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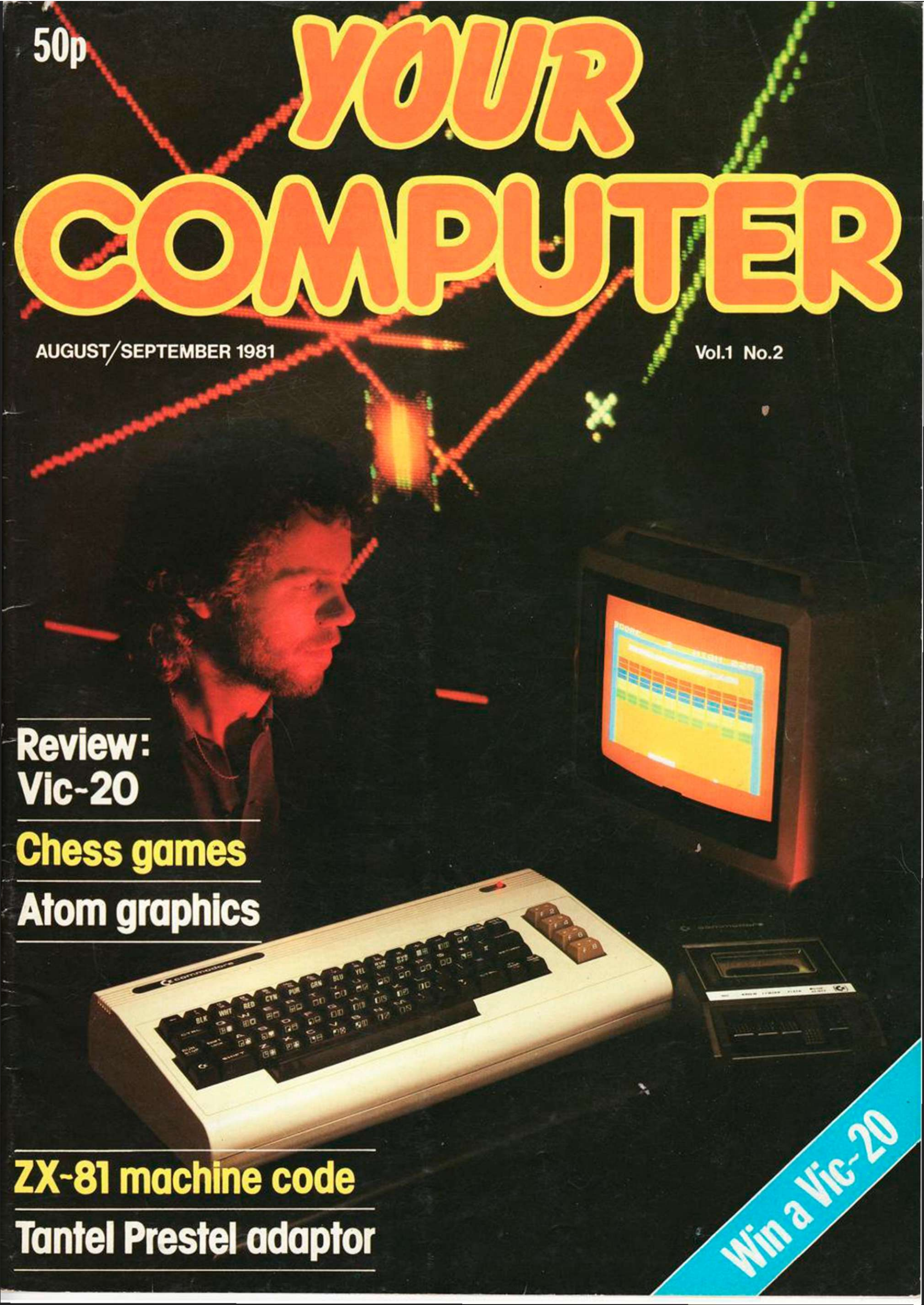


Review: Vic-20

Chess games

Atom graphics

ZX-81 machine code

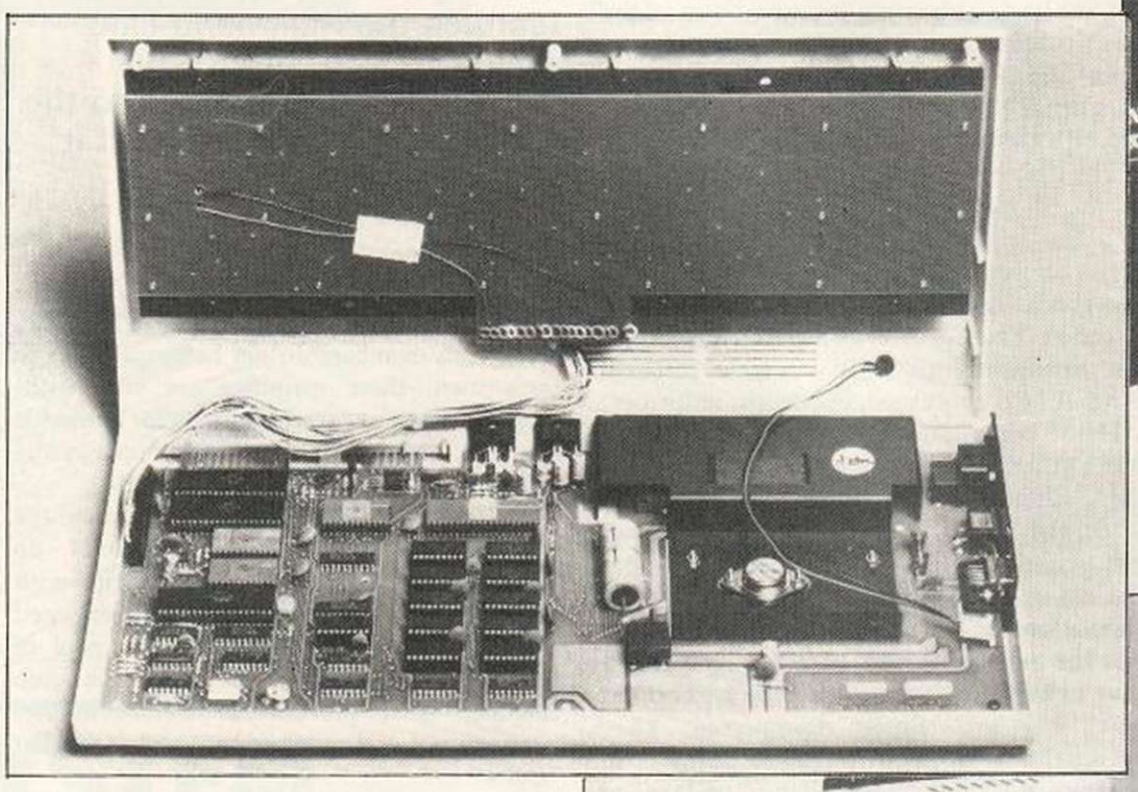
Tantel Prestel adaptor

Win a Vic-20

REVIEW

COMMODORE VIC~20

The Vic offers features such as high-resolution graphics and yet costs between half and one-third of the price of machines boasting the same facilities. Nick Hampshire assesses this, the latest addition to the Commodore stable.



VIC IS THE first true consumer computer to be produced by Commodore, the company which makes the very popular Pet computer. A consumer computer is a machine which is marketed at a price between cartridge-programmable TV games and low-cost computers like Pet and Apple.

It can be used as a TV games machine — games cartridges are available — or as a computer running commercial programs or programs the user has written himself. As a computer, the Vic is comparable with machines like the Texas Instruments TI-99, TRS-80 Colour computer, and the Atari 400 which all cost two or three times its price.

The Vic is, in fact, derived directly from the Pet and uses the same versions of Basic. The machine allows almost anyone to become involved in computing quickly, easily and with little expense. The designers of the Vic have built in sufficient expansion features which allow the machine to grow with the user as his knowledge and requirements expand.

It will appeal to people of all levels of computing expertise from the computer professional to the TV games enthusiast who has a desire to learn computing and write his own games.

The Vic, which stands for Visual Interface Computer, is designed to use an ordinary domestic colour TV set as a display. A black-and-white set can be used, but the colour display capabilities of the machine are obviously forfeit. The basic system consists therefore of the Vic, a colour TV and the Vic power pack.

The entire computer is housed in a keyboard unit featuring a full-size typewriter-type keyboard mounted in a cream-coloured plastic case. The keyboard is almost identical to that used in the larger Pet machines, but instead of the separate numeric keypad it has a set of four user-definable function keys.

As with the Pet, the keys are legended with both alpha-numerics and the graphics character set. In fact, there are two graphics symbols on each key which are displayed by pressing the key plus one of the two shift keys. Which of the two shift keys is pressed determines which graphics character is displayed.

The Vic has a memory-mapped video display which means that the programmer has total control over positioning characters on the screen without the need to erase and re-write. The screen is stored as a block of 506 bytes of memory, with a parallel 506 bytes used to store the colour code for each character.

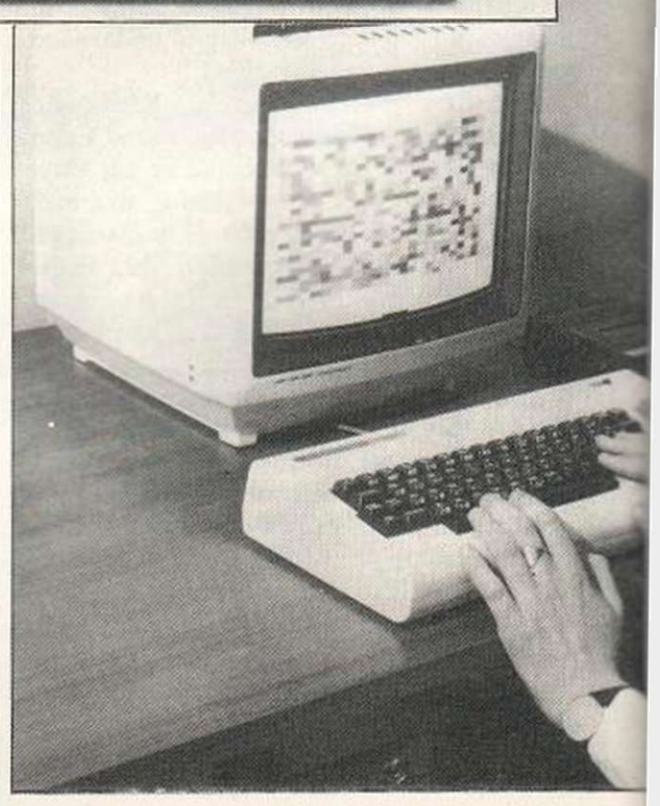
The entire video display is controlled by a single, very-sophisticated integrated circuit called the 6560 Visual Interface Chip after which the Vic is named. The 6560 is entirely under the control of the programmer which gives him great flexibility in the formatting and choice of displays.

The Vic has three display modes; text, multi-colour and high-resolution. In text mode, the display shows 23 lines of 22 characters, a total of 506 characters. The 22 character line may be rather small for some applications, but when writing programs this is overcome by using four lines of the screen to contain each program line. This gives an effective line length of 88 characters.

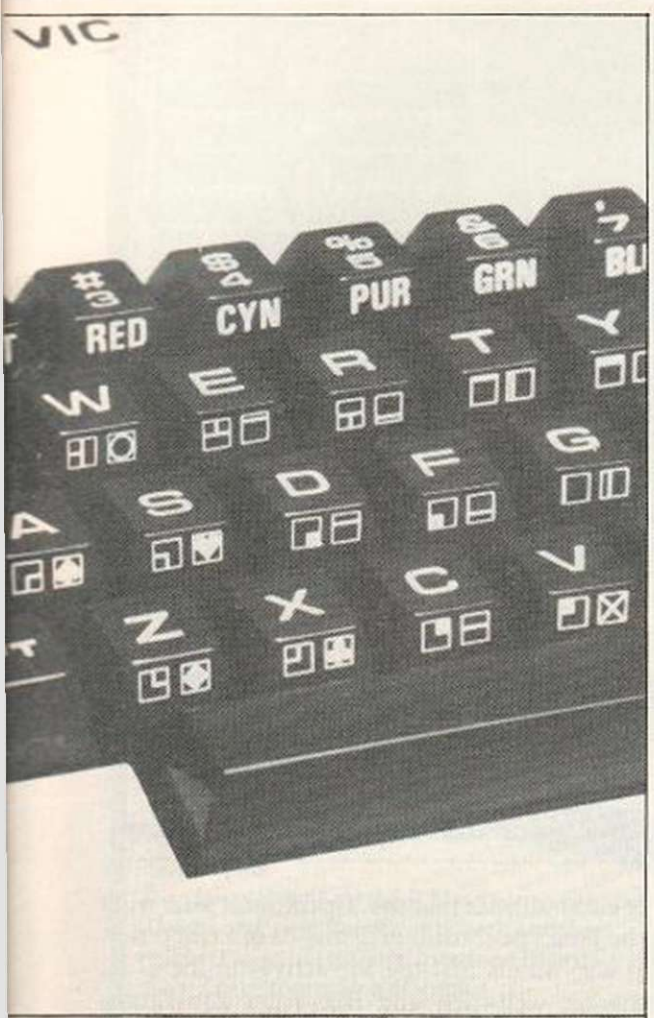
In text mode, each character can be in any one of eight colours, in addition there are 16 different screen background colours and eight border colours a total of 255 different colour combinations. In the multi-colour mode, the screen has a resolution for plotting of 88 by 160 — half the high-resolution figure.

Each character space in multi-colour mode consists of a matrix of eight-by-four plottable points, and each point within that character space can be in any one of four colours designated by the programmer.

In the high-resolution mode, the screen has a resolution of 176 by 160 plot points. Each character space consists of an eight-by-eight matrix of points, any of which can be in one of two colours designated. The high-resolution mode can also be used to create a user-defined character set such as specialised mathematical symbols for use with a text, multi-colour or high-resolution display.



The Vic is supplied with 5K of RAM memory of which 3.6K is available to the user for Basic programs, the other 1.4K is used to store system variables, cassette buffer and the screen memory. RAM memory can be expanded by using plug-in cartridges which allow the user memory area to be expanded up



to 32K. This can be either all RAM or a mixture of RAM and ROM.

The basic memory expander cartridge has 3K of RAM which boosts the user memory area to 6.6K, plus two empty ROM sockets used to store up to 16K of programs in ROM. Further expansion of RAM memory can be achieved with the 8K or 16K expansion cartridges and/or the master control panel which allows more than one cartridge to be plugged into the expansion port.

Programs can be stored on tape using a Pet-type cassette deck attached to the cassette port on the Vic. Unlike the Pet, the Vic can be attached to only one cassette deck, so file updating must be done in memory. Programs are stored on the Vic using the same format as programs stored on the Pet — this means software is transferable.

A very low-cost, single-disc drive and dot-matrix printer are being produced for the Vic, much less expensive and simpler than the devices currently available for the Pet. The Vic disc drive will be compatible with the Pet disc drives so programs and data on disc will be also interchangeable.

These devices will use the IEEE 488 interface on the Vic. This is not a true implementation since it uses serial data transmission. A true IEEE 488 interface is available as a plug-in cartridge on the expansion port. With this, one can connect the Vic to the Pet peripherals, Pet-based networks like MuPet, and any of the countless different instruments using this interface.

The Vic also supports a RS232 interface which is designed for use with a MODEM to allow Vics to communicate via a telephone line. This feature will eventually, when given Post Office approval, allow the creation of a whole range of communications services between Vic users: electronic mail and messages, information and database access among others.

The Vic can be used as a controller for any type of equipment from model train sets through laboratory experiments to industrial processes. It can be achieved using the programmable user port which gives the user an eight-line I/O with two handshake lines which are each individually-programmable as input or output.

The user port lines are from one of the two 6522 I/O chips which are versatile integrated circuits that place many useful features at the programmer's disposal.

The 6561 visual interface chip not only controls the video-display generation but also provides the user with several useful I/O functions. For example, a light pen can be connected to the Vic, a suitable device is being produced by Commodore and this will allow interactive graphics programs to be run.

The second function is the provision for connection of rotary paddles and joysticks which make the Vic a true consumer computer.

The last of the additional features of the 6561 is its programmable sound generator again of primary interest to games players. The sound generator is output to the speaker of the TV being used as the display and consists of three independently-programmable tone generators, each with a three-octave range plus a variable-frequency source of noise. By using all four generators together, very complex sound effects or multi-part music can be created.

The operating system and Basic occupy 16K of ROM in the Vic: the operating system occupies 8K and Basic occupies the other 8K. The Basic used is identical to that used in the 3000 series Pet with slight modification to allow for a changed operating system.

Since the Vic system architecture is very different to that of the Pet, the operating system also differs although to the user, it appears

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identical. This means that any Pet program which can be made to conform to the narrower-width screen and which is written entirely in Basic with no Peek, Poke or machine-code subroutine calls will run on the Vic.

Any Pet program using machine-code and system subroutine calls or system variables must be re-written to change these to the new locations used by the Vic.

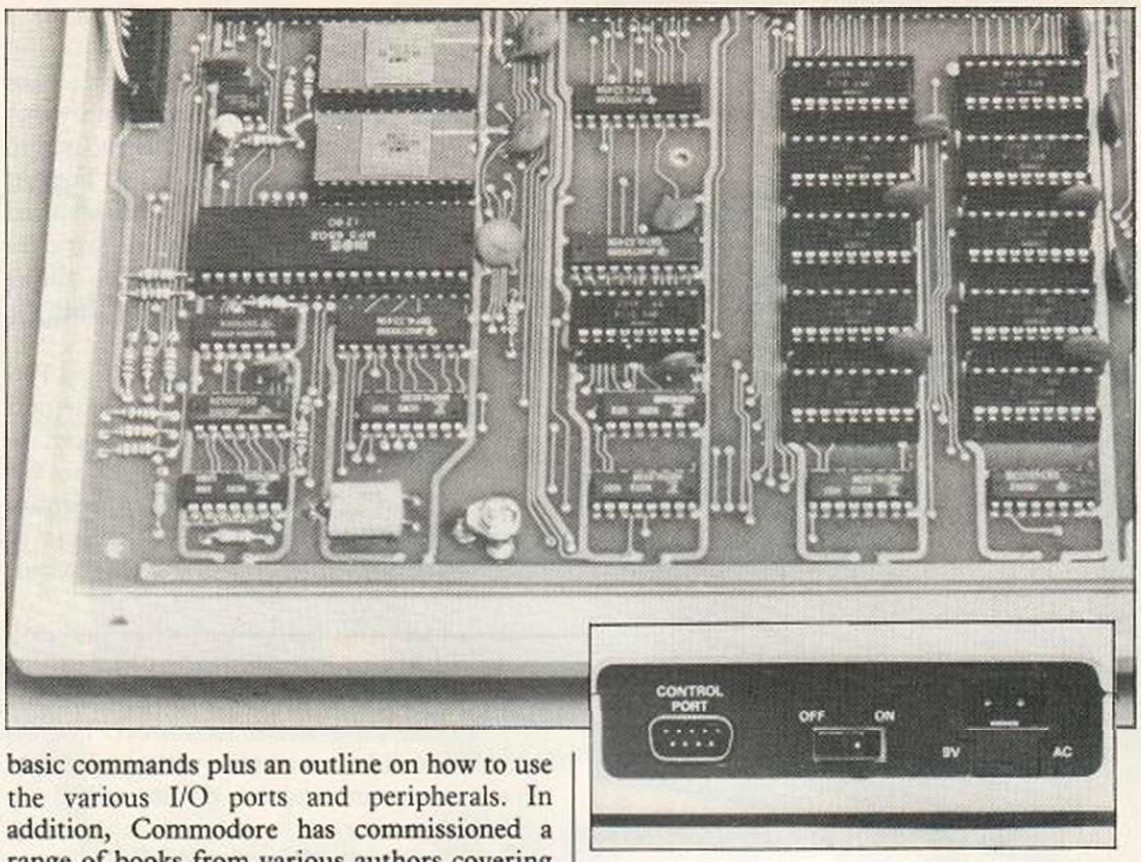
The Basic used by the Vic is both fast and powerful — in fact, the Vic runs at twice the speed of the Pet, since it uses a high-speed version of the 6502 microprocessor. It is a nine-digit full floating-point Basic capable of handling numbers in the range E-38 to E37. All trigonometric and log functions are provided and all are calculated to nine-digit accuracy.

Full string-handling and manipulation capabilities are provided and the only limitation is a maximum 88-character input. Machine-code subroutines can be run within a Basic program and all memory locations are accessible and alterable by Basic.

To aid programmers, Commodore has produced two special cartridges for plugging into the memory expansion port — the Vic Programming Cartridge and the Super Expander Cartridge. The Vic Programming Cartridge contains a ROM plus an extra 3K of RAM. The ROM contains a machine-code monitor, allows toolkit commands and function-key programming.

The Super Expander Cartridge adds a set of commands to Basic covering high-resolution graphics, and music, plus an extra 3K of RAM. For Vic users who are not familiar with programming, Commodore has developed a range of self-teaching books with associated plug-in cartridges.

For everyday use, there is the Vic programming guide. This manual covers all the basic commands plus an outline on how to use the various I/O ports and peripherals. In addition, Commodore has commissioned a range of books from various authors covering the more advanced concepts of Vic programming and applications.



The Vic is a well thought-out and developed product, and enters the U.K. market well tested by one of the toughest consumer societies in the world, Japan. Commodore has marketed the Vic in Japan for the last 10 months. The theory behind that decision is that if you can sell a consumer electronics product to the Japanese successfully, it must be good.

The Vic has been very successful in Japan selling more than 10,000 machines a month and still increasing. In the light of this, Commodore's aim of selling a similar volume of machines in the U.K. seems not unreasonable. It also indicates that the Vic fulfils at least what the Japanese consumer demands of a computer. It also means that the Vic arrives in the U.K. market well-tried and free from any fundamental design faults.

The Vic is intended to bridge the gap between the low-cost hobby market and the home or small-business computer market. As such it should appeal to a wide range of potential users, including:

- The hobbyist who previously could not afford a computer.
- The first-time computer user who wishes to learn about computing.
- In education, where the low-cost and Pet-compatibility will appeal.
- In industry, laboratories, and process-control which require cheap off-the-shelf computers.
- As a telecommunications terminal.

Because most of the very extensive range of software and add-on peripherals available for the Pet will be usable with little or no modifications, the Vic will find applications in all the many areas where the Pet is currently used. This ready-made and large market for support products will give the Vic a considerable lead over any of its competitors.

Documentation is an area where Commodore has in the past had a poor reputation. With the Vic it looks as if Commodore is trying to remedy the situation. There are three levels of documentation: basic system documentation; self-teaching courses in programming; and advanced application and programming guides.

Only the first of these documentation levels has so far been produced the other two levels are still in preparation. The documentation covers progamming the Vic in Basic with full explantion of commands and syntax — a whole page is devoted to each command.

Besides the Basic commands, the manual covers file handling I/O commands, programming the RS232 port, and all are illustrated with example programs. From the advanced specifications for the other two levels of documentation which I have seen I would say that they should be reasonably good. ■

CONCLUSIONS

- The Vic is a well-designed and well-produced consumer computer at a price which makes it one of the best buys currently available.
- My only doubt about the Vic is whether the designers have correctly gauged consumers' requirements for a low-cost consumer computer and if so, is the timing correct for its launch on to the market. My own opinion is that they have a product which is almost correct and that the timing for its launch is probably about right; it all depends on Commodore's marketing as to whether the Vic is a success or not.
- For anyone considering buying a computer, whether to help them learn about computing or to play computer games, the Vic must be one of their first choices of machine.
- Reliability seems to be good thanks to the relatively small number of components used in the machine. In five months of reasonably heavy use of the Vic, I have not had any problems.
- Market support for the Vic is bound to be very extensive given its close relationship to the Pet. This should cover all areas including software, add-on hardware, servicing, books and documentation.
- Availability: the Vic is being initially marketed through about 100 outlets in the existing Pet dealer network. Later this year it will be marketed through high-street stores.
- Though not the least expensive, the Vic compares very favourably to other products on a feature-by-feature basis. What is standard on the Vic is very often an optional extra on other lower-cost machines. It is interesting to note that Clive Sinclair when launching the ZX-81 said that the only competition that existed for his machine was the Vic.
- By using the plug-in modules on the memory expansion port, the Vic can be expanded to a full-sized system. By adding Pet peripherals to the Vic the Vic can be used as a stepping stone to aquisition of a full Pet system.

The VIC centre
It's the add on to start with for your VIC-20

When it comes to looking at what the incredible VIC-20 has to offer, there's one cost-free add-on it will pay you to consider right from the start – The VIC Centre. Established by Adda Microshops Ltd, part of the successful Adda Computers group, The VIC Centre aims to offer the kind of service you'll not find anywhere else in the country.

To begin with, our business is dedicated towards providing you with a "one-stop" source for the VIC-20, VIC-20 peripherals and VIC-20 software. On the basis of a very simple philosophy: to provide a friendly, fast and comprehensive service for the world's most user-friendly and helpful personal computer.

We'll be amongst the first to have available supplies of the VIC-20 with its magnificent sound and colour capabilities.

Contact us now to ensure early delivery of your VIC-20. When you've found how the VIC-20 makes it easy for you to learn all about computing, we'll supply the software to help your knowledge grow.

We'll keep you informed of new peripherals which will give the VIC-20 system unrivalled versatility on applications ranging from home budgeting and video games to business records and statistics.

All our customers benefit from our telephone technical advisory service and in-store repair facilities.

If you want to get to the heart of what the VIC-20 system is all about then go straight to the centre – The VIC Centre – and join our information service now.

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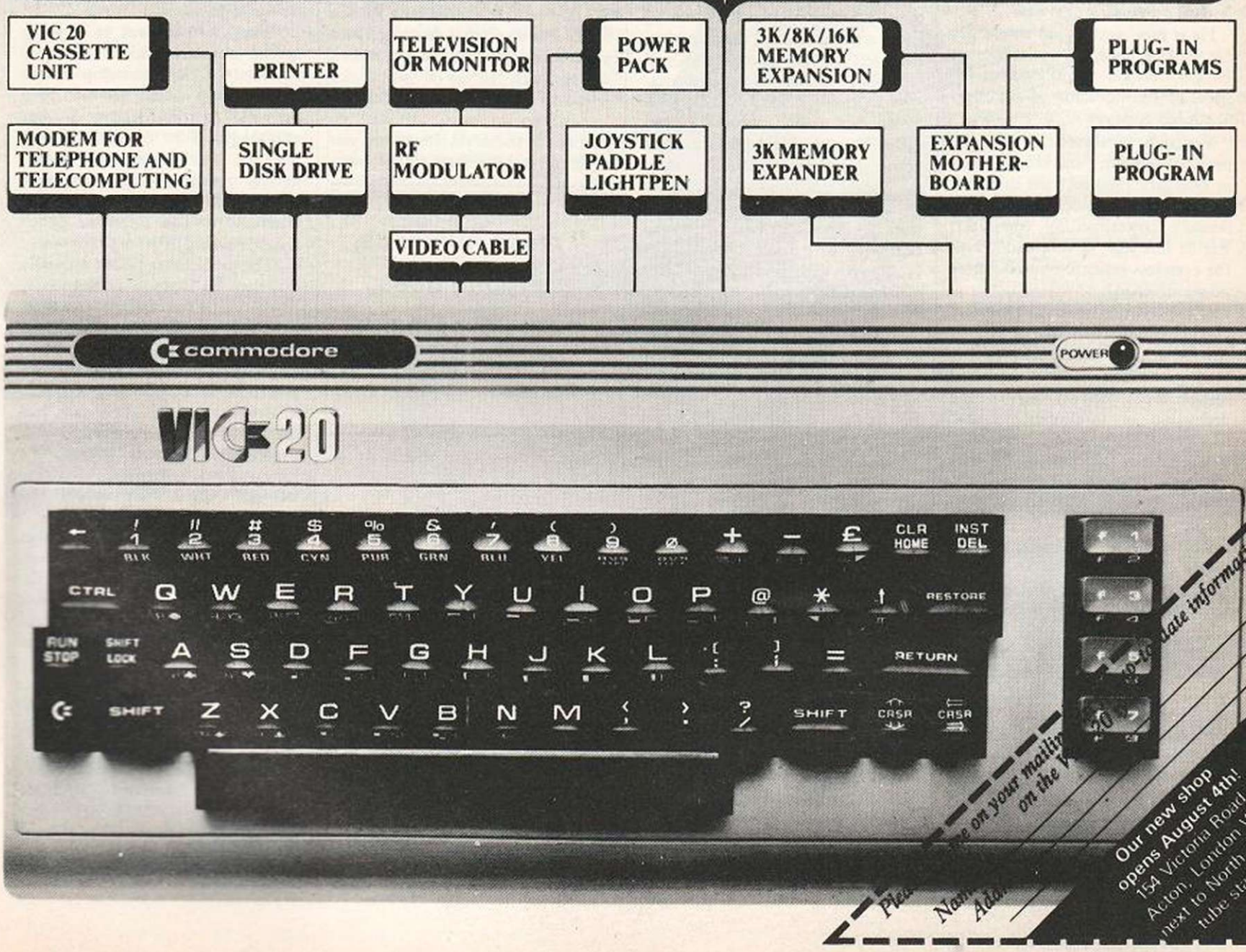

ANY TIME NOW IT WILL BE WORTH BUYING A HOME COMPUTER.

You haven't seen a real home computer until you've seen the VIC 20 by Commodore.

But by August you'll get your chance.

Because that's when the first VIC 20's will be arriving at your Commodore dealer.

Then you can take a good, long look at what makes VIC the best.

Like the real typewriter keyboard with full graphics. And eight border and sixteen screen colours. And music in three voices and three octaves, as well as language and sound effects.

So don't think of buying a home computer until then.

Because it simply isn't worth it.

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Commodore Home Computer Division, 818 Leigh Road Trading Estate, Slough, Berks. SL1 4BD. Telephone: Slough (0753) 74111.

VIC 20

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