A SIMPLE GUIDE TO HOME COMPUTERS

STEVE DITLEA

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By Steve Ditlea

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To my parents
for making science accessible, and to
Mr. Wizard for keeping it simple.

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PROGRAMMABLE VIDEO GAMES

■ The video game was originally an expensive toy that could only perform a single function. Who could foresee that the coin-operated electronic ping-pong game featured in bars and college lounges would prepare the way for versatile computers in the home?

Introduced in 1972, the first video games for home use carried price tags with three figures and were "dedicated" devices, that is, they performed only one built-in function for the user: Ping-pong. As more and more people bought these video games, prices dropped by half and by half again, and the idea of connecting something to the home TV set to permit interaction with the picture tube became commonplace for many Americans.

In 1977 over four million home video games were sold in the United States. In 1978 that number nearly doubled. As consumers became more sophisticated, manufacturers introduced

multi-purpose video games (combining ping-pong, tennis, handball, etc.) which were still dedicated, performing only those functions built into them.

Even with these added features, the more demanding consumers tended to get bored when the novelty wore off their video games. They could only be satisfied with a programmable game. To satisfy this growing market, units were developed that allowed new games to be fed onto the video screen simply by inserting a new program cartridge into a handy slot. Within a year of their introduction, Americans had purchased over one million programmable game units—the strongest response coming from men between the ages of 35 to 45 with sons, and younger adults with no children.

A programmable video game (the name used for the entire unit) is built around a microprocessor that can be programmed with a cartridge-full of instructions stored in a ROM chip or on a cassette tape. Take input in the form of a joy stick or other control device, display the output on your home TV screen, and you have the elementary workings of a home computer.

When manufacturers called their units "computer video games," some veteran computer hobbyists were outraged. These hard-core "hackers," pioneers in the use of computers at home, argued that no video game could attain the versatility and calculating power of a genuine microcomputer system.

Video game makers were soon using 8-bit microprocessors in their programmable units. To create a true home computer system, all they had to add was a means for entering letters and numbers as input, and such peripheral devices as the individual user might require.

The first expandable programmable TV games are now available to the public at base prices ranging from $179 to $500.

Add-on components can run into hundreds of dollars more, but without them most of these models are just glorified kids' games.

It's their simplicity that makes expandable video games so attractive to potential buyers. The initial investment is relatively small; the amount of pleasure that can be derived without knowing anything about programming seems well worth the cost.

Besides, the video game is easily mastered, and it can serve as an entertaining introduction to home computers. Users will find themselves programming a microprocessor without realizing it at first. Then with programming no longer a foreign notion, millions of Americans will be able to pick up a programming language like BASIC and learn to create their own programs.

So goes the manufacturers' scenario. The aim, naturally, is to turn the home computer into a mass-market item; presumably, this will lead to further price reductions. For this reason the industry is concentrating sales in department and chain stores, rather than limiting distribution to specialty shops.

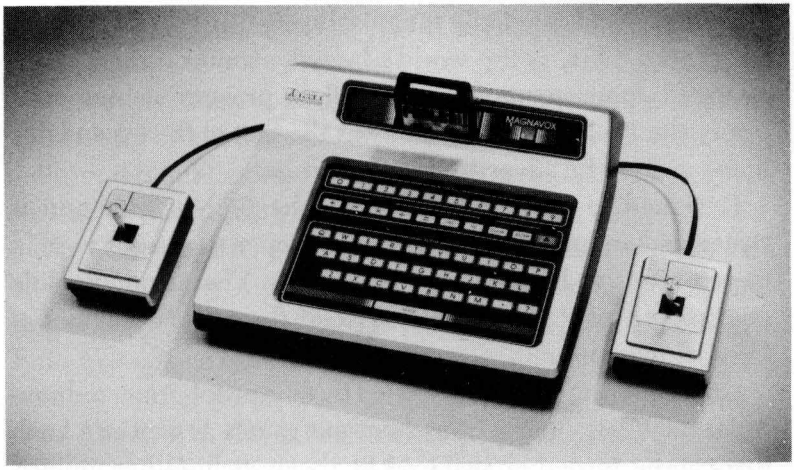
Like any of today's personal computers, the popularity of expandable video games will depend on the availability of pre-programmed cartridges and cassettes. After the first programmable video games were put on the market, it took over a year for additional software to be produced in sufficient quantities.

With the expandable games, individual manufacturers' effort have been supplemented by the entrance of G. R. T.—the leading maker of pre-recorded stereo cassettes—into the area of home computer software. Should these video games become runaway bestsellers, the price of a cartridge or cassette could tumble to that of a long-playing stereo record.

As with all the computer models described in these pages, prices and specifications are subject to change. Until now, the unexpected has been the stock in trade of the consumer electronics field; still any modifications or new models in the current generation of home computers will no doubt resemble units like those described below.

■ **Odyssey² Computer Video Game System**—Magnavox was the pace-setter in video games with its Odyssey, the first model designed specifically for home use. Now the company has beaten rivals Atari and Fairchild to the market with an alphanumeric programmable TV game, the Odyssey².

Priced at just $179.95, the Odyssey² represents an important price breakthrough. The base price model features an inexpensive full-size keyboard design: a flat plate that can be activated by touching any of the 49 characters indicated on its surface.



The Odyssey² from Magnavox: keyboard breakthrough. *(Photo courtesy of Magnavox)*

Data input is accomplished by electrical switches attached to the back of the plate, much like touch-operated elevator call buttons, thus eliminating failure-prone push type keys. The unit also comes with a pair of joysticks for playing arcade sports games.

The Odyssey² is offered with a cartridge for three games: Speedway, Spin-Out, and a word game called Crypto-Logic. Among the optional programs available at $19.95 each are Football, Baseball, Las Vegas Blackjack, and a pair of learning games, Math-A-Magic and Echo.

For $24.95 there's an Odyssey² Computer Introduction cartridge that teaches how to create and execute actual working computer programs. It also helps a user decide whether to expand to a home computer in the future.

The Odyssey² system has connectors for add-on units.

■ **Bally Professional Arcade**—Though new to the consumer electronics field, the Bally Manufacturing Corporation, in business since 1931, is the world's largest manufacturer of coin-operated amusement games. Bally's programmable video game, the Professional Arcade, was the first of the expandable home units to be advertised to the public.

Designed to sell for under $300, the Bally starter unit is structured around the same Zilog Z-80 microprocessor used in more expensive home computer systems. The Arcade module encloses 4K of RAM and 8K of ROM for a useful amount of internal memory.

Game-playing input is provided by four pistol-grip hand controls. Each has a trigger for shoot-out games as well as a knob that can be turned or swiveled like a joystick. Other input is entered with the help of a 24-key calculator-style key pad.

Built into the Arcade are three games: Gunfight, Checkmate

(a game of wits), and Scribbling (multi-color graphics), in addition to a convenient calculator with five functions and ten memory locations. Another handy feature is a pause control which freezes action and allows it to be resumed without starting the program over again. The unit shuts itself off automatically when left unattended to prevent damage to the TV picture tube.

Bally offers a variety of software on Videocade cassettes (actually ROM cartridges) at prices from $19.95 to $24.95. These cassettes include action games like Space Race, sports like Demolition Derby, educational programs like Bingo Math and Spell 'N' Score, and even an innovative Astrology cassette which will pinpoint the positions of stars and planets at any moment in the past, present, or future on a computer model of a planetarium.

The Bally BASIC program cassette turns the calculator key pad into the equivalent of an ASCII keyboard. It might seem a little slapdash to use a plastic key pad overlay and four different shift keys to express a full range of alphanumerics. This requires a lot of hunting and pecking on the user's part. Yet, this Bally unit is intelligently designed so that you can feed in entire instruction words with the push of a single key.

The Bally BASIC program includes a limited, though well thought-out, set of instructions that allows simple user programs for games, graphics, even music (with the help of a built-in 3-octave synthesizer). A clearly written and illustrated manual teaches elementary programming in a matter of minutes. The BASIC Cassette also makes the Arcade the first home computer system to utilize a full color TV spectrum of 256 hues.

To turn the Professional Arcade into a fully operational home computer, Bally has made available an interface for tape cas-

sette mass storage and an ASCII-type keyboard with an additional 16 K of memory. Promised for the near future are a high-speed printer and a MODEM telephone coupler.

One enterprising merchandiser has announced a Bally owners' Dial-A-Bargain Ordering System. This program allows the Arcade to place orders for electronic gadgetry with the retailer's computer right over the phone.

The Bally Professional Arcade is designed for growth. *(Photo courtesy of Bally)*

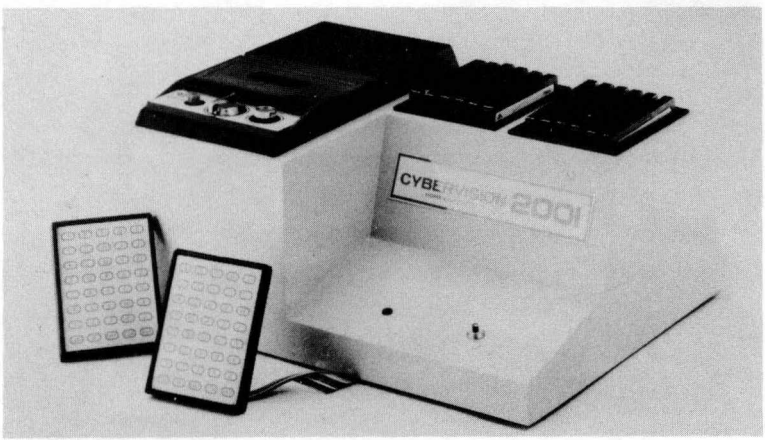
■ **Cybervision 2001**—By appearing in the Montgomery Ward Spring & Summer 1978 catalogue, the Cybervision 2001 became the first home computer offered to middle America via mail order. Produced by the Broadrein Instruments Corporation of Columbus, Ohio, the Cybervision has limited adaptability, but makes up for its shortcomings with unusual consumer-oriented software.

The Cybervision unit, which sells for $399, employs an RCA 1802 microprocessor along with 1K of operating instructions in

ROM and 4K of RAM memory. Input is entered with a pair of hand-held key pads of the touch activated type, bearing 40 different characters.

Programs for this hybrid video game unit are stored on audio tape cassettes that can be played by a built-in tape deck. The cassette (or Cybersette) is used both for instructions to the computer and for computer-controlled audio playback. This gives Cybervision 2001 the capability to entertain with music or special effects, and—using human voices—even to tell stories or provide instruction for educational programs.

Cybersettes retail for $10. Program titles are divided into a Home Series (Checkbook, Recipe File), Party Series (Trivia, Designer), Story Series (Three Little Pigs, Emperor's New Clothes), Education Series (Math Grade 1, Language Arts Grade 1), and the Game series (Bandit, Bulldozer). Programming is quick, thanks to an entry rate faster than any standard



The Cybervision 2001 offers listen-and-learn audio cassettes. *(Photo courtesy of Broadrien Instruments)*

cassette tape input. Tape to screen data transfer is also said to be faster than with any other home computer.

Still to come are several accessory units for the Cybervision 2001. These will make it possible to increase its capacity and to create original Cybersettes at home.

■ **VideoBrain**—In 1978 the VideoBrain became the first home computer system sold in department stores. Advertised with the slogan "'now you don't have to leave your brains at the office," the $500 VideoBrain drew the greatest response for a new product in the history of Macy's in New York and San Francisco.

The VideoBrain's Timeshare program allows communication with other computers. *(Photo courtesy of UMTECH)*

The VideoBrain is manufactured in Silicon Valley by a division of Umtech, Inc. The brains behind the champagne of video games are Dr. Albert Yu and Dr. David Chung, cofounders of the VideoBrain Computer Company. Dr. Yu guided product research at Intel, while Dr. Chung invented and managed the development of the Fairchild F8 microprocessor, one of the most widely used silicon brains.

The VideoBrain uses an F8 microprocessor coupled with 4K of ROM and 1K of RAM. Plug-in cartridges can add as much as 12K of ROM memory. The system's module has a keyboard with 36 push-type keys allowing the entry of 71 input symbols. Built-in VideoBrain features include a clock, alarm, and calendar activated by pressing a key. The computer unit also has connectors for up to four joysticks.

In creating program cartridges for the VideoBrain, its makers have emphasized financial and educational applications. Among the more imaginative offerings priced from $29.95 to $70.00 are Money Manager (an aid in keeping track of household and personal finances), Lemonade Stand (a business simulation that illustrates fundamentals of management and economics), and Old Regime (a Stanford History professor's simulation of pre-revolutionary France).

For users who want to create their own programs, there's a cartridge that provides STRUCTURE BASIC, a version of BASIC that facilitates financial programming. Of course, games haven't been neglected: VideoBrain offers Checkers, with the computer programmed for any of four skill levels, while the Gladiator cartridge provides 384 varieties of man-to-man combat.

Among the VideoBrain's options is the Expander 1 ($150), which acts as an interface for a pair of cassette recorders and a

hard copy printer. The Expander 2 ($300), a telephone MODEM, can be used in conjunction with a Timeshare program cartridge to communicate with a large time-sharing computer.

Future expansion units will include a light pen, special keyboards, a voice response interface, and home controllers. According to VideoBrain Computer Company's rosy vision of the future: "VideoBrain will even be able to monitor and record your telephone messages, start up the morning coffee, and regulate your home's temperature for maximum efficiency."

Though the cost of add-on's may ultimately make expandable video games as expensive as their more sophisticated competitors in the home computer field, these starter units represent a good value for the average consumer. Programmable video games can provide users with the simplest of computer functions in the form of games, as well as educational and financial programs, displayed in dazzling color on home TV screens with push-button simplicity.

But what if you'd rather not have to switch off your favorite television show so Junior can use the computer? Or perhaps the thought of learning BASIC and creating your own powerful programs turns you on. Then an expandable video game just won't be enough for you.

Clearly, there is a place for fully equipped home computer systems priced within reach of consumers. Indeed, compact computer systems selling for under $800 have proven to be the most popular units on the market.

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