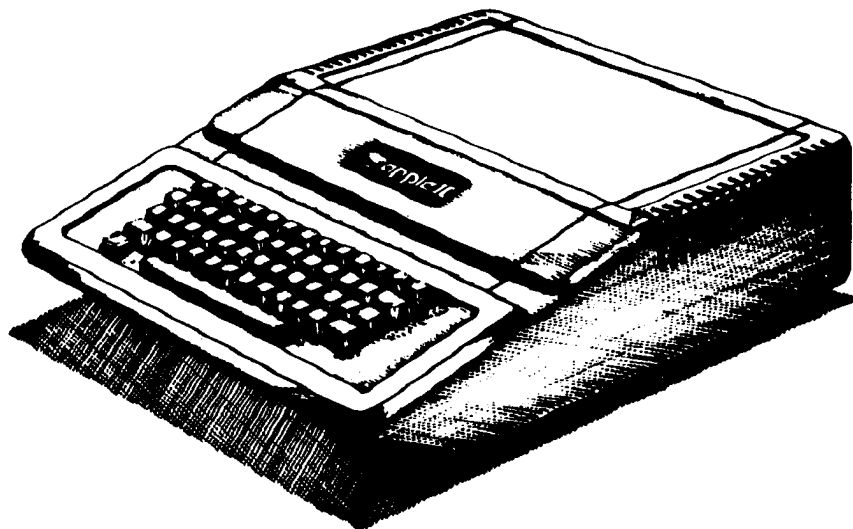


Apple 2 Computer Technical Information



Apple II Computer Family Information

Data Sheet

AppleSoft and Integer BASIC

Nov. 1981

Document #

25

Ex Libris David T. Craig

Applesoft and Integer BASIC										Languages and Utilities									
How to Program an Apple Without Really Trying																			

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

Applesoft and Integer BASIC

± 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.

Note: Applesoft and Integer BASIC languages and manuals are included in the Apple Pascal package (Apple Language 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