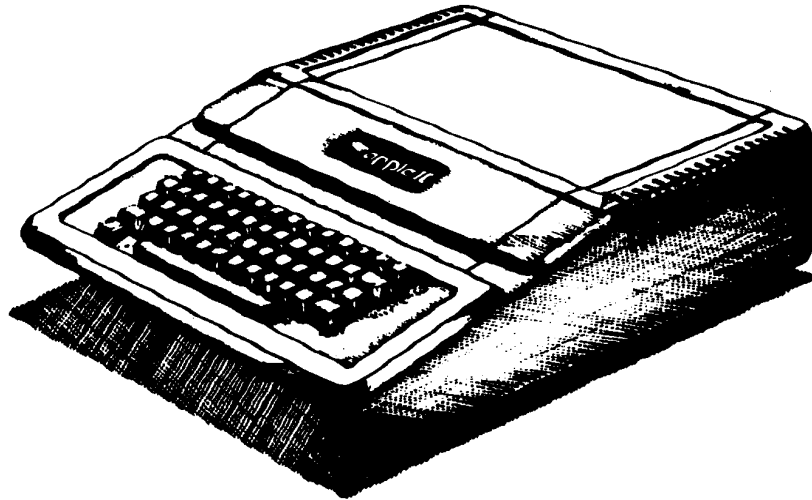Apple 2 Computer Technical Information

Apple][Computer Family Information

Product Info:

"Apple in Depth" Magazine *Apple Summer 1982*

March 1982

Document # *306*

Ex Libris David T. Craig

Apple® In Depth

A reference guide to Apple products

Spring/Summer 1982

MARCH 1982

Suggested Price: $3.00

System configurations listed in this catalog include a variety of Apple-supported products. Because of the growing number of peripheral devices that interface with Apple systems, all possible equipment options cannot be detailed. Consult your dealer to determine the configuration that best meets your needs.

Apple is taking steps to make its products compliant with new Federal Communications Commission emission standards for computer devices. As a result of this—or other factors—the specifications of certain products in this catalog may change without notice.

The Seeds of Success

The advent of a personal, affordable computer is one of those milestones of technology which mark the beginning of a new and better way to accomplish work and express creativity. Apple, acknowledged as a leader in personal computers, was the first company to make available to millions what was once available only to large organizations—computer power.

Founded in 1976, the company was the brainchild of two young engineers with big dreams and small resources. They made the prototype Apple computer in a garage, that now proverbial birthplace of many great ideas in California's Silicon Valley. This humble beginning—a nice but true touch to their success story—didn't detract from the technological sophistication of the computer they christened "Apple," a whimsical name as unusual as the product itself.

Acclaim by Innovation

Computer hobbyists were the first market of the fledgling company. Most were electronics engineers, targeted because they could easily recognize the high performance and overall quality of the new computer. And recognize it they did: demand for the unit soared, soon outstripping the production capabilities of the garage. Apple had arrived.

In 1977, the company revolutionized the personal computer market with the introduction of the Apple II, the first fully assembled computer of its kind. Unlike the "kits" offered by the competition, its performance did not depend upon the varying talents of its users to solder, wire, assemble components, and "debug" the finished product.

Additionally, the Apple II was the first fully programmable computer of its size. It brought many of the capabilities of large data processing systems into the everyday lives of individuals, at a cost and convenience not previously possible. Acceptance of the Apple rapidly spread from hobbyists to business managers and other professionals.

Apple *III*, the newest in the company's line of personal computers, was designed to provide these professionals—managers, engineers, financial analysts, accountants—with the most powerful, affordable, and versatile desktop computer on the market today. Equipped with twice the memory available on other personal computers, Apple *III* can perform sophisticated tasks to solve complex problems faster and more economically than ever before.

Today, Apple Computer Systems are used in small businesses and large corporations; in elementary and secondary schools; in college classrooms; in science and engineering laboratories; and in homes throughout the world. By any standard—price/performance, dependability, enhanceability, service, software support, ease of understanding and operation—Apples are the preferred personal computers.

Service and Support

The company's commitment to quality is reflected not only in its products, but in its outstanding service and user support as well. There are more than 1000 authorized Apple Level I Service Centers worldwide: the largest personal computer maintenance network in

existence. In addition, there are hotlines to Apple Regional Service Centers throughout the U.S., in Canada, and in Europe, where applications experts stand by to provide assistance by telephone when needed. And—because excellence is designed into every product—Apple is able to back its computer systems with the lowest-priced Extended Limited Warranty package in the industry. This total support, unique in the personal computer field, is another reason why Apple computers are the best personal computers available.

Documentation

A philosophy of excellence is also demonstrated in the company's comprehensive documentation. As the design of its computers indicates, Apple understands the challenge and utility of simplicity. Its equipment and program manuals contain easy-to-follow exercises and clear, detailed explanations of procedures. Apple's objective is to educate and build user confidence and familiarity so that its products can be put to work quickly.

Apple's Future

According to Business Week Magazine*, "Of all the companies that owe their existence to the hobby computer phenomena, only Apple has emerged so far with the strength to become a significant factor in the small-computer markets of the 1980s."

The company's dedication to quality is the basis of this strength and the most effective way it can continue its remarkable growth. Through its advanced research and development activities and commitment to product excellence, Apple is determined to expand its position as the preferred personal computer manufacturer. It is well on its way.

*"Surviving the Microcomputer Shift," April 16, 1979.

Table of Contents and Product Application Guide

P —Professional
B —Small Business
E —Education
S/I —Scientific/Industrial
H/H—Home/Hobby

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Table of Contents and Product Application Guide

P —Professional
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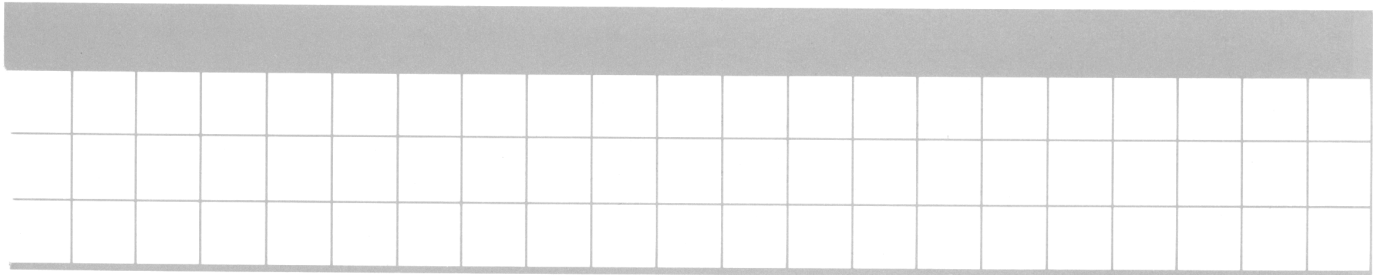
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2

The Apple II Plus
Personal Computer Systems

The Most Popular Personal Computers in Their Class

Apple II Plus computers have been specifically designed to make your working time more productive, exciting, and creative. Whether you use your Apple II Plus in your office, your classroom, your laboratory, you'll be impressed with its powerful capabilities and ease of operation.

Special Solutions For Special Needs
You'll discover that a variety of applications are just a few keystrokes away. For example, you can...
■ save hours of work by programming the Apple to perform repetitive measurements, calculations, or procedures...
■ set up a computer-based instrument system, using the new IEEE-488 interface card with any of the hundreds of instruments that conform to the IEEE-488 standard...
■ collect data from sensors (such as thermistors and flow meters), and use your data to control a process or experiment...
■ write and edit technical papers, articles, and manuals, letting the Apple save you hours of editing...
■ maintain a lab inventory to keep stocked with the parts you need and to reduce losses...
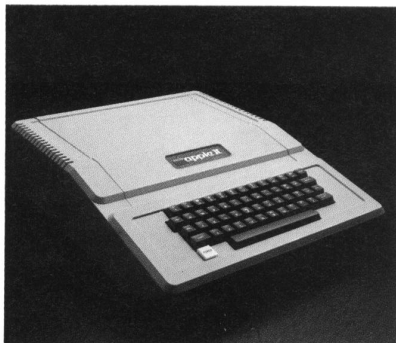
■ write programs in several high-level languages, such as BASIC, FORTRAN, and Pascal, giving you a flexible solution for almost any problem...
■ access world and business news 24 hours a day through the Dow Jones News Retrieval Service.

Apple Makes It Easy
To help meet your specific needs, Apple and many other companies offer a wide variety of programs for use with your Apple II Plus system. Programs from the Apple Software Bank are packaged with detailed reference manuals which will teach you, step-by-step, how to use each program. Simply read through each manual, following the instructions and completing all the exercises. Your hands-on experience makes it easy to become an expert.

Apple Offers Even More
In addition to extensive software and ease of programmability, Apple also...
■ allows you to expand your system as your needs grow, because of its modular method of adding memory and accessories...
■ prompts you for input, warns you of errors, and lets you explore music and speech applications with its sound capability...
■ heightens your interest with its color graphics capability...

■ offers safety and durability, because it is UL-approved as a unit and housed in a rugged, molded case...
■ travels with you, because it is lightweight and portable...
■ assures you of low service costs, because its components are easily accessible and socket-mounted for quick replacement...
■ offers you exceptional reliability, because of its built-in engineering excellence.

Standard Features
Apple II Plus Personal Computer Systems provide these standard features:
■ a built-in BASIC language (Applesoft BASIC in the Apple II Plus);
■ built-in disassembler;
■ A ROM-based system control program;
■ color graphics and sound capabilities;
■ sockets for up to 48K bytes of user memory (RAM); 64K with the plug-in Language System;
■ cassette interface;
■ input/output connector, for human-input applications, using optional joystick

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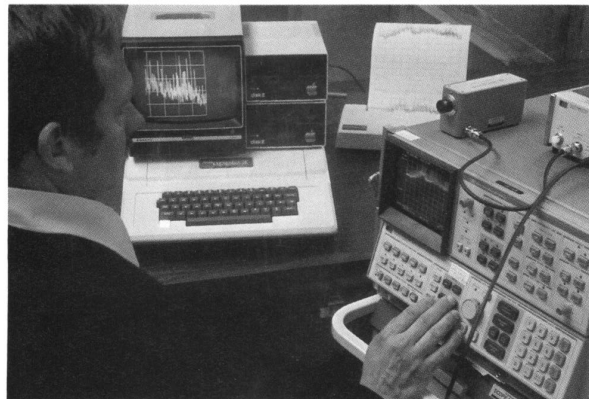
- typewriter-style ASCII keyboard;
- high-efficiency switching power supply;
- eight accessory expansion slots.
  Apple II Plus computers feature automatic start-up in BASIC, and optional automatic execution of any disk program on start-up.

Technical Specifications

Video Display:
Through software selection, an Apple displays text and high-resolution graphics and, when connected to a color monitor or television, color graphics. Its graphics commands allow either of two screen "pages" to be displayed, with four lines of text below the display area.

- Text Mode
  —40 characters/line, 24 lines
  —5x7 dot matrix, upper-case characters
  —normal, inverse or flashing characters
  —extensive display control software in ROM
  —full cursor control—protected screen feature
  —fast display—1000 cps
- Color Graphics Mode
  —40hx48v resolution (40hx40v with four lines text)
  —15 colors
- High Resolution Graphics Mode
  —280hx192v black/white resolution (or 280hx160v with four lines text)
  —six colors: black, white, violet, green, blue, orange (color resolution is 140hx192v or 160v)

Memory:
- User Memory (RAM)
  —organized in 16K-byte increments
  —easily expanded by inserting memory elements into plug-in sockets
  —up to 48K RAM can be installed without requiring expansion chassis
  —an additional 16K RAM can be installed through use of the Language System (a plug-in card), for a total of 64K RAM
- Language Memory (ROM)
  —up to 12K of Language Memory, organized in six blocks of 2K bytes each; 2K used for System Control

System Control:
- disassembler;
- automatic input/output device assignment;
- keyboard and screen editing features;
- register examine/modify and read/write cassette routine;
- hex add/subtract for relative branch calculations.

Inputs And Outputs:
- typewriter-style ASCII keyboard;
- cassette interface—1500 bps;
- eight peripheral board connectors, fully buffered, with interrupt and DMA priority structure;
- joystick I/O: four analog-to-digital inputs, three TTL inputs and four TTL outputs.

Physical Dimensions (Nominal):
Weight: 5kg (11 pounds)
Height: 11.4 cm (4½ in)
Depth: 45.7 cm (18 in)
Width: 39.4 cm (15½ in)

The Apple II Plus Package
Order Nos.
U.S.   European
A2S1016 A2S1016P (16K Bytes RAM)
A2S1032 A2S1032P (32K Bytes RAM)
A2S1048 A2S1048P (48K Bytes RAM)
With your order for any Apple II Plus system, you will receive:
- Apple II Plus, with memory as ordered, and features as specified in STANDARD FEATURES section above;
- AC power cord;
- Apple II Reference Manual;
- Applesoft BASIC Reference Manual;
- Applesoft Tutorial Manual.

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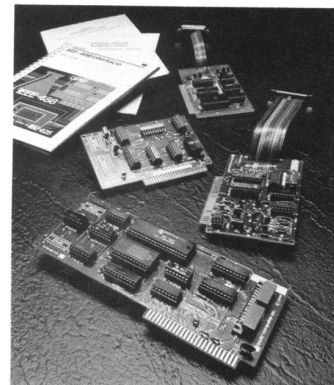
The Apple *III* Personal Computer System

The Most Powerful Professional Computer System in Its Class

The Apple III is a powerful desktop computer system designed to meet the complex application needs of managers, financial planners, analysts, software developers, writers, and others.

A wide variety of Apple III system configurations can be tailored to meet your specific needs. Consult your dealer for information.

Powerful Solutions for Complex Applications

The Apple *III* Computer System has been designed to tackle the tasks that keep you from being as productive as you'd like to be. With an Apple *III*, you can…

■ *plan budgets, compare actuals with forecasts, and modify projections…*
■ *calculate rate-of-return, pro formas, and financial statements…*
■ *develop highly accurate forecasting models and pricing strategies…*
■ *create scientific and engineering models, and study causes, effects, and trade-offs…*
■ *compose, revise, and print all kinds of documents—from memos and brochures to form letters and book-length manuscripts—quickly and easily…*

■ *maintain and update comprehensive mailing lists, sort them by name, ZIP code, or special key, and selectively print mailing labels and phone lists…*
■ *write complex computer programs in a variety of languages, including Apple Business BASIC, and Pascal.*

Professional Features for Professional Needs

In addition to its outstanding applications software, the Apple *III* offers a powerful operating system and all the hardware features professionals look for.

Apple *III*'s Sophisticated Operating System (SOS)

Designed to control all of the Apple *III*'s hardware for you, SOS handles interrupts, manages the system's memory and peripherals, provides the foundation for graphics, and performs comprehensive file management.

Apple *III*'s Keyboard

The typewriter-style Apple *III* keyboard has been sculptured for maximum typing speed and accuracy. It contains 61 alpha keys and a separate 13-key numeric pad.

Four dedicated cursor control keys provide single-keystroke cursor movement; each key also fast repeats when held down, so that you can move quickly from point to point in the text. The alpha-lock key shifts only the alphabetic keys into upper case, leaving the number row unaltered. To speed numeric data entry, the layout of the numeric keypad is identical to that of a standard calculator.

Apple *III*'s Disk Drive

A built-in, 140K-byte, flexible disk drive makes the Apple *III* a compact, space-saving unit. System expansion is cost-effective, too, because you can add up to three external disk drives without the need for additional control hardware or software.

For professionals with large-scale storage and programming needs, the optional ProFile Personal Mass Storage System provides 5 million bytes of hard-disk memory, equivalent to 35 floppy disks.

Apple *III*'s Back Panel

The system's back panel (as well as most of its case) is formed of diecast aluminum. The aluminum fins on the back of the unit keep the system cool and eliminate the need for a fan.

Most peripheral devices plug directly into the Apple *III*'s back panel connectors. Additionally, there are four large slots in the back panel for input/output connectors mounted on optional peripheral cards.

As many as three expansion floppy disk drives can be used with the Apple *III*. The first additional drive plugs into the "floppy disk" connector on the system's back panel; then, in "daisy chain" fashion, the second drive plugs into the first, and the third plugs into the second.

Back panel connectors are also provided for two joysticks. Application programs can be designed to take advantage of a joystick (for example, to move the cursor around the screen, or to point to displayed items). Also, one of the joystick connectors can alternately be used to connect a Silentype thermal printer to the Apple *III*.

The Apple *III* allows you to use a wide variety of video display devices. The high-resolution Monitor *III* connects to the system by a shielded cable, which plugs into a jack on the Apple *III*'s back panel. Color video monitors—including NTSC (standard) color, and RGB (for exceptional color purity and resolution)—require commercially available video adaptors, which attach to the Apple *III* by means of a 15-pin connector that provides all the power and signals necessary.

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Built into the Apple *III* is a two-inch speaker, which produces sound of such high quality that it can even be used to generate voice. An audio output jack located on the back panel of the Apple *III* also allows for connection of a separate earphone or external speaker (plugging into this jack silences the Apple *III*'s built-in speaker).

An RS-232C connector, also located on the Apple *III*'s back panel, provides for direct attachment of many types of "serial" input/output devices. Using a modem, for example, your Apple *III* can connect to other computers and data banks by phone line. Or you can quickly add a variety of high-speed or letter-quality printers—even other terminals or computers—to your system, simply by plugging them into the RS-232C connector.

Inside the Apple *III*

Removing the top cover reveals the peripheral card expansion section of the Apple *III*. Up to four different peripheral cards can be used at one time to supplement the Apple *III*'s built-in peripheral interfaces.

For optimal computing speed, the Apple *III*'s CPU can be "interrupted" by your system's peripheral devices whenever they require CPU control. Alternately, the CPU can also poll the devices to determine which need attention—thereby minimizing the software required for peripheral control.

The Apple *III* also contains many features that enhance its utility, including a number of powerful text, graphics, and color capabilities. In all text modes, for instance, the character set that appears on your monitor can be chosen from several available fonts. Special characters, graphics symbols, and even foreign language character sets can be selected quickly and easily from a diskette, and used by any program on the computer.

Through the Apple *III*'s professional display, you view 80 characters by 24 lines of easy-to-read characters. The system can also display 40 characters by 24 lines of color text on color background to add dramatic emphasis to programs.

Along with various text modes, several graphic modes are also available with the Apple *III*, including an ultra-high-resolution, monochromatic mode. Up to 16 different colors are available in the high-resolution color mode, and even higher resolution color can be generated by restricting color changes slightly. On a monochromatic monitor, color is displayed as 16 different shades, making it easy for you to use shading and highlighting to enhance and emphasize your displays.

The Apple *III* also has an Apple II emulation mode for those users who already have an investment in Apple II software. This mode enables you to run most Integer BASIC and Applesoft programs on your Apple *III*. (Minor modifications may be required for Apple II programs which use the game paddles or other peripherals, however.) Because the Apple *III* in emulation mode behaves exactly like an Apple II Plus, the screen will display 40-character by 24-line text.

Technical Specifications

Physical Dimensions:
  Height: 4.8 in. (12.20 cm.)
  Depth: 18.2 in. (46.22 cm.)
  Width: 17.5 in. (44.45 cm.)
  Weight: 26 lb. (11.8 kg.)
  Cast aluminum base with molded plastic.

Processor:
  Apple-designed processor utilizes 6502A as one of its major components. Other circuitry provides extended addressing capability, relocatable stack, zero page, and memory mapping.

Emulation Mode:
  Provides hardware emulation of 48K-byte Apple II Plus. Allows Apple II programs, with the exception of Pascal and FORTRAN, to run without modification.

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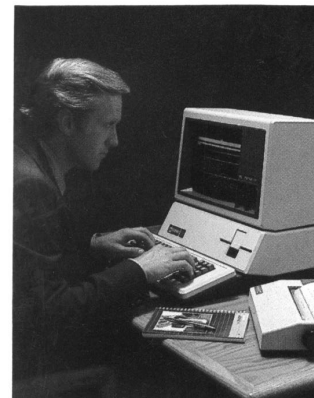
6 The Apple *III* Personal Computer System

Clock Speed:
1.8 MHz with video off, 1.4 MHz average;
1.0 MHz in emulation mode.

Main Memory:
128K (131,072) bytes of dynamic RAM memory.

ROM Memory:
4K (4096) bytes used for self-test diagnostics.

Power Supply:
High-voltage switching type
+5, −5, +12, −12 volts.

Mass Storage:
One 5.25-inch floppy disk drive built-in;
140K (143,360) bytes per diskette.
Up to three additional drives can be connected by daisy-chain cable (560K bytes on-line storage).
In addition, up to 4 ProFile hard-disk drives (5 megabytes each) may be added by means of plug-in cards.

Keyboard:
74 keys (61 on main keyboard, 13 on numeric pad);
Full 128-character, ASCII encoded;
All keys have automatic repeat;
Three special keys: SHIFT, CONTROL, ALPHA LOCK;
Two user-definable "Apple" keys;
Four directional arrow keys with two-speed repeat;
Four other special keys: TAB, ESCAPE, RETURN, ENTER.

Screen:
Three upper/lower case text modes:
80-column, 24-line, monochromatic;
40-column, 24-line, 16-color foreground and background;
40-column, 24-line, monochromatic;
All text modes have a software-definable, 128-character set (includes upper and lower case) with normal or inverse display.
Three graphics modes:
280 x 192, 16 colors (with some limitations);
140 x 192, 16 colors;
560 x 192, monochromatic;
plus Apple II modes.

Video Output:
RCA phono connector for NTSC monochromatic composite video;
DB-15 type connector for:
NTSC monochromatic composite video;
NTSC color composite video;
+5, −5, +12, −12 volt power supplies;
Four TTL outputs for generating RGB color;
Composite sync signal;
Color signals appear as 16-level grey scale on monochromatic outputs.

Audio Output:
Built-in two-inch speaker;
Miniature phono jack on back panel;
Driven by six-bit digital/analog converter or fixed-frequency "beep" generator.

Serial I/O:
RS-232C compatible, DB-25 female connector;
Software-selectable baud rate and duplex mode.

Joysticks:
Two DB-9 connectors for two joysticks with push-buttons and switches.

Printer:
One DB-9 connector (shared with second joystick) for Apple Silentype printer.

Expansion:
Four 50-pin expansion slots inside the cabinet.

SOS:
Sophisticated Operating System handles all system I/O;
SOS can be configured to handle standard or custom I/O devices and peripherals by adding or deleting "device drivers";
All languages and application programs access data through the SOS file system.

Languages:
Apple Business BASIC and Pascal.

The Apple *III* Package
Order Nos.
A3S0128 (128K Bytes RAM)
A3S0256 (256K Bytes RAM)

With your order for any Apple *III* system, you will receive:

■ Apple *III*, with memory as ordered,
■ Apple *III* System Software package, with:
—Apple *III* Owner's Guide;
—Apple *III* Standard Device Drivers Manual;
—System Utilities diskettes;
—Apple II Emulation diskette;
—System Demonstration diskette;
—blank diskette.
■ Apple *III* Confidence Program diskette.

™ VisiCalc is a trademark of Personal Software, Inc.

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Apple Update—1982

Apple In Depth is your personal guide to what's available, affordable and exciting in Apple personal computing. You'll find some new products that substantially add to your computer growth path, such as the ProFile Mass Storage System, and a catalog of Apple products—available, in most instances, worldwide.

Please note the following updates:

■ **The Apple *III* with 256K bytes RAM** *…provides business, scientific and industrial users with the largest usable memory capacity available today in any personal computer. You'll gain significant advantages in building larger models, using and creating programs particularly in BASIC and Pascal, sorting and merging large files, and handling sophisticated graphics and other documentation.*

■ **ProFile Personal Mass Storage System***…introduces Apple III users to high-speed operation and large-scale data storage via Winchester hard-disk technology. ProFile dramatically increases the Apple III's maximum on-line storage capacity from 560 thousand to 5 million bytes, allowing you to conveniently store in one location information that would fill 35 floppy diskettes.*

■ **Apple II Business Graphics***… allows you to transform numerical data into a wide variety of easy-to-understand charts and graphs. Based on a simple command language, it offers many powerful features—including mathematical and statistical functions—previously unavailable in business graphics packages.*

■ **Apple II Plus Super Serial Interface Card****…replaces two separate cards previously available from Apple, the Serial and the Communications Interface Cards. Employing a bi-directional RS-232C interface, it allows Apple II Plus computer systems to exchange data with other computers, modems, printers, terminals, and accessories.*

■ **Apple II Plus Parallel Interface Card*****…allows you to generate reports, listings, labels and letters with your Apple computer using a variety of parallel-interfaced printers. It consists of two sets of firmware, identical to that on the Centronics and Parallel Printer Interface cards previously made by Apple.*

■ **Products no longer available***… include The Apple III Information Analyst (Apple Business BASIC and VisiCalc III software is available separately), the Apple Language System (the Language Card and Apple Pascal are available as separate products), and Tax Planner. Please ignore any lingering references to these discontinued packages.*

If you have questions about any Apple product, please consult with your dealer. He or she can answer your question, or refer you to the appropriate product bulletin or data sheet. See the following page for a brief discussion of upcoming, supplementary literature.

*The Apple II Super Serial Interface Card replaces the Apple Serial and Communications Interface Cards. Where reference is made to these previously existing cards, you may still use them, or purchase the new Super Serial Interface Card.
**The Apple II Parallel Interface Card replaces the Apple Parallel Interface Card and Centronics Printer Interface Card. Where reference is made to these previously existing cards, you may still use them, or purchase the new Parallel Interface Card.

8

For Your Information

Published twice a year, Apple In Depth is the official reference to Apple's growing spectrum of "mainline" products. Catalog entries describe products in terms of their user benefits, features, and specifications. Each entry also tries to give you a feeling for what it's like to use that particular product, and points out specific limitations you should consider before purchasing it (see below).

In addition, many excellent software programs are described in another Apple publication, the Special Delivery Software Catalog.

At your dealer's you'll also find *Apple* Magazine on sale. Now published three times a year, *Apple* covers the many ways people are using Apple personal computers to enhance their lives. Features include user profiles, application stories, and articles by well-known authors.

Building Your System—
A Few Words of Advice

No data sheet or catalog can substitute for a "hands on" demonstration at your Apple Dealer, where you'll learn first-hand how the product is operated, how it's set up—and if it will work with other Apple or Apple-compatible products. For instance, you shouldn't expect to be able to use the Universal Parallel Interface Card, which is a product for the Apple *III*, with an Apple II Plus. (If you *do*, better read over the descriptions of both these products.) You won't be able to produce beautiful color graphics on a black and white monitor, either —though some people actually try!

Compatibility is especially important when building or adding on to your system. Even though Apple strives to make its products compatible, we can't guarantee they'll work with software or peripherals manufactured by other companies.

Apple tries to give you all the information you need to make an intelligent purchase decision—first in our literature, and then through our dealers. But the ultimate responsibility is yours. The best assurance that a system configuration or software application will, in fact, perform the way you wish, is to see it set up and working, and to try using it at your dealer's store. If you do this, and if you read the product literature before making your purchases, you'll find it easy to build a reliable Apple system to suit your needs.

"Apple How To!" Program Now Available

Just released but too late to make it into this edition of the catalog is "Apple How To!", a collection of four interactive programs that teach important math and computer literacy principles. RPN CALCULATOR turns your Apple into a keystroke calculator, based on the popular "Reverse Polish Notation" system, for performing simple and complex calculations; ROD'S COLOR PATTERN helps users understand how the BASIC language works; SCROLLING WINDOW TUTOR teaches how to create text windows; and the ASSEMBLE IT YOURSELF MULTI-TONE KIT introduces you to assembly language programming that utilizes the Apple's sound capabilities.

Applications Software

11

The Controller

Revision 1.1
Small Business Management and Accounting

Applications Software

The Controller is a comprehensive accounting system that enables the small business owner to manage more effectively. Not only does the system allow better planning of payments and faster cash collection, it also generates timely reports which allow the owner to act quickly, if necessary, on items affecting the financial health of the business. And, through Revision 1.1, The Controller offers improved processing speed (approximately 25 percent) over the previous version, and compatibility with the user's choice of several printers.

Consisting of three modules—Accounts Receivable, Accounts Payable, and General Ledger—The Controller also offers an easy, effective alternative to manual bookkeeping. It's flexible as well: The Accounts Payable and Receivable Systems may be used either independently or in conjunction with the General Ledger.

Discover the easier way to more effective cash and accounting management—put The Controller to work in your business.
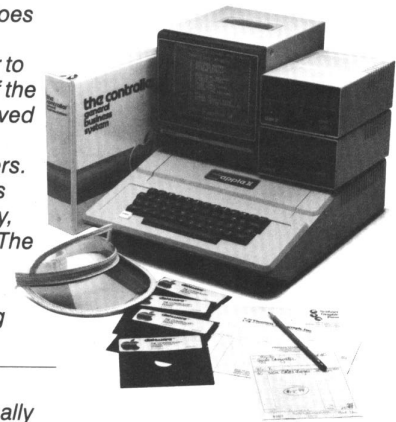
Benefits

The Controller...
■ allows you to easily trace any transaction because it automatically prints audit trails...
■ warns you of data entry errors and prompts you for further instructions through audio feedback (''beeps'')...
■ identifies and monitors slow-paying customers through its account aging feature...
■ assists you in planning cash needs for expenditures, and allows you to take advantage of discounts and ''net'' terms, because it tracks accounts payable by due date...
■ shortens bookkeeping time required to maintain accurate records, because it automatically posts and updates...
■ reduces bookkeeping errors by eliminating redundant writing, calculating and typing, and by automatically printing management summaries, detailed reports, vendor and customer lists, mailing labels, account statements, and archival copies of each month's data for historical records...
■ assists in maintaining complete, accurate and consistent records, because it encourages the use of standard bookkeeping practices...
■ reduces the time required to process your accounts and makes information available to you when you need it through the power of your Apple computer...
■ protects you from losing important business information by automatically making a back-up copy of all operational data after posting.

**The Controller—
A Closer Look**

To assist you in determining if The Controller is appropriate for your accounting needs, this section describes each system module by its menu, including numeric and financial limits. If your business fits within these limits, The Controller is probably just the package for you.

The Accounts Receivable, Accounts Payable and General Ledger menus include three common options. The first of these is CUSTOM-IZING FEATURES, a program which allows you to configure the system to your business needs—for example, whether finance charges should be calculated and at what percentage rate. The second is UTILITIES, a set of computer programs that enables you to: make back-up copies of your diskettes; restore diskettes that have been damaged in some way; and determine how many entries you have made and the amount of diskette space remaining. CHANGE TODAY'S DATE allows you to change the date each time you use the selected module.

12   The Controller

Accounts Receivable (A/R) System Module

After selecting ACCOUNTS RECEIVABLE from The Controller's main menu, your screen will display the A/R menu.

CUSTOMER MASTER allows you to establish and maintain an up-to-date listing of your customers. You may store data for up to 250 customers on each diskette (to a recommended maximum of three diskettes, or 750 customers).

SALES ENTRIES enables you to enter your sales by batch (up to a maximum of 100 per batch at any one time), and print reports for proofing. Sales adjustments can also be entered at this time.

PAYMENT ENTRIES permits you to record payments made by your customers. Payments may be entered in batches (up to a maximum of 100 entries per batch at any one time). As with SALES ENTRIES, adjustments can also be entered at this time.

As you post, sales and payment entries are put into summarized forms, so that they may be later transferred automatically to the GENERAL LEDGER should you choose to do so. One hundred TRANSFER JOURNAL entries may be made at any one time from the A/R program to the ledger.

AGED TRIAL BALANCE keeps track of outstanding balances, appropriately distributing them among four aging periods: current, 31–60 days, 61–90 days, and over 90 days. It also prints three different reports. The first is a SUMMARY REPORT, showing customer information, account balance by aging periods, and the total amount due. The second, DETAIL REPORT, includes the same information as the SUMMARY REPORT, as well as the balance forward for the month and current monthly transactions. The MONTHLY ACTIVITY REPORT details the business's total activity for the month by transaction, including sales, taxes and other amount categories. For audit purposes, the DETAIL REPORT must be printed before you can close the month.

FINANCE CHARGES is an optional feature which automatically computes, on a monthly basis, the finance charge percentages against your customers' balances. You are prevented from running FINANCE CHARGES more than once a month, and before you have posted sales and payment entries.

With the Accounts Receivable module, the total of finance charges, sales entries, or payment entries may not exceed 750 per diskette per month.

STATEMENTS generates computer-printed customer account statements. You may print up to 250 per month; the largest single balance for any one customer per aging period is $90,000.00.

SALES COMMISSIONS prints a report by salesperson number detailing the amounts a business owes its commissioned salespeople, based on their individual sales for the month.

CLOSE MONTH initiates the procedure that ends the monthly business cycle for billing. It eliminates all detailed transactions from ACCOUNTS RECEIVABLE and transfers the totals to the balance forward amount for the next month. Outstanding accounts receivable are aged automatically by one month.
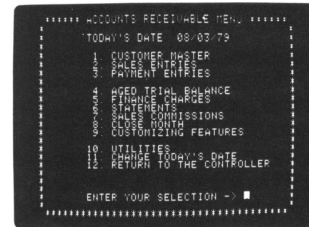
Accounts Payable (A/P) System Module

After selecting ACCOUNTS PAYABLE from The Controller's main menu, your screen will display the A/P menu.

VENDOR MASTER allows you to create a master file of all vendors with whom you do business. The vendors may be temporary or permanent, and you may have up to 125 vendors at one time. You can add, change, examine and remove vendors from the master file, and print a VENDOR MASTER report and vendor labels at any time.

NEW INVOICES enables you to enter data for up to 300 invoices with distribution to 12 GENERAL LEDGER accounts. The number of available invoice records is decreased for distributions more than three in number. For example, if an invoice is distributed to nine accounts, the computer will subtract three invoice records from the total available. Processing options for NEW INVOICES include adding, changing, displaying, and removing entries. Each invoice will be assigned a "voucher number" and you can print a proof report at

The Controller
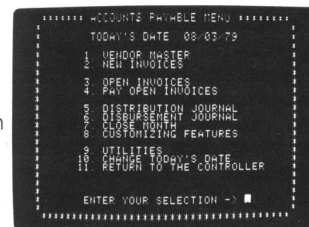
any time to double-check the data before posting.

PAY OPEN INVOICES directs the computer to print as many as 3000 checks in any one month for all invoices with a due date less than or equal to the date you enter as CHECK DATE. It also prints a PAID INVOICES REGISTER to keep track of all checks printed and posted. Up to 300 open invoices may be in the A/P system at any time. If you have chosen not to use your Apple to print checks, this selection can still be used to post the handwritten checks.

DISTRIBUTION JOURNAL allows you to post account distributions, print a report of all invoices by the respective accounts, and create all of the entries that will be transferred to the GENERAL LEDGER. Up to 100 TRANSFER JOURNAL entries may be made to the G/L system at any one time. You will be required to post at least once before you close the month.

DISBURSEMENT JOURNAL is a printed report that details what checks have been written, to whom, the check date/number/amount, and any discount received. The three accounts affected by the process are: ACCOUNTS PAYABLE and CASH IN BANK, which are reduced, and VENDOR DISCOUNTS TAKEN, which increases (if a discount for prompt payment was offered).

CLOSE MONTH is the process that ends each monthly business cycle. Before you are allowed to close the month, the system will check to be sure that certain processing functions have taken place, and that the corresponding reports have been printed. The system will also require you to make back-up copies of your data diskettes before and after closing the month.

General Ledger (G/L) System Module
After selecting GENERAL LEDGER from The Controller's main menu, your screen will display the G/L menu.

CHART OF ACCOUNTS permits you to add, change, and remove accounts, as well as to print and display them on your screen. The General Ledger System can handle up to 250 accounts, with a maximum recommended balance of $90,000,000.00 per account.

STANDARD ENTRIES is reserved for those same amounts posted to the same accounts each month, such as rent. Once these are established, you need only post them as a batch once each month, eliminating the need to retype individual entries every time. You can add, change, remove, print, and post the standard entries.

JOURNAL ENTRIES is used to make and adjust entries to the GENERAL LEDGER. Processing options include adding, changing, removing, printing, and posting entries.

The General Ledger System can handle up to a total of 700 JOURNAL ENTRY transactions and 50 STANDARD ENTRY transactions per month.

TRANSFER JOURNALS transfers data from the Accounts Receivable and Payable Systems into the GENERAL LEDGER.

TRIAL BALANCE may be run to determine if total debits equal total credits. It may be run any time you choose provided there are no unposted journal entries. The TRIAL BALANCE option will also print summarized and detailed reports.

BALANCE SHEET is used to present the financial health or status of a business at any specific time. It prints both summarized and detailed reports.

INCOME STATEMENT details the revenues and expenses of a company over a period of time. The INCOME STATEMENT is often known as "the bottom line" or the Profit and Loss (P&L) statement. This program prints both a summarized and detailed report.

CLOSE MONTH begins the process that ends each monthly business cycle. Before you are allowed to close the month, you will be required to complete certain processes and print specific reports. Closing the month will also initiate closing the year when the month-end and fiscal year-end dates coincide.

If you are using either or both ACCOUNTS RECEIVABLE and ACCOUNTS PAYABLE in conjunction with the GENERAL LEDGER, the items you have customized and the date you have specified must be identical within the system modules.
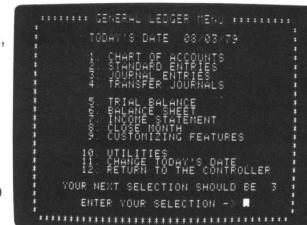
14   The Controller

System Configuration

To use The Controller, you will need the following system:
- Apple II Plus with 48K of memory;
- two Apple Disk II drives, one with 16-sector controller (see Apple Disk II section, page 71);
- a suitable video display device;
- a compatible printer* and printer controller card*.

*Note: Apple II Plus Computer Systems and Revision 1.1 of The Controller work with several printers and appropriate printer controller cards, including those specified below:
- Qume Sprint 5™ (Distributed Product D2M0060) with High Speed Serial Interface Card (Apple Product A2B0005) with P8-02 PROM (Forms Tractor: D2M0062);
- any printer with 12-pitch capability and the appropriate interface card.

Technical Specifications

Format:
16-sector diskettes.

Recommended Limits:

General Ledger

Number of Accounts	250
Journal Entries per Month	700
Standard Entries per Month	50
Entries in One Batch	100
Different Journal Numbers	700
Amount of Any One Entry	$9,000,000.00
Amount of Any One Batch	$9,000,000.00
Balance in Any One Account	$90,000,000.00

Accounts Receivable

Customers per Data Diskette	250
Monthly Transactions per Diskette	750
Statements per Diskette	250
Account Transfers to G/L	100
Transactions per Batch	100
Number of Salespeople	99
Number of Diskettes	3
Customer Balance	$360,000.00
Any Customer Aging Period	$90,000.00
Any One Sale Amount	$90,000.00
Any One "Other" Amount	$9,000.00
Any One Tax Amount	$999.99
Amount of Any One Batch	$9,000,000.00

Accounts Payable

Number of Vendors	125
Number of Open Invoices	300
Checks Printed per Month	300
Invoices per Batch	100
Monthly Transfers to G/L	100
Distribution Accounts per Inovice	12
Amount of One Transaction	$999,999.99
Amount Owed per Vendor	$999,999.99
Amount of Any One Batch	$9,000,000.00
Discount Amount per Invoice	$9,999.99

Language:
Written in Applesoft BASIC.

Reports Generated by The Controller:

General Ledger:

Chart of Accounts (no Balances)	Balance Sheet (Summary)
Chart of Accounts (with Balances)	Detail Balance Sheet
Chart of Accounts Changes	Income Statement (Summary)
General Journal Report	Detail Income Statement*
Standard Entries Journal	Income Statement (Summary for Departments)
Trial Balance (Summary)	Detail Income Statement (for Departments)
Detail Trial Balance	

Accounts Receivable:

Customer Master List	Summary Aged Trial Balance*
Customer Mailing Labels	Detail Aged Trial Balance
Sales Journal (by Entry No.)	Monthly Activity Report
Sales Journal (by Document No.)	Statements and Summary
Payment Journal (by Entry No.)	Sales Commission Report
Payment Journal (by Document No.)	

Accounts Payable:

Vendor Master List (by Vendor Name or Number)	Open Invoices by Vendor
Vendor Mailing Labels	A/P Paid Invoice Register
New A/P Invoice Register (by Voucher No.)	Checks and Stubs
New A/P Invoice Register (by Vendor No.)	A/P Distribution Journal
A/P Cash Requirements*	A/P Disbursement Journal

™Sprint 5 is a trademark of Qume Corp.

*These are the key reports generated by The Controller. Samples of each are included in The Controller appendix beginning on page 15.

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The Controller Package Revision 1.1 Order No. A2D0012

With your Controller order, you will receive:
- System Master Diskette and one back-up;
- two General Ledger System diskettes and one back-up for each;
- General Ledger Data Diskette and one back-up;
- two Accounts Receivable System diskettes and one back-up for each;
- Accounts Receivable Data Diskette and one back-up;
- two Accounts Payable System diskettes and one back-up for each;
- Accounts Payable Data Diskette and one back-up;
- four blank diskettes;
- Apple Controller instruction manual;
- 36 extra data diskette labels;
- Software License form, including an (800) toll-free number for Hotline support;
- three-ring binder;
- business forms kit sample and order forms;
- diskette holders.

Accounts Payable Cash Requirements

Obtained via Menu: A/P
Selection: Open Invoices
Purpose: Informs you of the ongoing cash requirements based on due dates for all unpaid invoices. The report produces totals per invoice, totals per due date and running totals for all unpaid invoices.
Sequence: By due date

Item	Description
A	REPORT ID—1306.1—reference this unique identifying number when calling the (800) Hotline
B	COMPANY NAME—the name of your company
C	REPORT TITLE—Accounts Payable Cash Requirements
D	DATE—date you entered for Today's Date
E	VENDOR NAME—the name of each vendor
F	VEN NO—vendor number, assigned by computer in Add Vendors
G	VOUCH NO—voucher number assigned to each invoice
H	INVOICE NUMBER—entered during New Invoices
I	INVOICE DATE—the date of the invoice
J	VOUCHER DATE—date the invoice was entered
K	INVOICE TOTAL—total amount of the invoice
L	INVOICE DISCOUNT—total amount of the terms discount for this invoice
M	INVOICE NET—amount to be paid to vendor for invoice (M = K − L)
N	DUE DATE—the date each invoice is due to be paid
O	DUE DATE TOTALS—total amount of invoices for this due date
P	DUE DATE TOTALS—total amount of discount for this due date
Q	DUE DATE TOTALS—total amount of invoice totals minus discount totals for this due date
R	RUNNING TOTALS—total amount of all invoices accumulated through this due date
S	RUNNING TOTALS—total amount of all discounts accumulated through this due date

Report key (with callout letters A–V):

01306.1 (A)

TOP-OF-THE-ICEBERG ICECUBE CO. (B)
ACCOUNTS PAYABLE CASH REQUIREMENTS (C)

DATE 02/01/84 (D)
PAGE 1

VENDOR NAME (E)	VEN NO (F)	VOUCH NO (G)	INVOICE NUMBER (H)	INVOICE DATE (I)	VOUCHER DATE (J)	INVOICE TOTAL (K)	INVOICE DISCOUNT (L)	INVOICE NET (M)
CACTUS DELIGHTS	9	9	B4567	01/27/84	02/03/84	80.12	2.40	77.72
				02/06/84 (N)	DUE DATE TOTALS	80.12 (O)	2.40 (P)	77.72 (Q)
					RUNNING TOTALS	80.12	2.40	77.72
SUNSHINE ICETRAY CO.	2	1	M2345	01/28/84	02/01/84	1000.00	30.00	970.00
				02/08/84	DUE DATE TOTALS	1000.00 (R)	30.00 (S)	970.00 (T)
					RUNNING TOTALS	1000.12	32.40	1047.72
AL'S PAPER CUPS	5	4	CM354	01/28/84	02/01/84	50.00 −	.00	50.00 −
AL'S PAPER CUPS	5	7	Z2213	01/25/84	02/02/84	283.67	.00	283.67
				02/24/84	DUE DATE TOTALS	233.67	.00	233.67
					RUNNING TOTALS	1313.79	32.40	1281.39
DESERT OASIS WATER CO.	1	5	GB215	01/26/84	02/01/84	900.00	27.00	873.00
				02/25/84	DUE DATE TOTALS	900.00	27.00	873.00
					RUNNING TOTALS	2213.79	59.40	2154.39
TUGBOAT ICEBERG MOVING	8	6	TM666	01/29/84	02/02/84	227.13	.00	227.13
COLDSTART FREEZER CO.	7	3	B333	01/28/84	02/01/84	1795.00	26.85	1768.15
PETE'S HOT PEPPERS	6	8	T1234	01/29/84	02/02/84	173.42	5.20	168.22
				02/28/84	DUE DATE TOTALS	2195.55	32.05	2163.50
					RUNNING TOTALS	4409.34 (U)	91.45 (V)	4317.89

Note: Key reports are shown less than actual size.

T	RUNNING TOTALS—total amount of all invoice totals minus all discounts accumulated through this due date
U	FINAL TOTALS—total amount of all invoices printed
V	FINAL TOTALS—total amount of all discounts printed
W	FINAL TOTALS—total amount of all invoices minus discounts printed

16   **The Controller**

Detail Income Statement

Obtained via Menu: G/L

Selection: Income Statement

Purpose: This report illustrates the revenue and expenses of your company over a period of time. This report is commonly called the "P and L" or Profit and Loss Statement. All accounts with balances for year-to-date are printed.

Sequence: Numeric by account number

Item	Description
A	REPORT ID—01111.1—reference this unique identifying number when calling the (800) Hotline
B	COMPANY NAME—the name of your company
C	REPORT TITLE—Detail Income Statement
D	DATE—date you entered as Today's Date
E	MONTH-ENDING DATE—current accounting month entered during Close Month or Startup procedures
F	CATEGORIES—Chart of Accounts category, followed by the account description
G	CURRENT MONTH—account total for the current month
H	YEAR TO DATE—account total for year-to-date
I	GROSS PROFIT/LOSS ON SALES—sales less cost of sales for current month
J	GROSS PROFIT/LOSS ON SALES—sales less cost of sales for the year-to-date
K	NET OPERATING INCOME—gross profit less operating expenses for current month
L	NET OPERATING INCOME—gross profit less operating expenses for year-to-date
M	NET INCOME/LOSS—net operating income plus other revenue less other expenses for current month
N	NET INCOME/LOSS—net operating income plus other revenue less other expenses for year-to-date

01111.1 **A**

B TOP-OF-THE-ICEBERG ICECUBE CO.
DETAIL INCOME STATEMENT **C**
E FOR MONTH ENDING 02/29/84

D DATE 02/27/84
PAGE 1

	CURRENT MONTH	YEAR TO DATE
	G	**H**
F SALES		
SALES - MERCHANDISE	11,400.00	11,400.00
SALES - OTHER	222.42	222.42
TOTAL SALES	11,622.42	11,622.42
COST OF SALES		
TOTAL COST OF SALES	.00	.00
GROSS PROFIT/LOSS ON SALES	**I** 11,622.42	11,622.42 **J**
OPERATING EXPENSES		
SALARIES - OFFICERS	1,787.50	1,787.50
LEGAL/ACCOUNTING FEES	75.00	75.00
RENT	250.00	250.00
DUES & SUBSCRIPTIONS	20.00	20.00
TOTAL OPERATING EXPENSES	2,132.50	2,132.50
NET OPERATING INCOME	**K** 9,489.92	9,489.92 **L**
OTHER REVENUE		
TOTAL OTHER REVENUE	.00	.00
OTHER EXPENSES		
INTEREST EXPENSE	1,200.00	1,200.00
TOTAL OTHER EXPENSES	1,200.00	1,200.00
NET INCOME/LOSS	**M** 8,289.92	8,289.92 **N**

Summary Aged Trial Balance

Obtained via Menu: A/R

Selection: Aged Trial Balance

Purpose: Shows who owes money and how current each customer's balance is. Only customers who have balances will be included in this report.

Sequence: Alphabetic by customer name

Item	Description
A	REPORT ID—01207.1—reference this unique identifying number if calling the (800) Hotline
B	COMPANY NAME—the name of your company
C	REPORT TITLE—Summary Aged Trial Balance
D	DATE—date you entered for Today's Date
E	MONTH-ENDING DATE—current accounting month-end date you entered during Close Month or Startup procedures
F	CUST NO—Customer number assigned by the computer
G	CUSTOMER NAME—customer's name

A 01207.1

B TOP-OF-THE-ICEBERG ICECUBE CO.
SUMMARY AGED TRIAL BALANCE **C**
E FOR THE MONTH ENDING 02/29/84

D DATE 02/28/84
PAGE 1

CUST NO.	CUSTOMER NAME	PHONE NUMBER	0 - 30 DAYS	31 - 60 DAYS	61 - 90 DAYS	PAST 90 DAYS	TOTAL DUE
F	**G**	**H**	**I**	**J**	**K**	**L**	**M**
1084	ABC COCKTAIL CO.	667-0111	.02	.00	.00	.00	.02
1088	HOTHOUSE PLANT CO.	555-1212	50.00	.00	.00	.00	50.00
1001	KENT, CLARK S.	819-4100	600.50	267.74	.00	.00	868.24
1010	MANY A SLIP TWIXT CO.	444-0120	112.90	.00	.00	.00	112.90
	T O T A L S		763.42	267.74	.00	.00	1031.16

N

Item	Description	Item	Description
H	PHONE NUMBER—customer's phone number, no area code	K	61–90 DAYS—amount of the customer's balance incurred during the 61–90 day aging period
I	0–30 DAYS—amount of the customer's balance incurred during the 0–30 day aging period	L	PAST 90 DAYS—amount of the customer's balance outstanding over 90 days
J	31–60 DAYS—amount of the customer's balance incurred during the 31–60 day aging period	M	TOTAL DUE—the total of all aging periods (I + J + K + L). This is the total amount the customer owes
		N	TOTALS—totals of all customers printed

17

Apple Writer
Text Editing Made Simple

Applications Software

The Apple Writer program turns your Apple II Plus Computer System into a sophisticated text editor—providing you with the capability to write, revise, edit, and print all types of documents quickly and inexpensively. You can easily perform every editing task, from correcting typographical errors to moving whole paragraphs. And you can precisely format and print your text letter-perfect every time.

Benefits

Apple Writer…
- *saves time often spent modifying, moving, and formatting text, with its extensive editing and printing commands…*
- *increases productivity by eliminating retyping because corrections can be made character-by-character, so there's no need to retype an entire line when only minor changes are required…*
- *is easy to learn and operate with its simplified command structure…*
- *saves paper costs and filing space with floppy diskette storage…*
- *reduces paperwork costs with its powerful editing capabilities…*
- *allows you to write in any order you choose, so text can be stored in sections and later combined in any order for printing…*
- *protects files from accidental loss through its program/system recovery and audible prompt features.*

**Apple Writer—
A Closer Look**

The Apple Writer program diskette contains a TUTORIAL text file which you can view on your screen. It introduces you to some of the features of the Apple Writer editor so that you'll feel more comfortable using the program for the first time. Just follow the simple instructions in the Apple Writer program manual to access the TUTORIAL.

The Apple Writer program is ready to use when the EDITOR MENU is displayed on your monitor or television screen.

To begin a new document, select INITIALIZE NEW FILE and press the "RETURN" key. Simply enter your text on the Apple's keyboard, and it will be displayed simultaneously on your screen. Although only upper case letters will appear, Apple Writer will automatically translate them into lower case during printing. To capitalize a letter or word, use the "ESC" key; capitals will appear as inverse video on your screen and upper case when printed.

When typing your text, pressing the "RETURN" key is necessary only at the end of paragraphs. Apple Writer will automatically insert all other "returns" during printing. You can type continuously—and faster—since there's no need to press the key at the end of every line.

If you want to insert a new word or sentence within your text, move the cursor to the desired location and begin typing. To delete information, use one of the Apple Writer commands that allow you to edit out by word, sentence, or block of text. Or simply position the cursor after the data to be deleted and backspace.

Apple Writer also provides a powerful automatic or manual "search and replace" feature. If you've misspelled a word throughout the text, for example, enter the misspelled word and its correct spelling. Then type two simple commands, and Apple Writer will change every misspelling of the word instantly. If you've overused a word and wish to replace it only in specific locations, enter the word and an appropriate synonym. Apple Writer will lead you through the text, stopping at each occurrence of the word. You can then specify where you wish each substitution to be made.

To format text, just type one of the four commands that center, left-, right-, or fill-justify lines during printing.

With your Apple Computer System connected to a compatible printer, Apple Writer will print your finished documents automatically. The Apple Writer PRINT MENU will be displayed after you have selected PRINT FILE from your EDITOR MENU.

18   Apple Writer

To print your document, select PRINT NEW DOCUMENT and press the "RETURN" key. Apple Writer will then display a listing of printer parameters.

Specify desired line spacing, number of lines per page, page numbering, and margins. Then press the "RETURN" key once more. Apple Writer will print your document exactly as you've specified.

With Apple Writer, a first draft can be the final copy—every time.

```
THE FOLLOWING PRINTER CONSTANTS ARE SET:

(A) LEFT MARGIN                       =  4
(B) RIGHT MARGIN                      = 90
(C) TOP MARGIN                        =  5
(D) BOTTOM MARGIN                     =  0
(E) SPACES BETWEEN LINES              =  0
(F) LINES PER PAGE                    = 56
(G) SINGLE PAGE (1)YES,(0)NO          =  0
(H) DATA BIT 8  (1)SET,(0)CLEAR       =  1
(I) PAGE NUMBER (0,DON'T PRINT)       =  0
(J) PRINTER ADDRESS                   = $C100

TO CHANGE, ENTER LETTER OF ITEM.

TO ACCEPT, MAKE NO ENTRY: ■
```

System Configuration

To use Apple Writer, you will need the following system:
■ Apple II Plus with 48K of memory;
■ Apple Disk II drive with 16-sector controller (see Apple Disk II section, page 71);
■ a suitable video display device;
■ a compatible printer* and printer controller card*.

*Note: Apple II Plus Computer Systems and Apple Writer work with several printers and appropriate controller cards, including those specified below:
■ Apple Silentype Printer with Silentype Interface Card (supplied with printer);
■ Printronix with Parallel Interface Card (Apple Product A2B0002);
■ Qume Sprint 5 (Distributed Product D2M0060), Diablo Hyterm™, and NEC Spinwriter™ 5510R with High Speed Serial Interface Card (Apple Product A2B0005) with P8-02 PROM.

Technical Specifications

Format:
16-sector diskettes.

Language:
Written in machine language, usable with Integer BASIC or Applesoft.

Display:
Up to 24 lines of 40 characters/spaces each. Upper case displayed in inverse video.

Storage:
Up to 31,901 characters per file, 95 pages of text per diskette.

Editing Functions:
Cursor Control—Cursor can be moved up, down, left or right one space at a time; up or down 12 lines at a time; or to beginning or end of text.
Free Memory—Allows user to check amount of memory available.
Disk Access—Allows user to catalog or save files to diskette.
Upper Case Conversion—Allows the user to change up to 15 lines of text into upper case instantly.
Insert/Save—Allows the user to insert a stored file into a new document or save a file segment to the diskette.
Search and Replace—Allows automatic or manual search and replacement of user-specified "strings," including single characters, or words and phrases, parts of words and phrases, sentences, etc., up to a maximum of 76 characters each.
Deletions—Deletes by character, word or paragraph up to 256 characters.
Move Block—Moves block of data within a file.

Printing Functions:
Justify—Allows user to specify centered, or fill-, right-, or left-justified lines of text.
New Page—Allows user to specify when a new page should be started.
Margin Set—Allows user to set top, bottom, left and right margins.
Line Spacing—Allows user to select the number of spaces between lines.
Paper—Provides for continuous fan-fold and single-sheet paper.

Note: Apple Writer does not provide tab, proportional spacing, or underscoring capabilities.

The Apple Writer Package
Order No. A2D0026

With your Apple Writer order, you will receive:
■ write-protected Apple Writer diskette;
■ non-write protected Apple Writer diskette;
■ Apple Writer instruction manual.

™ Hyterm is a trademark of Diablo Systems Inc.
 Spinwriter is a trademark of Nippon Electric Company

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Apple Plot

"Charting" the Way

Applications Software

The Apple Plot program allows you to use your Apple Computer System to create, revise, and print highly detailed charts and graphs quickly and easily. Any information, from sales and stock activities to caloric intake and miles per gallon, can be presented in a visually appealing, comprehensive bar, line or scatter chart.

The program allows you to specify each axis, update and change information, and label the charts exactly as you wish. Graphs can be colored for differentiation and effect. With the Apple Graphics Tablet, you can further customize any graph with a company logo or other marking. Transparencies of finished graphs can be used for presentations; hard copy can be printed for reports and later analysis.
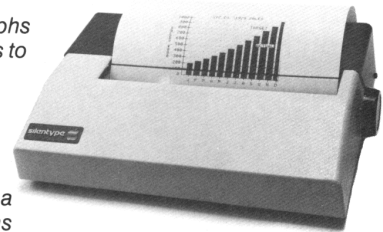
Benefits

Apple Plot…
■ helps you understand numerical information by displaying it graphically…
■ offers the capability for displaying externally generated data, because it can be used with other data base programs…
■ saves countless hours of design and drawing time by producing a finished chart automatically—you need only provide data points and choose the format…
■ offers versatility in presenting material, because it provides six graph forms from which to choose…
■ allows data to be differentiated on the screen through your Apple's color capability…
■ permits design of custom plots because the user controls every graph parameter…
■ provides for comparisons because two graphs can be displayed on the same axis, and each graph can contain up to 100 points.

Apple Plot— A Closer Look

It's easy to put Apple Plot to work. The program diskette contains sample data sets to help you learn to create custom plots. Following the step-by-step instructions in the Apple Plot manual, you can "chart" your way, selecting functions from the program's main menu.
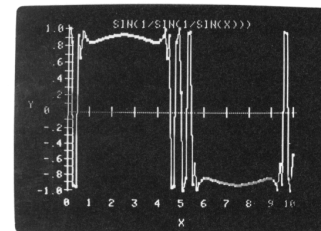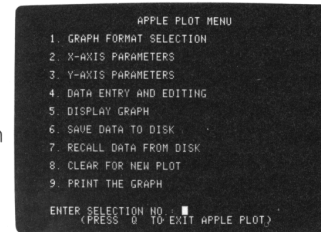
GRAPH FORMAT SELECTION—This Apple Plot option offers a choice of six graph formats for plotting up to two separate data sets in a single display. If you're plotting one or two separate data sets, there is a special overlay capability which allows additional data sets to be placed on the same graph. You can also physically exchange the coordinate data of the two data sets automatically, as well as specify colors.

X-AXIS AND Y-AXIS PARAMETERS—These options let you specify the limits, resolution and labeling of the axes. Apple Plot will ask questions about the data (for example, "IS THIS A MONTHLY PLOT?"), display a possible reply (called a "default" reply), and wait for you to either confirm its answer or type in a different one.

DATA ENTRY AND EDITING—This option is used for: entering the number of data points in a graph; specifying where they are to be placed; changing information if necessary; or displaying a list of the data points in the current data set.

DISPLAY GRAPH—This option actually produces the graph on the screen.

SAVE DATA TO DISK—There are two forms in which you can save Apple Plot data onto an Apple diskette: DATA and PICTURE. DATA saves the data points in both data sets, the selected graph format, and all of the X- and Y-axis parameters. PICTURE saves the Apple's high-resolution screen image of the most recently displayed graph (especially useful when other graphs have been overlayed).

```
           APPLE PLOT MENU
1. GRAPH FORMAT SELECTION
2. X-AXIS PARAMETERS
3. Y-AXIS PARAMETERS
4. DATA ENTRY AND EDITING
5. DISPLAY GRAPH
6. SAVE DATA TO DISK
7. RECALL DATA FROM DISK
8. CLEAR FOR NEW PLOT
9. PRINT THE GRAPH

ENTER SELECTION NO ■
   (PRESS  0  TO EXIT APPLE PLOT.)
```

20   Apple Plot

RECALL DATA FROM DISK—Although there are only two ways to store Apple Plot data onto a diskette, there are three in which to recall it: DATA, DATA (RAW) and PICTURE. When you recall DATA, Apple Plot will display all stored data; when you recall DATA (RAW), it will provide only the data points (used for reading data generated by external programs.) PICTURE recall simply redraws a previously developed high-resolution screen image, exactly as it looked when it was saved.

CLEAR FOR NEW GRAPH—Resets all parameters and data to begin a new graph.

PRINT THE GRAPH—Provides hard copy printout of graphs when an Apple Silentype or Qume Sprint 5 is connected to your system.

Additionally, there's a special program on the Apple Plot diskette that allows you to use your stored charts and graphs in a "slide show" on your monitor or television screen. This unique capability is ideal both for reviewing different graphs and for making presentations without the need for hard copy or other printed visuals.

System Configuration

To use Apple Plot, you will need the following system:
- Apple II Plus with 48K of memory;
- Apple Disk II drive with controller (second drive optional);
- a suitable video display device;
- a compatible printer* and printer controller card* (optional).

*Note: Apple II Plus Computer Systems and Apple Plot work with several printers and appropriate controller cards, including those specified below:
- Apple Silentype Printer with Silentype Interface Card (supplied with printer);
- Qume Sprint 5 (Distributed Product D2M0060) with High Speed Serial Interface Card (Apple Product A2B0005) with P8-02 PROM.

Technical Specifications

Format: 13-sector diskette.

Language: Written in Applesoft BASIC.

Program Status Codes:
Ranging Data—displayed when data has been read in the Raw format.
Check Your Input—displayed, accompanied by three "beeps," whenever Apple Plot encounters an error or inconsistency of any kind while trying to recall data from the diskette.
Clearing—displayed when Apple Plot is resetting all parameters to their original default values.

Default Values:
Graph Format Selection: Standard Graph with Graph Overlay
(bar and scatter plots also available)
Overlay Additional Graphs: OFF
Color for Plot 1: White   Color for Plot 2: Blue

X-Axis Parameters:

Monthly Plot: No	X-Axis Label: X
First Month: 1	Use Label #1: No
Number of months: 12	Change Label #1: No
Yearly Plot: No	Text for Label #1: (blank)
Number of first year: '80	Use Label #2: No
Number of last year: '90	Change Label #2: No
Number of Divisions: 10	Text for Label #2: (blank)
Maximum X-Axis Value: 1	Extended Vertical Grid Lines: No
Minimum X-Axis Value: 0	

Y-Axis Parameters:
Number of Divisions: 10
Maximum Y-Value: 1
Minimum Y-Value: 0
Y-Axis Label: Y
Title of Graph: Unformatted Graph
Extended Horizontal Grid Lines: No

Data Entry and Editing:

Number of data points:	Data Entry:
Starting point for plot 1:0 Starting point for plot 2:0	All data points, X-value: 0
Ending point for plot 1:0 Ending point for plot 2:0	All data points, Y-value: 0

Display Graph:
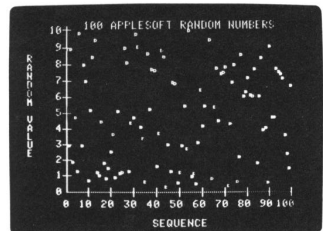Location of label 1
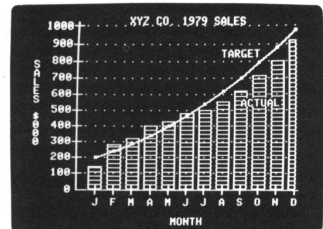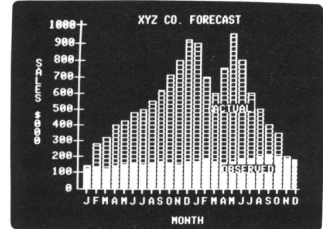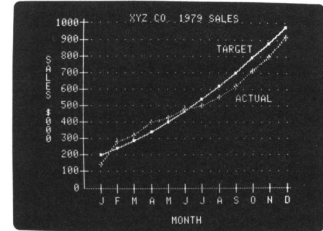(before positioning): upper left-hand corner
Location of label 2
(before positioning): upper left-hand corner

The Apple Plot Package Order No. A2D0033

With your Apple Plot order, you will receive:
- one write-protected Apple Plot diskette;
- Apple Plot instruction manual.

21

Apple Post
Mailing List Maintenance the Apple Way

Applications Software

Apple Post is a mailing list system designed for your Apple II Plus that allows you to enter, edit, and store names, addresses and telephone numbers. When your Apple Computer System is attached to a compatible printer, Apple Post will also print mailing labels, address and telephone lists, and your personal ZIP code directory.

Benefits

Apple Post…
- *allows small businesses to take advantage of direct mail to customers, because it uses the power of the Apple computer to maintain customer lists and print mailing labels…*
- *locates names that you wish to modify or which may have been misspelled during data entry, through its phonetic search routines…*
- *provides you with the capability to perform demographic mailings quickly and easily, because it will print addresses by specified ZIP codes or other identifiers through its special search routines…*
- *offers you the option of printing complete or specified portions of any list for your review, or files through its select routine…*
- *automatically prints mailing labels of completed or selected mailing lists through its LABELS routine.*

Apple Post—A Closer Look

Apple Post will hold approximately 500 name and address records on a single diskette (a minimum of two disk drives is required). Five full diskettes, or a maximum of 2590 records, can be kept on-line with a six-drive system*.

Apple Post allows you to break up large, unwieldy mailing lists into smaller, more manageable ones. With it, for example, a magazine subscription list could be divided into one list for subscriptions that expire in January, a second for those ending in February, and so on.

Examples from the program's VALID COMMANDS list illustrate Apple Post's versatility.

EXPLAIN lets you display a brief three-line summary of any command. It is an extremely handy reference guide to Apple Post's wide range of features.

With ENTER you can add new entries to your mail list. After keying in the command, a preformatted NEW ENTRY screen will appear. It includes NAME, ADDRESS, CITY/STATE, ZIP, ATTN, PHONE, SORT KEY, and UTILITY fields.

The ATTN line lets you store important information that can help your message reach the right hands. For example, if the NEW ENTRY screen NAME entry is the title of a company, the ATTN line (printed out above NAME on the Apple Post mailing label) could be used to target an individual or department within that organization.

All Apple Post listings are stored in alphabetical order by SORT KEY. Since most mail list applications utilize an A-to-Z addressee sequence, newly entered NAME information will automatically appear as your SORT KEY "default reply." You can replace any default SORT KEY entry simply by typing in the change.

UTILITY allows you to "flag" or designate entries as belonging to special groups. Used in conjunction with Apple Post's SELECT command, this handy feature enables you to specify and print out sub-lists of mailing labels.

EDIT lets you modify any name and address record entry (with the exception of the SORT KEY, which remains protected), or delete the entire record.

FIND makes it easy to locate names on your list even if you're unsure how they're spelled. Simply enter an appropriate spelling—the FIND command will zero in on every entry similar to the one you are seeking.

*Note: It may not be possible to build six-drive systems with the new, short FCC-proof cables.
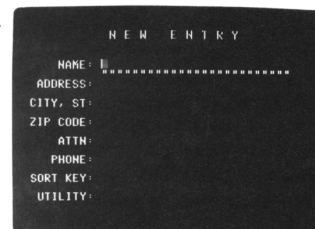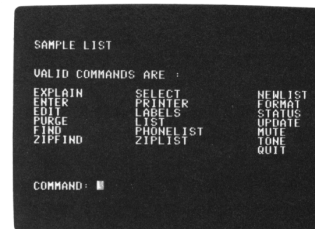
22   Apple Post

ZIPFIND searches Apple Post records based on any ZIP code you choose. You can also modify name and address entries accessed through this command.

System Configuration

To use Apple Post, you will need the following system:
- Apple II Plus with a minimum 32K of memory;
- two Apple Disk II drives, one with controller;
- a suitable video display device;
- a compatible printer* and printer controller card* (optional).

*Note: Apple II Plus Computer Systems and Apple Post work with several printers and appropriate controller cards, including those specified below:
- Printronix with Parallel Interface Card (Apple Product A2B0002);
- Qume Sprint 5 (Distributed Product D2M0060), Diablo Hyterm, and NEC Spinwriter 5510R with High Speed Serial Interface Card (Apple Product A2B0005) with P8-02 PROM.

Technical Specifications

Format:
13-sector diskette.

Language:
Written in Applesoft BASIC.

Function:
Mailing list maintenance.

Maximum Size of an On-line List:
2590 names.

Field Sizes:

Name	25 characters
Street Address	25 characters
City & State	20 characters
ZIP Code	9 characters
Attention Line	20 characters
Telephone Number	12 characters
Sort Key	10 characters
Utility Field	10 characters

Record Sizes:

Name & Address Files	155 bytes
Soundex Index File	17 bytes
ZIP Code Index File	17 bytes

Disk Drive Requirements:

1 to 500 Names	2 drives
501 to 1000 Names	3 drives
1051 to 1570 Names	4 drives
1571 to 2105 Names	5 drives
2106 to 2590 Names	6 drives

The Apple Post Package Order No. A2D0013

With your Apple Post order, you will receive:
- Apple Post diskette;
- Apple Post mailing list system manual.

23

Dow Jones Series Portfolio Evaluator

The Stock Market at Your Fingertips

Applications Software

The Dow Jones Series Portfolio Evaluator program allows you to store, modify, and update approximately 100 individual portfolios of up to 50 stocks each on a single diskette. Additionally, by connecting your Apple Computer System to a telephone, the Portfolio Evaluator program permits you to access quotes for thousands of companies using the Dow Jones News/Retrieval System.

The Portfolio Evaluator—a convenient, time-saving way to keep your finger on the pulse of the stock market.

Benefits

The Dow Jones Series Portfolio Evaluator…

■ *saves time usually spent obtaining quotes from a broker by giving you access to information about stocks, preferred stocks, and warrants listed by Dow Jones…*

■ *eliminates the need for time-consuming math, because it instantly tabulates the current value—gains or losses—of each portfolio, and displays it on the screen or on paper via a printer…*

■ *increases your efficiency, because it automatically catalogs the portfolios by name and displays the complete catalog for your review upon command.*

Dow Jones Series Portfolio Evaluator— A Closer Look

The Portfolio Evaluator main menu contains three program options.

To create a portfolio, select the EDIT or CREATE PORTFOLIOS option. The edit module will be loaded from the diskette, and the Portfolio Evaluator program will lead you through the data entry process step-by-step. Preformatted screens assist you in entering stock symbol, number of shares, purchase date, and purchase price for each stock in a portfolio.

Perhaps the most exciting aspect of the Portfolio Evaluator is its ability to let you "log on" to the Dow Jones News/Retrieval Service. With your password (which will be given to you by your dealer when you sign the Dow Jones Stock Quote Reporter agreement), you will be able to access the Dow Jones computer and "fetch" current quotes in real time. (To conform with federal regulations, stock quotations are delayed 15 minutes.) You'll need a working telephone, a modem, and a special interface to take advantage of this part of the program. (See System Configuration.)

To access Dow Jones, select FETCH CURRENT QUOTATIONS from the main menu; the "log on" module will be loaded into your Apple. Once again, the Portfolio Evaluator will lead you through this part of the program step-by-step. You'll be instructed to dial a Dow Jones telephone number (local, in most cases) and insert your telephone receiver into the modem. After you have satisfied the Dow Jones computer with an acceptable password, you'll be able to update every quote in every portfolio on your diskette.

You can review a revised portfolio simply by choosing DISPLAY OR EVALUATE STOCKS from the main menu. The display module will be loaded from the diskette, and you will be asked for the name of the portfolio you wish to review. Type the name and press the "RETURN" key. If you've forgotten the name of the portfolio, simply type a question mark and press the "RETURN" key to view the diskette catalog.

After identifying the desired portfolio from the catalog, press the space bar and enter its name. "SEARCHING FOR PORTFOLIO" will appear on your screen. You will be presented with a list of four options within seconds.

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The first three options listed allow you to obtain previously stored information within the specific portfolio; the fourth option—PRINTER ON/OFF—allows you to print that information.

Note: The Dow Jones Series Portfolio Evaluator maintains only those investment portfolios which are entirely composed of common stocks contained in the Dow Jones News/Retrieval Service. The Portfolio Evaluator does not maintain records of dividend payments. The user must manually adjust portfolios for stock splits.

System Configuration

To use the Dow Jones Series Portfolio Evaluator, you will need the following system:
- Apple II Plus with a minimum 32K of memory;
- Apple Disk II drive with controller;
- an acoustic coupler (modem) with appropriate interface card (e.g., Communications Interface Card: Apple Product A2B0003);
- a standard, working telephone;
- a suitable video display device;
- a compatible printer* and printer controller card*.
- "password" for the Dow Jones News/Retrieval Service.

*Note: Apple II Plus Computer Systems and the Dow Jones Series Portfolio Evaluator work with several printers and appropriate controller cards, including those specified below:
- Apple Silentype Printer with Silentype Interface Card (supplied with printer);
- Printronix with Parallel Interface Card (Apple Product A2B0002);
- Qume Sprint 5 (Distributed Product D2M0060), Diablo Hyterm, and NEC Spinwriter 5510R with High Speed Serial Interface Card (Apple Product A2B0005) with P8-02 PROM.

Technical Specifications

Format:
13-sector diskette.

Storage:
Up to 50 stocks in a single portfolio; 100 portfolios of 50 stocks each on a single diskette.

Language:
Written in Applesoft BASIC.

Dow Jones Access:
15-minute tape delay; exchanges include NYSE, AMEX, and OTC NASDAQ.

Note: The cost of the Portfolio Evaluator package includes the one-time password fee necessary to use the Dow Jones News/Retrieval Service. There are additional connect-time charges, as per the existing Dow Jones rate schedule. Your dealer can explain these to you.

The Portfolio Evaluator Package Order No. A2D0007

With your Portfolio Evaluator order, you will receive:
- Dow Jones Series Portfolio Evaluator diskette;
- Dow Jones Series Portfolio Evaluator instruction manual;
- Dow Jones News/Retrieval directory.
- Dow Jones Stock Quote Reporter contract.

25

Dow Jones
News & Quotes Reporter

Selected Business News at the Touch of a Key

Applications
Software

The Dow Jones News & Quotes Reporter gives investors, analysts, brokers, managers, and executives fast access to business and other news and stock market information.

The program allows users to retrieve—over telephone lines—the latest stock exchange quotations for more than 6000 securities, as well as past and current news stories and headlines from the Dow Jones News/Retrieval service, The Wall Street Journal, and Barron's. In addition, users can get financial operating data for thousands of companies through the Media General Financial Services, complete transcripts of the Wall Street Week television program, weekly money market forecasts, and other information.

The Dow Jones News & Quotes Reporter—your key to sound investment decisions in a fast-changing financial world.

Benefits

The Dow Jones News & Quotes Reporter...

■ *saves time spent skimming and searching through business media, by putting financial headlines and news stories at your fingertips...*

■ *keeps you informed of market price fluctuations, by providing fast access to quotations for more than 6000 securities listed on the major stock exchanges...*

■ *gives you greater flexibility, allowing you access to new Dow Jones information services and data bases as they develop in the future...*

■ *renders concise records for business or tax purposes through a monthly Dow Jones access time billing.*

Dow Jones News & Quotes Reporter— A Closer Look

You may automatically "log on" to Dow Jones News/Retrieval over local telephone lines, using either an auto-dial or acoustic modem, and a special password. In the U.S., access the service through local telephone numbers for either the TYMNET® or TELENET® communications networks. In Canada, access via a local telephone number of the Bell Canada DATAPAC™ system.

Manual log-on is provided in addition to the automatic log-on capability of the TYMNET, TELENET, and DATAPAC communications networks. Manual entry serves as a supplement to the automatic method, as well as log-on for future communications networks.

Your Apple II Plus system automatically initiates the log-on procedure —and even dials the correct phone number for you, if you have an auto-dial modem. Six program selections are displayed in the main menu.

By selecting the NEWS/RETRIEVAL SERVICE option, you can access, display, and print news headlines and entire stories from the worldwide network of Dow Jones News/Retrieval, The Wall Street Journal, and Barron's. You can obtain news either by category or company. For example, you may be interested in current news concerning taxes, aerospace, or Apple Computer, Inc. Simply enter the appropriate symbol (as found in the program guide provided by Dow Jones); then ask to see the most recent news story on the chosen subject or to review story headlines from the last three months.

The QUOTE SERVICE option lets you access, display, and print timely stock and composite quotes on corporate stocks and bonds, options, mutual funds, and treasury notes and bonds on the New York, American, Midwest, and Pacific Stock Exchanges, plus the Over-the-Counter market (OTC NASDAQ). (Stock quotations are delayed by at least 15 minutes.)

Selection 3—ADDITIONAL INFORMATION SERVICES—allows you

Note: Several of the Dow Jones data bases are presented best if viewed in 80-column format. Accordingly, Dow Jones News & Quotes Reporter supports an 80-column display using an appropriate 80-column circuit board. Ask your dealer for details.

Dow Jones is a trademark of Dow Jones & Co., Inc.
TYMNET is a registered trademark of Tymshare, Inc.
TELENET is a registered trademark of Telenet Communication Corp.
DATAPAC is a trademark of Bell Canada.

```
          DOW JONES
      NEWS & QUOTES REPORTER

   1   NEWS RETRIEVAL SERVICE
   2   QUOTE SERVICE
   3   ADDITIONAL INFORMATION SERVICES
   4   CUSTOMIZING FEATURES
   5   DISCONNECT FROM DOW JONES
   6   EXIT NEWS & QUOTES REPORTER


   ENTER YOUR SELECTION ■
```

```
NEWS I/RET     HEADLINE  PAGE 1/19 [B]
HM 08/12 J.C.PENNEY 2ND QTR NET 7C A
   (DJ )  SHR VS 24C
HL 08/12 KORVETTES SUPPLIERS REPORTEDLY
   (DJ )  HALT OR DELAY SHIPPING GOODS
HK 08/11 SHOPPING CENTER TENANTS
   (WSJ)  SQUABBLE OVER HOURS
HJ 08/08 ARLEN RLTY SAYS KORVETTES'
   (DJ )  LENDERS ACCELERATE LOANS
HI 08/08 WOOLWORTH BRITISH UNIT AGREES
   (D-W)  TO BUY FIRM FOR $39.3 MILLION
_____
HEADLINE PAGE ■  OR STORY ID ■    OR
! TO PRINT, # FOR NEW SYMBOL, ? FOR HELP
```

```
         STOCK QUOTES SERVICE
      QUOTES DELAYED 15 MINUTES
           SYMBOL  GM
       SECURITY  S       EXCHANGE
   BID /(CLOSE)    54 5/8
   ASKED /(OPEN)   54 1/2
   HIGH            54 5/8
   LOW             54 3/8
   LAST            54 3/8
   VOLUME (100'S)  675


   ■ RETRIEVING QUOTE...
```
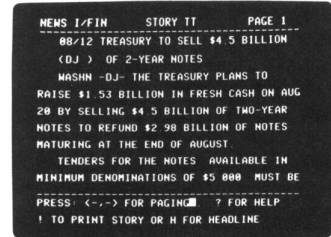
"DTCA2DOC-306-01-25.PICT" 2292 KB 2001-04-03 dpi: 300h x 300v pix: 2172h x 3012v

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to access, display, and print the many other available Dow Jones information services, including Medial General Financial Services, Wall Street Week transcripts, Earnings Estimator, weather forecasts and conditions for major cities, sports updates, and various financial data bases. It will also allow you to access new information services as they develop in the future.

    Any information accessed by the program may be printed—giving you a hardcopy record for future reference. By selecting the CUSTOMIZING FEATURES option, you can specify characteristics of your intended program. In addition, you can designate a local log-on telephone number and your modem tape, and be able to start the program automatically.

    The fifth menu option, DISCONNECT FROM DOW JONES, disconnects your line from the Dow Jones phone number but leaves the program ready to run as soon as you need it again. This feature helps you save money on connect-time charges. The final option, EXIT NEWS & QUOTES REPORTER, terminates the program, and leaves your Apple II Plus ready to use with other software.

```
NEWS I/FIN      STORY TT          PAGE 1
------------------------------------------
  08/12 TREASURY TO SELL $4.5 BILLION
 (DJ )  OF 2-YEAR NOTES
 WASHN -DJ- THE TREASURY PLANS TO
RAISE $1.53 BILLION IN FRESH CASH ON AUG
20 BY SELLING $4.5 BILLION OF TWO-YEAR
NOTES TO REFUND $2.98 BILLION OF NOTES
MATURING AT THE END OF AUGUST.
  TENDERS FOR THE NOTES  AVAILABLE IN
MINIMUM DENOMINATIONS OF $5.000  MUST BE

PRESS  <-,-> FOR PAGING█   ? FOR HELP
! TO PRINT STORY OR H FOR HEADLINE
```

System Configuration

To use the Dow Jones News and Quotes Reporter, you will need the following system:

- Apple II Plus, with a minimum 48K of memory;
- Apple Disk II drive with 16-sector controller (see Apple Disk II);
- an acoustic modem with either the Apple Super Serial Card (or previous Apple Communications Interface Card or Apple High-Speed Serial Card); or an autodial modem;
- a standard, working telephone;
- a suitable video display device;
- a compatible printer* and printer controller card* (optional).

*Note: Apple II Plus computer systems and Dow Jones News & Quotes Reporter work with several serial and parallel printers and appropriate controller cards, including those specified below:
- Apple Silentype Printer with Silentype Interface Card (supplied with printer);
- Qume Sprint 5 (Distributed Product D2M0060) with Apple Super Serial Card (Apple Product A2B0044) or previous High-Speed Serial Interface Card with P8-02 PROM.

Technical Specifications

Format:
16-sector diskettes.

Language:
Written in Pascal (Run time only—Language Card not required).

Dow Jones Access:
Minimum 15-minute tape delay; exchanges include NYSE, AMEX, Midwest, Pacific, Composite, and OTC NASDAQ.

Dow Jones Toll-Free Information: (800) 257-5114 [In New Jersey, call (609) 452-1511.]

Note: The cost of the Dow Jones News & Quotes Reporter package includes the one-time password fee necessary to use Dow Jones News/Retrieval. In addition, there are also Dow Jones connect-time charges. If you already own the Dow Jones Series Portfolio Evaluator program, or a previous release of the Dow Jones News & Quotes Reporter, then you have paid for and received a usable password. Should you already have a Dow Jones password, you will be credited with one hour of connect time (at no charge) from Dow Jones during non-prime-time hours. The free time offer is restricted to the first 30 days following purchase. To receive your password or credit, follow the steps on the Dow Jones Information Sheet contained in your program package.

The Dow Jones News & Quotes Reporter Package Order No. A2D0030

The News & Quotes Reporter package contains:
- Dow Jones News & Quotes Reporter master diskette;
- Dow Jones News & Quotes Reporter back-up diskette;
- instruction manual;
- Dow Jones News/Retrieval operating guide and symbol directory;
- Dow Jones News/Retrieval contract and password information sheet;
- free hour of connect time, to be used during non-prime-time hours, within 30 days of the date of purchase of the Dow Jones News & Quotes Reporter package. (Your dealer can give you the non-prime-time hours in your area.)

27

Apple II Business Graphics

For the Business Professional

Applications Software

Apple II Business Graphics allows you to transform numerical data into a wide variety of easy-to-understand charts and graphs. Based on a simple command language, it offers many powerful features — including mathematical and statistical functions — previously unavailable in business graphics packages.

With Apple II Business Graphics, you can: perform curve fitting and trend line analysis; produce pie charts and horizontal bar graphs; plot two or more graphs on the same set of axes; utilize the program's macro command language to develop complex graphic presentations; and much, much more.

Benefits

Apple II Business Graphics:
- *offers enormous flexibility, because it allows you to load and plot data from Apple Pascal, DIF,® as well as 13- and 16-sector BASIC, Apple Plot, and VisiCalc®;*
- *is ideal for video and print presentations because it converts numerical information into eye-catching, easy-to-comprehend charts and graphs;*
- *allows you to make in-depth comparisons quickly, because you can plot two or more graphs on the same set of axes with just a few keystrokes;*
- *facilitates data analysis by enabling you to enlarge any area of a graph and study it closely;*
- *lets you specify axis labels, floating labels, plot colors, and horizontal and vertical axis ranges, giving you complete control of all graph parameters.*

Apple II Business Graphics— A Closer Look

Apple II Business Graphics is extremely easy to use. With it, you can convert sales and stock activities, manpower projections, quality and control data—any numerical information, in fact—into visually attractive, comprehensive charts and graphs. Generate line, dash, and area-filled graphs; horizontal and vertical bar graphs; pie charts and scattergrams. You choose the graph type that will best display your data.

The program's easy-to-master command language is based on literal verb-noun and verb-noun-modifier statements. By typing DRAW BAR, for example, you can instruct Apple II Business Graphics to draw a bar graph. Highly interactive, this powerful program also recognizes abbreviated commands, further simplifying data entry. SET COLOR BLUE, for instance, can be accomplished with only six keystrokes—SE CO BL.

Apple II Business Graphics enables you to replace multiple command sequences with macro commands, allowing otherwise lengthy instructions to be entered simply and efficiently. This handy feature makes it possible for you to combine a number of commands into a single macro command requiring minimal keystrokes.

Apple II Business Graphics allows you to load, plot, and analyze data from: 13- and 16-sector VisiCalc print files; DIF format; 13- and 16-sector Apple Plot; 13- and 16-sector BASIC text files, as well as Apple Pascal text files. You can perform statistical analysis on data files to determine minimum, maximum, sum, mean, standard deviation, and variance. Or establish data trends through fitting least squares, constant, parabola, logarithmic, and sine curves.

28   Apple II Business Graphics
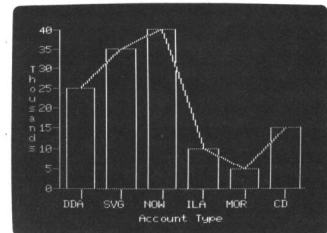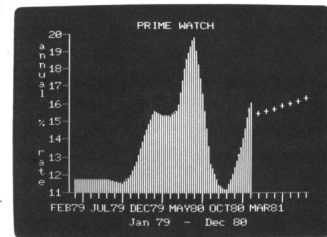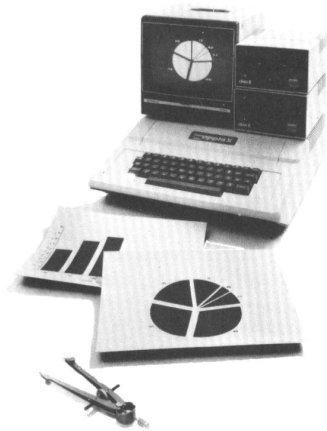
System Configuration

To use Apple II Business Graphics, you will need the following system:
- an Apple II Plus with 48K of memory;
- two Apple Disk II drives, one with 16-sector controller;
- Apple Language Card;
- a suitable video display device;
- a compatible printer* and printer controller card* (optional);
- a compatible plotter* and plotter controller card* (optional).

*Note: Apple II Plus Computer Systems and Apple II Business Graphics work with several plotters, printers and appropriate controller cards, including those specified below:
- Hewlett-Packard 7225A/B, Houston Instruments DMP-3, -4 plotters with High Speed Serial Interface Card (Apple Product A2B0005);
- Apple Silentype Printer with Silentype Interface Card (supplied with printer);
- Qume Sprint 5® (Distributed Product D2M0060) with High Speed Serial Interface Card (Apple Product A2B0005) with P8-02 PROM.
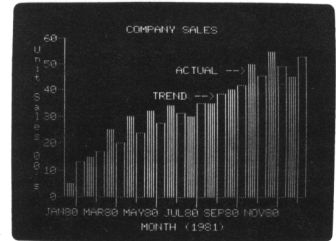
Technical Specifications

Format: 16-sector diskette.

Language: Written in Pascal and assembly language.

Imaging:

Graph Types: Scatter, solid-line, dash-line, bar (vertical or horizontal), pie (filled or outline), and multiple overlays.

Color: Six available on color monitor—user-selected or default values.

Titling/Labeling: Alphanumeric labeling on x- and y-axis. Auto-scale or user-defined label ranges. Centered titles. Floating titles—any number of horizontal or vertical. Tick marks and extended grid lines.

Graphic Devices: Console, Silentype, and Qume Sprint 5 printers; Hewlett-Packard 7225A/B (with 17603A, RS-232 Personality Module) and Houston Instruments DMP-3, -4 high-quality pen plotters.

Data Manipulation:

The following curves can be FITted to any data set:
LINE LOGARITHMIC CONSTANT SINE PARABOLA
Coefficients can be manually set to produce known curves.

The following statistical analysis can be performed on any data set:
MINIMUM MEAN MAXIMUM STANDARD DEVIATION SUM VARIANCE

Either moving average or exponential smoothing may be performed with a single command.

Additional data manipulation commands: ADD SHIFT DIFFERENCE SUBTRACT (FROM) DIVIDE (BY/INTO) SUM MULTIPLY

TAKE Files: Store Business Graphics commands in a single file that allows multiple, complex plots to be recreated with a single command. WAIT command allows user to insert a timed pause in a TAKE file.

Virtual Files: Virtual file system allows user to utilize large data files exceeding the size of computer memory. Default virtual file provides space for approximately 90-100 points. SET VIRTUAL FILE command allows user to define a virtual file on another diskette, greatly expanding the maximum number of points to be processed.

Interchange Facility: Generates a BUSINESS GRAPHICS data file from the following common formats: VisiCalc print files (13- and 16-sector); Apple Plot (13- and 16-sector); DIF format; BASIC text files (13- and 16-sector); Apple Pascal.
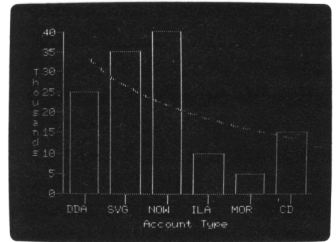
The Apple II Business Graphics Package Order No. A2D0049

With your Apple II Business Graphics order, you will receive:
- two Apple II Business Graphics master diskettes;
- one Apple II Business Graphics data diskette;
- blank diskette;
- Apple II Business Graphics tutorial/reference manual.

® DIF (Data Interchange Format) is a registered trademark of Software Arts, Inc.
  VisiCalc is a registered trademark of Personal Software, Inc.
  Sprint 5 is a registered trademark of Qume Corp.

29

Elementary, My Dear Apple

Problem Solving and Spelling for Youngsters

Applications Software

Elementary, My Dear Apple is a collection of four programs designed to help youngsters learn to spell, understand arithmetic concepts, and sharpen problem-solving skills. Recommended for children 12 years of age and up, Elementary, My Dear Apple is an entertaining way to learn some basic educational concepts.

The first program on the Elementary, My Dear Apple diskette is LEMONADE, a business simulation game for one or two players. The remaining three, each designed for a single player, are DARTS, SUPERMATH, and DON'T FALL. Respectively, they help students understand fractions, solve basic arithmetic problems, and improve word recognition and spelling.

Elementary, My Dear Apple will provide young users with many hours of educational entertainment.

Benefits

Elementary, My Dear Apple…
■ *is an excellent teaching aid, because it turns rote learning into friendly competition with an Apple computer…*
■ *absorbs children's attention for hours while they learn by offering four different educational games that are all challenging to play…*
■ *provides wholesome home entertainment that can be enjoyed by all family members.*

Elementary, My Dear Apple— A Closer Look

It's simple and fun to play the games in Elementary, My Dear Apple. Just insert the program diskette into your disk drive. A colorful title page welcomes you to the program and leads directly to the program selection chart menu.

LEMONADE is a business simulation game that combines math drills with business acumen. The player tries to make profits each day from his or her lemonade stand by estimating the number of glasses that will be sold, setting the price per glass, forecasting the cost of material and advertising, and anticipating the effect on sales of changes in the weather.

DARTS teaches fractions and fraction estimation in a game that simulates throwing darts at balloons. Every time the player hits a balloon, a fraction is displayed. The displayed fraction is then used as a reference for the next "throw."

SUPERMATH is a drill and practice program that teaches addition, subtraction, multiplication, and division at several levels of difficulty. The player can concentrate on specific drills (for example, "7x" multiplication tables), and can specify whether only integers should be used, or integers with remainders. The program will also help the player determine the level of difficulty and will automatically increase or decrease difficulty as required.

DON'T FALL—a variation of the traditional game, "Hangman"—tests word recognition and spelling. The player tries to guess and spell the correct word before the character displayed on the screen falls over a cliff. DON'T FALL incorporates one of Apple's "Shell Games" editors, which makes it simple for teachers and parents to supply special words to work with and to guess. In this way, the game can be quickly customized for a particular age group, or to teach a specific terminology (scientific, for instance).

With Elementary, My Dear Apple, youngsters can use the Apple computer with little training and guidance to discover how much fun learning can be.
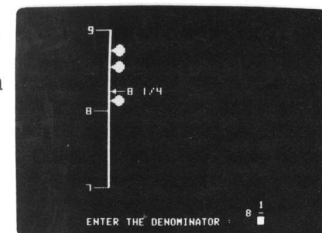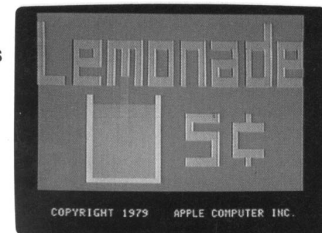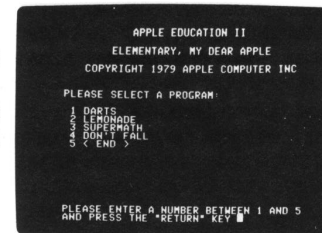
30   Elementary, My Dear Apple

System Configuration	To use Elementary, My Dear Apple, you will need the following system: ■ Apple II Plus (with Integer BASIC Firmware Card or the Apple Language Card) with 48K of memory; ■ Apple Disk II drive with 16-sector controller (see Apple Disk II section, page 71); ■ a suitable video display device.
Technical Specifications	**Format:** 16-sector diskette. **Language:** Written in Applesoft and Integer BASIC.
The Elementary, My Dear Apple Package Order No. A2D0015	With your Elementary, My Dear Apple order, you will receive: ■ Elementary, My Dear Apple diskette; ■ Elementary, My Dear Apple instruction manual.

31

Apple Music Theory
The Sound of Music at Your Fingertips

Applications Software

Apple Music Theory is a series of clever programs that makes it interesting to learn music fundamentals. Developed for Apple by music teachers from the Minnesota Educational Computing Consortium (MECC), the programs use the superb graphic and sound capabilities of your Apple II Plus to generate tones and display "sheet music" on a video monitor. Because you can both hear and see the music, as well as repeat and practice lessons easily, you quickly learn what otherwise might take dozens of private lessons to master.

Designed for teenagers and up, Apple Music Theory is an excellent teacher, whether you're starting from scratch or simply reviewing forgotten concepts. The programs provide challenging drill and practice exercises for scales, chords, sharps and flats, half-tones, intervals, and other music elements. Apple Music Theory also keeps track of performance, so you can identify weak areas and gauge your progress.

Apple Music Theory is the perfect teaching aid for anyone interested in grasping music fundamentals—from the child who is just beginning to learn, to the adult who simply wants a refresher course.

Benefits

Apple Music Theory...
■ *frees you from music lesson appointments by providing personalized drills that always fit your schedule...*
■ *allows you to progress at your own pace, because you can determine the length and intensity of the lessons...*
■ *reinforces learning skills, because it allows you to listen to music as it's being displayed visually on the screen...*
■ *frees music instructors to work with individual students by providing an "assistant" that handles drill and practice exercises for the whole class.*

Apple Music Theory— A Closer Look

Imagine having a private music tutor at your beck and call. That's what Apple Music Theory is—an "instructor" that's available whenever you are.

Apple Music Theory lets you learn at your own pace, at home or in a classroom. And anyone can use it easily. Just insert the program diskette into your disk drive, turn on the system, and "class" begins.

The programs provide fundamental exercises in aural intervals, counting, enharmonics, key signatures, naming notes, note types, visual intervals, music terms, halves, rhythm, scales, sevenths, triads, and whole and half-step intervals.

Your Apple II Plus computer generates clear tones and passages of music that demonstrate a wide range of music concepts. Bars of music are displayed on your screen exactly as they would appear on a sheet of music. By matching the notes and other music symbols with their corresponding sounds, you can quickly learn to read and "hear" music, so that you can interpret both played and written passages.

Whether you're considering it for your school, your child, or yourself, Apple Music Theory provides a truly convenient and effective way to learn music fundamentals.

System Configuration

To use Apple Music Theory, you will need the following system:
■ Apple II Plus with a minimum 32K of memory;
■ Apple Disk II drive with 16-sector controller (see Apple Disk II section, page 71);
■ a suitable video display device.
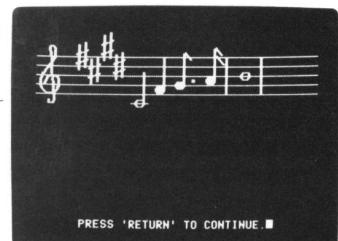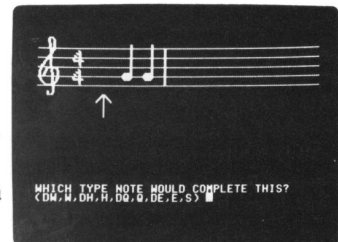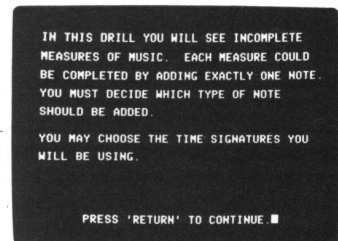
32   Apple Music Theory

Technical Specifications

Format:
16-sector diskette.

Language:
Apple Music Theory is written in Applesoft BASIC.

The Apple Music Theory Package

Order No. A2D0038

With your Apple Music Theory order, you will receive:
- write-protected Apple Music Theory diskette;
- Apple Music Theory instruction manual.

33

The Shell Games

An Entertaining Approach to Learning

Applications Software

Apple's Shell Games turn your Apple Computer System into an excellent teaching aid for the home or classroom. The Shell Games diskette contains four programs. The first is an introductory color cartoon "THE ANIMATED APPLE"; the remaining three are: THE MATCH MACHINE, MR. MULTIPLE, and PROFESSOR TRUE. They offer matching, multiple choice, and true/false quizzes, respectively, on a wide variety of subjects. Combined, these three programs contain over 180 ready-to-solve problems. And that's not all.

Because The Shell Games diskette also contains its own Editor, you can choose your own quiz problems to place into each "Shell." And you don't have to be a programmer in order to create highly successful quizzes. In only a few short minutes, you can enter a complete quiz into any one of the three quiz programs. Revisions can be made just as quickly.

The Shell Games interest, motivate and reward adults and children alike. Together, they offer the most exciting educational series available for use with a personal computer!

Benefits

The Shell Games…

■ provide excellent teaching assistance to the educator by turning standard testing into exciting, challenging computer games…

■ hold childrens' attention in the classroom by offering a variety of quiz and drill formats from which to choose…

■ motivate children to perform well by rewarding correct responses with audio and video feedback…

■ offer the parent a means of helping children with schoolwork at home, because quizzes and drills can be easily created for extra study in weak areas…

■ provide interesting and amusing family entertainment through computerized trivia quizzes.

The Shell Games— A Closer Look

Playing The Shell Games is fun and simple. Insert the program diskette into your disk drive. Then sit back and enjoy "THE ANIMATED APPLE," a brief, colorful cartoon that will lead you directly into the program selection chart menu.

Because The Shell Games were designed with children in mind, no complicated commands are necessary. Just select one of the three games and then follow the instructions on the screen. Correct responses to questions are rewarded, and scoring is performed automatically by each program.

Use the Shell Games Editor to enter new questions and answers into existing games, to delete material you don't wish to use, or to create entire quizzes on your own. You'll quickly build up large libraries of material that you can use over and over again.
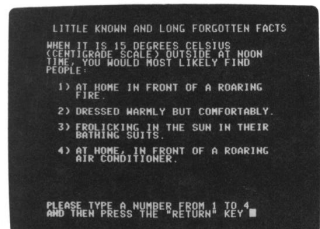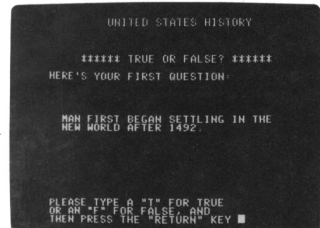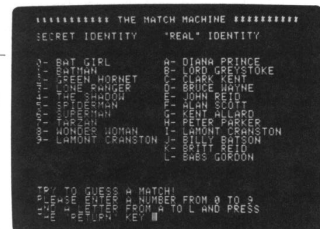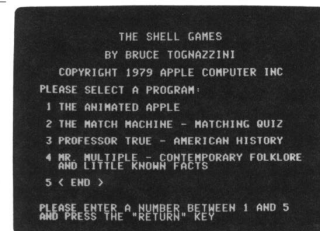
34   The Shell Games

System Configuration

To use The Shell Games program, you will need the following system:
- Apple II Plus (with Integer BASIC Firmware Card or the Apple Language Card) with 48K of memory;
- Apple Disk II drive with controller.
- a suitable video display device.

Technical Specifications

Format:
13-sector diskette

Language:
Written in Integer BASIC.

The Shell Games Package Order No. A2D0014

With your Shell Games order, you will receive:
- Shell Games diskette;
- Shell Games instruction manual.

35

Apple Pot Pourri
Personal and Entertainment Programs for Your Apple

Applications Software

Apple Adventure
Apple Product A2D0034—13-Sector Diskette

You're lost in a huge cavern, with an open chasm on one side of you and a fire-breathing dragon on the other. How can you overcome these and other treacherous obstacles, then press on to find the treasure?

Apple Adventure is an exciting, puzzling, sometimes mind-boggling game that challenges your memory, perseverance and verbal and intuitive abilities. You'll be kept mesmerized for hours—avoiding monsters, wandering through an underground maze, and bringing back treasure (if you're lucky). Save continuing games on a diskette, and print out your moves to record your progress. To make the game even more challenging, there are few instructions and no warnings. (But watch out for the pirate!)

Requires Apple II Plus with 48K RAM. (For optional printing, a printer with the appropriate Apple controller card is also required.)

Copyright 1980 by Apple Computer
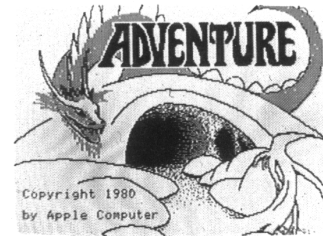
Apple Stellar Invaders
Apple Product A2D0031—13-Sector Diskette

You're being bombarded by alien invaders! Evasive maneuvers and laser-sharp shooting are your only self-defense against extinction.

Four crumbling barricades shield you from above—should any aliens reach the ground or blast your tank five times, the game is over. Zap the invaders out of the ozone before they annihilate you!

Requires Applesoft or Integer BASIC and 48K RAM. (Players can control the game either with Apple Hand Controls or the Apple keyboard.)
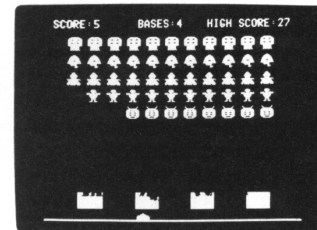
Apple Bowl
Apple Product A2D0018—13-Sector Diskette

With Apple Bowl, the elusive 300 game is only a matter of time. This realistic full-color bowling alley simulation lets you bowl non-stop to your heart's content—your Apple keeps score automatically.

Requires Integer BASIC, Programmer's Aid #1, 32K RAM, and Apple Hand Controls.

36

VisiCalc® III
The Electronic Worksheet

Applications Software

VisiCalc III is a powerful new version of the award-winning VisiCalc software, designed especially for use with the Apple III Computer System. It virtually eliminates calculator, paper, and pencil in developing plans and analyzing results. Any problem you might wish to tackle using rows and columns can be solved quickly—and accurately—with VisiCalc III. You can create your own models or use an existing one from the VisiCalc III library of "tool kits." General purpose business, real estate, and financial models are already available, with more planned for the future.

Managers can use VisiCalc III to plan budgets, create forecasts, and develop pricing strategies. Financial professionals can prepare statements, compute ratios, and modify projections. Scientists and engineers can study causes, effects, and trade-offs—all in seconds, instead of hours or days.

One of the most innovative and versatile planning programs ever designed, VisiCalc III is a powerful productivity tool for every manager and professional.
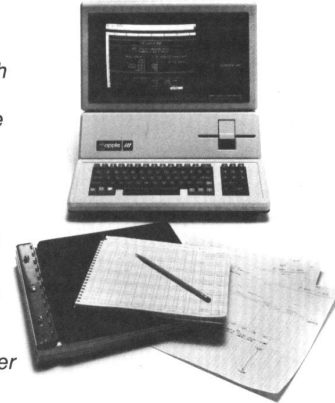
Benefits

VisiCalc III...

■ increases personal productivity, because of its flexibility, ease of use, convenient editing capability and high-speed computation...

■ can be put to work immediately, because it allows you to write and use complex "programs" without learning a programming language...

■ speeds data manipulation through an extensive, built-in library of financial, statistical, and scientific functions, including search and logic...

■ expands the effective workspace of your monitor screen, because the Apple III's four cursor control keys allow rapid display of any portion of a large spread sheet...

■ simplifies data checking and comparison through its "split-screen" capability, which allows you to display, move, and modify widely separated entries side-by-side...

■ eliminates trial-and-error columnar formatting of documents, because its display—with 80 upper- and lower-case characters per line—prints exactly as it appears on the screen...

■ increases your data handling capabilities, because the Apple III's large, 65K-byte user memory space allows you to construct and work with very large models...

■ enhances the appearance of your reports, because you can title rows and columns—and vary the numeric and graphic format—to give you the look you want.
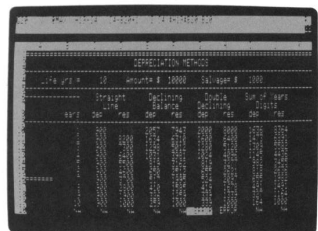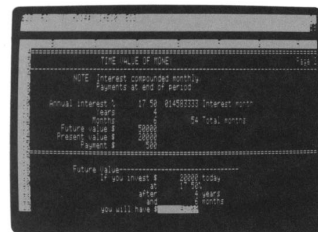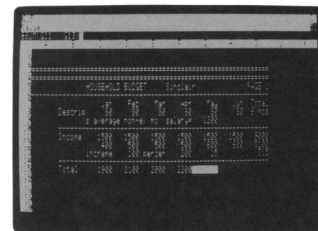
**VisiCalc III—
A Closer Look**

To use VisiCalc III, simply insert the program diskette into the Apple III disk drive and "boot" the system. On your monitor screen you'll see an electronic worksheet—resembling a columnar pad—of up to 63 columns and 254 rows. At the juncture of any column and row, you can type in words, numbers, or formulas.

Your monitor screen is a "window" which allows you to view a section of the entire VisiCalc III worksheet. The window can be moved (or "scrolled") in all four directions for viewing every section. Or you can split the screen into two "windows," so that you can compare pieces of data that are in different places on your worksheet. You can even synchronize "windows" so that they move together, always keeping particular lines or columns of data next to one another.

VisiCalc III's cursor is a white box one column wide (you set the width you need) and one row deep. When "filling in" the worksheet, the new values and words you enter are displayed within this box as you type them.

™VisiCalc is a registered trademark of Visicorp.

VisiCalc *III*

By using either the Apple *III*'s arrow keys, or the "GO TO" capability of VisiCalc *III*, you can quickly move the cell cursor to any area of the worksheet. Visible at any given time are 20 rows of data; the number of columns you can see depends on the column width you've designated. Typically, you will see at least eight columns—the same number that would fit on an 8½-inch sheet of paper.

Entering and changing values and words on the worksheet are straightforward procedures. To enter data, first position the box cursor to the place where you want the data to appear. Then simply enter the new numbers or words. To make any editing changes requires a simple deletion of the entry and retyping of correct data.

Titles and column headings can be written anywhere on the worksheet. When placed either along the top or down the left-hand side you can "lock" them into place. Once locked, the title or column heading will "follow" and identify the data associated with it, even when you move to the furthest row or column position. And you can easily unlock titles whenever you want.

When you enter a formula, it will be displayed on the top row of the screen. If you change it at some point, the new values that result will be calculated and displayed instantly on the worksheet.

Formulas can be as simple or as complex as you like. For instance, VisiCalc *III* can add, subtract, multiply, or divide values located anywhere on the screen—even those values derived by other formulas. You can also build powerful formulas using Boolean-type equations. A built-in function library conveniently provides many financial, scientific, statistical, and mathematical functions—including search and logic, net present value, average value and transcendental functions. The result of any calculation is displayed instantly on your screen.

In addition, a replication capability allows you to repeat a formula automatically many times, with different variables substituted. For example, the formula you use to compute January's profit can be replicated to compute monthly profits from February through December as well. VisiCalc *III*'s replication feature automatically substitutes the appropriate data elements for each month.

Because VisiCalc *III* performs complex calculations instantly, you can play "What if…?" as often as you like to solve thousands of different problems. For example, imagine that you've created a business forecast model that takes your gross profit, cost, and net income into account. Sometime later, you begin to wonder what the impact would be if your vendors decided to raise finance charges by 2 percent. With a few keystrokes, you can update your forecast based on this new assumption, and VisiCalc *III* will perform the calculations and display the new results instantly for your review.

Another useful feature of VisiCalc *III* is its "Insert and Delete" editing capability. Using Insert and Delete you can add or delete entire rows or columns in your worksheet model. For instance, suppose you suddenly see that the forecast or plan you're working on is more complex than had been originally thought, and you wish to add more elements to your model. VisiCalc *III*'s Insert and Delete feature allows you to add them painlessly, without having to redesign the entire worksheet. Similarly, you can move entire rows or columns to rearrange pieces of data in your model. VisiCalc *III* automatically keeps all formulas updated, as you move pieces of your worksheet around.

VisiCalc *III* lets you quickly save entire worksheets as files on diskettes—including the data, formats, and location on the worksheet where the cursor was last positioned. VisiCalc *III* data can also be saved by itself, without the worksheet, to be graphed or plotted by other Apple *III* programs.

Any printer that works with the Apple *III* can be used to produce a hard copy of your VisiCalc *III* worksheet. You can print entire worksheets, or—by specifying column letters and row numbers—only selected parts of the data.

If your job frequently involves organizing and manipulating data to prepare budgets, schedules, forecasts, or tables of information, Apple's VisiCalc *III* can significantly increase your productivity, and improve the overall quality of your planning.
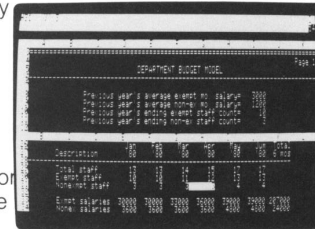
38   VisiCalc *III*

System Configuration

To use VisiCalc *III*, you will need:
- any Apple *III*;
- Monitor *III* (or any suitable video display device);
- a compatible printer* and printer interface*.

*Note: Apple *III* Computer Systems and Visicalc *III* work with several printers and appropriate interfaces, including those specified below:
- Apple Silentype Printer using Apple *III* built-in Silentype interface;
- Qume Sprint 5 (Distributed Product D2M0060) using Apple *III* built-in RS-232 interface.

Technical Specifications

Format:
16-sector diskettes.

Worksheet size:
63 columns by 254 rows.

Available Worksheet Memory:
Approximately 65K bytes available storage on 128K-byte Apple *III*.

Commands:

Blank Entry	Print Portion of Screen
Clear Sheet	Replicate Formula
Delete Row or Column	Load or Save Worksheet
Edit Entry Contents	Initialize Disk
Format an Entry	Delete Saved Worksheet
Set Global Format or Option	Create New Subdirectory
Insert Row or Column	Set Title Area
Move Row or Column	Split Screen

Functions:

Absolute Value	
Average	Functions without Arguments:
Number of Non-blank Entries	Error
Natural Exponent	True
Integer	False
Natural Logarithm	NA
Base 10 Logarithm	PI
Maximum Value	
Minimum Value	Logic:
Net Present Value	AND
Square Root	IF
Sum of Values	NOT
	OR
Trigonometric:	ISERROR
Arccosine	ISNA
Arcsine	
Arctangent	Logical Operators:
Cosine	<
Sine Tangent	>
	=
Search:	< =
Choose	> =
Lookup	<>

The VisiCalc *III* Package Order No. A3D0002

With your VisiCalc *III* order, you will receive:
- two VisiCalc *III* program diskettes;
- blank diskette;
- VisiCalc *III* User's Manual;
- VisiCalc *III* Reference Card;
- VisiCalc Sampler Diskette (prewritten VisiCalc worksheets to help you get started);
- VisiCalc *III* Sampler User's Guide.

Mail List Manager

Professional Mail Lists and Labels at Your Fingertips

Applications Software

Apple's Mail List Manager program for the Apple III lets you easily generate and maintain the mailing information and telephone listings of your customers, colleagues, prospects, and acquaintances. Designed for professional performance and ease of use, the program stores, sorts, edits, and prints mailing labels and phone lists in their entirety, or selectively by ZIP code, name, or any user-defined field.

Each Mail List Manager entry may contain up to six lines of user-definable information—enough to include a name, address, company name, and phone number, or whatever information is appropriate for your business needs. As many as 960 entries can be stored on a single diskette, and any number of diskettes may be combined to create a single large mailing list.

Fast and sophisticated sorting is routine with Mail List Manager. You can sort an entire diskette of mailing labels in less than two minutes. You can merge several lists to create a new, larger single list. And you can print letter-perfect mailing labels, phone lists, or customer information lists quickly and efficiently, saving hours of typing.

If you're looking for a more convenient, flexible way to keep important names, addresses, and telephone numbers organized and at your fingertips, Apple's Mail List Manager for the Apple III is the ideal solution.

Benefits

Mail List Manager…

■ *allows you to maintain and generate mailing lists efficiently, because it stores, sorts, edits, and prints out labels at the touch of a few keys…*

■ *requires no special training to use, because its menu and forms entry displays are simple and self-explanatory…*

■ *increases your mailing list control, because it lets you sort mailing lists in either of two ways, and print mailing lists in their entirety—or just certain labels determined by fields within the label…*

■ *speeds sorting, because a single diskette (holding information for up to 960 labels) can be sorted completely in less than two minutes…*

■ *extends your system flexibility, because its unique, user-definable label formats and wide range of printing capabilities let you customize your list without any programming.*

Mail List Manager— A Closer Look

To use Mail List Manager, just insert the program diskette into your disk drive and boot your Apple III system. Mail List Manager's main menu will appear on your video display. Through this menu, all the program's functions are accessed.

Label Formatting

The DEFINE MAILING LABEL FORMAT option allows you to select a standard mail list format, or to create one that meets your special needs.

By selecting the MAIL LIST MANAGER STANDARD FORMAT, you can tackle most mail list applications. This simple, predefined format lets you enter or modify an addressee's name, company name, street address, city, state, and ZIP code.

The NEW LABEL FORMAT menu option lets you define a six-line label with enough space for one or more field names per line. Any two fields can be designated "sort fields"—and you can quickly sort your list by name and/or ZIP code, or according to any other two parameters of your choice. NEW LABEL FORMAT also lets you determine which fields get printed on your labels. This means that sensitive information—like age, income, and credit ratings—can be conveniently, and confidentially, stored on diskette, right alongside names and addresses.

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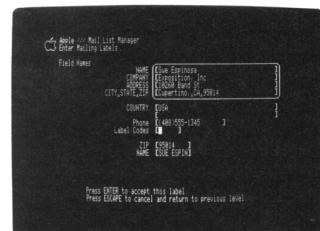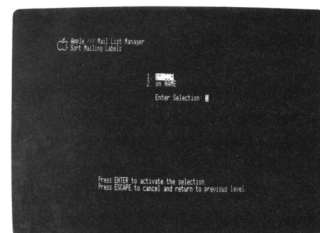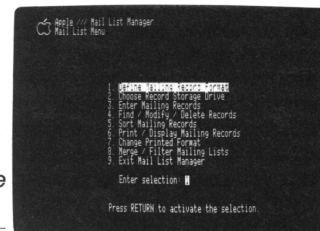
The PREVIOUS LABEL FORMAT menu option simply allows you to use—automatically—label formats you previously created and saved on diskette.

Label Entry

To create mailing labels, select the ENTER MAILING LABELS option from the main menu. You'll be prompted—by label field names that appear on your video display, followed by blank data entry areas—to enter information line-by-line. Simply type the information, and it will appear in the blank areas, looking just as you'll get it when printed.

Label Searching

Mail List Manager's FIND/CHANGE/DELETE LABELS option allows you to search and revise your list quickly. It will prompt you for an exact or approximate value or match for the primary sort fields. This approximate value—also called the "Soundex" feature—is particularly useful when you need to find a label, but are unsure of the exact spelling of the addressee's name.

In the event your list contains one or more labels with the same sort field value, the first label with the value is displayed. Using the Apple ///'s arrow keys, you can then scroll through the other labels with the same sort field value.

You can easily modify or delete a label once it has been located. Pressing "M" for modify will allow you to use arrow keys to move through the label, making the required changes. Pressing "D" will allow you to delete the label.

Label Sorting

It's easy to sort your labels in sequence by using either of the two sort fields. Then you can print your labels, phone lists, or customer information in alphabetical, numerical, geographical, or other order. Just select the SORT MAILING LABELS option from the main menu, and specify your sort field (e.g., "Name"). The Mail List Manager can sort an entire diskette of 960 labels in less than two minutes.

Merging Label Files

If you have several lists of labels, all using the same label format, you may combine them into a single large list by selecting the MERGE MAILING LABELS option from the main menu. Mail List Manager will prompt you to specify the disk drives containing the merging lists and the disk drive creating the merged list, and will also ask you to name the new merged file.

Printing

Printing with the Mail List Manager is simple and flexible, allowing you to use your mailing label file for a variety of purposes.

By selecting the DISPLAY/PRINT LABELS option from the main menu, you may print mailing labels, phone lists (name and phone number), or any information stored under a particular label entry (e.g., credit ratings, favorite restaurants, birthday, etc.) that you don't want actually printed on the mailing label.

You may choose to print only a portion of a list, specifying a range of values you desire. For example, you could print mailing labels for all people who work for the company "Apple Computer," who also live in the state of "California," who also earn salaries that range between "$10,000" and $20,000." The output from the label file may be to a printer, or to the video display.

Mail List Manager uses any type of labels you require. By selecting the PRINT PARAMETERS option of the main menu, you can easily specify the physical dimensions of your labels, the number of labels across a page, and the space between each label. These specifications give you centered labels every time.

In addition, the label formatting and printing capabilities of Mail List Manager let you use it for other applications besides mailing labels. You could generate price labels or information files, for example—or badges or library cards, or lists of any kind. Mail List Manager actually has much of the flexibility of many data base management systems.

Mail List Manager   41

The Apple *III* Mail List Manager is a sophisticated, yet intuitively easy-to-use tool which allows you to produce mailing labels effortlessly, as well as a large variety of information files, phone directories, and other lists—for all your personal business needs.

System Configuration

To use the Apple *III* Mail List Manager, you will need:
- an Apple *III* system with 128K bytes RAM;
- at least one additional Disk *III* drive;
- Monitor *III* (or any suitable video display device);
- a compatible printer* and printer interface*.

*__Note:__ Apple *III* Computer Systems and Mail List Manager work with several printers and appropriate interfaces, including those specified below:
- Printronix with Universal Parallel Interface Card (Apple Product A3B0002);
- Qume Sprint 5 (Distributed Product D2M0060) using Apple *III* built-in RS-232 interface.

Technical Specifications

Format:
16-sector diskettes.

Label Formatting:
- User-definable format with up to 11 fields;
- Two user-definable sort fields;
- 105 (sum of all label field entries) characters per label;
- Up to 6 lines/label.

Max. Number Labels/diskette:
960.

Number of Diskettes:
Unlimited.

Typical Sort Time:
90 seconds for 960 labels (1 full diskette).

Printing Capabilities:
- User-selectable printing by ranges for one or more fields within the label;
- Flexible formatting to meet the physical specifications of your labels.

The Apple *III* Mail List Manager Package Order No. A3D0003

With your Mail List Manager order you will receive:
- Mail List Manager program diskette;
- one blank Mailing List diskette;
- instruction manual.

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Apple Pascal

**A Powerful Language and Development
Environment for Apple II Plus Computers**

Languages
and Utilities

Apple Pascal is a fully integrated software development environment. It incorporates an Apple II adaptation of the UCSD Pascal™ Operating System, with enhancements for color graphics, sound generation, and Apple's special input/output features. Because it offers a compiled language, the Apple Pascal system enables programs to execute quickly in minimal space.

The discipline imposed by structured programming facilities and extensive data structures helps programmers work more efficiently, thus making Apple Pascal the language of choice for large business, scientific, and educational programs.

Benefits

Apple Pascal…
- *increases programmer productivity because it provides a total software development facility…*
- *simplifies program design through Pascal's structured environment and rich variety of data types…*
- *lowers software development costs because it is a powerful, high-level language…*
- *cuts maintenance costs because Pascal's modular design helps the programmer write well-structured, easy-to-understand, documented programs…*
- *allows programs larger than available RAM to run, through the use of memory overlays…*
- *includes a powerful, easy-to-use text editor that affords documentation and source code maintenance…*
- *supports Apple's special graphics and sound capabilities, plus optional hand controls, through System Library routines…*
- *offers a performance increase of two to five times over equivalent BASIC programs.*

**Apple Pascal—
A Closer Look**

Apple Pascal meets the programming requirements of a wide range of users. Its variety of data types, control functions, and powerful utility routines can dramatically improve a programmer's productivity on large projects. This is one reason Apple Computer has selected Pascal as a standard vehicle for most system and applications development.

Why UCSD Pascal?
Apple Pascal provides the programmer with a high level of portability because it's based on UCSD Pascal, the microcomputer industry standard. Users can access large existing libraries of Pascal programs, and can use Apple Pascal programs with minimum conversion on most computer systems offering Pascal.

UCSD Pascal is more than a language. Compiler, Assembler, Editor, Linker, and Filer are all integrated within a single, powerful system. Built-in procedures and functions enhance the string, byte, and I/O capabilities. This total package provides the user with a comprehensive set of software tools for program development, and the ability to create and maintain program libraries.

Why Pascal For The Apple II Plus?
Apple has taken advantage of all of UCSD Pascal's features while offering additional capabilities. These include:
- easy access to Apple's human interface features—color graphics, speaker, hand controls, and keyboard;
- transcendental functions;
- extensive documentation.

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System Configuration

To use Apple Pascal, you will need the following system:
■ an Apple II Plus with 48K of memory;
■ Apple Disk II drive with controller (a maximum of six drives are supported—two are recommended);
■ Apple Language Card;
■ a suitable video display device.
Note: Apple Pascal can utilize several terminals and the appropriate controller cards, including those specified below:
■ Soroc IQ120 with Communications Interface Card (Apple Product A2B0003);
■ Hazeltine 1500 with Communications Interface Card (Apple Product A2B0003).

Technical Specifications

Format: 16-sector diskettes.

Editor:
Editing functions include cursor control, text modification, formatting, searching, and marking capabilities. The Editor offers:
■ fast, screen-oriented editing for program development and text editing;
■ 80-character lines.

Compiler:
■ Translates Pascal source text into P-code.
■ Source language procedures or functions can be compiled separately as UNITs, allowing a large program to be subdivided into smaller, more manageable parts. Commonly used procedures and functions can be compiled once, stored in a library file, and accessed by other programs through the Linker.
■ EXTERNAL routines can be declared and later linked into the host program by the Linker.
■ Compiler option specifications can be embedded in the source text in order to control listings, suppress screen messages, generate range-checking code, allow GOTO statements, or include separate source files.

Assembler:
The Apple Pascal Assembler converts assembly language routines into code files that can be linked with a Pascal host program. The Apple Pascal Assembler is a version of the UCSD Adaptable Assembler, implemented specifically for the 6502 microprocessor used in the Apple II Plus computer.

Linker:
The Apple Pascal Linker lets you combine code files (which may be compiled P-code or assembled machine code) into a specified code file. This lets you incorporate useful routines into programs without having to rewrite, recompile, or reassemble these routines.

Filer:
The Filer handles chores, such as storing and retrieving data on disk, moving and deleting disk files, and creating or modifying diskette directories. It also:
■ provides complete control over all file facilities, including directories, disk management and data transfer;
■ sets or changes prefix so that long filenames can be entered easily;
■ manages the assignment of system workfiles.

System Library:
The Apple Pascal system includes a utility program that will collect separately compiled or assembled routines into a library file. The System Library contains:
■ The TURTLEGRAPHICS intrinsic unit, which provides easy access to Apple II Plus high-resolution color graphics routines. Functions and procedures permit the user to choose a color, move and turn the cursor, specify viewpoint boundaries, fill the viewport with color, copy an array of data to the screen from memory, write text on the graphics screen, and interrogate the system regarding the state of the cursor and screen.

Apple Pascal   45

■ The APPLESTUFF intrinsic unit, which contains routines to generate random numbers, interface with hand controls, and generate sound on the Apple II Plus speaker.
■ The TRANSCEND intrinsic unit, which contains transcendental functions useful for mathematical calculations.
■ The CHAINSTUFF intrinsic unit, which allows one program to "chain to" another program.

The Apple Pascal Package Order No. A2D0024

Apple Pascal includes:
■ four Apple Pascal system diskettes;
■ Apple Pascal Operating System Reference Manual;
■ Apple Pascal Language Reference Manual;
■ Apple Pascal Hands-On Tutorial.

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Apple PILOT
Courseware Development System

Languages and Utilities

Apple PILOT is a powerful, easy-to-use system designed to support program development for Computer-Assisted Instruction (CAI). If you're familiar with the PILOT language, you'll quickly become proficient in developing Apple PILOT courseware—and at a fraction of the cost of most other systems.

Based on COMMON PILOT, Apple PILOT offers much more than simple language capabilities. Color graphics, sound effects, and a character set editor allow lessons to be presented in words, pictures and sounds.

Benefits

Apple PILOT...

■ *significantly heightens students' interest and retention through its graphics, animation, and sound effects capabilities...*
■ *allows educators to share material in creating new and different lessons, because libraries of pictures, sounds, character sets, and PILOT routines can be saved on diskettes...*
■ *may be learned quickly by anyone familiar with the PILOT language, because it is menu-driven and provides HELP screens...*
■ *gives instructors access to large libraries of material, because programs written in PILOT 73 and COMMON PILOT may be run on the Apple system...*
■ *provides the capability of recording both student lessons and grades on the same diskette, because the author can programmatically create files for general purpose record keeping...*
■ *places no restriction on lesson length, since a single lesson may span many files and/or diskettes...*
■ *helps evaluate student performance by timing individual student responses...*
■ *assists in foreign language instruction, because character sets in different languages can be developed easily...*
■ *allows educators to make hard-copy files of lesson text through a built-in print routine.*

**Apple PILOT—
A Closer Look**

Apple PILOT operates in two modes—Author and Lesson. In Author Mode, the instructor/designer creates lessons and stores them on a lesson diskette. The student then uses that diskette to "take a lesson," that is, interact with the computer as specified by the teacher.

In Author Mode, menus and HELP screens direct and assist in creating a lesson. The main menu provides the following options:
INITIALIZE A DISKETTE—Automatically formats a diskette and copies from the Author diskette certain required system programs and files.
CREATE/EDIT PILOT LESSON TEXT—PILOT is a high-level language particularly suited to the needs of courseware developers. It is the heart of the system. Using simple commands, the author defines the flow and logic of a lesson and integrates any previously defined graphics, sound effects, and special characters into that lesson. The lesson can also be tested by using the RUN option.

CREATE/EDIT GRAPHICS—The author can create high-resolution color graphics to include anywhere in the lesson(s). Simple keyboard commands draw lines, circles and rectangles; or the control paddles can be used to sketch free-form designs. Text may be written anywhere on the graphic screen. These "pictures" are stored on diskette.
CREATE/EDIT SOUND EFFECTS—Music/sounds can be dynamically created and played back using simple menus and keyboard commands. The sounds are stored on diskette for inclusion in any lesson.

Apple PILOT

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CREATE/EDIT CHARACTER SETS—User-defined characters are simply "drawn" on a grid using keyboard commands or control paddles. These special characters can be associated with any Apple keyboard printing characters.

COPY A LESSON DISKETTE—Allows the author to make multiple copies of a lesson diskette for wide distribution or concurrent use by many students.

In Lesson Mode, the student merely inserts a lesson diskette into a disk drive and is presented with the material as specified by the author/teacher.

System Configuration

To use Apple PILOT, you will need the following system:
- Apple II Plus with 48K of memory;
- one Apple Disk II drive with 16-sector controller for Lesson Mode, or two Disk II drives—one with 16-sector controller—for both Author and Lesson Modes (no more than two drives are supported—see Apple Disk II section, page 71);
- a suitable video display device;
- Apple Hand Controls (optional).

Note: If lessons are to be printed, an optional compatible printer and printer controller card are required. Apple II Plus Computer Systems and Apple PILOT work with several printers and appropriate controller cards, including those specified below:
- Apple Silentype Printer with Silentype Interface Card (supplied with printer);
- Centronics 737 with Centronics Printer Interface Card (Apple Product A2B0007);
- Printronix with Parallel Interface Card (Apple Product A2B0002);
- Qume Sprint 5 (Distributed Product D2M0060), Diablo Hyterm, and NEC Spinwriter 5510R with High Speed Serial Interface Card (Apple Product A2B0005) with P8-02 PROM.

Technical Specifications

Format: 16-sector diskettes.

Language:
Written in Pascal; however the Apple Language Card is not required to run Apple PILOT.

Commands:

Apple PILOT includes all of the following standard COMMON PILOT commands:

A:	Accept	FO:	File Output	T:	Type
AS:	Accept Single	G:	Graphics	TH:	Type and Hang
C:	Compute	J:	Jump	U:	Use
D:	Dimension	M:	Match	XI:	Execute Indirect
E:	End	PR:	Problem		
FI:	File Input	R:	Remark		

In addition to providing all of the COMMON PILOT commands and facilities, Apple features the following extensions:

AP:	Accepts point on graphics screen.
FIX:n,var$	Opens diskette file <var$> for input and/or output with <n> records.
FOX:n,var$	Creates new diskette file <var$> with <n> records.
G: C n	Sets pen color to <n>.
G:ES n	Erases the graphics screen color to <n>.
G:T	Prints text at the graphic cursor position.
G:VI,r,t,b	Sets graphic viewport coordinates.
GX:name	Draws previously defined graphic image <name> onto the screen.
L:name	
L:name, label	Links to PILOT lesson <name>, optionally at the specified point <label>.
PR:T nnn	Sets accept response time in seconds.
S:p,d	Generates a sound of pitch <p> for duration <d>.
SX:name	Plays previously defined sound effect <name>.
TX:name	Types output and accepts input using previously defined character set <name>.
W:nnn	Waits <nnn> seconds.
X = BTN(n)	Returns push-button status.
X = KEY(0)	Returns keyboard status.
X = PDL(n)	Returns control paddle position.
X = RND(0)	Returns a random number between zero and one.
X = TIM(0)	Reads accept response time.

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The Apple PILOT
Package
Order No. A2D0028

With your Apple PILOT order, you will receive:
- Apple PILOT Author Diskette;
- Apple PILOT Lesson Diskette;
- Apple PILOT Language Reference Manual;
- Apple PILOT Editors Manual.

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Apple FORTRAN

For the FORTRAN Programmer

Languages
and Utilities

FORTRAN is a powerful programming language, especially suitable for work in mathematics, engineering, and the sciences. Apple FORTRAN, the ANSI Standard Subset of the recently defined FORTRAN 77 standard, runs on the Apple Pascal Operating System. In several areas, Apple FORTRAN contains enhanced features and capabilities.

Apple is providing FORTRAN for use by technical professionals and educators who are both familiar with the FORTRAN language and are using packages written in FORTRAN. Because FORTRAN is a well-established language, large libraries of FORTRAN programs are already in existence, particularly for engineering and scientific applications. Apple FORTRAN provides the sophisticated FORTRAN user with the capability to develop new—and modify existing—FORTRAN programs on an Apple.

Benefits

Apple FORTRAN...

■ *offers enhanced features and capabilities because it supports the newest computer industry standard, ANSI X3.9-1978...*
■ *runs on the Apple Pascal Operating System, which provides a comprehensive software design environment including an Editor, Linker, File Handler, Assembler, Apple Pascal Compiler, and System Library...*
■ *eliminates the need to recompile or reassemble existing code files when incorporating them into FORTRAN programs; compiled P-code and assembled machine code can be combined with a FORTRAN P-code file through the Apple Pascal Operating System's Linker facilities...*
■ *allows you to take full advantage of Apple's hi-res graphics capabilities by interfacing to graphics routines in the System Library...*
■ *gives programmers access to large libraries of material, since FORTRAN is a familiar, well-established language...*
■ *provides access to special Apple features, such as sound generation and control paddles, through its System Library routines...*
■ *permits you to combine several source files in a single compilation through Compiler directives in the source code.*

**Apple FORTRAN—
A Closer Look**

Apple FORTRAN is the ANSI Standard Subset FORTRAN 77. It also supports enhancements and facilities from the full FORTRAN 77 language.

FORTRAN 77 contains significant additions and enhancements to the previous 1966 standard. For example, mixed-mode arithmetic expressions are allowed. Structured programming is supported through expanded IF statement constructs. Logical IF, Block IF, ELSE IF, ELSE, and END IF statements provide a vastly improved method of clearly and accurately specifying the flow of program control. CHARACTER data type replaces Hollerith; alphanumeric data can be represented as strings rather than array elements.

Some specifics about Apple FORTRAN:
■ Subscript expressions may include array elements and function calls.
■ DO statement limits may be defined by expressions, rather than just single variables.
■ I/O units may be specified by expressions, rather than just constants or simple variables.
■ The I/O list of a WRITE statement may include expressions.
■ All combinations of FORMATTED/UNFORMATTED and SEQUENTIAL/DIRECT files are allowed, with the following restrictions:
BACKSPACE is supported only for files connected to the blocked devices—it is not supported for UNFORMATTED SEQUENTIAL files;

50   Apple FORTRAN

DIRECT files must be connected to block devices.

Apple FORTRAN contains a number of enhancements beyond the full FORTRAN 77 specifications. In particular:

■ Compiler directives may be included in the source code. For instance, the $INCLUDE directive allows you to insert previously developed code into your program without having to repeat the code. This is useful, for example, when you are writing many subroutines which use the same COMMON block. You can write the COMMON block just once, and $INCLUDE it in every subroutine.

■ An additional parameter to the OPEN statement allows you to specify whether the file is blocked or unblocked.

There are two minor differences between the ANSI Standard Subset FORTRAN 77 and Apple FORTRAN. They are:

■ Subprogram names cannot be passed as parameters.

■ INTEGER and REAL data types have different storage requirements—two bytes for INTEGER, four bytes for REAL.

Note: Apple FORTRAN on the Apple II Plus does not support double-precision arithmetic.

System Configuration

To use Apple FORTRAN, you will need the following system:

■ Apple II Plus with 48K of memory,

■ Apple Pascal package;

■ Apple Disk II drive with controller*;

■ a suitable video display device.

*Note: While a single drive system is adequate for very small programs, two drives are strongly recommended for ease of operation and more serious program development.

Apple FORTRAN can utilize several terminals and appropriate controller cards, including those specified below:

■ Soroc IQ120 with Communications Interface Card (Apple Product A2B0003);

■ Hazeltine 1500 with Communications Interface Card (Apple Product A2B0003).

Technical Specifications

Format: 16-sector diskettes.

Language:

Apple FORTRAN is written in Pascal and produces P-code which runs in the Apple Pascal Operating System.

The standard library of intrinsic functions supplied with Apple FORTRAN includes:

ABS	AMOD	EOF	LGE	NINT
ACOS	ANINT	EXP	LGT	REAL
AINT	ASIN	FLOAT	LLE	SIGN
ALOG	ATAN	IABS	LLT	SIN
ALOG10	ATAN2	ICHAR	MAX0	SINH
AMAX0	CHAR	IDIM	MAX1	SQRT
AMAX1	COS	IFIX	MIN0	TAN
AMIN0	COSH	INT	MIN1	TANH
AMIN1	DIM	ISIGN	MOD	

The Apple FORTRAN Package Order No. A2D0032

With your Apple FORTRAN order, you will receive:

■ two FORTRAN system diskettes;

■ Apple FORTRAN Language Reference Manual.

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Applesoft and Integer BASIC

How to Program an Apple Without Really Trying

Languages and Utilities

When you purchase the Apple II Plus computer, you buy more than hardware—you receive a powerful, built-in programming language (or "firmware") as well.

Applesoft Extended Floating Point BASIC—Applesoft, for short— allows you to create interesting and useful programs even if you've never programmed before. Applesoft is an enhanced version of the popular BASIC (Beginners' All-purpose Symbolic Instruction Code) programming language. Another version of BASIC—Integer—is also available through Apple as a plug-in firmware card, or as part of Apple's powerful Language Card.

Both Applesoft and Integer BASIC come with easy-to-follow tutorial manuals that start you programming with your Apple right away.

Benefits

Integer BASIC and Applesoft…

■ *allow you to take advantage of large libraries of existing programs because both are very popular languages…*

■ *permit critical portions (e.g., graphics animation) of programs to be run at high speed, because both allow direct access to assembly language subprograms…*

■ *turn your Apple into a desktop calculator because both automatically perform arithmetic computations (add, subtract, multiply, divide, raise to a power)…*

■ *allow you to modify and store data for repeated use, because both accept input/output operations from the keyboard, disk drive, video display, and other peripheral devices…*

■ *provide you with greater flexibility in conveying information, because both will create color dots and horizontal and vertical lines on the screen…*

■ *allow you to quickly and easily change or correct any part of a program because both accept editing commands…*

■ *save you time in locating programming errors, because both give immediate feedback if an error exists—and provide its location.*

Applesoft and Integer BASIC— A Closer Look

Applesoft II Floating Point BASIC language, resident in Apple II Plus computers, is an expanded version of Microsoft's popular floating point BASIC. It is a fast, convenient, general purpose language. Applesoft's nine-digit arithmetic and large function library make it ideal for the majority of BASIC programming applications. Features like high-resolution graphics routines and user-programmable error messages make the language both powerful and friendly.

Integer BASIC, resident in Apple II computers, is a subset of standard BASIC. It is well-suited to writing games, because its high performance makes realistic animation possible. It is not generally suitable for business or scientific applications since it works only with integers (whole numbers).

A Special Note to Non-Programmers

Have you ever purchased a product advertised as "so simple to use even a child can do it," only to discover that it was neither simple nor child's play? This is not the case with Applesoft or Integer BASIC. All you need to use either language is an interest in programming. Apple's comprehensive tutorial manuals will provide the rest. As you progress, you'll learn to speak a BASIC language to your Apple, create new applications, and become familiar with programming terminology. Before you know it, you'll be writing programs for your Apple.

For Those Already Familiar With Programming

There is one fundamental difference between Applesoft and Integer BASIC. Integer BASIC deals only with integer values in the range

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±32,767. Applesoft, in addition to dealing with those same integer values, is also capable of manipulating floating point (real) quantities. Its range is approximately ±10 to the 38th power, with nine-digit precision. Additionally, Applesoft offers built-in trigonometric, transcendental, and other mathematical functions ideal for financial and scientific calculations. Applesoft can also handle multi-dimensional arrays (up to 88 dimensions, both numeric and string), while Integer BASIC recognizes only single-dimension arrays.

System Configuration

If you own an Apple II Plus, Applesoft BASIC is resident within the system. To run Integer BASIC on your Apple II Plus, you will need either:
- an Integer BASIC Firmware Card; or
- the Apple Language Card and the DOS 3.3 operating system.

If you own an Apple II, Integer BASIC is resident within the system. To run Applesoft BASIC on your Apple II, you will need:
- an Applesoft BASIC Firmware Card; or
- the Apple Language Card and the DOS 3.3 operating system.

Technical Specifications

Applesoft BASIC

Applesoft BASIC capabilities include:
- Three data types—Real, Integer, and String
- N-Dimensional Arrays and N-Letter Variable Names (first two letters significant)
- Extensive Mathematical, Logical and Scientific Capabilities:
  EXP, LN, SQ RT., SIN, COS, TAN, ARCTAN, AND, OR, NOT, ABS, INT, RND, SIGN
- String Operations to Aid the Business Programmer:
  Compare >, <, > =, < =, < >
  Concatenate: +
  Variable Type Conversion: ASC, STR, VAL
  Substring Functions: LEFT, RIGHT, MID, LEN
- Graphics Statements that Simplify Display Programming:
  Print Control: NORMAL, INVERSE, FLASH
  Graphics Control: COLOR, PLOT, POSN, HLIN, VLIN, SCRN, GRAPHICS, TEXT, HGR, ROT, SCALE, SHLOAD
- General Operations that Include and Extend Upon Dartmouth BASIC:
  Program Manipulation: CLEAR, NEW, LIST, RUN, CONT, LOAD, SAVE
  Variable and Function Definition: DATA, DEF, DIM
  Data Handling and Storage: READ, RESTORE, STORE, RECALL
  Loops and Branching: FOR...NEXT, IF...GOTO, IF...THEN, ON...GOTO, ON...GOSUB, ONERRGOTO, RESUME, GOTO, GOSUB, RETURN
  Input/Output and Format Control: INPUT, GET, PRINT IN#, PR#, VTAB, TAB, HOME
  Machine Level Statements: PEEK, POKE, CALL, POP, LOMEM, HIMEM

Integer BASIC

In addition to normal BASIC capabilities, Apple Integer BASIC includes:
- Any-length variable names (ALPHA, BETA$) (all characters significant)
- Syntax and range errors indicated immediately when entered
- Multiple statements on one line
- Integers from −32767 to +32767
- Strings to 255 characters; single-dimension integer arrays
- Graphics Commands
- Paddle read function
- TEXT and Graphics Commands to set display mode from BASIC
- Immediate execution of most statements
- Break and Continue program execution
- Debug commands: line number trace and variable trace
- Switchable I/O device assignments
- PEEK, POKE, CALL, POP commands
- Auto line number mode
- RND, SGN, ASC, LEN and ABS functions
- GOTO expr, GOSUB expr allowed

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DOS Tool Kit
Selected Aids for the Apple II Programmer

Languages and Utilities

Apple's DOS Tool Kit is a collection of programs and subroutines designed to aid the Apple II user in the development of Applesoft BASIC and 6502 Assembly Language programs. The Tool Kit simplifies program development by providing a number of handy features that make programming easier.

Included are an Assembler and Source Editor for use under DOS on Apple II Plus systems, as well as an assembly language program that renumbers, merges, and deletes remarks from Applesoft BASIC programs. In addition, there are two special high-resolution graphics programs in the Tool Kit—one that helps you create and edit high-resolution character sets, and another that lets you display characters on the high-resolution graphics screen. Also included are three graphics demo programs, and character sets for editing high-resolution characters.

If you're a programmer familiar with Applesoft BASIC and/or machine language, Apple's DOS Tool Kit contains a number of unique programming aids that will prove invaluable to you.

Benefits

Apple's DOS Tool Kit...
- *reduces programming time by providing the user with such powerful program editing capabilities as character search, line search, and string replace...*
- *allows the user to assemble arbitrarily large source files, because its disk-based operation requires that only the symbol table be held in RAM...*
- *makes the assembler easier to learn, since it is fully compatible with 6502 syntax...*
- *increases programming flexibility, because its text files feature provides a degree of compatibility with other assemblers...*
- *simplifies the creation of relocatable modules by providing the user with a relocating Loader...*
- *speeds program development, because its multiple applications assist users in accomplishing many time-consuming and difficult programming tasks...*
- *aids in the design of high-resolution graphics characters through the use of a special graphics editor.*

**The DOS Tool Kit—
A Closer Look**

The four programs and subroutines that make up the DOS Tool Kit were designed to meet a variety of programming needs. **THE EDITOR/ASSEMBLER** is an integrated Assembler and Source Editor designed for the creation of 6502 Assembly Language programs. After accessing the EDITOR/ASSEMBLER from the Tool Kit diskette, you can create and edit source code files in RAM; store and retrieve programs as text files; assemble disk source files into disk object files; and create your own symbol table summary. The EDITOR/ ASSEMBLER program also features relocatable or absolute code output, as well as a relocating Loader.

THE HI-RES CHARACTER GENERATOR is an assembly language program for displaying text on the high-resolution graphics screen. Using the Generator, you can mix text with high-resolution graphics; write text over an existing background; automatically downshift alphabetic characters for displaying lower-case text; and animate figures. The HI-RES CHARACTER GENERATOR also allows alternate character sets for user-defined characters, and features a text wrap-around within the text window. Additionally, it provides examples of graphic implementation through three graphics-oriented demos and several alphabetic fonts.

ANIMATRIX *(Character Editor)* is a special Applesoft BASIC program which makes it easy for you to create and edit character sets for the HI-RES CHARACTER GENERATOR.

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APPLESOFT PROGRAMMER'S ASSISTANT is an assembly language program that helps you write your own programs in Applesoft BASIC. The Assistant can determine program length, renumber and merge several programs, and delete remarks. Its automatic line numbering feature makes program entry easier, and—since it allows you to cross-reference variables—takes some of the confusion out of programming. The Assistant also provides you with the use of three non-standard keys: underscore, left bracket, and backslash. In addition, it will print non-visible characters when listing a program.

System Configuration	To use the DOS Tool Kit, you will need the following system: ■ Apple II Plus with 48K of memory; ■ Apple Disk II drive with 16-sector controller (see Apple Disk II section, page 71); ■ a suitable video display device.
Technical Specifications	**Format:** 16-sector diskette. **Language:** DOS Tool Kit is written in Applesoft BASIC and machine language.
The DOS Tool Kit Package **Order No.** **A2D0029**	With your DOS Tool Kit order, you will receive: ■ DOS Tool Kit diskette; ■ 6502 Assembler/Editor instruction manual; ■ Applesoft Tool Kit instruction manual.

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Applegraphics II
Graphics Software for the Technical Professional

Languages and Utilities

Applegraphics II is a collection of high-resolution graphics programs and procedures for Pascal and FORTRAN programmers. It simplifies graphics programming, and expands the graphics capabilities of the Apple II Plus.

The Applegraphics II diskette contains code files, source files, a library file, and demonstration programs that make it easy for you to plot, project, and print out data. Since source files are all accessible, you can easily tailor the software to your specific needs.

A series of drawing procedures allows you to plot data according to your own parameters—independent of the coordinate system of your screen or printer. The program's geometric transformation procedures enable you to scale, translate, rotate, and skew an image, then project the three-dimensional object onto a two-dimensional display.

Designed for technical professionals, Applegraphics II offers greater graphics flexibility than is normally available on a personal computer. It is a valuable programming tool that turns your mathematical models into meaningful displays.

Benefits

Applegraphics II…

■ *saves you programming time by providing core routines that can be used in a variety of applications;*

■ *simplifies graphics production, because it automatically projects normalized graphics coordinates onto the Apple II Plus screen;*

■ *expands system flexibility by providing an easy interface to user-defined peripherals, such as plotters or graphics terminals;*

■ *increases the effectiveness of your charts and graphics by making it easy to add labels or color.*

Applegraphics II— A Closer Look

The Applegraphics II diskette includes procedures written specifically for output to an Apple II Plus hi-res graphics screen, as well as procedures designed for easy adaptation to other output devices. You can either transfer the Applegraphics II SYSTEM LIBRARY file to your boot diskette or transfer the Applegraphics II procedures to your customized library file, then call the procedures from within your own programs.

The drawing procedures are vector-oriented, drawing lines between endpoints. After you define the first point (using one of the MOVE procedures), you can specify subsequent points (using one of the DRAW procedures) either as absolute numeric coordinates or in terms of relative displacement. This capability lets you relocate complex figures on the screen without having to recalculate all coordinates.

Plotting procedures allow you to define your own "world coordinate" system, which is totally independent of the coordinates used by your output device. Instead of working with the 280 x 192 coordinate system of a high-resolution graphics screen, for example, you could define the plot dimensions as 1000 units of production by 60 months. Simply call the WINDOW procedure, specifying your X range as 0 to 60, and your Y range as 0 to 1000. You can also take a close-up look at one part of your graph by narrowing your coordinate ranges. The window is mapped automatically onto your output device.

Using the VIEWPORT procedures, you can confine the display to one part of the screen, and you can even plot two displays at once on different parts of the screen. Since this manipulation is done with Applegraphics II routines, your programs remain transportable onto other system configurations. Six user-defined procedures (UMOV, UDRAW, UTEXT, UPENCOLOR, UFILLPORT, and UVIEWPORT) make it easy for you to tailor your graphics to any vector-oriented output device compatible with the Apple II Plus.

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You can draw lines in the viewport, or—when using a suitable video display device—fill the viewport with colors: green, violet, orange, blue, black, and white. You can also use the TXT, INUM, and RNUM procedures to print characters within a graphics display.

The Applegraphics II package also retains the specialized functions of Turtlegraphics. DRAWBLOCK, for example, is a high-speed, raster-oriented procedure which translates an array of bits to dots on the screen. And SCREENBIT reads the status of each point in the display, returning a value of "TRUE" for a point with color, and "FALSE" for a black spot.

System Configuration

To use Applegraphics II you will need:
- Apple II Plus with 48K memory;
- Apple Pascal package;
- Apple Disk II drive with controller;
- a suitable video display device.

Technical Specifications

Applegraphics II is written in Pascal, and produces P-code which runs in the Apple Pascal Operating System. It is accessible to programs in Apple FORTRAN and any other language supported by the Apple Pascal system.

Format: 16-sector diskette.

Applegraphics II includes these procedures:

MAKEPORT	FILLSCREEN
SETPORT	FRAME
SETDEFAULTS	TEXTMODE
PENCOLOR	GRAFMODE

MOVE2	MOVE3	MOVES
DRAW2	DRAW3	DRAWS
RMOVE2	RMOVE3	RMOVES
RDRAW2	RDRAW3	RDRAWS

VIEWPORT	SCREENBIT
WINDOW	DRAWBLOCK
IDENTITY	TXTCHR
SCALE	TXT
TRANSLATE	INUM
XROT	RNUM
YROT	
ZROT	
SKEWX	

Applegraphics II lets you tailor your graphics output to your own output device using these procedures (currently Pascal 1.1 only):

UMOV	UTEXT	UFILLPORT
UDRAW	UPENCOLOR	UVIEWPORT

The Applegraphics II Package Order No. A2D0037

With your Applegraphics II order, you will receive:
- Applegraphics II diskette;
- Applegraphics II reference manual.

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Apple Business BASIC
Apple *III's* Advanced BASIC for Business Applications

Languages and Utilities

Apple Business BASIC for the Apple III Computer System is one of the most powerful versions of BASIC ever developed for a microcomputer. Designed for those who want the flexibility, power, and ease of use of the popular BASIC language, Apple Business BASIC incorporates a number of innovative features which can be used to satisfy some of the most demanding business and scientific programming needs.

With Apple Business BASIC, programmers can address over 70K bytes of extended memory—the largest workspace available on any personal computer. In addition, Apple Business BASIC's special 64-bit, 18-digit data type handles the toughest accounting chores with "penny accuracy."

For producing reports, Apple Business BASIC offers some of the most comprehensive and flexibly formatted output capabilities found on any version of BASIC—even those used on large system mainframes. Apple Business BASIC also features: advanced file handling, with flexible file formats to match application needs; 16-bit binary integer, and 32-bit binary floating point data types; 64-character variable names (all characters significant) for documentation purposes; easy access to a wide variety of plug-in peripherals or auxiliary devices; and a trace mode for debugging.

If you prefer programming in BASIC, but require more power, flexibility, and precision than most BASICs can give you, turn to Apple Business BASIC for the Apple III—an advanced language for an advanced computer system.

Benefits

Apple Business BASIC…
- makes it easier to generate reports, because of its flexible, extensive, formatted output capabilities, and versatile PRINT USING and IMAGE statements…
- increases system efficiency, because its large, user-available workspace (over 70K bytes) allows lengthy programs to be kept in memory…
- adds programming flexibility, because it lets you keep multiple (up to 10) files open simultaneously, with virtually no size constraints…
- allows you to display and calculate financial accounting data with "penny accuracy" through the use of a 64-bit, 18-digit data type and special functions…
- speeds up disk file storage, because its built-in facilities let programs read and write files more efficiently…
- simplifies system input/output (I/O) control, because just a few key words let you control a wide variety of peripherals, as well as machine language routines and graphics facilities…
- aids development and debugging of complex programs, because its optional ELSE statement and automatically indented listings encourage a structured approach to programming.

Apple Business BASIC— A Closer Look

Apple Business BASIC is a general purpose, problem-solving language designed especially for business and scientific applications calling for: 1) an easy-to-use debugging environment; 2) fast, high-precision operations—such as accounting—on numbers with a range less than $\pm 10^{18}$; 3) a high degree of output formatting for printing reports; and 4) greater flexibility for file I/O operations. Apple Business BASIC's powerful features provide the programmer with a number of advanced capabilities and conveniences.

Extended User Program Memory Space
In an Apple *III* Computer System with 128K bytes of RAM, Apple Business BASIC presents you with a huge 70K-byte workspace—

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more than is available with any other personal computer BASIC. This means you can write large programs more easily and run them more efficiently. Access time is reduced, because large files can be kept in memory—instead of on disk—and because many files can be opened for access simultaneously. In addition, large, high-resolution graphics areas can be used without fear of unduly restricting program size.

Flexible Output Formatting
Apple Business BASIC's versatile PRINT USING and IMAGE statements allow you to use a variety of format strings to prepare reports. Specifications are extremely flexible, and include string, literal, digit, scientific notation, and engineering notation categories.

Advanced File Handling
In Business BASIC, file handling is done through numbered file references defined within the program. You can make these file definitions perform chores simply by using generic terms. To print, for example, call out the generic term ".printer" within the program. Apple Business BASIC works with the Apple *III*'s Sophisticated Operating System (SOS) to handle the details automatically, including which printer you're addressing (if your system has more than one), its I/O address, etc. For greater user convenience, disk files are referenced by directory, sub-directory, and file name, without regard to the storage device on which the file resides.

Long Variable Names
Apple Business BASIC allows you to use variable names (up to 64 characters in length) for documentation purposes, with each character significant. Furthermore, because spaces are used as delimiters, embedded BASIC keywords are allowed in variable names, permitting even more flexibility.

"Structured" BASIC Features
With Apple Business BASIC, you can add the ELSE statement to the usual IF…THEN statement provided by BASIC. And your ELSE clauses can themselves contain other IF…THEN…ELSE constructs. Apple Business BASIC also provides a LISTing feature that automatically indents the contents of FOR…NEXT loops. These "structured" BASIC features encourage programmers to use a more logical, structured approach to developing their programs, and greatly aid development and debugging of complex programs.

Powerful Interface to Assembly Language
Because Apple Business BASIC runs in the SOS environment, you don't have to worry about memory management, buffer allocation, or file handling. This freedom will save you a significant amount of programming time.

Additionally, Apple Business BASIC relates to SOS through a powerful Invoke/Perform interface mechanism. For example, if you have created assembly language routines using the disk assembler, you can specify the assembled routine by name in an Apple Business BASIC program. Once the routines are mentioned in the "INVOKE" statement, Apple Business BASIC works with SOS to find a residence in memory for the routines, and to establish—as entry points in the resultant linked module—any function or procedure names mentioned in the routines. All you have to do is PERFORM the previously invoked routine—specifying any variables to be passed—and Apple Business BASIC and SOS automatically handle all the operational details.

Apple Business BASIC makes life a lot easier for programmers by expanding system capabilities, reducing program development time, and adding greater flexibility to formatted output and file handling facilities.

Technical Specifications

Format
16-sector diskette

Variables
- 64 characters (max.), all significant
- Reserved variables:
  ERR, KBD, EOF, VPOS, ERRLIN, HPOS, FRE, PREFIX$

Apple Business BASIC

- Data Types
  16-bit binary integers (-32768 to $+32767$)
  64-bit binary integers (± 9223372036854775807 or $2^{63} - 1$)
  32-bit binary floating point ($\pm 10^{38}$ with 6-digit precision)
  Character strings (0 to 255 characters, dynamic)
  String and numeric arrays (indexed starting with 0, no dimensional limits)

Operators

- General: $+, -, *, /, \quad , DIV, mod$
  (Note: DIV and MOD are only for long integer operations)
- Binary logical operators:
  AND, OR, $=, <, >, <>, ><, >=, <=, =<, =>$
- Unary logical operator:
  NOT
- String operator:
  $+$ (concatenation)

Statements

(Note: No statement or statement list may exceed 254 characters, including delimiters.)
LET (optional)
REM
GOTO
IF…GOTO
IF…THEN
IF…statementlist: ELSE statementlist
FOR ctrl variable = expression TO expression STEP expression
NEXT ctrl variable (,other ctrl variable)
GOSUB
RETURN
POP
ON expression GOTO
ON expression GOSUB
ON ERR
ON KBD
ON EOF #
OFF ERR
OFF KBD
OFF EOF #
RESUME

Utility Statements:

NEW	LOAD	STOP
CLEAR	SAVE	END
FRE	DELETE	CONT
PREFIX$	RUN	CHAIN prog name, line number

User-Defined Functions:

FN functionname (argument)
DEF FN functionname (argument) = expression

Debugging:

TRACE
NOTRACE

Cursor and Screen:

LIST	VPOS	HOME	NORMAL
DEL	HPOS	INVERSE	TEXT

String, Numeric and File Functions:

LEN	TEN	CONV	TAN	SQR
STR$	MID$	CONV%	ATN	EXP
VAL	LEFT$	CONV&	INT	LOG
CHR$	RIGHT$	CONV$	RND	TYP
ASC	SUB$	SIN	SGN	REC
HEX$	INSTR	COS	ABS	

Program Resident Data Statements:

DATA
READ
RESTORE

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Machine Statements and Functions:
INVOKE
PERFORM
EXFN
EXFN%

File I/O:
CATALOG
DELETE
RENAME
LOCK
UNLOCK
CREATE
OPEN # filenumber (AS INPUT, AS OUTPUT, AS EXTENSION)
CLOSE # filenumber
CLOSE
INPUT # filenumber, recordnumber
OUTPUT # filenumber
PRINT # filenumber, recordnumber
PRINT # filenumber, recordnumber USING
READ # filenumber, recordnumber
WRITE # filenumber, recordnumber

Console I/O:
INPUT
GET
TAB
SPC
SCALE
PRINT
PRINT USING
IMAGE specification(s)

String specifications:
   A reserves a character position left-justified
   C reserves a character position center-justified
   R reserves a character position right-justified

Literal specifications:
   X prints a space
   / prints a carriage return/line feed
   "literal" prints whatever is in quotes

Digit specifications:
   # reserves one numeric digit, leading zeros suppressed
   Z reserves one numeric digit, leading zeros printed
   & reserves one numeric digit or comma (comma fill every three digits)
   . reserves a position for the decimal point
   + reserves a position for the sign
   − reserves a position for the sign (if negative)
   $ reserves a position for the dollar sign
   ** asterisk fill
   + + floating sign
   − − floating sign (if negative)
   $$ floating dollar sign

Scientific notation specification:
   E reserves a position for the exponent (power of 10)

Engineering notation specification:
   same as scientific notation, except the exponent is always a multiple of three

The Apple Business BASIC Package Order No. A3D0004

With your Apple Business BASIC order, you will receive:
■ Apple Business BASIC diskette;
■ one blank diskette;
■ Apple Business BASIC Reference Manual (Volumes I and II).

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Apple *III* Pascal
A Powerful Language and Development Environment

Languages and Utilities

Apple III Pascal is a fully integrated software development environment. It incorporates an Apple III adaptation of the UCSD Pascal™ Operating System with the Apple III's Sophisticated Operating System (SOS). Because it offers a compiled language, the Apple III Pascal system enables programs to execute quickly in minimal space.

The discipline imposed by structured programming facilities and extensive data structures helps programmers work more efficiently, thus making Apple III Pascal the language of choice for large business, scientific, and educational programs.

Benefits

Apple *III* Pascal…

■ *increases programmer productivity because it provides a total software development facility…*
■ *simplifies program design through Pascal's structured programming environment and rich variety of data types…*
■ *lowers software development costs because it is a powerful, high-level language…*
■ *is source-program compatible with routines written in Apple II Pascal, so programs can be easily transported without being redeveloped…*
■ *cuts maintenance costs because Pascal's modular design helps the programmer write well-structured, easy-to-understand programs…*
■ *expands your programming workspace, because it enables adaptation to available memory…*
■ *optimizes your use of available memory, because its command processor allows each application to use only as much graphics space as needed…*
■ *includes a powerful, easy-to-use text editor that affords documentation and source code maintenance…*
■ *provides flexible input/output through its user-transparent access to Apple III's SOS.*

Apple *III* Pascal— A Closer Look

Apple *III* Pascal meets the programming requirements of a wide range of users. Its variety of data types, control functions, and powerful utility routines can dramatically improve a programmer's productivity on large projects. This is one reason why Apple Computer has selected Pascal as a standard vehicle for most system and applications development.

Why UCSD Pascal?
Apple *III* Pascal provides the programmer with a high level of portability because it's based on UCSD Pascal, the microcomputer industry standard. Users can access large existing libraries of Pascal programs, and can run Apple *III* Pascal programs with minimum conversion on most computer systems offering Pascal.

UCSD Pascal is more than a language. Compiler, Assembler, Editor, Linker, and Filer are all integrated within a single, powerful system. Built-in procedures and functions enhance the string, byte, and I/O capabilities. This total package provides the user with a comprehensive set of software tools for program development, and the ability to create and maintain program libraries.

Why Pascal For Apple *III*?
Apple has taken advantage of all of UCSD Pascal's features while offering additional capabilities. They include:
■ up to 64K bytes of memory for data;
■ code space limited only by total memory size of the machine;
■ conformance to the IEEE Proposed Standard for 32-bit Binary

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Floating-Point Arithmetic (this standard specifies special optional treatment of exceptions like overflow, configurable arithmetic under program control, and accuracy of arithmetic, I/O conversions, remainder, and square root);
■ easy access to Apple *III*'s human interface features—color graphics, speaker, joysticks, and keyboard;
■ transcendental functions;
■ extensive documentation.

System Configuration

To use Apple *III* Pascal, you will need the following system:
■ an Apple *III* system with 128K bytes RAM;
■ a suitable high-resolution video display device (Monitor *III* recommended);
■ one Disk *III* expansion drive.

Technical Specifications

Format:
16-sector diskettes, 140K (143,360) bytes per diskette.

Editor:
Editing functions include cursor control, text modification, formatting, searching and marking capabilities. The Editor offers:
■ fast, screen-oriented editing for program development and text editing;
■ 80-character lines;
■ upper and lower case;
■ editing capabilities for Apple Business BASIC ASCII data files.

Compiler:
■ Translates Pascal source text into P-code.
■ Source language procedures or functions can be compiled separately as UNITs, allowing a large program to be subdivided into smaller, more manageable parts. Commonly used procedures and functions can be compiled once, stored in a library file, and accessed by other programs through the Linker.
■ EXTERNAL routines can be declared and later linked into the host program by the Linker.
■ Compiler option specifications can be embedded in the source text in order to control listings, suppress screen messages, generate range-checking code, allow GOTO statements, or include separate source files.

Assembler:
The Apple *III* Pascal Assembler converts assembly language routines into code files that can be linked with a Pascal host program. The Apple *III* Pascal Assembler is a version of the UCSD Adaptable Assembler, implemented specifically for the 6502 microprocessor used in the Apple *III* computer.

Linker:
The Apple *III* Pascal Linker lets you combine code files (which may be compiled P-code or assembled machine code) into a specified code file. This lets you incorporate useful routines into programs without having to rewrite, recompile, or reassemble these routines.

Filer:
The Filer handles chores, such as storing and retrieving data on disk, moving and deleting disk files, and creating or modifying diskette directories. It also:
■ provides complete control over all SOS file facilities, including directories, sub-directories, and data transfer;
■ sets or changes prefix so that long filenames can be entered easily;
■ manages the assignment of system workfiles.

System Library:
The Apple *III* Pascal system includes a utility program that will collect separately compiled or assembled routines into a library file. The System Library contains:
■ The PGRAF intrinsic unit, which provides easy access to Apple *III*'s high-resolution color capability. PGRAF provides a set of procedures for plotting dots and lines, setting colors, and defining the viewport. A

Apple *III* Pascal   63

feature of the display is an invisible cursor which is used as a position reference in certain operations. Procedures exist for moving the cursor without affecting the display.

■ The APPLESTUFF intrinsic unit, which contains routines to generate random numbers, interface with joysticks, and generate sound on the Apple *III*'s speaker.

■ The TRANSCEND intrinsic unit, which contains transcendental functions useful for mathematical calculations.

■ The CHAINSTUFF intrinsic unit, which allows one program to ''chain to'' another program.

The Apple *III* Pascal Package Order No. A3D0005

With your Apple *III* Pascal order, you will receive:

■ three Apple *III* Pascal System diskettes;

■ one blank diskette;

■ Apple *III* Pascal Introduction, Filer, and Editor manual;

■ Apple *III* Pascal Program Preparation Tools manual;

■ Apple *III* Pascal Programmer's Manual (Volumes I and II).

Operating Systems

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DOS 3.3

The Apple Disk II "Housekeeper"

Operating Systems

DOS 3.3 is the handy housekeeper developed by Apple to help you take full advantage of your Disk II Floppy Disk Subsystem. DOS automatically keeps track of files, saves and retrieves information on a diskette, and performs a variety of other "housekeeping" chores. It dynamically allocates diskette space, maximizing diskette capacity. DOS stands for Disk Operating System; 3.3 is the version update number. When you purchase an Apple Disk II with controller, you are buying an Apple floppy disk drive and DOS 3.3.

(NOTE: DOS 3.2.1 has been superceded by DOS 3.3. Programs which operate under DOS 3.2.1 cannot be read by DOS 3.3 unless converted by "Muffin," a DOS 3.3 utility program. Conversely, DOS 3.2.1 cannot read DOS 3.3 programs.)

For those Apple II Plus owners who wish to use, or are currently using, programs running under the previous operating system, Apple will continue to offer and support DOS 3.2.1 (Apple Product A2D0010).

Benefits

DOS 3.3…

■ *simplifies system start-up by allowing for turnkey operation under Apple BASIC…*

■ *increases disk capacity by more than 20 percent over previous versions of DOS…*

■ *increases a system's capability by storing and retrieving information much more accurately, quickly, and conveniently than is possible with cassette tape…*

■ *adds to system efficiency by allowing you to access data by the name under which it is filed…*

■ *saves time spent searching for files because it automatically catalogs them by name and displays the complete catalog upon command…*

■ *provides the capability to save, load, run, rename, delete, and verify files quickly and easily through its variety of housekeeping commands…*

■ *allows rapid data retrieval through both sequential and random access to the data…*

■ *allows you to make back-up copies of diskettes on a single disk drive system, rather than requiring two drives for the same purpose.*

DOS 3.3— A Closer Look

If you've purchased an Apple Disk II with DOS 3.3, only a few keystrokes are required to put the program to work for you. This process is called "booting" the disk and is explained in detail in the DOS manual.

If you are using a previous version of DOS and want to update your system to run DOS 3.3, you'll need the DOS 3.3 Kit to boost your disk capacity to accommodate the new version. The kit contains two PROMs which you will need to install. (If you are using Apple Pascal, you've already installed them).

The System Master diskette that comes with the DOS manual is a very special one: it allows you to copy an entire diskette, convert any diskette that has an earlier version of DOS, and much more. Programs that demonstrate various capabilities of DOS are also included on the diskette and discussed in the manual.

With approximately 20 percent more storage capacity per diskette made available by DOS 3.3, you can store even more files on each diskette. Just type SAVE and the file name, and DOS will save it for you.

So that you'll know exactly which programs you've stored to a particular diskette, DOS provides the CATALOG command. When you use it, a list of all the files contained on the diskette will appear on your screen. To access a particular program, simply type LOAD and its name, and within seconds, you'll be using the code you've selected.

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DOS also lets you rename your files quickly and simply. To change the name of your telephone number file from "PHONE NUMBERS" to "FREQUENTLY CALLED NUMBERS," for example, just type RENAME PHONE NUMBERS, FREQUENTLY CALLED NUMBERS. Presto— you've got a new file name.

It's just as easy to delete an entire file as it is to rename it. Type DELETE and the file name, and it's gone.

Some files will be more important to you than others. To ensure their safety, DOS provides the LOCK command. To prevent your file from accidental erasure, simply type LOCK and the file name. If you decide later that you want to delete the file, just type UNLOCK and the file name. You can then use the DELETE command.

The DOS 3.3 package also includes some important utility programs for file and diskette maintenance and back-up. Once you become familiar with them, you'll find that they perform many chores that save you time and make your life easier.

System Configuration

DOS 3.3 is included with all Apple Disk II drives (with controller). To use DOS 3.3 and its utilities, you will need the following system:
- Apple II Plus with minimum of 32K memory.

Technical Specifications

Format:
Sectoring: soft (hard-sectored diskettes may be used)
Recording surfaces: one
Tracks per surface: 35
Sectors per track: 16
Bytes per sector: 256

Housekeeping Commands:

INIT	LOAD	DELETE	VERIFY
CATALOG	RUN	LOCK	MON
SAVE	RENAME	UNLOCK	NOMON
MAXFILES			

Access Commands:

FP	INT	PR#	IN#	CHAIN

Sequential Text File Commands:

OPEN	READ	APPEND	EXEC
CLOSE	WRITE	POSITION	

Random Access Text File Commands:

OPEN	CLOSE	READ	WRITE
BYTE			

Machine Language File Commands:

BLOAD	BRUN	BSAVE

DOS Messages:

DISK FULL	NO BUFFERS AVAILABLE
END OF DATA	NOT DIRECT COMMAND
FILE LOCKED	PROGRAM TOO LARGE
FILE NOT FOUND	RANGE ERROR
FILE TYPE MISMATCH	SYNTAX ERROR
I/O ERROR	VOLUME MISMATCH
LANGUAGE NOT AVAILABLE	WRITE PROTECTED

The DOS 3.3 Package Order No. A2M0044 (Disk II with controller)

With your order for an Apple Disk II with controller, you will receive:
- Apple Disk II with controller;
- DOS 3.3 System Master diskette, including utility programs;
- DOS Version 3.3 Instructional and Reference Manual;
- BASICS diskette (for diskettes written under earlier versions of DOS);
- blank diskette.

The DOS 3.3 Kit Package Order No. A2D0023

With your order for the DOS 3.3 Kit, you will receive:
- two 16-sector PROMs* (P5A and P6A);
- IC puller;
- DOS 3.3 System Master diskette, including utility programs;
- DOS Version 3.3 Instructional and Reference Manual;
- BASICS diskette (for diskettes written under earlier versions of DOS).

*If you are using Apple Pascal, these PROMs were already supplied (PROMS supplied with the DOS 3.3 Kit will be spares).

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Apple *III* Sophisticated Operating System (SOS)

Simplicity in System Control

Operating Systems

The Apple III Sophisticated Operating System (SOS) is a powerful software interface that helps you exploit Apple III's advanced system capabilities. With SOS, you don't need to worry about most internal system functions, such as which disk drive contains a file, which bank of memory is being used, or which slot a peripheral interface card occupies. These and other functions are all controlled automatically.

Designed for easy expandability as well as operational convenience, SOS enhances and ensures Apple III system flexibility. A simple-to-use SYSTEM CONFIGURATION PROGRAM (supplied on diskette) allows even inexperienced users to custom-configure SOS to meet their specific needs.

SOS provides a solid foundation for writing advanced applications on the Apple III. It features a hierarchical file system, device level interrupt capabilities, user level interrupt capability (events), a device-independent file system, and memory management capabilities. And, since all languages on the Apple III use SOS, they all share a common disk format. For instance, a Pascal application program can access a BASIC text file just as easily as it can access a Pascal text file.

Apple's Sophisticated Operating System for the Apple III gives you the efficiency, comprehensiveness, and expandability you've always wanted in an operating system, with a degree of convenience you may never have thought possible. SOS is supplied with all Apple III systems and software.

Benefits

The Apple *III* Sophisticated Operating System…
- *improves personal productivity, because it frees you from most system control responsibilities…*
- *simplifies programming, because it provides powerful, standard device and file interfaces for all languages and applications…*
- *maximizes system efficiency by automatically controlling the use and allocation of system resources…*
- *speeds up software development by reducing program size and complexity…*
- *ensures system adaptability, because it's designed for easy expansion and custom configuration.*

**The Apple *III* Sophisticated Operating System— A Closer Look**

SOS, which consists of five basic components, acts as a buffer between user programs and the Apple *III* hardware. Using these components, SOS controls Apple *III* system operation and resource allocation with a minimum of user involvement. As far as the user is concerned, handling the system's input/output (I/O) devices is as easy as handling its data files once SOS has been configured with the proper drivers.

Configuring SOS is a quick and easy process, even for the most inexperienced user. Simply follow the directions in the SYSTEM CONFIGURATION PROGRAM, one of the programs contained on the System Master diskette supplied with your Apple *III*.

Suppose, for example, that you've added an Apple *III* Silentype Printer to your system. To configure SOS so it will automatically control the printer, execute the SYSTEM CONFIGURATION PROGRAM and select the first option on the menu, ADD A DRIVER FILE. Then simply follow the directions displayed on the screen.

Once you've configured SOS to control your Silentype, you need never concern yourself again with its system operational requirements. SOS handles them for you—automatically—whenever you use the printer. Configuring SOS for other printers and peripherals is just as easy.

You don't have to be a system architect to get complete access to the Apple *III*'s advanced capabilities. Apple's Sophisticated

68   Apple *III* Sophisticated Operating System (SOS)
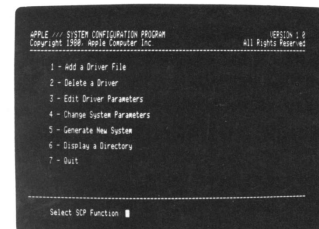
Operating System helps you control and configure your Apple *III*, maximizing its benefits and power in every configuration and application.

Technical Specifications

The Structure of SOS
At the core of SOS is the "Kernel," a set of programs and subroutines that control the flow of information around and through SOS. The Kernel is divided into five main areas: the File Manager, the Device Manager, the Memory Manager, the Interrupt Manager, and the Utility Manager.

The File Manager controls the logical storage, transfer and routing of information within the Apple. All information is stored in units called files. The File Manager can create and destroy files, read their contents, write new information into them, change their names, or move them from place to place.

The Device Manager controls the physical storage and flow of information into and out of the Apple *III*. Together with its associated device drivers, it controls the operation of the console (the screen and keyboard), the serial port, the printer port, the disk drives, and all other peripheral devices connected to the Apple.

The Memory Manager in SOS allows programs and languages to use all the memory you have in your Apple quickly and efficiently. It keeps track of "banks" and "pages" of memory, and allocates their use to different programs and languages.

The Interrupt Manager works with the Device Manager to allow devices such as the keyboard or the serial port to interrupt the Apple in the middle of an operation. The Apple can then attend to the interrupting device, and resume its previous operation as if nothing had happened. The operation of the Interrupt Manager, like that of the Memory Manager, is normally invisible to you.

The Utility Manager lets programs access the built-in joystick interfaces. Most languages and applications that use the joysticks will have more convenient, higher-level commands to read the status of those devices. These high-level commands simply request the information from the Utility Manager through SOS.

Besides those components of SOS making up the Kernel, there are two other components. One is System Utilities, which provides high-level routines for performing more complicated system tasks with a minimum of user interaction. Another is the System Configuration Program, which allows custom configuration of SOS and the I/O device drivers, in order to match the user's specific needs.

File Management System Calls
CREATE (pathname,create__list,length)
DESTROY (pathname)
RENAME (pathname,new__pathname)
SET__FILE__INFO (pathname,file__list,length)
GET__FILE__INFO (pathname,file__list,length)
VOLUME (dev__name,vol__name,free__blocks)
SET__PREFIX (prefix__path)
GET__PREFIX (prefix__path,length)
OPEN (pathname,ref__num,open__list,length)
NEW__LINE (ref__num,is__newline,newline__char)
READ (ref__num,buf,bytes,bytes__read)
WRITE (ref__num,buf,bytes)
CLOSE (ref__num)
FLUSH (ref__num)
SET__MARK (ref__num,base,displacement)
GET__MARK (ref__num,mark)
SET__EOF (ref__num,base,displacement)
GET__EOF (ref__num,eof)

Apple *III* Sophisticated Operating System (SOS)   69

Device Management System Calls
D__CONTROL (dev__num,control__code,control__list)
D__STATUS (dev__num,status__code,status__list)
GET__DEV__NUM (dev__name,dev__num)
D__INFO (dev__num,dev__name,dev__list,length)

Utility Management System Calls
SET__FENCE (priority)
GET__FENCE (priority)
JOYSTICK (j__mode,j__value)

Memory Management System Calls
REQUEST__SEG (base,limit,seg__id,seg__num)
FIND__SEG (srch__mode,seg__id,pages,base,limit,seg__num)
CHANGE__SEG (seg__num,chg__mode,pages)
GET__SEG__INFO (seg__num,base,limit,pages,sed__id)
GET__SEG__NUM (bankpage,seg__num)
RELEASE__SEG (seg__num)

Accessories

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Apple Disk II
Floppy Disk Subsystem

Dynamic and Versatile Data Storage

Accessories

The Apple Disk II Floppy Disk Subsystem increases the capability of your Apple Computer System through the use of flexible, or "floppy," disks for data storage. Expanded memory capacity, greater data retrieval speed, and random access to your stored data—all of these, and more, are made available through the Disk II subsystem. Whether you use your Apple with a Disk II in business to control inventory, or at home for household management, you'll find that it's the superior answer to your data storage needs.

Benefits

The Apple Disk II Floppy Disk Subsystem…

■ *optimizes efficiency by offering one of the highest storage capacities available with any personal computer on today's market…*
■ *offers an economical advantage over other disk drives by providing one of the lowest storage costs per character of any personal computer disk drive…*
■ *increases productivity by allowing you to access data much more quickly than is possible with cassette tape…*
■ *makes possible a wide range of computer applications by allowing software to access data…*
■ *provides for greater system expansion than is possible with any other personal computer system, because it supports up to three interface cards and six disk drives.*

**Disk II—
A Closer Look**

The Disk II drive, unlike the Apple II Plus, is a mechanical device with motors and moving parts. Understanding the principle behind the Apple Disk II drive is as simple as understanding the way a phonograph turntable works. Disk II has been designed in the same manner, although it is enclosed in a special cabinet. The record, or "diskette," is flexible ("floppy") and fits on a spindle inside the drive. The drive turns the diskette at much faster speeds than a phonograph turns a record.

Within the drive, a special record/playback head replaces the phonograph needle, and it reads the diskette the way a tape head reads an audio cassette. The head is mounted on a positioner, the counterpart of the phonograph arm, and it moves the head laterally across the floppy diskette to any area requested by the computer program. This capability is called "random access." It allows you to retrieve information from the diskette much more quickly than is possible with cassette tape.

Apple's Disk II may be purchased with or without a controller; however, the first one you buy must have the controller in order to interface the Disk II system to your Apple. Because each controller supports two disk drives, you'll be able to attach a second drive to it when you wish to expand your system. Your Apple will support a recommended maximum of three interface cards and six drives.

In addition to the advantages offered by a disk storage system, you'll also receive a special disk operating system program (DOS)* when you purchase a Disk II with controller. It automatically keeps track of your files, saves and retrieves information on a diskette, and performs a variety of other functions.

Note: Disk II drives purchased prior to September, 1980 were generally supplied with 13-sector PROMs. To use these products with 16-sector software (see software Technical Specifications), you must upgrade them through the purchase of the DOS 3.3 Kit (Apple Product A2D0023).

*DOS 3.2.1 has been superceded by DOS 3.3. Programs which operate under DOS 3.2.1 cannot be read by DOS 3.3 (unless converted by "Muffin," a DOS 3.3 utility program). Conversely, DOS 3.2.1 cannot read DOS 3.3 programs.

For those Apple II Plus owners who wish to use, or are currently using, programs running under the previous operating system, Apple will continue to offer and support DOS 3.2.1 (Apple Product A2D0010).

72   Apple Disk II Floppy Disk Subsystem

System Configuration

To use the Apple Disk II Floppy Disk Subsystem, you will need:
- Apple II Plus with a recommended minimum of 32K memory.

Technical Specifications

Format:
Sectoring: soft (hard-sectored diskettes may be used)
Recording surfaces: one
Tracks per surface: 35
Sectors per track: 16
Bytes per sector: 256

Capacity:
Formatted data capacity: 140K bytes, 16-sector (with Pascal and DOS 3.3)
Available data capacity: 137K bytes with Pascal
                     124K bytes under DOS (both 16-sector)

Characteristics:
Head movement time (track to track): 25 msec.
                   (across all tracks): 600 msec.
Head load time: 50 msec.
Average rotational delay: 100 msec.

Packaging:
Controller: PC board that plugs into one of the Apple's eight expansion slots
Drives per controller: two
Drive dimensions (H x W x D): 3.25 in. (8.3 cm.) x 5.75 in. (14.6 cm.) x 8.0 in. (20.3 cm.)
Weight: 3.0 lb. (1.36 kg.)
Power source for drives: Apple system power supply

The Apple Disk II Package
Order No. A2M0044 (with controller)
Order No. A2M0003 (without controller)

With your order for a Disk II drive with controller, you will receive:
- Apple Disk II drive (the main box);
- a printed circuit card (the controller) that plugs into the Apple;
- a flat ribbon cable already fastened to the disk drive, for connecting the disk drive to the controller card;
- System Master diskette (DOS);
- BASICS diskette;
- warranty card;
- DOS Instructional and Reference Manual.

With your order for a Disk II without controller, you will receive:
- Apple Disk II drive (the main box);
- a flat ribbon cable already fastened to the disk drive, for connecting the disk drive to a controller card;
- warranty card.

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Apple Disk *III*

All the Advantages of the Floppy Disk, and More

Accessories

Apple Disk III for the Apple III Professional Computer System is a floppy disk drive subsystem that allows you to increase the data storage capacity of your Apple III as your needs expand.

The Apple III Computer System accepts up to three external disk drives, in addition to its one built-in drive, for a total on-line storage capacity of 560K bytes. And because the Apple III was designed for easy, inexpensive system expansion, no extra control hardware or software are required as you add second, third, and fourth drives.

As your storage requirements increase, expand your system's capacity with Disk III—Apple's professional, reliable disk storage subsystem.
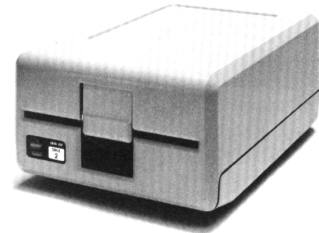
Benefits

Disk *III*…
- *increases your system's capabilities by offering you up to 560K bytes of on-line storage capacity…*
- *maximizes your system's flexibility, because it allows you to expand disk storage in step with your needs, in convenient 140K-byte increments…*
- *simplifies interfacing, because it quickly plugs in, and doesn't require any additional control hardware or software.*

Disk *III*— A Closer Look

Installation of the disk subsystem couldn't be easier. The first external drive that you add to your system just plugs into the back of your Apple *III*. Then up to two more drives can be added in "daisy chain" fashion simply by plugging the second drive into the first, and the third into the second. There are no separate power cords to tangle up because the Apple *III* supplies power directly to the disks.

Whether you add expansion drives to the Apple *III* Information Analyst, or any other system configuration, Apple *III*'s Sophisticated Operating System (SOS) automatically takes care of all interface software requirements for up to three external disk drives. Once your expansion drives are installed, SOS automatically identifies the number and the name of each whenever you start up your system. SOS also automatically maintains and updates content directories of each diskette in a system drive. This allows you to access data—directly by file name—from any diskette in any of the drives.

The additional storage capacity provided by the Apple Disk *III* expansion drives can speed up many of the common operations you perform with your Apple *III*. For example, adding just one expansion drive to your system cuts the time required to make a back-up copy of a diskette from minutes to seconds.

In addition, some Apple *III* programs require more than one disk drive to perform certain functions. For instance, some programs— such as Apple's Mail List Manager—need two drives to merge data files from two different diskettes into a separate, single file. Similarly, program development in Apple Pascal requires two or more disk drives.

Whether you want to increase your storage capacity or extend your system capabilities, Disk *III* lets you quickly and easily expand your Apple *III* Professional Computer System.

System Configuration

To use Disk *III*, you will need:
- any Apple *III*.

Technical Specifications

Format:
Sectoring: soft (hard-sectored diskettes may be used)
Recording surfaces: one
Tracks per surface: 35

74   **Apple Disk *III***

Sectors per track: 16
Bytes per sector: 256

Capacity:
Formatted Data Capacity: 140K bytes

Characteristics:
Head movement time (track to track): 25 msec.
                              (across all tracks): 600 msec.
Head load time: 50 msec.
Average rotational delay: 100 msec.
Data transfer rate: 125K bits per second

Packaging:
Drive dimensions (H x W x D): 4.12 in. (10.4 cm.) x 6.35 in. (16.1 cm.) x
8.8 in. (22.4 cm.)
Weight: 3.0 lb. (1.36 kg.)
Power source for drives: Apple *III* system power supply

**The Apple Disk *III*
Package**

**Order No.
A3M0004**

With your Disk *III* order, you will receive:
■ Disk *III*;
■ drive identification labels for numbering your expansion drive(s)
either 2, 3, or 4.

Note: All instructions and documentation for installation of expansion drives are contained
in the Apple *III* Owner's Guide.

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The Apple Silentype Thermal Printer

Eliminating the High Cost of Hard Copy

Accessories

The Apple Silentype is a quiet, versatile, and compact thermal graphics printer. It offers increased flexibility over other printers—at a fraction of the cost—because the Silentype receives both its power and intelligence from your Apple computer. To the extent you can program your Apple, you can program the Silentype—whether you're using machine language, BASIC, or Apple Pascal. Or you can use the Silentype effectively without doing any programming at all. With a few simple keystrokes, you can change margins and line spacing, specify printing intensity, and print finely detailed charts and graphs.

The Apple Silentype, offering you programmable printing—and much more—at an affordable price.
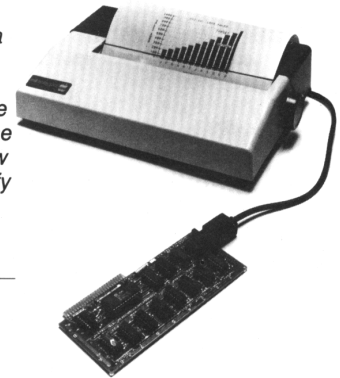
Benefits

The Apple Silentype…
■ offers you higher reliability than other microprocessor-based printers since it contains fewer components…
■ offers you more printing flexibility, because it has the capability of printing high-resolution graphics…
■ may be used in any office or home environment without a muffler, because it's quiet…
■ can be transported easily along with your Apple, because it takes up little space and weighs just six pounds…
■ saves you time and money, because it requires no preventive maintenance, adjustments, or lubrication.

The Silentype— A Closer Look

Connecting the Apple Silentype to your Apple Computer System takes just minutes. With the Apple ///, turn off the system and plug the printer cable into the Silentype interface jack on the rear connector panel. Next, program the printer for the type style you want by inserting the supplied diskette into the Apple ///'s disk drive, and following the instructions. (Only Apple /// Silentype systems can print in various type styles.) Once the type style has been programmed, you're ready to print.

If you're connecting the Silentype to an Apple II Plus, begin by making sure your system is off. Plug the printer cable into the Silentype interface card (supplied with the Silentype package) and remove the Apple's cover. Then plug the interface card into one of its expansion slots (usually slot #1), and replace the cover. That's all there is to it.

The Silentype prints upper- and lower-case text at up to 40 characters per second, 80 characters per line; high-resolution graphics are printed at 60 dots per inch. The Silentype prints clear, readable copy on white paper—there's no hard-to-read, scratch-susceptible aluminized paper required.

The Silentype paper path is short and straight, so you don't need to worry about paper jams. Paper is available in 80-ft. rolls, and—because the Silentype has no tractors—loading it into the printer takes just a minute. To alert you that reloading is necessary, a colored stripe along one edge signals the last few feet of the roll. While the printer cannot be damaged by running without paper, changing the roll when the stripe appears will ensure that you don't run out of paper in the middle of printing a file. Because the Silentype is a thermal printer, no ribbons—or messy ribbon changes—are required.

System Configuration

To use the Apple Silentype Printer, you will need:
■ any Apple ///; or
■ any Apple II Plus.

"DTCA2DOC-306-01-75.PICT" 1628 KB 2001-04-30 dpi: 300h x 300v pix: 2174h x 3041v

76   The Apple Silentype Thermal Printer

Technical Specifications

Text Mode:
Print Rate—up to 40 characters/second, bidirectional
Line Length—80 characters
Horizontal Spacing—10 characters/inch, nominal
Vertical Spacing—6 lines/inch, nominal
Line Feed Time—65 milliseconds, nominal
Character Format—upper and lower case, 5 x 7

Graphics Mode:
Print Rate—240 columns of 7 dots each per second
Line Length—480 dots
Horizontal Resolution—60 dots/inch, nominal
Vertical Resolution—60 dots/inch, nominal
Line Feed Time—55 milliseconds, nominal

Interface:
Power Supply—from Apple computer via 9-conductor data/power interface cable (supplied)
Interface—custom synchronous serial
Interface Cable—9-conductor, 3.5 ft. (1.2 m.) nominal length

Paper:
Width—8.5 in. (21.6 cm.) nominal
Length—80.0 ft. (24.4 m.) nominal
Technology—thermal, low temperature; black image

Mechanical:
Dimensions—7.75 in. (19.7 cm.) x 12.25 in. (31.1 cm.) x
   2.75 in. (7.0 cm.) nominal
Weight—6.0 lb. (2.7 kg.), excluding paper

The Apple *III* Silentype Package Order No. A3M0001

With your Apple *III* Silentype Package, you will receive:
- Silentype printer;
- Apple *III* Silentype driver diskette;
- one roll of heat-sensitive paper (already installed in the Silentype printer);
- Silentype User's Guide;
- warranty card.

The Apple II Plus Silentype Package Order No. A2M0036

With your Apple II Plus Silentype Package, you will receive:
- Silentype printer;
- Silentype Interface Card with cable;
- one roll of heat-sensitive paper (already installed in the Silentype printer);
- Silentype Operation and Reference Manual;
- warranty card.
Note: Replacement rolls of heat-sensitive paper (Apple Product A2C0001) may be ordered through your Apple dealer.

The Apple *III* Silentype Conversion Kit Order No. A3M0013

This kit will allow the Apple II Plus Silentype to work with your Apple *III*. With your Apple *III* Conversion Kit, you will receive:
- Apple *III* Silentype driver diskette;
- Silentype User's Guide.

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Daisywheel Printer
(Qume Sprint 5™)

Letter-Quality Hard Copy for Business Communications

Accessories

The Qume Sprint 5 is a popular, fully-formed character, impact printer that produces documents of better-than-typewriter quality at an average speed of 45 characters per second. Field-proven and highly reliable, it works with any Apple II Plus or Apple III Computer System, in applications ranging from word processing to business forecasting.

When used with the Apple III, the Qume Sprint 5 connects directly to the serial (RS-232) interface port on the system's rear panel. With an Apple II Plus system, the printer plugs into a connector on the High Speed Serial Interface Card (A2B0005), which is then installed in any unused expansion slot in the Apple.

The Qume Sprint 5 handles all kinds of documents, from form letters printed on letterhead to financial statements up to 198 characters per line in length. The Qume Sprint 5 is the professional printer for professional-looking documents.
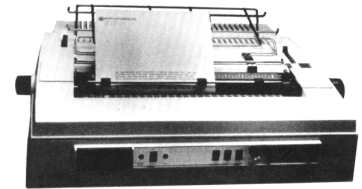
Benefits

The Qume Sprint 5…
- *improves the quality and impact of your letters and documents, because its fully formed, highly readable characters give all your printed communications a thoroughly professional look…*
- *increases office productivity through letter-perfect 45 character-per-second printing…*
- *allows you to match type styles with your needs, because it provides a variety of available type fonts on easily interchanged printwheels…*
- *increases printing reliability, thanks to its field-proven, highly dependable design and components…*
- *interfaces quickly with your system by plugging directly into the Apple III's back panel, or into a connector on the High Speed Serial Interface Card for the Apple II Plus.*

System Configuration

To use the Qume Sprint 5, you will need:
- any Apple *III* system; or
- any Apple II Plus system with a High Speed Serial Interface Card installed.

Technical Specifications

Parameter	Description
Print Speed:	45 characters/second (average)
Interface:	Asynchronous Serial (RS-232C or 20 milliamp DC current loop)
Forms:	15" max. width, single sheet or continuous forms
Fonts:	96-character "daisy" printwheels in various styles/alphabets
Character Spacing:	10, 12, and 15 characters/inch, plus proportional spacing
Horizontal Format:	
—10 pitch	132 columns
—12 pitch	158 columns
—15 pitch	198 columns
Vertical Format:	6 lines/inch (normal)
Vertical Slew Rate:	5 inches/second
Plotting Resolution:	Two modes—5760 or 2880 points/inch^2
Paper Feed:	Pressure platen (standard); forms tractor (optional)
Ribbon:	Cartridge type; carbon or fabric ribbon
Printwheel:	Easily changeable; large variety of typestyles

™ Sprint 5 is a trademark of Qume Corp.

78   Daisywheel Printer

Operator Controls:	Horizontal/Vertical Forms Positioning
	Forms Thickness
	Manual Ribbon Advance
	Communications
	Form Feed
	Printer Control Functions
Temperature:	
—Operating	50 to 105 degrees F. (10 to 40 degrees C.)
—Storage	−40 to +170 degrees F. (−40 to +76 degrees C.)
Relative Humidity:	
—Operating	10% to 90% RH (no condensation)
—Storage	2% to 98% RH (no condensation)
Size:	
—Width	23.5 in. (59.7 cm.)
—Height	7.6 in. (19.4 cm.)
—Depth	18.8 in. (47.8 cm.)
Weight:	44.0 lb. (20.0 kg.)
Power Requirements:	115 volts @ 3.0 amps

The Qume Sprint 5 Package

Apple Order No. D2M0060

With your Qume Sprint 5 order, you will receive:

- Qume Sprint 5;
- pressure feed platen;
- paper guide;
- cover for power supply;
- interface cable and connector;
- "Prestige Elite" printwheel;
- fabric ribbon cartridge;
- operating documentation;
- warranty.

Note: To use the Qume Sprint 5 with the Apple II Plus computer, a High Speed Serial Interface Card (Apple Product A2B0005) is also required.

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Monitor *III*

Up to 80 Sharp Characters per Line

Accessories

Monitor III is a custom-designed display device for Apple III Computer Systems that is also suited for use with the Apple II Plus. Its 12-inch screen produces sharp, highly readable, 80-character by 24-line text and high-resolution graphics. It fits neatly on top of the Apple III, and is equipped with a monochromatic, non-glare screen for exceptional reading comfort. Monitor III connects easily to the computer via a standard cable supplied with every Apple III system.
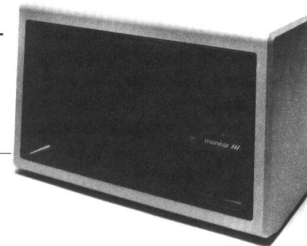
Benefits

Monitor *III*…
- *displays highly readable characters and graphics, because its sharp resolution extends over the entire screen, even into the corners…*
- *reduces eye strain and fatigue, so you can work comfortably and productively with your Apple III or Apple II Plus for hours at a time…*
- *allows quick adjustment of its display through convenient front-panel contrast control…*

System Configuration

To use Monitor *III*, you will need:
- any Apple *III* system;
- high-frequency RCA-type video cable (supplied with the Apple *III*).

Technical Specifications

Electrical

CRT Type:	12" (30.5 cm.) diag., 90° diagonal deflection; anti-glare screen
Phosphor:	P39—green (A3M0039) or P4—black & white (A3M0006)
Scanning:	EIA standard; 525 lines; 30 frames, 60 fields/sec.; overscan
Data Input Signal:	1.0 volt p-p + 0.2 volt composite, sync. neg. into 75 ohms
Drive Rates:	
—Horizontal	15.699 KHz
—Vertical	60 Hz
Video Bandwidth:	18 MHz
Horizontal Resolution:	700 TV lines center; 500 TV lines corners
Geometric Distortion:	Less than 2%
Nonlinearity:	Horizontal—less than 7%
Operating Temperature Range:	10° to 40°C.
Power Requirements:	117 VAC, ± 10%, 50/60 Hz 27 VA typical, 45 VA maximum

Mechanical

Cabinet:	GE Noryl (color coordinated with the Apple *III* cabinet)
Dimensions:	
—Width	17³⁄₁₆ in. (43.7 cm.)
—Height	10⅝ in. (27 cm.)
—Depth	12½ in. (31.8 cm.)
—Weight	16.5 lbs. (7.5 kg.)

Controls/Connector

Front Controls:	Power on/off; contrast
Rear Controls:	Bright; vert. hold; height
Internal Controls:	Focus; vert. linearity, horiz. hold; horiz. sub-hold; horiz. size, B + adjust
Input Connector:	RCA-type; 75 ohms terminated

Monitor *III* Package
Order No. A3M0006
(Black & White)
Order No. A3M0039
(Green Phosphor)

With your Monitor *III* order, you will receive:
- Monitor *III*;
- operating documentation;
- warranty card;
- dust-free wiping cloth.

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ProFile™

The Apple III Personal Mass Storage System

ProFile is the new Personal Mass Storage System for Apple III computers. ProFile is a complete storage system: it includes a 5¼-inch, Winchester technology hard disk housed in a compact, sealed environment; device driver software; and the ProFile interface card.

The Personal Mass Storage System dramatically increases the Apple III's maximum on-line storage capacity from 560 kilobytes to 5 million bytes, allowing you to safely store in one location information that would fill 35 floppy diskettes.

Designed for professionals with large-scale, low-cost-per-byte data storage and programming needs, the ProFile is an ideal tool for software and computer graphic developers, accountants, financial planners, doctors, educators, and engineers. Its Winchester technology provides rapid data access (approximately 10 times faster than the conventional floppy disk drive), letting you tackle complex projects on the Apple III more efficiently than ever before.
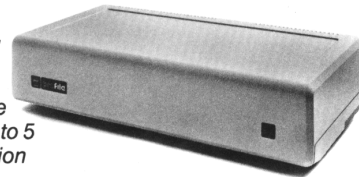
Benefits

ProFile

■ *simplifies large data processing and programming tasks by allowing you to centralize 5 megabytes of storage in a single, compact unit…*
■ *increases productivity, because it accesses data 10 times faster than the conventional floppy disk drive…*
■ *assures data integrity, because its intelligent controller automatically scans for error conditions, and relocates marginal data blocks elsewhere on the disk, if necessary…*
■ *is usable in any work environment because it is compact, light, simple to install, and extremely quiet…*
■ *offers cost-effective data storage—less than one-tenth of a cent per byte…*
■ *is highly reliable, designed to offer better than 10,000 in-use hours of mean time between failures.*

**ProFile—
A Closer Look**

The ProFile Personal Mass Storage System is styled to be placed between the Apple *III* and Monitor *III*. It can also be conveniently located next to the computer, occupying little desktop space. (It should never be placed, however, on thick carpeting or any other surface that might obstruct its ventilation.)

ProFile is a Winchester-technology device, and its four disk surfaces, two read/write heads, and actuator mechanism are integrated in a sealed, protected unit. Unlike the floppy disk drive, it relies on rigid, non-removable ("fixed-media") disks for data storage, rather than flexible, manually inserted diskettes.

The ProFile system is easy to install. Simply insert the ProFile interface card, supplied with the drive, into one of the four Apple *III* slots. Two cables are packaged with the hard disk: a power cable, which supplies ProFile with AC power; and a shielded interface cable (with identical 25-pin, D-type connectors on each end) for transferring control signals between the computer and the drive. Attach one end of this cable to the D-type mating connector on the edge of the interface card; the other end, similarly, fits in the connector on the back of the ProFile cabinet.

Connect the mating plug on the power cord into the recessed, 3-pin AC power connector, also located on the back of the cabinet. Now just plug ProFile into any electical outlet and your Personal Mass Storage System is completely installed and ready to operate.

The compact ProFile unit houses the power supply, head-disk assembly, an analog-to-digital card, and intelligent controller card. The analog card serves as the interface between the controller and head-disk assembly, and is primarily dedicated to read/write functions.

During the first 60 seconds after "powering up" ProFile, the controller analyzes all disk surfaces, checking the data integrity of each sector. If a head positioning error is detected, the controller will instantly attempt to reposition the head to the proper track location. Should a read error be discovered, the controller analyzes the error, retries the data, and attempts to recover from the error. And, in the event a given sector's error rate is too high, the controller will automatically relocate data to another area of the disk. The ready light indicates the drive is ready for use.

System Configuration

To use ProFile, you will need:
- an Apple *III*, with a recommended minimum of 128K bytes RAM;
- SOS operating system with ProFile driver.

Technical Specifications

Storage Characteristics:

Data Surfaces:	4
Heads per Surface:	1
Tracks per Surface:	153
Track Spacing:	254 tracks per inch
Block Size:	512 bytes
Data Capacity (formatted):	5 megabytes
Sectors per Track:	16
Sectors per Surface:	2448
Bytes per Sector:	512

Drive Characteristics:

Seek Time Distribution:	1300 tracks per second
Average Seek Time:	95 milliseconds
Data Transfer Rate:	5 megabits/second
Rotational Speed:	3600 RPM
Rotational Start-Up Time:	20 seconds
Drive Ready to Operate:	60 seconds

Power Requirements:

110 VAC (U.S.);
35 watts

Environmental Characteristics:

Operating Temperature:	50°F (10°C) to 104°F (40°C)
Storage Temperature:	−7.6°F (−22°C) to 176°F (80°C)
Operating Humidity:	20% to 80% (no condensation)
Storage Humidity:	1% to 95%

Packaging:

Interface:	PC board that plugs into one of the Apple *III*'s four expansion slots
Drives per Interface:	one
Drive Dimensions (H x W x D):	4.39 in. (1.15 cm.) x 17.28 in. (43.89 cm.) x 8.81 in. (22.38 cm.)
Drive Weight:	11 lb. (5 kg.)
Power Source For Drive:	internal to the ProFile Drive

The Profile Package Order No. A3M0305

With your ProFile order, you will receive:
- Apple *III* ProFile hard disk drive;
- ProFile interface card;
- interface cable;
- AC power supply cable;
- ProFile driver diskette;
- ProFile demonstration diskette;
- ProFile Owner's Manual.

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The Apple Graphics Tablet

Accessories

Creative Electronics for the '80s

The Apple Graphics Tablet is a versatile electronic medium for creating computer graphics and computer pictures. It lets you use your Apple II Plus Personal Computer System to develop and display block diagrams, architectural renderings, logic diagrams, schematics, mechanical shapes—even fine art. Its advanced features and simplicity of operation make the Graphics Tablet an ideal medium for turning your creative ideas into visual realities.
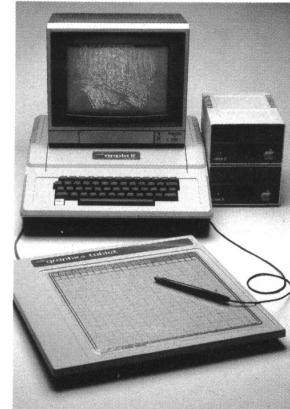
Benefits

The Apple Graphics Tablet…
- *can be quickly understood and operated by anyone, thanks to its easy-to-use command menu…*
- *allows you to change, delete, or add to existing software, so you can modify the system to fit your graphics needs…*
- *offers storage and editing features that permit you to save works in progress onto diskette, then conveniently load them for change or review…*
- *uses power supply and control electronics that reside within your Apple, providing a low-profile desktop package that fits easily into even the smallest workspace.*

The Graphics Tablet—A Closer Look

The Graphics Tablet connects to the Tablet Interface Card, which plugs into one of the peripheral connector slots in your Apple computer. After these have been installed, insert the 13-sector Apple Graphics Tablet Software diskette in your disk drive, turn on the power, and you're ready to start.

Using Color
Command boxes located at the top of the Tablet offer 22 operating modes from which to choose. Simply press the Tablet's pen to the desired mode.

Suppose you want to draw a landscape layout. Begin by pressing the DRAW command box and then the PEN COLOR command box. A color options menu will appear on your screen.

An indicator will follow the path of your pen as you move it lightly across the screen. Move the pen until the indicator rests on the color block you want, then press down on the Tablet's surface. The color menu will disappear, and the blank screen will be ready for your first stroke in the chosen color. Changing colors simply requires pressing the PEN COLOR command box and repeating the selection process.

To erase errors, select the background color and draw over the mistake. Then choose the appropriate color to redraw.

Framing, Reducing, and Enlarging Areas
Maximum drawing space on the Graphics Tablet is 11 by 10 inches. If you wish to draw in a smaller space, press the VIEWPORT command box with your pen, and indicate with dots the corners of the drawing area desired. REDUCER and WINDOW commands allow you to shrink or enlarge VIEWPORT-specified portions of your drawing, giving you added design flexibility.

When you're done or wish to stop drawing for awhile, you can save your work for future review or revision by pressing the SAVE command box.

Problem-Solving Graphics
Because the Graphics Tablet employs your Apple's problem-solving capability, it allows you to perform important calculations. Suppose your landscape includes a swimming pool. To determine how much earth would be excavated, you can convert screen units into square feet through a scaling feature. Press the CALIBRATE command box and answer the BEGINNING POINT? request by pressing down on the Tablet at the point you wish with your pen.

The Apple Graphics Tablet

In the same manner, supply an ENDING POINT when it's requested. Your Apple will automatically convert the distance between the two points into screen units and ask you to assign a scale value—for example, 10 screen units equals two feet. Finally, press the AREA command and move the pen over the perimeter of the pool. Your Apple will automatically convert the units into square feet.

The Graphics Tablet is also very handy for other special applications. Suppose you're conducting a telephone survey. Instead of recording responses on separate sheets of paper and totaling all the answers at the end, you could draw the survey form on your Tablet, write a simple program for your Apple, and get the total number of responses automatically as you check them off the grid.

Whether you're an engineer, professional artist, architect, illustrator, novice, or programmer, the Apple Graphics Tablet offers you an exciting, new approach to self-expression and problem solving.

System Configuration

To use the Apple Graphics Tablet, you will need the following system:
- Apple II plus with 48K of memory;
- a suitable video display device*;
- Apple Disk II drive with controller.

*A black and white monitor or television may also be used if you do not require color (RF modulator required with TV).
NOTE: Video monitors or televisions lacking vertical hold controls may not work with an Apple Computer System.

Technical Specifications

Power Requirements (supplied from Apple power supply):
230mA + 5 VDC
40mA + 12 VDC
20mA − 5 VDC
40mA − 12 VDC

Software/Firmware:
Control program in Applesoft BASIC.
Quick-draw routine in assembly language.
Interface Firmware in ROM.

Digitizing Area:
11 in. x 11 in. (28 cm. x 28 cm.)

Overall Size:
15.5 in. x 15.5 in. x 1.0 in. (39.5 cm. x 39.5 cm. x 2.5 cm.)

Controller Card Size:
7.0 in. x 2.75 in. x 0.5 in. (17.8 cm. x 7.0 cm. x 1.3 cm.)

Pen Size:
6.0 in. (15.2 cm.) with 6.0 ft. (1.8 m.) cable

Data Rate:
Up to 120 coordinate pairs per second

Coordinate System:
Absolute cartesian with selectable origin and scale

Output Forms:
Eight-bit binary coordinate pairs

Interface Levels:
TTL—provided by Apple interface

The Graphics Tablet Package Order No. A2M0029

With your Graphics Tablet order, you will receive:
- Apple Graphics Tablet with cable;
- pen with 6-ft. connector cable;
- two Graphics Tablet Software diskettes (13-sector);
- Graphics Tablet instruction manual;
- interface;
- mylar overlay;
- warranty card.

Interface Cards
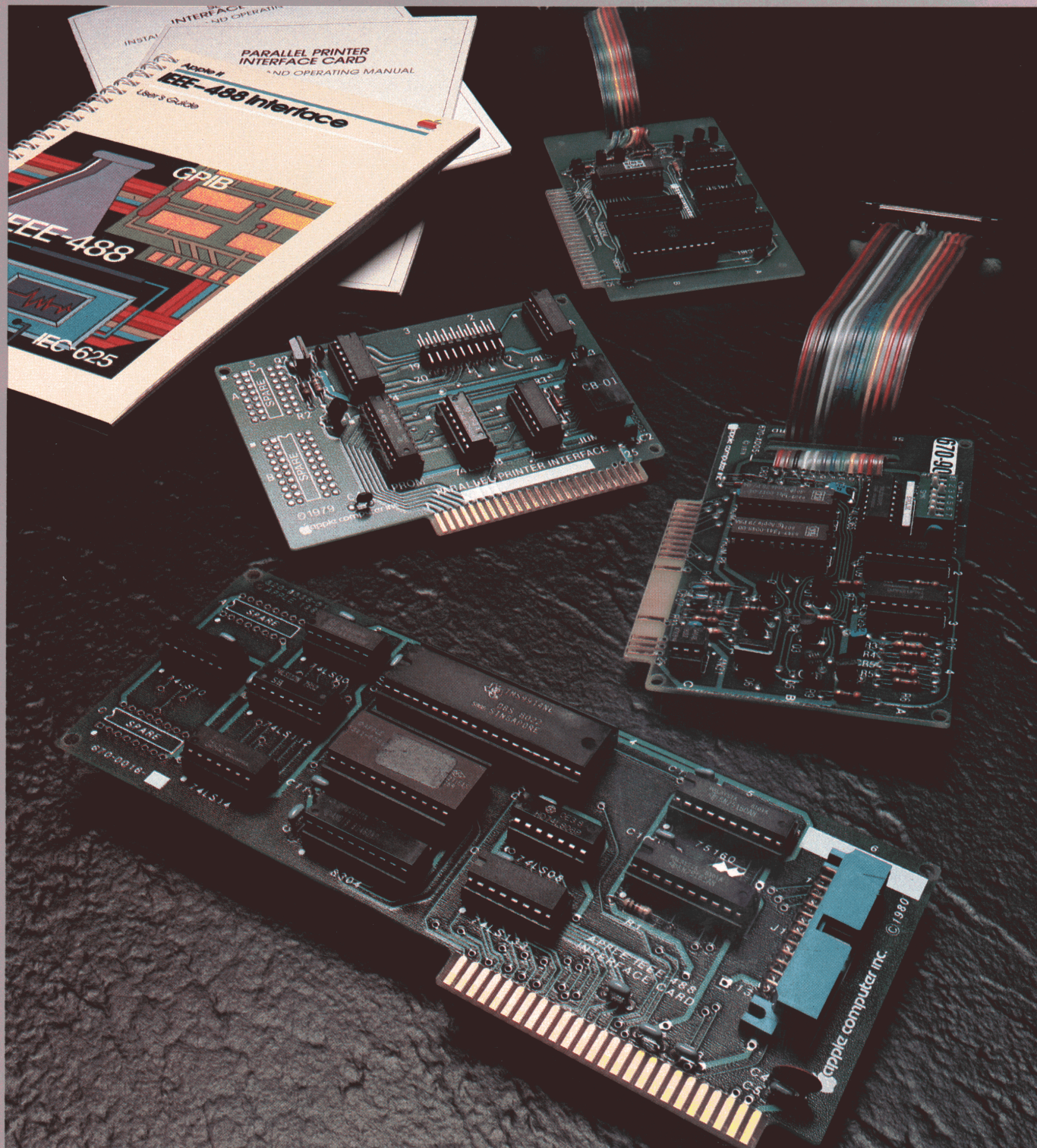
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Apple II Plus
Super Serial Interface Card

The Single-Card Solution To Serial Communication

The Apple II Super Serial Card replaces two separate cards previously available from Apple, the Serial and the Communications Interface Cards. It allows Apple II Plus computer systems to exchange data with other computers, modems, printers, terminals, and accessories, employing a bi-directional RS-232C interface in serial format (one bit at a time).

The Super Serial Card features an on-board switch that lets you operate either a printer or modem port. This switch also eliminates the need for special connection cables such as modem eliminators.

Benefits

The Apple II Super Serial Card...

■ *expands your system's usefulness by providing an industry standard (RS-232) interface to most computer accessories...*
■ *is easily controlled from BASIC or Pascal by simple commands...*
■ *prevents false or lost data, and frees up software time, through its "hardware handshaking" control of information flow...*
■ *provides access to a wide range of local and remote computer equipment, as it rapidly transfers data either by telephone (through a modem), or directly, at speeds from 50 to 19.2K baud...*
■ *allows software or on-board switch selection of baud rates, so both programming and telecommunications are more flexible...*
■ *is easily installed, thanks to switch-selectable, pre-set conditions that let you set speed, line length and auto line feed parameters.*

System Configuration

To use the Apple II Super Serial Card, you will need:
■ Apple II or II Plus system;
■ a printer, modem, or other serial device;
■ external cable (Apple Part No. A2M0050).

Technical Specifications

Parameter	Description
Signal Level:	EIA RS-232C
Connector Type:	DB-25 female
On-Board ROM:	2K x 8 bit (2316 or equivalent)
ACIA:	SY6551 or equivalent
Baud Rate Selection:	Via on-board DIP switches (default) or via software commands
Data Word Format:	1 start bit, 1 or 2 stop bits, 7 or 8 data bits; odd, even, or no parity
Available Baud Rates:	50, 79, 110, 134.6, 150, 300, 600, 1200, 1800, 2400, 3600, 4800, 7200, 9600, 19,200
RS-232C Signals Supported:	CTS (Clear to Send) RTS (Request to Send) DTR (Data Terminal Ready) DSR (Data Set Ready) DCD (Data Carrier Detect) RXD (Receive Data) TXD (Transmit Data) Signal Ground

The Super Serial Interface Card Package Order No. A2B0044

With your Apple II Super Serial Card order, you will receive:
■ Apple II Super Serial Card;
■ DB-25 female bulkhead connector and mounting bracket;
■ Installation and Operating Manual.

"DTCA2DOC-306-01-85.PICT" 1316 KB 2001-04-30 dpi: 300h x 300v pix: 2145h x 3065v

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Apple II Plus
Parallel Interface Card

An Efficient Way to Expand Your Apple System

The Parallel Interface Card allows you to generate reports, listings, labels and letters with your Apple computer using a variety of parallel-interfaced printers.

Designed for user convenience, the Parallel Printer Interface Card consists of two sets of firmware, identical to the Centronics and Parallel Printer Interface cards previously made by Apple. The user can select interface characteristics via seven card-resident switches— which eliminates the need to wire configuration blocks. Switch selection includes strobe and acknowledge polarities, strobe length and firmware code.

The Parallel Interface Card can also function as a general-purpose input/output port, passing 8-bit parallel information to and from the Apple II without the intervention of firmware.

Benefits

The Parallel Interface Card...
■ *allows you to generate printed material on a variety of popular printers...*
■ *is fully compatible with all Apple software...*
■ *uses built-in intelligence, eliminating the need to write or load assembly language programs to control attached printers...*
■ *allows simple printer control from BASIC or Pascal...*
■ *provides printer speed flexibility, accommodating printing as fast as 5000 characters per second (3700 LPM at 80 characters per line)...*
■ *has full 8-bit input/output ports that allow you to monitor printer error functions.*

System Configuration

To use the Parallel Interface Card, you will need:
■ an Apple II or II Plus;
■ printer with parallel interface requirements;
■ an external cable (Apple Part No. A2M0052).

Technical Specifications

Parameter	Description
Data and Control Signals:	Strobe 1-15 microseconds, switch-selectable
	Acknowledge and Strobe polarity, switch-selectable
	8 bits out, parallel
	8 bits in, parallel
Print Line Width:	40-255 char/line
	Automatic formatting of BASIC listings

The Parallel Interface Card Package Order No. A2B0021

With your Parallel Interface Card order, you will receive:
■ Parallel Interface Card;
■ Installation and Operating Manual.

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Apple IEEE-488 Interface Card

IEEE-488 Standard For Instrument Control

With the Apple IEEE-488 Interface Card installed, Apple II Plus Computer Systems can be used to program and operate virtually any test, measurement, or control instrument that is bus-compatible with the IEEE-488 interface standard. The interface card plugs into any expansion slot in the Apple II Plus computer. Its cable comes with a standard IEEE-488 bus plug for quick connection to IEEE-488 instruments.

The IEEE-488 Interface Card simplifies design and implementation of complex instrument systems—including frequency generators, digital multimeters, programmable power sources, disk drives, speech synthesizers, and other equipment. Powerful resident software allows you to program instrument control in BASIC and assembly language using straightforward macro commands. The interface card can be driven from other Apple II-supported languages (Pascal, FORTRAN) through assembly language routines. And there's no need to worry about signal protocol on the bus, because the card's resident software handles it all for you.

The Apple IEEE-488 Interface Card lets you take advantage of the power, reliability, and reasonable price of Apple computers to control a wide variety of scientific/industrial instruments.

Benefits

The Apple IEEE-488 Interface Card...
■ simplifies the design of instrumentation systems, because it conforms to the industry-wide IEEE-488 standard...
■ lets you use simple commands to operate the most complex instruments...
■ expands your instrument control capabilities by using fully integrated Apple II Plus Computer Systems...
■ provides for flexibility in system design, including the ability to plug multiple interface cards into a single Apple computer (controls up to 14 devices per card).

System Configuration

To use the Apple IEEE-488 Interface Card, you will need:
■ Apple II Plus with minimum 32K of memory;
■ Apple Disk II drive with controller;
■ a suitable video display device (optional).

Technical Specifications

As a Listener/Talker/Controller, the Apple IEEE-488 Interface Card provides a fully compatible subset of the IEEE-488 standard. (Its only limitation is that it cannot pass control to another IEEE-488 controller.)

The interface card can also function as a device on the IEEE-488 Bus. With a user-defined program, the card can be used to attach non-IEEE-488-compatible instruments to the bus.

The following is a list of GPIB (General Purpose Instrument Bus) commands that can be used with the interface card:

Command	Description
WRITE	Write Data Out
WRITECNT	Write Data Out With Count
READ	Read Data In
READCNT	Read Data In With Count
XFER	Transfer Data
TRIGR	Group Execute Trigger
CLRAL	Clear All Devices
CLEAR	Clear Selected Devices
REMAL	Remote Enable All
REMDV	Remote Enable Selected Devices
LLKAL	Local Lockout All Devices
LOCAL	Local Mode All Devices
LOCDV	Local Mode Selected Devices
SRQD	Service Requested
SPOLL	Serial Poll

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PPOLL	Parallel Poll
PPENB	Parallel Poll Enable
PPDIS	Parallel Poll Disable
PPUAL	Parallel Poll Unconfigure All Devices
DEVICE	Controller Device Number
LINEFEED	Line Feed Control
EOS	End of String Character
SCREEN	Screen Control
ABORT	Clear All Interfaces
UNTALK	Universal Untalk

The device capabilities are: SH1, AH1, T3, L1, DC1, DT1, C1, C2, C3, C4, C25.

**The Apple
IEEE-488 Interface
Card Package
Order No. A2B0015**

With your Apple IEEE-488 Interface Card order, you will receive:
■ Apple IEEE-488 Interface Card (terminated in a standard IEEE-488 female connector);
■ on-board, ROM-based firmware;
■ back-panel bracket with connection to Apple case ground (for low-RFI systems);
■ instruction manual.

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Apple *III* Universal Parallel Interface Card

Three Interface Cards in One

The Apple III Universal Parallel Interface (UPI) Card lets users attach a variety of parallel-mode printers—including most dot matrix models, plus some thermal and daisywheel units—to Apple III Computer Systems. Included with the card is a diskette containing an operating system driver, which lets you custom-configure the card to work with the printer you are using.

Because the UPI Card also emulates two Apple II interface cards— the Centronics Interface Card and the Parallel Printer Interface Card—it's able to control your printer directly from Apple III software, or from Apple II software running in emulation mode. And it spares you from having to juggle different cards for different jobs.

The Apple III UPI Card can also be used with equipment other than printers, functioning as a general purpose parallel input/output interface. Sixteen output lines (two groups of eight lines each) and eight input lines provide wide data paths for sending, receiving, and acknowledging data transfers. Other features of the card's general purpose function include: control signals with software-selectable priority; a programmable pulse-length strobe line; and software interrupt capabilities. A complete bi-directional, 8-bit parallel port software driver is also included for your convenience.

Because it's three cards in one, the Apple III Universal Parallel Interface Card gives you the convenience of printer plug-compatibility, the economy of Apple II printer emulation, and the flexibility of a full-featured parallel interface.

Benefits	**The Universal Parallel Interface Card…** ■ *increases system flexibility by permitting control of a wide range of dot matrix, thermal, and daisywheel printers…* ■ *reduces system costs and hardware requirements by providing complete Apple II parallel printer emulation…* ■ *broadens the Apple III's capabilities, because it can also be used as a powerful, general purpose parallel input/output port for a wide range of custom applications.*
System Configuration	To use the Universal Parallel Interface Card, you will need: ■ any Apple *III* system with an available expansion slot.

Technical Specifications

Parameter	Description
Data Lines:	16 output (24 mA at 0.5V) 8 input (1 LSTTL load)
Control Lines:	Data Ready Output Acknowledge Input Reset Data Ready Output Strobe Signal Ground Chassis Ground
Control Signal Polarity:	Software-setable
Signal Levels:	LSTTL
Strobe Length:	1-15μ sec in 2μ sec steps
Interrupts:	Software-controlled
Connector:	40-Pin Ribbon (Parallel), center-keyed—accepts 20-Pin Ribbon (Printer), center-keyed

The Apple *III* Universal Parallel Interface Card Package **Order No. A3B0002**	With your Apple *III* Universal Parallel Interface Card order, you will receive: ■ Universal Parallel Interface Card; ■ software driver diskette; ■ instruction manual;

Expansion Options

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Expansion Options
Growing Your Apple System

Apple Language Card
The Language Card expands the capabilities of your 48K Apple Computer System by increasing its internal memory to 64K bytes. While some languages cannot access the entire 16K of additional memory, the card does allow you to have both BASICs available at one time in your system.

VisiCalc™ users interested in developing larger models will benefit from the additional memory space. The Language Card also increases memory capacity available to Microsoft SoftCard™ CP/M*™ users from 44K to 56K.

If you want to write programs in Pascal, you need the Apple Pascal package (Apple Product A2B0006). To write FORTRAN programs, both the Apple Pascal package and Apple FORTRAN are necessary. (Please refer to the Languages and Utilities section for further information.)
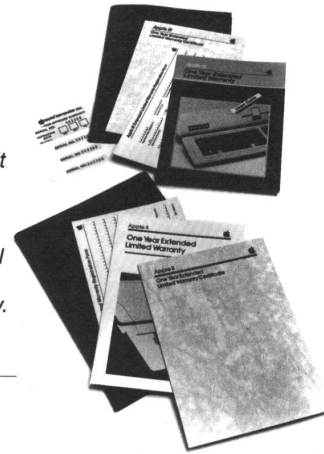
The Apple Language Card Package Order No. A2B0043

With your Apple Language Card order, you will receive:
- Apple Language Card containing:
  —16K bytes of RAM;
  —Auto-Start monitor ROM;
- IC puller;
- Language Card Installation and Operation Manual.

The CP/M operating system runs on any 48K Apple Computer System with the Microsoft SoftCard interface.
™VisiCalc is a trademark of Personal Software, Inc.
CP/M is a trademark of Digital Research, Inc.
SoftCard is a trademark of Microsoft.

Applesoft Firmware Card
The Applesoft Firmware Card contains hardware and software controls that allow it to electrically replace the existing Integer BASIC firmware in Apple II Standard computers. It offers access to the growing library of programs written in Applesoft BASIC. A complete description of the Applesoft language may be found in the Languages and Utilities section of this reference guide.

The Applesoft Firmware Card Package Order No. A2B0009

With your Applesoft Firmware Card order, you will receive:
- Applesoft Firmware Card;
- Auto-Start monitor ROM;
- Applesoft II BASIC Programming Reference Manual.

Integer BASIC Firmware Card
This card provides access to a library of programs written in the Integer BASIC language.

It contains hardware and software controls that allow it to electrically replace the existing Applesoft BASIC firmware in Apple II Plus computers.

A complete description of the Integer BASIC language may be found in the Languages and Utilities section of this reference guide.

The Integer BASIC Firmware Card Package Order No. A2B0010

With your Integer BASIC Firmware Card order, you will receive:
- Integer BASIC Firmware Card;
- BASIC Programming Manual;
- Apple II monitor ROM;
- Programmer's Aid #1 ROM;
- Programmer's Aid #1 Installation and Operation Manual.

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Auto-Start ROM
The Auto-Start ROM makes any Apple II system friendlier and easier to use by adding such features as:
- *automatic start-up in BASIC for systems without disks;*
- *automatic disk program loading when system turns on;*
- *RESET protection ("RESET" key halts programs, returns to BASIC);*
- *easy screen editing, with up to 90 percent fewer keystrokes.*
(The device is a plug-in replacement for the existing Apple II monitor ROM. It is included with Apple II Plus systems, the Applesoft Firmware Card, and the Apple Language Card.)

The Auto-Start ROM Package Order No. A2M0027

With your Auto-Start ROM order, you will receive:
- Auto-Start ROM;
- Auto-Start ROM Installation and Operation Manual.

16K Byte Expansion Memory Module
This module allows user memory expansion in 16K-byte increments for any 16K or 32K Apple II computer.

The 16K Byte Expansion Memory Module Package Order No. A2M0016

With your Expansion Memory Module order, you will receive:
- eight 16K-bit RAM devices;
- installation instructions;
- test program to ensure installation is correct.

Hobby/Prototyping Card
Create your own Apple interface boards with this wire-wrap card. The 2¾" x 7" double-sided circuit board includes a hole pattern (on 100-mil centers) that accepts all conventional ICs and passive components. It plugs directly into any Apple expansion connector, and fits entirely within the computer case.

The Hobby/ Prototyping Card Package Order No. A2B0001

With your Hobby/Prototyping Card order, you will receive:
- Hobby/Prototyping Card;
- complete bus documentation.

Programmer's Aid #1
Programmer's Aid #1 is a ROM-based library of routines to simplify and enhance your Integer BASIC programs. Its capabilities include:
- *high-resolution graphics generation;*
- *program renumbering and linking;*
- *tape verification;*
- *musical tone generation (12 timbres and five octaves);*
- *RAM testing;*
- *machine language program relocation.*
Note: Programmer's Aid #1 is now included with Apple II computers and with the Integer BASIC Firmware Card.

The Programmer's Aid #1 Package Order No. A2M0019

With your order for Programmer's Aid #1, you will receive:
- 2K-byte ROM;
- Programmer's Aid #1 Installation and Operation Manual.

Apple Hand Controls
Apple Hand Controls provide exciting real-time interaction with a wide variety of educational and entertainment software. They feature handy rotary and push-button control devices, and plug directly into a socket inside your Apple II Plus.

The Apple Hand Controls Package Order No. A2M0007

With your Apple Hand Controls order, you will receive:
- two hand controls;
- installation sheet;
- warranty card.

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Apple *III* OEM Prototyping Card

An Effective Aid for Custom Interface Design

Apple's OEM Prototyping Card is a convenient, modular printed circuit card on which to build custom interfaces for the Apple III Computer System. The card offers ample space to handle the majority of interface designs. It accommodates most integrated circuits and components, and has built-in facilities for attaching a variety of edge connectors and switches to your circuits. Also included are decoupling networks and shields to ensure maximum immunity from RF noise.

Equally important, the OEM Prototyping Card assures you of Apple product quality and compatibility. The card is double-sided, with plated-through holes for positive connection. And its 50-pin, gold-plated edge connector plugs right into any unused expansion slot in your Apple III, giving you complete access to all of the signals on the bus.

Even the most advanced custom interfaces for the Apple III are easier to design and more reliable to use when you start with Apple's OEM Prototyping Card.

Benefits

The Apple *III* OEM Prototyping Card…
- *simplifies designing even the most advanced system interfaces with its convenient, built-in RF shielding, power bus, and other features…*
- *allows greater flexibility, because it accepts a wide range and combination of components mounted in various positions…*
- *saves you time and money implementing Apple III custom interfaces by reducing the effort required to assemble working prototypes…*
- *assures you of Apple reliability and compatibility, because of the card's high-quality printed circuits, connectors, and construction.*

System Configuration

To use the Apple *III* OEM Prototyping Card, you will need:
- any Apple *III* system with an available expansion slot.

Technical Specifications

Circuit Development Area (A):
- 5.40" x 3.70" space;
- 0.10" hole spacing;
- accepts up to 42, 14-pin; 36, 16-pin; 24, 24-pin; or 12, 40-pin DIP packages; or combinations thereof.

Input Buffering Area (B): for installation of RFI isolation circuitry.

Connector Interface Areas:
- Area **C**: for up to 67-pin, "D"-type connectors;
- Area **D**: for up to 50-pin, ribbon cable connectors.

Additional Board Areas:
- SPST switch position (**E**);
- RF Shield (supplied) connection points (**F**);
- 50-pin, gold-plated edge connector.
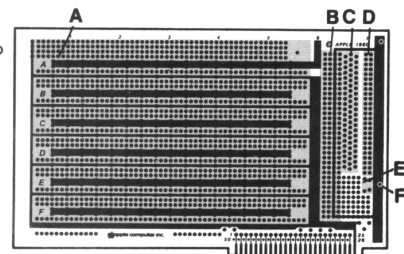
The Apple *III* OEM Prototyping Card Package Order No. A3B0001

With your Apple *III* OEM Prototyping Card order, you will receive:
- OEM Prototyping Card;
- twelve ferrite bead inductors for RFI isolation;
- one RF Shield;
- four power supply decoupling capacitors;
- instruction manual (includes Apple *III* Bus technical description).

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The Apple One-Year Extended Limited Warranty

Low-Cost Service Protection for Your Apple

The Apple Extended Limited Warranty is an insurance policy for your Apple. It covers all Apple-manufactured hardware and system software on a single system for one full year*.

Benefits

The Apple Extended Limited Warranty…
- *assures you of continuing product excellence, because any corrective update to Apple system software is yours free…*
- *grows with your system, because all Apple-manufactured products, including those you buy during the one-year period, are automatically covered*…*
- *offers you the lowest cost protection in the industry, less than ¾ percent per month of a typical system's price.*

The Apple Extended Limited Warranty— A Closer Look

Apple has become a leader in the personal computer industry by providing the best products available on the market—and keeping them the best by finding ways to improve them. When you're part of the Apple Extended Limited Warranty Program, any corrective update to Apple system software is yours—free. System software includes Integer BASIC, Applesoft BASIC, Apple Business BASIC, DOS, SOS, Apple Pascal, and more.

Because there are more than 1000 Apple Authorized Service Centers, there's probably one located near you. Apple guarantees that your warranty will be honored at all of its service centers in the country of purchase—added insurance should you move to a new area. Local service means you won't have to wait extra days while your Apple is shipped to and from a repair center.

If you purchase additional Apple products during the one-year warranty period, they are automatically covered. You don't have to buy more coverage or another warranty*. And your Apple warranty is renewable in one-year increments. Although the price in future years can't be guaranteed, you're assured of the same outstanding coverage—and benefits—that you enjoyed the first year.

Although Apple recommends—for your maximum protection—that you buy your warranty with your system, Apple gives you the option to do so at any time. However, should your Apple be out of its initial 90-day warranty period, you'll need to take it to your local Apple service dealer for an owner-paid inspection before you can purchase the warranty.

The Apple II Extended Limited Warranty Package Order No. A2G0003

The Apple III Extended Limited Warranty Package Order No. A3G0003

With your Apple Extended Limited Warranty order, you'll receive an attractive folder designed for easy, convenient storage. Inside, you'll find:
- a booklet explaining how you can take full advantage of Apple's warranty and service programs;
- a document containing all terms and conditions of the warranty;
- a warranty agreement in triplicate—one copy for you, one for your local Apple service dealer, and one for Apple's worldwide headquarters;
- warranty validation labels to identify your warranty and prevent others from using it.

*Some Apple products may be specifically exempted from the coverage because they have their own individual Extended Limited Warranties.

Look To Your Full-Support Dealer

Apple backs a worldwide network of full-support dealers. Each provides a complete package of services that help you get the most from your Apple.

Talk to dealers in your area. Explain your needs, and select one with whom you feel comfortable. Then look to your dealer for support that includes:

Needs Analysis Full-support dealers are trained to evaluate your needs and propose custom-tailored solutions. Your dealer will help determine what your system should do, and make sure you get some hands-on experience with an Apple II Plus or an Apple *III*. The dealer will then suggest the combination of system, software, and peripherals you need. That way, you'll be sure to get a system-oriented solution that will do what you want.

Pre-Delivery System Checkout Once you've selected a computer system, your full-support dealer will assemble and run it to make certain that all components and software are compatible and will operate properly together. This in-store test is your best assurance that you'll be able to use your system right away.

Installation Instructions Before you leave the store, the dealer will make sure you know how to set up your system and are familiar with the basic operating procedures you need to use the Apple. If you have any problems afterwards, your dealer is just a local call away.

After-Purchase Support Buying from a full-support dealer guarantees you continued service and support in the future. Your dealer can provide fast answers to your technical questions, give you the latest information on new hardware and software products, and keep you informed about any product updates. If you want to upgrade your system, a full-support dealer will help you pick compatible components.

Quick Service Authorized Apple Service Centers are equipped with an inventory of repair parts and modules that allows them to give you same-day (often "while-you-wait") service for most repairs. Service is provided whether your system is covered under the standard or Extended Limited warranties, or even if it's out of warranty (although there is a charge for out-of-warranty service). Apple's Extended Limited Warranty, available through your full-support dealer, provides you fast, reliable service for your Apple system and Apple-built peripherals.

Dealers are backed by Apple Regional Support Centers, which can supply additional parts, technical help, or training.

In addition to the services and support listed above, many full-support dealers also offer additional services. Ask your dealer for details on:
■ training classes that help you learn programming languages and applications software products;
■ programming services to create specialized programs or adapt existing applications software to meet the needs of your business;
■ delivery and on-site installation for professional customers, along with an on-site service program.

Ask your Authorized Apple Dealer for a free demonstration of Apple's personal computer systems. To locate the Apple dealer nearest you, call toll free (800) 538-9696. In California, call (800) 662-9238.

Visit the expert—your local, full-support Apple dealer.

Notes:

apple computer

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