



# Apple® Inside Macintosh X-Ref

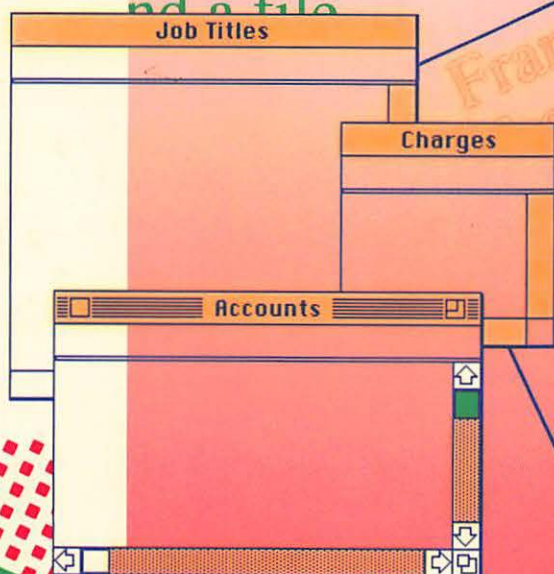
*Your key to Apple's  
official programming  
books for the Macintosh®  
family of computers*

## GLOSSARY

**Access path:** A description of how a file is opened.

**Access path buffer:**

and a file



Edit

Undo

Cut

⌘Z

⌘X

# **Inside Macintosh® X Ref**



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# **Inside Macintosh X-Ref**

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## PREFACE: ABOUT THIS BOOK

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The *Inside Macintosh® X-Ref* is your key to Apple's official programming books for the Macintosh family of computers. The *X-Ref* gives you:

- a general index to eight books: all five volumes of *Inside Macintosh*, the *Programmer's Introduction to the Macintosh Family*, the *Technical Introduction to the Macintosh Family*, and *Designing Cards and Drivers for the Macintosh II and Macintosh SE*. The general index also contains references to the *Macintosh Technical Notes* for 1984–1987.
- a complete list of routines that may move or purge memory
- a list of all Macintosh system traps
- a list of all Macintosh global variables
- a comprehensive Macintosh glossary

In addition, the *Inside Macintosh X-Ref* contains a new index, never before published, listing all constants and field names in *Inside Macintosh*.

The books for which the *Inside Macintosh X-Ref* is a cross-reference are published by Addison-Wesley as part of the Apple Technical Library. *Macintosh Technical Notes* may be ordered from APDA, the Apple Programmer's and Developer's Association. For information about APDA, see the inside back cover of this book.

The text of the *Inside Macintosh X-Ref* is also available from APDA in the form of Macintosh text files on a 3.5-inch disk.



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## INDEX I: GENERAL INDEX

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The General Index lists page references for eight books plus the *Macintosh Technical Notes* for 1984–1987. The eight books include all five volumes of *Inside Macintosh*, the *Programmer's Introduction to the Macintosh Family*, the *Technical Introduction to the Macintosh Family*, and *Designing Cards and Drivers for the Macintosh II and Macintosh SE*.

The index entries for the different books are distinguished by letter codes, as follows:

Code	Book	Sample listing
I, II, III, IV, V	<i>Inside Macintosh</i>	II-276 = Volume II, page 276
P	<i>Programmer's Introduction to the Macintosh Family</i>	P-103 = page 103
T	<i>Technical Introduction to the Macintosh Family</i>	T-78 = page 78
C	<i>Designing Cards and Drivers for the Macintosh II and Macintosh SE</i>	C8-12 = chapter 8, page 12
N	<i>Macintosh Technical Notes</i>	N2 = Technical Note 2

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## APPENDIX A: ROUTINES THAT MAY MOVE OR PURGE MEMORY

---

This appendix lists all the routines that may move or purge blocks in the heap. As described in *Inside Macintosh*, Volume II, chapter 1, calling these routines may cause problems if a handle has been dereferenced. None of these routines may be called from within an interrupt, such as in a completion routine or a VBL task.

The Pascal name of each routine is shown, except for a few cases where there's no Pascal interface corresponding to a particular trap; in those cases, the trap macro name is shown instead (without its initial underscore character).

ActivatePalette	CloseCPort	DisposCTable
ADBReInit	CloseDialog	DisposDialog
AddComp	ClosePicture	DisposeControl
AddResMenu	ClosePoly	DisposeMenu
AddSearch	ClosePort	DisposePalette
Alert	CloseResFile	DisposeRgn
AllocCrsr	CloseRgn	DisposeWindow
AppendMenu	CloseWindow	DisposGDevice
ATPAddRsp	CMY2RGB	DisposHandle
ATPCloseSocket	Color2Index	DisposPixMap
ATPGetRequest	CompactMem	DisposPixPat
ATPLoad	Control	DisposPtr
ATPOpenSocket	CopyBits	DIUnload
ATPReqCancel	CopyMask	DIVerify
ATPRequest	CopyPalette	DIZero
ATPResponse	CopyRgn	DlgCopy
ATPRspCancel	CouldAlert	DlgCut
ATPSndRequest	CouldDialog	DlgDelete
ATPSndRsp	CreateResFile	DlgPaste
ATPUnload	CStr2Dec	DragControl
BackColor	CTab2Palette	DragGrayRgn
BackPat	DDPCloseSocket	DragWindow
BackPixPat	DDPOpenSocket	Draw1Control
BeginUpdate	DDPRdCancel	DrawChar
BringToFront	DDPRead	DrawDialog
Button	DDPWrite	DrawGrowIcon
CalcMenuSize	Dec2Str	DrawJust
CalcVis	DelComp	DrawMenuBar
CalcVisBehind	DelMenuItem	DrawNew
CautionAlert	DelSearch	DrawPicture
Chain	DialogSelect	DrawString
ChangedResource	DIBadMount	DrawText
Char2Pixel	DiffRgn	DriveStatus
CharWidth	DIFormat	DrvInstall
CheckItem	DILoad	DrvRemove
CheckUpdate	DiskEject	Eject
ClipAbove	DispMCInfo	EmptyHandle
ClipRect	DisposIcon	EndUpdate

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EraseArc	GetDCtlEntry	InitPalettes
EraseOval	GetDItem	InitPort
ErasePalette	GetFNum	InitPort
ErasePoly	GetFontInfo	InitPRAMRecs
EraseRect	GetFontName	InitProcMenu
EraseRgn	GetGrayRgn	InitResources
EraseRoundRect	GetIcon	InitSDeclMgr
EventAvail	GetIndPattern	InitSRsrcTable
ExitToShell	GetIndResource	InitWindows
FillArc	GetIndString	InitZone
FillCArc	GetKeys	InsertMenu
FillCOval	GetMCInfo	InsertResMenu
FillCPoly	GetMenu	InsetRgn
FillCRect	GetMenuBar	InsMenuItem
FillCRgn	GetMouse	IntlScript
FillCRoundRect	GetNamedResource	InvalRect
FillOval	GetNewControl	InvalRgn
FillPoly	GetNewCWindow	InvertArc
FillRect	GetNewDialog	InvertOval
FillRgn	GetNewMBar	InvertPoly
FillRoundRect	GetNewPalette	InvertRect
FindControl	GetNewWindow	InvertRgn
FindDItem	GetNextEvent	InvertRoundRect
FindWord	GetPattern	IUCompString
Fix2SmallFract	GetPicture	IUDatePString
FlashMenuBar	GetPixPat	IUDateString
FlushVol	GetResource	IUEqualString
FMSwapFont	GetScrap	IUGetIntl
Font2Script	GetString	IUMagIDString
FontMetrics	GetStylHandle	IUMagString
FontScript	GetStylScrap	IUMetric
ForeColor	GetSubTable	IUSetIntl
FrameArc	GrowWindow	IUTimePString
FrameOval	HandAndHand	IUTimeString
FramePoly	HandToHand	KeyScript
FrameRect	HideControl	KillControls
FrameRgn	HideDItem	KillPicture
FrameRoundRect	HideWindow	KillPoly
FreeAlert	HiliteControl	LAPCloseProtocol
FreeDialog	HiliteMenu	LAPOpenProtocol
FreeMem	HiliteText	LAPRdCancel
Get1IndResource	HiliteWindow	LAPRead
Get1IndType	HSL2RGB	LAPWrite
Get1NamedResource	HSV2RGB	Launch
Get1Resource	InitAllPacks	Line
GetAuxCtl	InitApplZone	LineTo
GetCCursor	InitCPort	LoadResource
GetCIcon	InitFonts	LoadScrap
GetClip	InitGDevice	LoadSeg
GetColor	InitGraf	MakeITable
GetCTable	InitMenus	MapRgn
GetCursor	InitPack	MeasureJust

## *Routines That May Move or Purge Memory*

MeasureText	PaintRgn	RecoverHandle
MenuKey	PaintRoundRect	RectRgn
MenuSelect	Palette2CTab	ReleaseResource
ModalDialog	ParamText	ResrvMem
MoreMasters	PBControl	Restart
MoveControl	PBEject	RGB2CMY
MoveHHi	PBFlushVol	RGB2HSL
MoveWindow	PBMountVol	RGB2HSV
MPPClose	PBOffLine	RGBBackColor
MPPOpen	PBOpen	RGBForeColor
Munger	PBOpenRF	RGetResource
NBPConfirm	PBStatus	RmveResource
NBPExtract	PenNormal	RsrcZoneInit
NBPLoad	PenPat	SaveOld
NBPLookup	PenPixPat	ScrollRect
NBPRegister	PicComment	SectRgn
NBPRemove	Pixel2Char	SelectWindow
NBPUnload	PlotCIcon	SelfText
NewCDialog	PlotIcon	SendBehind
NewControl	PMBBackColor	SerClrBrk
NewCWindow	PMForeColor	SerGetBrk
NewDialog	PrClose	SerHShake
NewEmptyHandle	PrCloseDoc	SerReset
NewGDevice	PrClosePage	SerSetBrk
NewHandle	PrCtlCall	SerSetBuf
NewMenu	PrDrvrclose	SerStatus
NewPalette	PrDrvrclose	SetApplBase
NewPixMap	PrDrvrclose	SetCCursor
NewPixPat	PrDrvrclose	SetClip
NewPort	PrError	SetCPixel
NewPtr	PrGeneral	SetCTitle
NewRgn	PrintDefault	SetCtlColor
NewString	PrJobDialog	SetCtlMax
NewWindow	PrJobMerge	SetCtlMin
NoteAlert	PrOpen	SetCtlValue
NumToString	PrOpenDoc	SetDeskCPat
OpenCPicture	PrOpenPage	SetDItem
OpenCPort	PrPicFile	SetEmptyRgn
OpenDeskAcc	PrSetError	SetFontLock
OpenPicture	PrStlDialog	SetHandleSize
OpenPixMap	PrValidate	SetItem
OpenPoly	PStr2Dec	SetItemIcon
OpenPort	PtrAndHand	SetItemMark
OpenResFile	PtrToHand	SetItemStyle
OpenRFPern	PtrToXHand	SetItemText
OpenRgn	PurgeMem	SetMCInfo
PaintArc	PutScrap	SetPtrSize
PaintBehind	RAMSDClose	SetRectRgn
PaintOne	RAMSDOpen	SetResInfo
PaintOval	RealColor	SetString
PaintPoly	RealFont	SetStylHandle
PaintRect	ReallocHandle	SetTagBuffer

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SetWinColor	TECut
SetWTitle	TEDeactivate
sExec	TEDelete
SFGetFile	TEDispose
SFPGetFile	TEFromScrap
SFPPutFile	TEGetHeight
SFPutFile	TEGetOffset
sGetBlock	TEGetPoint
sGetCString	TEGetStyle
sGetDriver	TEGetText
ShowControl	TEIdle
ShowDItem	TEInit
ShowHide	TEInsert
ShowWindow	TEKey
ShutDownInstall	TENew
ShutDownRemove	TEPaste
SizeControl	TEPinScroll
SizeWindow	TEReplaceStyle
SmallFract2Fix	TEScroll
SndAddModifier	TESelView
SndDisposeChannel	TESetJust
SndNewChannel	TESetSelect
sPrimaryInit	TESetStyle
StartSound	TESetText
Status	TestControl
StdArc	TESTylInsert
StdBits	TESTylNew
StdComment	TESTylPaste
StdLine	TEToScrap
StdOval	TEUpdate
StdPoly	TextBox
StdPutPic	TextWidth
StdRect	TickCount
StdRgn	TrackBox
StdRRect	TrackControl
StdText	TrackGoAway
StdTxMeas	Transliterate
StillDown	UnionRgn
StopAlert	UnloadScrap
StopSound	UnloadSeg
StringToNum	UpdtControl
StringWidth	UpdtDialog
SysBeep	ValidRect
SysError	ValidRgn
SystemClick	WaitMouseUp
SystemEdit	XorRgn
SystemMenu	ZeroScrap
TEActivate	ZoomWindow
TEAutoView	
TECaText	
TEClick	
TECopy	

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## APPENDIX B: SYSTEM TRAPS

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This appendix lists the trap macros for the Toolbox and Operating System routines and their corresponding trap word values in hexadecimal. The "Name" column gives the trap macro name (without its initial underscore character). In those cases where the name of the equivalent Pascal call is different, the Pascal name appears indented under the main entry. The routines in Macintosh packages are listed under the macros they invoke after pushing a routine selector onto the stack; the routine selector follows the Pascal routine name in parentheses.

There are two tables. The first is ordered alphabetically by name; the second is ordered numerically by trap number, for use when debugging. The trap number is the last two digits of the trap word unless the trap word begins with A9, in which case the trap number is 1 followed by the last two digits of the trap word, or AA, in which case the trap number is 2 followed by the last two digits of the trap word.

**Note:** The Operating System Utility routines GetTrapAddress and SetTrapAddress take a trap number as a parameter, not a trap word.

**Warning:** Traps that aren't currently used by the system are reserved for future use.

Name	Trap word	Name	Trap word
ActivatePalette	AA94	BitTst	A85D
ADBOp	A07C	BitXor	A859
ADBReInit	A07B	BlockMove	A02E
AddComp	AA3B	BringToFront	A920
AddDrive	A04E	Button	A974
(internal use only)		CalcCMask	AA4F
AddPt	A87E	CalcMask	A838
AddResMenu	A94D	CalcMenuSize	A948
AddResource	A9AB	CalcVBehind	A90A
AddSearch	AA3A	CalcVisBehind	
Alert	A985	CalcVis	A909
Allocate	A010	CautionAlert	A988
PBAllocate		Chain	A9F3
AllocCursor	AA1D	ChangedResource	A9AA
AngleFromSlope	A8C4	CharExtra	AA23
AnimateEntry	AA99	CharWidth	A88D
AnimatePalette	AA9A	CheckItem	A945
AppendMenu	A933	CheckUpdate	A911
AttachVBL	A071	ClearMenuBar	A934
BackColor	A863	ClipAbove	A90B
BackPat	A87C	ClipRect	A87B
BackPixPat	AA0B	Close	A001
BeginUpdate	A922	PBClose	
BitAnd	A858	CloseCPort	A87D
BitClr	A85F	CloseDeskAcc	A9B7
BitNot	A85A	CloseDialog	A982
BitOr	A85B	ClosePgon	A8CC
BitSet	A85E	ClosePoly	
BitShift	A85C	ClosePicture	A8F4

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Name	Trap word	Name	Trap word
ClosePort	A87D	DisposDialog	A983
CloseResFile	A99A	DisposGDevice	AA30
CloseRgn	A8DB	DisposHandle	A023
CloseWindow	A92D	DisposMenu	A932
CmpString	A03C	DisposeMenu	
EqualString		DisposePalette	AA93
ColorBit	A864	DisposPixMap	AA04
Color2Index	AA33	DisposPixPat	AA08
CompactMem	A04C	DisposPtr	A01F
Control	A004	DisposRgn	A8D9
PBControl		DisposeRgn	
CopyBits	A8EC	DisposWindow	A914
CopyMask	A817	DisposeWindow	
CopyPixMap	AA05	DoVBLTask	A072
CopyPixPat	AA09	DragControl	A967
CopyRgn	A8DC	DragGrayRgn	A905
CouldAlert	A989	DragTheRgn	A926
CouldDialog	A979	DragWindow	A925
Count1Resources	A80D	Draw1Control	A96D
Count1Types	A81C	DrawChar	A883
CountADBs	A077	DrawControls	A969
CountMItems	A950	DrawDialog	A981
CountResources	A99C	DrawGrowIcon	A904
CountTypes	A99E	DrawMenuBar	A937
Create	A008	DrawNew	A90F
PBCreate		DrawPicture	A8F6
CreateResFile	A9B1	DrawString	A884
CTab2Palette	AA9F	DrawText	A885
CurResFile	A994	DrvrInstall	A03D
Date2Secs	A9C7	(internal use only)	
Delay	A03B	DrvrRemove	A03E
DelComp	AA4D	(internal use only)	
Delete	A009	DTInstall	A082
PBDelete		Eject	A017
DeleteMenu	A936	PBEject	
DelMCEntries	AA60	Elems68K	A9EC
DelMenuItem	A952	EmptyHandle	A02B
DelSearch	AA4C	EmptyRect	A8AE
DeltaPoint	A94F	EmptyRgn	A8E2
Dequeue	A96E	EnableItem	A939
DetachResource	A992	EndUpdate	A923
DialogSelect	A980	Enqueue	A96F
DiffRgn	A8E6	EqualPt	A881
DisableItem	A93A	EqualRect	A8A6
DispMCInfo	AA63	EqualRgn	A8E3
DisposCCursor	AA26	EraseArc	A8C0
DisposCIcon	AA25	EraseOval	A8B9
DisposControl	A955	ErasePoly	A8C8
DisposeControl		EraseRect	A8A3
DisposCTable	AA24	EraseRgn	A8D4

Name	Trap word	Name	Trap word
EraseRoundRect	A8B2	FreeAlert	A98A
ErrorSound	A98C	FreeDialog	A97A
EventAvail	A971	FreeMem	A01C
ExitToShell	A9F4	FrontWindow	A924
FillArc	A8C2	GetADBInfo	A079
FillCArc	AA11	GetAppParms	A9F5
FillCOval	AA0F	GetAuxCtl	AA44
FillCPoly	AA13	GetAuxWin	AA42
FillCRect	AA0E	GetBackColor	AA1A
FillCRgn	AA12	GetCCursor	AA1B
FillCRoundRect	AA10	GetCIcon	AA1E
FillOval	A8BB	GetClip	A87A
FillPoly	A8CA	GetCPixel	AA17
FillRect	A8A5	GetCRefCon	A95A
FillRgn	A8D6	GetCTable	AA18
FillRoundRect	A8B4	GetCTitle	A95E
FindControl	A96C	GetCtlAction	A96A
FindDItem	A984	GetCtlValue	A960
FindWindow	A92C	GetCTSeed	AA28
Fix2Frac	A841	GetCursor	A9B9
Fix2Long	A840	GetCVariant	A809
Fix2X	A843	GetCWMgrPort	AA48
FixAtan2	A818	GetDefaultStartup	A07D
FixDiv	A84D	GetDeviceList	AA29
FixMul	A868	GetDItem	A98D
FixRatio	A869	GetEntryColor	AA9B
FixRound	A86C	GetEntryUsage	AA9D
FlashMenuBar	A94C	GetEOF	A011
FlushEvents	A032	PBGetEOF	
FlushFile	A045	GetFileInfo	A00C
PBFlushFile		PBGetFInfo	
FlushVol	A013	GetFName	A8FF
PBFlushVol		GetFontName	
FMSwapFont	A901	GetFNum	A900
FontMetrics	A835	GetFontInfo	A88B
ForeColor	A862	GetForeColor	AA19
FP68K	A9EB	GetFPos	A018
Frac2Fix	A842	PBGetFPos	
Frac2X	A845	GetGDevice	AA32
FracCos	A847	GetHandleSize	A025
FracDiv	A84B	GetIcon	A9BB
FracMul	A84A	GetIndADB	A078
FracSin	A848	GetIndResource	A99D
FracSqrt	A849	GetIndType	A99F
FrameArc	A8BE	GetItem	A946
FrameOval	A8B7	GetItemCmd	A84E
FramePoly	A8C6	GetIText	A990
FrameRect	A8A1	GetItmIcon	A93F
FrameRgn	A8D2	GetItemIcon	
FrameRoundRect	A8B0		

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Name	Trap word	Name	Trap word
GetItmMark	A943	GetSubTable	AA37
GetItemMark		GetTrapAddress	A146
GetItmStyle	A941	GetVideoDefault	A080
GetItemStyle		GetVol	A014
GetKeys	A976	PBGetVol	
GetMainDevice	AA2A	GetVollInfo	A007
GetMaxCtl	A962	PBGetVInfo	
GetCtlMax		GetWindowPic	A92F
GetMaxDevice	AA27	GetWMgrPort	A910
GetMCEntry	AA64	GetWRefCon	A917
GetMCInfo	AA61	GetWTitle	A919
GetMenuBar	A93B	GetWVariant	A80A
GetMHandle	A949	GetZone	A11A
GetMinCtl	A961	GlobalToLocal	A871
GetCtlMin		GrafDevice	A872
GetMouse	A972	Grow Window	A92B
GetNamedResource	A9A1	HandAndHand	A9E4
GetNewControl	A9BE	HandleZone	A126
GetNewCWindow	AA46	HandToHand	A9E1
GetNewDialog	A97C	HClrRBit	A068
GetNewMBar	A9C0	HFSDispatch	A260
GetNewPalette	AA92	OpenWD	(1)
GetNewWindow	A9BD	CloseWD	(2)
GetNextDevice	AA2B	CatMove	(5)
GetNextEvent	A970	DirCreate	(6)
Get11xResource	A80E	GetWDInfo	(7)
Get11ndResource		GetFCBInfo	(8)
Get11xType	A80F	GetCatInfo	(9)
Get11ndType		SetCatInfo	(10)
Get1NamedResource	A820	SetVollInfo	(11)
Get1Resource	A81F	LockRng	(16)
GetOSDefault	A084	UnlockRng	(17)
GetOSEvent	A031	HGetState	A069
GetPalette	AA96	HideControl	A958
GetPattern	A9B8	HideCursor	A852
GetPen	A89A	HideDItem	A827
GetPenState	A898	HidePen	A896
GetPicture	A9BC	HideWindow	A916
GetPixel	A865	HiliteColor	AA22
GetPixPat	AA0C	HiliteControl	A95D
GetPort	A874	HiliteMenu	A938
GetPtrSize	A021	HiliteWindow	A91C
GetResAttr	A9A6	HiWord	A86A
GetResFileAttr	A9F6	HLock	A029
GetResInfo	A9A8	HNoPurge	A04A
GetResource	A9A0	HomeResFile	A9A4
GetRMenu	A9BF	HPurge	A049
GetMenu		HSetRBit	A067
GetScrap	A9FD	HSetState	A06A
GetString	A9BA	HUnlock	A02A



Name	Trap word	Name	Trap word
Index2Color	AA34	LineTo	A891
InfoScrap	A9F9	LoadResource	A9A2
InitAllPacks	A9E6	LoadSeg	A9F0
InitApplZone	A02C	LocalToGlobal	A870
InitCport	AA01	LodeScrap	A9FB
InitCursor	A850	LoadScrap	
InitDialogs	A97B	Long2Fix	A83F
InitFonts	A8FE	LongMul	A867
InitGDevice	AA2E	LoWord	A86B
InitGraf	A86E	MakeITable	AA39
InitMenus	A930	MakeRGBPat	AA0D
InitPack	A9E5	MapPoly	A8FC
InitPalettes	AA90	MapPt	A8F9
InitPort	A86D	MapRect	A8FA
InitProcMenu	A808	MapRgn	A8FB
InitQueue	A016	MaxApplZone	A063
FInitQueue		MaxBlock	A061
InitResources	A995	MaxMem	A11D
InitUtil	A03F	MaxSizeRsrc	A821
InitWindows	A912	MeasureText	A837
InitZone	A019	MenuChoice	AA66
InsertMenu	A935	MenuKey	A93E
InsertResMenu	A951	MenuSelect	A93D
InsetRect	A8A9	ModalDialog	A991
InsetRgn	A8E1	MoreMasters	A036
InsMenuItem	A826	MountVol	A00F
InternalWait	A07F	PBMountVol	
SetTimeout	(0)	Move	A894
GetTimeout	(1)	MoveControl	A959
InvalRect	A928	MoveHHi	A064
InvalRgn	A927	MovePortTo	A877
InverRect	A8A4	MoveTo	A893
InvertRect		MoveWindow	A91B
InverRgn	A8D5	Munger	A9E0
InvertRgn		NewCDialog	AA4B
InverRoundRect	A8B3	NewControl	A954
InvertRoundRect		NewCWindow	AA45
InvertArc	A8C1	NewDialog	A97D
InvertColor	AA35	NewEmptyHandle	A066
InvertOval	A8BA	NewGDevice	AA2F
InvertPoly	A8C9	NewHandle	A122
IsDialogEvent	A97F	NewMenu	A931
KeyTrans	A9C3	NewPalette	AA91
KillControls	A956	NewPixMap	AA03
KillIO	A006	NewPixPat	AA07
PBKillIO		NewPtr	A11E
KillPicture	A8F5	NewRgn	A8D8
KillPoly	A8CD	NewString	A906
Launch	A9F2	NewWindow	A913
Line	A892	NoteAlert	A987

## Inside Macintosh X-Ref

Name	Trap word
ObscureCursor	A856
Offline	A035
PBOffline	
OffsetPoly	A8CE
OffsetRect	A8A8
OffsetRgn	A8E0
OffsetRgn	
OpColor	AA21
Open	A000
PBOpen	
OpenCport	AA00
OpenDeskAcc	A9B6
OpenPicture	A8F3
OpenPoly	A8CB
OpenPort	A86F
OpenResFile	A997
OpenRF	A00A
PBOpenRF	
OpenRFPPerm	A9C4
OpenRgn	A8DA
OSEventAvail	A030
Pack0	A9E7
LActivate	(0)
LAddColumn	(4)
LAddRow	(8)
LAddToCell	(12)
LAutoScroll	(16)
LCellSize	(20)
LClick	(24)
LClrCell	(28)
LDelColumn	(32)
LDelRow	(36)
LDispose	(40)
LDoDraw	(44)
LDraw	(48)
LFind	(52)
LGetCell	(56)
LGetSelect	(60)
LLastClick	(64)
LNew	(68)
LNextCell	(72)
LRect	(76)
LScroll	(80)
LSearch	(84)
LSetCell	(88)
LSetSelect	(92)
LSize	(96)
LUpdate	(100)
Pack1	A9E8
(reserved for future use)	

Name	Trap word
Pack2	A9E9
DIBadMount	(0)
DIFormat	(6)
DILoad	(2)
DIUnload	(4)
DIVerify	(8)
DIZero	(10)
Pack3	A9EA
SFGetFile	(2)
SFGetFile	(4)
SFPPutFile	(3)
SFPutFile	(1)
Pack4	A9EB
Pack5	A9EC
Pack6	A9ED
IUDatePString	(14)
IUDateString	(0)
IUGetIntl	(6)
IUMagIDString	(12)
IUMagString	(10)
IUMetric	(4)
IUSetIntl	(8)
IUTimePString	(16)
IUTimeString	(2)
Pack7	A9EE
NumToString	(0)
StringToNum	(1)
PStr2Dec	(2)
Dec2Str	(3)
CStr2Dec	(4)
Pack8	A816
Pack9	A82B
Pack10	A82C
Pack11	A82D
(Pack 8–11 reserved for future use)	
Pack12	A82E
Fix2SmallFract	(1)
SmallFract2Fix	(2)
CMY2RGB	(3)
RGB2CMY	(4)
HSL2RGB	(5)
RGB2HSL	(6)
HSV2RGB	(7)
RGB2HSV	(8)
GetColor	(9)
Pack13	A82F
Pack14	A830
Pack15	A831
(Pack 13–15 reserved for future use)	
PackBits	A8CF

Name	Trap word	Name	Trap word
PaintArc	A8BF	RectRgn	A8DF
PaintBehind	A90D	ReleaseResource	A9A3
PaintOne	A90C	RelString	A050
PaintOval	A8B8	Rename	A00B
PaintPoly	A8C7	PBRename	
PaintRect	A8A2	ResError	A9AF
PaintRgn	A8D3	ReserveEntry	AA3E
PaintRoundRect	A8B1	ResrvMem	A040
Palette2CTab	AAA0	RestoreEntries	AA4A
ParamText	A98B	RGBBackColor	AA15
PenMode	A89C	RGBForeColor	AA14
PenNormal	A89E	RGetResource	A80C
PenPat	A89D	RmveResource	A9AD
PenPixPat	AA0A	RsrcMapEntry	A9C5
PenSize	A89B	RsrcZoneInit	A996
PicComment	A8F2	RstFilLock	A042
PinRect	A94E	PBRstFLock	
PlotIcon	AA1F	SaveEntries	AA49
PlotIcon	A94B	SaveOld	A90E
PmBackColor	AA98	ScalePt	A8F8
PmForeColor	AA97	ScriptUtil	A8B5
PopUpMenuSelect	A80B	smFontScript	(0)
PortSize	A876	smIntlScript	(2)
PostEvent	A02F	smKybdScript	(4)
PPostEvent	A12F	smFont2Script	(6)
PrGlue	A8FD	smGetEnvirons	(8)
ProtectEntry	AA3D	smSetEnvirons	(10)
Pt2Rect	A8AC	smGetScript	(12)
PtInRect	A8AD	smSetScript	(14)
PtInRgn	A8E8	smCharByte	(16)
PtRAndHand	A9EF	smCharType	(18)
PtToHand	A9E3	smPixel2Char	(20)
PtToXHand	A9E2	smChar2Pixel	(22)
PtZone	A148	smTranslit	(24)
PtToAngle	A8C3	smFindWord	(26)
PurgeMem	A04D	smHiliteText	(28)
PurgeSpace	A062	smDrawJust	(30)
PutScrap	A9FE	smMeasureJust	(32)
QDError	AA40	ScrollRect	A8EF
Random	A861	SCSIDispatch	A815
RDrvrInstall	A04F	SCSIReset	(0)
(internal use only)		SCSIGet	(1)
Read	A002	SCSISelect	(2)
PBRead		SCSICmd	(3)
ReadDateTime	A039	SCSIComplete	(4)
RealColor	AA36	SCSIRead	(5)
RealFont	A902	SCSIWrite	(6)
ReallocHandle	A027	SCSIInstall	(7)
RecoverHandle	A128	SCSIRBlind	(8)
RectInRgn	A8E9	SCSIWBlind	(9)

## Inside Macintosh X-Ref

Name	Trap word	Name	Trap word
SCSIStat	(10)	SetHandleSize	A024
SCSISelAttn	(11)	SetItem	A947
SCSIMsgIn	(12)	SetItemCmd	A84F
SCSIMsgOut	(13)	SetIText	A98F
Secs2Date	A9C6	SetItemIcon	A940
SectRect	A8AA	SetItemIcon	
SectRgn	A8E4	SetItemMark	A944
SeedCFill	AA50	SetItemMark	
SeedFill	A839	SetItemStyle	A942
SelectWindow	A91F	SetItemStyle	
SellText	A97E	SetMaxCtl	A965
SendBehind	A921	SetCtlMax	
SetADBInfo	A07A	SetMCEntries	AA65
SetAppBase	A057	SetMCInfo	AA62
SetApplBase		SetMenuBar	A93C
SetApplLimit	A02D	SetMFlash	A94A
SetCCursor	AA1C	SetMenuFlash	
SetClientID	AA3C	SetMinCtl	A964
SetClip	A879	SetCtlMin	
SetCPixel	AA16	SetOrigin	A878
SetCPortPix	AA06	SetOSDefault	A083
SetCRefCon	A95B	SetPalette	AA95
SetCTitle	A95F	SetPBits	A875
SetCtlAction	A96B	SetPortBits	
SetCtlColor	AA43	SetPenState	A899
SetCtlValue	A963	SetPort	A873
SetCursor	A851	SetPt	A880
SetDateTime	A03A	SetPtrSize	A020
SetDefaultStartup	A07E	SetRecRgn	A8DE
SetDeskCPat	AA47	SetRectRgn	
SetDeviceAttribute	AA2D	SetRect	A8A7
SetDItem	A98E	SetResAttrs	A9A7
SetEmptyRgn	A8DD	SetResFileAttrs	A9F7
SetEntries	AA3F	SetResInfo	A9A9
SetEntryColor	AA9C	SetResLoad	A99B
SetEntryUsage	AA9E	SetResPurge	A993
SetEOF	A012	SetStdCProcs	AA4E
PBSetEOF		SetStdProcs	A8EA
SetFileInfo	A00D	SetString	A907
PBSetFInfo		SetTrapAddress	A047
SetFilLock	A041	SetVideoDefault	A081
PBSetFLock		SetVol	A015
SetFilType	A043	PBSetVol	
PBSetFVers		SetWinColor	AA41
SetFontLock	A903	SetWindowPic	A92E
SetFPos	A044	SetWRefCon	A918
PBSetFPos		SetWTitle	A91A
SetFScaleDisable	A834	SetZone	A01B
SetGDevice	AA31	ShieldCursor	A855
SetGrowZone	A04B	ShowControl	A957

Name	Trap word	Name	Trap word
ShowCursor	A853	sFindsInfoRecPtr	(47)
ShowDIItem	A828	sFindsRsrcPtr	(48)
ShowHide	A908	sdeleteSRTRec	(49)
ShowPen	A897	SlotVInstall	A06F
ShowWindow	A915	SlotVRemove	A070
Shutdown	A895	SndAddModifier	A802
ShutDownPower	(1)	SndControl	A806
ShutDownStart	(2)	SndDisposeChannel	A801
ShutDownInstall	(3)	SndDoCommand	A803
ShutDownRemove	(4)	SndDoImmediate	A804
SIntInstall	A075	SndNewChannel	A807
SIntRemove	A076	SndPlay	A805
SizeControl	A95C	SpaceExtra	A88E
SizeRsrc	A9A5	StackSpace	A065
SizeResource		Status	A005
SizeWindow	A91D	PBStatus	
SlopeFromAngle	A8BC	StdArc	A8BD
SlotManager	A06E	StdBits	A8EB
sReadByte	(0)	StdComment	A8F1
sReadWord	(1)	StdGetPic	A8EE
sReadLong	(2)	StdLine	A890
sGetcString	(3)	StdOval	A8B6
sGetBlock	(5)	StdPoly	A8C5
sFindStruct	(6)	StdPutPic	A8F0
sReadStruct	(7)	StdRect	A8A0
sReadInfo	(16)	StdRgn	A8D1
sReadPRAMRec	(17)	StdRRect	A8AF
sPutPRAMRec	(18)	StdText	A882
sReadFHeader	(19)	StdTxMeas	A8ED
sNextRsrc	(20)	StillDown	A973
sNextTypesRsrc	(21)	StopAlert	A986
sRsrcInfo	(22)	StringWidth	A88C
sDisposePtr	(23)	StripAddress	A055
sCkCardStatus	(24)	StuffHex	A866
sReadDrvName	(25)	SubPt	A87F
sFindDevBase	(27)	SwapMMUMode	A05D
InitSDeclMgr	(32)	SysBeep	A9C8
sPrimaryInit	(33)	SysEdit	A9C2
sCardChanged	(34)	SystemEdit	
sExec	(35)	SysEnvirons	A090
sOffsetData	(36)	SysError	A9C9
InitPRAMRecs	(37)	SystemClick	A9B3
sReadPBSize	(38)	SystemEvent	A9B2
sCalcStep	(40)	SystemMenu	A9B5
InitsRsrcTable	(41)	SystemTask	A9B4
sSearchSRT	(42)	TEActivate	A9D8
sUpdateSRT	(43)	TEAutoView	A813
sCalcsPointer	(44)	TECalText	A9D0
sGetDriver	(45)	TEClick	A9D4
sPtrToSlot	(46)	TECopy	A9D5

## Inside Macintosh X-Ref

Name	Trap word	Name	Trap word
TECut	A9D6	TextMode	A889
TEDeactivate	A9D9	TextSize	A88A
TEDelete	A9D7	TextWidth	A886
TEDispatch	A83D	TickCount	A975
TEStylePaste	(0)	TrackBox	A83B
TESetStyle	(1)	TrackControl	A968
TEReplaceStyle	(2)	TrackGoAway	A91E
TEGetStyle	(3)	UnionRect	A8AB
GetStyleHandle	(4)	UnionRgn	A8E5
SetStyleHandle	(5)	Unique1ID	A810
GetStyleScrap	(6)	UniqueID	A9C1
TEStyleInsert	(7)	UnloadSeg	A9F1
TEGetPoint	(8)	UnlodeScrap	A9FA
TEGetHeight	(9)	UnloadScrap	
TEDispose	A9CD	UnmountVol	A00E
TEGetOffset	A83C	PBUnmountVol	
TEGetText	A9CB	UnpackBits	A8D0
TEIdle	A9DA	UpdateResFile	A999
TEInit	A9CC	UpdtControl	A953
TEInsert	A9DE	UpdtDialog	A978
TEKey	A9DC	UpString	A054
TENew	A9D2	UseResFile	A998
TEPaste	A9DB	ValidRect	A92A
TEPinScroll	A812	ValidRgn	A929
TEScroll	A9DD	VInstall	A033
TESelView	A811	VRemove	A034
TESetJust	A9DF	WaitMouseUp	A977
TESetSelect	A9D1	Write	A003
TESetText	A9CF	PBWrite	
TestControl	A966	WriteParam	A038
TestDeviceAttribute	AA2C	WriteResource	A9B0
TEStyleNew	A83E	X2Fix	A844
TEUpdate	A9D3	X2Frac	A846
TextBox	A9CE	XorRgn	A8E7
TextFace	A888	ZeroScrap	A9FC
TextFont	A887	ZoomWindow	A83A

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Trap word	Name	Trap word	Name
A000	Open	A005	Status
	PBOpen		PBStatus
A001	Close	A006	KillIO
	PBClose		PBKillIO
A002	Read	A007	GetVolInfo
	PBRead		PBGetVInfo
A003	Write	A008	Create
	PBWrite		PBCreate
A004	Control	A009	Delete
	PBControl		PBDelete

Trap Word	Name	Trap Word	Name
A00A	OpenRF	A034	VRemove
	PBOpenRF	A035	Offline
A00B	Rename		PBOffline
	PBRename	A036	MoreMasters
A00C	GetFileInfo	A038	WriteParam
	PBGetInfo	A039	ReadDateTime
A00D	SetFileInfo	A03A	SetDateTime
	PBSetFInfo	A03B	Delay
A00E	UnmountVol	A03C	CmpString
	PBUnmountVol		EqualString
A00F	MountVol	A03D	DrvrInstall
	PBMountVol		(internal use only)
A010	Allocate	A03E	DrvrRemove
	PBAllocate		(internal use only)
A011	GetEOF	A03F	InitUtil
	PBGetEOF	A040	ResrvMem
A012	SetEOF	A041	SetFilLock
	PBSetEOF		PBSetFLock
A013	FlushVol	A042	RstFilLock
	PBFlushVol		PBRstFLock
A014	GetVol	A043	SetFilType
	PBGetVol		PBSetFVers
A015	SetVol	A044	SetFPos
	PBSetVol		PBSetFPos
A016	InitQueue	A045	FlushFile
A017	Eject		PBFlushFile
	PBEject	A047	SetTrapAddress
A018	GetFPos	A049	HPurge
	PBGetFPos	A04A	HNoPurge
A019	InitZone	A04B	SetGrowZone
A01B	SetZone	A04C	CompactMem
A01C	FreeMem	A04D	PurgeMem
A01F	DisposPtr	A04E	AddDrive
A020	SetPtrSize		(internal use only)
A021	GetPtrSize	A04F	RDrvrInstall
A023	DisposHandle		(internal use only)
A024	SetHandleSize	A050	RelString
A025	GetHandleSize	A054	UpString
A027	ReallocHandle	A055	StripAddress
A029	HLock	A057	SetAppBase
A02A	HUnlock		SetApplBase
A02B	EmptyHandle	A05D	SwapMMUMode
A02C	InitApplZone	A061	MaxBlock
A02D	SetApplLimit	A062	PurgeSpace
A02E	BlockMove	A063	MaxApplZone
A02F	PostEvent	A064	MoveHHi
A030	OSEventAvail	A065	StackSpace
A031	GetOSEvent	A066	NewEmptyHandle
A032	FlushEvents	A067	HSetRBit
A033	VInstall	A068	HClrRBit

## Inside Macintosh X-Ref

Trap Word	Name	Trap Word	Name
A069	HGetState	A07E	SetDefaultStartup
A06A	HSetState	A07F	InternalWait
A06E	SlotManager		SetTimeout (0)
	sReadByte (0)		GetTimeout (1)
	sReadWord (1)	A080	GetVideoDefault
	sReadLong (2)	A081	SetVideoDefault
	sGetcString (3)	A082	SIntInstall
	sGetBlock (5)	A083	SetOSDefault
	sFindStruct (6)	A084	GetOSDefault
	sReadStruct (7)	A090	SysEnviorns
	sReadInfo (16)	A11A	GetZone
	sReadPRAMRec (17)	A11D	MaxMem
	sPutPRAMRec (18)	A11E	NewPtr
	sReadFHeader (19)	A122	NewHandle
	sNextRsrc (20)	A126	HandleZone
	sNextTypesRsrc (21)	A128	RecoverHandle
	sRsrcInfo (22)	A12F	PPostEvent
	sDisposePtr (23)	A146	GetTrapAddress
	sCkCardStatus (24)	A148	PtrZone
	sReadDrvName (25)	A260	HFSDispatch
	sFindDevBase (27)		OpenWD (1)
	sPrimaryInit (33)		CloseWD (2)
	sCardChanged (34)		CatMove (5)
	sExec (35)		DirCreate (6)
	sOffsetData (36)		GetWDInfo (7)
	InitPRAMRecs (37)		GetFCBInfo (8)
	sReadPBSize (38)		GetCatInfo (9)
	sCalcStep (40)		SetCatInfo (10)
	InitsRsrcTable (41)		SetVolInfo (11)
	sSearchSRT (42)		LockRng (16)
	sUpdateSRT (43)		UnlockRng (17)
	sCalcsPointer (44)	A801	SndDisposeChannel
	sGetDriver (45)	A802	SndAddModifier
	sPtrToSlot (46)	A803	SndDoCommand
	sFindsInfoRecPtr (47)	A804	SndDoImmediate
	sFindsRsrcPtr (48)	A805	SndPlay
	sdeleteSRTRec (49)	A806	SndControl
A06F	SlotVInstall	A807	SndNewChannel
A070	SlotVRemove	A808	InitProcMenu
A071	AttachVBL	A809	GetCVariant
A072	DoVBLTask	A80A	GetWVariant
A075	DTInstall	A80B	PopUpMenuSelect
A076	SIntRemove	A80C	RGetResource
A077	CountADBs	A80D	Count1Resources
A078	GetIndADB	A80E	Get1IxResource
A079	GetADBInfo		Get1IndResource
A07A	SetADBInfo	A80F	Get1IxType
A07B	ADBReInit		Get1IndType
A07C	ADBOp	A810	UniqueIID
A07D	GetDefaultStartup	A811	TESelView



Trap Word	Name	Trap Word	Name
A812	TEPinScroll	A83B	TrackBox
A813	TEAutoView	A83C	TEGetOffset
A815	SCSIDispatch	A83D	TEDispatch
	SCSIReset (0)		TEStylePaste (0)
	SCSIGet (1)		TESetStyle (1)
	SCSISelect (2)		TEReplaceStyle (2)
	SCSICmd (3)		TEGetStyle (3)
	SCSIComplete (4)		GetStyleHandle (4)
	SCSIRead (5)		SetStyleHandle (5)
	SCSIWrite (6)		GetStyleScrap (6)
	SCSIInstall (7)		TEStyleInsert (7)
	SCSIRBlind (8)		TEGetPoint (8)
	SCSIWBlind (9)		TEGetHeight (9)
	SCSIStat (10)	A83E	TEStyleNew
	SCSISelAtm (11)	A83F	Long2Fix
	SCSIMsgIn (12)	A840	Fix2Long
	SCSIMsgOut (13)	A841	Fix2Frac
A816	Pack8	A842	Frac2Fix
A817	CopyMask	A843	Fix2X
A818	FixAtan2	A844	X2Fix
A81C	Count1Types	A845	Frac2X
A81F	Get1Resource	A846	X2Frac
A820	Get1NamedResource	A847	FracCos
A821	MaxSizeRsrc	A848	FracSin
A826	InsMenuItem	A849	FracSqrt
A827	HideDItem	A84A	FracMul
A828	ShowDItem	A84B	FracDiv
A82B	Pack9	A84D	FixDiv
A82C	Pack10	A84E	GetItemCmd
A82D	Pack11	A84F	SetItemCmd
A82E	Pack12	A850	InitCursor
	Fix2SmallFract (1)	A851	SetCursor
	SmallFract2Fix (2)	A852	HideCursor
	CMY2RGB (3)	A853	ShowCursor
	RGB2CMY (4)	A855	ShieldCursor
	HSL2RGB (5)	A856	ObscureCursor
	RGB2HSL (6)	A858	BitAnd
	HSV2RGB (7)	A859	BitXor
	RGB2HSV (8)	A85A	BitNot
	GetColor (9)	A85B	BitOr
A82F	Pack13	A85C	BitShift
A830	Pack14	A85D	BitTst
A831	Pack15	A85E	BitSet
A834	SetFScaleDisable	A85F	BitClr
A835	FontMetrics	A861	Random
A836	GetMaskTable	A862	ForeColor
A837	MeasureText	A863	BackColor
A838	CalcMask	A864	ColorBit
A839	SeedFill	A865	GetPixel
A83A	ZoomWindow	A866	StuffHex

## Inside Macintosh X-Ref

Trap Word	Name	Trap Word	Name
A867	LongMul		ShutDwnInstall (3)
A868	FixMul		ShutDwnRemove (4)
A869	FixRatio	A896	HidePen
A86A	HiWord	A897	ShowPen
A86B	LoWord	A898	GetPenState
A86C	FixRound	A899	SetPenState
A86D	InitPort	A89A	GetPen
A86E	InitGraf	A89B	PenSize
A86F	OpenPort	A89C	PenMode
A870	LocalToGlobal	A89D	PenPat
A871	GlobalToLocal	A89E	PenNormal
A872	GrafDevice	A8A0	StdRect
A873	SetPort	A8A1	FrameRect
A874	GetPort	A8A2	PaintRect
A875	SetPBits	A8A3	EraseRect
	SetPortBits	A8A4	InverRect
A876	PortSize		InvertRect
A877	MovePortTo	A8A5	FillRect
A878	SetOrigin	A8A6	EqualRect
A879	SetClip	A8A7	SetRect
A87A	GetClip	A8A8	OffsetRect
A87B	ClipRect	A8A9	InsetRect
A87C	BackPat	A8AA	SectRect
A87D	CloseCPort	A8AB	UnionRect
A87D	ClosePort	A8AC	Pt2Rect
A87E	AddPt	A8AD	PtInRect
A87F	SubPt	A8AE	EmptyRect
A880	SetPt	A8AF	StdRRect
A881	EqualPt	A8B0	FrameRoundRect
A882	StdText	A8B1	PaintRoundRect
A883	DrawChar	A8B2	EraseRoundRect
A884	DrawString	A8B3	InverRoundRect
A885	DrawText		InvertRoundRect
A886	TextWidth	A8B4	FillRoundRect
A887	TextFont	A8B5	ScriptUtil
A888	TextFace		smFontScript (0)
A889	TextMode		smIntlScript (2)
A88A	TextSize		smKybdScript (4)
A88B	GetFontInfo		smFont2Script (6)
A88C	StringWidth		smGetEnvirons (8)
A88D	CharWidth		smSetEnvirons (10)
A88E	SpaceExtra		smGetScript (12)
A890	StdLine		smSetScript (14)
A891	LineTo		smCharByte (16)
A892	Line		smCharType (18)
A893	MoveTo		smPixel2Char (20)
A894	Move		smChar2Pixel (22)
A895	Shutdown		smTranslit (24)
	ShutDwnPower (1)		smFindWord (26)
	ShutDwnStart (2)		smHiliteText (28)

Trap Word	Name		Trap Word	Name
	smDrawJust	(30)	A8E2	EmptyRgn
	smMeasureJust	(32)	A8E3	EqualRgn
A8B6	StdOval		A8E4	SectRgn
A8B7	FrameOval		A8E5	UnionRgn
A8B8	PaintOval		A8E6	DiffRgn
A8B9	EraseOval		A8E7	XorRgn
A8BA	InvertOval		A8E8	PtInRgn
A8BB	FillOval		A8E9	RectInRgn
A8BC	SlopeFromAngle		A8EA	SetStdProcs
A8BD	StdArc		A8EB	StdBits
A8BE	FrameArc		A8EC	CopyBits
A8BF	PaintArc		A8ED	StdTxMeas
A8C0	EraseArc		A8EE	StdGetPic
A8C1	InvertArc		A8EF	ScrollRect
A8C2	FillArc		A8F0	StdPutPic
A8C3	PtToAngle		A8F1	StdComment
A8C4	AngleFromSlope		A8F2	PicComment
A8C5	StdPoly		A8F3	OpenPicture
A8C6	FramePoly		A8F4	ClosePicture
A8C7	PaintPoly		A8F5	KillPicture
A8C8	ErasePoly		A8F6	DrawPicture
A8C9	InvertPoly		A8F8	ScalePt
A8CA	FillPoly		A8F9	MapPt
A8CB	OpenPoly		A8FA	MapRect
A8CC	ClosePgon		A8FB	MapRgn
	ClosePoly		A8FC	MapPoly
A8CD	KillPoly		A8FD	PrGlue
A8CE	OffsetPoly		A8FE	InitFonts
A8CF	PackBits		A8FF	GetFName
A8D0	UnpackBits			GetFontName
A8D1	StdRgn		A900	GetFNum
A8D2	FrameRgn		A901	FMSwapFont
A8D3	PaintRgn		A902	RealFont
A8D4	EraseRgn		A903	SetFontLock
A8D5	InverRgn		A904	DrawGrowIcon
	InvertRgn		A905	DragGrayRgn
A8D6	FillRgn		A906	NewString
A8D8	NewRgn		A907	SetString
A8D9	DisposRgn		A908	ShowHide
	DisposeRgn		A909	CalcVis
A8DA	OpenRgn		A90A	CalcVBehind
A8DB	CloseRgn			CalcVisBehind
A8DC	CopyRgn		A90B	ClipAbove
A8DD	SetEmptyRgn		A90C	PaintOne
A8DE	SetRecRgn		A90D	PaintBehind
A8DF	SetRectRgn		A90E	SaveOld
	RectRgn		A90F	DrawNew
A8E0	OfsetRgn		A910	GetWMgrPort
	OffsetRgn		A911	CheckUpdate
A8E1	InsetRgn		A912	InitWindows

## Inside Macintosh X-Ref

Trap Word	Name	Trap Word	Name
A913	NewWindow	A941	GetItmStyle
A914	DisposWindow		GetItemStyle
	DisposeWindow	A942	SetItmStyle
A915	ShowWindow		SetItemStyle
A916	HideWindow	A943	GetItmMark
A917	GetWRefCon		GetItemMark
A918	SetWRefCon	A944	SetItmMark
A919	GetWTitle		SetItemMark
A91A	SetWTitle	A945	CheckItem
A91B	MoveWindow	A946	GetItem
A91C	HiliteWindow	A947	SetItem
A91D	SizeWindow	A948	CalcMenuSize
A91E	TrackGoAway	A949	GetMHandle
A91F	SelectWindow	A94A	SetMFlash
A920	BringToFront		SetMenuFlash
A921	SendBehind	A94B	PlotIcon
A922	BeginUpdate	A94C	FlashMenuBar
A923	EndUpdate	A94D	AddResMenu
A924	FrontWindow	A94E	PinRect
A925	DragWindow	A94F	DeltaPoint
A926	DragTheRgn	A950	CountMItems
A927	InvalRgn	A951	InsertResMenu
A928	InvalRect	A952	DelMenuItem
A929	ValidRgn	A953	UpdtControl
A92A	ValidRect	A954	NewControl
A92B	GrowWindow	A955	DisposControl
A92C	FindWindow		DisposeControl
A92D	CloseWindow	A956	KillControls
A92E	SetWindowPic	A957	ShowControl
A92F	GetWindowPic	A958	HideControl
A930	InitMenus	A959	MoveControl
A931	NewMenu	A95A	GetCRefCon
A932	DisposMenu	A95B	SetCRefCon
	DisposeMenu	A95C	SizeControl
A933	AppendMenu	A95D	HiliteControl
A934	ClearMenuBar	A95E	GetCTitle
A935	InsertMenu	A95F	SetCTitle
A936	DeleteMenu	A960	GetCtlValue
A937	DrawMenuBar	A961	GetMinCtl
A938	HiliteMenu		GetCtlMin
A939	EnableItem	A962	GetMaxCtl
A93A	DisableItem		GetCtlMax
A93B	GetMenuBar	A963	SetCtlValue
A93C	SetMenuBar	A964	SetMinCtl
A93D	MenuSelect		SetCtlMin
A93E	MenuKey	A965	SetMaxCtl
A93F	GetItmIcon		SetCtlMax
	GetItemIcon	A966	TestControl
A940	SetItmIcon	A967	DragControl
	SetItemIcon	A968	TrackControl

Trap Word	Name	Trap Word	Name
A969	DrawControls	A99B	SetResLoad
A96A	GetCtlAction	A99C	CountResources
A96B	SetCtlAction	A99D	GetIndResource
A96C	FindControl	A99E	CountTypes
A96D	Draw1Control	A99F	GetIndType
A96E	Dequeue	A9A0	GetResource
A96F	Enqueue	A9A1	GetNamedResource
A970	GetNextEvent	A9A2	LoadResource
A971	EventAvail	A9A3	ReleaseResource
A972	GetMouse	A9A4	HomeResFile
A973	StillDown	A9A5	SizeRsrc
A974	Button		SizeResource
A975	TickCount	A9A6	GetResAttrs
A976	GetKeys	A9A7	SetResAttrs
A977	WaitMouseUp	A9A8	GetResInfo
A978	UpdtDialog	A9A9	SetResInfo
A979	CouldDialog	A9AA	ChangedResource
A97A	FreeDialog	A9AB	AddResource
A97B	InitDialogs	A9AD	RmveResource
A97C	GetNewDialog	A9AF	ResError
A97D	NewDialog	A9B0	WriteResource
A97E	SelfText	A9B1	CreateResFile
A97F	IsDialogEvent	A9B2	SystemEvent
A980	DialogSelect	A9B3	SystemClick
A981	DrawDialog	A9B4	SystemTask
A982	CloseDialog	A9B5	SystemMenu
A983	DisposDialog	A9B6	OpenDeskAcc
A984	FindDItem	A9B7	CloseDeskAcc
A985	Alert	A9B8	GetPattern
A986	StopAlert	A9B9	GetCursor
A987	NoteAlert	A9BA	GetString
A988	CautionAlert	A9BB	GetIcon
A989	CouldAlert	A9BC	GetPicture
A98A	FreeAlert	A9BD	GetNewWindow
A98B	ParamText	A9BE	GetNewControl
A98C	ErrorSound	A9BF	GetRMenu
A98D	GetDItem		GetMenu
A98E	SetDItem	A9C0	GetNewMBar
A98F	SetUText	A9C1	UniqueID
A990	GetUText	A9C2	SysEdit
A991	ModalDialog		SystemEdit
A992	DetachResource	A9C3	KeyTrans
A993	SetResPurge	A9C4	OpenRFPern
A994	CurResFile	A9C5	RsrcMapEntry
A995	InitResources	A9C6	Secs2Date
A996	RsrcZoneInit	A9C7	Date2Secs
A997	OpenResFile	A9C8	SysBeep
A998	UseResFile	A9C9	SysError
A999	UpdateResFile	A9CB	TEGetText
A99A	CloseResFile	A9CC	TEInit

## Inside Macintosh X-Ref

Trap Word	Name	Trap Word	Name
A9CD	TEDispose		LSetSelect (92)
A9CE	TextBox		LSize (96)
A9CF	TESetText		LUpdate (100)
A9D0	TECaText	A9E8	Pack1
A9D1	TESetSelect		(reserved for future use)
A9D2	TENew	A9E9	Pack2
A9D3	TEUpdate		DIBadMount (0)
A9D4	TEClick		DILoad (2)
A9D5	TECopy		DIUnload (4)
A9D6	TECut		DIFormat (6)
A9D7	TEDelete		DIVerify (8)
A9D8	TEActivate		DIZero (10)
A9D9	TEDeactivate	A9EA	Pack3
A9DA	TEIdle		SFPutFile (1)
A9DB	TEPaste		SFGetFile (2)
A9DC	TEKey		SFPPutFile (3)
A9DD	TEScroll		SFPGetFile (4)
A9DE	TEInsert	A9EB	Pack4
A9DF	TESetJust		(synonym: FP68K)
A9E0	Munger	A9EC	Pack5
A9E1	HandToHand		(synonym: Elems68K)
A9E2	PtrToXHand	A9ED	Pack6
A9E3	PtrToHand		IUDateString (0)
A9E4	HandAndHand		IUTimeString (2)
A9E5	InitPack		IUMetric (4)
A9E6	InitAllPacks		IUDGetIntl (6)
A9E7	Pack0		IUSetIntl (8)
	LActivate (0)		IUMagString (10)
	LAddColumn (4)		IUMagIDString (12)
	LAddRow (8)		IUDatePString (14)
	LAddToCell (12)		IUTimePString (16)
	LAutoScroll (16)	A9EE	Pack7
	LCellSize (20)		NumToString (0)
	LClick (24)		StringToNum (1)
	LClrCell (28)		PStr2Dec (2)
	LDelColumn (32)		CStr2Dec (4)
	LDelRow (36)	A9EF	PtrAndHand
	LDispose (40)	A9F0	LoadSeg
	LDoDraw (44)	A9F1	UnloadSeg
	LDraw (48)	A9F2	Launch
	LFind (52)	A9F3	Chain
	LGetCell (56)	A9F4	ExitToShell
	LGetSelect (60)	A9F5	GetAppParms
	LLastClick (64)	A9F6	GetResFileAttrs
	LNew (68)	A9F7	SetResFileAttrs
	LNextCell (72)	A9F9	InfoScrap
	LRect (76)	A9FA	UnlodeScrap
	LScroll (80)		UnloadScrap
	LSearch (84)	A9FB	LodeScrap
	LSetCell (88)		LoadScrap

Trap Word	Name	Trap Word	Name
A9FC	ZeroScrap	AA31	SetGDevice
A9FD	GetScrap	AA32	GetGDevice
A9FE	PutScrap	AA33	Color2Index
AA00	OpenCport	AA34	Index2Color
AA01	InitCport	AA35	InvertColor
AA03	NewPixMap	AA36	RealColor
AA04	DisposPixMap	AA37	GetSubTable
AA05	CopyPixMap	AA39	MakeITable
AA06	SetCPortPix	AA3A	AddSearch
AA07	NewPixPat	AA3B	AddComp
AA08	DisposPixPat	AA3C	SetClientID
AA09	CopyPixPat	AA3D	ProtectEntry
AA0A	PenPixPat	AA3E	ReserveEntry
AA0B	BackPixPat	AA3F	SetEntries
AA0C	GetPixPat	AA40	QDError
AA0D	MakeRGBPat	AA41	SetWinColor
AA0E	FillCRect	AA42	GetAuxWin
AA0F	FillCOval	AA43	SetCtlColor
AA10	FillCRoundRect	AA44	GetAuxCtl
AA11	FillCArc	AA45	NewCWindow
AA12	FillCRgn	AA46	GetNewCWindow
AA13	FillCPoly	AA47	SetDeskCPat
AA14	RGBForeColor	AA48	GetCWMgrPort
AA15	RGBBackColor	AA49	SaveEntries
AA16	SetCPixel	AA4A	RestoreEntries
AA17	GetCPixel	AA4B	NewCDialog
AA18	GetCTable	AA4C	DelSearch
AA19	GetForeColor	AA4D	DelComp
AA1A	GetBackColor	AA4E	SetStdCProcs
AA1B	GetCCursor	AA4F	CalcCMask
AA1C	SetCCursor	AA50	SeedCFill
AA1D	AllocCursor	AA60	DelMCEntries
AA1E	GetCIcon	AA61	GetMCInfo
AA1F	PlotCIcon	AA62	SetMCInfo
AA21	OpColor	AA63	DispMCInfo
AA22	HiliteColor	AA64	GetMCEntry
AA23	CharExtra	AA65	SetMCEntries
AA24	DisposCTable	AA66	MenuChoice
AA25	DisposCIcon	AA90	InitPalettes
AA26	DisposCCursor	AA91	NewPalette
AA27	GetMaxDevice	AA92	GetNewPalette
AA28	GetCTSeed	AA93	DisposePalette
AA29	GetDeviceList	AA94	ActivatePalette
AA2A	GetMainDevice	AA95	SetPalette
AA2B	GetNextDevice	AA96	GetPalette
AA2C	TestDeviceAttribute	AA97	PmForeColor
AA2D	SetDeviceAttribute	AA98	PmBackColor
AA2E	InitGDevice	AA99	AnimateEntry
AA2F	NewGDevice	AA9A	AnimatePalette
AA30	DisposGDevice	AA9B	GetEntryColor

## *Inside Macintosh X-Ref*

<b>Trap Word</b>	<b>Name</b>
AA9C	SetEntryColor
AA9D	GetEntryUsage
AA9E	SetEntryUsage
AA9F	CTab2Palette
AAA0	Palette2CTab



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## APPENDIX C: GLOBAL VARIABLES

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This appendix gives an alphabetical list of all system global variables described in *Inside Macintosh*, along with their locations in memory.

Name	Location	Contents
ABusVars	\$2D8	Pointer to AppleTalk variables
ACount	\$A9A	Stage number (0 through 3) of last alert (word)
ANumber	\$A98	Resource ID of last alert (word)
ApFontID	\$984	Font number of application font (word)
ApplLimit	\$130	Application heap limit
ApplScratch	\$A78	12-byte scratch area reserved for use by applications
ApplZone	\$2AA	Address of application heap zone
AppParmHandle	\$AEC	Handle to Finder information
AtMenuBottom	\$A0C	Flag for menu scrolling (word)
AuxWinHead	\$CD0	Auxiliary window list header (long)
BootDrive	\$210	Working directory reference number for system startup volume (word)
BufPtr	\$10C	Address of end of jump table
BufTgDate	\$304	File tags buffer: date and time of last modification (long)
BufTgFBkNum	\$302	File tags buffer: logical block number (word)
BufTgFFlg	\$300	File tags buffer: flags (word: bit 1=1 if resource fork)
BufTgFNum	\$2FC	File tags buffer: file number (long)
CaretTime	\$2F4	Caret-blink interval in ticks (long)
CPUFlag	\$12F	Microprocessor in use (word)
CrsrThresh	\$8EC	Mouse-scaling threshold (word)
CurActivate	\$A64	Pointer to window to receive activate event
CurAppName	\$910	Name of current application (length byte followed by up to 31 characters)
CurApRefNum	\$900	Reference number of current application's resource file (word)
CurDeactive	\$A68	Pointer to window to receive deactivate event
CurDirStore	\$398	Directory ID of directory last opened (long)
CurJTOffset	\$934	Offset to jump table from location pointed to by A5 (word)
CurMap	\$A5A	Reference number of current resource file (word)
CurPageOption	\$936	Sound/screen buffer configuration passed to Chain or Launch (word)

## *Inside Macintosh X-Ref*

<b>Name</b>	<b>Location</b>	<b>Contents</b>
CurPitch	\$280	Value of count in square-wave synthesizer buffer (word)
CurrentA5	\$904	Address of boundary between application globals and application parameters
CurStackBase	\$908	Address of base of stack; start of application globals
DABeeper	\$A9C	Address of current sound procedure
DAStrings	\$AA0	Handles to ParamText strings (16 bytes)
DefltStack	\$322	Default space allotment for stack (long)
DefVCBPtr	\$352	Pointer to default volume control block
DeskHook	\$A6C	Address of procedure for painting desktop or responding to clicks on desktop
DeskPattern	\$A3C	Pattern with which desktop is painted (8 bytes)
DeviceList	\$8A8	Handle to the first element in the device list
DlgFont	\$AFA	Font number for dialogs and alerts (word)
DoubleTime	\$2F0	Double-click interval in ticks (long)
DragHook	\$9F6	Address of procedure to execute during TrackGoAway, DragWindow, GrowWindow, DragGrayRgn, TrackControl, and DragControl
DragPattern	\$A34	Pattern of dragged region's outline (8 bytes)
DrvQHdr	\$308	Drive queue header (10 bytes)
DSAlertRect	\$3F8	Rectangle enclosing system error alert (8 bytes)
DSAlertTab	\$2BA	Pointer to system error alert table in use
DSErrCode	\$AF0	Current system error ID (word)
DTQueue	\$D92	Deferred task queue header (10 bytes)
EventQueue	\$14A	Event queue header (10 bytes)
ExtStsDT	\$2BE	External/status interrupt vector table (16 bytes)
FCBSPtr	\$34E	Pointer to file-control-block buffer
FinderName	\$2E0	Name of the Finder (length byte followed by up to 15 characters)
FractEnable	\$BF4	Nonzero to enable fractional widths (byte)
FScaleDisable	\$A63	Nonzero to disable font scaling (byte)
FSFCBLen	\$3F6	Size of a file control block; on 64K ROM, it contains -1 (word)
FSQHdr	\$360	File I/O queue header (10 bytes)
GhostWindow	\$A84	Pointer to window never to be considered frontmost
GrayRgn	\$9EE	Handle to region drawn as desktop
GZRootHnd	\$328	Handle to relocatable block not to be moved by grow zone function

<b>Name</b>	<b>Location</b>	<b>Contents</b>
<b>HeapEnd</b>	<b>\$114</b>	Address of end of application heap zone
<b>HiliteMode</b>	<b>\$938</b>	Set if highlighting is on
<b>HiliteRGB</b>	<b>\$DA0</b>	Default highlight color for the system
<b>IntlSpec</b>	<b>\$BA0</b>	International software installed if not equal to -1 (long)
<b>JADBProc</b>	<b>06B8</b>	Pointer to ADBReInit preprocessing/ postprocessing routine
<b>JDTInstall</b>	<b>\$D9C</b>	Jump vector for DTInstall routine
<b>JFetch</b>	<b>\$8F4</b>	Jump vector for Fetch function
<b>IODone</b>	<b>\$8FC</b>	Jump vector for IODone function
<b>JournalRef</b>	<b>\$8E8</b>	Reference number of journaling device driver (word)
<b>JStash</b>	<b>\$8F8</b>	Jump vector for Stash function
<b>JVBLTask</b>	<b>\$D28</b>	Jump vector for DoVBLTask routine
<b>KbdLast</b>	<b>\$218</b>	ADB address of the keyboard last used (byte)
<b>KbdType</b>	<b>\$21E</b>	Keyboard type of the keyboard last used (byte)
<b>KeyRepThresh</b>	<b>\$190</b>	Auto-key rate (word)
<b>KeyThresh</b>	<b>\$18E</b>	Auto-key threshold (word)
<b>LastFOND</b>	<b>\$BC2</b>	Handle to last family record used
<b>Lo3Bytes</b>	<b>\$31A</b>	<b>\$00FFFFFF</b>
<b>Lvl2DT</b>	<b>\$1B2</b>	Level-2 secondary interrupt vector table (32 bytes)
<b>MainDevice</b>	<b>\$8A4</b>	Handle to the current main device
<b>MBarEnable</b>	<b>\$A20</b>	Unique menu ID for active desk accessory, when menu bar belongs to the accessory (word)
<b>MBarHeight</b>	<b>\$BAA</b>	Height of menu-bar (word)
<b>MBarHook</b>	<b>\$A2C</b>	Address of routine called by MenuSelect before menu is drawn
<b>MemErr</b>	<b>\$220</b>	Current value of MemError (word)
<b>MemTop</b>	<b>\$108</b>	Address of end of RAM (on Macintosh XL, end of RAM available to applications)
<b>MenuCInfo</b>	<b>\$D50</b>	Header for menu color information table
<b>MenuDisable</b>	<b>\$B54</b>	Menu ID and item for selected disabled item
<b>MenuFlash</b>	<b>\$A24</b>	Count for duration of menu item blinking (word)
<b>MenuHook</b>	<b>\$A30</b>	Address of routine called during MenuSelect
<b>MenuList</b>	<b>\$A1C</b>	Handle to current menu list
<b>MinStack</b>	<b>\$31E</b>	Minimum space allotment for stack (long)
<b>MinusOne</b>	<b>\$A06</b>	<b>\$FFFFFFFF</b>
<b>MMU32Bit</b>	<b>\$CB2</b>	Current address mode (byte)

## *Inside Macintosh X-Ref*

<b>Name</b>	<b>Location</b>	<b>Contents</b>
OldContent	\$9EA	Handle to saved content region
OldStructure	\$9E6	Handle to saved structure region
OneOne	\$A02	\$00010001
PaintWhite	\$9DC	Flag for whether to paint window white before update event (word)
PortBUse	\$291	Current availability of serial port B (byte)
PrintErr	\$944	Result code from last Printing Manager routine (word)
QDColors	\$8B0	Default QuickDraw colors
RAMBase	\$2B2	Trap dispatch table's base address for routines in RAM
ResErr	\$A60	Current value of ResError (word)
ResErrProc	\$AF2	Address of resource error procedure
ResLoad	\$A5E	Current SetResLoad state (word)
ResumeProc	\$A8C	Address of resume procedure
RndSeed	\$156	Random number seed (long)
ROM85	\$28E	Version number of ROM (word)
ROMBase	\$2AE	Base address of ROM
ROMBase	\$2AE	Base address of ROM
ROMFont0	\$980	Handle to font record for system font
RomMapInsert	\$B9E	Flag for whether to insert map to the ROM resources (byte)
SaveUpdate	\$9DA	Flag for whether to generate update events (word)
SaveVisRgn	\$9F2	Handle to saved visRgn
SCCRd	\$1D8	SCC read base address
SCCWrt	\$1DC	SCC write base address
ScrapCount	\$968	Count changed by ZeroScrap (word)
ScrapHandle	\$964	Handle to desk scrap in memory
ScrapName	\$96C	Pointer to scrap file name (preceded by length byte)
ScrapSize	\$960	Size in bytes of desk scrap (long)
ScrapState	\$96A	Tells where desk scrap is (word)
Scratch8	\$9FA	8-byte scratch area
Scratch20	\$1E4	20-byte scratch area
ScrDmpEnb	\$2F8	0 if GetNextEvent shouldn't process Command-Shift-number combinations (byte)
ScrHRes	\$104	Pixels per inch horizontally (word)
ScrnBase	\$824	Address of main screen buffer

Name	Location	Contents
ScrVRes	\$102	Pixels per inch vertically (word)
SdVolume	\$260	Current speaker volume (byte: low-order three bits only)
SEvtEnb	\$15C	0 if SystemEvent should return FALSE (byte)
SFSaveDisk	\$214	Negative of volume reference number, used by Standard File Package (word)
SoundBase	\$266	Pointer to free-form synthesizer buffer
SoundLevel	\$27F	Amplitude in 740-byte buffer (byte)
SoundPtr	\$262	Pointer to four-tone record
SPAlarm	\$200	Alarm setting (long)
SPATalkA	\$1F9	AppleTalk node ID hint for modem port (byte)
SPATalkB	\$1FA	AppleTalk node ID hint for printer port (byte)
SPClikCaret	\$209	Double-click and caret-blink times (byte)
SPConfig	\$1FB	Use types for serial ports (byte)
SPFont	\$204	Application font number minus 1 (word)
SPKbd	\$206	Auto-key threshold and rate (byte)
SPMisc2	\$20B	Mouse scaling, system startup disk, menu blink (byte)
SPPortA	\$1FC	Modem port configuration (word)
SPPortB	\$1FE	Printer port configuration (word)
SPPrint	\$207	Printer connection (byte)
SPValid	\$1F8	Validity status (byte)
SPVolCtl	\$208	Speaker volume setting in parameter RAM (byte)
SynListHandle	\$D32	Handle to synthetic font list
SysEvtMask	\$144	System event mask (word)
SysFontFam	\$BA6	If nonzero, the font number to use for system font (word)
SysFontSize	\$BA8	If nonzero, the size of the system font (word)
SysMap	\$A58	Reference number of system resource file (word)
SysMapHndl	\$A54	Handle to map of system resource file
SysParam	\$1F8	Low-memory copy of parameter RAM (20 bytes)
SysResName	\$AD8	Name of system resource file (length byte followed by up to 19 characters)
SysZone	\$2A6	Address of system heap zone
TEDoText	\$A70	Address of TextEdit multi-purpose routine
TERecal	\$A74	Address of routine to recalculate line starts for TextEdit
TEScrpHandle	\$AB4	Handle to TextEdit scrap

## *Inside Macintosh X-Ref*

<b>Name</b>	<b>Location</b>	<b>Contents</b>
TEScrpLength	\$AB0	Size in bytes of TextEdit scrap (long)
TheGDevice	\$CC8	Handle to current active device (long)
TheMenu	\$A26	Menu ID of currently highlighted menu (word)
TheZone	\$118	Address of current heap zone
Ticks	\$16A	Current number of ticks since system startup (long)
Time	\$20C	Seconds since midnight, January 1, 1904 (long)
TimeDBRA	\$D00	Number of times the DBRA instruction can be executed per millisecond (word)
TimeSCCDB	\$D02	Number of times the SCC can be accessed per millisecond (word)
TimeSCSIDB	\$DA6	Number of times the SCSI can be accessed per millisecond (word)
TmpResLoad	\$B9F	Temporary SetResLoad state for calls using ROMMapInsert (byte)
ToExtFS	\$3F2	Pointer to external file system
ToolScratch	\$9CE	8-byte scratch area
TopMapHndl	\$A50	Handle to resource map of most recently opened resource file
TopMenuItem	\$A0A	Pixel value of top of scrollable menu
UTableBase	\$11C	Base address of unit table
VBLQueue	\$160	Vertical retrace queue header (10 bytes)
VCBQHdr	\$356	Volume-control-block queue header (10 bytes)
VIA	\$1DA	VIA base address
WidthListHand	\$8E4	Handle to a list of handles to recently-used width tables
WidthPtr	\$B10	Pointer to global width table
WidthTabHandle	\$B2A	Handle to global width table
WindowList	\$9D6	Pointer to first window in window list; 0 if using events but not windows
WMgrPort	\$9DE	Pointer to Window Manager port

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## GLOSSARY

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**access path:** A description of the route that the File Manager follows to access a file; created when a file is opened.

**access path buffer:** Memory used by the File Manager to transfer data between an application and a file.

**acknowledge cycle:** For the NuBus: Last period of a transaction during which /ACK is asserted by a slave responding to a master. Often shortened to *ack cycle*.

**action procedure:** A procedure, used by the Control Manager function TrackControl, that defines an action to be performed repeatedly for as long as the mouse button is held down.

**activate event:** An event generated by the Window Manager when a window changes from active to inactive or vice versa.

**active control:** A control that will respond to the user's actions with the mouse.

**active end:** In a selection, the location to which the insertion point moves to complete the selection.

**active window:** The frontmost window on the desktop.

**ADB device table:** A structure in the system heap that lists all devices connected to the Apple DeskTop Bus.

**address:** A number used to identify a location in the computer's address space. Some locations are allocated to memory, others to I/O devices.

**address mark:** In a sector, information that's used internally by the Disk Driver, including information it uses to determine the position of the sector on the disk.

**ALAP:** See AppleTalk Link Access Protocol

**ALAP frame:** A packet of data transmitted and received by ALAP.

**ALAP protocol type:** An identifier used to match particular kinds of packets with a particular protocol handler.

**alert:** A warning or report of an error, in the form of an alert box, sound from the Macintosh's speaker, or both.

**alert box:** A box that appears on the screen to give a warning or report an error during a Macintosh application.

**alert template:** A resource that contains information from which the Dialog Manager can create an alert.

**alert window:** The window in which an alert box is displayed.

**alias:** A different name for the same entity.

## *Inside Macintosh X-Ref*

**allocate:** To reserve an area of memory for use.

**allocation block:** Volume space composed of an integral number of logical blocks.

**amplitude:** The maximum vertical distance of a periodic wave from the horizontal line about which the wave oscillates.

**AMU (Address Mapping Unit):** For the Macintosh II: A custom integrated circuit that allows an operating system to quickly reconfigure the arrangement of memory without physically moving data. Different tasks can be "swapped" within the same space.

**anchor point:** In a selection, the location of the insertion point when the selection was started.

**AppleTalk address:** A socket's number and its node ID number.

**AppleTalk Link Access Protocol (ALAP):** The lowest-level protocol in the AppleTalk architecture, managing node-to-node delivery of frames on a single AppleTalk network.

**AppleTalk Manager:** An interface to a pair of RAM device drivers that enable programs to send and receive information via an AppleTalk network.

**AppleTalk Transaction Protocol (ATP):** An AppleTalk protocol that's a DDP client. It allows one ATP client to request another ATP client to perform some activity and report the activity's result as a response to the requesting socket with guaranteed delivery.

**application font:** The font your application will use unless you specify otherwise—Geneva, by default.

**application heap:** The portion of the heap available to the running application program and the Toolbox.

**application heap limit:** The boundary between the space available for the application heap and the space available for the stack.

**application heap zone:** The heap zone initially provided by the Memory Manager for use by the application program and the Toolbox; initially equivalent to the application heap, but may be subdivided into two or more independent heap zones.

**application list:** A data structure, kept in the Desktop file, for launching applications from their documents in the hierarchical file system. For each application in the list, an entry is maintained that includes the name and signature of the application, as well as the directory ID of the folder containing it.

**application parameters:** Thirty-two bytes of memory, located above the application globals, reserved for system use. The first application parameter is the address of the first QuickDraw global variable.

**application space:** Memory that's available for dynamic allocation by applications.

**application window:** A window created as the result of something done by the application, either directly or indirectly (as through the Dialog Manager).

**arbitration phase:** The phase in which an initiator attempts to gain control of the bus.

**ascent:** The vertical distance from a font's base line to its ascent line.



**ascent line:** A horizontal line that coincides with the tops of the tallest characters in a font.

**asynchronous communication:** A method of data transmission where the receiving and sending devices don't share a common timer, and no timing data is transmitted.

**asynchronous execution:** After calling a routine asynchronously, an application is free to perform other tasks until the routine is completed.

**at-least-once transaction:** An ATP transaction in which the requested operation is performed at least once, and possibly several times.

**ATP:** See AppleTalk Transaction Protocol

**auto-key event:** An event generated repeatedly when the user presses and holds down a character key on the keyboard or keypad.

**auto-key rate:** The rate at which a character key repeats after it's begun to do so.

**auto-key threshold:** The length of time a character key must be held down before it begins to repeat.

**auxiliary control record:** A Control Manager data structure containing the information needed for drawing controls in color.

**auxiliary window record:** A Window Manager data structure that stores the color information needed for each color window.

**background activity:** A program or process that runs while the user is engaged with another application.

**background procedure:** A procedure passed to the Printing Manager to be run during idle times in the printing process.

**base line:** A horizontal line that coincides with the bottom of each character in a font, excluding descenders (such as the tail of a "p").

**baud rate:** The measure of the total number of bits sent over a transmission line per second.

**Binary-Decimal Conversion Package:** A Macintosh package for converting integers to decimal strings and vice versa.

**bit image:** A collection of bits in memory that have a rectilinear representation. The screen is a visible bit image.

**bit map:** A set of bits that represent the position and state of a corresponding set of items; in QuickDraw, a pointer to a bit image, the row width of that image, and its boundary rectangle.

**BIU (bus interface unit):** For the Macintosh II: The electronics connecting the MC68020 bus to the NuBus.

**block:** A group regarded as a unit; usually refers to data or memory in which data is stored. See **allocation block** and **memory block**.

**block contents:** The area that's available for use in a memory block.

## *Inside Macintosh X-Ref*

**block device:** A device that reads and writes blocks of bytes at a time. It can read or write any accessible block on demand.

**block header:** The internal "housekeeping" information maintained by the Memory Manager at the beginning of each block in a heap zone.

**block map:** Same as volume allocation block map.

**board sResource list:** A standard Apple sResource list that must be present in every NuBus slot card that communicates with the Paris.

**boundary rectangle:** A rectangle, defined as part of a QuickDraw bit map, that encloses the active area of the bit image and imposes a coordinate system on it. Its top left corner is always aligned around the first bit in the bit image.

**break table:** A list of templates that determine the general rules for making word divisions in a particular script.

**break:** The condition resulting when a device maintains its transmission line in the space state for at least one frame.

**bridge:** An intelligent link between two or more AppleTalk networks.

**broadcast service:** An ALAP service in which a frame is sent to all nodes on an AppleTalk network.

**bundle:** A resource that maps local IDs of resources to their actual resource IDs; used to provide mappings for file references and icon lists needed by the Finder.

**bus free phase:** The phase in which no SCSI device is actively using the bus.

**button:** A standard Macintosh control that causes some immediate or continuous action when clicked or pressed with the mouse. See also **radio button**.

**byte lane:** Any of the four bytes that make up the NuBus data width. NuBus slot cards may use any or all of the byte lanes to communicate with each other or with the Paris.

**byte swapping:** The process by which the order of bytes in each 4-byte NuBus word is changed to conform to the byte order of certain processors.

**card-generic driver:** A driver that is designed to work with a variety of plug-in cards.

**card-specific driver:** A driver that is designed to work with a single model of plug-in card.

**caret-blink time:** The interval between blinks of the caret that marks an insertion point.

**caret:** A generic term meaning a symbol that indicates where something should be inserted in text. The specific symbol used is a vertical bar (|).

**catalog tree file:** A file that maintains the relationships between the files and directories on a hierarchical directory volume. It corresponds to the file directory on a flat directory volume.

**cdev:** A resource file containing device information, used by the Control Panel.

**cell:** The basic component of a list from a structural point of view; a cell is a box in which a list element is displayed.

**cGrafPort:** The drawing environment in Color QuickDraw, including elements such as a pixel map, pixel patterns, transfer modes, and arithmetic drawing modes.

**channel:** A queue that's used by an application to send commands to the Sound Manager.

**character code:** An integer representing the character that a key or combination of keys on the keyboard or keypad stands for.

**character device:** A device that reads or writes a stream of characters, one at a time. It can neither skip characters nor go back to a previous character.

**character image:** An arrangement of bits that defines a character in a font.

**character key:** A key that generates a keyboard event when pressed; any key except Shift, Caps Lock, Command, or Option.

**character offset:** The horizontal separation between a character rectangle and a font rectangle.

**character origin:** The point on a base line used as a reference location for drawing a character.

**character position:** An index into an array containing text, starting at 0 for the first character.

**character rectangle:** A rectangle enclosing an entire character image. Its sides are defined by the image width and the font height.

**character style:** A set of stylistic variations, such as bold, italic, and underline. The empty set indicates plain text (no stylistic variations).

**character width:** The distance to move the pen from one character's origin to the next character's origin.

**check box:** A standard Macintosh control that displays a setting, either checked (on) or unchecked (off). Clicking inside a check box reverses its setting.

**Chooser:** A desk accessory that provides a standard interface for device drivers to solicit and accept specific choices from the user.

**chunky:** A pixel image in which all of a pixel's bits are stored consecutively in memory, all of a row's pixels are stored consecutively, and rowBytes indicates the offset from one row to the next.

**clipping:** Limiting drawing to within the bounds of a particular area.

**clipping region:** Same as clipRgn.

**clipRgn:** The region to which an application limits drawing in a grafPort.

**clock chip:** A special chip in which are stored parameter RAM and the current setting for the date and time. This chip is powered by a battery when the system is off, thus preserving the information.

**close routine:** The part of a device driver's code that implements Device Manager Close calls.

**closed driver:** A device driver that cannot be read from or written to.

**closed file:** A file without an access path. Closed files cannot be read from or written to.

**clump:** A group of contiguous allocation blocks. Space is allocated to a new file in clumps to promote file contiguity and avoid fragmentation.

**clump size:** The number of allocation blocks to be allocated to a new file.

**Color Look-Up Table (CLUT):** A data structure that maps color indices, specified using QuickDraw, into actual color values. Color Look-Up Tables are internal to certain types of video cards.

**Color Look-Up Table device:** This kind of video device contains hardware that converts an arbitrary pixel value stored in the frame buffer to some actual RGB video value, which is changeable.

**Color Manager:** The part of the Toolbox that supplies color-selection support for Color QuickDraw on the Macintosh II.

**Color QuickDraw:** The part of the Toolbox that performs color graphics operations on the Macintosh II.

**color table animation:** Color table animation involves changing the index entries in the video device's color table to achieve a change in color, as opposed to changing the pixel values themselves. All pixel values corresponding to the altered index entries suddenly appear on the display device in the new color.

**color table:** A set of colors is grouped into a QuickDraw data structure called a color table. Applications can pass a handle to this color table in order to use color entries.

**command phase:** The phase in which the SCSI initiator tells the target what operation to perform.

**compaction:** The process of moving allocated blocks within a heap zone in order to collect the free space into a single block.

**complement:** The numerical amount that must be added to a number to give the least number containing one more digit.

**completion routine:** Any application-defined code to be executed when an asynchronous call to a routine is completed.

**content region:** The area of a window that the application draws in.

**control:** An object in a window on the Macintosh screen with which the user, using the mouse, can cause instant action with visible results or change settings to modify a future action.

**Control Manager:** The part of the Toolbox that provides routines for creating and manipulating controls (such as buttons, check boxes, and scroll bars).

**control definition function:** A function called by the Control Manager when it needs to perform type-dependent operations on a particular type of control, such as drawing the control.

**control definition ID:** A number passed to control-creation routines to indicate the type of control. It consists of the control definition function's resource ID and a variation code.

**control information:** Information transmitted by an application to a device driver. It may select modes of operation, start or stop processes, enable buffers, choose protocols, and so on.

**control list:** A list of all the controls associated with a given window.

**control record:** The internal representation of a control, where the Control Manager stores all the information it needs for its operations on that control.

**control routine:** The part of a device driver's code that implements Device Manager Control and KillIO calls.

**control template:** A resource that contains information from which the Control Manager can create a control.

**coordinate plane:** A two-dimensional grid. In QuickDraw, the grid coordinates are integers ranging from -32767 to 32767, and all grid lines are infinitely thin.

**current heap zone:** The heap zone currently under attention, to which most Memory Manager operations implicitly apply.

**current resource file:** The last resource file opened, unless you specify otherwise with a Resource Manager routine.

**cursor:** A 16-by-16 bit image that appears on the screen and is controlled by the mouse; called the "pointer" in Macintosh user manuals.

**cursor level:** A value, initialized by InitCursor, that keeps track of the number of times the cursor has been hidden.

**data bits:** Data communications bits that encode transmitted characters.

**data buffer:** Heap space containing information to be written to a file or device driver from an application, or read from a file or device driver to an application.

**data fork:** The part of a file that contains data accessed via the File Manager.

**data mark:** In a sector, information that primarily contains data from an application.

**data phase:** The phase in which the actual transfer of data between an SCSI initiator and target takes place.

**Datagram Delivery Protocol (DDP):** An AppleTalk protocol that's an ALAP client, managing socket-to-socket delivery of datagrams over AppleTalk internets.

**datagram:** A packet of data transmitted by DDP.

**date/time record:** An alternate representation of the date and time (which is stored on the clock chip in seconds since midnight, January 1, 1904).

**DDP:** See Datagram Delivery Protocol.

**declaration ROM:** A ROM on a NuBus slot card that contains information about the card and may also contain code or other data.

## *Inside Macintosh X-Ref*

**default button:** In an alert box or modal dialog, the button whose effect will occur if the user presses Return or Enter. In an alert box, it's boldly outlined; in a modal dialog, it's boldly outlined or the OK button.

**default directory:** A directory that will be used in File Manager routines whenever no other directory is specified. It may be the root directory, in which case the default directory is equivalent to the default volume.

**default volume:** A volume that will receive I/O during a File Manager routine call, whenever no other volume is specified.

**deny modes:** File access modes that include both the access rights of that path and denial of access to others.

**dereference:** To refer to a block by its master pointer instead of its handle.

**descent:** The vertical distance from a font's base line to its descent line.

**descent line:** A horizontal line that coincides with the bottoms of the characters in a font that extend furthest below the base line.

**Desk Manager:** The part of the Toolbox that supports the use of desk accessories from an application.

**desk accessory:** A "mini-application", implemented as a device driver, that can be run at the same time as a Macintosh application.

**desk scrap:** The place where data is stored when it's cut (or copied) and pasted among applications and desk accessories.

**desktop:** The screen as a surface for doing work on the Macintosh.

**Desktop file:** A resource file in which the Finder stores the version data, bundle, icons, and file references for each application on the volume.

**destination rectangle:** In TextEdit, the rectangle in which the text is drawn.

**device:** A part of the Macintosh, or a piece of external equipment, that can transfer information into or out of the Macintosh.

**device address:** A value in the range \$00-\$0F assigned to each device connected to the Apple DeskTop Bus.

**device control entry:** A 40-byte relocatable block of heap space that tells the Device Manager the location of a driver's routines, the location of a driver's I/O queue, and other information.

**device driver event:** An event generated by one of the Macintosh's device drivers.

**device driver:** A program that controls the exchange of information between an application and a device.

**device handler ID:** A value that identifies the kind of device connected to the Apple DeskTop Bus.

**DeviceList:** A linked list containing the gDevice records for a system. One handle to a gDevice record is allocated and initialized for each video card found by the system.

**Device Manager:** The part of the Operating System that supports device I/O.

**device partition map:** A data structure that must be placed at the start of physical block 1 of an SCSI device to enable it to perform Macintosh system startup. It describes the allocation of blocks on the device.

**device resource file:** An extension of the printer resource file, this file contains all the resources needed by the Chooser for operating a particular device (including the device driver code).

**dial:** A control with a moving indicator that displays a quantitative setting or value. Depending on the type of dial, the user may be able to change the setting by dragging the indicator with the mouse.

**dialog:** Same as dialog box.

**dialog box:** A box that a Macintosh application displays to request information it needs to complete a command, or to report that it's waiting for a process to complete.

**Dialog Manager:** The part of the Toolbox that provides routines for implementing dialogs and alerts.

**dialog record:** The internal representation of a dialog, where the Dialog Manager stores all the information it needs for its operations on that dialog.

**dialog template:** A resource that contains information from which the Dialog Manager can create a dialog.

**dialog window:** The window in which a dialog box is displayed.

**dimmed:** Drawn in gray rather than black

**direct device:** A video device that has a direct correlation between the value placed in the video card and the color you see on the screen.

**directory ID:** A unique number assigned to a directory, which the File Manager uses to distinguish it from other directories on the volume. (It's functionally equivalent to the file number assigned to a file; in fact, both directory IDs and file numbers are assigned from the same set of numbers.)

**directory:** A subdivision of a volume that can contain files as well as other directories; equivalent to a folder.

**disabled:** A disabled menu item or menu is one that cannot be chosen; the menu item or menu title appears dimmed. A disabled item in a dialog or alert box has no effect when clicked.

**Disk Driver:** The device driver that controls data storage and retrieval on 3 1/2-inch disks.

**Disk Initialization Package:** A Macintosh package for initializing and naming new disks; called by the Standard File Package.

**disk-inserted event:** An event generated when the user inserts a disk in a disk drive or takes any other action that requires a volume to be mounted.

## *Inside Macintosh X-Ref*

**display rectangle:** A rectangle that determines where an item is displayed within a dialog or alert box.

**dithering:** A technique for mixing existing colors together to create the illusion of a third color that may be unavailable on a particular device.

**document window:** The standard Macintosh window for presenting a document.

**double-click time:** The greatest interval between a mouse-up and mouse-down event that would qualify two mouse clicks as a double-click.

**draft printing:** Printing a document immediately as it's drawn in the printing grafPort.

**drag delay:** A length of time that allows a user to drag diagonally across a main menu, moving from a submenu title into the submenu itself without the submenu disappearing.

**drag region:** A region in a window frame. Dragging inside this region moves the window to a new location and makes it the active window unless the Command key was down.

**drive number:** A number used to identify a disk drive. The internal drive is number 1, the external drive is number 2, and any additional drives will have larger numbers.

**drive queue:** A list of disk drives connected to the Macintosh.

**drive queue:** A list of disk drives connected to the Macintosh.

**driver descriptor map:** A data structure that must be placed at the start of physical block 0 of an SCSI device to enable it to perform Macintosh system startup. It identifies the various device drivers on the device.

**driver I/O queue:** A queue containing the parameter blocks of all I/O requests for one device driver.

**driver name:** A sequence of up to 255 printing characters used to refer to an open device driver. Driver names always begin with a period (.).

**driver reference number:** A number from -1 to -32 that uniquely identifies an individual device driver.

**Echo Protocol:** An echoing service provided on static socket number 4 (the echoer socket) by which any correctly-formed packet will be echoed back to its sender.

**edit record:** A complete editing environment in TextEdit, which includes the text to be edited, the grafPort and rectangle in which to display the text, the arrangement of the text within the rectangle, and other editing and display information.

**empty handle:** A handle that points to a NIL master pointer, signifying that the underlying relocatable block has been purged.

**empty shape:** A shape that contains no bits, such as one defined by only a single point.

**end-of-file:** See logical end-of-file or physical end-of-file.

**entity name:** An identifier for an entity, of the form object:type@zone.



**event:** A notification to an application of some occurrence that the application may want to respond to.

**event code:** An integer representing a particular type of event.

**Event Manager:** See **Toolbox Event Manager** or **Operating System Event Manager**.

**event mask:** A parameter passed to an Event Manager routine to specify which types of events the routine should apply to.

**event message:** A field of an event record containing information specific to the particular type of event.

**event queue:** The Operating System Event Manager's list of pending events.

**event record:** The internal representation of an event, through which your program learns all pertinent information about that event.

**exactly-once transaction:** An ATP transaction in which the requested operation is performed only once.

**exception:** An error or abnormal condition detected by the processor in the course of program execution; includes interrupts and traps.

**exception vector:** One of 64 vectors in low memory that point to the routines that are to get control in the event of an exception.

**extent:** A series of contiguous allocation blocks.

**extent descriptor:** A description of an extent, consisting of the number of the first allocation block of the extent followed by the length of the extent in blocks.

**extent record:** A data record, stored in the leaf nodes of the extents tree file, that contains three extent descriptors and a key identifying the record.

**extents tree file:** A file that contains the locations of the files on a volume.

**external reference:** A reference to a routine or variable defined in a separate compilation or assembly.

**family record:** A data structure, derived from a family resource, that contains all the information describing a font family.

**file:** A named, ordered sequence of bytes; a principal means by which data is stored and transmitted on the Macintosh.

**file catalog:** A hierarchical file directory.

**file control block:** A fixed-length data structure, contained in the file-control-block buffer, where information about an access path is stored.

**file directory:** The part of a volume that contains descriptions and locations of all the files and directories on the volume. There are two types of file directories: hierarchical file directories and flat file directories.

## *Inside Macintosh X-Ref*

**file I/O queue:** A queue containing parameter blocks for all I/O requests to the File Manager.

**File Manager:** The part of the Operating System that supports file I/O.

**file name:** A sequence of up to 255 printing characters, excluding colons (:), that identifies a file.

**file number:** A unique number assigned to a file, which the File Manager uses to distinguish it from other files on the volume. A file number specifies the file's entry in a file directory.

**file reference:** A resource that provides the Finder with file and icon information about an application.

**file tags:** Information associated with each logical block, designed to allow reconstruction of files on a volume whose directory or other file-access information has been destroyed.

**file tags buffer:** A location in memory where file tags are read from and written to.

**file type:** A four-character sequence, specified when a file is created, that identifies the type of file.

**file-control-block buffer:** A nonrelocatable block in the system heap that contains one file control block for each access path.

**Finder information:** Information that the Finder provides to an application upon starting it up, telling it which documents to open or print.

**fixed device:** A video device that converts a pixel value to some actual RGB video value, but the hardware colors can't be changed.

**fixed-point number:** A signed 32-bit quantity containing an integer part in the high-order word and a fractional part in the low-order word.

**fixed-width font:** A font whose characters all have the same width.

**Floating-Point Arithmetic Package:** A Macintosh package that supports extended-precision arithmetic according to IEEE Standard 754.

**font:** A complete set of characters of one typeface, which may be restricted to a particular size and style, or may comprise multiple sizes, or multiple sizes and styles, as in the context of menus.

**font characterization table:** A table of parameters in a device driver that specifies how best to adapt fonts to that device.

**font family:** A group of fonts of one basic design but with variations like weight and slant.

**font height:** The vertical distance from a font's ascent line to its descent line.

**Font Manager:** The part of the Toolbox that supports the use of various character fonts for QuickDraw when it draws text.

**font number:** The number by which you identify a font to QuickDraw or the Font Manager.

**font record:** A data structure, derived from a font resource, that contains all the information describing a font.

**font rectangle:** The smallest rectangle enclosing all the character images in a font, if the images were all superimposed over the same character origin.

**font script:** The script used by the font currently designated by thePort; hence the system that determines in what form text characters are displayed to the user.

**font size:** The size of a font in points; equivalent to the distance between the ascent line of one line of text and the ascent line of the next line of single-spaced text.

**fork:** One of the two parts of a file; see **data fork** and **resource fork**.

**format block:** A structure in a declaration ROM that provides a standard entry point for other structures in the ROM.

**four-tone record:** A data structure describing the tones produced by a four-tone synthesizer.

**four-tone synthesizer:** The part of the Sound Driver used to make simple harmonic tones, with up to four "voices" producing sound simultaneously.

**frame:** The time elapsed from the start bit to the last stop bit during serial communication.

**frame buffer:** A buffer memory in which is stored all the picture elements (pixels) of a frame of video information.

**Frame Buffer Controller (FBC):** A register-controlled CMOS gate array used to generate and control video data and timing signals.

**frame check sequence:** A 16-bit value generated by the AppleTalk hardware, used by the receiving node to detect transmission errors.

**frame header:** Information at the beginning of a packet.

**frame pointer:** A pointer to the end of the local variables within a routine's stack frame, held in an address register and manipulated with the LINK and UNLK instructions.

**frame trailer:** Information at the end of an ALAP frame.

**framed shape:** A shape that's drawn outlined and hollow.

**framing error:** The condition resulting when a device doesn't receive a stop bit when expected.

**free block:** A memory block containing space available for allocation.

**free-form synthesizer:** The part of the Sound Driver used to make complex music and speech.

**frequency:** The number of cycles per second (also called hertz) at which a wave oscillates.

**full pathname:** A pathname beginning from the root directory.

**full-duplex communication:** A method of data transmission where two devices transmit data simultaneously.

**gamma table:** A table that compensates for nonlinearities in a monitor's color response.

## *Inside Macintosh X-Ref*

**gDevice:** A QuickDraw data structure that allows an application to access a given device. A gDevice is a logical device, which the software treats the same whether it is a video card, a display device, or an offscreen pixel map.

**global coordinate system:** The coordinate system based on the top left corner of the bit image being at (0,0).

**global width table:** A data structure in the system heap used by the Font Manager to communicate fractional character widths to QuickDraw.

**go-away region:** A region in a window frame. Clicking inside this region of the active window makes the window close or disappear.

**grafPort:** A complete drawing environment, including such elements as a bit map, a subset of it in which to draw, a character font, patterns for drawing and erasing, and other pen characteristics.

**graphics device:** A video card, a printer, a display device, or an offscreen pixel map. Any of these device types may be used with Color QuickDraw.

**GrayRgn:** The global variable that in the multiple screen desktop describes and defines the desktop, the area on which windows can be dragged.

**grow image:** The image pulled around when the user drags inside the grow region; whatever is appropriate to show that the window's size will change.

**grow region:** A window region, usually within the content region, where dragging changes the size of an active window.

**grow zone function:** A function supplied by the application program to help the Memory Manager create free space within a heap zone.

**handle:** A pointer to a master pointer, which designates a relocatable block in the heap by double indirection.

**hardware overrun error:** The condition that occurs when the SCC's buffer becomes full.

**heap:** The area of memory in which space is dynamically allocated and released on demand, using the Memory Manager.

**heap zone:** An area of memory initialized by the Memory Manager for heap allocation.

**hierarchical menu:** A menu that includes, among its various menu choices, the ability to display a submenu. In most cases the submenu appears to the right of the menu item used to select it, and is marked with a filled triangle indicator.

**highlight:** To display an object on the screen in a distinctive visual way, such as inverting it.

**horizontal blanking interval:** The time between the display of the rightmost pixel on one line and the leftmost pixel on the next line.

**hotSpot:** The point in a cursor that's aligned with the mouse location.

**I/O queue:** See driver I/O queue or file I/O queue.

**I/O request:** A request for input from or output to a file or device driver, caused by calling a File Manager or Device Manager routine asynchronously.

**icon:** A 32-by-32 bit image that graphically represents an object, concept, or message.

**icon list:** A resource consisting of a list of icons.

**icon number:** A digit from 1 to 255 to which the Menu Manager adds 256 to get the resource ID of an icon associated with a menu item.

**image width:** The width of a character image.

**inactive control:** A control that won't respond to the user's actions with the mouse. An inactive control is highlighted in some special way, such as dimmed.

**inactive window:** Any window that isn't the frontmost window on the desktop.

**indicator:** The moving part of a dial that displays its current setting.

**initiator device:** An SCSI device that initiates a communication by asking another device (known as the target device) to perform a certain operation.

**input driver:** A device driver that receives serial data via a serial port and transfers it to an application.

**insertion point:** An empty selection range; the character position where text will be inserted (usually marked with a blinking caret).

**interface routine:** A routine called from Pascal whose purpose is to trap to a certain Toolbox or Operating System routine.

**International Utilities Package:** A Macintosh package that gives you access to country-dependent information such as the formats for numbers, currency, dates, and times.

**internet:** An interconnected group of AppleTalk networks.

**internet address:** The AppleTalk address and network number of a socket.

**interrupt:** An exception that's signaled to the processor by a device, to notify the processor of a change in condition of the device, such as the completion of an I/O request.

**interrupt handler:** A routine that services interrupts.

**interrupt priority level:** A number identifying the importance of the interrupt. It indicates which device is interrupting, and which interrupt handler should be executed.

**interrupt vector:** A pointer to an interrupt handler.

**invalidation:** When a color table is modified, its inverse table must be rebuilt, and the screen should be redrawn to take advantage of this new information. Rather than being reconstructed when the color table is changed, the inverse table is marked invalid, and is automatically rebuilt when next accessed.

**inverse table:** A special Color Manager data structure arranged in such a manner that, given an arbitrary RGB color, the pixel value can be very rapidly looked up.

## *Inside Macintosh X-Ref*

**invert:** To highlight by changing white pixels to black and vice versa.

**invisible control:** A control that's not drawn in its window.

**invisible window:** A window that's not drawn in its plane on the desktop.

**item:** In dialog and alert boxes, a control, icon, picture, or piece of text, each displayed inside its own display rectangle. See also **menu item**.

**item list:** A list of information about all the items in a dialog or alert box.

**item number:** The index, starting from 1, of an item in an item list.

**IWM:** "Integrated Woz Machine"; the custom chip that controls the 3 1/2-inch disk drives.

**job dialog:** A dialog that sets information about one printing job; associated with the Print command.

**journal code:** A code passed by a Toolbox Event Manager routine in its Control call to the journaling device driver, to designate which routine is making the Control call.

**journaling mechanism:** A mechanism that allows you to feed the Toolbox Event Manager events from some source other than the user.

**jump table:** A table that contains one entry for every routine in an application and is the means by which the loading and unloading of segments is implemented.

**justification:** The horizontal placement of lines of text relative to the edges of the rectangle in which the text is drawn.

**justification gap:** The number of pixels that must be added to a line of text to make it exactly fill a given measure. Also called **slop**.

**kern:** To draw part of a character so that it overlaps an adjacent character.

**key code:** An integer representing a key on the keyboard or keypad, without reference to the character that the key stands for.

**key script:** The system that determines the keyboard layout and input method for the user interface. It may be different from the font script, which determines how text is displayed.

**key-down event:** An event generated when the user presses a character key on the keyboard or keypad.

**key-up event:** An event generated when the user releases a character key on the keyboard or keypad.

**keyboard configuration:** A resource that defines a particular keyboard layout by associating a character code with each key or combination of keys on the keyboard or keypad.

**keyboard equivalent:** The combination of the Command key and another key, used to invoke a menu item from the keyboard.

**keyboard event:** An event generated when the user presses, releases, or holds down a character key on the keyboard or keypad; any key-down, key-up, or auto-key event.

**leading:** The amount of blank vertical space between the descent line of one line of text and the ascent line of the next line of single-spaced text.

**ligature:** A character that combines two letters.

**line-height table:** A TextEdit data structure that holds vertical spacing information for an edit record's text.

**List Manager:** The part of the Operating System that provides routines for creating, displaying, and manipulating lists.

**list definition procedure:** A procedure called by the List Manager that determines the appearance and behavior of a list.

**list element:** The basic component of a list from a logical point of view, a list element is simply bytes of data. In a list of names, for instance, the name Melvin might be a list element.

**list record:** The internal representation of a list, where the List Manager stores all the information it requires for its operations on that list.

**list separator:** The character that separates numbers, as when a list of numbers is entered by the user.

**local coordinate system:** The coordinate system local to a grafPort, imposed by the boundary rectangle defined in its bit map.

**local ID:** A number that refers to an icon list or file reference in an application's resource file and is mapped to an actual resource ID by a bundle.

**localization:** The process of adapting an application to different languages, including converting its user interface to a different script.

**location table:** An array of words (one for each character in a font) that specifies the location of each character's image in the font's bit image.

**lock:** To temporarily prevent a relocatable block from being moved during heap compaction.

**lock bit:** A bit in the master pointer to a relocatable block that indicates whether the block is currently locked.

**locked file:** A file whose data cannot be changed.

**locked volume:** A volume whose data cannot be changed. Volumes can be locked by either a software flag or a mechanical setting.

**logical block:** Volume space composed of 512 consecutive bytes of standard information and an additional number of bytes of information specific to the Disk Driver.

**logical end-of-file:** The position of one byte past the last byte in a file; equal to the actual number of bytes in the file.

**logical size:** The number of bytes in a memory block's contents.

**luminance:** The intensity of light. Two colors with different luminances will be displayed at different intensities.

**M.I.D.I. synthesizer:** This synthesizer interfaces with external synthesizers via a Musical Instrument Data Interface (M.I.D.I.) adaptor connected to the serial ports.

**magnitude:** The vertical distance between any given point on a wave and the horizontal line about which the wave oscillates.

**main event loop:** In a standard Macintosh application program, a loop that repeatedly calls the Toolbox Event Manager to get events and then responds to them as appropriate.

**main screen:** On a system with multiple display devices, the screen with the menu bar is called the main screen.

**main segment:** The segment containing the main program.

**mark state:** The state of a transmission line indicating a binary 1.

**mark:** A marker used by the File Manager to keep track of where it is during a read or write operation. It is the position of the next byte in a file that will be read or written.

**master directory block:** Part of the data structure of a flat directory volume; contains the volume information and the volume allocation block map.

**master pointer:** A single pointer to a relocatable block, maintained by the Memory Manager and updated whenever the block is moved, purged, or reallocated. All handles to a relocatable block refer to it by double indirection through the master pointer.

**Memory Manager:** The part of the Operating System that dynamically allocates and releases memory space in the heap.

**memory block:** An area of contiguous memory within a heap zone.

**menu:** A list of menu items that appears when the user points to a menu title in the menu bar and presses the mouse button. Dragging through the menu and releasing over an enabled menu item chooses that item.

**menu bar:** The horizontal strip at the top of the Macintosh screen that contains the menu titles of all menus in the menu list.

**menu definition procedure:** A procedure called by the Menu Manager when it needs to perform type-dependent operations on a particular type of menu, such as drawing the menu.

**menu entry:** An entry in a menu color table that defines color values for the menu's title, bar, and items.

**menu ID:** A number in the menu record that identifies the menu.

**menu item:** A choice in a menu, usually a command to the current application.

**menu item number:** The index, starting from 1, of a menu item in a menu.

**menu list:** A list containing menu handles for all menus in the menu bar, along with information on the position of each menu.

**Menu Manager:** The part of the Toolbox that deals with setting up menus and letting the user choose from them.



**menu record:** The internal representation of a menu, where the Menu Manager stores all the information it needs for its operations on that menu.

**menu title:** A word or phrase in the menu bar that designates one menu.

**message phase:** The phase in which the target sends one byte of message information back to the initiator.

**missing symbol:** A character to be drawn in case of a request to draw a character that's missing from a particular font.

**modal dialog:** A dialog that requires the user to respond before doing any other work on the desktop.

**modeless dialog:** A dialog that allows the user to work elsewhere on the desktop before responding.

**modifier:** A program that interprets and processes Sound Manager commands as they pass through a channel.

**modifier key:** A key (Shift, Caps Lock, Option, or Command) that generates no keyboard events of its own, but changes the meaning of other keys or mouse actions.

**mounted volume:** A volume that previously was inserted into a disk drive and had descriptive information read from it by the File Manager.

**mouse-down event:** An event generated when the user presses the mouse button.

**mouse scaling:** A feature that causes the cursor to move twice as far during a mouse stroke than it would have otherwise, provided the change in the cursor's position exceeds the mouse-scaling threshold within one tick after the mouse is moved.

**mouse-scaling threshold:** A number of pixels which, if exceeded by the sum of the horizontal and vertical changes in the cursor position during one tick of mouse movement, causes mouse scaling to occur (if that feature is turned on); normally six pixels.

**mouse-up event:** An event generated when the user releases the mouse button.

**Name-Binding Protocol (NBP):** An AppleTalk protocol that's a DDP client, used to convert entity names to their internet socket addresses.

**name lookup:** An NBP operation that allows clients to obtain the internet addresses of entities from their names.

**names directory:** The union of all name tables in an internet.

**names information socket:** The socket in a node used to implement NBP (always socket number 2).

**names table:** A list of each entity's name and internet address in a node.

**NBP tuple:** An entity name and an internet address.

**NBP:** See Name-Binding Protocol.

## *Inside Macintosh X-Ref*

**network event:** An event generated by the AppleTalk Manager.

**network number:** An identifier for an AppleTalk network.

**network-visible entity:** A named socket client on an internet.

**newline character:** Any character, but usually Return (ASCII code \$0D), that indicates the end of a sequence of bytes.

**newline mode:** A mode of reading data where the end of the data is indicated by a newline character (and not by a specific byte count).

**node ID:** A number, dynamically assigned, that identifies a node.

**node:** A device that's attached to and communicates via an AppleTalk network.

**nonbreaking space:** The character with ASCII code \$CA; drawn as a space the same width as a digit, but interpreted as a nonblank character for the purposes of word wraparound and selection.

**nonrelocatable block:** A block whose location in the heap is fixed and can't be moved during heap compaction.

**note synthesizer:** Functionally equivalent to the old square-wave synthesizer, the note synthesizer lets you generate simple melodies and informative sounds such as error warnings.

**null event:** An event reported when there are no other events to report.

**null-style record:** A TextEdit data structure used to store the style information for a null selection.

**off-line volume:** A mounted volume with all but the volume control block released.

**offset/width table:** An array of words that specifies the character offsets and character widths of all characters in a font.

**offspring:** For a given directory, the set of files and directories for which it is the parent.

**on-line volume:** A mounted volume with its volume buffer and descriptive information contained in memory.

**open driver:** A driver that can be read from and written to.

**open file:** A file with an access path. Open files can be read from and written to.

**open permission:** Information about a file that indicates whether the file can be read from, written to, or both.

**open routine:** The part of a device driver's code that implements Device Manager Open calls.

**Operating System:** The lowest-level software in the Macintosh. It does basic tasks such as I/O, memory management, and interrupt handling.

**Operating System Event Manager:** The part of the Operating System that reports hardware-related events such as mouse-button presses and keystrokes.

**Operating System Utilities:** Operating System routines that perform miscellaneous tasks such as getting the date and time, finding out the user's preferred speaker volume and other preferences, and doing simple string comparison.

**output driver:** A device driver that receives data via a serial port and transfers it to an application.

**overflow error:** See **hardware overflow error** and **software overflow error**.

**Package Manager:** The part of the Toolbox that lets you access Macintosh RAM-based packages.

**package:** A set of routines and data types that's stored as a resource and brought into memory only when needed.

**page rectangle:** The rectangle marking the boundaries of a printed page image. The boundary rectangle, portRect, and clipRgn of the printing grafPort are set to this rectangle.

**palette:** A collection of small symbols, usually enclosed in rectangles, that represent operations that can be selected by the user. Also, a collection of colors provided and used by your application according to your needs.

**Palette Manager:** The part of the Toolbox that establishes and monitors the color environment of the Macintosh II. It gives preference to the color needs of the front window, making the assumption that the front window is of greatest interest to the user.

**pane:** An independently scrollable area of a window, for showing a different part of the same document.

**panel:** An area of a window that shows a different interpretation of the same part of a document.

**paper rectangle:** The rectangle marking the boundaries of the physical sheet of paper on which a page is printed.

**parameter block:** A data structure used to transfer information between applications and certain Operating System routines.

**parameter RAM:** In the clock chip, 20 bytes where settings such as those made with the Control Panel desk accessory are preserved.

**parent:** For a given file or directory, the directory immediately above it in the tree.

**parent ID:** The directory ID of the directory containing a file or directory.

**parity bit:** A data communications bit used to verify that data bits received by a device match the data bits transmitted by another device.

**parity error:** The condition resulting when the parity bit received by a device isn't what was expected.

**part code:** An integer between 1 and 253 that stands for a particular part of a control (possibly the entire control).

**partial pathname:** A pathname beginning from any directory other than the root directory.

**path reference number:** A number that uniquely identifies an individual access path; assigned when the access path is created.

**pathname:** A series of concatenated directory and file names that identifies a given file or directory. See also **partial pathname** and **full pathname**.

**pattern:** An 8-by-8 bit image, used to define a repeating design (such as stripes) or tone (such as gray).

**pattern transfer mode:** One of eight transfer modes for drawing lines or shapes with a pattern.

**period:** The time elapsed during one complete cycle of a wave.

**phase:** Some fraction of a wave cycle (measured from a fixed point on the wave).

**physical end-of-file:** The position of one byte past the last allocation block of a file; equal to 1 more than the maximum number of bytes the file can contain.

**physical size:** The actual number of bytes a memory block occupies within its heap zone.

**picture:** A saved sequence of QuickDraw drawing commands (and, optionally, picture comments) that you can play back later with a single procedure call; also, the image resulting from these commands.

**picture comments:** Data stored in the definition of a picture that doesn't affect the picture's appearance but may be used to provide additional information about the picture when it's played back.

**picture frame:** A rectangle, defined as part of a picture, that surrounds the picture and gives a frame of reference for scaling when the picture is played back.

**PIO (programmed input/output):** An interfacing technique where the processor directly accesses registers assigned to I/O devices by executing processor instructions. Memory mapped I/O port registers are addressed as memory locations.

**pixel:** A dot on a display screen. Pixel is short for picture element.

**pixel map:** Color QuickDraw's extended data structure, containing the dimensions and content of a pixel image, plus information on the image's storage format, depth, resolution, and color usage.

**pixel pattern:** The pattern structure used by Color QuickDraw, one of three types: old-style pattern, full color pixel pattern, or RGB pattern.

**pixel value:** The bits in a pixel, taken together, form a number known as the pixel value. Color QuickDraw represents each pixel on the screen using one, two, four, or eight bits in memory.

**plane:** The front-to-back position of a window on the desktop.

**point:** The intersection of a horizontal grid line and a vertical grid line on the coordinate plane, defined by a horizontal and a vertical coordinate; also, a typographical term meaning approximately 1/72 inch.

**polygon:** A sequence of connected lines, defined by QuickDraw line-drawing commands.

**pop-up menu:** A menu not located in the menu bar, which appears when the user presses the mouse button in a particular place.

**port:** See **grafPort**.

**portBits:** The bit map of a **grafPort**.

**portRect:** A rectangle, defined as part of a **grafPort**, that encloses a subset of the bit map for use by the **grafPort**.

**post:** To place an event in the event queue for later processing.

**prime routine:** The part of a device driver's code that implements Device Manager Read and Write calls.

**print record:** A record containing all the information needed by the Printing Manager to perform a particular printing job.

**Printer Driver:** The device driver for the currently installed printer.

**printer resource file:** A file containing all the resources needed to run the Printing Manager with a particular printer.

**Printing Manager:** The routines and data types that enable applications to communicate with the Printer Driver to print on any variety of printer via the same interface.

**printing grafPort:** A special **grafPort** customized for printing instead of drawing on the screen.

**processor priority:** Bits 8-10 of the MC68000's status register, indicating which interrupts will be processed and which will be ignored.

**proportional font:** A font whose characters all have character widths that are proportional to their image width.

**protocol:** A well-defined set of communications rules.

**protocol handler table:** A list of the protocol handlers for a node.

**protocol handler:** A software process in a node that recognizes different kinds of frames by their ALAP type and services them.

**purge:** To remove a relocatable block from the heap, leaving its master pointer allocated but set to NIL.

**purge bit:** A bit in the master pointer to a relocatable block that indicates whether the block is currently purgeable.

**purge warning procedure:** A procedure associated with a particular heap zone that's called whenever a block is purged from that zone.

**purgeable block:** A relocatable block that can be purged from the heap.

**queue:** A list of identically structured entries linked together by pointers.

## *Inside Macintosh X-Ref*

**QuickDraw:** The part of the Toolbox that performs all graphic operations on the Macintosh screen.

**radio button:** A standard Macintosh control that displays a setting, either on or off, and is part of a group in which only one button can be on at a time.

**RAM:** The Macintosh's random access memory, which contains exception vectors, buffers used by hardware devices, the system and application heaps, the stack, and other information used by applications.

**range locking:** Locking a range of bytes in a file so that other users can't read from or write to that range, but allowing the rest of the file to be accessed.

**raw key codes:** Hardware-produced key codes on the Macintosh II and Apple Extended Keyboard, which are translated into virtual key codes by the 'KMAP' resource.

**read/write permission:** Information associated with an access path that indicates whether the file can be read from, written to, both read from and written to, or whatever the file's open permission allows.

**reallocate:** To allocate new space in the heap for a purged block, updating its master pointer to point to its new location.

**reference number:** A number greater than 0, returned by the Resource Manager when a resource file is opened, by which you can refer to that file. In Resource Manager routines that expect a reference number, 0 represents the system resource file.

**reference value:** In a window record or control record, a 32-bit field that an application program may store into and access for any purpose.

**region:** An arbitrary area or set of areas on the QuickDraw coordinate plane. The outline of a region should be one or more closed loops.

**register-based routine:** A Toolbox or Operating System routine that receives its parameters and returns its results, if any, in registers.

**relative handle:** A handle to a relocatable block expressed as the offset of its master pointer within the heap zone, rather than as the absolute memory address of the master pointer.

**release:** To free an allocated area of memory, making it available for reuse.

**release timer:** A timer for determining when an exactly-once response buffer can be released.

**relocatable block:** A block that can be moved within the heap during compaction.

**reselection phase:** An optional phase in which the SCSI initiator allows a target device to reconnect itself to the initiator.

**resource:** Data or code stored in a resource file and managed by the Resource Manager.

**resource attribute:** One of several characteristics, specified by bits in a resource reference, that determine how the resource should be dealt with.

**resource data:** In a resource file, the data that comprises a resource.

**resource file:** The resource fork of a file.

**resource fork:** The part of a file that contains data used by an application (such as menus, fonts, and icons). The resource fork of an application file also contains the application code itself.

**resource header:** At the beginning of a resource file, data that gives the offsets to and lengths of the resource data and resource map.

**resource ID:** A number that, together with the resource type, identifies a resource in a resource file. Every resource has an ID number.

**Resource Manager:** The part of the Toolbox that reads and writes resources.

**resource map:** In a resource file, data that is read into memory when the file is opened and that, given a resource specification, leads to the corresponding resource data.

**resource name:** A string that, together with the resource type, identifies a resource in a resource file. A resource may or may not have a name.

**resource reference:** In a resource map, an entry that identifies a resource and contains either an offset to its resource data in the resource file or a handle to the data if it's already been read into memory.

**resource specification:** A resource type and either a resource ID or a resource name.

**resource type:** The type of a resource in a resource file, designated by a sequence of four characters (such as 'MENU' for a menu).

**response BDS:** A data structure used to pass response information to the ATP module.

**result code:** An integer indicating whether a routine completed its task successfully or was prevented by some error condition (or other special condition, such as reaching the end of a file).

**resume procedure:** A procedure within an application that allows the application to recover from system errors.

**retry count:** The maximum number of retransmissions for an NBP or ATP packet.

**retry interval:** The time between retransmissions of a packet by NBP or ATP.

**RGB space:** How Color QuickDraw represents colors. Each color has a red, a green, and a blue component, hence the name RGB.

**RGB value:** Color QuickDraw represents color using the RGBColor record type, which specifies the red, green, and blue components of the color. The RGBColor record is used by an application specifies the colors it needs. The translation from the RGB value to the pixel value is performed at the time the color is drawn.

**ROM:** The Macintosh's permanent read-only memory, which contains the routines for the Toolbox and Operating System, and the various system traps.

**root directory:** The directory at the base of a file catalog.

**routine selector:** A value pushed on the stack to select a particular routine from a group of routines called by a single trap macro.

## *Inside Macintosh X-Ref*

**Routing Table Maintenance Protocol (RTMP):** An AppleTalk protocol that's used internally by AppleTalk to maintain tables for routing datagrams through an internet.

**routing table:** A table in a bridge that contains routing information.

**row width:** The number of bytes in each row of a bit image.

**RTMP:** See **Routing Table Maintenance Protocol**

**RTMP socket:** The socket in a node used to implement RTMP.

**RTMP stub:** The RTMP code in a nonbridge node.

**sampled sound synthesizer:** Functionally equivalent to the old free-form synthesizer, the sample sound synthesizer lets you play pre-recorded sounds or sounds generated by your application.

**scaling factor:** A value, given as a fraction, that specifies the amount a character should be stretched or shrunk before it's drawn.

**SCC:** See **Serial Communications Controller**.

**Scrap Manager:** The part of the Toolbox that enables cutting and pasting between applications, desk accessories, or an application and a desk accessory.

**scrap:** A place where cut or copied data is stored.

**scrap file:** The file containing the desk scrap (usually named "Clipboard File").

**screen buffer:** A block of memory from which the video display reads the information to be displayed.

**script:** A writing system, such as Cyrillic or Arabic. This book is printed in Roman script.

**script interface system:** Special software that supports the display and manipulation of a particular script.

**SCSI:** See **Small Computer Standard Interface**.

**SCSI Manager:** The part of the Operating System that controls the exchange of information between a Macintosh and peripheral devices connected through the Small Computer Standard Interface (SCSI).

**sector:** Disk space composed of 512 consecutive bytes of standard information and 12 bytes of file tags.

**segment:** One of several parts into which the code of an application may be divided. Not all segments need to be in memory at the same time.

**Segment Loader:** The part of the Operating System that loads the code of an application into memory, either as a single unit or divided into dynamically loaded segments.

**selection phase:** The phase in which the initiator selects the target device that will be asked to perform a certain operation.



**selection range:** The series of characters (inversely highlighted), or the character position (marked with a blinking caret), at which the next editing operation will occur.

**sequence number:** A number from 0 to 7, assigned to an ATP response datagram to indicate its ordering within the response.

**Serial Communications Controller (SCC):** The chip that handles serial I/O through the modem and printer ports.

**Serial Driver:** A device driver that controls communication, via serial ports, between applications and serial peripheral devices.

**serial data:** Data communicated over a single-path communication line, one bit at a time.

**server:** A node that manages access to a peripheral device.

**service request enable:** A bit set by a device connected to the Apple DeskTop Bus to tell the system that it needs servicing.

**session:** A session consists of a series of transactions between two sockets, characterized by the orderly sequencing of requests and responses.

**signature:** A four-character sequence that uniquely identifies an application to the Finder.

**slop:** See **justification gap**.

**slot exec parameter block:** A data structure that provides communication with the Slot Manager routines sMacBoot and sPrimaryInit.

**Slot Manager:** A set of Macintosh II ROM routines that let applications access declaration ROMs on slot cards.

**slot parameter block:** A data structure that provides communication with all Slot Manager routines except sMacBoot and sPrimaryInit.

**slot resource:** A software structure in the declaration ROM of a slot card.

**slot space:** The upper one sixteenth of the total address space. These addresses are in the form \$Fsxx xxxx where *F*, *s*, and *x* are hex digits of 4 bits each. This address space is geographically divided among the NuBus slots according to slot ID number.

**Small Computer Standard Interface (SCSI):** A specification of mechanical, electrical, and functional standards for connecting small computers with intelligent peripherals such as hard disks, printers, and optical disks.

**socket:** A logical entity within the node of a network.

**socket client:** A software process in a node that owns a socket.

**socket listener:** The portion of a socket client that receives and services datagrams addressed to that socket.

**socket number:** An identifier for a socket.

**socket table:** A listing of all the socket listeners for each active socket in a node.

## *Inside Macintosh X-Ref*

**software overrun error:** The condition that occurs when an input driver's buffer becomes full.

**solid shape:** A shape that's filled in with any pattern.

**Sound Driver:** The device driver that controls sound generation in an application.

**sound buffer:** A block of memory from which the sound generator reads the information to create an audio waveform.

**sound procedure:** A procedure associated with an alert that will emit one of up to four sounds from the Macintosh's speaker. Its integer parameter ranges from 0 to 3 and specifies which sound.

**source transfer mode:** One of eight transfer modes for drawing text or transferring any bit image between two bit maps.

**space state:** The state of a transmission line indicating a binary 0.

**spool printing:** Writing a representation of a document's printed image to disk or to memory, and then printing it (as opposed to immediate draft printing).

**square-wave synthesizer:** The part of the Sound Driver used to produce less harmonic sounds than the four-tone synthesizer, such as beeps.

**sResource:** See **slot resource**.

**sResource directory:** The structure in a declaration ROM that provides access to its sResource lists.

**sResource list:** A list of offsets to sResources.

**stack:** The area of memory in which space is allocated and released in LIFO (last-in-first-out) order.

**stack frame:** The area of the stack used by a routine for its parameters, return address, local variables, and temporary storage.

**stack-based routine:** A Toolbox or Operating System routine that receives its parameters and returns its results, if any, on the stack.

**stage:** Every alert has four stages, corresponding to consecutive occurrences of the alert, and a different response may be specified for each stage.

**Standard File Package:** A Macintosh package for presenting the standard user interface when a file is to be saved or opened.

**start bit:** A serial data communications bit that signals that the next bits transmitted are data bits.

**startup screen:** When the system is started up, one of the display devices is selected as the startup screen, the screen on which the "happy Macintosh" icon appears.

**status information:** Information transmitted to an application by a device driver. It may indicate the current mode of operation, the readiness of the device, the occurrence of errors, and so on.

**status phase:** The phase in which the SCSI target sends one byte of status information back to the initiator.

- status routine:** The part of a device driver's code that implements Device Manager Status calls.
- stop bit:** A serial data communications bit that signals the end of data bits.
- structure region:** An entire window; its complete "structure".
- style:** See **character style**.
- style dialog:** A dialog that sets options affecting the page dimensions; associated with the Page Setup command.
- style record:** A TextEdit data structure that specifies the styles for the edit record's text.
- style scrap:** A new TextEdit scrap type, 'styl', is used for storing style information in the desk scrap along with the old 'TEXT' scrap.
- style table:** A TextEdit data structure that contains one entry for each distinct style used in an edit record's text.
- subdirectory:** Any directory other than the root directory.
- submenu delay:** The length of time before a submenu appears as a user drags through a hierarchical main menu; it prevents rapid flashing of submenus.
- super slot space:** The large portion of memory in the range \$9000 0000 through \$EFFF FFFF. NuBus addresses of the form \$sxxx xxxx (that is, \$s000 0000 through \$sFFF FFFF) reference the super slot space that belongs to the card in slot *s*, where *s* is an ID digit in the range \$9 through \$E.
- synchronous execution:** After calling a routine synchronously, an application cannot continue execution until the routine is completed.
- synthesizer:** A program which, like a device driver, interprets Sound Manager commands and produces sound. See **free-form**, **four-tone**, or **square-wave synthesizer**.
- synthesizer buffer:** A description of the sound to be generated by a synthesizer.
- System Error Handler:** The part of the Operating System that assumes control when a fatal system error occurs.
- system error alert table:** A resource that determines the appearance and function of system error alerts.
- system error alert:** An alert box displayed by the System Error Handler.
- system error ID:** An ID number that appears in a system error alert to identify the error.
- system event mask:** A global event mask that controls which types of events get posted into the event queue.
- system font:** The font that the system uses (in menus, for example). Its name is Chicago.
- system font size:** The size of text drawn by the system in the system font; 12 points.
- system heap:** The portion of the heap reserved for use by the Operating System.

## *Inside Macintosh X-Ref*

**system heap zone:** The heap zone provided by the Memory Manager for use by the Operating System; equivalent to the system heap.

**system resource:** A resource in the system resource file.

**system resource file:** A resource file containing standard resources, accessed if a requested resource wasn't found in any of the other resource files that were searched.

**system startup information:** Certain configurable system parameters that are stored in the first two logical blocks of a volume and read in at system startup.

**system window:** A window in which a desk accessory is displayed.

**target device:** An SCSI device (typically an intelligent peripheral) that receives a request from an initiator device to perform a certain operation.

**text styles:** TextEdit records used for communicating style information between the application program and the TextEdit routines.

**TextEdit:** The part of the Toolbox that supports the basic text entry and editing capabilities of a standard Macintosh application.

**TextEdit scrap:** The place where certain TextEdit routines store the characters most recently cut or copied from text.

**theGDevice:** When drawing is being performed on a device, a handle to that device is stored as a global variable `theGDevice`.

**thousands separator:** The character that separates every three digits to the left of the decimal point.

**thumb:** The Control Manager's term for the scroll box (the indicator of a scroll bar).

**tick:** A sixtieth of a second.

**Time Manager:** The part of the Operating System that lets you schedule a routine to be executed after a given number of milliseconds have elapsed.

**Toolbox:** Same as User Interface Toolbox

**Toolbox Event Manager:** The part of the Toolbox that allows your application program to monitor the user's actions with the mouse, keyboard, and keypad.

**Toolbox Utilities:** The part of the Toolbox that performs generally useful operations such as fixed-point arithmetic, string manipulation, and logical operations on bits.

**track:** Disk space composed of 8 to 12 consecutive sectors. A track corresponds to one ring of constant radius around the disk.

**transaction:** A request-response communication between two ATP clients. See **transaction request** and **transaction response**.

**transaction ID:** An identifier assigned to a transaction.

**transaction request:** The initial part of a transaction in which one socket client asks another to perform an operation and return a response.

**transaction response:** The concluding part of a transaction in which one socket client returns requested information or simply confirms that a requested operation was performed.

**Transcendental Functions Package:** A Macintosh package that contains trigonometric, logarithmic, exponential, and financial functions, as well as a random number generator.

**transfer mode:** A specification of which Boolean operation QuickDraw should perform when drawing or when transferring a bit image from one bit map to another.

**trap dispatch table:** A table in RAM containing the addresses of all Toolbox and Operating System routines in encoded form.

**trap dispatcher:** The part of the Operating System that examines a trap word to determine what operation it stands for, looks up the address of the corresponding routine in the trap dispatch table, and jumps to the routine.

**trap macro:** A macro that assembles into a trap word, used for calling a Toolbox or Operating System routine from assembly language.

**trap number:** The identifying number of a Toolbox or Operating System routine; an index into the trap dispatch table.

**trap word:** An unimplemented instruction representing a call to a Toolbox or Operating System routine.

**type coercion:** Many compilers feature type coercion (also known as typecasting), which allows a data structure of one type to be converted to another type. In many cases, this conversion is simply a relaxation of type-checking in the compiler, allowing the substitution of a differently-typed but equivalent data structure.

**unimplemented instruction:** An instruction word that doesn't correspond to any valid machine-language instruction but instead causes a trap.

**unit number:** The number of each device driver's entry in the unit table.

**unit table:** A 128-byte nonrelocatable block containing a handle to the device control entry for each device driver.

**unlock:** To allow a relocatable block to be moved during heap compaction.

**unmounted volume:** A volume that hasn't been inserted into a disk drive and had descriptive information read from it, or a volume that previously was mounted and has since had the memory used by it released.

**unpurgeable block:** A relocatable block that can't be purged from the heap.

**update event:** An event generated by the Window Manager when a window's contents need to be redrawn.

**update region:** A window region consisting of all areas of the content region that have to be redrawn.

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**User Interface Toolbox:** The software in the Macintosh ROM that helps you implement the standard Macintosh user interface in your application.

**user bytes:** Four bytes in an ATP header provided for use by ATP's clients.

**valence:** The number of offspring for a given directory.

**validity status:** A number stored in parameter RAM designating whether the last attempt to write there was successful. (The number is \$A8 if so.)

**variation code:** The part of a window or control definition ID that distinguishes closely related types of windows or controls.

**VBL task:** A task performed during the vertical retrace interrupt.

**vector table:** A table of interrupt vectors in low memory.

**Versatile Interface Adapter (VIA):** The chip that handles most of the Macintosh's I/O and interrupts.

**version data:** In an application's resource file, a resource that has the application's signature as its resource type; typically a string that gives the name, version number, and date of the application.

**version number:** A number from 0 to 255 used to distinguish between files with the same name.

**Vertical Retrace Manager:** The part of the Operating System that schedules and executes tasks during the vertical retrace interrupt.

**vertical blanking interrupt:** See **vertical retrace interrupt**.

**vertical blanking interval:** The time between the display of the last pixel on the bottom line of the screen and the first one on the top line.

**vertical retrace interrupt:** An interrupt generated 60 times a second by the Macintosh video circuitry while the beam of the display tube returns from the bottom of the screen to the top; also known as vertical blanking interrupt.

**vertical retrace queue:** A list of the tasks to be executed during the vertical retrace interrupt.

**VIA:** See **Versatile Interface Adapter**.

**view rectangle:** In TextEdit, the rectangle in which the text is visible.

**virtual key codes:** The key codes that appear in keyboard events. (See also **raw key codes**)

**visible control:** A control that's drawn in its window (but may be completely overlapped by another window or other object on the screen).

**visible window:** A window that's drawn in its plane on the desktop (but may be completely overlapped by another window or object on the screen).

**visRgn:** The region of a grafPort, manipulated by the Window Manager, that's actually visible on the screen.

**volume:** A piece of storage medium formatted to contain files; usually a disk or part of a disk. A 3.5-inch Macintosh disk is one volume.

**volume allocation block map:** A list of 12-bit entries, one for each allocation block, that indicate whether the block is currently allocated to a file, whether it's free for use, or which block is next in the file. Block maps exist both on flat directory volumes and in memory.

**volume attributes:** Information contained on volumes and in memory indicating whether the volume is locked, whether it's busy (in memory only), and whether the volume control block matches the volume information (in memory only).

**volume bit map:** A data structure containing a sequence of bits, one bit for each allocation block, that indicate whether the block is allocated or free for use. Volume bit maps exist both on hierarchical directory volumes and in memory.

**volume buffer:** Memory used initially to load the master directory block, and used thereafter for reading from files that are opened without an access path buffer.

**volume control block:** A nonrelocatable block that contains volume-specific information, including the volume information from the master directory block.

**volume index:** A number identifying a mounted volume listed in the volume-control-block queue. The first volume in the queue has an index of 1, and so on.

**volume information block:** Part of the data structure of a hierarchical directory volume; it contains the volume information.

**volume information:** Volume-specific information contained on a volume, including the volume name and the number of files on the volume.

**volume name:** A sequence of up to 27 printing characters that identifies a volume; followed by a colon (:) in File Manager routine calls, to distinguish it from a file name.

**volume reference number:** A unique number assigned to a volume as it's mounted, used to refer to the volume.

**volume-control-block queue:** A list of the volume control blocks for all mounted volumes.

**wave table synthesizer:** Similar to the old four-tone synthesizer, the wave table synthesizer produces complex sounds and multi-part music.

**waveform description:** A sequence of bytes describing a waveform.

**waveform:** The physical shape of a wave.

**wavelength:** The horizontal extent of one complete cycle of a wave.

**window:** An object on the desktop that presents information, such as a document or a message.

**window class:** In a window record, an indication of whether a window is a system window, a dialog or alert window, or a window created directly by the application.

**window definition function:** A function called by the Window Manager when it needs to perform certain type-dependent operations on a particular type of window, such as drawing the window frame.

## *Inside Macintosh X-Ref*

**window definition ID:** A number passed to window-creation routines to indicate the type of window. It consists of the window definition function's resource ID and a variation code.

**window frame:** The structure region of a window minus its content region.

**window list:** A list of all windows ordered by their front-to-back positions on the desktop.

**Window Manager:** The part of the Toolbox that provides routines for creating and manipulating windows.

**Window Manager port:** A grafPort that has the entire screen as its portRect and is used by the Window Manager to draw window frames.

**window record:** The internal representation of a window, where the Window Manager stores all the information it needs for its operations on that window.

**window template:** A resource from which the Window Manager can create a window.

**word wraparound:** Keeping words from being split between lines when text is drawn.

**word-selection break table:** A break table that is used to find word boundaries for word selection, spelling checking, and so on.

**word-wrapping break table:** A break table that is used to find word boundaries for screen wrapping of text.

**working directory:** An alternative way of referring to a directory. When opened as a working directory, a directory is given a working directory reference number that's used to refer to it in File Manager calls.

**working directory control block:** A data structure that contains the directory ID of a working directory, as well as the volume reference number of the volume on which the directory is located.

**working directory reference number:** A temporary reference number used to identify a working directory. It can be used in place of the volume reference number in all File Manager calls; the File Manager uses it to get the directory ID and volume reference number from the working directory control block.

**workstation:** A node through which a user can access a server or other nodes.

**write data structure:** A data structure used to pass information to the ALAP or DDP modules.

**X-Ref:** An abbreviation for *cross-reference*.

**zone:** An arbitrary subset of AppleTalk networks in an internet. See also **heap zone**.

**zone header:** The internal "housekeeping" information maintained by the Memory Manager at the beginning of each heap zone.

**zone pointer:** A pointer to a zone record.

**zone record:** A data structure representing a heap zone.

**zone trailer:** A minimum-size free block marking the end of a heap zone.



# Inside Macintosh X-Ref

Welcome to the world of programming for the Macintosh.® No other personal computer has been as enthusiastically received by the programming community, and the large—and growing—body of Macintosh software attests to this. The Macintosh programming books provide the guidelines and technical information you'll need to develop Macintosh programs, but there are many other resources that can help speed and simplify your development efforts.

## The Apple Programmer's and Developer's Association

Whether you are a programmer, enthusiast, or make your living developing Apple-compatible products, you need fast access to the latest technical information and development tools. Now there's a source for you: The Apple Programmer's and Developer's Association (APDA).

An independent organization sponsored by Apple Computer, APDA is the one-stop source for the Apple programmer. Members get timely and easy access to technical information and tools that will speed your development efforts.

Whether you're looking for programming tools, technical notes, or manuals, you have a single, convenient source. All these materials—including selected products and materials from Apple and other vendors—are available to APDA members with one simple phone call. Here are some of the products you'll be able to order as an APDA member:

- Tools, system software, technical notes, and manuals for the Apple® II and Macintosh computers.
- Language products from companies such as Think Technologies, Borland, and Consulair.
- Technical books, including the entire Apple Technical Library from Addison-Wesley.

APDA was created to serve the needs of the entire Apple programming community. For membership information, please contact:

APDA  
290 SW 43rd Street  
Renton, WA 98055  
(206) 251-6548  
AppleLink: APDA  
MCI: 312-7449  
CompuServe 73527,27

## Programs for the Commercial Developer

If your primary business is developing software products for commercial markets, we strongly suggest that you investigate the Apple Certified Developer Program, an aggressive program designed to help independent software developers get products to market quickly and successfully. For information, write to:

Developer Programs  
Apple Computer, Inc.  
M/S 27-W  
20525 Mariani Avenue  
Cupertino, CA 95014

## Developer Tools

You won't have to look far to find a development language that suits your specific requirements. A large family of Macintosh languages will serve your development needs, whether your expertise is in Pascal, Assembler, C, FORTH, FORTRAN, COBOL, BASIC, Logo, Lisp, Modula, or one of many others. And the information contained in *Inside Macintosh* can be applied to any of these languages.

Apple offers a number of special products essential to Macintosh programmers. Available through APDA, they include:

- Apple's Macintosh Programmer's Workshop (MPW) and MacApp™ development system products.
- Macintosh utilities, example programs, and source code.
- Preliminary drafts of technical documentation.
- Latest versions of the Macintosh system software.

Apple is constantly updating the tools and utilities you need. Become an APDA member and you'll be kept informed of their availability.

## Technical Notes

Macintosh Technical Notes are published on a bi-monthly basis. Available through APDA, user groups, developer consortiums, and electronic information services, they provide timely and helpful information, programming hints, and example code to help make your programming efforts more creative and productive.

## Want More Information?

Apple has put together an information packet that includes:

- Information about independent and Apple-sponsored programs for Apple developers.
- Support resources for developers, including names and addresses of Macintosh user groups, developer consortiums, and electronic services that cater to your special needs.
- A current list of Apple and third-party programming languages.
- Other materials of interest to the Apple developer.

This package is yours for the asking. Simply send your request to:

Apple Computer, Inc.  
M/S 37-S  
20525 Mariani Avenue  
Cupertino, CA 95014



# Apple® Inside Macintosh X-Ref

The Official  
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*Inside Macintosh X-Ref* is your key to eight programming books for the Apple Macintosh® family of computers: *Inside Macintosh*, volumes I through V; *Programmer's Introduction to the Macintosh Family*; *Technical Introduction to the Macintosh Family*; and *Designing Cards and Drivers for Macintosh II and Macintosh SE*. It provides a single general index to all eight volumes, together with three global appendixes, a comprehensive glossary, and a new index of constants and field names.

Written by the people at Apple Computer, the five volumes of *Inside Macintosh* provide the essential information you'll need to write software for the entire Macintosh family. Volume I contains important introductory material and describes the QuickDraw graphics package and important Managers such as the Resource, Font, and Menu Managers. Volume II complements Volume I in describing the Managers that perform such basic routines as file and device I/O, memory management, and interrupt handling. Volume III discusses your program's interface with the Macintosh Finder™, describes the Macintosh 128K and 512K computers, and provides summaries of all the Managers and other software described in volumes I through III. Volume IV discusses the changes introduced by the Macintosh 512K Enhanced and Macintosh Plus computers, including the Hierarchical File System and the SCSI port. Volume V discusses the changes introduced by the Macintosh SE and Macintosh II computers, including color, NuBus™ slots, and the Apple Desktop Bus.™

*Programmer's Introduction to the Macintosh Family* provides an overview of software development for all Macintosh computers. It focuses on the differences between event-driven programming and more traditional programming techniques, while explaining topics such as the Macintosh user interface and programming in high-level languages. *Technical Introduction to the Macintosh Family* provides an introduction to the general design, system architecture, and ROM design of Macintosh computers. It introduces the ideas behind the Macintosh user interface and outlines A/UX®, Apple's implementation of the AT&T UNIX® operating system for the Macintosh II. *Designing Cards and Drivers for Macintosh II and Macintosh SE* provides programmers and hardware developers with all the information needed to design Macintosh expansion cards.

*Inside Macintosh X-Ref* is a valuable guide to Apple Computer's official programmer's references for creating software for the entire family of Macintosh computers.

**About the cover:** This design represents a new look for the original edition of *Inside Macintosh X-Ref*, and the other books in the Apple Technical Library. The contents have not been changed.

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