MPW® Speaks Your Language

Macintosh Programmer's Workshop 3.2

"MPW offers the flexibility to customize at the programmer level, yet at the same time allows us good control at the multiple programmer-project level."

William Laleker
Manager, Systems Development
CSX Corporation

In the world of software development, the environment in which the language operates is as important as the language itself.

The Macintosh Programmer's Workshop (MPW)–Apple Computer's own Macintosh® development system–offers one of the most powerful programming environments available. With MPW, you can create programs using any combination of C, C++, Object Pascal, or assembly language from Apple, as well as Ada, Fortran, and other languages from third parties.
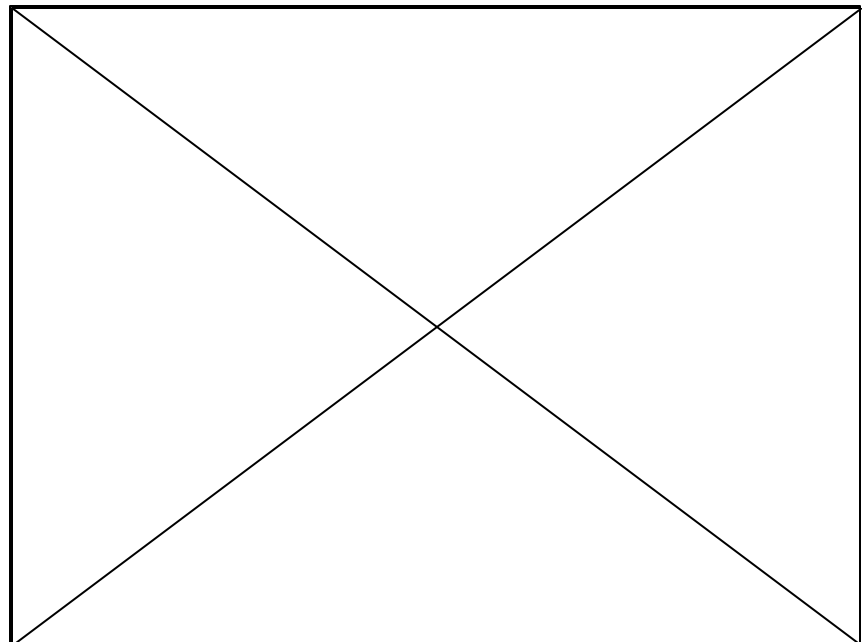
MPW has been used to write a wide range of award-winning and powerful software including Macintosh System Software 7, HyperCard® 2.1, Adobe Photoshop, ACIUS's 4th DIMENSION, Farallon's MediaTracks, Disinfectant, and numerous in-house applications.

The Features of Macintosh Programmer's Workshop 3.2

MPW 3.2 has these features:

- Compatibility with Macintosh System Software 7

- Compatibility with A/UX® version 2.0 or later

- New 32-bit run-time architecture which breaks 32K segment limit

- Improved compiler optimizations

- Improved source-code navigation in the MPW shell

- Ability to use Ada, C++, C, FORTRAN, Object Pascal, and Modula-2 compilers from Apple and third parties

- 411, an electronic information retrieval system for essential technical information. Available only on CD-ROM-based bundles.

The MPW Shell, an integrated multi-window text editor and command shell

Features

Benefits

Features	Benefits
Integrated development environment	• Lets you switch between tasks without leaving the main environment • Provides multiwindow editing • Includes Projector ®, a source-management system
Open, customizable environment	• Lets you create your own menus for tasks you do frequently, and lets you expand MPW by adding tools from third parties or your own tools and scripts • Increases productivity by allowing you to automate redundant tasks and to customize the system to your way of working
Support for programming in multiple languages	• Lets you take advantage of other languages so that you can use existing routines, combine the work of different programmers working in different languages, or build an application from different parts—regardless of the languages used
SADE® (Symbolic Application Debugging Environment)	• Provides a powerful, non-intrusive, source-level debugger • Allows you to script your own customized debugging routines • Lets you debug the exact version of the program that you plan to ship—no code modifications are required
Disk-based bundles	• Offer a complete collection of tools for creating any type of Macintosh software • Include ResEdit ⁵ (Apple's graphical resource editor) and MacsBug (Apple's machine-level debugger)
CD-ROM-based bundles	• Offer a complete collection of tools for creating any type of Macintosh software • Include ResEdit (Apple's graphical resource editor) and MacsBug (Apple's machine-level debugger) • Include 411, an electronic information retrieval system for essential technical information • Include Developer Essentials

Product Details

MPW Development Environment
The MPW Development Environment is the foundation upon which the rest of the Macintosh Programmer's Workshop is built. The MPW Development Environment consists of the MPW Shell and the MPW Tool Suite.

The MPW Shell is an integrated multiwindow text editor and command shell. It has numerous built-in commands; a powerful scripting language; and Projector, an integrated source-management facility. It is also able to execute MPW scripts and tools.

The MPW Shell scripting language includes input and output redirection, piping, shell variables, standard control structures, and powerful regular expression-matching facilities.

Projector, the MPW Shell's integrated source-management facility, helps programmers (both individuals and teams) control and account for all changes to the files (including source, object, applications, and documentation) associated with a software project. Projector can run on a local hard disk or across a network from an AppleShare® file server.

Projector saves the most recent version of a file and the modifications necessary to re-create earlier versions. It maintains the revision history of a project's files in a tree format. This format allows you to experiment on a file (by making a branch) without affecting your primary development work. The MPW Tool Suite provides tools to help you merge branches together.

The MPW Tool Suite provides over 50 tools and scripts to assist you in the development process. These include
· *MPW Linker*, which supports the object-module format shared by the MPW Assembler, MPW C, MPW C++, MPW Object Pascal, and third party languages. This allows you to mix and match languages to build multi-language programs.

In addition, the MPW Linker includes a number of features to optimize your programs, including removal of unused code and data and jump table optimization.
· *Resource tools*, which make it easy for you to compile and decompile resources, compare resource files, and check resource files for inconsistencies.

MPW Assembler
The MPW Assembler is a powerful macro assembler that supports all the instructions and addressing modes of the MC68000, MC68010, MC68020, and MC68030 microprocessors, as well as the MC68851 Paged Memory Management Unit (PMMU) and the MC68881/882 floating-point coprocessors.

The MPW Assembler includes examples of a Macintosh application, a desk accessory, a Control Panel device, and an MPW tool, written in assembly language.

MPW C
The MPW C compiler supports K&R C, as well as many ANSI extensions to C, including function prototypes and strong type checking. It includes a standard C library that offers the functions described in the ANSI C standard.

MPW C generates optimized code for the MC68000 family of microprocessors and optionally generates for the MC68881/882 floating-point coprocessors.

MPW C includes examples of a Macintosh application, a desk accessory, a Control Panel device, and an MPW tool, written in C.

MPW C++
MPW C++ is an implementation of C++, the industry-standard object-oriented extension to C, as defined by AT&T. It has been enhanced to support the Macintosh Toolbox and Operating System, and Object Pascal-based functions and procedures.

MPW C++ is a translator that converts C++ source code into C code, which is then compiled by MPW C. For more information, see the MPW C++ datasheet.

MPW C++ includes examples of a Macintosh application, a desk accessory, a Control Panel device, and an MPW tool, written in C++.

MPW Object Pascal
The MPW Object Pascal compiler supports the ANSI Pascal feature set and Apple's Pascal extensions. In addition, it implements Object Pascal, the industry standard for object-oriented programming in Pascal.

MPW Object Pascal generates optimized code for the MC68000 family of microprocessors and optionally generates for the MC68881/882 floating-point coprocessors.

MPW Object Pascal includes examples of a Macintosh application, a desk accessory, a Control Panel device, and an MPW tool, written in Object Pascal.

MPW Toolbox Interfaces and Libraries
The MPW Toolbox Interfaces and Libraries include the assembler, C, C++, and Object Pascal interfaces and libraries that provide access to the Macintosh Toolbox and Operating System.

The MPW Toolbox Interfaces and Libraries are included with all of the MPW language products.

SADE

You can use SADE, Apple's Symbolic Application Debugging Environment, at either the source level or the assembly level to debug applications and MPW tools that you built with MPW Assembler, MPW C, MPW C++, and MPW Object Pascal. You can also use SADE with third party languages that support Apple's symbol file format.

SADE comes with a set of predefined menus that provide all basic debugging features, such as setting breakpoints, viewing variables and structures at the source level, and stepping through source code.

The greatest strength of SADE is its scripting language. For example, you can write a script that checks for a particular condition every time a function is called, break the third time that the condition arises, and then display variables, structures, and other information about the state of the program in a predetermined format.

411

411 is an electronic information retrieval system which provides quick access to information from *Inside Macintosh,* Macintosh toolbox interfaces, DTS Technical Notes, and MPW command pages from within the MPW Shell. With 411, you can quickly and easily generate procedure and function templates for all Macintosh toolbox routines. 411 is available to purchasers of the CD-ROM-based MPW bundles—the Macintosh Programmer's C Workshop and the Macintosh Programmer's C and Object Pascal Workshop.

Developer Essentials

Developer Essentials provides the tools and information that all developers of products for the Macintosh should have, regardless of the development system they use. It includes a HyperCard-based version of *Inside Macintosh* (SpInside Macintosh), DTS Technical Notes, DTS Sample Code, Human Interface Notes, U.S. and international versions of Macintosh system software, and more. Developer Essentials is available to purchasers of the CD-ROM-based MPW bundles—the Macintosh Programmer's C Workshop and the Macintosh Programmer's C and Object Pascal Workshop.

ResEdit

ResEdit is Apple's graphical editor for creating elements of the Macintosh user interface. Typical uses of ResEdit include creating and modifying dialog boxes, icons, text strings, and windows. ResEdit is interactive, allowing you to quickly try different interface prototypes.

MacsBug

MacsBug is a 68000-family assembly-level debugger. In addition to supporting all 68000-family central processing units, MacsBug handles the MC68851 Paged Memory Management Unit (PMMU), and the MC68881/882 floating-point coprocessors.

MPW bundles

In addition to being available as stand-alone products that give you the freedom to mix and match as needed, MPW is available in specially priced bundles. There are two types of MPW bundles: disk-based and CD-ROM-based.

The disk-based MPW bundles include a collection of MPW stand-alone products, as well as ResEdit and MacsBug. Purchasers of disk-based MPW bundles receive a discount off the new pricing and the update pricing for an equivalent set of stand-alone products.

The CD-ROM-based MPW bundles, the Macintosh Programmer's C Workshop and the Macintosh Programmer's C and Object Pascal Workshop, include all of the software and information required for Macintosh programming in a given language or languages. In addition to the software included in the disk-based MPW bundles, CD-ROM-based bundles include 411, Developer Essentials, and recent, previous versions of MPW.

Purchasers of CD-ROM-based MPW bundles receive a discount off the new pricing and the update pricing for an equivalent set of stand-alone products and equivalent disk-based MPW bundles.

For more information on MPW bundles, see the ordering information section.

System Requirements

To use MPW, you need

· An Apple Macintosh Plus, Macintosh SE, Macintosh Classic®, Macintosh Portable, Macintosh LC, Macintosh SE/30, or Macintosh II family personal computer (a Macintosh SE/30 or a member of the Macintosh II family is strongly recommended), with at least 2 MB of free RAM (4 MB is highly recommended and 8 MB or more may be needed for large programs) and a hard disk with at least 12 MB of free space. The CD-ROM-based bundles require a Macintosh-compatible CD-ROM drive.

· Compatible with Macintosh System Software version 6.0.2 or later, Macintosh System Software 7, or A/UX version 2.0 or later.

Product Ordering Information
All products are available from Apple through APDA®. MPW products are also available through APDA programs in many countries. Contact your local Apple office for more information.

New stand-alone products

MPW Development Environment
Includes the MPW Shell and the MPW Tool Suite. Documentation includes reference guides to the MPW Shell and MPW Tool Suite. Product includes 5 disks.
M0019LL/D $150.00

MPW Assembler
Includes the MPW Assembler and the interfaces and libraries required for Macintosh programming under Macintosh System Software 7. Documentation includes a reference to the MPW Assembler and release notes. Product includes 6 disks.
B0236LL/D $150.00

MPW C
Includes MPW C and the interfaces and libraries required for Macintosh programming under Macintosh System Software 7. Documentation includes a reference to MPW C and release notes. Product includes 6 disks.
B0237LL/D $150.00

MPW C++
Includes MPW C++. Documentation includes a reference to MPW C++ and release notes. Product includes 2 disks.
M0346LL/E $175.00

MPW Object Pascal
Includes MPW Object Pascal and the interfaces and libraries required for Macintosh programming under Macintosh System Software 7. Documentation includes a reference to MPW Object Pascal and release notes. Product includes 6 disks.
B0235LL/D $150.00

MPW Toolbox Interfaces and Libraries
Includes the interfaces and libraries required for Macintosh programming in assembler, C, C++, and Object Pascal under Macintosh System Software 7. This product is included in all MPW language products (MPW Assembler, MPW C, MPW Object Pascal). Documentation includes release notes. Product includes 5 disks.
M0615LL/B $40.00

SADE
Includes SADE, sample scripts, tutorial examples, and a special version of MultiFinder® (required for using SADE under System 6.x). Documentation includes the SADE reference and release notes. Product includes 2 disks.
M0026LL/D $150.00

New bundle products

Macintosh Programmer's C Workshop--CD-ROM
This CD-ROM-based bundle includes all of the software and information you need for C programming on the Macintosh, including the MPW Development Environment, MPW Assembler, MPW C, SADE, ResEdit, MacsBug, 411, and Developer Essentials. Documentation includes manuals and release notes for all MPW components, ResEdit, and MacsBug. Product includes one CD-ROM.
B0502LL/A $375.00

MPW C Bundle--Disk
Includes the MPW Development Environment, MPW Assembler, MPW C, SADE, ResEdit, and MacsBug. Documentation includes manuals and release notes for all MPW components, ResEdit, and MacsBug. Product includes 16 disks.
B0031LL/F $425.00

Macintosh Programmer's C and Object Pascal Workshop--CD-ROM
This CD-ROM-based bundle includes all of the software and information you need for C and Object Pascal programming on the Macintosh, including the MPW Development Environment, MPW Assembler, MPW C, MPW Object Pascal, SADE, ResEdit, MacsBug, 411, and Developer Essentials. Documentation includes manuals and release notes for all MPW components, ResEdit, and MacsBug. Product includes one CD-ROM.
B0508LL/A $500.00

MPW C and Object Pascal Bundle--Disk
Includes the MPW Development Environment, MPW Assembler, MPW C, MPW Object Pascal, SADE, ResEdit, and MacsBug. Documentation includes manuals and release notes for all MPW components, ResEdit, and MacsBug. Product includes 17 disks.
B0032LL/F $550.00

MPW Object Pascal Bundle--Disk
Includes the MPW Development Environment, MPW Assembler, MPW Object Pascal, SADE, ResEdit, and MacsBug. Documentation includes manuals and release notes for all MPW components, ResEdit, and MacsBug. Product includes 16 disks.
B0030LL/F $425.00

Update stand-alone products

MPW Development Environment Update
Includes an update to the MPW Development Environment. Documentation includes release notes. Product includes 5 disks.
M0027LL/D $50.00

MPW Assembler Update
Includes an update to MPW Assembler, and the interfaces and libraries required for Macintosh programming under Macintosh System Software 7. Documentation includes release notes. Product includes 6 disks.
B0234LL/D $50.00

MPW C Update
Includes an update to MPW C, and the interfaces and libraries required for Macintosh programming under Macintosh System Software 7. Documentation includes release notes. Product includes 6 disks.
B0233LL/D $50.00

MPW Object Pascal Update
Includes an update to MPW Object Pascal, and the interfaces and libraries required for Macintosh programming under Macintosh System Software 7. Documentation includes release notes. Product includes 6 disks.
B0232LL/D $50.00

SADE Update
Includes an update to SADE. Documentation includes release notes. Product includes 2 disks.
M0614LL/B $50.00

Update bundle products

Macintosh Programmer's C Workshop--CD-ROM
This CD-ROM-based bundle updates the MPW C Bundle, and includes 411 and Developer Essentials. Documentation includes release notes for all MPW C Bundle components. Product includes one CD-ROM.
B0531LL/A $50.00

MPW C Bundle--Disk
Includes an update to the MPW C Bundle on disks. Documentation includes release notes for all MPW C Bundle components. Product includes 14 disks.
B0034LL/F $100.00

Macintosh Programmer's C and Object Pascal Workshop--CD-ROM
This CD-ROM-based bundle updates the MPW C and Object Pascal Bundle, and includes 411 and Developer Essentials. Documentation includes release notes for all MPW C and Object Pascal Bundle components. Product includes one CD-ROM.
B0231LL/F $50.00

MPW C and Object Pascal Bundle--Disk
Includes an update to the MPW C and Object Pascal Bundle on disks. Documentation includes release notes for all MPW C and Object Pascal Bundle components. Product includes 15 disks.
B0035LL/F $100.00

MPW Object Pascal Bundle--Disk
Includes an update to the MPW Object Pascal Bundle on disks. Documentation includes release notes for all MPW Object Pascal Bundle components. Product includes 14 disks.
B0033LL/F $100.00

Other products of interest

E.T.O.--Essentials · Tools · Objects
With an E.T.O. order, you'll receive the MPW Product Suite, MacApp Product Suite, Developer Essentials, and a one-year update subscription. For more information, see the current *APDAlog®* or contact APDA.

Licensing Information

Site licenses are available for the MPW Development Environment and the MPW C and Object Pascal Bundle.

For details, contact Apple Software Licensing at 408-974-4667.

Training Information

Apple Developer University offers courses in MPW programming as part of a comprehensive curriculum of Macintosh programming courses. Beginning and advanced Macintosh programming courses are offered at convenient training sites. You can also order self-paced training materials through APDA. For a course catalog or to register, contact Apple Developer University at (408) 974-6215.

APDA Ordering Information

APDA offers the widest selection of development tools and information for anyone interested in developing applications on Apple platforms. APDA members receive the *APDAlog*, a quarterly catalog of over 400 technical products from Apple and select third-party developers, and access to pre-release versions of key development tools and utilities. To obtain product ordering information, contact

APDA
Apple Computer, Inc.
20525 Mariani Avenue, M/S 33-G
Cupertino, California 95014-6299 USA
800-282-2732 (U.S.)
800-637-0029 (Canada)
(408) 562-3910 (International)
(408) 562-3971 (Fax)
AppleLink®: APDA