

# Apple IIgs

## The most powerful Apple II



### Overview

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The Apple IIgs™ personal computer takes the Apple® family to a new level of performance and expandability.

Using an advanced 16-bit microprocessor, the Apple IIgs runs most existing Apple IIe and IIc software as much as 2.8 times faster. Add the Apple IIgs Memory Expansion Card, and it can also take advantage of graphics - based applications (similar to those for Apple

Macintosh™ computer) developed especially for this newest Apple II.

The video and audio abilities of the Apple IIgs are nothing short of amazing. It's new high-resolution graphics mode can reproduce 4,096 different colours, and a 15-voice sound generator produces beautifully natural-sounding music and speech.

Just add a disk drive and mo-

nitor and the Apple IIgs is ready to go, with built-in ports for all the most common accessories (including the AppleTalk® network). It is also ready to grow with 8 expansion slots, and internal memory that can be expanded to more than 8 megabytes.

The Apple IIgs. It is the most powerful, most colourful Apple II we've ever made.



### The Apple IIGS ...

- ▶ Runs thousands of programs written for Apple IIe and IIc — up to 2.8 times faster.
- ▶ Runs new applications that use windows, pull-down menus, and other Macintosh-like features.
- ▶ Includes 512 kilobytes of user memory (RAM) expandable to 8 megabytes.
- ▶ Includes 128 kilobytes of ROM (read-only-memory) expandable to a full megabyte.
- ▶ Provides seven general-purpose expansion slots for peripherals, plus a dedicated RAM/ROM slot.
- ▶ Gives you access to AppleTalk Personal Network without an interface card.
- ▶ Includes two built-in serial ports for easy connection of AppleTalk, modem, printer, or other serial devices.
- ▶ Lets you connect as many as four 3.5-inch and 5.25-inch disk drives.
- ▶ Generates up to fifteen separate audio voices simultaneously, for realistic music, speech, and sound effects.
- ▶ Is compatible with most Apple II peripherals.
- ▶ Offers an analogue RGB port for quick connector to the AppleColor RGB Monitor; no adaptors or additional interface are required.
- ▶ Uses the Apple Desktop Bus™ standard for easy connection of multiple input devices (such as a graphics tablet and mouse).
- ▶ Includes a built-in clock for automatic time stamping of files and documents.
- ▶ Features a detached keyboard with 14-key numeric pad.
- ▶ Displays 8 international character sets.
- ▶ Offers you a choice of QWERTY (Sholes), Dvorak, and international keyboard layouts.
- ▶ Lets you use software desk accessories (Not applicable to all operating systems).
- ▶ Includes an easily accessible Control Panel for setting screen colours, speaker volume, clock time, and so on.



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## A Closer Look

The Apple IIGS incorporates several features that make it the most powerful member of the Apple II family.

Its 16-bit 65C816 processor is compatible with the 65C02 used in the Apple IIc and enhanced Apple IIe, so most of the thousands of existing Apple II applications will run on it without modification. But since the 65C816 has a clock speed of 2.8 instead of 1 megahertz, these programs will run up to 2.8 times faster on the IIGS.

The 65C816, combined with the computer's 512 kilobytes of built-in RAM and extensive memory-expansion capability, let the Apple IIGS run more sophisticated applications, including ones with a Macintosh-style user interface. With the addition of the Apple IIGS Memory Expansion Card, applications that previously required frequent disk access can now reside entirely in the computer, so you don't waste time waiting for disk reads. And you can work with much larger files, such as extensive text documents, spreadsheets, and data bases.

ROM memory in the Apple IIGS has also been enhanced. It contains an extensive Control Panel, as well as QuickDraw II graphics routine, Applesoft BASIC, and numerous other items. And just like its RAM, the ROM of the Apple IIGS is expandable via the memory expansion slot—up to a full megabyte.

The Control Panel accessed with the keyboard commands, lets you change the screen colours (text, background and border), keyboard layout, display character set, speaker volume, system speed, key-repeat speed and delay mouse, double-click speed, and so on. By setting the real-time clock from the Control Panel, your ProDOS files will automatically be time-stamped when they are saved; some applications also let you insert the current time and date into your documents. The Control Panel can also be used to assign memory space on the Apple IIGS Memory Expansion Card, and to start up the computer from an application stored on the card.

The new processor also enables the Apple IIGS to handle more complex graphic and sound. The computer offers two new super-high-resolution modes designed especially to work with the vibrant AppleColor RGB Monitor. You can choose from over 4,000 different colours to create

rich, highly detailed graphics, for home, school or business. The RGB Monitor also allows the IIGS to display 80-column coloured text with the same crisp resolution usually possible only in monochrome.

If high-quality sound is as important to you as high-quality graphics, the Apple IIGS is an ideal choice. An advance 32-oscillator Ensoniq chip lets you compose for and play up to 15 different "Instruments" simultaneously, for extremely life-like music, speech, and sound effects.

The 8 expansion slots of the Apple IIGS give it virtually unlimited growth path. One slot is dedicated to ROM/RAM cards, while the other seven are general purpose peripheral-interface slots. On the outside, the Apple IIGS is just as remarkable. Its wide range of built-in ports means you can connect most peripherals without any additional interfaces.

The disk drive port lets you take advantage of the new 800-kilobyte Apple 3.5 drive and 143-kilobyte 5.25 drive. Both compliment the platinum colouring of the Apple IIGS. Use them individually in any combination, or with your existing UniDisk™ 3.5 drives; you can daisy-chain up to four drives from the drive port. And with the addition of the Apple II SCSI Card, the Apple IIGS can work with the 20-megabyte Apple Hard Disk 20SC, for high-performance storage needs.

AppleTalk Personal Network capability is built right into the Apple IIGS, and is accessible through the serial interface ports. You can use AppleTalk to print your files in publication quality on an Apple LaserWriter® printer, or to access a remote Apple ImageWriter™II.

The keyboard of the Apple IIGS is detached, so you can position it wherever it is most comfortable for you. It contains two Apple Desktop Bus (ADB) ports on opposite ends; one is for connecting the keyboard to the computer, and the second for adding other ADB-compatible input devices. The most common addition would be a mouse, and it can be connected on either side of the keyboard, for easy use with either the left or right hand. Or you can connect another ADB peripheral—such as a graphic tablet or joystick—to the keyboard, then daisy-chain more accessories from it, with the mouse at the end.



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## Technical Specifications

### Central Processing Unit (CPU)

Microprocessor: 65C816  
Clock speed: 2.8 or 1.0 megahertz; user - or software selectable  
Address bus: 24 bits

Up to 16 distinct devices can be on-line at one time.

Address range: 16, 777, 216 bytes

16-bit registers: accumulator, two index registers, direct register, stack pointer, and

program counter  
8-bit registers: data bank, program bank and status  
Addressable memory (as used in the Apple II GS): up to 8 megabytes of RAM and 1 megabyte of ROM.

## Memory

512 kilobytes RAM, expandable to 8 megabytes  
128 kilobytes ROM, expandable to 1 megabyte ROM, includes:  
► Control Panel  
► QuickDraw II graphic routines  
► Applesoft BASIC  
► Desk Accessory Manager

► Memory Manager  
► Free-form wave form synthesiser  
► Apple IIe and IIc software switches and supporting code  
► AppleTalk protocols  
► Apple Desktop Bus firmware  
► SANE™ Numerics  
► Event Manager

► Tool Locator  
► Video Firmware  
► Drivers for built-in devices (such as serial and disk drive ports)  
► Extension to system monitor for 65C816 support  
► Diagnostic routines

## Display Modes

Graphics  
► Super-high-resolution  
—320 dots horizontally by 200 dots vertically, up to 16 colours per line and 256 colours per screen from a palette of 4,096 colours.  
—640 dots horizontally by 200 dots vertically, in four or more colours per line and 128 colours per screen from a

palette of 4,096 colours.  
—Double-high-resolution (560 dots horizontally by 192 dots vertically; 16 colours)  
—Double-low-resolution, (80 dots horizontally by 48 dots vertically; 16 colours)  
—High-resolution (280 dots horizontally by 192 dots vertically; 6 colours)

—Low-resolution (40 dots horizontally by 48 dots vertically; 16 colours)  
► Text  
—40-column text mode (40 columns by 24 lines)  
—80-column text mode (80 columns by 24 lines)

### Character Sets

32 uppercase letters, 32 lowercase letters, 32 special characters, 32 Mouse Text

characters, and 12 unique characters for each of these international character sets: U.S., U.K., French, Danish,

Spanish, Italian, German and Swedish.

### Keyboard

► Standard typewriter-style  
► 80 keys, plus 14-key numeric keypad  
► Two Apple Desktop Bus connectors (one for attaching

keyboard to computer; one for daisy-chaining additional input devices)  
► Keyboard layouts (selectable through Control Panel)  
—QWERTY, (Sholes)

—Dvorak  
—Nine international (all those listed under Character Sets, plus French Canadian)



## Technical Specifications

### Interfaces

- Expansion slots
  - one multiple purpose RAM/ROM memory-expansion slot
  - Seven general-purpose input/output slots for peripheral-control cards, all fully buffered, with interrupt and DMA priority.
- Serial ports: two 8-pin mini-circular connectors; either one can be used for

AppleTalk; utilise SCC communication chip.

- Disk-Drive Port: One 19-pin D-Style connector; allows daisy-chain connection of up to four Apple 3.5, 5.25 and UniDisk 3.5 drives.
- Video Output
  - Analog RGB, via 15-pin D-style connector
  - Composite colour, via RCA phono connector
- Apple Desktop Bus port;

one 4-pin mini-circular connector on back of computer; two on keyboard

- Game I/O; 9-pin D-style connector for joysticks, graphics tablet. etc.

### ► Audio

- RCA mini headphone/speaker output jack with programmable volume control
- Input/output connector on main logic board

### Sound capability

Ensoniq 32-oscillator digital synthesiser chip with dedicated 64K RAM. Produces up to

15 voices simultaneously.

Uses internal speaker, or external speaker or headphones via audio output jack (volume

is controlled from the Control Panel)

### Operating Systems

- ProDOS® 8 and ProDOS 16
- Pascal

—DOS 3.3

—CP/M (with appropriate coprocessor card)

### Other Features

- Real-time clock; can be set through Control Panel

- Battery backup for Control Panel settings

### Electrical

- Line voltage: 220 to 240 volts AC; 50 to 60 hertz
- Power consumption
  - Typical: 11 watts
  - Maximum: 60 watts
- Supply voltages
  - ±5 volts (±3 %)

+12 volts (±6 %)

-5 volts (±10 %)

-12 volts (±10 %)

- Maximum supply currents

+5 volts: 2.5 amps

+12 volts: 1.5 amps

-5 volts: 250 milliamps

-12 volts: 250 milliamps

- Safety and EMI qualifications

—FCC Part 15, Class B Computing Devices

—CSA 22.2, No. 154 - 1979

—UL 114-Office Applications and Business Equipment

### Environmental

- Ambient operating temperature: 0° to 45°C (32° to 113°F)

- Maximum temperature on power supply case: 55°C (130°F)

- Relative humidity: 5 % to 85 %

### Physical (Main unit)

- Width: 284mm (11.2 in.)
- Depth: 348mm (13.7 in.)

- Height: 117mm (4.6 in.)

- Weight: 3.96kg (8.72 lbs)





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## The Apple IIGS

With your order, you'll receive:

- ▶ Apple IIGS personal computer, with 512K RAM and 128K ROM
- ▶ Apple Desktop Bus detached keyboard with numeric pad
- ▶ Keyboard cable

- ▶ Apple Desktop Bus mouse
- ▶ Power cord
- ▶ *Your Tour of the Apple IIGS* interactive training disk
- ▶ *Setting up Your Apple IIGS* installation guide
- ▶ *Apple IIGS Owner's Guide*
- ▶ *A Touch of Applesoft BASIC* introduction to programming

- ▶ Owner support guide
- ▶ 12 months warranty
- ▶ Product registration card

You will also receive the Apple IIGS System Disk package, which contains:

- ▶ System disk
- ▶ User's guide

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LD 2021

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