

Contents

1	Preface	
3	About <i>Inside Macintosh</i>	
4	A Horse of a Different Color	
5	The Structure of a Typical Chapter	
5	Conventions	
7	1 A Road Map	
9	About This Chapter	
9	Overview of the Software	
13	A Simple Example Program	
21	Where to Go From Here	
23	2 The Macintosh User Interface Guidelines	
27	About This Chapter	
27	Introduction	
29	Types of Applications	
31	Using Graphics	
32	Components of the Macintosh System	
33	The Keyboard	
36	The Mouse	
38	Selecting	
44	Windows	
51	Commands	
54	Standard Menus	
62	Text Editing	
64	Dialogs and Alerts	
70	Do's and Don'ts of a Friendly User Interface	
71	3 Macintosh Memory Management: An Introduction	
73	About This Chapter	
73	The Stack and the Heap	
75	Pointers and Handles	
78	General-Purpose Data Types	
81	Summary	
83	4 Using Assembly Language	
85	About This Chapter	
85	Definition Files	
86	Pascal Data Types	

87	The Trap Dispatch Table	
88	The Trap Mechanism	
90	Calling Conventions	
95	Pascal Interface to the Toolbox and Operating System	
95	Mixing Pascal and Assembly Language	
99	Summary	
101	5 The Resource Manager	
103	About This Chapter	
103	About the Resource Manager	
105	Overview of Resource Files	
107	Resource Specification	
110	Resource References	
112	Using the Resource Manager	
113	Resource Manager Routines	
127	Resources Within Resources	
128	Format of a Resource File	
132	Summary of the Resource Manager	
135	6 QuickDraw	
137	About This Chapter	
137	About QuickDraw	
138	The Mathematical Foundation of QuickDraw	
142	Graphic Entities	
147	The Drawing Environment: GrafPort	
153	Coordinates in GrafPorts	
155	General Discussion of Drawing	
158	Pictures and Polygons	
160	Using QuickDraw	
162	QuickDraw Routines	
197	Customizing QuickDraw Operations	
201	Summary of QuickDraw	
215	7 The Font Manager	
217	About This Chapter	
217	About the Font Manager	
219	Font Numbers	
220	Characters in a Font	
220	Font Scaling	
222	Using the Font Manager	
222	Font Manager Routines	

224	Communication Between QuickDraw and the Font Manager	319
227	Format of a Font	328
234	Fonts in a Resource File	332
236	Summary of the Font Manager	334
Desk Manager Routines		
241	8 The Toolbox Event Manager	339
243	About This Chapter	341
243	About the Toolbox Event Manager	341
244	Event Types	344
245	Priority of Events	344
246	Keyboard Events	345
249	Event Records	346
253	Event Masks	349
255	Using the Toolbox Event Manager	351
257	Toolbox Event Manager Routines	352
261	The Journaling Mechanism	353
263	Summary of the Toolbox Event Manager	356
Summary of the Scrap Manager		
267	9 The Window Manager	371
269	About This Chapter	373
269	About the Window Manager	373
271	Windows and GrafPorts	374
271	Window Regions	381
272	Windows and Resources	383
274	Window Records	392
278	How a Window is Drawn	
279	Making a Window Active: Activate Events	397
280	Using the Window Manager	399
281	Window Manager Routines	399
297	Defining Your Own Windows	401
302	Formats of Resources for Windows	402
303	Summary of the Window Manager	403
About This Chapter		
309	10 The Control Manager	409
311	About This Chapter	410
311	About the Control Manager	411
314	Controls and Windows	423
314	Controls and Resources	425
315	Part Codes	429
316	Control Records	
318	Using the Control Manager	

319	Control Manager Routines	324
328	Defining Your Own Controls	327
332	Formats of Resources for Controls	334
334	Summary of the Control Manager	336
11 The Menu Manager		
339	About This Chapter	343
341	About the Menu Manager	343
344	Menus and Resources	344
344	Menu Records	345
345	Menu Lists	346
346	Creating a Menu in Your Program	349
349	Using the Menu Manager	353
351	Menu Manager Routines	353
362	Defining Your Own Menus	357
363	Formats of Resources for Menus	361
366	Summary of the Menu Manager	363
12 TextEdit		
371	About This Chapter	373
373	About TextEdit	373
374	Edit Records	374
381	Using TextEdit	375
383	TextEdit Routines	375
392	Summary of TextEdit	374
13 The Dialog Manager		
397	About This Chapter	399
399	About the Dialog Manager	399
401	Dialog and Alert Windows	397
402	Dialogs, Alerts, and Resources	398
403	Item Lists in Memory	398
407	Dialog Records	399
409	Alerts	399
410	Using the Dialog Manager	399
411	Dialog Manager Routines	399
423	Modifying Templates in Memory	399
425	Formats of Resources for Dialogs and Alerts	399
429	Summary of the Dialog Manager	399

435	14 The Desk Manager	204
437	About This Chapter	208
437	About the Desk Manager	
439	Using the Desk Manager	212
440	Desk Manager Routines	217
443	Writing Your Own Desk Accessories	217
448	Summary of the Desk Manager	218
451	15 The Scrap Manager	219
453	About This Chapter	227
453	About the Scrap Manager	
454	Memory and the Desk Scrap	
454	Desk Scrap Data Types	
456	Using the Scrap Manager	
457	Scrap Manager Routines	
461	Private Scraps	
462	Format of the Desk Scrap	
463	Summary of the Scrap Manager	
465	16 Toolbox Utilities	
467	About This Chapter	
467	Toolbox Utility Routines	
476	Formats of Miscellaneous Resources	
477	Summary of the Toolbox Utilities	
481	17 The Package Manager	
483	About This Chapter	
483	About Packages	
484	Package Manager Routines	
485	Summary of the Package Manager	
487	18 The Binary-Decimal Conversion Package	
489	About This Chapter	
489	Binary-Decimal Conversion Package Routines	
491	Summary of the Binary-Decimal Conversion Package	
493	19 The International Utilities Package	
495	About This Chapter	
495	International Resources	
501	International String Comparison	
503	Using the International Utilities Package	

504	International Utilities Package Routines	433
508	Summary of the International Utilities Package	437
	Format of Resources for Conversion	437
515	20 The Standard File Package	439
517	About This Chapter	440
517	About the Standard File Package	443
518	Using the Standard File Package	448
519	Standard File Package Routines	
527	Summary of the Standard File Package	451
344	Menu Records	453
345	Menu Lists	453
346	Creating a Menu in Your Program	454
349	Using the Menu Manager	454
351	Menu Manager Routines	456
362	Defining Your Own Menus	457
363	Format of Resources for Menus	461
366	Summary of the Menu Manager	463
	Summary of the Scrap Manager	463
	About This Chapter	463
	About the Scrap Manager	463
	Memory and the Desk Scrap	464
	Desk Scrap Data Types	464
	Using the Scrap Manager	466
	Scrap Manager Routines	467
	Private Scraps	461
	Format of the Desk Scrap	463
	Summary of the Scrap Manager	463
	16 Toolbox Utilities	465
	About This Chapter	467
	Toolbox Utility Routines	467
	Format of Miscellaneous Resources	476
	Summary of the Toolbox Utilities	477
	Summary of TextEdit	
	12 TextEdit	471
	About This Chapter	473
	About TextEdit	473
	Edit Records	474
	Using TextEdit	481
	TextEdit Routines	483
	Summary of TextEdit	492
	17 The Package Manager	481
	About This Chapter	483
	About Packages	483
	Package Manager Routines	484
	Summary of the Package Manager	485
	18 The Binary-Decimal Conversion Package	487
	About This Chapter	489
	Binary-Decimal Conversion Package Routines	489
	Summary of the Binary-Decimal Conversion Package	491
	19 The International Utilities Package	493
	About This Chapter	495
	International Resources	495
	International String Comparison	501
	Using the International Utilities Package	503

Contents

ix	Preface
xi	About Inside Macintosh Volume IV
1	1 The Macintosh User Interface Guidelines
3	About This Chapter
3	Arrow Keys
7	Reserved Command Key Combinations
7	Window Zooming
10	Standard Close Dialog
13	2 Using Assembly Language
13	The Trap Dispatch Table
13	Format of the Trap Words
15	3 The Resource Manager
15	Resource Manager Routines
17	Resource Types
18	Checking For Errors
18	ROM Resources
21	Summary of the Resource Manager
23	4 QuickDraw
23	QuickDraw Routines
26	Summary of QuickDraw
27	5 The Font Manager
29	About the Font Manager
29	Fonts and Their Families
31	Font Manager Routines
33	Communication Between QuickDraw and the Font Manager
34	Font Manager Data Structures
42	Font and Font Family Resources
45	Summary of the Font Manager
49	6 The Window Manager
50	Window Manager Routines
51	Summary of the Window Manager
53	7 The Control Manager
53	Control Manager Routines
53	The Control Definition Function
54	Summary of the Control Manager
55	8 The Menu Manager
55	Menu Manager Routines
56	The Menu Definition Procedure
56	Summary of the Menu Manager

57	9 TextEdit
57	TextEdit Routines
58	Default Click Loop Routine
58	Summary of TextEdit
59	10 The Dialog Manager
59	Dialog Manager Routines
60	Summary of the Dialog Manager
61	11 The Scrap Manager
63	12 Toolbox Utilities
63	Toolbox Utility Routines
66	Summary of the Toolbox Utilities
67	13 The Package Manager
68	Summary of the Package Manager
69	14 The Binary-Decimal Conversion Package
71	15 The Standard File Package
73	Using the Standard File Package
74	Creating Your Own Dialog Box
76	Summary of the Standard File Package
77	16 The Memory Manager
77	Memory Manager Routines
80	Error Reporting
81	Summary of the Memory Manager
83	17 The Segment Loader
85	18 The Operating System Event Manager
85	Summary of the Operating System Event Manager
87	19 The File Manager
89	About This Chapter
89	About the File Manager
96	Using the File Manager
104	Information Used by the Finder
106	High-Level File Manager Routines
115	Low-Level File Manager Routines
159	Data Organization on Volumes
174	Data Structures in Memory
182	Using an External File System
183	Summary of the File Manager
213	20 The Device Manager
215	About the Device Manager
216	The Chooser
222	Summary of the Device Manager

Preface	ix
About Inside Macintosh Volume IV	xi
1 The Macintosh User Interface Guidelines	1
About This Chapter	3
Arrow Keys	3
Reserved Command Key Combinations	7
Window Conventions	7
Standard Close, Quit, and Print Buttons	10
The System of Windows	13
The Top-Desktop Table	13
Format of the Top Window	13
NO WINDOW ON SCREEN	13
3 The Resource Manager	15
Resource Manager	15
Resource Types	17
Checking for Errors	18
ROM Resources	18
Summary of the Resource Manager	21
4 QuickDraw	23
QuickDraw Routines	23
Summary of QuickDraw	28
5 The Port Manager	33
About the Port Manager	33
Ports and Their Families	33
Port Manager Routines	31
Communicating with Hardware	33
Font Manager	34
Font and Font Family Resources	42
Summary of the Font Manager	42
6 The Window Manager	49
Window Manager Routines	49
Summary of the Window Manager	51
7 The Control Manager	53
Control Manager Routines	53
The Control Definition Function	53
Summary of the Control Manager	54
8 The Menu Manager	55
Menu Manager Routines	55
The Menu Definition Procedure	58
Summary of the Menu Manager	58

223	21 The Disk Driver
223	Advanced Control Calls
224	Summary of the Disk Driver
225	22 The Serial Driver
226	Advanced Control Calls
227	Summary of the Serial Driver
229	23 The AppleTalk Manager
231	24 The System Error Handler
233	25 The Operating System Utilities
233	Operating System Utility Routines
236	Summary of the Operating System Utilities
239	26 The Disk Initialization Package
241	Summary of the Disk Initialization Package
243	27 The Finder Interface
243	The Desktop File
245	28 The Macintosh Plus Hardware
245	Overview of the Hardware
247	The Video Interface
247	The Sound Generator
248	The SCC
250	The Keyboard
250	The Floppy Disk Interface
251	The Real-Time Clock
251	The SCSI Interface
254	Summary
255	29 The System Resource File
256	Initialization Resources
259	30 The List Manager Package
261	About This Chapter
261	About the List Manager Package
262	List Records
266	Cell Selection Algorithm
268	Using the List Manager Package
269	List Manager Package Routines
276	Defining Your Own Lists
278	Summary of the List Manager Package

Contents

xii	Preface
xii	About Inside Macintosh Volume V
xii	What's New?
xiii	The Material in This Volume
xvi	The Languages
xvii	Version Numbers
xvii	Conventions
1	1 Compatibility Guidelines
2	About This Chapter
2	Compatibility
5	Determining the Features of a Machine
8	Localization
10	Applications in a Shared Environment
11	Summary of Compatibility Guidelines
13	2 The Macintosh User Interface Guidelines
14	About This Chapter
14	Color
19	Sound
21	New Keyboard Keys
23	New Menu Features
27	User Testing
28	Bibliography
29	3 The Resource Manager
30	About This Chapter
30	The Resource Manager
30	Resources
32	Resources in ROM
34	Resources in the System File
37	Summary of the Resource Manager
39	4 Color QuickDraw
41	About This Chapter
42	Color Representation
44	Using Color on the Macintosh II
47	About Color QuickDraw
49	The Color Graphics Port
62	The Color Cursor
64	Color Icons
65	Using Color QuickDraw
67	Color QuickDraw Routines
78	Color QuickDraw Resource Formats
81	Using Text with QuickDraw
84	Color Picture Format
96	PICT Opcodes
106	Summary of Color QuickDraw

117	5 Graphics Devices
118	About This Chapter
118	About Graphics Devices
119	Device Records
121	Multiple Screen Devices
122	Graphics Device Routines
125	Drawing to Offscreen Devices
127	Graphics Device Resources
129	Summary of Graphics Devices
133	6 The Color Manager
134	About This Chapter
134	About the Color Manager
139	Using the Color Manager
141	Color Manager Routines
145	Custom Search and Complement Procedures
148	Summary of the Color Manager
151	7 The Palette Manager
152	About This Chapter
152	About the Palette Manager
159	Color Palette Records
160	Using the Palette Manager
160	Color Palettes in a Resource File
161	Palette Manager Routines
167	Summary of the Palette Manager
171	8 The Color Picker Package
172	About This Chapter
172	The Color Picker Package
172	The Color Picker Dialog Box
174	Color Picker Package Routines
174	Conversion Facilities
176	Summary of the Color Picker Package
179	9 The Font Manager
180	About the Font Manager
180	Font Manager Routines
180	Fractional Character Widths
181	Font Search Algorithm
181	Font Manager Data Structures
187	Summary of the Font Manager
189	10 The Toolbox Event Manager
190	About This Chapter
190	New Standard Keyboards
193	The Keyboard Event Message
194	New Modifier Flag
194	KeyTrans
196	Summary of the Toolbox Event Manager

xv	Preface
xvii	About Inside Macintosh Volume V
xvii	What's New?
xviii	The Material in This Volume
xvi	The Language
xvii	Version Numbers
xvii	Conventions
1	1. Computer Architecture
2	2. About the Operating System
2	3. Compatibility
2	4. Determining the Features of a Machine
8	5. Location Awareness
10	6. Application-Specific Procedures
11	7. Summary of Operating System Features
13	8. THE ORIGINAL RETAIL EDITION
14	9. ABOUT THIS CHAPTER
14	10. Color
19	11. Sound
21	12. New Keyboard
23	13. New Menu Features
27	14. User Testing
28	15. Bibliography
29	16. THE RESOURCE MANAGER
30	17. About This Chapter
30	18. The Resource Manager
30	19. Resources
32	20. Resource Types
34	21. Resources in the System File
37	22. Summary of the Resource Manager
38	23. Color QuickDraw
41	24. About This Chapter
42	25. Color Representation
44	26. Using Color on the Macintosh II
47	27. About Color QuickDraw
49	28. The Color Graphics Port
62	29. The Color Cursor
64	30. Color Icons
65	31. Using Color QuickDraw
67	32. Color QuickDraw Routines
78	33. Color QuickDraw Resource Formats
81	34. Using Text with QuickDraw
84	35. Color Structure Format
96	36. PICT Objects
106	37. Summary of Color QuickDraw

197 11 The Window Manager
 198 About This Chapter
 199 Color Window Records
 202 Window Color Tables
 204 Using Color Windows
 205 Defining Your Own Windows
 206 Window Manager Routines
 211 Summary of the Window Manager

215 12 The Control Manager
 216 About This Chapter
 216 Auxiliary Control Records
 218 Control Color Tables
 220 Using Color Controls
 221 The Control Color Table Resource
 221 Control Manager Routines
 223 Summary of the Control Manager

225 13 The Menu Manager
 226 About This Chapter
 228 Menu Manager Data Structures
 235 Using the Menu Manager
 238 Menu Manager Routines
 248 The Standard Menu Definition Procedure
 250 The Standard Menu Bar Definition Procedure
 256 Summary of the Menu Manager

259 14 TextEdit
 260 About This Chapter
 260 Data Structures
 267 Cutting and Pasting
 267 TextEdit Routines
 271 Summary of TextEdit

277 15 The Dialog Manager
 278 About This Chapter
 278 Color Dialog and Alert Resources
 279 Color Dialog Item Lists
 283 Using Color Dialogs and Alerts
 283 Dialog Manager Routines
 286 Summary of the Dialog Manager

287 16 The International Utilities Package
 288 About the International Utilities Package
 288 International Resources
 290 Formatting Options
 291 Sorting Routines
 292 Summary of the International Utilities Package

293 17 The Script Manager
 294 About This Chapter
 294 About the Script Manager
 297 Text Manipulation
 303 Using the Script Manager

306	Script Manager Routines	197
316	Hints for Using the Script Manager	198
319	Summary of the Script Manager	199
323	18 The Control Panel	202
324	About This Chapter	204
324	The Control Panel	208
325	Operation	211
329	Cdev call	215
334	Storage in a Cdev	216
334	Cdev Error Checking	216
336	Sample Cdev	218
346	Summary of the Control Panel	220
347	19 The Start Manager	221
348	About This Chapter	221
348	Initialization	223
349	System Startup	228
350	Special Topics	228
352	Start Manager Routines	228
357	Summary of the Start Manager	228
361	20 The Apple Desktop Bus	228
362	About This Chapter	228
362	About the Apple Desktop Bus	230
367	ADB Manager Routines	230
371	Writing ADB Device Drivers	230
372	Summary of the ADB Manager	230
375	21 File Manager Extensions in a Shared Environment	239
376	About This Chapter	239
376	About the File Manager Extensions	240
377	Overview of the New File Access Methods	247
380	The Shared Environment	247
386	The Shared Environment Calls	277
400	Summary of the File Manager Extensions	278
407	22 The Printing Manager	278
408	About the Printing Manager	278
408	Calling the Printing Manager in ROM	279
409	New Low-Level Printer Controls	283
410	PrGeneral	283
417	Summary of the Printing Manager	286
421	23 The Device Manager	287
422	About the Device Manager	288
422	The Startup Process	288
425	Opening Slot Devices	290
426	Slot Device Interrupts	291
427	New Routines	292
428	Chooser Changes	292
433	Summary of the Device Manager	293

435	24 The Slot Manager
436	About This Chapter
436	Slot Card Firmware
437	Slot Manager Routines
458	Summary of the Slot Manager
465	25 The Deferred Task Manager
466	About This Chapter
466	About the Deferred Task Manager
467	Deferred Task Manager Routine
468	Summary of the Deferred Task Manager
469	26 The Disk Driver
470	Changes to the Disk Driver
470	Using the Disk Driver
472	Summary of the Disk Driver
473	27 The Sound Manager
474	About This Chapter
474	About the Sound Manager
476	Using the Sound Manager
477	Sound Manager Routines
480	Sound Manager Data Structures
482	Sound Manager Commands
490	Sound Resources
496	MIDI Implementation
502	Summary of the Sound Manager
507	28 The AppleTalk Manager
509	About This Chapter
510	Changes to The AppleTalk Manager
520	New AppleTalk Protocols
524	Extended Protocol Package Driver
530	Calling the .XPP Driver
551	Summary of the AppleTalk Manager
565	29 The Vertical Retrace Manager
566	Changes to the Vertical Retrace Manager
567	Vertical Retrace Manager Routines
569	Summary of the Vertical Retrace Manager
571	30 The System Error Handler
572	New Error Codes
573	31 The SCSI Manager
574	Changes to the SCSI Manager
574	Using the SCSI Manager
574	SCSI Manager Routines
575	Transfer Modes
576	Disk Partitioning
583	Summary of the SCSI Manager

585	32 The Shutdown Manager	435
586	About This Chapter	436
586	About the Shutdown Manager	436
586	Using the Shutdown Manager	437
587	Shutdown Manager Routines	438
589	Summary of the Shutdown Manager	438
591	33 The Operating System Utilities	445
592	Changes to the Operating System Utilities	446
592	Operating System Utility Routines	447
594	Summary of the Operating System Utilities	448
595	34 The Floating-Point Arithmetic and Transcendental Functions Packages	469
597	Appendix A: Result Codes	470
601	Appendix B: Routines That May Move or Purge Memory	473
603	Appendix C: System Traps	474
609	Appendix D: Global Variables	476
611	Glossary	480
617	Index	490
		496
		502
		507
		509
		510
		520
		524
		530
		531
		565
		566
		567
		569
		571
		572
		573
		574
		574
		574
		575
		576
		583

Contents

xxix **Figures, Tables, and Listings**

Preface

- P-3 About *Inside Macintosh*
- P-8 An Overview of the Chapters in Volume VI
- P-16 A Road Map to Volume VI

1 Introduction to the System Software Version 7.0 Environment

- 1-3 About This Chapter
- 1-4 About the System Software Version 7.0 Environment
- 1-6 The Cooperative Multitasking Environment
- 1-7 Interapplication Communication
- 1-10 Sharing Data Among Applications
- 1-12 Sending Events Between Applications
- 1-13 Exchanging Message Blocks Between Programs
- 1-14 Remote Data Access
- 1-15 Enhanced User Interface
- 1-16 Sound
- 1-16 TrueType Fonts
- 1-16 Graphics
- 1-18 File Management
- 1-19 Memory Management
- 1-19 Temporary Memory
- 1-20 24-Bit and 32-Bit Addressing
- 1-20 Process Management
- 1-21 Timing Services
- 1-21 Compatibility
- 1-21 Worldwide Development
- 1-23 Communication Over a Network
- 1-23 Hardware Interfaces
- 1-24 Overview of Chapters in This Volume

2 User Interface Guidelines

- 2-3 About This Chapter
- 2-3 User Interface Design Principles
- 2-4 Worldwide Software Development
- 2-5 Cultural Values
- 2-5 Resources
- 2-6 Language Differences
- 2-6 Text Display and Text Editing
- 2-8 Default Alignment of Interface Elements
- 2-8 Keyboards
- 2-11 Fonts
- 2-12 User Documentation
- 2-13 Terminology
- 2-14 The Version 7.0 Environment
- 2-14 User Feedback
- 2-15 Background Notification