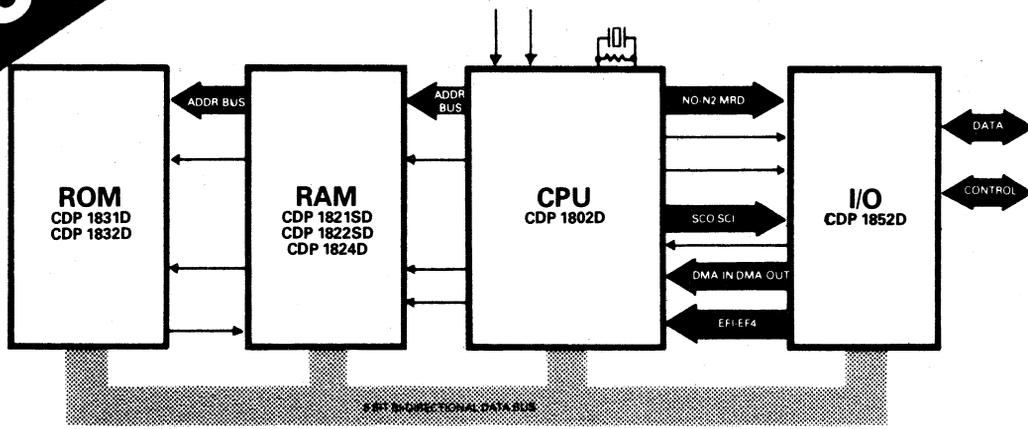


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For further information on the above and other solid state products, please contact:



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Victory Home TV Programmer

... has plug-in cartridges, colour & sound effects

The "Victory" Home TV Programmer from Soundic is a video games unit based on the COSMAC 1802 microprocessor. It offers a range of games and amusements for one or two players, in full colour, and with sound effects. The unit connects directly to a television set, and is capable of providing hours of entertainment and instruction.

The Home TV Programmer is attractively presented in a black and grey plastic console measuring approximately 375 x 170 x 65mm. As can be seen from the photograph, the console consists of a front panel with the prominent "Clear" button, a slot for inserting cartridges programmed with various games, and two recesses which hold the keypads. The numeric keypads can be detached from the unit and held in the hand, with almost a metre of connecting cable between the console and the keypads.

Buttons on the keypads are used for the control of movement, colour, and sound while playing the games. The unit also comes with two joystick controllers which clip in place over the keypads. Movement of the joystick then causes studs on the underside of the controllers to contact the buttons of the keypad, giving a more convenient way of controlling movement on the screen. Because of the mechanical arrangement of these joysticks however diagonal movement is not possible, whereas it is available by pushing the appropriate button on the keypad.

The Victory Home TV Programmer is similar to the Fairchild Video Entertainment Centre which we reviewed in December 1978. Like the Fairchild game it offers a selection of games in pre-programmed plug-in cartridges and twin hand controllers. However it has features which the Fairchild game lacked, such as a larger number of built-in games, a wider choice of colours which can be displayed and numeric keypads. It is also considerably cheaper than the Fairchild unit.

Because it uses a CMOS processor, the games unit can be powered from a 6V plug pack or battery eliminator. The COSMAC processor is fairly slow, however, and the task of driving the video display further reduces its speed. This means that some of the games tend to lack excitement because everything happens so slowly.

The Home TV Programmer interfaces directly to a television set, with both video and sound signals fed to a VHF modulator and input to the antenna terminals of the set. The game we reviewed was set up for operation on Channel 1.

Without a cartridge inserted the machine provides four games. The first

of these, called "Doodle" is an excellent example of the capabilities of the system. The program transforms a colour TV set into an electronic "canvas". At the start of the program a white dot appears at the lower left hand corner of the screen. The user can set the colour of the dot by pressing keys on one keypad, and control the movement of the dot by keys on the other keypad to draw lines. Each key on the pad used for changing colours also generates a musical note as it is operated. Other keys provide for erasing and re-writing lines.

The second game, "Patterns" is similar, except that once a pattern is formed it is

stake in the game and asks the players to cut the cards and bet. Players can then draw other cards or pass, attempting to beat the dealer (the games unit). Winnings are automatically added to the player's total stake and losses deducted and then a new hand is dealt. You can break the bank by increasing your winnings to \$999.

These four games, with sound and colour graphics, are in themselves excellent value, and would be a selling point even if no other games were available with the unit. As it turns out however they are just the beginning. . .

At the moment there are 13 plug-in cartridges available, with a number of them containing two games. "Spacewar/Intercept", the first cartridge to come to hand, is a variation on the UFO and missile theme. Two versions of the game are available, again for one or two players. A good sense of timing and a steady hand are necessary to launch



stored in memory and automatically repeated, along with the musical notes generated as the colour of the pattern changes. With a bit of practice it is possible to create very pleasing designs in eight colours, and have them repeated endlessly, along with the music created by the changing pattern. Up to 128 key entries can be stored in memory, allowing intricate patterns to be created.

Also built in is "Bowling", a representation of ten-pin bowling for two players. Each player takes turns at controlling the path of a ball which can be directed to strike the pins. The games unit automatically displays the score for each player and keeps track of the number of frames played.

The fourth game provided by the basic unit is Blackjack, which may be played as either a one or two person game. The machine displays each player's total

the missile at the appropriate time and steer it onto a collision course with the moving target. Players take turns, in which case the games unit computes and displays their scores, or the game can be played solo.

The "Star War" cartridge, based on the movie of the same name, involves manoeuvring spaceships around on the screen and attempting to frame your enemy in the viewfinder of your automatic weapons system. A musical note tells you that you have succeeded, followed by a gratifying visual display as the enemy ship explodes. Another version of the same game allows two players, one the pursuer and the other the pursued - but be careful, because the roles can be easily reversed!

Other cartridges available include:

(continued on p98)

Victory Home TV Programmer . . .

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Concentration match; Schoolhouse II – Maths Fun; Speedway/Tag, Pinball; and Biorhythm. The last named cartridge is not a game, but instead computes and displays the user's biorhythms for a selected 32 days period.

Overall the Victory Home TV Programmer represents excellent value for money in the video games field. The unit is robust enough to take some hard knocks, and the numeric keypads and joystick controllers are well suited to the hands of children. The colours are a little

lacking in saturation, and the unit does appear to suffer from interference, possibly because of the plastic case but neither of these problems is particularly annoying.

The Victory Home TV Programmer and cartridges are available from Radio Despatch Service, 869 George St, Sydney, NSW, 2001. Recommended retail price of the games unit is \$95.50, including the joysticks and 6V power supply. The cartridges cost \$20.00 each. (PV).

A low-cost, graphics-oriented computer

COSMAC VIP

RCA have now released an updated version of their COSMAC VIP single board microcomputer. Featuring a video output and cassette interface plus many optional peripherals, the COSMAC's low cost should interest beginners.

Most of our readers will be familiar with the DREAM 6800 microcomputer, but few may realise that it was largely a 6800 version of RCA's COSMAC. In fact, the CHIPOS language operating on the DREAM is derived from the CHIP-8 language interpreter on the COSMAC and the video display is virtually identical.

The similarities do not end there either: both use a hex keypad for data entry, a cassette interface for program or data storage and a speaker output. It's natural then to compare the DREAM and the COSMAC's other features. The most obvious advantage of the COSMAC is that it is fully assembled on a double sided PC board, all you have to do is solder up the power supply, video and cassette leads. Also the COSMAC only requires a single +5V power supply which is readily obtained from the on-board regulator and a 9V DC plug pack.

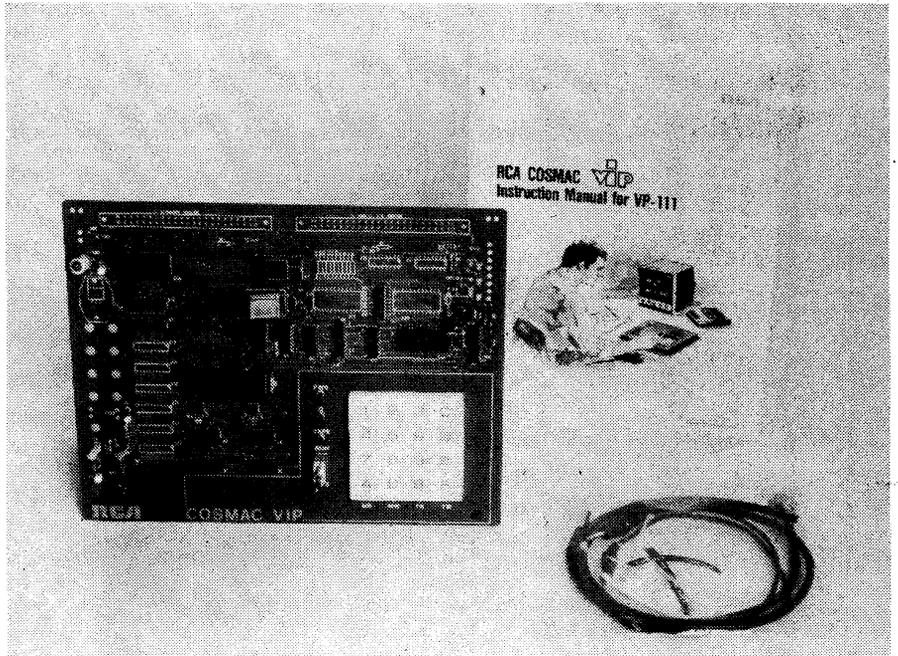
With the various connections to the cassette, and VHF modulator or video monitor made it is a simple matter to get the COSMAC up and running. Just flip the RUN/RESET switch to RUN, hold the "C" key on the hex keypad down and you are into the monitor. Four hexadecimal digits have to be entered first and these form an address which is displayed on the lower left of the screen in the DREAM's familiar "chunky" graphics. The COSMAC then displays the two digit hexadecimal data at that

memory location on the lower right of the screen.

Monitor commands are particularly straightforward, in fact there are only four commands, viz memory read, memory write, tape read and tape write.

The commands are selected by pressing one of four keys on the bottom row of the hex keypad immediately after entering the address. If memory write is selected, then the next two hexadecimal digits entered on the keypad will be stored at the memory location selected. The address is then automatically incremented ready for the next location to be written into, making it easy to enter long programs.

Programs can be checked using the memory read command and then saved using the tape write command. The only



information required by the tape write command is the starting address, which is merely the address just entered, and the number of "pages" of memory to be written out. Programs are not named as in larger microcomputers so it's up to the user to position the tape when loading. In most cases, this means it's only convenient to store one program per side of a cassette. One feature we did like about the cassette interface though, is that it has a relatively fast 100 characters/sec transfer rate.

The actual code which is entered into memory can be either CHIP-8 or machine code for the COSMAC's CDP1802 CMOS microprocessor. This micro was apparently intended as an in-

dustrial controller where the noise immunity of CMOS is an advantage but it has not enjoyed the same degree of popularity as the 6800, 8080 etc. It does have quite a good instruction set though, and there should be little difficulty in programming in machine-code alone.

Some beginners may prefer to use the CHIP-8 interpreter language which offers a more powerful instruction set for generating displays and interfacing with the keypad etc, plus 16 general purpose "variables". One slight disadvantage with CHIP-8 on the COSMAC system is that the CHIP-8 interpreter is not ROM resident as on the DREAM, but has to be entered into memory from a hex listing. This of course only has to be done once, since it can then be saved on cassette tape and reloaded whenever required.

The actual video display on the COSMAC consists of a matrix of chunky squares, 64 squares horizontally and 32 squares vertically. Each point can be individually turned on or off to generate either video games or numbers and digits. The monitor for example generates the hexadecimal address and data display by forming each digit from a 4x5 cell. While each point can of course be accessed directly from machine code, CHIP-8 also provides a high level instruction for XY graphics.

Looking at the hardware now, the hex keypad is a 4x4 matrix of membrane switches. These provide virtually no tactile feedback but the monitor does generate a "bleep" from the speaker during each keypress, in effect indicating a valid keystroke. Incidentally the actual keyboard scanning circuitry consists of a CMOS 4515 4-to-16 multiplexer which is used to software-scan the keyboard and the common line from the keypad goes to one of the four sense inputs on the 1802.

One advance made on the original COSMAC is the CDP1816 video controller chip which generates all the video-refresh addresses plus the horizontal and vertical sync and replaces a large number of discrete counters and monostables. Despite this the COSMAC, like the DREAM, uses a crude video-refresh scheme. For half the field period of the TV, the video accesses memory via the bus generating the TV display, for the other half the microprocessor gets access to the bus. This results in a display which occupies only slightly more than half the screen and it also means that the micro is only working half the time. In this non-critical application though this is quite acceptable.

1K of on-board memory is supplied consisting of two 1Kx4 bit static RAMS. Additional sockets are provided for six more chips so that a total of 4K can be obtained without further expansion. Using the expansion interface it would be possible to extend this to 32K or add various peripherals.

A large number of peripherals are available for the COSMAC including an Expansion Kit with 3K additional RAM, 8-bit I/O ports (sockets already provided on-board), 4K RAM expansion kit, a locally developed PAL colour board, two channel "Super Sound Board" music synthesiser, EPROM Programmer, Auxiliary keypad, Tiny BASIC, ASCII keyboard with touch keys and a Floating-Point BASIC.

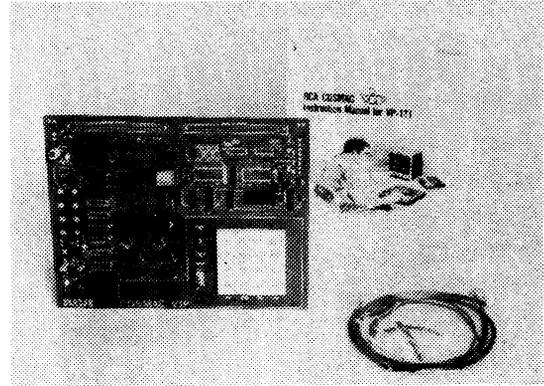
The COSMAC VIP Instruction manual which comes with the computer gives a quite reasonable introduction and covers the initial connection procedure to cassette, TV, loading memory, saving on cassette, complete descriptions of the CHIP-8 and machine languages, complete circuit diagrams, hexadecimal listing of the operating system and seven video games programs. While this manual is adequate for the experienced programmer we recommend the Users Guide which gives a more detailed discussion of CHIP-8 programming.

Clearly the COSMAC VIP is not in the same league as the TRS-80, System-80 and Sorcerer, but then it is a fraction of the cost of these micros and should provide enough computing power for the beginner. It is also important to note that it is less expensive than the DREAM and it comes fully assembled so there should be no problems in getting it up and going. Add to this the large number of peripherals available and you have an attractive low-cost system.

The computer we reviewed came from J.R. Components, PO Box 128, Eastwood, NSW 2122. (02) 85-3976. Quoted price of the COSMAC is \$139 including sales tax. A 9VDC plug pack and 5V regulator are \$10 extra.

RCA

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OPTIONAL ACCESSORIES . . .

User Guide — Additional information for the beginner and the newcomer to CHIP-8. Recommended.

Expansion Kit — Extra RAM, and full expansion facilities allowing the use of the following —

- | | |
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| Sound Generator — 256 note | EPROM Programmer |
| Stereo Music Synthesiser | Auxiliary keypads |
| Quadrasonic Expander Board | Tiny BASIC (Integer) |
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