

Beyond the Required Suite

**A collection of
Apple event-aware
applications**

Dear Developers:

We are pleased to announce that Microsoft Excel version 4.0 supports Apple events and the Apple event object model. So, why did we decide to do it? Frankly, we knew that it would be no simple task to implement these features, but quickly determined that the benefits of including them far outweighed the costs, in both the short and long term.

As you know, Apple events are a standard way to communicate. In recent years, programs have been getting bigger and bigger. When programs communicate, one program can use the features of another without having to reimplement those features. In addition, end users can create automated solutions using multiple applications tied together with AppleScript software. But in order for this communication to work, programs have to agree on how to communicate. Apple and the developer community have defined not only the standard messages (Apple events), but a flexible way to refer to the data within applications and documents (Apple event objects).

By implementing this technology, we achieved a very important goal: Virtually all of Microsoft Excel 4.0's core functionality is available to other applications and script writers via Apple events and the Apple event object model. Microsoft Excel handles the Core and Table suites as well as a number of the miscellaneous standards. It also defines a chart suite, a handful of custom Apple events, and twelve object classes.

Using these events and objects, for example, data can be sent to and retrieved from Microsoft Excel, worksheets can be formatted, and charts can be created, formatted and retrieved. In addition, Apple events can invoke Microsoft Excel functions or macros for evaluation and/or execution. For example, another program could use Microsoft Excel's charting engine by sending data to it, creating a chart, formatting it, and then retrieving the chart, all using standard events and objects. In addition to charting, Microsoft Excel has made its calculation engine available to other applications. Suppose, for example, a third-party program needs to calculate a mortgage payment. Instead of writing the code to do so, the developer can now use Apple events to let Microsoft Excel do the calculation.

True, it was not trivial to implement this technology in Microsoft Excel. In fact, supporting Apple events properly has been a major investment, but this advance in Macintosh technology is truly beneficial to both the development and end-user communities.

Sincerely yours,

Bill Johnson
Product Manager,
Microsoft Excel for the Macintosh

© 1992 Apple Computer, Inc. Apple, the Apple logo, APDA, AppleLink, AppleTalk, A/UX, Macintosh, MacTCP, and MPW are registered trademarks of Apple Computer, Inc. AppleScript, Macintosh Quadra, ResEdit, and Tool Server are trademarks of AppleComputer, Inc.

Claris, FileMaker, HyperCard, and MacProject are registered trademarks of Claris Corporation. Resolve is a trademark of Claris Corporation.

DEC is a trademark of Digital Equipment Corporation.

UNIX is a registered trademark of UNIX System Laboratories, Inc.

Mention of third-party products is for informational purposes only and constitutes neither an endorsement nor a recommendation. All product specifications and descriptions were supplied by the respective vendor or supplier. Apple assumes no responsibility with regard to the selection, performance, or use of these products. All understandings, agreements, or warranties, if any, take place directly between the vendors and the prospective users.

Table of Contents

About this guide		4
Introduction: A collection of Apple event-aware programs	5	
Analysis and Reporting		11
Business		17
Design, Graphics, and Sound	25	
Development and Scripting		31
Networking and Communication		39
Index of Products		45
Index of Companies	47	

About this guide

This guide is designed to encourage you to implement Apple events, the messaging language of System 7. If you publish a System 7-compatible application, you already support the required set of Apple events.

But this is just the tip of the iceberg. The information in this guide should convince you to move quickly and positively toward complete Apple event object model implementation, and provide you with a clear vision of the benefits you'll get.

The introduction describes the Apple perspective on the role that Apple events plays in Macintosh computing. It also describes the resources Apple has for developers working with Apple events. Each chapter contains descriptions of applications that take advantage of Apple events. The categories are Analysis and Reporting; Business; Design, Graphics, and Sound; Development and Scripting; and Networking and Communication.

These product descriptions are from developers who have gone beyond the required suite of Apple events, and are a sample of the already rich collection of Apple event-aware applications. We hope they encourage you to the ideal Macintosh standard.

Introduction:

A collection of Apple event-aware programs

Many Macintosh developers instantly grasped the potential of the Open Scripting Architecture (OSA) of System 7, realizing that Apple events will greatly enhance the Macintosh user experience. Apple events raises the level for customization by delivering the ability to integrate applications in a way that allows applications to share commands and data.

Developers see further promise. The OSA includes a scripting standard that will support personal scripting using AppleScript software or other OSA scripting systems. As scripting systems communicate with applications via Apple events, users can request services and retrieve data from different programs as it suits their own creative purposes. Tailoring applications will become as much a part of the Macintosh interface as copying and pasting.

Although traditional scripting languages tend to be abstract and complex, the Apple events foundation makes it possible to create an intuitive language that works consistently across applications. Apple is now developing such a language; which will bring scripting abilities to both novice and power users. Already, some Macintosh developers, such as UserLand, offer scripting tools that take advantage of Apple events (see page 35).

The developers listed in this guide are among the first who took action and recognized that Apple events imply abundant possibilities and inexhaustible variations for applications. Many other developers are working on scriptable products. You can too!

Apple events basics

Apple events are the messaging language of the System 7 Interapplication Communication (IAC) technology allowing programs to share both data and commands across a machine or, more important, across a network. In addition to System 7 support, the Apple Event Manager is fully supported in A/UX 3.0, Apple's implementation of the UNIX operating system. Therefore, Apple event-aware applications that run under System 7 will run under A/UX 3.0 without modification.

The Apple events language consists of events and objects. Events are the verbs, such as move, delete, get data. Objects are the nouns—the things that events act upon, such as windows, documents, paragraphs. (Although the Apple events language involves objects, both object-oriented and procedural applications can support it.) The object model approach ensures a consistent and flexible scripting environment—one that conforms naturally to the way users think about data. Eventually, users who recognize copy and paste across all the programs they use,

will also depend on scripts as part of the standard Macintosh interface.

In collaboration with Macintosh developers, Apple has defined the most common events and objects. They are organized into event suites—sets of related events and objects—that provide a standard way to do discrete tasks. Apple publishes the event suites in the Apple Event Registry: Standard Suites (available from APDA, Apple’s source for developer tools). Using Apple events, developers can bring their own innovations to the system, and, if appropriate, the events and objects are standardized and added to the *Apple Event Registry*.

Applications must support the required suite of Apple events to ensure System 7 compatibility. Developers should implement all 15 of the Core suite events, beginning with get data and set data, and then move on to use other appropriate published suites or events, or to propose a new standard suite.

Why you should support Apple events

As a Macintosh developer, you’re understandably concerned about what Apple events can do for you. Naturally, you want every hour and every dollar you invest implementing new capabilities to pay off in a better product. It’s safe to say that incorporating Apple events and scripting makes good business sense in a number of ways.

- > **The standard suits are stable.** A major concern of developers is that the standard will change and their application will be out-of-date before the product ships. But this is not the case: The Registry is final, and the Core suite is final. These serve as the basis for all future IAC work.
- > **The standard suites are the future.** Apple events and the object model form the basis of Apple’s IAC strategy. These technologies have evolved beyond just allowing “plug and play” applications. The standard suites form the basis for Apple Script support, communicating with the Finder and other system components, and a host of other technologies. These technologies will depend upon Apple events as an integral part of system software.
- > **The standard suites allow for focused applications.** The ability to customize applications allows you to do what you do best. You can create smaller applications because optional or peripheral functions are easily provided by integration with other programs—adding value without extra work.
- > **The standard suites are straightforward.** Your goal should be to make your product scriptable, and then scripting savvy. To make your application scriptable, it should include an Apple Event Terminology Extension (AETE) and support get data and set data on at least five objects relevant to the application. Your product is scripting savvy when the application is recordable or allows for editing or running of scripts from within the application, and supports the Core Event Suite at a

minimum.

> **Scripting is as rich as you want it to be.** This means using the object model. Once you understand the object model, it will take two to three months to do a complete implementation of scripting support. To cover every feature will take longer, but you can determine the level you want to achieve.

Implementation of Apple events is an investment in technology that users will grow to expect within a very short time. Your work with the Core suite will take your application a long way toward scriptability, and will put you in the position to create the next generation of Macintosh applications.

Adding support for Apple events does not mean loading your application up with significant amounts of code. Supporting Apple events simply means that people can use your product in a new and more powerful way.

Apple has already done a significant amount of the work necessary for developers to implement Apple events. In the following section, you'll find information about the extensive resources available to you.

Getting started

Apple has prepared a variety of Apple event resources for developers: basic software tools, documentation, and sample code. In addition, training, on-line discussions, and a clearinghouse for standard events round out the offering. You can go from investigation to involvement by following these steps:

1 Read.

Read the Apple Event Manager chapter in the new Inside Macintosh VI. It introduces Apple events and the object model, and has been completely rewritten to include the Core suite. You can locate it on the Developer Series CD (February, 1992 and beyond; available to Associates and Partners).

2 Take a class.

The Apple Developer University course, “AppleScript and the Open Scripting Architecture,” teaches everything you need to know about scripting support. You can reach Apple Developer University at (408) 974-6215, or at the AppleLink address, DEVUNIV.

Learn the ins and outs of Apple events and the object model. Learn how to define Apple events. Learn how to factor your applications for recording support and work with the script-embedding API.

3 Obtain tools and sample code.

The Apple Events and Scripting Development Kit includes the Apple event tools, and is available on the AppleLink on-line service and the Developer Series CD. The kit includes these components:

> **Apple Event Tools.** Software tools that help you develop and test Apple events and scripting support.

> **Apple Event Object Support Library.** Routines that help you support Apple event object specifiers.

> **Apple Event User Terminology Resources.** Resources that map Apple events to terms understandable to end users.

> **Sample code.** Apple event-aware sample applications. The latest versions of sample code are posted in the Developer Services folder on the AppleLink system. The AEObject Edition Sample code is one of the most complete examples of Apple events implementation and is a “must read.”

Refer to the Apple Event Registry: Standard Suites, which documents all registered Apple events, data types, and object classes. It is available from APDA, as well as on the AppleLink system, the Essentials•Tools•Objects (E.T.O) subscription CD (available from APDA), and the Developer Series CD.

4 Communicate during development.

As you implement Apple events, stay in touch with other developers. People involved in similar work are among your most valuable resources. Find out what they're doing, and bounce ideas off one another about how to add value to your applications.

The Developer Support folder on the AppleLink on-line service includes a discussion folder for Apple events. Posting questions or other notices is a good way to share information with other developers and Apple engineers.

The Apple Events Developer Association (AEDA) is a clearinghouse for Apple event information. You can submit your events and objects as a proposed standard suite by sending a message to the AppleLink address, AEDA. The AEDA can connect you with developers interested in similar events and objects, and review your suite for standardization.

For developers who are Apple Partners, the Developer Support Center (DSC) can help with specific technical problems. Contact DEVSUPPORT through the AppleLink on-line service.

Remember that APDA distributes the Apple Event Registry, Inside Macintosh, and the E.T.O subscription CD, along with many other development products. Contact the AppleLink address, APDA. Or call 1-800-282-2732 in the United States, 1-800-637-0029 from Canada, or (408) 562-3910 from other countries.

5 Submit your Apple events.

If you need access to pre-release AppleScript software to test your Apple event implementation, send your requests to the AppleLink address, APPLESCRIPT.

6 Obtain AppleScript software.

If you don't have the AppleScript software and want access to pre-release versions to test your Apple event implementation, send in your request to AppleScript. Your request will be evaluated and filled as appropriate.

Analysis and reporting applications

Links to other applications through Apple events are a key element of our product development strategy for two major reasons: to deliver flexibility and functionality to the user, and to reduce development costs and time to market.

***--Michael Demeyer
President, GeoQuery***

Claris Resolve 1.1

Claris Corporation
PO Box 58168, Santa Clara, CA 95052-8168
(408) 987-7000

Claris Resolve is a spreadsheet program for Macintosh computers. Support for Apple events allows other applications to put data into and retrieve data out of cells in Claris Resolve worksheets, execute Resolve script commands or script files, and retrieve graphic objects from Resolve worksheets. Using Apple events, other programs can use Claris Resolve as a data analysis and charting tool. For example, MacProject II and HyperCard are able to place data in Resolve worksheet cells using one Apple event, then use another Apple event to run a script that performs calculations on the data and creates a chart from the results. The chart can be returned in PICT format to the requesting application through another Resolve Apple event.

DataPivot

Brio Technology, Inc.
444 Castro Street, Suite 700, Mountain View, CA 94041
(415) 961-4110

DataPivot is a dynamic data reporting and analysis tool that manipulates data from local or remote databases and spreadsheets. DataPivot allows the user interactive control over data layout and reporting. DataPivot also builds templates that can be reused even when the underlying data changes.

Using DataPivot, any Apple event-aware application can flow data into a DataPivot template report and produce a fully formatted report that can be sent back to the original document.

DataPrism 1.7

Brio Technology, Inc.
444 Castro Street, Suite 700, Mountain View, CA 94041
(415) 961-4110

DataPrism is a graphics query tool for SQL databases that enables Macintosh users to retrieve data without programming. DataPrism supports popular database protocols including Apple's Data Access Language (DAL), TechGnosis Incorporated's SequelLink, and Oracle Corporation's SQL*Net.

Any Apple event-aware application, such as Claris Resolve, can retrieve data from a remote database application by sending a single event to DataPrism. DataPrism takes the request and queries the remote database for the appropriate data.

Expressionist 3.0

Prescience Corporation
939 Howard Street, San Francisco, CA 94103
(415) 543-2252

Expressionist 3.0 is an equation editor that permits technical (typically mathematical) equations to be edited using a WYSIWYG approach. Complex expressions may be constructed with a few clicks on an expression palette or keystrokes from the keyboard. After the equation is constructed, it is copied and pasted into a word processing document. Modifying a document is simple—it is transferred back from the word processor to Expressionist for modification.

Using the EGO (Edit Graphic Object) Apple event, supported in Expressionist 3.0, the process of moving and modifying equations between Expressionist and the word processor is streamlined. With an EGO-aware word processor users can edit equations by double-clicking on them within the word processor program, instead of having to cut and paste between Expressionist and the word processor.

GeoQuery 3.0

GeoQuery Corporation
475 Alexis R. Shuman Blvd., Suite 385E, Naperville, IL 60563
(708) 357-0535

GeoQuery is a business program that allows users to see and manipulate database information on interactive maps. It is most commonly used by sales, marketing, and field service personnel for travel and territory planning.

Apple events are used to integrate GeoQuery's map views into other related applications (primarily databases of one form or another). This suite, which is designed to facilitate cooperative applications use by a one person, gives applications use of GeoQuery's maps as if they were another report (or chart) format in another application. These maps can further be used to query the database using geographic criteria (such as all the records within 50 miles of a city). This function is not found in traditional database applications.

This event suite is presently supported by ACIUS (4th DIMENSION), Contact Software (ACT! for Macintosh), and several other contact management vendors. Its includes integration of GeoQuery's geographic views into 4th DIMENSION-based sales automation and Executive Information System applications.

LabVIEW 2

National Instruments Corporation
6504 Bridge Point Parkway, Austin, TX 78730-5039
(512) 794-0100

LabVIEW 2.2 is a data acquisition and data analysis application for engineering and scientific applications that takes advantage of Apple events to further automate, test, and measurement systems. LabVIEW 2.2 responds to four custom Apple events for remote operation of Virtual Instruments (VIs). LabVIEW can also send any Apple event to any other application, including the Do Script Apple event. By sending Apple events to itself or other LabVIEW applications on the network, LabVIEW can be used to automate a multi-computer test system. LabVIEW 2.2 supports Program-to-Program Communication (PPC) with the ability to open and close ports, initiate and terminate sessions, and read and write to ports.

Microsoft Excel 4.0

Microsoft Corporation
One Microsoft Way, Redmond, WA 98052
(206) 882-8080

Microsoft Excel 4.0 is a spreadsheet application that makes all of its core functions available to other applications and script writers via Apple events and the Apple object model. Excel supports the core, miscellaneous, and table suites. It also defines a chart suite, and custom events.

Using these events, data can be sent to and retrieved from Excel, worksheets can be formatted, and charts can be created, formatted and retrieved. In addition, through the use of the custom Do-Macro event, a list of Excel functions or macros can be sent to Excel for evaluation or execution. For example, another application could use Excel's charting engine by sending data to Excel, creating a chart, formatting it, and then retrieving the chart, just by using standard events and objects.

SerePlot 2.0

Scientific Visions
PO Box 1971, Silver Spring, MD 20915-1971
(301) 593-0317

SerePlot 2.0 is a tool used for scientific graphing and data analysis, emphasizing graphic data exploration. Using Apple events enables users to send data from their programs to SerePlot for analysis, which can take place as a background process. SerePlot is scriptable by Userland's Frontier.

Spyglass Transform 2.1

Spyglass, Inc.
701 Devonshire Drive, C-17, Champaign, IL 61820
(217) 355-6000

Spyglass Transform is a data analysis and visualization program. Transform ships with a HyperCard stack that contains the Do Script event and its capabilities are available as commands in a notebook window within Transform. The Do Script event allows the remote program to submit notebook window scripts for execution. Transform does not support data transfer. Data is written into a data file and then the Open script command (or 'odoc') is sent to Transform to tell it to read the data. A sample program written in Language Systems FORTRAN is provided for users who prefer Fortran to HyperTalk.

This application can be used to process hundreds of datasets to create movies from time sequences of scientific data. For example, Transform can be used to visualize a moving display of the stress along the San Andreas Fault over a 130-year period based on a theoretical model. Transform can create all of the images from scripting commands.

Business applications

In the future, you'll have as much trouble
selling a program that doesn't understand
Apple events as you do today selling a
program without a File or Edit menu.

***--Donald M. Brown
CE Software, Inc.***

4th DIMENSION 2.2.3

ACIUS, Inc.
10351 Bubb Road, Cupertino, CA 95014
(408) 252-4444

4th DIMENSION 2.2.3 is multiuser relational database that can be used to create stand-alone applications. Developers can take advantage of the database capabilities of 4th DIMENSION by using Apple events to modify or retrieve data in 4th DIMENSION applications. For example, in GeoQuery, users can select a geographic area and through an Apple event, obtain sales or other relevant information from a 4th DIMENSION database.

Moreover, 4th DIMENSION has an open architecture that allows developers to implement features for any type of Apple events through third party applications. For example, ISIS International's System 7 Pack provides a way for 4th DIMENSION developers to incorporate Apple event awareness into a stand-alone database applications.

Accountant, Inc.

Softsync
600 Fairway Drive, Suite 201, Deerfield Beach, Florida 33441
(305) 481-9252

Accountant, Inc. is a complete accounting system for small businesses. It includes General Ledger, Accounts Payable, Accounts Receivable, Payroll, Inventory, Invoicing, Checkbook Management, and Project Costing features. It is used by many types of businesses to manage their finances, sales, purchases, collections, bill payment, payroll, and inventory. Accountant uses Apple events to share accounting information with other applications, and to allow other applications to serve as custom front-ends to Accountant, Inc. For example, Shana's Informed Designer and Manager can be used to create custom forms which will look up information from Accountant to aid in filling out forms. Completed forms can be sent as transactions to Accountant, Inc.

Accountant, Inc. v 3.0.1 supports required and core Apple Events and the Database Apple events suite, version 0.6.

Dynodex

Portfolio Systems, Inc.
10062 Miller Avenue, Suite 201, Cupertino, CA 95014
(408) 252-0420

Dynodex is a personal information manager. Apple events, Dynodex uses Apple events and has has two main focuses: First, it provides address and contact information to other applications, and second it can trade contact information with other information sources.

DynoPage 1.7

Portfolio Systems, Inc.
10062 Miller Avenue, Suite 201, Cupertino, CA 95014
(408) 252-0420

DynoPage is a system extension that expands any application's printing capabilities. DynoPage lets any Macintosh document print to any page size, single- or double-sided. Any document can be print previewed. Under System 7, DynoPage allows Drag-and-Drop printing for any application via the DynoPage Drop file, and users can have copies of it on their desktop for the different ways they print.

DynoPage comes with DynoPage/IAC, a small faceless application, which allows control of DynoPage via Apple events, using CE Software's QuicKeys or UserLand Frontier. DynoPage Lite is the System 7-savvy freeware version of DynoPage 1.7.

Easy Alarms 1.5

Essential Software
28 Mulford Avenue, Staatsburg, NY 12580
(914) 889-8365

Easy Alarms is a personal calendar, reminder, and to-do list manager. The New Reminder Apple event allows Easy Alarms to receive reminders (time, date, message, repeat frequency) from other applications. Easy Alarms then executes the reminders at appropriate times by bringing up dialog boxes, playing sounds, executing Easy Alarms scripts, and so forth. This may be useful for To Do list and contacts list applications, for example, that can now pass on reminder information to Easy Alarms, which will then take care of executing the reminders at the proper times. Easy Alarms 1.5 has a built-in user scripting language. The Do Script Apple event gives other applications access to Easy Alarms scripts. Easy Alarms scripts, in turn can perform many tasks, including launching applications, opening documents, clicking the mouse, typing text, flashing the screen, emptying the trash, bringing up user-interactive dialog boxes, restarting, or shutting down the Macintosh.

EasyTime

SoftLab
Via del Campo 32 B, 44100 Ferrara, Italy
+39-532-740444

EasyTime is a multiuser personal information manager with workgroup features. EasyTime integrates daily plans with 24-hours worth of appointments and activities; monthly planning; phonebook with automatic posting of the call to do in the activities list; group meeting scheduler; alarms; and frequent phone numbers list for instant dialing.

EasyTime supports custom events for logon, logoff, userlist, userlevel, daily appointments list, daily activities list, monthly appointments list, and list of searched contacts.

Developers can use Apple events to access the calendar, search contacts, schedule appointments, and set alarm notifications from within their applications.

FileMaker Pro

Claris Corporation
5201 Patrick Henry Drive, PO Box 58168, Santa Clara, CA 95052
(408) 987-7000

FileMaker Pro is a database application. A future version will use Apple events as an extension to its scripting interface. Users and third-party developers will be able to use Apple events to take advantage of FileMaker Pro's data handling and manipulation capabilities to provide solutions that were previously impossible with FileMaker Pro. Examples of such solutions range from autodialing a telephone to database publishing. A future version of FileMaker Pro will support the core, table, and database suites. It should support simple object specifiers for the core suite object classes, and complex specifiers for other object classes.

MiniTBAccess and TouchBase

After Hours Software
5990 Sepulveda Blvd. Suite 240, Van Nuys, CA 91411
(818) 780-2220

MiniTBAccess, available later this year, is a faceless background application that is initially part of DateBook. MiniTBAccess is used by DateBook to gain access to TouchBase (a personal contacts database) data using Apple events, and is integrated into the DateBook interface.

Users can use Apple events with TouchBase (or MiniTBAccess) to streamline the process of mail merge printing with a word processor application. The user can print the merged document from either TouchBase or the word processor. TouchBase (or MiniTBAccess) eliminates the need to export to a text file, set character delimiters, or check field spelling.

Other options are available, such as saving a text file containing the names used in the merge (for record purposes).

On Location 2.0

ON Technology, Inc.
155 Second Street, Cambridge, MA 02141
(617) 876-0900

On Location is a filename and text in file finding utility. Other applications can add ON Technology fast file searching capabilities to their products by sending an Apple event to On Location. Any application that requires generating a list of files that meet a given criteria would find this useful. For example, a script could be written to automatically back up all files ending in “.c”, getting the list of files from On Location. Another example would be the creation of a custom front end to a large multifile text database. On Location could be queried for the list of files that contained a particular set of words. Another example would be selecting which file to have a word processor open by searching for words within the file, directly from the Open dialog.

Spellswell and Writeswell Jr.

Working Software, Inc.
P.O. Box 1844, Santa Cruz, CA 95061-1844
(408) 423-5696

Spellswell is a spelling checker that implements the Word Services Apple events suite. The Word Services suite allows any application that edits text to have that text processed by spelling checkers, grammar checkers, hyphenators, or other text services. Users will be able to purchase their favorite spell checker or grammar checker, and use just one dictionary for all their documents. Developers will no longer need to pay to license OEM speller modules, and will not need to spend time debugging unfamiliar code. Developers also will save on product costs, because they will not need to ship dictionaries on their product disks.

Spellswell includes Writeswell, Jr., a simple TeachText-like text editor. The source code to Writeswell, Jr. will be on the product disk, so developers will have sample code to help them support Word Services in their products. It will also give users something to try IAC spelling with, until the Word Services suite is fully supported by the other applications.

StuffIt Deluxe 3.0 and StuffIt 3.0

Aladdin Systems, Inc.
165 Westridge Drive, Watsonville, CA 95076
(408) 761-6200

StuffIt is a file compression and decompression application for Macintosh computers. There are two major uses for the scriptability of StuffIt. First, in the telecommunications realm, the handling of incoming (or outgoing) files can be easily automated. Compressed files can be decompressed as they arrived—including files from other platforms. Also, repetitive sends (such as the daily report) can be compressed and then sent automatically. Second, StuffIt can assist in the automation and integration of system backups into the user's daily activity. By using a set of common match criteria (such as modified dates and icon labels), users can have their daily work automatically archived. With scripting environments, it is also possible for users to make backup and archiving common parts of the saving process. StuffIt also uses Apple events to perform "anti-viral" checks on decompressed files.

Tiles

CE Software, Inc.
1801 Industrial Circle, West Des Moines, IA 50265
(515) 224-1995

Tiles, through the use of Apple events, gives users the capability to control applications and CE Software's QuickKeys from a network or via remote access. One use would be to have a network administrator trigger a tile that runs a QuickKey to close applications that may have been left open, so that remote back up can take place. Tiles includes the ability to create a "project" of all open documents so that the process could include returning the user's Macintosh to the state it was in before backup.

Design and graphics applications

Apple events are good for business because our users now have the ability to automate their workflow—they spend less time watching our products work and more time actually using them.

*-- Wade Eilrich
Caere Corporation
Manager of Macintosh Products*

Aldus PageMaker 4.2

Aldus Corporation
411 1st Avenue S., Seattle, WA 98199
(206) 622-5500

Aldus PageMaker 4.2 is a page layout program that provides the tools needed to create documents ranging from newsletters to long documents. The ability to script Aldus Additions enables experts and consultants to create desktop publishing utilities that can automate the features of PageMaker. It also enables third-party developers to add enhancements and customization to PageMaker.

Using Apple events, developers can have their applications send PageMaker commands using the Do Script event to open a publication and use the Eval event to query the layout and information content of the document. The required information is then sent back to the application which executed the Apple event. The PageMaker Script Language Reference may be obtained by registered users of PageMaker through Aldus Customer Relations at (206) 628-2320

Autopage II and Autopage II Extension to QuarkXPress

KyTek, Inc.
28 Duck Pond Road, Weare, NH 03281
(603) 529-2512

The combination of the Autopage II application and the Autopage II Extension to QuarkXPress provides long document handling features for QuarkXPress. Long documents such as textbooks, user manuals, and journals can be automatically made into pages. This includes the balancing of columns across page spreads, placement of footnotes at the bottom of the column containing the reference, placement of art and tables in proximity to their references and placement of sidenotes (margin notes) in the margin beside their reference. Orphans and widows (single lines of a paragraph at the top or bottom of a column) are automatically eliminated and heads are not split from the body text following.

The Autopage II application is a stand-alone batch processing application. With a custom Apple event users can queue up a pagination job to Autopage II from within QuarkXPress. Once the pagination is completed, an Apple event is used to send a message back to QuarkXPress indicating that the job has finished.

Douglas CAD/CAM DesignWorks

Douglas CAD/CAM Professional Layout

Douglas Electronics, Inc.
2777 Alvarado Street, San Leandro, CA 94577
(510) 483 8770

Douglas CAD/CAM is a family of printed circuit board design tools. DesignWorks is a schematic capture and digital simulation product. Professional Layout is a circuit board design editing tool. Both of these products use Apple events to communicate with one another, as well as with Interleaf Publisher.

DesignWorks uses AES to connect schematics with the PCB Layout in Professional Layout. The designer can click on a part or signal in the schematic, and see the actual footprints or pads highlighted on the board layout. Conversely, clicking on a part in the PCB graphics, or on a part or signal in the net list or part list display of Professional Layout, will select the matching element in the schematic.

Design schematics can be imported to Interleaf Publisher. Using Apple events, Interleaf can be used to interrogate the layout program for pictures and parts information for use in Interleaf technical publications. Users of an InterLeaf database can download the parts list and even a picture of the PCB.

Generic CADD 2.0

Autodesk Retail Products
32307 NE 193rd, Duvall, WA 98019-9745
(206) 487-2233

Generic CADD is a 2-D design application. Using Apple events, users can enhance the capabilities of Generic CADD. Some examples include print tiling, bill of materials, and innumerable vertical applications. An Apple event can gain access to approximately 250 commands of Generic CADD.

Informed Designer
Informed Manager
Informed Number Server

Shana Corporation
9650 - 20 Avenue, Suite 105, Edmonton, Alberta, T6N 1G1, Canada
(403) 463 - 3330

Informed is a series of electronic forms applications that can be used for forms design and forms filling. The Informed products use Apple events to provide seamless integration of two different, yet complimentary applications: electronic forms and databases.

Users can design custom forms with Informed Designer and link them to applications such as ACIUS's 4th DIMENSION and Softsync's Accountant, Inc. With Informed Manager, forms can automatically look up database or accounting information and place it in the form. Completed forms can be sent directly and interactively into the database or accounting system over a network using Apple events.

LaserPlot

Pole Position Software GmbH
Ebrardstraße 126, Erlangen, D-8520, Germany
(49) 9131 538120

LaserPlot is a Hewlett-Packard Graphic Language (HPGL) to Encapsulated PostScript (EPS) converter. Using Apple events, other applications can take advantage of LaserPlot from within their application. Currently, RagTime 3.17 uses Apple events to convert HPGL directly in RagTime without launching, switching, or learning LaserPlot.

OmniPage Direct

Caere Corp.
100 Cooper Court, Los Gatos, CA 95030
(408) 395-7000

OmniPage Direct provides optical character recognition for scanners, allowing users to convert documents into editable text. USING Apple events and the OmniPage Direct engine, users can convert an image into text and place that text into an application.

PROMotion 1.0

Motion Works International
#130 - 1020 Mainland Street, Vancouver, B.C., V6B 2T4, Canada
(604) 685-9975

The PROMotion package contains complete glue scripts for use with UserLand Frontier. PROMotion uses Apple events to create presentations through scripting, mathematical generation of an actor's (a character in a PROMotions movie) path, and so on.

Users can design a presentation using PROMotion by creating actors or props, change their appearance using PICT images from other applications, and then sequence the events. An existing animation can be customized by setting characteristics of the animation through Apple events.

PROMotion also has the ability to generate the path of an actor based on a mathematical equation. For example, users can draw a ball and have it follow a path that simulated gravity using Apple events.

RocketShare

Radius Inc.
1710 Fortune Drive, San Jose, CA 95131
408/434-1010

RocketShare is system software for Radius Rocket coprocessor cards (68040 NuBus cards that maybe populated with up to 128 MB of RAM) on Macintosh II or Macintosh Quadra computers running System 7. RocketShare enables cooperative multiprocessing between one or multiple Rocket cards and the Macintosh by turning installed Rocket cards into virtual Macintosh computers on a dedicated NuBus network. As a result, any application written for a network of Macintosh computers using IAC capabilities will run without modification under RocketShare.

RocketShare includes a small, faceless application known as “Robot,” which supports Apple events. All of the supported Apple events have the event class ‘rbot’ (Robot event class). These events are designed to support applications doing remote processing.

Support for objects and scripting will be provided after the initial release of RocketShare. These features will allow greater user control and access of Rockets without directly interfacing with the Rocket Finder session. Developers interested in RocketShare can find information under the Radius icon on AppleLink, in the Developer Support folder.

TimeBandit

Steinberg Soft- und Hardware GmbH
Eiffestrasse 596, 2000 Hamburg 26, Germany
T(0049) 40 211 594

TimeBandit compresses or stretches audio files without affecting the pitch, and pitch shifting and harmonizing without changing the length. Users of hard disk recording systems and people who require sound for multimedia presentations can use TimeBandit to fit audio to sequence in a given length of video footage.

Other applications can take advantage of the features of TimeBandit by using Apple events. Users save time because audio can be selected and manipulated directly from the user’s document. This eliminates the need to manually start TimeBandit, locate and modify the audio file on the disk and place it in the application that the user is using. The interface for TimeBandit will be published at a later date.

Development and scripting applications

PhonePro, Apple Events, and AppleScript provide a powerful combination! Apple events have given Cypress a clear and concise way for third-party developers to take advantage of PhonePro's extensive capabilities, without the burden of supporting a separate API.

***--Mike Speiser
Cypress Research Corporation***

AAIS Full Control Prolog

Advanced A. I. Systems, Inc.
P. O. Box 39-0360, Mountain View, CA 94039-0360
(415) 948-8658

AAIS Full Control Prolog is an implementation of the rule-based A. I. programming language, Prolog. Apple events are supported as programming tools. The product provides the ability to send and receive any Apple event to processes on both local and remote machines.

The user can define functions or rules to be run whenever Prolog receives any specified Apple event. Parameters and attributes can be automatically retrieved from the Apple event and converted to Prolog data objects. Reply parameters may be specified by binding variables to Prolog objects that can be converted by the Prolog system to the corresponding Apple event descriptor record inside the reply event.

The user does not need to handle the Apple event or reply event directly.

The user can send any event or id to send Apple events. High-level object oriented commands are provided for creating and sending Apple events, and putting the parameters and attributes in the Apple event. Prolog object types can be defined to be converted automatically to Apple desc records when specified as parameters and attributes. Prolog will either wait for the reply, or can queue your reply function which will be run automatically when the reply is received. Clean up and disposal of Apple event data structures is done automatically by Prolog when your program is finished with them.

ControlTower

Simple Software
220 Redwood Highway, Suite 42, Mill Valley, CA 94941
(415) 381-2650

ControlTower is an Apple event scripting engine that can be used to send Apple events to other programs. Developers can use ControlTower to build Apple event scripts using its point-and-click user interface that guides the user.

ControlTower's detailed Debug Window shows each command as it is sent, and what data is substituted for each variable. Error conditions are displayed, and can be trapped for further processing. Powerful programming structures, including conditional tests and iteration loops, give developers full control over a script's run-time behavior.

FRONTIER 1.0

UserLand Software
490 California Avenue, Palo Alto, CA 94306
(415) 325-5700

Frontier is scripting software that allows users to program the Macintosh operating system, file system, networks and Apple event-aware software. Frontier has all the development tools needed to get scripts running quickly, including a full script debugger and structured symbol tables. Users can watch and edit while their scripts are running. When the user is done editing the script, he or she can link it into Frontier's editable menu bar or save them to the Finder desktop.

Using Frontier, users can create scripts that incorporate Apple event messages in applications that support Apple events, including the System 7 Finder. These Frontier scripts allow users to automate Finder tasks, drive graphics, page layout, file management, electronic mail, and utility software.

HyperCard 2.1

Claris Corporation
5201 Patrick Henry Drive, Box 58168, Santa Clara, CA 95052-8168
(408) 987-7000

HyperCard is a tool for creating custom Macintosh software. Using Apple events, users can create custom network services such as personnel directories, forms and data entry, front ends for databases, simple messaging, and games. HyperCard stacks can be used as Apple event clients, servers, or both.

Language Systems FORTRAN

Language Systems Corp.
441 Carlisle Drive, Herndon, VA 22070
(703) 478-0181 or 1-800-252-6479

Language Systems FORTRAN is a Fortran compiler that runs under MPW. It creates applications that can be Apple event-aware beyond the required events. Using a function call, applications created with Language Systems FORTRAN version 3.0 can send Do Script events.

Users of the Language Systems FORTRAN compiler can create a Fortran application that generates a data file or an array of numbers. Once the data is generated in the FORTRAN application it can then open a graphics application and send it a Do Script event to plot the data.

Marksman 1.1

IT Makers
2926 Glen Darby Court, San Jose, CA 95148
(408) 274-8669

Marksman is a graphics user interface design tool, with instant simulation as well as source code generation. Version 1.1 of Marksman includes an Apple event editor that allows developers to create a custom AETE resource and generate the source code necessary to handle all the Apple events that the AETE resource describes.

NEXPERT Object 3.0

Neuron Data
156 University Avenue, Palo Alto, CA 94301
(415) 321-4488

NEXPERT Object 3.0: Expert System Shell was demonstrated at the System 7 intro in 1991 using the NEXPERT inference engine which was called by a front-end application using Neuron Data's IPC mechanism. Version 3.0 will implement the same functions through Apple events, and uses NEXPERT as an "AI Server" whose services can be used by any application capable of sending custom Apple events.

Open Interface 2.0

Neuron Data
156 University Avenue, Palo Alto, CA 94301
(415) 321-4488

Open Interface allows users to build graphic user interfaces across Macintosh, OS/2, Windows, and UNIX (Motif, OpenLook) platforms. It consists of a layout editor the developer can use to draw window resources and generate C templates, and a set of run-time libraries the developer can use to build the stand-alone application. Applications built with Open Interface on the Macintosh can easily take advantage of the built-in support for the required Apple events, and developers can also add support for any custom Apple events through a hook to the internal event loop (The Apple events code itself is not portable to other platforms, although developers can use other native IPC mechanisms to implement the same functions).

PhonePro 1.0

Cypress Research Corporation
240 E. Caribbean Drive, Sunnyvale, CA 94089
(408) 752-2700

PhonePro is a telephony applications builder for the Macintosh that can build scriptable applications. PhonePro can make and receive telephone calls, build and execute scripts using AppleScript, and can respond to another application's requirements through PhonePro's icon-based scripting language. For example, Puget Power is using PhonePro in a "proof of technology" to design repair crew response systems. A HyperCard stack monitors RF-modem messages from electricity monitors throughout the northwest, and sends an Apple event to PhonePro. PhonePro identifies the crew by location and type of problem and calls everyone in the crew to inform them of the situation. This required no modification of PhonePro, and only a small script to be written to make the look-ups and telephone calls.

Another application of PhonePro allows customers to place orders for products found in an Accountant Inc. database. PhonePro verifies customer and product information, and Database Apple events provide simple access to external databases. Telephony Apple events allow PhonePro to act as a "call server" for other applications and scripting environments.

PowerTools

ICONIX Software Engineering, Inc.
2800 Twenty-Eighth Street, Suite 320, Santa Monica, CA 90405
(310) 458-0092

PowerTools is a CASE package that offers full life cycle support. Its ten modules encourage analysts to use object-oriented, structured, and information engineering approaches to software development. It is based on a mouse-driven, iconic user interface. PowerTools allows real-time problems to be partitioned into smaller pieces and then modeled, creating a graphic representation of tasks, flows, processes, states, events, and actions. The tools communicate with each other through shared data and a common user interface. PowerTools allows data sharing with external word processors, project management software, and existing customer databases.

ProCLIPS

Randal Jones & Associates
22307 65th Avenue W., Mountlake Terrace, WA 98043
(206) 774-9044

ProCLIPS executes expert systems to augment the functions of other Macintosh applications. ProCLIPS is an expansion on CLIPS, a language originally developed by NASA, and includes a fast forward chaining production system that pairs patterns matched against a factbase with actions to modify the factbase or interact with the user or other applications. The language also includes object-oriented constructs that integrate data and the code that operates on it. A finished system may use any combination of the expert system facilities, the object-oriented constructs, or conventional procedural techniques.

Using Apple events, the host application exchanges data, commands, and results with a run-time copy of ProCLIPS executing in the background. The ProCLIPS development environment includes an integrated editor and debugging windows for tracing facts and rule activations. The designer can set watch points or single step to debug a program. A run-time system lowers the cost of distributing finished work. Alternatively, by special arrangement with Randal Jones & Associates, the ProCLIPS system may be embedded into an application.

System 7 Pack

ISIS International, Inc.
14270 Dickens Street, Suite 6, Sherman Oaks, CA 91423-4196
(818) 788-4747

System 7 Pack allows developers to add Apple event-awareness to user-designed database applications. It permits scriptability of 4th DIMENSION applications. System 7 Pack also includes support for the Open Scripting Architecture.

ToolServer v. 1.0

Apple Computer, Inc.

APDA, 20525 Mariani Avenue, M/S 33-G, Cupertino, CA 95014

1-800-282-2732 (U.S.), 1-800-637-0029 (Canada), (408) 562-3910 (Int'l)

ToolServer is currently available only in beta form (v. 1.0b1) on E.T.O., a subscription CD-ROM product available through APDA. ToolServer is an Apple event-aware MPW Shell that can execute MPW tools and scripts in the background on a local computer or on a remote computer over an AppleTalk network. Through Apple events, developers can use the capabilities of ToolServer within their development environments. This is illustrated in the following examples.

- > If a client application has a text editor but no development environment, the client can use Apple events to take text input (like a Build or Link command) and send it to ToolServer, which can execute the command and return output as the client directs.
- > If a client application consists of a development environment that has no resource compiler or decompiler, the client can use Apple events, triggered perhaps by a menu selection, to send Rez and DeRez commands to ToolServer.
- > A client application's functions can be enhanced by the use of an MPW tool. Apple events allow the client to gain access to these tools. For example, ResEdit now provides a menu option that, when selected, uses Apple events to execute a DeRez command in ToolServer and to return the information to ResEdit.

Networking and Communication

Networking & Communication
Apple events are an extraordinarily useful mechanism. Notify! could not have been developed without them. We even use Apple events to tie the server into its own user interface. This means that anything our own application does can also be done under program control by anyone else.

*--David s. Rose
President
Ex Machina, Inc.*

Backup Retriever Pro 1.2

Additional Design

10, avenue du Quebec - Local postal 522, 91946 Les Ulis Cedex, France
33 1 69 07 30 28

Backup Retriever is a backup utility application. The Do Script Apple event allows users to send a Backup Retriever script (containing information such as file and folder selection, backup device, and so on) to a local or remote copy of Backup Retriever.

CompuServe Navigator 3.1

CompuServe

4000 Arlington Centre Drive, Columbus, OH
(614) 457-8600

The CompuServe Navigator is a communication application that automates on-line sessions in order to minimize connect time. After the session, the user can review and respond to messages off line, review library listings, and schedule downloads.

Navigator 3.1 supports the 'dosc' Do Script Apple event. A user can pass commands through the Do Script event to open a saved session file, run the session, check the status of the running session, and quit. Session files are plain text with navigation codes embedded in them that allow the application to examine the results by opening the text file. Additional events enable Navigator to support the shared menu protocol defined by UserLand Frontier.

The upcoming Navigator 4.0, scheduled for release in early 1993, will allow complete control of the session with Apple events. A user can give all commands, set up a session, mail messages, transfer files, and search the libraries by using Apple events and the object model.

EtherPeek LocalPeek Net Watchman

The AG Group, Inc.
2540 Camino Diablo, Suite 202, Walnut Creek, CA 94596
(510) 937-7900

EtherPeek and LocalPeek are network analysis packages for Ethernet and LocalTalk networks, respectively. Both products offer features that can localize problems, perform diagnostic tests, monitor network loads and events, test hardware and software, and provide information for the management and planning of network configurations. Net Watchman uses the AppleTalk protocols to monitor all zones, bridges, nodes, and services, and notifies a network manager when any item disappears or reappears, or if there is a change in function.

Previously, Macintosh-based network management utilities could notify users through text logs, visual alerts, or audible alerts at the workstation. Using Apple events through Ex Machina's Notify!, EtherPeek, LocalPeek, and Net Watchman can pass alphanumeric messages to a remote pager when a user-specified network event occurs. For example, a network manager could configure EtherPeek to notify with a page that reads, "A new node appeared" when a new or unknown node appears .

GatorTools v1.5.0

Cayman Systems, Inc.
26 Landsdowne Street, Cambridge, MA 02139
(617) 494-1999

GatorTools provides network administrators with information pertaining to an AppleTalk or TCP/IP network. This information includes node id's and network numbers for all nodes on the network. In addition, general network information such as zone lists can be obtained. GatorTools can be used to send NBP Lookups and ZIP queries on the network from an application capable of sending Apple events. This can be used by network managers who want to use a scripting aware program to track network visible entities and available zones.

Node Informer v1.1

Cayman Systems, Inc.
26 Landsdowne Street, Cambridge, MA 02139
(617) 494-1999

Node Informer provides network administrators or users with network information for a specific Macintosh on an AppleTalk and/or TCP/IP network. This information includes network number, node number, TCP/IP address and Ethernet hardware address on the Macintosh node. Node Informer allows applications capable of sending Apple events to request network related information from a Macintosh, including its network and node numbers, MacTCP IP address and Subnet Mask, and local zone name. Network managers can acquire this information without going to the Macintosh via a scripting aware program.

MicroPhone II

Software Ventures
2907 Claremont Avenue, Berkeley, CA 94705
(415) 644-3232

MicroPhone is a general purpose communications program. Users are using MicroPhone scripts to do the low-level work of interacting with on-line services, under the high-level control of other applications through Do Script. Get Data, Set Data, and files can be used to pass information back and forth.

NetOctopus

Pole Position Software GmbH
Ebrardstraße 126, Erlangen, D-8520, Germany
(49) 9131 538120

NetOctopus is a network management product. It will have custom events to control NetOctopus from scripting systems like UserLand Frontier. There will be a list of the functions of all Apple events in NetOctopus at the time of the release. Most of the core Apple events will be available. With Frontier, users will be able to automate different types of network management processes.

Notify!

Ex Machina, Inc.
45 East 89th Street #39-A, New York, NY 10128-1232
(718) 965-0309

Notify! provides remote wireless messaging capabilities to any application. Current applications that support Notify! include the following:

- > Calendaring, alarm and scheduling programs (to alert the user throughout the day of upcoming scheduled activities)
- > Network management programs (to keep network administrators updated on the status of their network)
- > Electronic mail systems (to relay urgent messages to a remote user)
- > Voicemail systems (to allow incoming callers to generate text messages to be sent to people in the field)
- > Personal information managers (to allow instant messaging from within address book type applications)
- > Communication programs (to allow a user to create a custom wireless information feed from on-line sources such as stock quotes or weather reports)
- > Spreadsheets (to relay calculation results to remote users)
- > Desktop scripting and macro programs (to allow the users to customize their own interapplication wireless messaging solutions)

Working in conjunction with wireless message receivers such as the Motorola NewsStream, Notify! allows Macintosh-based applications to directly update files (including calendars, phone books and spreadsheets) on remote palmtop computers in the field. Complete developer documentation for the Notify object model and the special Paging Suite of Apple events are available at no cost directly from Ex Machina, Inc.

RouterCheck

Neon Software, Inc.
1009 Oak Hill Road, Suite 203, Lafayette, CA 94549
(510) 283-9771

The product update to RouterCheck, an AppleTalk router management software uses the Apple events mechanism supported by Ex Machina's Notify! product. Customers will be able to configure a response to various network conditions. They will be notified via a pager through an Apple event sent from RouterCheck to Notify! when the condition occurs.

VersaTerm and VersaTerm-PRO

Synergy Software
2457 Perkiomen Avenue, Reading, PA 19606
(215) 779-0522

VersaTerm 4.6 is a terminal emulation and communications application that provides DEC VT100 and VT220 text, and Tektronix 4014 graphic terminal emulations. VersaTerm supports the Macintosh Communications Toolbox, and is compatible with A/UX 2.0.

An Apple event can be used to launch and execute a macro in VersaTerm that could transfer a file from a host computer to the Macintosh for use by a Macintosh application. An Apple event can also read text from the emulation screen and make it available to another Macintosh application. For example, numerical data from a terminal session can be transferred to a designated row of cells in a spreadsheet. VersaTerm-PRO provides the same emulations as VersaTerm but adds the Tektronix 4105 (color/high-resolution) graphic terminal emulation.

Index of Products

4th DIMENSION 2.2	18
AAIS Full Control Prolog	32
Accountant, Inc.	18
Aldus PageMaker 4.2	6
Autopage II and Autopage II Extension to QuarkXPress	26
Backup Retriever Pro 1.2	40
Claris Resolve 1.1	12
CompuServe Navigator 3.1	40
ControlTower	32
DataPivot	12
DataPrism 1.7	13
Douglas CAD/CAM DesignWorks Professional Layout	27
Dynodex	19
DynoPage 1.7	19
Easy Alarms 1.5	20
EasyTime	20
EtherPeek / LocalPeek / Net Watchman	41
Expressionist 3.0	13
FileMaker Pro	21
FRONTIER 1.0	33
GatorTools v1.5.0	41
Generic CADD 2.0	27
GeoQuery 3.0	14
HyperCard 2.1	33
Informed Designer / Informed Manager / Informed Number Server	28
LabVIEW 2	14
Language Systems FORTRAN	34
LaserPlot	28
Marksman 1.1	34
MicroPhone II	42
Microsoft Excel 4.0	15
MiniTBAccess and TouchBase	21
NetOctopus	42
NEXPERT Object 3.0	35
Node Informer v1.1	42
Notify!	43
OmniPage Direct	29
On Location 2.0	22
Open Interface 2.0	35
PhonePro 1.0	36
PowerTools	36
ProCLIPS	37
PROMotion 1.0	29
RocketShare	30

Beyond the Required Suite		
46		
RouterCheck	44	
SerePlot 2.0	15	
Spellswell and Writeswell Jr.		22
Spyglass Transform 2.1		16
StuffIt Deluxe 3.0 and StuffIt 3.0	23	
System 7 Pack		37
Tiles	23	
TimeBandit	30	
ToolServer v. 1.0	38	
VersaTerm and VersaTerm-PRO	44	

Index of Companies

ACIUS, Inc.	18	
Additional Design	40	
Advanced A. I. Systems, Inc.	32	
After Hours Software		21
The AG Group, Inc.	41	
Aladdin Systems, Inc.		23
Aldus Corporation	26	
Apple Computer, Inc.	38	
Autodesk Retail Products	27	
Brio Technology, Inc.	12	
Brio Technology, Inc.	13	
Caere Corp.	29	
Cayman Systems, Inc.		41
Cayman Systems, Inc.		42
CE Software, Inc.		23
Claris Corporation	12, 21, 33	
CompuServe	40	
Cypress Research Corporation		36
Douglas Electronics, Inc.	27	
Essential Software	20	
Ex Machina, Inc.		43
GeoQuery Corporation		14
ICONIX Software Engineering		36
ISIS International, Inc.		37
IT Makers		34
KyTek, Inc.	26	
Language Systems Corp.	34	
Microsoft Corporation		15
Motion Works International	29	
National Instruments Corporation	14	
Neon Software, Inc.	44	
Neuron Data	35	
ON Technology, Inc.	22	
Pole Position Software GmbH		28, 42
Portfolio Systems, Inc.		19
Prescience Corporation		13
Radius Inc.	30	
Randal Jones & Associates	37	
Scientific Visions		15
Shana Corporation	28	
Simple Software		32
SoftLab		20
Softsync		18
Software Ventures	42	

Beyond the Required Suite

48

Spyglass, Inc.

16

Steinberg Soft- und Hardware GmbH

30

Synergy Software

44

UserLand Software

33

Working Software, Inc.

22