

## **Reviewer's Guide**

# **Macintosh System-Level Scripting Software**

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## Defining the Category

The purpose of system-level scripting software is to offer users and developers a way to customize and automate the use of the Macintosh file system, operating system, networks and application and utility software. To serve this market, a scripting product must offer a comprehensive set of integrated tools that provide for script editing and debugging, user interface design, persistent storage of information, on-line and printed documentation and developer support services.

System-level scripting is not an entirely new category. Character-based systems, such as Unix and MS-DOS, offered system-level scripting thru their shell or batch languages. But graphic operating systems such as the Macintosh OS offer an opportunity to do much more.

## Who is the user?

They are Macintosh system and network managers. In-house support people. Consultants and contractors. Service bureau operators. Commercial and in-house software developers.

These people are script writers. They are looking for ways to establish standard procedures, to detect and avoid errors, and to make computer use simpler and more streamlined for casual users. They can also automate processes within their organizations to offload work from highly paid designers to clerical people, or in some cases automate an repetitive process entirely. Some of the tools they develop are for their own use, and others are deployed to end-users.

UserLand Frontier is a script writer's development tool.

## Script Writing is a Skill

Script writing is a skill that requires a some amount of time and effort to acquire. However, it's no more difficult than becoming a skilled user of other technically rich software products such as Adobe PhotoShop, Quark XPress, Microsoft Excel or Apple Computer's HyperCard.

UserLand Software believes it's possible to smooth the script writing learning curve by providing a user-interface design tool that's tightly coupled with system-level scripting. UserLand software has such a product in development, its codename is "Iowa."

## Basic Feature Set

The scripting system should define a full-featured language with logic and looping, sub-procedures, error recovery, compilation and coercion. It should have a persistent storage system.

The language should include built-in verbs to control the Macintosh operating system, file system, network and scriptable applications. Full access to both the data and resource forks of files should be provided.

It should excel at text and numeric operations and have an open architecture to support new data types and allow compiled machine code (e.g. XCMDs) to be executed.

Scripts should be able to call other scripts, allowing reusable code. Script writers should be able to add verbs to the language.

A full-featured script editor should be included, with an integrated script debugger. Full documentation should be included, both in print and in on-line form. It should come with a wide variety of sample scripts in source code. It should be easy to put a standard user interface on scripts and sets of scripts. A low-cost runtime interpreter should be available. On-line support should be provided.

## About the Feature List

In the following sections, we break out each of the categories and detail the specific features that we believe should be part of any system-level scripting product. The list is brief, and many of the items are just examples of features, backed up by entire sub-systems in the Frontier software.

This list can be used to compare UserLand Frontier 2.0 with other products aimed at the system-level scripting software market.

We've tried to be objective putting this list together. In some cases, we list necessary features that are not present in Frontier 2.0. In other cases, we've omitted major features that are implemented in Frontier because they seem optional and not required for a minimally-featured product. We welcome feedback.

## Language Features

Frontier 2.0

- **Looping, if then else, case statement, scoping, sub-procedures.** •
- **Language is integrated with the storage system, allowing easy and efficient access to temporary values (locals) and values that persist between invocations of the script.** •
- **Error recovery is built into the language.** •
- **Scripts are compiled into an intermediate (p-code) form prior to execution.** •
- **Structural symbols such as semicolons, curly braces, begin/end, are not necessary.** •
- **Variable typing is dynamic, with predictable type coercion built into the interpreter.** •

## Macintosh Operating System

Frontier 2.0

- **Scripts can launch an application, data file, control panel or desk accessory. Determine if an application is running. Bring a specified application to the front. Quit from an application.** •
- **Loop over all the running applications.** •
- **Determine how much memory is available.** •
- **Determine the version of the operating system.** •
- **Wait a specified number of seconds or sixtieths of a second.** •
- **Get the current time from the system clock. Set the system clock.** •

- **Get the contents of the system clipboard, put a value on the clipboard.** •
- **Access the desktop database to locate an application file.** •
- **Determine if an application supports Apple Events.** •
- **Play a sound.** •

## File System Access

Frontier 2.0

- **Scripts can move, copy, delete and rename files and folders; and reconcile the changes between two versions of the same folder.** •
- **Get and modify file/folder attributes such as creation date, modification date, file type and creator, file size, file comment, version information, icon position, label, visibility, whether the file is locked or unlocked.** •
- **Determine if a file or folder exists.** •
- **Read and write from data files, with special (easy) support for text files.** •
- **Manage the resource fork of any file.** •
- **Loop over all files in a folder, or any level of nested folders.** •
- **Loop over all mounted disks.** •
- **Locate and create a special folders in the Macintosh System Folder.** •
- **Create and manage aliases.** •

## Text Operations

Frontier 2.0

- **Concatenate two strings.** •
- **Delete a range of characters.** •
- **Extract a range of characters from one string, resulting in a new string.** •
- **Convert a string to all upper-case or all lower-case.** •
- **Determine if a string is contained within another string, if it begins with a string, or ends with a string.** •
- **Replace each occurrence of one string contained within another string.** •
- **Access tab-delimited or comma-delimited fields in any text.** •
- **Scriptable text editor.** •
- **Scriptable outliner.** •
- **Text is not limited to any length, other than the amount of available memory.** •

## Networking

Frontier 2.0

- **Mount or unmount remote (shared) disk.** •
- **Run a script on a remote machine, pass parameters and receive returned results.** •
- **Send an Apple Event message to a remote application and receive returned results.** •
- **Allow remote connections via the AppleTalk Remote Access protocol.** •



## Script Editing & Debugging

Frontier 2.0

- **Full-featured, integrated script editor and debugger.** •
- **Script editor is scriptable.** •
- **Find & Replace within a single script and over groups of scripts.** •  
**Case insensitive search, wrap around, find language identifiers.**
- **Allows editing of program structure.** •
- **Fully integrated script debugger. Set a breakpoint at any statement, step from statement to statement, go into a script call, go out from a script call, trace statement execution, resume normal execution, halt the script.** •
- **Examine and edit all local and global variables in the storage system while any number of scripts are running.** •
- **When a syntax or runtime error occurs, user can jump to the line where the error occurs, with all script editing features enabled. View all local and global variables before terminating the script.** •

## Storage System

Frontier 2.0

- **Has a persistent storage system. Allows script writers to access groups of small and large values as a natural part of the language, efficiently, without having to implement a file format for each script.** •
- **The storage system is hierarchic, allowing groups of objects be treated as a single object.** •
- **Directly supports the following standard data types: boolean, character, 16-bit signed integers, 32-bit signed integers, floating point numbers, date, text, picture.** •
- **Allow arbitrary un-typed binary objects to be stored using the same naming scheme as for directly supported types.** •
- **Store and run scripts and executable machine code (e.g. XCMDs, UCMDs).** •

## UI Design Tools

Frontier 2.0

- **Run dialogs created with a resource editing tool such as ResEdit or Resorcerer.** •

- **Menu editor allows script writers to add commands to the Finder's menu bar, and to the menu bars of compatible applications (menu sharing).** •
- **Scripts can include standard "file dialogs" in their scripts.** •
- **Graphic interface builder makes it easy for script writers to front-<sup>1</sup> end their scripts with standard user interface elements.**

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<sup>1</sup>UserLand has a user interface builder in development, codenamed Iowa.

## Architecture/Economics

Frontier 2.0

- **Works over AppleTalk network.** •
- **Code is re-usable. Scripts can call other scripts, passing parameters and receiving multiple returned values.** •
- **Launch a script from the desktop.** •
- **Drag and drop files/folders/disks onto a script.** •
- **Run “agent” scripts in the background.** •
- **Multi-threaded, allowing multiple scripts to run concurrently.** •
- **Scripts can handle incoming Apple Events.** •
- **Apple Events can be processed while waiting for a response from a message.** •
- **Script writers can add new verbs to the language.** •
- **C, Pascal and HyperTalk programmers can add verbs to the language.** •
- **Scripts can be compiled into an intermediate non-human-readable form, and it's possible to distribute scripts in this form.** <sup>2</sup>
- **Suggested retail price for development system.** \$249
- **Runtime shareware registration fee.** \$25
- **Inexpensive network license for runtime.** •
- **Annual runtime license fee for commercial developers.** \$100<sup>3</sup>
- **Software Developer's Kit (SDK) with toolkits and sample code for all architecture features. Full C source code included. Available at no cost, on-line. Royalty-free license for all code.** •

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<sup>2</sup>Planned for a future release of Frontier.

<sup>3</sup>Royalty-free.

## Interapplication Communication

Frontier 2.0

- **Supports the client side of all major interapplication protocols including object model Apple Events, procedural Apple Events, system-level Apple Events, Dynamic Data Exchange (DDE) and application-specific models such as Aldus Corp's *Additions* protocol.** •
- **Supports recording for applications that are recordable.** 4
- **Is a scriptable application, allowing script writers to customize its feature set.** •
- **Supports Open Scripting Architecture (OSA).** 4

## Documentation & Support

Frontier 2.0

- **Printed documentation covers language syntax and all built-in verbs.** •
- **On-line documentation. Information about each built-in verb. Hot-link to script editor. Other developers can add documentation for application-specific verbs. It's a scriptable application.** •
- **Quarterly subscription service for utilities, beta software, sample scripts, code extensions, technical notes.** •
- **Support forums on CompuServe, America On-Line and AppleLink staffed by lead developers and company president.** •
- **Sample scripts illustrate all commonly used scripting techniques. Distributed on-line and thru subscription service.** •

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<sup>4</sup>Planned for a future release of Frontier.