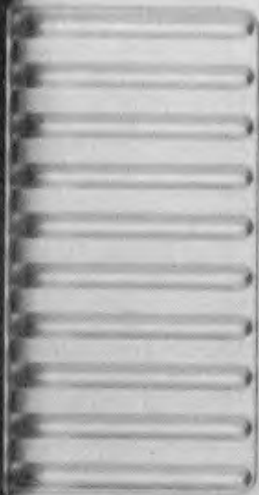# Australian
Personal
Computer

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APC SHOW - FULL REPORT

AUSTRALIA'S TOP SELLING COMPUTER MAGAZINE

DICK SMITH BREAKS THE PRICE BARRIER
Colour and sound for under $200

VZ 200

Dick Smith has surprised Australia with a price/performance breakthrough in home computers. Tim Hartnell reports.

INTRODUCTION

A colour computer for less than $200? It sounds hard to believe, but Dick Smith has done it with the VZ-200, which will be released in Australia towards the end of May. Manufactured in Hong Kong by Video Technology Ltd to Dick Smith's specifications, this small computer is certain to send shivers of dismay up the spines of dealers in other small computers, such as the VIC-20 and the Sinclair Spectrum.

HARDWARE

The VZ-200 is tiny. Smaller than a telephone directory (29cm long, 16.5cm from front to back, with a height of just 2.5cm at the front of the keyboard, rising to 5cm at the back), the unit is built from cream plastic. The computer is light, but does not feel excessively fragile.

The keys are rubber (much like the Spectrum keys), in light brown, with easy-to-read white legends on them. A red LED in the top right hand corner of the keyboard lets you know the machine is on (and the on/off switch is located under the 'lip' of the keyboard, down the right hand side, in a position where it would be almost impossible to turn it off accidentally).

Each key has one or two things written on it, generally a letter (the computer works all in upper case on the screen) and a symbol (such as & or *), or a graphics element. These are a series of squares, each the size of a letter, with various quarters blocked off, to give a total of 15 different fairly coarse shapes. Above most keys are key words (such as FOR, INPUT and PRINT) while below the keys is another set of words, the functions (such as CHR$, SIN and LOG).

This single element on the VZ-200 shows the influence of Sinclair, who pioneered the 'single touch, key word' entry system back with the ZX80. In contrast to the ZX81 and the Spectrum, the VZ-200 does not demand you use the single-touch keys. If you feel happier typing out words in full (which is almost certain to be the case if you decide to move from another computer to the VZ-200), this Dick Smith machine will allow you to do so. You can even mix single-touch entered words, and spelt out words, in the same program line.

As you can see from the photograph of the keyboard, there is a SHIFT key in the bottom left hand corner, and above that is the control key (marked CTRL). If you hold down CTRL and then touch another key, you'll get the key word written above the key. Underneath the power LED is the RETURN key, and written above this is FUNCTION. If you hold down the CTRL key, then press RETURN/ FUNCTION, and then press a key, the word underneath the key will appear on the screen.

The keys numbered one to eight have a further set of words above them. These are the colours (green, yellow, blue, red, buff, cyan, magenta and orange) and above these is the message 'Mode 0 only'. We'll be discussing the modes in the software section.

You may feel, on reading this description and looking at the keyboard and its bewildering array of words and symbols, that the VZ-200 will be extremely difficult to get used to. I felt that way when I first tackled the Sinclair Spectrum keyboard (which is even more complicated), but discovered that it became remarkably easy to use after a very short time. I am sure the same thing will happen with the VZ-200. Even if you start programming on it without using the one-touch key word entry system, you'll probably soon find yourself using some of the 'pre-programmed' words (such as RUN above the 6 key, and LIST above the 5) rather than type out the whole word every time. From there, it won't be long before you're introducing more of the single keys into your programming.

The keys feel good. Although they are a sort of 'dead rubber', they are extremely responsive, requiring only the slightest touch to trigger (in contrast to the Spectrum, whose keys have to be squeezed slightly to get the finger pressure to register). The keyboard beeps when each key is pressed, giving good audio feedback to your typing, although there is no tactile feedback at all. Of course, a keyboard of this type can never really compete with a real keyboard such as the one provided on the VIC-20, but when you're buying a colour computer for $200, you have to
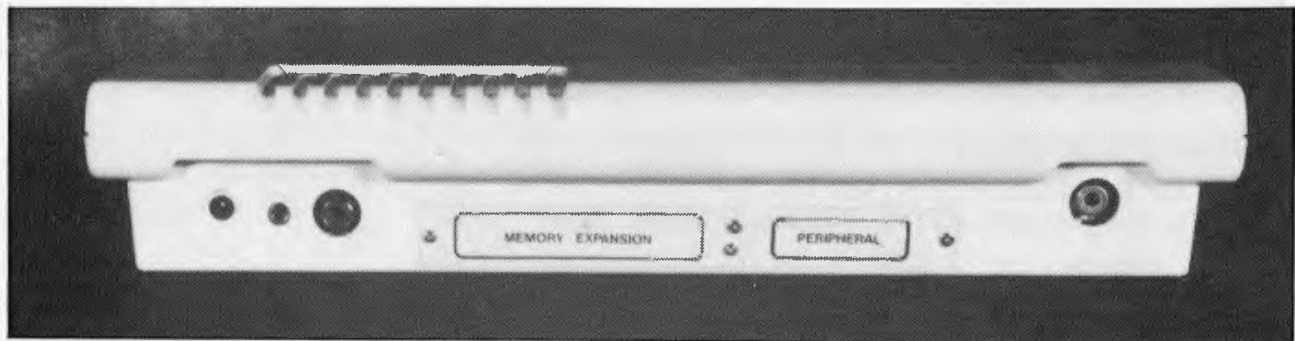
Left: The VZ-200 in actual size less about 10%. Above: The rear end showing sockets for the monitor, TV, cassette and plate covered edge connectors for peripherals and additional memory.

be willing to make some compromises.

The computer comes with a separate power unit (producing 10 volts at 800 milliamps) which plugs into the rear of the machine. This is supplied with a generous three metre cable (unlike some computers which come with leads so short manufacturers must imagine you like sitting on your power point to do your computing). A much shorter (around a metre) cable is provided to connect a cassette player to the VZ-200. A 'stereo' plug goes into the computer socket which is marked TAPE and the other end of the cable branches into two 3.5mm plugs, one each for the earphone and microphone sockets.

There are two video outlets. One connects your computer to a standard television, and while I did have a little difficulty locating the correct channel for the picture, once I'd found it, the picture was clear and steady, and did not drift. The second video output is to drive a monitor, allowing a somewhat superior picture to be produced. Providing both these outlets is a good touch, allowing you to upgrade your picture quality if you have a monitor, without having to adapt the modulator output for it.

When you turn the computer on, the screen comes up with a black border framing a green central area, with white writing (VIDEO TECH-NOLOGY BASIC V1.1 READY). The letters tend to be fairly large and square, rather like those produced by the TRS-80 Color Computer. The cursor is a flashing white oblong.

The computer comes with 8k of RAM on board of which approximately 6k is available to use (in contrast with the VIC, which has only 3.5k or so of user RAM on the unexpanded model).

There are two sockets at the back of the machine which are protected by small panels, held in place by a couple of Philips screws. They are marked 'memory expansion' and 'peripherals'. The 16k memory unit (which will cost $79.00) is rectangular, somewhat larger than a cigarette box, in the same pale cream plastic as the computer. The memory module fitted easily into place, and sat in position fairly firmly, although I would not advise waving the computer around in the air with the extra memory in place.

The 'peripherals' bus will take plug-in ROM cartridges. As well, it can be used to interface (via an optional unit which will sell for $49.50) to any Centronics-type printer.

The computer case is held together with six screws, fitted underneath. There are a few ventilation grills in the base of the machine, which is supported a few millimetres above the table surface with four tiny rubber feet. Inside the computer, much as you'd expect, there is the normal assortment of chips and other components which are always incomprehensible to people like me who find the whole hardware area a forbidding jungle.

The keyboard unit, which is fastened solidly to the top half of the computer case, is linked with the main body of the machine via a short, 16-wire cable. It appears it would be a simple job to tap into this to connect up a larger, full key keyboard if you wanted to do so. There is a small heatsink which lies under the grill you can see in the left hand corner of the computer, when looking at it from the front. I am constantly surprised by how tiny modern computers are, and the VZ-200 reinforces that surprise. The case isn't even full.

The memory map is as expected. The Basic ROM occupies the first 16k (up to 16384, 3FFF) with the next 14k or so divided up into 10k for the ROM cartridges, 4k for the keyboard, cassette port, video controller and sound, and 2k video RAM. Next comes the inbuilt user 6k RAM. The memory of the unexpanded machine ends at 36863 (8FFF). The computer can be expanded by a further 16k, using the module mentioned earlier, to 65535 (FFFF).

SOFTWARE

The computer has a 16k ROM, of which 8k is a good implementation of standard Microsoft Basic, with the second 8k holding the commands for accessing the sound and colour. Additional text and graphics commands, such as PRINT @ (to position a character in an exact

position on the screen; an ideal and easy way to create moving graphics) and PRINT USING are also supported.

As I said earlier, the screen comes up green, with white writing. Holding down the CTRL key, then pressing the key second from the bottom right hand corner (marked INVERSE) produces green letters on little white oblongs. These inverse letters come out as lower case letters when the computer output is dumped to a printer. Holding down CTRL, then pressing INVERSE again changes the letters back to white on green.

The VZ-200 works in two graphics modes. The display in text mode is 32 by 16, while in the higher graphics mode you have a resolution of 128 by 64. This is not particularly high, but is adequate for many applications.

The computer defaults to the text mode (MODE 0) when you first turn it on. The colours are easy to use in this mode. You simply include the command COLOR n,m (where n is a number between one and eight, and m is either zero or one) and the VZ-200 prints the following text in that colour.

There are only two background colours, and these are controlled by m. The two backgrounds are green (0) and orange (1). COLOR 1 will switch the background colour, no matter which one is currently in place. The computer will

stay in the specified colour until a new one is evoked.

The cursor position is controlled by four arrowed keys (all grouped together conveniently in the bottom right hand corner of the screen). Holding down CTRL, then pressing one of these will cause the cursor to move rapidly about the screen, inverting any letter or symbol it moves over. Once you've got the cursor where you want it to be to edit a program line, you can either use the INSERT key (still holding down CTRL) to make room for new material you wish to add (the new spaces stream off from the right of the cursor) or RUBOUT (which 'draws in' material from the right of the cursor, causing it to vanish underneath the cursor). The arrow keys are easy and swift to use, and allow program lines to be edited simply.

The SET and RESET commands are used in the higher resolution mode to turn on (SET) and off (RESET) specific points on the screen. The command is of the form SET (X, Y) where X is from zero to 127, and Y is zero to 63. The dots are printed in specific colours. (The Spectrum, by contrast, boasts a 256 by 172 screen, but the colour resolution is only 32 x 22). POINT is used in conjunction with SET and RESET to return the state of a particular position (that is, to tell if it is 'turned on' or not).

Of course, PEEK and POKE can be used to directly access the display file, for fast moving graphics. (The display file starts at 28672 in both modes, ending at 29183 in mode 0 and 30719 in mode 1). You need to POKE with numbers between 127 and 255 to get coloured graphics, while POKE codes 64 to 127 hold the inverses of the letters, numbers and symbols which precede 64.

SOUND

The musical output of the computer, and the beeps when you press the keys, come from a tiny inbuilt sound device. The volume is just adequate (although louder than the Spectrum's sound) but is far better than having no sound at all. The VZ-200 sound is, however, woefully inferior to the sound produced through the TV loudspeaker by the VIC-20, where you have three voices and white noises to play with (even if the VIC sound must be accessed through tiresome and complex POKE statements).

The VZ-200 sound is controlled by a SOUND statement, of the form SOUND n,m — where n is the pitch (1 to 31) and m is the duration (1 — shortest — to 9). The following, two-line program will put the VZ-200 through its musical paces forever:

```
10 SOUND RND(31), RND(9)
20 GOTO 10
```

CASSETTE HANDLING

Cassette handling on the VZ-200 is quite sophisticated. The computer dumps the programs to cassette with the command CSAVE "nnnn", where "nnnn" is a file name. The command CLOAD — again qualified by a file name — is used to get programs back from tape into the computer. The computer will print up the names of other programs found on the tape before the one you have specified, and while loading prints up the message LOADING:nnnn. I have used (and cursed at) a variety of cassette interfaces in my years of working with computers. The VZ-200 performed faultlessly for me once I had worked out the right setting for my cassette recorder, and when I used good quality audio or computer cassettes. It did not work so well with ordinary, cheap audio tapes. Tapes made by companies like TDK should give consistently good results.

A third cassette command, VERIFY, is provided so that you can check the quality of a SAVE before wiping the program from the computer. This compares the program on the tape with the one in the computer and reports VERIFY OK if the two correspond exactly.

Many Basics support the CHAIN
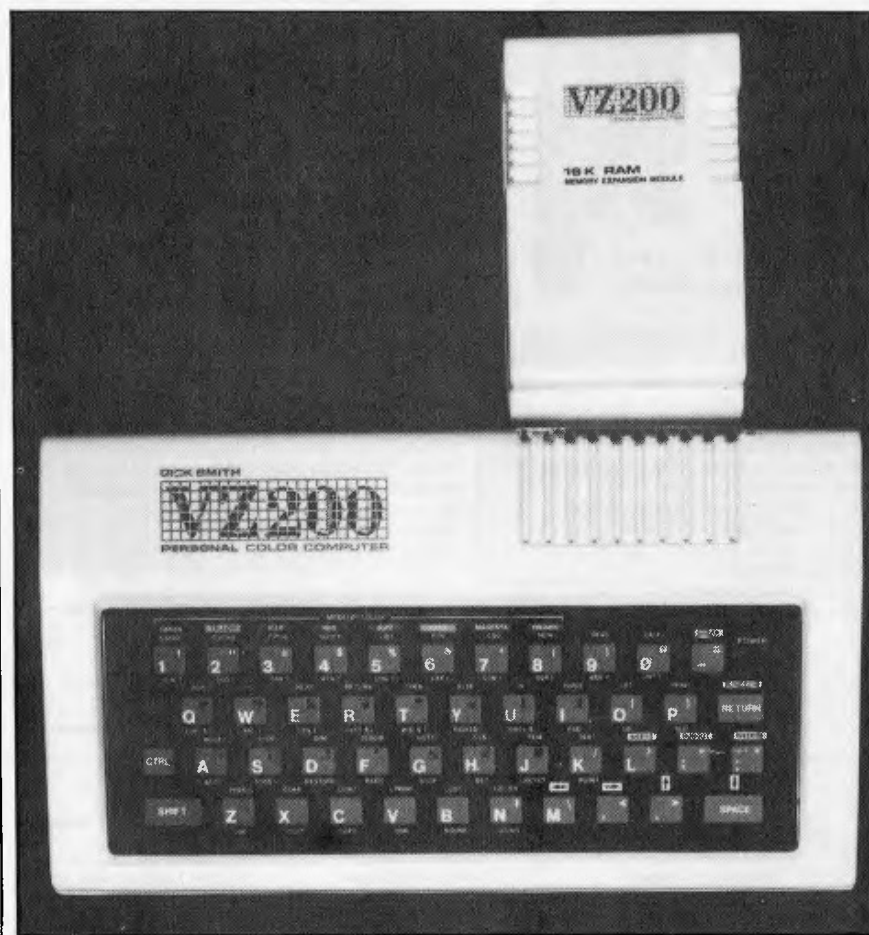
The 16k RAM expansion module is quite large as compared with the VZ-200 itself.

command (used as CHAIN "nnnn") which is a 'load and go' command. The command finds the specified program on the tape or disk, loads it, and then starts running the program automatically. The VZ-200 command CRUN provides this facility.

The hash (#) symbol, in conjunction with INPUT and PRINT, can be used to put and get file data from tape. This is an advanced feature which could substantially extend the potential uses of the VZ-200.

DOCUMENTATION

The computer comes with a hefty manual, which covers the entire VZ-200 Basic language, touching briefly (but relatively clearly, given the complexity of the subjects) on PEEK and POKE, INP and OUT (for returning the content of a port, and for sending values to an I/O port) and USR (to call a machine language subroutine).

The manual starts with a two-page explanation of the major parts which make up a computer system. This is not needed in order to use the computer, and first-time users are advised to skip over it (as it contributes nothing to getting your VZ-200 up and running) with the idea of perhaps coming back to it later.

The manual is clear. It has been written by Video Technology under strict instructions from Jime Rowe of Dick Smith Electronics. The intention has been (and this is supported by the notes I saw which have gone back and forth from Hong Kong to Australia) to make everything as clear as possible for the first-time user.

A book 'Getting Acquainted With Your VZ-200', is in preparation. This will introduce programming in a more informal style than that provided by the manual, which will remain the standard source of information for users.

A series of software packs, mostly games, will shortly be available from the manufacturer, and Dick Smith has commissioned several more original programs from Australian programmers. A users' club has been organised (with the co-operation of, but not under the control of, Dick Smith) and members will be entitled to free copies of the club's newsletter.

CONCLUSIONS

Overall, this is a great little machine, and one that is likely to change the face of Australian personal computing. With one move, it has attacked the market of every machine under $1000. Assuming the promised support materialises (and Dick Smith has a reputation for delivering) VZ-200 users should shortly find that their computer is better supported (in terms of available software, books, magazine articles and a users' club) than any other machine in this country.

Purchasers who buy the machine, knowing that for $200 they won't be getting the sound output or keyboard quality of a more expensive machine, will probably be well-pleased with their purchase.

When the editor of *APC* came over to my place to see the machine while I was writing this review, he said: "I'm certainly going to buy one." I am sure this will be the reaction of a great number of Australians. I have a feeling we are going to be hearing a whole lot more of the Dick Smith VZ-200 Personal Color Computer in the coming months.

BENCHMARKS

The standard eight Benchmark tests were applied, and produced the following results:

BM1 loop 1.5 seconds
BM2 loop/addition 6.7 seconds
BM3 loop/addition/arithmetic 17 seconds
BM4 loop/addition/arithmetic numbers 17.5 seconds
BM5 as above/subroutine call 19 seconds
BM6 as above/dim/inner loop 31 seconds
BM7 as above, fill array 47 seconds
BM8 trig functions 72 seconds (1000 loops).
Average -- 26.5 seconds.

Comparing these with the VIC-20, we find that they are very close, with the VIC's average time of 28.7. However, they are significantly faster than the Spectrum, coming in with an average of 58.5 for the eight Benchmarks. As Dick Pountain pointed out in *APC* in November, 1982, the result of the Benchmarks tests does not necessarily prove very much, although the results are interesting.

TABLE OF RESERVED WORDS — VZ-200

ABS AND ASC ATN
CHR$ CLOAD CLS COLOR CONT COPY COS CRUN CSAVE
DATA DIM
ELSE END EXP
FOR
GOSUB GOTO
IF INKEY$ INP INPUT INT
LEFT$ LEN LET LIST LOG LLIST LPRINT
MODE MID$
NEW NEXT NOT
OR OUT
PEEK POKE POINT PRINT
READ RED RESET RESTORE RETURN RND RUN
SET SGN SOUND SIN SQR STEP STOP STR$
TAB TAN TO THEN
USING USR

VZ-200 TECHNICAL SPECIFICATIONS

PROCESSOR: Z80, 3.58 MHz
ROM: 16k
RAM: 6k, expandable by a further 16k
Keyboard: Rubber keys. 45 keys with auto repeat, contact 'beep'
Mass Storage: Standard audio cassette recorder 600 baud
Screen: Television (colour) or monitor, 32 x 16 (text mode), 128 x 64 (graphics mode)
Sound: Internal speaker
Ports: Two expansion edge ports, one has full address, data and control lines, the other is just an I/O port
Language: Microsoft Basic (8k) plus screen, cassette and sound handling (second 8k)