

It offers 8K BASIC in ROM, user-programmed graphics:

Exidy's Sorcerer

One of the most recent entries in the blossoming personal computer market is the Exidy Sorcerer, which offers features like programmable graphics and 8K Standard BASIC in a plug-in ROM pack. Sorcerers are now available in Australia, and our Editor Jim Rowe has been able to try one out for a few weeks. Here is what he found:

I first came across the Exidy Sorcerer in April last year, when I visited the Percomp '78 hobby computer exhibition in Long Beach. It had just been announced, and the firm had an early prototype on their stand displaying graphics. It looked good, as I reported later in the magazine, although at that stage hardly anyone had even heard of Exidy — at least in the small computer field.

It turned out that Exidy Inc was a firm based in Sunnyvale, California, who had been making very successful coin-operated video arcade games for about five years. They had decided to use their microprocessor experience and branch into the personal computer area, and Sorcerer was the first of their new products.

In the months that have followed, the Sorcerer seems to have met with quite a warm reception in the USA. It has also started to appear "in disguise", under other brand names. So it was with some interest that I learned recently that Dick Smith Electronics had arranged with Exidy to market the Sorcerer in Australia, and that there would be an opportunity to try out one of the systems for myself.

A few weeks ago the sample Sorcerer arrived, and since then I have had quite a good chance to use it.

The Sorcerer itself is a single-board Z80 based microcomputer which is housed, along with its power supply, in a compact keyboard case. It is complete with inbuilt video interface, providing a video output suitable for either a standard video monitor or for connection via an RF modulator to a standard TV set.

The keyboard on the front of the unit has a total of 79 keys: 63 in a standard alphanumeric array and the remaining 16 in a numeric/graphics control pad. The main array offers both upper and lower case characters, together with provision for encoding up to 128 graphics codes.

Sorcerer has an inbuilt audio cassette interface, capable of working at either 300 or 1200 baud and with optional software control of up to two cassette deck motors. There is also an RS232

serial interface, 8-bit parallel input and output ports, and a 50-pin expansion port which mates with a forthcoming S-100 bus expansion unit.

The basic Sorcerer comes with either 8K or 16K bytes of user RAM memory, together with 4K bytes of ROM containing a powerful monitor program. With it also comes a plug-in "ROM-PAC" containing an 8K byte BASIC interpreter, written by Microsoft Inc. The ROM PAC is housed in what appears to be a converted 8-track tape cartridge moulding, and plugs into a slot in Sorcerer's right-hand end.

The idea of having the interpreter in a plug-in module is that you have greater flexibility; other software can be plugged in instead. In fact you can apparently already get cartridges with 8K of blank PROMs, to load with custom software. And Exidy itself is apparently about to release a second "Development System" ROM PAC, containing things like an assembler, a text editor, a debugging program and similar development aids.

The 4K monitor program which is

permanently resident in Sorcerer has some powerful commands. When you dump programs onto a tape cassette, you give them a file name which can then be used by the load routine to seek and load a specified program from the cassette at a later stage. A file listing program can also be used to list all of the programs stored on a cassette.

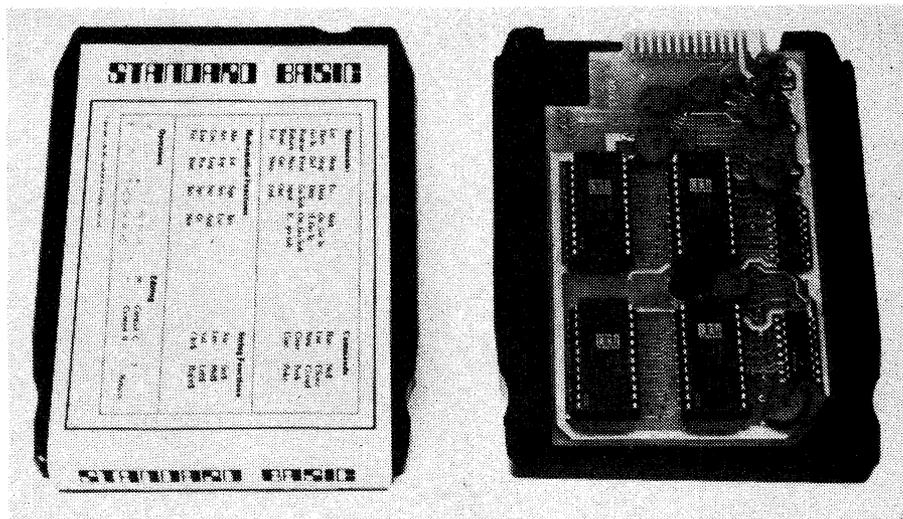
The BASIC interpreter which comes with Sorcerer is a full 8K standard BASIC. It allows named-program loading and dumping, a wide range of functions, 6-digit floating point arithmetic, and all normal BASIC commands. Other desirable features include PEEK and POKE statements, a USR command to link with machine language routines, string handling, and both numerical and string arrays.

And of course there are the graphics facilities. Sorcerer allows you to have up to 128 different graphics characters, any of which may be placed on the display screen in a 64 x 30 matrix. As the characters are themselves based on an 8 x 8 dot matrix, this gives an overall graphics resolution of 512 x 240 points.

All of the graphics character generation information is stored in RAM, and is potentially programmable by the user. However the monitor program normally creates the information for 64 "standard" graphics characters on power-up, and stores these away in half of the allocated 1K of memory space. The user can use these,



Here is the Sorcerer in a typical user situation, with the BASIC interpreter cartridge plugged in the side. The TV monitor, cassette recorder and books don't come with it for the price quoted — they're extra!



Outside and inside views of the plug-in ROM PAC, containing 8K BASIC.

together with another 64 custom-programmed characters, or can replace them if desired with a further 64 programmed characters.

Programming the graphics characters themselves is simply a matter of storing appropriate bit patterns in the right memory locations. Each character occupies eight consecutive memory locations, with the bits of each location corresponding to the eight graphics elements in each of the eight horizontal rows making up the character.

Two books come with the basic

Sorcerer. One is a user manual, titled "A Guided Tour of Personal Computing"; the other is an introduction to BASIC programming called "A Short Tour of BASIC". Both are in ring binder form for ease of use, but I found them both rather disappointing in terms of content and organisation.

A significant proportion of the material in the user manual is little more than a repetition of material in the BASIC BOOK. At the same time, there is very little information on machine language programming, and

none on such things as the significance of monitor error messages, and the use of monitor subroutines by user programs. To my mind this is almost essential information for any intelligent system user.

Similarly although both books describe the way the user can program graphics characters, neither devotes any space at all to explaining how the graphics are actually used in programming!

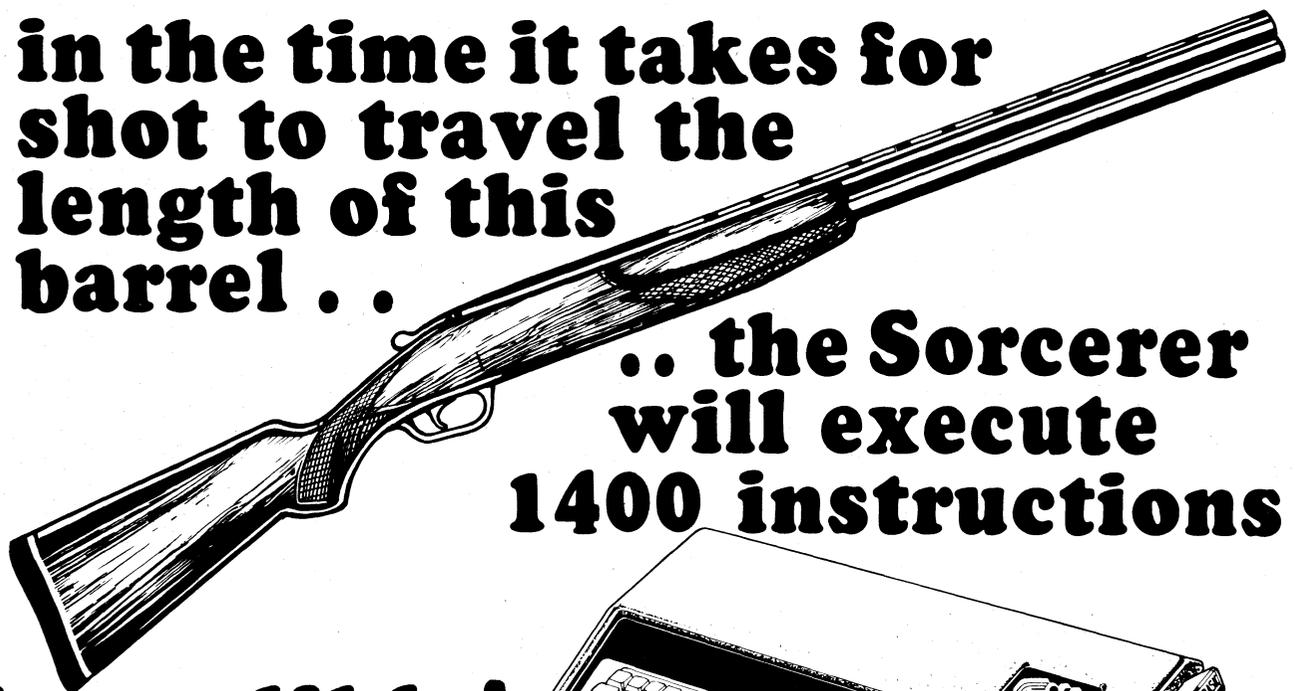
I understand that Dick Smith Electronics is going to remedy these shortcomings by providing some supplementary information.

The Sorcerer itself seems a well made unit. I did have a little trouble initially with faulty program reloading from cassettes, but this was apparently due to overload of the recorder's ALC circuitry during record. It was solved by fitting a small fixed attenuator in the recording lead. The recorder does not come with the Exidy; this probably explains the incompatibility.

I found the Sorcerer quite easy to use. The BASIC interpreter is a good one, and provides all the commands one would normally require. The monitor is also powerful, although I would have liked to see at least one breakpoint facility.

Still, at \$995 for the 8K version and \$1250 for the 16K version, it seems very good value for money. You can see the Sorcerer at most DSE stores; it's well worth a closer look.

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shot to travel the
length of this
barrel . . .**



**.. the Sorcerer
will execute
1400 instructions**

incredible!

The Sorcerer is the personal computer with the speed, the features, the flexibility and the right price. This speed, power and flexibility is all standard with the Sorcerer. The only other things you need to be up and running are a video monitor (Cat. X-1196) and a cassette recorder (Cat. A-4092).

No other computer can compare at the price of the Sorcerer. Come in to any of our stores and see the Sorcerer in action. You'll be convinced.



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Cat. X-1192
\$1250**

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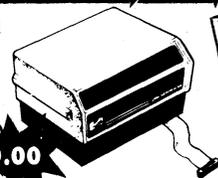
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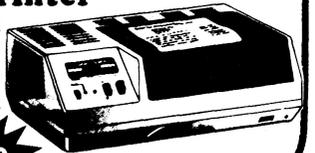


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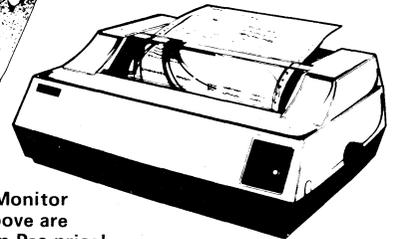
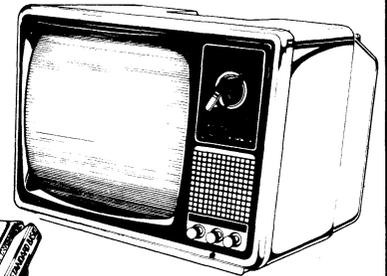
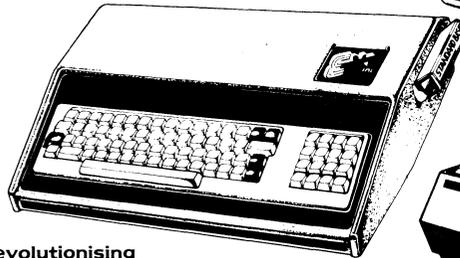


Ask for our comparison of the Sorcerer. Apple II is 20% cheaper than a comparable TRS-80 and over 50% less than a similar Apple II!

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We've been able to get more - but limited - stocks of the incredible Word Processor Rom Pac™ for our Sorcerer Computer!

This word processor system has created a tremendous amount of interest, because of its fantastic performance/cost ratio!



Note: Sorcerer, Video Monitor and printer as shown above are not included in the Rom Pac price!

You've seen word processors advertised - they're revolutionising business communications. If you buy a commercial word processor, you get just that: a word processor.

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WORD PROCESSOR ROM PAC™ ONLY

\$199⁰⁰

INCLUDING INSTRUCTION MANUAL!

Cat X-3085

SPECIAL NOTE: The incredibly low price of the Sorcerer Word Processor System is partly because a certain amount of 'do-it-yourself' work is involved for the operation of the system. If you do not have a basic electronics knowledge, make sure you can obtain some basic assistance before purchasing the system.

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Check out the Micropolis MacroFloppy™ 1042 system from Dick Smith Electronics: your home of home computers.

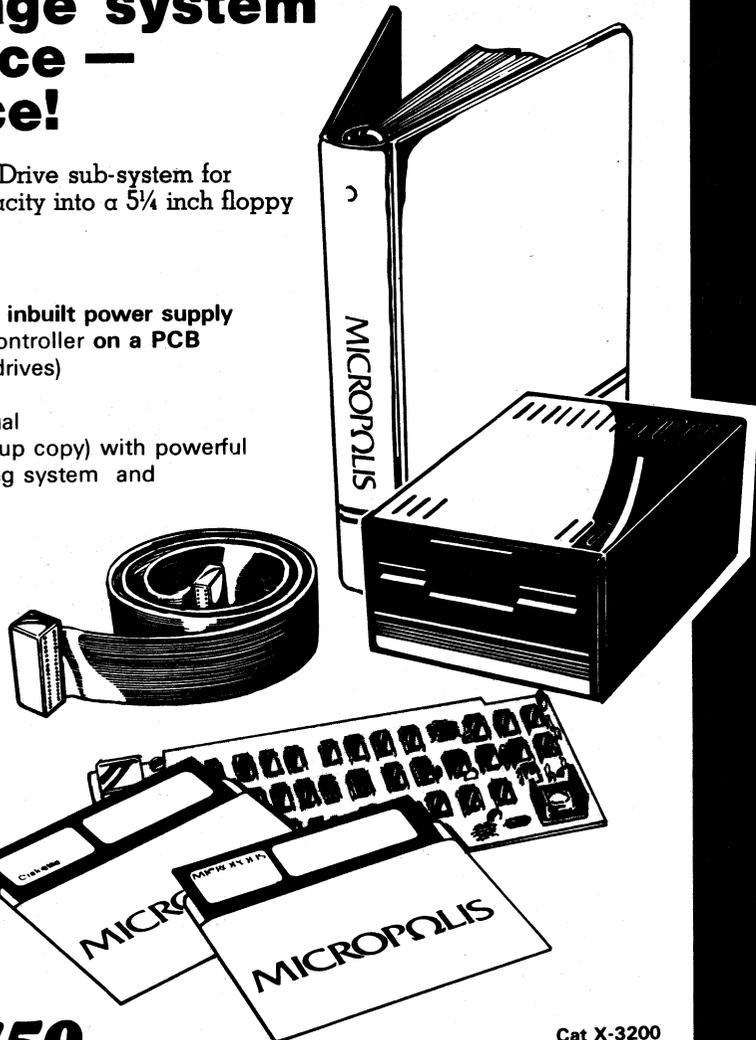
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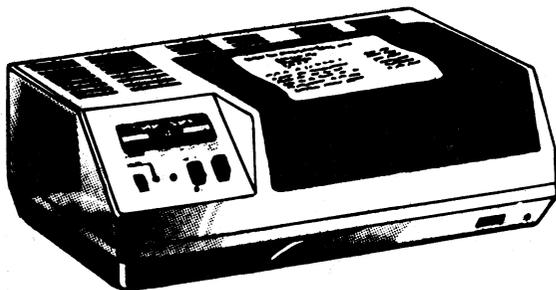
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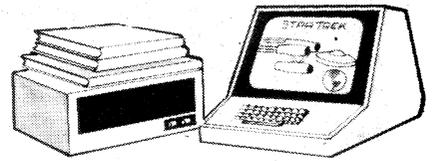
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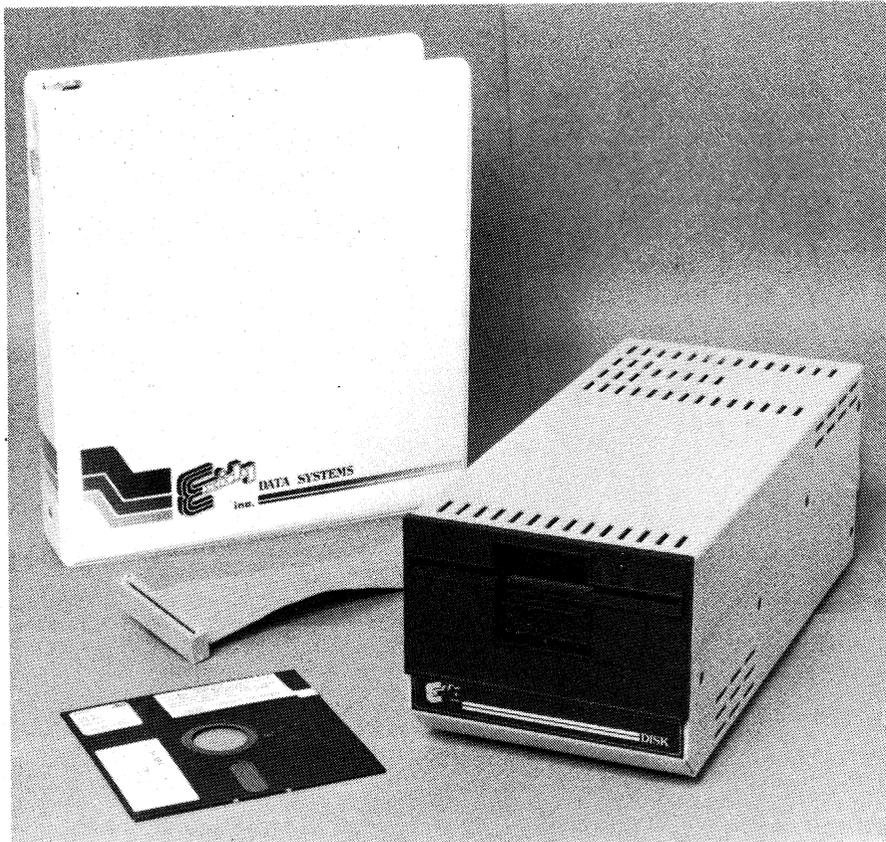


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Microcomputer News & Products



New Exidy Disk System From Dick Smith



Dick Smith Electronics has announced the availability of a new, self-contained add on Floppy Disk System for the Sorcerer Mark 11 computer. The new disk system provides the Sorcerer with a high capacity disk storage unit at minimum cost. All of the disk controller and interface logic is included within the unit, together with a power supply, so that the system plugs directly into the expansion socket at the rear of the computer. No. S-100 expansion unit is required.

The floppy disk system provides 77 tracks on standard soft-sectored diskettes, using the Modified Frequency Modulation, or MFM "double density" technique. Total formatted data capacity is 308K bytes per disk — sufficient for the majority of home and small business applications. For those who need more than a single drive, the controller within the unit is capable of handling up to two additional drives.

The Disk system comes complete with

a master diskette containing CP/M, the industry standard disk operating system. The version of CP/M, supplied has been specially configured by Exidy Inc to suit the Sorcerer and disk combination.

With CP/M, there is a variety of utility programs, including a Z80 assembler, a linking loader, a debug program and an editor. Also provided is a comprehensive manual covering hardware installation, software functions, and operating instructions.

Price of the Sorcerer Floppy Disk system is \$1190, and it is available from Dick Smith Electronics branches and resellers in each state.

Also available from Dick Smith Electronics is new disk driver enhancement for the Sorcerer's ROM-based word processor package. Called PPRINT/DSKCITOH, the enhancement provides the Sorcerer word processor with new features, including the ability to save and load word processor files on disk and to perform boldface and pro-

portional printing in conjunction with a suitable printer.

PPRINT/DSKCITOH is supplied on a minifloppy disk together with comprehensive documentation. Price is \$99 including tax, and the program runs under the Exidy CP/M disk operating system on a 32K Sorcerer system with two Micropolis quad-density disk drives and a suitable printer. It is available from Dick Smith Electronics branches and resellers in all states.

THE MOST POWERFUL MICROCOMPUTER



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Sorcerer computer, we now include at no extra charge, an additional 16K of RAM! Here's your chance to buy the superb Sorcerer, and save money at the same time.

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- Built-in serial and parallel ports
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- Expandable to 48K on board.
- Uniquely versatile ROMPACS™ — instant change to dedicated processor, and back again!
- Built-in 4K ROM resident monitor.
- Economic disk storage now available (optional) with Exidy's new FDS — floppy disk subsystem (does not need expansion interface).

All this for only \$1895

including 32K memory and standard BASIC ROMPAC™

\$1195

Cat. X-3002

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Give the Sorcerer its incredible versatility

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EPROM PAC™

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Development Pac™

A powerful dedicated development tool: contains a debug, text editor, linking loader, assembler & I/O routines. Complete with 90p manual. (X-3090).

\$139⁵⁰

Standard BASIC

(Supplied with Sorcerer computer in basic price - not available as a separate item).

UTILITY SOFTWARE ON CASSETTE

Z-80 DISASSEMBLER **\$17⁹⁵**

This program 'disassembles' Z-80 machine language programs i.e. it translates them back into easier to follow assembly language. It is a BASIC program, but may be used to examine any machine language program in the Sorcerer's memory X-3622.

DEBUG **\$17⁹⁵**

Designed to make it much easier to troubleshoot Sorcerer machine language programs. Lets you run programs one instruction at a time, examine contents of processor registers & insert breakpoints into the program wherever needed X-3624.

DUMB TERMINAL **\$9⁹⁵**

Allows your Sorcerer to act as a 'dumb' communications terminal for X-3637. communication with a larger computer or with other terminals via the RS-232C serial port. Allows both duplex & half duplex operation.

DISK UTILITIES FOR FDS & MICROPOLIS

EXIDY CP/M with EXBASIC **\$699**

Identical with Exidy CP/M EX. X-3710 BASIC is an extended disk version of Microsoft™ BASIC 80. Complete with comprehensive documentation.

DSKCITOH/PPRINT **\$129**

(Hard Sector). X-3725

Disk driver & proportional printing driver for the Sorcerer Word Processor. Check these features: ability to save & load word processor files on disk, perform proportional spaced & bold faced printing

MICROSOFT EXT **\$399**

DISK BASIC FOR X-3712

FDS. The most extensive version of BASIC available for Z-80 based computers. Features full line editing, all normal disk facilities & commands, & much, more!

SORCERER GAMES SOFTWARE ON CASSETTE



A enemy tank is on the rampage. Your job is to build a wall around it without getting run over. Fascinating! X-3628

\$14⁹⁵



Very similar to 'Space Invaders'. A very challenging game, requiring skill & a fast mind. X-3626

\$17⁹⁵

New range of Sorcerer Software Arriving Soon Ask at your nearest store!

* Wilderness **\$6²⁵**

Here you trudge through the uncharted wilderness fighting foul monsters of many types. Great fun! X-3639

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One of the most challenging games ever written! You awaken in a bed in Transylvania. You don't know why you're there but you'd better solve the puzzle before it's too late! X-3638

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Enhanced monitor for Exidy Sorcerer computer

A new machine language monitor program is now available for the Exidy Sorcerer computer which greatly expands the capabilities of the machine. The monitor is supplied as a pair of EPROMs which replace those already present in the computer. A graphics enhancement EPROM is also available for use with the Basic ROM pack.

Unlike many similar computers the Sorcerer includes a monitor program.

Powerful as this monitor is it does give cause for dissatisfaction. The RS-232 routine does not work correctly in either Mark I or Mark II Sorcerers, as the keyboard scan routine uses the same port and resets the RS232 interface each time it is called. There is also no convenient way to set the RS232 mode or baud rate from the monitor command level.

All of these problems are fixed with the revised monitor from D. K. Wong. The new program, called DWMON 2.2, also adds a considerable number of enhancements to the standard Sorcerer monitor.

Using DWMON the existing memory dump and enter commands will now work with ASCII characters as well as hex. The built-in memory test command has been changed so that it can now be used with a single memory location as well as blocks of memory. The memory move command has also been altered to allow moving a block of memory to any location, even if the new location overlaps the block to be moved.

New commands added by DWMON include CM, to compare a block of memory with another block. The routine returns to the monitor if no differences are found, and otherwise all differences are reported. A Fill Memory (FM) command has been added, allowing a specified block of memory to be filled with any hexadecimal number. Also added is a search command which allows memory to be searched through a specified range for any pattern of bytes, including mixed strings of hex and ASCII characters.

A new command, DK, will automatically boot up a disk operating system. The routine checks to see that a disk drive controller is attached and returns to the monitor if not. Otherwise the command will boot the disk, working with either the Micropolis disk drive or the Exidy FDS system.

Another new command, VT, will

change the Sorcerer to a new Video Terminal mode. Parameters for baud rate (300 or 1200), full or half duplex operation, word length, parity and number of stop bits can be entered, allowing the configuration of the terminal to be altered to suit almost any database server or mainframe computer.

A new graphics EPROM is available separately which places the pre-defined graphics of the Sorcerer in the Basic ROM pack rather than in the monitor ROMs. If this EPROM is installed subsequent clearing of the screen will not rewrite the graphics characters, a reverse video graphics set is available and a special video driver can be used to magnify all characters on the screen by 16, making a 16-column by 7-line display for teaching or demonstration purposes.

An optional solid-state beeper can also be added to the Sorcerer, supported by a routine in the new monitor which produces a 100ms tone in response to the ASCII character BEL (07) or Control-G. The tone is produced by hardware and does not affect programs in any way.

This review cannot provide an exhaustive listing of all of the features of DWMON. The new monitor is compatible with most of the existing software for the Sorcerer, as the addresses of the major monitor routines are unchanged. System 3, the enhanced Basic editor program, works perfectly in Basic but changes I/O vectors which affect the DUMP command of the monitor. These vectors can be easily changed back.

If the new monitor is installed alone the existing Sorcerer graphics set (card suits, line segments, etc) will be lost. Mr Wong advises saving the character set on tape or disk before installing the new DWMON. If the additional Basic EPROM is also installed the graphics set remains available.

The pair of new monitor EPROMs costs \$32 and the graphics EPROM costs \$15. When both sets are ordered together the combined price is \$40. The optional beeper costs \$30, with three EPROMs and the beeper available for \$65. The prices include postage and packing. For further information contact D. K. Wong, PO Box 32, Westmead, NSW 2145.

DICK gives you more - without compromising

NOW EVEN BETTER! Sorcerer Mk II



As part of their on-going research and development, Exidy have made some changes giving the Sorcerer on-board capability of up to 48K RAM - plus greater-reliability. You still get the interchangeable ROM PAC™ feature, high resolution graphics of 122,880 pixels (nearly twice that of any rival computer), both upper and lower case characters, graphics, I/O ports as standard, S-100 expansion capability, 2 cassette player interface plus many more outstanding features.

Mk II

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8K
ONLY

Cat. X-3001

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The Micropolis Metafloppy™ gives you more than four times the capacity of anyone else's 133mm floppy. Because it uses 77 tracks instead of the usual 35. The Metafloppy™ model 1053 comes with 630,000 bytes on-line and is designed for use with S-100/8080/Z80 bus. Comes complete with controller board, inbuilt power supply, cables, a new BASIC software package, DOS with assembler and editor, even an inbuilt ROM to eliminate tiresome button pushing.

For a superb disc system see Dick Smith - the Micropolis has more bytes in store for you!

Cat. X-3210..... **\$1950**

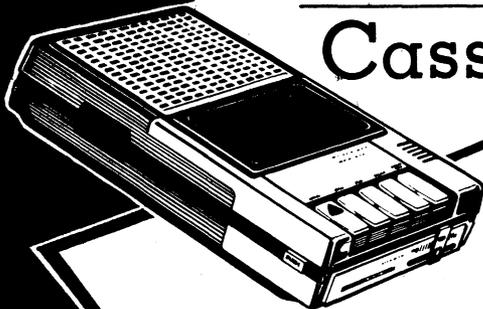


Cassette Recorder

A good quality cassette recorder for use with your computer. If using the Sorcerer you simply interface with serial cable (Cat. X-3110 @ \$34.50), which can handle two cassette recorders, and the computer will stop and start your program tape. This unit works on 240V AC or 6V DC and measures 260x140x65mm. Ideal for use with the Tandy TRS-80.

\$39⁹⁵

Cat. A-4092



ROM PACs

Word Processor PAC™

Add to your Sorcerer for a system that is more powerful than other available systems. It includes instruction manual and features auto text wrap, auto checking drastic commands, powerful search functions auto commands and macro programming, single key commands plus much more.

Cat. X-3085..... **\$199⁰⁰**

Development PAC™

Turns your Sorcerer into a dedicated development tool. Includes instructions and features designer's debugging tool, text editor, Z80 assembler, linking loader, I/O driver routines.

Cat. X-3090..... **\$139⁵⁰**

EPROM PAC™

Write your own program. This PAC comes complete with special PCB, ancillary components and case and is ready for insertion of your EPROM IC.

Cat. X-3095..... **\$75⁰⁰**



system for your dollar on quality!

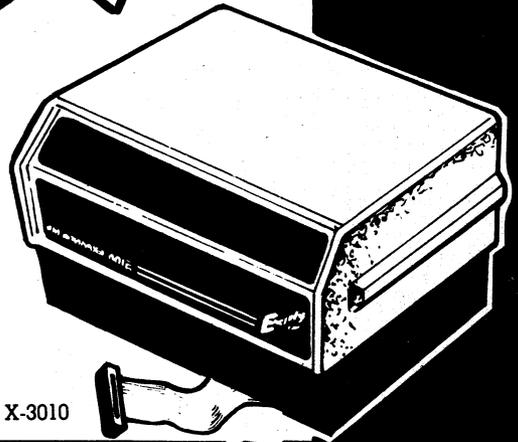
Exidy S-100 Expansion Unit

The Exidy S-100 expansion unit opens the way to almost unlimited expansion of your Sorcerer system, because more than 100 manufacturers world wide produce plug-in PCB card modules designed for the S-100 bus system. There are S-100 plug-ins available for almost every conceivable avenue of system expansion. Memory cards, floppy disc and hard disc controllers, EPROM programmers, special I/O interfaces and power control cards, colour video graphics controllers, D-to-A and A-to-D converters, music and speech synthesis cards, even speech recognition cards plus more being announced all the time. Supplied complete with inbuilt power supply, ribbon cable and connector.

**Use other manufacturers
peripherals with your
SORCERER**

\$499⁰⁰

Cat. X-3010

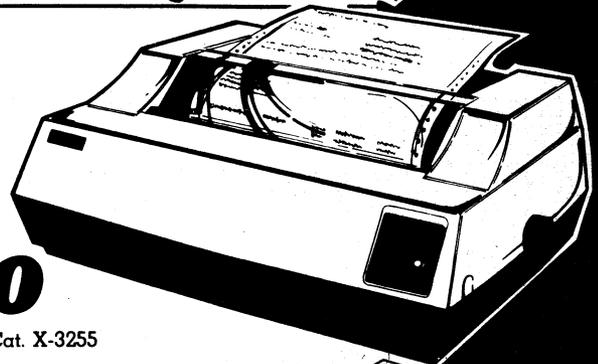


ECONOMICAL PRINTER

The C.I.T.O.H model 8300 dot matrix printer is a high performance unit that incorporates the latest micro processor technology. This unit is priced below many printers offered by other companies but if you want a no-nonsense printer that can chum out the full 96-character ASCII at a brisk 125 characters per second on standard fan-fold paper, then you can't do better. Character spacing of 80 and 40 columns - software selectable with inbuilt 80 byte character buffer and self testing string generation. Interface 7-bit parallel Centronics type, this is available as Cat. X-3112 @ \$49.50.

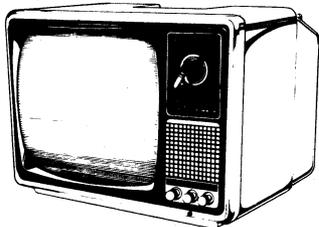
\$970

Cat. X-3255



Universal Monitor WHY PAY MORE?

Suits virtually all systems including The Sorcerer, Tandy TRS-80, Apple, System 80 etc. Compare our prices to theirs! Large screen (30cm) with jitter free, distortion free characters. Simple connection plus dual power - 240V AC or 12V DC.

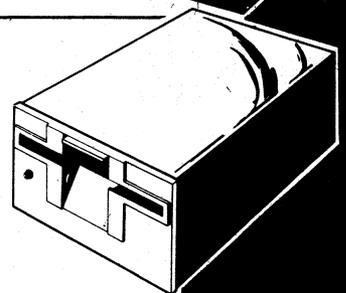


\$149⁵⁰

Cat. X-1196

TANDY OWNERS - DON'T MISS OUT

This superb Dick Smith Mini Disc Drive provides 228% the storage capacity of the Tandy drives yet costs far less! Check these features - ● 133.4mm minifloppy diskette ● 40 tracks instead of 35 - 14% more storage per side ● soft sectored ● dual sensors for reading on both sides - doubles the storage capacity ● recording density (inside track) 2768bpi ● 100K bytes per side ● drive number is switch selectable ● use as first drive or add-on drives for TRS-80. (SAVE \$1000 plus on the latest Tandy price - Jan 1980)



\$379

Cat. X-3230

Power Supply

Cat. X-3234

\$60⁰⁰

Especially suited to the Dick Smith mini disc drive. The unit has dual voltage and will power TWO drives.

Connecting Cable

Cat. X-3232

\$49⁵⁰

34 way daisy-chain cable for controlling 4 disc drives to your TRS-80.

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