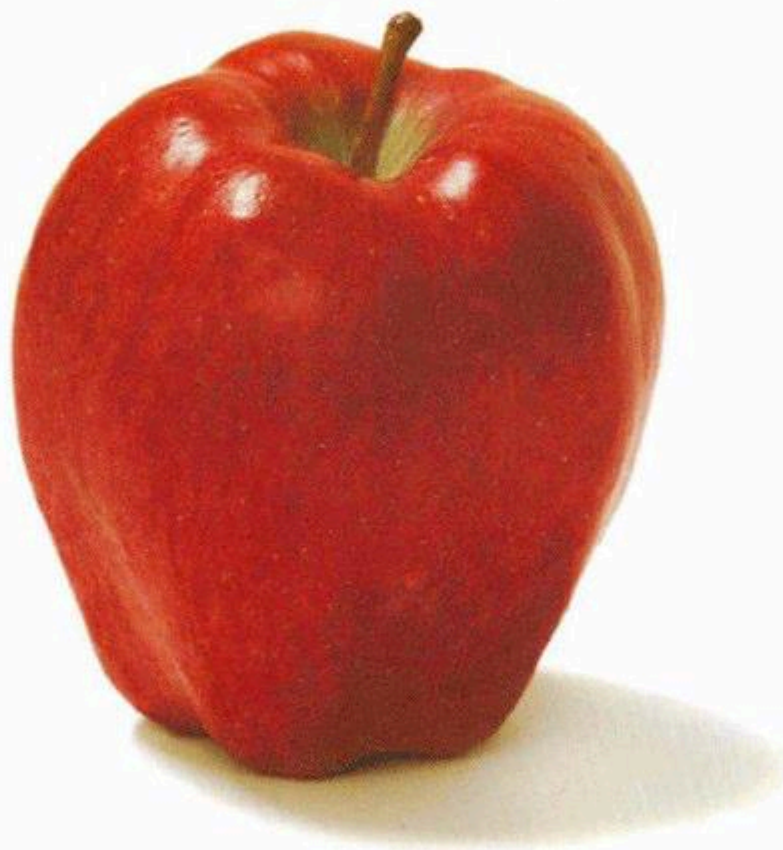
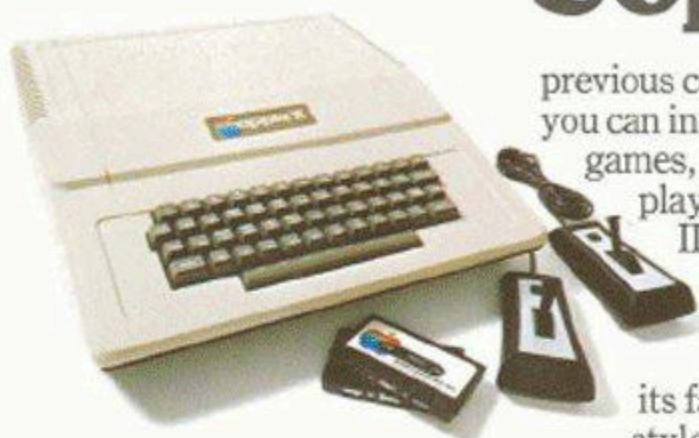


**Simplicity
is the
ultimate
sophistication.**



**Introducing
Apple II,
the personal
computer.**

Sophisticated des



Apple II will change the way you think about computers. Compared to first generation "hobby" computers, Apple II is easier to use, faster, smaller and more powerful. It brings to personal computing a new level of simplicity through hardware and software sophistication. And Apple II can grow with you as your skill and experience with computers grows.

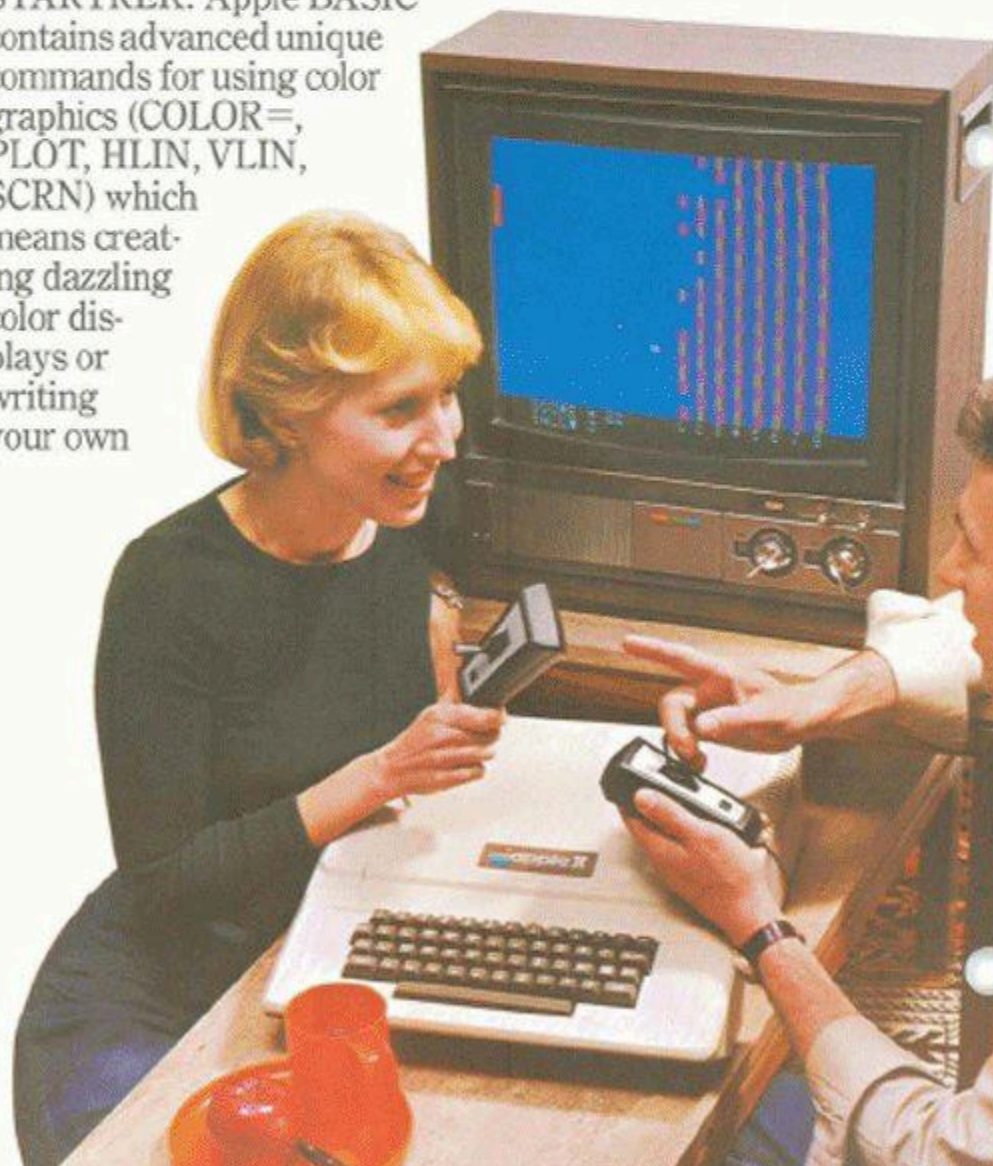
Sophisticated built-in features such as BASIC, the English-like programming language, advanced color graphics, and use of state-of-the-art high density memory components (16K ROMs and RAMs), set Apple II apart from all the others.

But you don't even need to know a ROM from a RAM to use and enjoy Apple II. Its beauty is in its simplicity. It's a complete, ready to use computer—not a kit. Everything is included. Hook it up to your color TV* and begin writing your own computer programs the very first evening. Even if you've had no

previous computer experience, you can invent your own color games, create artistic displays, or instruct Apple II to chart your home finances. Conversing with Apple II in BASIC is easy using its familiar typewriter-style keyboard.

Games have always been one of the most creatively challenging applications for the computer, and Apple II's sophistication shows through in the games it can help you create. Games like PONG or STARTREK. Apple BASIC contains advanced unique commands for using color graphics (COLOR=, PLOT, HLIN, VLIN, SCRN) which means creating dazzling color displays or writing your own

PONG type game becomes something even a beginner can master. Since text can be displayed along with graphics, your program can keep score, give and accept instructions and even comment on your ability as a player. Paddles and joysticks are interfaced easily using the built-in Apple GAME I/O connector. And a special BASIC command (PDL) automatically senses the position of the paddle. That simplifies writing action games. Apple II's built-in speaker sounds when the ball is hit, and when



Apple makes it simple.

At a point is made or lost. In STARTREK, you'll actually hear the phasers and photon torpedoes.

Apple II will do more than entertain you. Playing with it, you'll begin to learn what a computer is all about and how rewarding it can be. You'll discover that it's easy to program your Apple II to do things like teach your kids arithmetic or spelling. (Yes, it's OK to let your kids use Apple II. It's ruggedly engineered and has a virtually unbreakable plastic case.)

And you can save your programs on an ordinary cassette tape using the built-in cassette inter-

face and your home cassette



recorder. Other sources of programs are the Apple software library and the Apple II owner down the block.

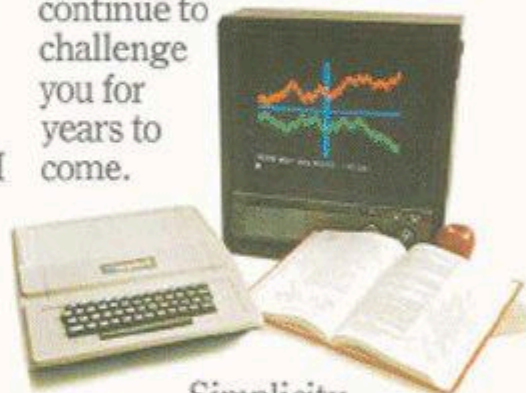
Increased memory can extend your horizons. For instance, with 12K or more memory, Apple II can generate a high-resolution (280h x 192v) graphic display in 4 colors useful for scientific, medical or artistic applications. The user memory can be expanded up to 48K bytes by simply inserting more memory packages in the sockets provided.

Also, there are several peripheral boards scheduled for introduction soon which will plug into the expansion connectors — Apple II has eight built-in — enabling you to syn-

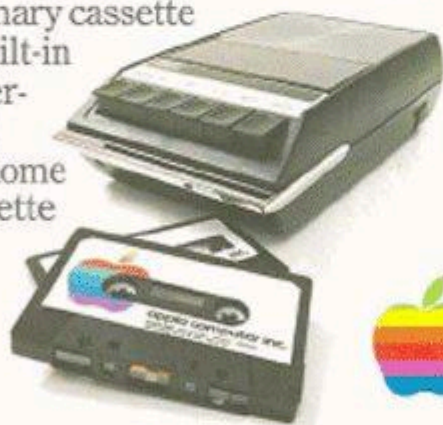
thesize music or talk to another computer over the phone. Many more interesting peripheral boards to expand your Apple II will be available this year.

As you become an expert, you'll grow to appreciate the sophistication inside Apple II. Its 2K byte ROM monitor contains a mini-assembler, a disassembler, single-step and trace routines, floating point package, a software-simulated 16-bit processor routine, and more.

Apple II is an advanced personal computer that will continue to challenge you for years to come.



Simplicity.
Sophistication. Apple II.



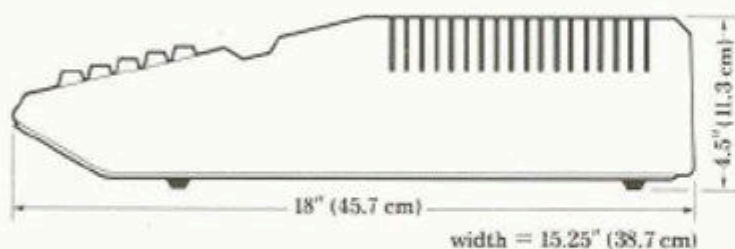
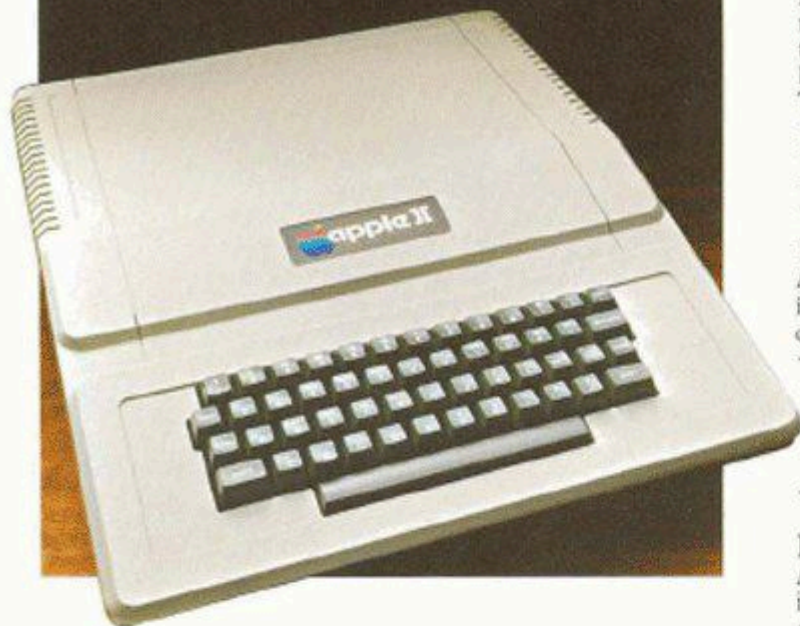
apple computer inc.™

*Apple II plugs into a TV monitor or hooks up to any standard television using an inexpensive commercially available RF modulator (not supplied).

PONG is a trademark of Atari, Inc.

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Technical Overview



Apple II is a complete, self-contained, ready to use computer. Standard features include BASIC and Monitor in ROM (8K bytes), Color Graphics, up to 48K bytes RAM (4K included), cassette interface, Apple GAME I/O connector, typewriter-style ASCII keyboard, high-efficiency switching power supply and plastic molded case. Also included as standard are: 1 demonstration cassette tape, two game paddle controllers and detailed operations manual.

MICROPROCESSOR:

6502 operating at 1 MHz clock.

VIDEO DISPLAY

The Apple II video display section displays memory as either text, color graphics, or high-resolution graphics (completely transparent memory access). Both graphics modes can be selected to include 4 lines of text at the bottom of the display area. All display modes are software selectable. In addition, the user can select under software one of two memory blocks to be displayed.

Text

- 40 characters/line, 24 lines.
- 5 x 7 upper case characters.
- Normal, inverse or flashing characters.
- Extensive display control software in ROM.
- Full cursor control.
- Fast display — 1000 cps.

Color Graphics

- 40h x 48v resolution or 40h x 40v with 4 lines text.
- 15 colors — color generated digitally.
- BASIC commands to use graphics easily: COLOR=, PLOT x, y, HLIN, VLIN, SCRN.

High Resolution Graphics

- 280h x 192v resolution or 280h x 160v with 4 lines text.
- 4 colors — black, white, violet, green.
- Displays 8K bytes (requires 12K minimum RAM).

MEMORY

RAM is organized into 3 increments. Each increment can be either 4K bytes using 4K chips or 16K bytes using advanced 16K chips. Memory may be easily increased by inserting an additional increment of chips. From 4K to 48K bytes of RAM can be contained on the single board. 8K bytes of ROM are supplied which permanently store Apple BASIC (6K) and a powerful system monitor (2K). Two additional ROM sockets are provided for future Apple software.

- Up to 48K bytes on-board RAM — no peripheral memory boards!
- Unique automatic RAM refresh system, completely transparent.
- Uses 4096, 2104 type 4K and 4116, 2116 type 16K RAMs.
- Fast memory — 350ns access time.

I/O

Apple II includes as standard an ASCII keyboard, audio cassette interface, 8 peripheral board connectors, speaker, Apple GAME I/O connector and two game paddle controllers.

- Reliable typewriter-style keyboard.
- Fast cassette interface — 1500 bps.
- Peripheral board connectors:
 - fully buffered busses & timing
 - Daisy-chained interrupt and DMA priority structure
- GAME I/O — 4 paddle inputs, 3 TTL inputs and 4 TTL outputs.

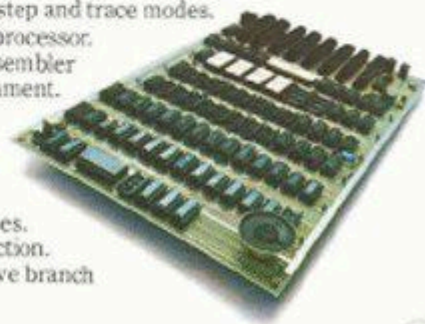
BASIC

Apple BASIC is an integer BASIC supplied in 6K bytes of ROM and includes the following features (in addition to normal basic features):

- Apple BASIC is a fast translated BASIC.
- Any length variable names (ALPHA, BETA\$).
- Syntax and range errors indicated immediately when entered.
- Multiple statements on one line.
- Integers from -32767 to +32767.
- String arrays to 255 characters. Single dimension integer arrays.
- Graphics Commands: COLOR=expr, PLOT, HLIN (draw horizontal line), VLIN, SCRN (x, y) (reads the screen color).
- Paddle read function: PDL (0-3).
- TEXT and Graphics Commands set display mode from BASIC.
- Immediate execution of most statements.
- Memory boundary adjust (does not destroy current program).
- Break and Continue program execution.
- Debug commands: line number trace and variable trace.
- Switchable I/O device assignments.
- Direct memory access: PEEK, POKE, CALL commands.
- Cassette SAVE and LOAD commands.
- Auto line number mode.
- RND, SGN, ASC, LEN and ABS functions.
- POP instruction pops the return stack one level.
- GOTO expr, GOSUB expr allowed.

MONITOR

- 2K byte ROM monitor.
- Screen control (intelligent display routines). Full cursor control.
- Scrolling window adjustable (protected screen feature).
- Software simulated single-step and trace modes.
- Software simulated 16-bit processor.
- Dis-assembler and mini-assembler
- Input/Output device assignment.
- Editing on keyboard entry.
- Floating point package.
- Breakpoint handling.
- Register examine/modify.
- Read/Write cassette routines.
- Inverse/Normal video selection.
- Hex add/subtract for relative branch calculations.



apple computer inc.

10260 Bantley Drive, Cupertino, California 95014, (408) 996-1010

Introducing Apple II.™



The home computer that's ready to work, play and grow with you.

Clear the kitchen table. Bring in the color T.V. Plug in your new Apple II*, and connect any standard cassette recorder/player. Now you're ready for an evening of discovery in the new world of personal computers.

Only Apple II makes it that easy. It's a complete, ready to use computer—not a kit. At \$1298, it includes features you won't find on other personal computers costing twice as much.



Features such as video graphics in 15 colors. And a built-in memory capacity of 8K bytes ROM and 4K bytes RAM—with room for lots more. But you don't even need to know a RAM from a ROM to use and enjoy Apple II. It's the first personal computer with a fast version of BASIC—the English-like programming language—permanently built in. That means you can begin running your Apple II the first evening, entering your own instructions and watching them work, even if you've had no previous computer experience.

The familiar typewriter-style keyboard makes communication easy. And your programs and data can be stored on (and retrieved from) audio cassettes, using the built-in cassette interface, so you can swap with other Apple II users. This and other peripherals—optional equipment on most personal computers, at hundreds of dollars extra cost—are *built into* Apple II. And it's designed to keep up with changing technology, to expand easily whenever you need it to.

As an educational tool, Apple II is a sound investment. You can program it to tutor your children in most any subject, such as spelling,

history or math. But the biggest benefit—no matter *how* you use Apple II—is that you and your family increase your familiarity with the computer itself. The more you experiment with it, the more you discover about its potential.

Start by playing PONG. Then invent your own games using the input keyboard, game paddles and built-in speaker. As you experiment you'll acquire new programming skills which will open up new ways to use your Apple II. You'll learn to "paint" dazzling color displays using the unique color graphics commands in Apple BASIC, and write programs to create beautiful kaleidoscopic designs.

As you master Apple BASIC, you'll be able to organize, index and store data on household finances, income tax, recipes, and record collections. You can learn to chart your biorhythms, balance your checking account, even control your home environment. Apple II will go as far as your imagination can take it.

Best of all, Apple II is designed to grow with you. As your skill and experience with computing increase, you may want to add new Apple peripherals. For example, a refined, more sophisticated BASIC language is being developed for advanced scientific and



mathematical applications. And in addition to the built-in audio, video and game interfaces, there's room for eight plug-in options such as a prototyping board for experimenting with interfaces to other equipment; a serial board for connecting teletype, printer and other terminals; a parallel interface for communicating with a printer or another computer; an EPROM board for storing programs permanently; and a modem board communications interface. A floppy disk interface with software and complete operating systems will be available at the end of 1977. And there are many more options to come, because Apple II was designed from the beginning to accommodate increased power and capability as your requirements change.

If you'd like to see for yourself how easy it is to use and enjoy Apple II, visit your local dealer for a demonstration and a copy of our

Apple II™ is a completely self-contained computer system with BASIC in ROM, color graphics, ASCII keyboard, lightweight, efficient switching power supply and molded case. It is supplied with BASIC in ROM, up to 48K bytes of RAM, and with cassette tape, video and game I/O interfaces built-in. Also included are two game paddles and a demonstration cassette.

SPECIFICATIONS

- **Microprocessor:** 6502 (1 MHz).
- **Video Display:** Memory mapped, 5 modes—all Software-selectable:
 - Text—40 characters/line, 24 lines upper case.
 - Color graphics—40h x 48v, 15 colors
 - High-resolution graphics—280h x 192v; black, white, violet, green (16K RAM minimum required)
 - Both graphics modes can be selected to include 4 lines of text at the bottom of the display area.
 - Completely transparent memory access. All color generation done digitally.
- **Memory:** up to 48K bytes on-board RAM (4K supplied)
 - Uses either 4K or new 16K dynamic memory chips
 - Up to 12K ROM (8K supplied)
- **Software**
 - Fast extended Integer BASIC in ROM with color graphics commands
 - Extensive monitor in ROM
- **I/O**
 - 1500 bps cassette interface
 - 8-slot motherboard
 - Apple game I/O connector
 - ASCII keyboard port
 - Speaker
 - Composite video output



Apple II is also available in board-only form for the do-it-yourself hobbyist. Has all of the features of the Apple II system, but does not include case, keyboard, power supply or game paddles. \$598.

PONG is a trademark of Atari Inc.

*Apple II plugs into any standard TV using an inexpensive modulator (not supplied).

detailed brochure. Or write Apple Computer Inc., 20863 Stevens Creek Blvd., Cupertino, California 95014.



 **apple computer inc.™**