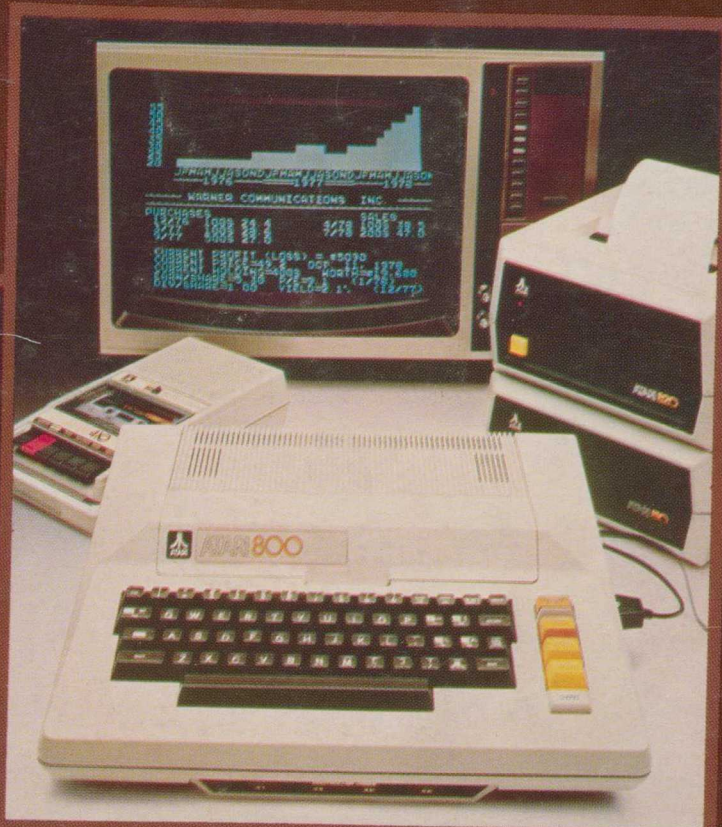


# INTERFACE AGE™

COMPUTING FOR HOME AND BUSINESS APPLICATIONS

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TEXAS INSTRUMENTS,  
ATARI, MATTEL USHER  
IN THE NEW AGE OF  
HOME COMPUTERS



**NTS**  
mini series  
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**MICRO AIDS  
FOR THE  
HANDICAPPED**



# THE ATARI COMPUTER



## A TOOL FOR EDUCATION

By Don Inman

The barriers to the use of computers in our schools will finally come tumbling down as educators become familiar with the capabilities of the Atari 400 and 800 computers. Atari is providing features which make the computer a truly versatile and flexible tool which can easily be used by a non-technical person. These features will be especially significant to teachers who must quickly be "brought up to speed" in computer usage. This is necessary if our children are to receive the instruction needed to function capably in our computerized society.

What does Atari have that puts it one giant step in front of other computer manufacturers? Probably the most significant feature is the plug-in ROM cartridges which provide for easy, rapid change of programming languages and software application programs.

Atari provides a BASIC language cartridge, but the computer has the capability of accepting other languages as they are developed. Application software possibilities include entry by either a second plug-in ROM cartridge or conventional cassette tape. A disk drive is an available option which can



also be used for software entry.

The plug-in cartridge will provide educators with the opportunity to teach their students a variety of programming languages as the cartridges are developed. The student will then be able to develop an ability to program, and to use programs, in several different languages. This is extremely important, since some things may be impossible to do in one language, but be very easy to do in another.

Old ideas about computer hardware usually frighten the non-technical person. In the past a maintenance technician was a necessary extension of the computer. However, today's small computers *should be* highly reliable machines. A teacher's time is limited, and there should be no need for a computer user's capabilities to include technical hardware knowledge and skill. The modular construction used today largely eliminates maintenance problems, but when needed a capable repair facility is usually within reach. With its cartridges plugged in, the Atari is easy to use — yet its capabilities are extensive.

What features should a computer have to satisfy a wide variety of needs? There are many schools and many "pioneering" teachers who are experimenting with the new breed of micro-computers. However, the range of possible educational applications has hardly been touched. The computer should be available to every person in our public schools from kindergarten through adult education. But it isn't.

Cost has always been a prohibitive factor in the past. But off-the-shelf, inexpensive computers with a built-in high-level language (usually BASIC) are readily available today. Atari has two models with suggested retail prices of \$549.99 and \$999.99. These prices are for the base units and assume that you will provide your own television or video monitor for output. This puts the price of a computer in the range of normal educational audio-visual machines.

Old ideas about computer applications still pervade. Many think of computers spitting out reams of printed paper — largely mathematical calculations. This is static information resulting from the solution of cold, technical questions that have little, or no, meaning for most of us. Today, the video display can present moving pictures that change shape and size, disappear and reappear — a whole new world of dynamic visual output is now possible. We *must* capitalize on this new capability. It can lift the computer out of the math and business classes, and put it into every classroom in the school — as it should be.

Atari responds to this need because of its several features. Different programs require different levels of graphic display resolution. Atari's BASIC allows you to select one of eight mixed (text/graphics) screen display modes. This enables you to choose one of several levels of resolution for your display. With its use of color and sound, a visual display can leap out at you and provide a relationship with the real world that is not possible with a black and white printed static display. The use of the video display is the key to future use of educational applications. The enhancement that color and sound add to a dynamic visual display provides a second and third dimension that open up a new world for educators.

Since most educators do not want to become programmers, provisions should be available for the use of pre-written educational software that can be readily inserted in the machine. Interchangeable ROM cartridges can also be

used for this application. Professionally written educational programs can be provided in several high-level languages to "match" the language being used. The Atari computers have this capability. Atari has published a list of application cartridges and educational system cassette programs that are, or will be, available. From this list, one quickly draws the conclusion that educators will be supported by Atari software application packages.

One last feature that can't be ignored is the string of connectors on the front of the computer. They will take the Atari joysticks and paddles — promise of fun and recreation — to be integrated with educational applications for dynamic reaction programs. The possibilities are unlimited.

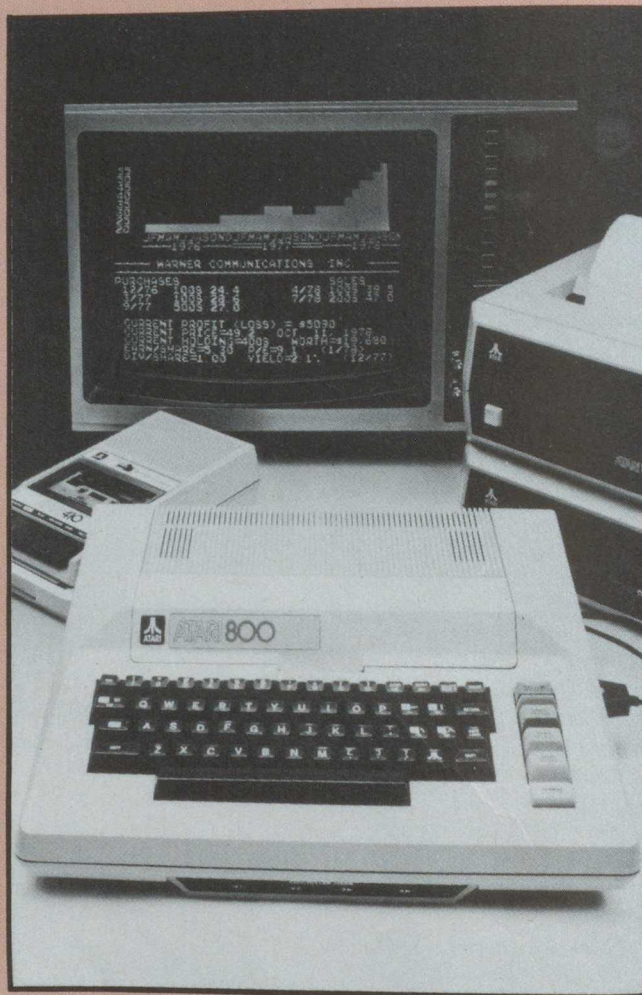
The combination of the many built-in features promises to make the Atari a "best buy" for educators. Below is a list of BASIC statements for the Atari machines, giving hints of possible applications.

- GRAPHICS X — This statement is used to select one of 8 mixed (text/graphics) screen display modes and clears the screen. The graphics resolution is selected by parameter X (which may be any arithmetic expression whose value is an integer 0-7)
- PLOT X,Y — This statement causes a single point to be plotted at X,Y (non-negative integers). The range of values used for X and Y depend upon the graphics mode being used.
- DRAWTO W,Z — This statement draws a line from the previous PLOT statement to the point W,Z. The values for W and Z again depend upon the display mode being used.
- COLOR X — This statement selects a color register for PLOT and DRAWTO. X may be any integer 0-3.
- SETCOLOR X,Y — This statement sets the selected color register for brightness and coloring. Values for X are integers 0-7 and for Y integers 0-15.

A sample program using the above:

- 10 GRAPHICS 5 would select screen mode 5 which is a graphics grid 80 x 40 with a text window at the bottom of the screen — would also clear the screen
- 20 COLOR 0 would select color register 0
- 30 SETCOLOR 0,6 would select a purple-blue color for graphics





40 PLOT 0,0

would plot a purple-blue colored point in the upper left corner of the screen

50 DRAWTO 80,40

would draw a purple-blue line from the upper left to the lower right corner of the screen

SOUND W,X,Y,Z — sets the sound registers for note, tone and volume  
 W selects voice registers 0-3 (integers)  
 X selects notes 0-255 (integers)  
 Y selects tones 0-15 (integers)  
 Z selects volume 0-15 (integers)

A sample program using sound:

```
100 FOR N = 0 TO 255
110 SOUND, 0,N,10,8
```

```
120 FOR W = 1 TO 50: NEXT W
130 NEXT N
```

This loop would play 256 successive notes with tone = 10 and volume = 8 through voice 0 — some would be out of your hearing range.

PADDLE (X) — This statement returns the setting (0-255) of the paddle specified by X. X is the paddle number (0-3).

PTRIG (X) — This statement returns the status (0= OFF, 1=ON) of the paddle trigger specified by X. X again is the paddle number (0-3).

STICK (X) — This statement returns the setting (0-15) of the joystick specified by X. X is the joystick number (0-3).

STRIG (X) — This statement returns the status (0= OFF, 1=ON) of the joystick trigger specified by X. X is the joystick number (0-3). □



# INTELLIVISION

## Another Step Towards A Computer In Every Home



By Kathy Nehira

The impact of the computer is causing people both in and outside the industry to realize that a computer is not just developed for businessmen or programmers, but it can and should be used by everyone. Manufacturers are expounding on this fact as they develop more systems geared toward the home, where every member of the family — from preschoolers to parents — can use it.

Mattel Electronics is one company reaching towards the futuristic dream of every household equipped with a computer. They have developed a new home and game computer system, Intellivision, which they consider to be one of the first of its kind to reach the mass market.

Intellivision, which consists of two modularized hardware components and a wide range of software, hooks up to a standard television set (Photo 1).

The master component which came out last month, and the keyboard component which will be out in October, will each sell for approximately \$250. The whole system will be marketed with a multi-million dollar advertising campaign this fall, right before Christmas.

The master component, which uses plug-in ROM cartridges, permits the consumer to play a variety of video games and become involved in a series of educational programs. Inside, the master component is a 16-bit microprocessor. A wide range of simulated sound effects, including three-part harmony music, should brighten game playing.

One of the reasons for taking advantage of the 16-bit technology was to provide high-quality, full color graphics. A broad color spectrum and a high degree of resolution makes the characters in the games more lifelike, and their moves more fluid. Creating graphics that would take full advantage of color TVs was an important consideration.

When the keyboard component is added to the system, the operators can use all the features of entertainment and game play *plus* the added feature of personal home computer applications.

The keyboard is a 64-key typewriter-like board with micro-pressure control for data input. This component also contains a tape cassette drive mechanism constructed to accept pre-programmed tapes, which give digital audio output as well as input. A microphone is included in order to deliver audio input for those programs which feature it.

When one purchases a master controller, he may do so without purchasing the keyboard component. But the keyboard component cannot function without the master controller; therefore if the keyboard is bought first, the consumer would have to purchase both components.

Edward Krakauer, Senior Vice President and General Manager of Mattel Electronics, claims that there are several differences between the Intellivision and other systems on the market.

"The first difference," he says, "is the fact that the system comes in component form. Usually the whole system must be purchased at a relatively high price. There is only one other system I know of that sells the components separately."

"We don't think that most families are ready for a \$500, one-shot investment, so we are offering them the chance to get started with just one component and then expand when they think they can," explains Jeffrey Rochlis, President of Mattel Electronics.

Rochlis draws an analogy that Intellivision can be purchased like a stereo system. Stereos come in component form, such as the receiver or amplifier, turntable, tape deck, and speakers. Consumers are able to purchase these separately, although the first component they would need in order for the system to work would be the amplifier, just as the master component would need to be purchased first for the home computer.

Another difference between the Intellivision and other systems, Krakauer says, is that no programming knowledge is needed. The system speaks to the operator in plain English, asking questions either verbally or via the screen. The operator in turn responds by either typing on the keyboard



and/or speaking into a microphone.

Since no programming knowledge is needed, the entertainment or game-oriented software have been placed on ROM cartridges. Mattel considers the software to be one of the more unique qualities of the Intellivision.

"Most of the traditional games that are out on the market are very archaic; once you've played one, you've played them all," says Krakauer.

There will be 14 different game and educational cassettes available this year. The cassettes are arranged in network categories. The entertainment cartridge networks are: Sports, Action, Gaming, Strategy, and Children's Learning Fun.

Under the sports network there are six games. One, for example, is football, a full-length copy played in four 15-minute quarters. The user playing offense would actually handle the quarterback and act as coach. The defensive player can pursue the ball carrier to make a tackle or he can try to intercept a pass. There are 18 offensive and defensive plays taken from the National Football League playbooks (Photo 2).

To provide enough software packages to keep consumers from getting bored with the system due to limitations caused by the elimination of programming, Mattel is using both ROM cartridges and preprogrammed cassettes. After the Christmas buying season, persons who send in warranty cards will be mailed flyers detailing new developments in software packages for the system.

Hobbyists and those interested in developing their own programs will have to wait approximately a year. In 1980 there will be a BASIC and a Pascal cartridge available.

According to Krakauer, another unique quality of the Intellivision is a handheld disk controller for the master component instead of a joystick. Objects on the screen can be maneuvered in 16 different directions in a 360° manner by the object control disk pad.

Each controller features side mounted launch and fire buttons. There are two on each side, in order for a right- or left-handed person to easily play.

Also, on the controllers, an "overlay" system may be used instead of using a complicated book of instructions. Each game comes with printed overlays which fit directly over the keys on the controllers. Everything one needs to know about that individual game is printed on the overlay.

After a great deal of research, Mattel found that one area people were becoming concerned with was physical fitness. Their answer to this is a program in the Personal Improvement Network that resembles a television fitness show, but adds a personalized diet.

An instructor appears on the screen, first asking questions about size, age, desired weight, etc. After determining a complete program for the person, the taskmaster will lead the fitness buff through the jumping jacks, situps, and other exercises. As he counts the exercises off, a photo of an ice cream cone or other food disappears to show how many calories are being burned up.



The instructor also will prescribe a menu of 21 different meals, all nutritionally balanced and designed to cut down on calories. If there is a certain food the dieter dislikes, then he would tell the instructor by typing on the keyboard. The computer would then substitute that food with something that has equal nutritional and caloric value.

Unlike a TV personality, Intellivision's instructor adapts to the individual. If the user cannot meet the exercise requirements, the coach would scale down the number. If the operator does not like a certain exercise, such as situps, then the computer would give him another exercise to do which is equally as effective for the midsection.

For those more interested in developing their minds rather than their bodies, Intellivision offers a Self-Education Network. One program can teach the operator a foreign language in a relatively short period of time. Each of the magnetic tape cassettes features two audio and two digital tracks. One set is for prerecorded program content and the other set for the user to input whatever information is necessary.

The microphone and cassette program allows the person to hear and see the language as well as record his own voice. By using the microphone, the user is able to speak and compare his voice to the computer's.

## THE MARKET

According to Krakauer, they expect the initial, primary consumers to be families with incomes of approximately \$25,000 a year. By designing the software to meet the needs of each member of the family, the company is hoping it will enable the consumer to justify such an extravagant expense.

Rochlis thinks the father in the family will be the main purchaser. But in order to justify his \$500 purchase, he will have to prove benefits for other family members. With the functions contained in the Intellivision he will easily be able to do this.

Mattel sees the Intellivision as a significant breakthrough towards tearing down the walls of fear many people have built up towards a computer-oriented society. The company projects that the home computer consumer will need approximately a three to five year educational time to give the consumer the opportunity to increase his awareness of home computers.

"As computers become more commonplace and prices come down, people will lose their fear of computers and instead see them as something they can use. Anybody can use systems such as the Intellivision and we feel that by 1985 it will have as much household penetration as the color television has today," says Krakauer.

Mattel feels that the home computers will be a long-term involvement where consumers and the electronic industry will gain worthwhile, valuable benefits. The prospects of a computer in every home grow rapidly every day and the Intellivision may very well be the beginning of a major breakthrough towards this idealistic dream. □

