

# Contents

	Figures, Tables, and Listings	xv
<b>Preface</b>	<b>About This Book</b>	<b>xxiii</b>
	Format of a Typical Chapter	xxiv
	Conventions Used in This Book	xxv
	Special Fonts	xxv
	Types of Notes	xxv
	Assembly-Language Information	xxvi
	The Development Environment	xxvi
<b>Chapter 1</b>	<b>Introduction to Interapplication Communication</b>	<b>1-1</b>
	Overview of Interapplication Communication	1-3
	Sharing Data Among Applications	1-6
	Sending and Responding to Apple Events	1-9
	Standard Apple Events	1-10
	Handling Apple Events	1-12
	Supporting AppleScript and Other Scripting Languages	1-13
	Scriptable Applications	1-16
	Recordable Applications	1-18
	Applications That Manipulate and Execute Scripts	1-19
	Exchanging Message Blocks	1-22
<b>Chapter 2</b>	<b>Edition Manager</b>	<b>2-1</b>
	Introduction to Publishers, Subscribers, and Editions	2-4
	About the Edition Manager	2-12
	Using the Edition Manager	2-12
	Receiving Apple Events From the Edition Manager	2-13
	Creating the Section Record and Alias Record	2-15
	Saving a Document Containing Sections	2-19
	Opening and Closing a Document Containing Sections	2-22
	Reading and Writing a Section	2-24
	Formats in an Edition	2-24
	Opening an Edition	2-26
	Format Marks	2-27
	Reading and Writing Edition Data	2-27
	Closing an Edition	2-28

Creating a Publisher	2-29	
Creating the Edition Container	2-32	
Opening an Edition Container to Write Data	2-35	
Creating a Subscriber	2-37	
Opening an Edition Container to Read Data	2-41	
Choosing Which Edition Format to Read	2-41	
Using Publisher and Subscriber Options	2-43	
Publishing a New Edition While Saving or Manually	2-47	
Subscribing to an Edition Automatically or Manually	2-48	
Canceling Sections Within Documents	2-48	
Locating a Publisher Through a Subscriber	2-49	
Renaming a Document Containing Sections	2-50	
Displaying Publisher and Subscriber Borders	2-50	
Text Borders	2-54	
Spreadsheet Borders	2-55	
Object-Oriented Graphics Borders	2-56	
Bitmapped Graphics Borders	2-57	
Duplicating Publishers and Subscribers	2-58	
Modifying a Subscriber	2-59	
Relocating an Edition	2-60	
Customizing Dialog Boxes	2-60	
Subscribing to Non-Edition Files	2-62	
Getting the Current Edition Opener	2-63	
Setting an Edition Opener	2-63	
Calling an Edition Opener	2-64	
Opening and Closing Editions	2-68	
Listing Files That Can Be Subscribed To	2-68	
Reading From and Writing to Files	2-68	
Calling a Format I/O Function	2-68	
Edition Manager Reference	2-71	
Data Structures	2-71	
The Edition Container Record	2-71	
The Section Record	2-72	
Edition Manager Routines	2-73	
Initializing the Edition Manager	2-74	
Creating and Registering a Section	2-74	
Creating and Deleting an Edition Container	2-79	
Setting and Getting a Format Mark	2-81	
Reading in Edition Data	2-83	
Writing out Edition Data	2-86	
Closing an Edition After Reading or Writing	2-88	
Displaying Dialog Boxes	2-90	
Locating a Publisher and Edition From a Subscriber	2-98	
Edition Container Formats	2-101	
Reading and Writing Non-Edition Files	2-102	
Application-Defined Routines	2-105	

Summary of the Edition Manager	2-106
Pascal Summary	2-106
Constants	2-106
Data Types	2-108
Edition Manager Routines	2-111
Application-Defined Routines	2-113
C Summary	2-114
Constants	2-114
Data Types	2-116
Edition Manager Routines	2-119
Application-Defined Routines	2-122
Result Codes	2-122

---

## Chapter 3      Introduction to Apple Events      3-1

About Apple Events	3-3
Apple Events and Apple Event Objects	3-6
Apple Event Attributes and Parameters	3-7
Apple Event Attributes	3-8
Apple Event Parameters	3-9
Interpreting Apple Event Attributes and Parameters	3-10
Data Structures Within Apple Events	3-12
Descriptor Records	3-12
Keyword-Specified Descriptor Records	3-15
Descriptor Lists	3-16
Responding to Apple Events	3-20
Accepting and Processing Apple Events	3-20
About Apple Event Handlers	3-23
Extracting and Checking Data	3-23
Interacting With the User	3-25
Performing the Requested Action and Returning a Result	3-25
Creating and Sending Apple Events	3-28
Creating an Apple Event Record	3-29
Adding Apple Event Attributes and Parameters	3-29
Sending an Apple Event and Handling the Reply	3-30
Working With Object Specifier Records	3-32
Data Structures Within an Object Specifier Record	3-34
The Classification of Apple Event Objects	3-39
Object Classes	3-39
Properties and Elements	3-42
Finding Apple Event Objects	3-46
About the Apple Event Manager	3-48
Supporting Apple Events as a Server Application	3-48
Supporting Apple Events as a Client Application	3-49
Supporting Apple Event Objects	3-49
Supporting Apple Event Recording	3-50

---

Handling Apple Events	4-4
Accepting an Apple Event	4-5
Installing Entries in the Apple Event Dispatch Tables	4-7
Installing Entries for the Required Apple Events	4-8
Installing Entries for Apple Events Sent by the Edition Manager	4-9
How Apple Event Dispatching Works	4-9
Handling the Required Apple Events	4-11
Required Apple Events	4-11
Handling the Open Application Event	4-14
Handling the Open Documents Event	4-15
Handling the Print Documents Event	4-17
Handling the Quit Application Event	4-19
Handling Apple Events Sent by the Edition Manager	4-20
The Section Read, Section Write, and Section Scroll Events	4-21
Handling the Create Publisher Event	4-22
Getting Data Out of an Apple Event	4-25
Getting Data Out of an Apple Event Parameter	4-26
Getting Data Out of an Attribute	4-28
Getting Data Out of a Descriptor List	4-31
Writing Apple Event Handlers	4-33
Replying to an Apple Event	4-36
Disposing of Apple Event Data Structures	4-39
Writing and Installing Coercion Handlers	4-41
Interacting With the User	4-45
Setting the Client Application's User Interaction Preferences	4-46
Setting the Server Application's User Interaction Preferences	4-48
Requesting User Interaction	4-49
Reference to Responding to Apple Events	4-56
Data Structures Used by the Apple Event Manager	4-56
Descriptor Records and Related Data Structures	4-56
Apple Event Array Data Types	4-60
Routines for Responding to Apple Events	4-61
Creating and Managing the Apple Event Dispatch Tables	4-61
Dispatching Apple Events	4-66
Getting Data or Descriptor Records Out of Apple Event Parameters and Attributes	4-68
Counting the Items in Descriptor Lists	4-74
Getting Items From Descriptor Lists	4-74
Getting Data and Keyword-Specified Descriptor Records Out of AE Records	4-78
Requesting User Interaction	4-81
Requesting More Time to Respond to Apple Events	4-84
Suspending and Resuming Apple Event Handling	4-85
Getting the Sizes and Descriptor Types of Descriptor Records	4-89
Deleting Descriptor Records	4-92

Deallocating Memory for Descriptor Records	4-93
Coercing Descriptor Types	4-94
Creating and Managing the Coercion Handler Dispatch Tables	4-96
Creating and Managing the Special Handler Dispatch Tables	4-99
Getting Information About the Apple Event Manager	4-103
Application-Defined Routines	4-104
Summary of Responding to Apple Events	4-108
Pascal Summary	4-108
Constants	4-108
Data Types	4-112
Routines for Responding to Apple Events	4-114
Application-Defined Routines	4-118
C Summary	4-118
Constants	4-118
Data Types	4-123
Routines for Responding to Apple Events	4-124
Application-Defined Routines	4-128
Assembly-Language Summary	4-128
Trap Macros	4-128
Result Codes	4-129

---

## Chapter 5      Creating and Sending Apple Events      5-1

Creating an Apple Event	5-3
Adding Parameters to an Apple Event	5-5
Specifying Optional Parameters for an Apple Event	5-7
Specifying a Target Address	5-10
Creating an Address Descriptor Record	5-11
Addressing an Apple Event for Direct Dispatching	5-13
Sending an Apple Event	5-13
Dealing With Timeouts	5-21
Writing an Idle Function	5-22
Writing a Reply Filter Function	5-24
Reference to Creating and Sending Apple Events	5-25
Routines for Creating and Sending Apple Events	5-25
Creating Apple Events	5-26
Creating and Duplicating Descriptor Records	5-27
Creating Descriptor Lists and AE Records	5-29
Adding Items to Descriptor Lists	5-30
Adding Data and Descriptor Records to AE Records	5-33
Adding Parameters and Attributes to Apple Events	5-34
Sending Apple Events	5-38
Application-Defined Routines	5-42

Summary of Creating and Sending Apple Events	5-45
Pascal Summary	5-45
Constants	5-45
Data Types	5-49
Routines for Creating and Sending Apple Events	5-51
Application-Defined Routines	5-52
C Summary	5-52
Constants	5-52
Data Types	5-57
Routines for Creating and Sending Apple Events	5-58
Application-Defined Routines	5-60
Assembly-Language Summary	5-60
Trap Macros	5-60
Result Codes	5-61

---

Chapter 6	<b>Resolving and Creating Object Specifier Records</b>	6-1
-----------	--	-----

Resolving Object Specifier Records	6-4
Descriptor Records Used in Object Specifier Records	6-8
Object Class	6-9
Container	6-9
Key Form	6-11
Key Data	6-12
Key Data for a Property ID	6-13
Key Data for an Object's Name	6-14
Key Data for a Unique ID	6-14
Key Data for Absolute Position	6-14
Key Data for Relative Position	6-15
Key Data for a Test	6-15
Key Data for a Range	6-20
Installing Entries in the Object Accessor Dispatch Tables	6-21
Installing Object Accessor Functions That Find Apple Event Objects	6-23
Installing Object Accessor Functions That Find Properties	6-27
Writing Object Accessor Functions	6-28
Writing Object Accessor Functions That Find Apple Event Objects	6-29
Writing Object Accessor Functions That Find Properties	6-37
Defining Tokens	6-39
Handling Whose Tests	6-41
Writing Object Callback Functions	6-45
Writing an Object-Counting Function	6-48
Writing an Object-Comparison Function	6-50
Writing Marking Callback Functions	6-53
Creating Object Specifier Records	6-55
Creating a Simple Object Specifier Record	6-57
Specifying the Container Hierarchy	6-61

Specifying a Property	6-63
Specifying a Relative Position	6-64
Creating a Complex Object Specifier Record	6-64
Specifying a Test	6-64
Specifying a Range	6-72
Reference to Resolving and Creating Object Specifier Records	6-75
Data Structures Used in Object Specifier Records	6-75
Routines for Resolving and Creating Object Specifier Records	6-77
Initializing the Object Support Library	6-77
Setting Object Accessor Functions and Object Callback Functions	6-77
Getting, Calling, and Removing Object Accessor Functions	6-81
Resolving Object Specifier Records	6-85
Deallocating Memory for Tokens	6-87
Creating Object Specifier Records	6-88
Application-Defined Routines	6-94
Object Accessor Functions	6-94
Object Callback Functions	6-96
Summary of Resolving and Creating Object Specifier Records	6-104
Pascal Summary	6-104
Constants	6-104
Data Types	6-106
Routines for Resolving and Creating Object Specifier Records	6-106
Application-Defined Routines	6-108
C Summary	6-109
Constants	6-109
Data Types	6-111
Routines for Resolving and Creating Object Specifier Records	6-112
Application-Defined Routines	6-114
Assembly-Language Summary	6-115
Trap Macros	6-115
Result Codes	6-115

## Chapter 7

## Introduction to Scripting 7-1

---

About Scripts and Scripting Components	7-4
Script Editors and Script Files	7-6
Scripting Components and Scriptable Applications	7-8
Scripting Components and Applications That Execute Scripts	7-11
Making Your Application Scriptable	7-14
About Apple Event Terminology Resources	7-15
How AppleScript Uses Terminology Information	7-17
Dynamic Loading of Terminology Information	7-20
Making Your Application Recordable	7-20
Manipulating and Executing Scripts	7-22
Compiling, Saving, Modifying, and Executing Scripts	7-24
Using a Script Context to Handle an Apple Event	7-25

<b>Chapter 8</b>	<b>Apple Event Terminology Resources</b>	<b>8-1</b>
	Defining Terminology for Use by the AppleScript Component	8-3
	Structure of Apple Event Terminology Resources	8-8
	Creating an Apple Event Terminology Extension Resource	8-13
	Supporting Standard Suites Without Extensions	8-14
	Extending the Standard Suites	8-16
	Supporting Subsets of Suites	8-23
	Supporting New Suites	8-23
	Handling the Get AETE Event	8-23
	Reference to Apple Event Terminology Resources	8-26
	Header Data for an Apple Event Terminology Resource	8-27
	Suite Data for an Apple Event Terminology Resource	8-27
	Event Data	8-29
	Object Class Data	8-36
	Comparison Operator Data	8-42
	Enumeration and Enumerator Data	8-43
	The Scripting Size Resource	8-45
<b>Chapter 9</b>	<b>Recording Apple Events</b>	<b>9-1</b>
	About Recordable Applications	9-3
	Factoring Your Application for Recording	9-6
	Factoring the Quit Command and the New Command	9-6
	Sending Apple Events Without Executing Them	9-12
	What to Record	9-14
	Recording User Actions	9-15
	Recording the Selection of Text Objects	9-18
	Recording Insertion Points	9-23
	Recording Typing	9-27
	Recording the Selection of Nontext Objects	9-30
	Identifying Objects	9-32
	Moving the Selection During Recording	9-34
	Recording Interactions With Dialog Boxes	9-35
	How Apple Event Recording Works	9-35
<b>Chapter 10</b>	<b>Scripting Components</b>	<b>10-1</b>
	Connecting to a Scripting Component	10-3
	Using Scripting Component Routines	10-7
	Compiling and Executing Source Data	10-7
	Saving Script Data	10-12
	Storage Formats for Script Data	10-12
	Resource and File Types for Script Data	10-13



Loading and Executing Script Data	10-14
Modifying and Recompiling a Compiled Script	10-17
Using a Script Context to Handle an Apple Event	10-19
Supplying a Resume Dispatch Function	10-21
Supplying an Alternative Active Function	10-23
Supplying Alternative Create and Send Functions	10-24
Alternative Create Functions	10-24
Alternative Send Functions	10-25
Recording Scripts	10-26
Writing a Scripting Component	10-27
Scripting Components Reference	10-28
Data Structures	10-29
Required Scripting Component Routines	10-30
Saving and Loading Script Data	10-30
Executing and Disposing of Scripts	10-33
Setting and Getting Script Information	10-41
Manipulating the Active Function	10-45
Optional Scripting Component Routines	10-46
Compiling Scripts	10-47
Getting Source Data	10-51
Coercing Script Values	10-52
Manipulating the Create and Send Functions	10-55
Recording Scripts	10-59
Executing Scripts in One Step	10-61
Manipulating Dialects	10-67
Using Script Contexts to Handle Apple Events	10-71
AppleScript Component Routines	10-80
Initializing AppleScript	10-80
Getting and Setting Styles for Source Data	10-82
Generic Scripting Component Routines	10-84
Getting and Setting the Default Scripting Component	10-86
Using Component-Specific Routines	10-87
Routines Used by Scripting Components	10-92
Manipulating Trailers for Generic Storage Descriptor Records	10-92
Application-Defined Routines	10-94
Summary of Scripting Components	10-99
Pascal Summary	10-99
Constants	10-99
Data Types	10-105
Required Scripting Component Routines	10-106
Optional Scripting Component Routines	10-107
AppleScript Component Routines	10-110
Generic Scripting Component Routines	10-110
Routines Used by Scripting Components	10-111
Application-Defined Routines	10-111

C Summary	10-112
Constants	10-112
Data Types	10-118
Required Scripting Component Routines	10-119
Optional Scripting Component Routines	10-120
AppleScript Component Routines	10-123
Generic Scripting Component Routines	10-123
Routines Used by Scripting Components	10-124
Application-Defined Routines	10-124
Result Codes	10-125

---

Chapter 11	<b>Program-to-Program Communications Toolbox</b>	11-1
------------	--	------

About the PPC Toolbox	11-4
Ports, Sessions, and Message Blocks	11-4
Setting Up Authenticated Sessions	11-6
Using the PPC Toolbox	11-10
PPC Toolbox Calling Conventions	11-14
Specifying Port Names and Location Names	11-17
Opening a Port	11-20
Browsing for Ports Using the Program Linking Dialog Box	11-22
Obtaining a List of Available Ports	11-27
Preparing for a Session	11-29
Initiating a PPC Session	11-29
Receiving Session Requests	11-35
Accepting or Rejecting Session Requests	11-37
Exchanging Data During a PPC Session	11-39
Reading Data From an Application	11-40
Sending Data to an Application	11-42
Ending a Session and Closing a Port	11-43
Invalidating Users	11-44
PPC Toolbox Reference	11-46
Data Structures	11-46
The PPC Toolbox Parameter Block	11-46
The PPC Port Record	11-49
The Location Name Record	11-50
The Port Information Record	11-51
PPC Toolbox Routines	11-51
Initializing the PPC Toolbox	11-52
Using the Program Linking Dialog Box	11-52
Obtaining a List of Ports	11-55
Opening and Closing a Port	11-57
Starting and Ending a Session	11-60
Receiving, Accepting, and Rejecting a Session	11-67
Reading and Writing Data	11-72
Locating a Default User and Invalidating a User	11-76

Application-Defined Routines	11-78
Completion Routines for PPC Toolbox Routines	11-78
Port Filter Functions	11-79
Summary of the PPC Toolbox	11-81
Pascal Summary	11-81
Constants	11-81
Data Types	11-82
PPC Toolbox Routines	11-88
Application-Defined Routines	11-89
C Summary	11-90
Constants	11-90
Data Types	11-91
PPC Toolbox Routines	11-96
Application-Defined Routines	11-97
Assembly-Language Summary	11-97
Trap Macros	11-97
Result Codes	11-98

---

<b>Chapter 12</b>	<b>Data Access Manager</b>	12-1
-------------------	----------------------------	------

About the Data Access Manager	12-5
The High-Level Interface	12-7
Sending a Query Through the High-Level Interface	12-8
Retrieving Data Through the High-Level Interface	12-9
The Low-Level Interface	12-9
Sending a Query Through the Low-Level Interface	12-10
Retrieving Data Through the Low-Level Interface	12-11
Comparison of the High-Level and Low-Level Interfaces	12-11
Using the Data Access Manager	12-12
Executing Routines Asynchronously	12-12
General Guidelines for the User Interface	12-13
Keep the User in Control	12-13
Provide Feedback to the User	12-13
Using the High-Level Interface	12-14
Writing a Status Routine for High-Level Functions	12-22
Using the Low-Level Interface	12-28
Getting Information About Sessions in Progress	12-36
Processing Query Results	12-37
Getting Query Results	12-37
Converting Query Results to Text	12-43
Creating a Query Document	12-47
User Interface Guidelines for Query Documents	12-47
Contents of a Query Document	12-49
Query Records and Query Resources	12-52
Writing a Query Definition Function	12-52

Data Access Manager Reference	12-55
Data Structures	12-55
The Asynchronous Parameter Block	12-56
The Query Record	12-57
The Results Record	12-59
Data Access Manager Routines	12-60
Initializing the Data Access Manager	12-61
High-Level Interface: Handling Query Documents	12-62
High-Level Interface: Handling Query Results	12-66
Low-Level Interface: Controlling the Session	12-69
Low-Level Interface: Sending and Executing Queries	12-77
Low-Level Interface: Retrieving Results	12-83
Installing and Removing Result Handlers	12-87
Application-Defined Routines	12-90
Resources	12-91
The Query Resource	12-91
The Query String Resource	12-92
The Query Definition Function Resource	12-93
Summary of the Data Access Manager	12-94
Pascal Summary	12-94
Constants	12-94
Data Types	12-95
Data Access Manager Routines	12-97
Application-Defined Routines	12-99
C Summary	12-99
Constants	12-99
Data Types	12-101
Data Access Manager Routines	12-102
Application-Defined Routines	12-104
Assembly-Language Summary	12-104
Trap Macros	12-104
Result Codes	12-105

---

## Glossary

GL-1

---

## Index

IN-1

---