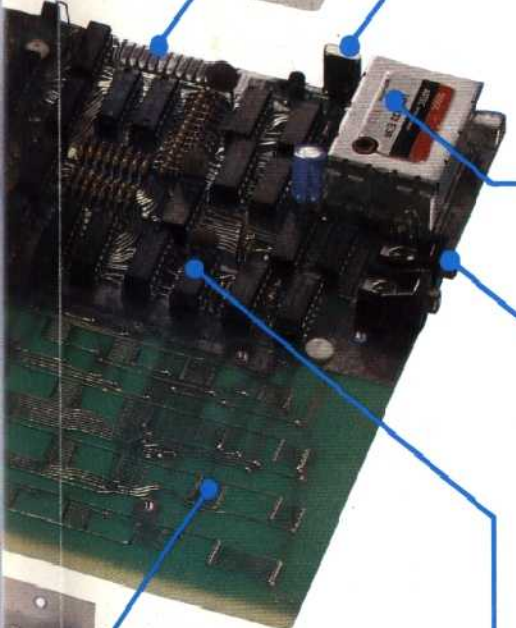
This drives the microprocessor at 1MHz

RF Modulator

Provides black and white output only for a television

Cassette Port

One of the most reliable systems devised

**Video Circuitry**

Machines sold in larger quantities would have a specially-designed chip to do the same work as this collection of chips

CHRIS STEVENS

ZX80) had. There is a small solid-state bleeper that can produce a range of single tones, but with a greater knowledge of the Ace complex sounds can be produced. Like all the Sinclair computers, the Ace has a power connector, a socket for a lead to a television and two large connectors for any other special pieces of equipment.

The cassette has a simple two-jack socket connection, which is one of the most reliable cassette interfaces on any computer.

The display is black and white with 32 characters to a line, although it has a graphics resolution of 64 by 48. Each of the characters can be redesigned by the user to create specific mathematical symbols or game shapes.

There is not such a pressing need as with other cheap machines to increase the amount of memory available. FORTH programs are usually quite short, so a surprising amount can be put into the standard 3 Kbytes of memory. To write larger programs, more memory is needed. Both 16 Kbyte and 32 Kbyte RAM packs are available, and an adaptor can be obtained that will enable the machine to accept most Sinclair devices. A Centronics printer interface, a sound box and a device to improve the 'feel' of the keypads can all be obtained.

JUPITER ACE**PRICE**

Obtainable second-hand from £40

SIZE

215 × 190 × 30 mm

WEIGHT

246g

CPU

Z80A

CLOCK SPEED

1MHz

MEMORY

3Kbytes RAM expandable externally to 51Kbytes; 8Kbytes ROM

VIDEO DISPLAY

Black and white, 32 × 22 rows of text, 64 × 48 graphics

INTERFACES

TV connector, cassette, power (9v), two edge connectors; first has complete address and data lines from the processor, second has data and some selection lines

LANGUAGES SUPPLIED

FORTH

OTHER LANGUAGES AVAILABLE

none

COMES WITH

Power supply in mains plug, cassette and TV leads

KEYBOARD

Rubber keypad similar to Sinclair Spectrum but softer and less accurate. Keys have to be pressed dead centre. All keys have auto repeat and two shifts allow all ASCII codes to be produced

DOCUMENTATION

Easily the best manual for a small computer and would put quite a lot of larger computer suppliers to shame. The author wrote both the ZX81 and the Spectrum manuals. In 180 pages there is an introduction to FORTH and a full description of the Ace, both supported by copious examples. The book is available separately for £5.95. The contents list annotates each chapter, there are four appendices giving quick references to all the facilities available and an index

Information about currently available add-ons and software for the Ace can be found in 'Forth User', obtainable from the Jupiter Ace Users' Club, c/o John L. Noyce, P.O. Box 450, Brighton BN1 8GR