

MBS Main Plugin Documentation

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0.1 Introduction

This is the PDF version of the documentation for the Xojo Plug-in from Monkeybread Software Germany.
Plugin part: MBS Main Plugin

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Chapter 1

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Chapter 5

Cocoa

5.1 class NSAutoreleasePoolMBS

5.1.1 class NSAutoreleasePoolMBS

Plugin Version: 8.5, Platform: macOS, Targets: All.

Function: The class for memory management in Cocoa.

Example:

```
Var pool as NSAutoreleasePoolMBS
```

```
sub MyThread.Run  
pool=new NSAutoreleasePoolMBS  
// do work  
end sub
```

Notes: If you use threads, you need to create a NSAutoreleasePoolMBS on the start to have correct Cocoa memory manager.

Blog Entries

- [REALbasic 2009r4 and MBS Plugins](#)

5.1.2 Methods

5.1.3 Constructor

Plugin Version: 8.5, Platform: macOS, Targets: All.

Function: The constructor to create a new Autorelease Pool.

Example:

```
// Cleanup memory for Cocoa objects

Sub Action() // in Timer
static LastPool as NSAutoreleasePoolMBS = nil
static CurrentPool as NSAutoreleasePoolMBS = nil

LastPool = CurrentPool
CurrentPool = new NSAutoreleasePoolMBS
End Sub
```

Notes: The example code above is not needed in Xojo 2009r4 and above as the runtime does it automatically for you.

5.1.4 Properties

5.1.5 Handle as Integer

Plugin Version: 8.5, Platform: macOS, Targets: All.

Function: The handle to the internally used NSAutoreleasePool object.

Notes: (Read and Write property)

5.2 Globals

5.2.1 NSLogMBS(message as string)

Plugin Version: 12.3, Platform: macOS, Targets: All.

Function: Writes a message to the Console.app on Mac OS X.

Example:

```
Sub Log(message as string)
if TargetMacOS then
NSLogMBS message
else
System.DebugLog message
end if
```

End Sub

Notes: As with Mac OS X 10.8 the system.debugLog method does not write to Console.app. So use this function.

Blog Entries

- [MBS Real Studio Plugins, version 12.3pr16](#)

5.2.2 NSStringArraySortMBS(texts() as string, options as Integer) as string()

Plugin Version: 16.1, Platform: macOS, Targets: All.

Function: Sorts array of string with options.

Example:

```
// constants for the function:
const NSCaseInsensitiveSearch = 1
const NSLiteralSearch = 2
const NSBackwardsSearch = 4
const NSAnchoredSearch = 8
const NSNumericSearch = 64
const NSDiacriticInsensitiveSearch = 128
const NSWidthInsensitiveSearch = 256
const NSForcedOrderingSearch = 512
```

```
const NSOrderedAscending = -1
const NSOrderedSame = 0
const NSOrderedDescending = 1
```

```
// test array
```

```

Var a() as string = array("Test 1", "Test 2", "Test 12")

// sort with Cocoa sorting
Var r() as string = NSStringArraySortMBS(a, NSDiacriticInsensitiveSearch + __
NSWidthInsensitiveSearch + __
NSCaseInsensitiveSearch + __
NSNumericSearch)

// sort with xoyo
a.sort

// show result
MsgBox "Cocoa: "+Join(r, ",")+EndOfLine+__
"Xoyo: "+Join(a, ", ")

```

Notes: This function allows you to use NSStringCompareMBS for array sorting.

Blog Entries

- [MBS Xoyo / Real Studio Plugins, version 16.1pr5](#)

5.2.3 NSStringCompareMBS(s as string, t as string, options as Integer) as Integer

Plugin Version: 8.6, Platform: macOS, Targets: All.

Function: Compares two things using the Cocoa string functions.

Example:

```

// constants for the function:
const NSCaseInsensitiveSearch = 1
const NSLiteralSearch = 2
const NSBackwardsSearch = 4
const NSAnchoredSearch = 8
const NSNumericSearch = 64
const NSDiacriticInsensitiveSearch = 128
const NSWidthInsensitiveSearch = 256
const NSForcedOrderingSearch = 512

const NSOrderedAscending = -1
const NSOrderedSame = 0
const NSOrderedDescending = 1

if NSStringCompareMBS("Hello", "hello", NSCaseInsensitiveSearch)=0 then
msgbox "equal (correct)"
else
msgbox "not equal"
end if

```



```

if NSStringCompareMBS("Hello","hello", 0)=0 then
msgbox "equal"
else
msgbox "not equal (correct)"
end if

if NSStringCompareMBS("Hello","Hell√", NSDiacriticInsensitiveSearch)=0 then
msgbox "equal (correct)"
else
msgbox "not equal"
end if

```

Notes: Following constants can be used for the compare:

| | | |
|------------------------------|-----|--|
| NSCaseInsensitiveSearch | 1 | Case Insensitive |
| NSLiteralSearch | 2 | Exact character-by-character equivalence |
| NSBackwardsSearch | 4 | Search from end of source string |
| NSAnchoredSearch | 8 | Search is limited to start (or end, if NSBackwardsSearch) of source string |
| NSNumericSearch | 64 | Added in 10.2; Numbers within strings are compared using numeric value, that is, Foo2.txt < Foo7.txt < Foo25.txt; only applies to compare methods, not find |
| NSDiacriticInsensitiveSearch | 128 | If specified, ignores diacritics (o-umlaut = o) |
| NSWidthInsensitiveSearch | 256 | If specified, ignores width differences ('a' = UFF41) |
| NSForcedOrderingSearch | 512 | If specified, comparisons are forced to return either NSOrderedAscending or NSOrderedDescending if the strings are equivalent but not strictly equal, for stability when sorting (e.g. "aaa" > "AAA" with NSCaseInsensitiveSearch specified) |

The constants NSDiacriticInsensitiveSearch, NSWidthInsensitiveSearch and NSForcedOrderingSearch are only for Mac OS X 10.5 and newer versions.

Returns value constants:

| | |
|---------------------|----|
| NSOrderedAscending | -1 |
| NSOrderedSame | 0 |
| NSOrderedDescending | 1 |

Blog Entries

- [MonkeyBread Software Releases the MBS REALbasic plug-ins 8.6](#)

5.2.4 NSMakePointMBS(x as Double, y as Double) as NSPointMBS

Plugin Version: 9.4, Platform: macOS, Targets: All.

Function: Creates a NSPoint object based on coordinates.

Blog Entries

- [MBS REALbasic plug-ins version 9.4](#)

5.2.5 NSMakeRangeMBS(location as UInt32, length as UInt32) as NSRangeMBS

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Creates a new range with the given values.

5.2.6 NSMakeRectMBS(x as Double, y as Double, w as Double, h as Double) as NSRectMBS

Plugin Version: 9.4, Platform: macOS, Targets: All.

Function: Creates a NSRect object based on coordinates and size.

Blog Entries

- [MBS REALbasic plug-ins version 9.4](#)

5.2.7 NSMakeSizeMBS(w as Double, h as Double) as NSSizeMBS

Plugin Version: 9.4, Platform: macOS, Targets: All.

Function: Creates a NSSize object based on a size.

Blog Entries

- [Line Wrap for Textarea in Xojo Mac applications](#)
- [MBS REALbasic plug-ins version 9.4](#)

Videos

- [Apple MapView In Xojo](#)

5.3 class NSEdgeInsetsMBS

5.3.1 class NSEdgeInsetsMBS

Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

Function: A description of the distance between the edges of two rectangles.

Notes: Edge insets describe the distance between the edges of one rectangle to a related rectangle that can be described by measuring a constant but edge-specific distance from each edge.

A common use for this structure is to describe the relationship between a view's frame and its alignment rectangle.

Blog Entries

- [MBS Xojo Plugins, version 20.6pr2](#)

5.3.2 Methods

5.3.3 Constructor

Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

Function: The constructor to create an edge insets object with all values zero.

See also:

- [5.3.4 Constructor\(p as Ptr\)](#) 27
- [5.3.5 Constructor\(top as double, left as double, bottom as double, right as double\)](#) 27

5.3.4 Constructor(p as Ptr)

Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

Function: The constructor to take a ptr to an NSEdgeInsets structure.

See also:

- [5.3.3 Constructor](#) 27
- [5.3.5 Constructor\(top as double, left as double, bottom as double, right as double\)](#) 27

5.3.5 Constructor(top as double, left as double, bottom as double, right as double)

Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

Function: Creates an edge inset with given values.

Example:

```
Var e As New NSEdgeInsetsMBS(10, 20, 10, 20)
```

[Break](#) // see in debugger

See also:

- 5.3.3 Constructor 27
- 5.3.4 Constructor(p as Ptr) 27

5.3.6 Equal(other as NSEdgeInsetsMBS) as boolean

Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

Function: Returns true if both edge insets are equal.

5.3.7 Properties

5.3.8 Bottom as Double

Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

Function: The distance from the bottom of the source rectangle to the bottom of the result rectangle.

Notes: (Read and Write property)

5.3.9 Handle as Ptr

Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

Function: The ptr to the NSEdgeInsets structure.

Notes: (Read only property)

5.3.10 Left as Double

Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

Function: The distance from the left side of the source rectangle to the left side of the result rectangle.

Notes: (Read and Write property)

5.3.11 Right as Double

Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

Function: The distance from the right side of the source rectangle to the right side of the result rectangle.

Notes: (Read and Write property)

5.3.12 Top as Double

Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

Function: The distance from the top of the source rectangle to the top of the result rectangle.

Notes: (Read and Write property)

5.4 class NSErrorMBS

5.4.1 class NSErrorMBS

Plugin Version: 7.7, Platform: macOS, Targets: All.

Function: The class for error information in the Cocoa World.

Blog Entries

- [Find computer location](#)
- [Managing File Access in Xojo with NSFileCoordinator](#)
- [Picking picture on macOS](#)
- [Send email message in iOS Xojo App](#)
- [Print dialogs for iOS in Xojo](#)
- [Contacts history for Xojo](#)
- [News from the MBS Xojo Plugins Version 21.1](#)
- [Write audio file with samples using AVFoundation](#)
- [Automated video editing with Xojo](#)
- [MBS REALbasic plug-in 9.6](#)

Xojo Developer Magazine

- [18.6, page 71: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter](#)
- [18.3, page 80: Xojo Maps, Part 4, Finding and Displaying Addresses with the MapKitMBS plugin by Markus Winter](#)
- [18.3, page 72: Xojo Maps, Part 4, Finding and Displaying Addresses with the MapKitMBS plugin by Markus Winter](#)
- [15.5, page 46: Touch/©, Using Apple's Touch Bar with Xojo by Marc Zeedar](#)
- [12.6, page 35: Writing OS X Apps for Game Center, Part 3: Turn-Based Games by Tom Baumgartner](#)
- [12.6, page 27: Writing OS X Apps for Game Center, Part 3: Turn-Based Games by Tom Baumgartner](#)
- [12.6, page 25: Writing OS X Apps for Game Center, Part 3: Turn-Based Games by Tom Baumgartner](#)
- [12.5, pages 31 to 32: Writing OS X Apps for Game Center, Part 2: Requesting a Match by Tom Baumgartner](#)
- [12.4, page 31: Writing OS X Apps for Game Center, Getting started by authenticating the local player with the Game Center Sandbox testing facility by Tom Baumgartner](#)
- [12.2, pages 45 to 46: Moving to AVFoundation, Leaving QuickTime behind by Christian Schmitz](#)

5.4.2 Methods

5.4.3 Constructor(Domain as String, Code as Integer, UserInfo as dictionary = nil)

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: Initializes error for a given domain and code with a given userInfo dictionary.

Notes: domain: The error domain—this can be one of the predefined NSError domains, or an arbitrary string describing a custom domain. domain must not be nil.

code: The error code for the error.

dict: The userInfo dictionary for the error. userInfo may be nil.

Returns an NSErrorMBS object initialized for domain with the specified error code and the dictionary of arbitrary data userInfo.

See also:

- 5.4.4 Constructor(Handle as Integer) 31

5.4.4 Constructor(Handle as Integer)

Plugin Version: 13.1, Platform: macOS, Targets: All.

Function: The constructor for a handle value of NSError.

Notes: Retains reference number and destructor later releases it.

Handle must be a NSError reference number and should not be zero.

See also:

- 5.4.3 Constructor(Domain as String, Code as Integer, UserInfo as dictionary = nil) 31

5.4.5 error(Domain as String, Code as Integer, UserInfo as dictionary = nil) as NSErrorMBS

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: Creates and initializes an NSError object for a given domain and code with a given userInfo dictionary.

Notes: domain: The error domain—this can be one of the predefined NSError domains, or an arbitrary string describing a custom domain. domain must not be nil.

code: The error code for the error.

dict: The userInfo dictionary for the error. userInfo may be nil.

Returns an NSErrorMBS object for domain with the specified error code and the dictionary of arbitrary data userInfo.

5.4.6 NSCocoaErrorDomain as String

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: The cocoa error domain.

5.4.7 NSFilePathErrorKey as String

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: One of the user info dictionary keys.

Notes: Contains the file path of the error.

5.4.8 NSLocalizedDescriptionKey as String

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: One of the user info dictionary keys.

Notes: The corresponding value is a localized string representation of the error that, if present, will be returned by localizedDescription.

5.4.9 NSLocalizedFailureReasonErrorKey as String

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: One of the user info dictionary keys.

Notes: The corresponding value is a localized string representation containing the reason for the failure that, if present, will be returned by localizedFailureReason.

5.4.10 NSLocalizedRecoveryOptionsErrorKey as String

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: One of the user info dictionary keys.

Notes: The corresponding value is an array containing the localized titles of buttons appropriate for displaying in an alert panel.

The first string is the title of the right-most and default button, the second the one to the left, and so on. The recovery options should be appropriate for the recovery suggestion returned by localizedRecoverySuggestion.

5.4.11 NSLocalizedRecoverySuggestionErrorKey as String

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: One of the user info dictionary keys.

Notes: The corresponding value is a string containing the localized recovery suggestion for the error.

This string is suitable for displaying as the secondary message in an alert panel.

5.4.12 NSMachErrorDomain as String

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: Error domain for Mach errors.

5.4.13 NSOSStatusErrorDomain as String

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: Error domain for Mac OS 9/Carbon errors.

5.4.14 NSPOSIXErrorDomain as String

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: Error domain for unix errors.

5.4.15 NSRecoveryAttempterErrorKey as String

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: One of the user info dictionary keys.

Notes: The corresponding value is an object that conforms to the NSErrorRecoveryAttempting informal protocol.

The recovery attempter must be an object that can correctly interpret an index into the array returned by recoveryAttempter.

5.4.16 NSStringEncodingErrorKey as String

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: One of the user info dictionary keys.

Notes: The corresponding value is an NSNumber object containing the NSStringEncoding value.

5.4.17 NSUnderlyingErrorKey as String

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: One of the user info dictionary keys.

Notes: The corresponding value is an error that was encountered in an underlying implementation and caused the error that the receiver represents to occur.

5.4.18 NSErrorKey as String

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: One of the user info dictionary keys.

Notes: The corresponding value is an NSError object.

5.4.19 Properties

5.4.20 code as Integer

Plugin Version: 7.7, Platform: macOS, Targets: All.

Function: This is a domain specific error code.

Notes: (Read only property)

5.4.21 description as string

Plugin Version: 11.0, Platform: macOS, Targets: All.

Function: Returns the description for this object.

Notes: (Read only property)

5.4.22 domain as string

Plugin Version: 7.7, Platform: macOS, Targets: All.

Function: The error domain.

Notes: Domains are described by names that are arbitrary strings used to differentiate groups of codes; for custom domain using reverse-DNS naming will help avoid conflicts.
(Read only property)

5.4.23 Handle as Integer

Plugin Version: 7.7, Platform: macOS, Targets: All.

Function: The internal used handle for the NSError reference.

Notes: (Read and Write property)

5.4.24 localizedDescription as string

Plugin Version: 7.7, Platform: macOS, Targets: All.

Function: The localized error description.

Example:

```
Var f as FolderItem=SpecialFolder.Desktop.Child("test.mov")
Var q as new QTKitMovieMBS(f)
Var e as NSErrorMBS
```

```
f=SpecialFolder.Desktop.Child("test2.aif")
```

```
MsgBox str(q.Handle)
```

```
if q.exportToFile(f,e,"AIFF","soun","") then
MsgBox "ok"
else
MsgBox "Fail"
end if
```

```
if e<>Nil then
MsgBox e.localizedDescription
end if
```

Notes: The primary user-presentable message for the error. This method can be overridden by subclasses wishing to present better error strings. By default this looks for NSLocalizedDescriptionKey in the user info. If not present, it manufactures a string from the domain and code. Also, for some of the built-in domains it

knows about, it might try to fetch an error string by calling a domain-specific function. In the absence of a custom error string, the manufactured one might not be suitable for presentation to the user, but can be used in logs or debugging.

(Read only property)

5.4.25 `localizedFailureReason` as string

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Returns a string containing the localized explanation of the reason for the error.

Notes: A string containing the localized explanation of the reason for the error. By default this method returns the object in the user info dictionary for the key `NSLocalizedStringFailureReasonErrorKey`.

This method can be overridden by subclasses to present customized error strings.

Available in Mac OS X v10.4 and later.

(Read only property)

5.4.26 `localizedRecoverySuggestion` as string

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Returns a string containing the localized recovery suggestion for the error.

Notes: Returns a string containing the localized recovery suggestion for the error. By default this method returns the object in the user info dictionary for the key `NSLocalizedStringRecoverySuggestionErrorKey`. If the user info dictionary doesn't contain a value for `NSLocalizedStringRecoverySuggestionErrorKey`, nil is returned.

The returned string is suitable for displaying as the secondary message in an alert panel.

This method can be overridden by subclasses to present customized recovery suggestion strings.

Available in Mac OS X v10.4 and later.

(Read only property)

5.4.27 `userInfo` as dictionary

Plugin Version: 13.2, Platform: macOS, Targets: All.

Function: Returns the receiver's user info dictionary.

Notes: The receiver's user info dictionary, or nil if the user info dictionary has not been set.

(Read only property)

5.5 class NExceptionHandlerMBS

5.5.1 class NExceptionHandlerMBS

Plugin Version: 13.2, Platform: macOS, Targets: All.

Function: The class for a global handler to catch unhandled cocoa exceptions.

Notes: Previous plugin versions tried to show a dialog to inform you. Now you can intercept that. If code is in this event, we do not show the dialog from the plugin.

Blog Entries

- [Xojo Tips and Tricks](#)
- [MBS Xojo / Real Studio Plugins, version 17.0pr4](#)
- [MBS Xojo / Real Studio Plugins, version 13.2pr3](#)

5.5.2 Methods

5.5.3 Disable

Plugin Version: 17.0, Platform: macOS, Targets: All.

Function: Disables the global exception handler.

5.5.4 Enable

Plugin Version: 17.0, Platform: macOS, Targets: All.

Function: Enables the global exception handler.

Notes: By default the MBS Plugin automatically enables it when you use Cocoa classes.

5.5.5 Events

5.5.6 CaughtException(e as NExceptionHandlerMBS, IsMainThread as boolean)

Plugin Version: 13.2, Platform: macOS, Targets: .

Function: An exception was caught.

Notes: If IsMainThread is true, you can show a dialog/window. But if it's false, you may be in trouble on a worker thread and showing a dialog can cause more trouble.

5.6 class NSEExceptionMBS

5.6.1 class NSEExceptionMBS

Plugin Version: 7.4, Platform: macOS, Targets: All.

Function: The Cocoa exception class.

Example:

```
Var m1 as new NSMenuMBS
Var m2 as new NSMenuMBS
Var n as new NSMenuItemMBS
```

```
n.CreateMenuItem
```

```
m1.addItem n
m2.addItem n // raises an exception as a menuItem can't be in two menus.
```

```
Exception e as NSEExceptionMBS
MsgBox e.Message
```

```
// e.reason: "Item to be inserted into menu already is in another menu"
// e.name: "NSInternalInconsistencyException"
// e.message: "A Cocoa NSInternalInconsistencyException was not handled: Item to be inserted into menu
already is in another menu"
```

Notes: The plugin installs exception handling code. If you use the NSEExceptionMBS class somewhere in your code, the NSEException plugin part will be included and a NSEExceptionMBS object will be Subclass of the RuntimeException class.

This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

Blog Entries

- [MBS Xojo Plugins, version 22.6pr1](#)
- [More than just a wrapper](#)
- [MBS Xojo / Real Studio Plugins, version 14.2pr12](#)
- [MBS Xojo / Real Studio Plugins, version 13.2pr3](#)
- [MBS Plugins 10.3 Release Notes](#)

Xojo Developer Magazine

- [5.6, page 49: Made in the Shade, Using Core Graphics in a REALbasic Project by Toby Rush](#)
- [15.5, pages 46 to 47: Touch√©, Using Apple's Touch Bar with Xojo by Marc Zeedar](#)

5.6.2 Methods

5.6.3 callStackSymbols as string()

Plugin Version: 13.2, Platform: macOS, Targets: All.

Function: Returns an array containing the current call symbols.

Notes: This method returns an array of strings describing the call stack backtrace at the moment the exception was first raised. The format of each string is non-negotiable and is determined by the backtrace symbols API. (like BacktraceMBS function)

Available in OS X v10.6 and later. On older versions this array is empty.

5.6.4 Constructor

Plugin Version: 13.2, Platform: macOS, Targets: All.

Function: The private constructor.

5.6.5 RaiseException(name as string, reason as string, userInfo as dictionary)

Plugin Version: 13.2, Platform: macOS, Targets: All.

Function: Raises an exception.

Notes: The plugin does not catch it right away here, so this is a way to pass back an exception to the Cocoa frameworks.

5.6.6 Properties

5.6.7 Name as string

Plugin Version: 7.4, Platform: macOS, Targets: All.

Function: The name of the exception. (Its type)

Notes: (Read only property)

5.6.8 Reason as string

Plugin Version: 7.4, Platform: macOS, Targets: All.

Function: Reason the exception was raised.

Notes: (Read only property)

5.6.9 UserInfo as Dictionary

Plugin Version: 13.2, Platform: macOS, Targets: All.

Function: Returns a Dictionary object containing application-specific data pertaining to the receiver.

Notes: Returns nil if no application-specific data exists. As an example, if a method's return value caused the exception to be raised, the return value might be available to the exception handler through this method. (Read only property)

5.6.10 Constants

Constants

| Constant | Value | Description |
|----------------------------------|------------------------------------|-----------------------------|
| NSDestinationInvalidException | "NSDestinationInvalidException" | One of the exception names. |
| NSGenericException | "NSGenericException" | One of the exception names. |
| NSInternalInconsistencyException | "NSInternalInconsistencyException" | One of the exception names. |
| NSInvalidArgumentException | "NSInvalidArgumentException" | One of the exception names. |
| NSInvalidReceivePortException | "NSInvalidReceivePortException" | One of the exception names. |
| NSInvalidSendPortException | "NSInvalidSendPortException" | One of the exception names. |
| NSMallocException | "NSMallocException" | One of the exception names. |
| NSObjectInaccessibleException | "NSObjectInaccessibleException" | One of the exception names. |
| NSObjectNotAvailableException | "NSObjectNotAvailableException" | One of the exception names. |
| NSPortReceiveException | "NSPortReceiveException" | One of the exception names. |
| NSPortSendException | "NSPortSendException" | One of the exception names. |
| NSPortTimeoutException | "NSPortTimeoutException" | One of the exception names. |
| NSRangeException | "NSRangeException" | One of the exception names. |

5.7 class NSPointMBS

5.7.1 class NSPointMBS

Plugin Version: 9.1, Platform: macOS, Targets: All.

Function: A Xojo class for the point structure in Cocoa.

Example:

```
Var n as NSPointMBS = NSMakePointMBS(500,600)
MsgBox n.String
```

Blog Entries

- [MBS Xojo / Real Studio Plugins, version 16.1pr1](#)
- [MBS REALbasic plug-in 9.6](#)

5.7.2 Methods

5.7.3 Constructor

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Creates an empty point.

Example:

```
Var p as new NSPointMBS
MsgBox p // shows { 0 ,0 }
```

See also:

- [5.7.4 Constructor\(p as Ptr\)](#) 41
- [5.7.5 Constructor\(s as string\)](#) 42
- [5.7.6 Constructor\(x as Double, y as Double\)](#) 42

5.7.4 Constructor(p as Ptr)

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: Creates a new instance using data at the pointer.

Notes: Make sure the pointer is valid and has the right data and size.

See also:

- [5.7.3 Constructor](#) 41

- 5.7.5 Constructor(s as string) 42
- 5.7.6 Constructor(x as Double, y as Double) 42

5.7.5 Constructor(s as string)

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Creates a new NSPoint object using the given string.

Example:

```
Var p as new NSPointMBS(" { 3,4 } ")
MsgBox p // shows { 3 ,4 }
```

See also:

- 5.7.3 Constructor 41
- 5.7.4 Constructor(p as Ptr) 41
- 5.7.6 Constructor(x as Double, y as Double) 42

5.7.6 Constructor(x as Double, y as Double)

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Creates a new NSPoint object using the given values.

See also:

- 5.7.3 Constructor 41
- 5.7.4 Constructor(p as Ptr) 41
- 5.7.5 Constructor(s as string) 42

5.7.7 Equal(other as NSPointMBS) as boolean

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Whether two points are equal.

5.7.8 Operator_Convert as String

Plugin Version: 9.6, Platform: macOS, Targets: All.

5.7. CLASS NSPOINTMBS

Function: Converts the object to string.

Example:

```
Var p as new NSPointMBS(1,2)
```

```
MsgBox p // shows { 1 ,2 }
```

5.7.9 String as String

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Returns the string representation of this point.

Example:

```
Var p as new NSPointMBS(1,2)
```

```
MsgBox p.String // shows { 1,2 }
```

5.7.10 Zero as NSPointMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: Returns a point with all values being zero.

5.7.11 Properties

5.7.12 Handle as Ptr

Plugin Version: 16.1, Platform: macOS, Targets: All.

Function: The pointer to the internal data structure.

Notes: May be useful for passing to declares requiring a NSPoint*.

Size of structure is 8 bytes for 32-bit (two singles) and 16 bytes for 64-bit (two doubles).

(Read only property)

5.7.13 X as Double

Plugin Version: 9.1, Platform: macOS, Targets: All.

Function: The horizontal coordinate.

Notes: (Read and Write property)

5.7.14 Y as Double

Plugin Version: 9.1, Platform: macOS, Targets: All.

Function: The vertical coordinate.

Notes: (Read and Write property)

5.8 class NSRangeMBS

5.8.1 class NSRangeMBS

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: This is the Cocoa class for a Range.

Blog Entries

- [Styled Text for Labels in your Xojo iOS app](#)
- [MBS Xojo / Real Studio Plugins, version 16.1pr1](#)
- [Tip of the day: Adding links to Textarea on OS X](#)
- [Apply fonts to font PopupMenu](#)
- [Nearly 2000 new Functions in the 9.6 prerelease of MBS](#)
- [MBS REALbasic plug-in 9.6](#)

Xojo Developer Magazine

- [7.6, page 8: News](#)

5.8.2 Methods

5.8.3 Constructor

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Creates an empty range.

Example:

```
Var r as new NSRangeMBS
MsgBox r // { 0, 0 }
```

See also:

- [5.8.4 Constructor\(Location as UInt32, Length as UInt32\)](#) 46
- [5.8.5 Constructor\(p as Ptr\)](#) 46
- [5.8.6 Constructor\(s as string\)](#) 46

5.8.4 Constructor(Location as UInt32, Length as UInt32)

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Creates a new range with the given values.

See also:

- 5.8.3 Constructor 45
- 5.8.5 Constructor(p as Ptr) 46
- 5.8.6 Constructor(s as string) 46

5.8.5 Constructor(p as Ptr)

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: Creates a new instance using data at the pointer.

Notes: Make sure the pointer is valid and has the right data and size.

See also:

- 5.8.3 Constructor 45
- 5.8.4 Constructor(Location as UInt32, Length as UInt32) 46
- 5.8.6 Constructor(s as string) 46

5.8.6 Constructor(s as string)

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Creates a new NSRange object using the given string.

Example:

```
Var r as new NSRangeMBS(" { 3, 4 } ")
MsgBox r // { 3, 4 }
```

See also:

- 5.8.3 Constructor 45
- 5.8.4 Constructor(Location as UInt32, Length as UInt32) 46
- 5.8.5 Constructor(p as Ptr) 46

5.8.7 Equal(other as NSRangeMBS) as boolean

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Whether two ranges are equal.

5.8.8 Intersection(other as NSRangeMBS) as NSRangeMBS

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Returns the intersection of the two ranges.

5.8.9 LocationInRange(location as UInt32) as boolean

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Whether the location is in the range.

5.8.10 Operator_Convert as String

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Converts the object to string.

Example:

```
Var r as new NSRangeMBS(" { 3, 4 } ")
MsgBox r // { 3, 4 }
```

5.8.11 String as String

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Returns the string representation of this range.

Example:

```
Var r as new NSRangeMBS(" { 3, 4 } ")
MsgBox r.String // { 3, 4 }
```

5.8.12 Union(other as NSRangeMBS) as NSRangeMBS

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Creates the union of two ranges.

5.8.13 Properties

5.8.14 Handle as Ptr

Plugin Version: 16.1, Platform: macOS, Targets: All.

Function: The pointer to the internal data structure.

Notes: May be useful for passing to declares requiring a NSRange*.
(Read only property)

5.8.15 Length as UInt32

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: The length of the range.

Example:

```
Var r as new NSRangeMBS(" { 3, 4 } ")  
MsgBox str(R.Length) // 4
```

Notes: (Read and Write property)

5.8.16 Location as UInt32

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: The position of the range.

Notes: (Read and Write property)

5.8.17 MaxRange as UInt32

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: The maximum value of the range.

Notes: Same as location+length.

5.8. *CLASS NSRANGEMBS*

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(Read only property)

5.9 class NSRectMBS

5.9.1 class NSRectMBS

Plugin Version: 9.1, Platform: macOS, Targets: All.

Function: A Xojo class for the rect structure in Cocoa.

Example:

```
Var n as NSRectMBS = NSMakeRectMBS(100,200,500,600)
MsgBox n.String
```

Blog Entries

- [News from the MBS Xojo Plugins Version 24.4](#)
- [Several ways for picture to PDF in MBS Plugins](#)
- [MBS Xojo Plugins, version 17.3pr4](#)
- [MBS Xojo / Real Studio Plugins, version 16.1pr1](#)
- [Apply fonts to font PopupMenu](#)
- [MBS Real Studio Plugins, version 12.1pr1](#)
- [MBS REALbasic plug-in 9.6](#)

5.9.2 Methods

5.9.3 Constructor

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Creates an empty rectangle.

Example:

```
Var p as new NSRectMBS
MsgBox p // shows { { 0 ,0 } , { 0 ,0 } }
```

See also:

- 5.9.4 Constructor(p as Ptr) 51
- 5.9.5 Constructor(s as string) 51
- 5.9.6 Constructor(X as Double, Y as Double, W as Double, H as Double) 51

5.9.4 Constructor(p as Ptr)

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: Creates a new instance using data at the pointer.

Notes: Make sure the pointer is valid and has the right data and size.

See also:

- 5.9.3 Constructor 50
- 5.9.5 Constructor(s as string) 51
- 5.9.6 Constructor(X as Double, Y as Double, W as Double, H as Double) 51

5.9.5 Constructor(s as string)

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Creates a new NSRect object using the given string.

Example:

```
Var p as new NSRectMBS(" { { 1,2 } , { 3,4 } } ")  
MsgBox p // shows { { 1, 2 } , { 3, 4 } }
```

See also:

- 5.9.3 Constructor 50
- 5.9.4 Constructor(p as Ptr) 51
- 5.9.6 Constructor(X as Double, Y as Double, W as Double, H as Double) 51

5.9.6 Constructor(X as Double, Y as Double, W as Double, H as Double)

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Creates a new NSRect object using the given values.

See also:

- 5.9.3 Constructor 50
- 5.9.4 Constructor(p as Ptr) 51
- 5.9.5 Constructor(s as string) 51

5.9.7 Contains(other as NSPointMBS) as boolean

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Whether the rectangle contains the given point.

See also:

- 5.9.8 Contains(other as NSRectMBS) as boolean 52

5.9.8 Contains(other as NSRectMBS) as boolean

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Whether the rectangle contains the given rectangle.

See also:

- 5.9.7 Contains(other as NSPointMBS) as boolean 52

5.9.9 Equal(other as NSRectMBS) as boolean

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Whether two rectangles are equal.

5.9.10 Inset(dx as Double, dy as Double) as NSRectMBS

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Insets the rectangle by the given delta.

Example:

```
Var p as new NSRectMBS(1.1,2.2,3.3,4.4)
Var r as NSRectMBS = p.Inset(2,3)
MsgBox r.String // shows { { 3.1, 5.2 } , { -0.7, -1.6 } }
```

5.9.11 Integral as NSRectMBS

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Returns the integral of the rectangle.

Example:

```
Var p as new NSRectMBS(1.1,2.2,3.3,4.4)
Var r as NSRectMBS = p.Integral
```

```
MsgBox r.String // shows { { 1, 2 } , { 4, 5 } }
```

5.9.12 Intersection(other as NSRectMBS) as NSRectMBS

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Returns the intersection of two rectangles.

5.9.13 Intersects(other as NSRectMBS) as boolean

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Returns the intersection of the rectangle with the other rectangle.

5.9.14 Operator_Convert as String

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Converts the object to string.

Example:

```
Var p as new NSRectMBS(1,2,3,4)
MsgBox p // shows { { 1, 2 } , { 3, 4 } }
```

5.9.15 String as String

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Returns the string representation of this point.

Example:

```
Var p as new NSRectMBS(1,2,3,4)
MsgBox p.String // shows { { 1, 2 } , { 3, 4 } }
```

5.9.16 Union(other as NSRectMBS) as NSRectMBS

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Returns the union of two rectangles.

5.9.17 Zero as NSRectMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: Returns a rect with all values being zero.

5.9.18 Properties

5.9.19 Handle as Ptr

Plugin Version: 16.1, Platform: macOS, Targets: All.

Function: The pointer to the internal data structure.

Notes: May be useful for passing to declares requiring a NSRect*.

Size of structure is 16 bytes for 32-bit (four singles) and 32 bytes for 64-bit (four doubles).

(Read only property)

5.9.20 Height as Double

Plugin Version: 9.1, Platform: macOS, Targets: All.

Function: The height of this rectangle.

Notes: (Read and Write property)

5.9.21 IsEmpty as boolean

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Whether the rectangle is empty.

Notes: (Read only property)

5.9.22 MaxX as Double

Plugin Version: 17.3, Platform: macOS, Targets: All.

Function: Returns maximum x coordinate.

Notes: return x + width.

(Read only property)

5.9.23 MaxY as Double

Plugin Version: 17.3, Platform: macOS, Targets: All.

Function: Returns maximum y coordinate.

Notes: return y + height.

(Read only property)

5.9.24 MidX as Double

Plugin Version: 17.3, Platform: macOS, Targets: All.

Function: Returns center x coordinate.

Notes: (Read only property)

5.9.25 MidY as Double

Plugin Version: 17.3, Platform: macOS, Targets: All.

Function: Returns center y coordinate.

Notes: (Read only property)

5.9.26 MinX as Double

Plugin Version: 17.3, Platform: macOS, Targets: All.

Function: Returns x coordinate.

Notes: (Read only property)

5.9.27 MinY as Double

Plugin Version: 17.3, Platform: macOS, Targets: All.

Function: Returns y coordinate.

Notes: (Read only property)

5.9.28 Origin as NSPointMBS

Plugin Version: 9.1, Platform: macOS, Targets: All.

Function: The origin of the rectangle.

Notes: (Read and Write property)

5.9.29 Size as NSSizeMBS

Plugin Version: 9.1, Platform: macOS, Targets: All.

Function: The size of the rectangle.

Notes: (Read and Write property)

5.9.30 Width as Double

Plugin Version: 9.1, Platform: macOS, Targets: All.

Function: The width of this rectangle.

Notes: (Read and Write property)

5.9.31 X as Double

Plugin Version: 9.1, Platform: macOS, Targets: All.

Function: The horizontal coordinate.

Notes: (Read and Write property)

5.9.32 Y as Double

Plugin Version: 9.1, Platform: macOS, Targets: All.

Function: The vertical coordinate.

Notes: (Read and Write property)

5.10 class NSSizeMBS

5.10.1 class NSSizeMBS

Plugin Version: 9.1, Platform: macOS, Targets: All.

Function: A Xojo class for the size structure in Cocoa.

Example:

```
Var n as NSSizeMBS = NSMakeSizeMBS(500,600)
MsgBox n.String
```

Blog Entries

- [MBS Xojo / Real Studio Plugins, version 16.1pr1](#)
- [Apply fonts to font PopupMenu](#)
- [MBS REALbasic plug-in 9.6](#)

5.10.2 Methods

5.10.3 Constructor

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Creates an empty size.

Example:

```
Var p as new NSSizeMBS
MsgBox p // shows { 0 ,0 }
```

See also:

- [5.10.4 Constructor\(p as Ptr\)](#) 57
- [5.10.5 Constructor\(s as string\)](#) 58
- [5.10.6 Constructor\(Width as Double, Height as Double\)](#) 58

5.10.4 Constructor(p as Ptr)

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: Creates a new instance using data at the pointer.

Notes: Make sure the pointer is valid and has the right data and size.

See also:

- 5.10.3 Constructor 57
- 5.10.5 Constructor(s as string) 58
- 5.10.6 Constructor(Width as Double, Height as Double) 58

5.10.5 Constructor(s as string)

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Creates a new NSSize object using the given string.

Example:

```
Var p as new NSSizeMBS(" { 1,2 } ")
MsgBox p // shows { 1, 2 }
```

See also:

- 5.10.3 Constructor 57
- 5.10.4 Constructor(p as Ptr) 57
- 5.10.6 Constructor(Width as Double, Height as Double) 58

5.10.6 Constructor(Width as Double, Height as Double)

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Creates a new NSSize object using the given values.

See also:

- 5.10.3 Constructor 57
- 5.10.4 Constructor(p as Ptr) 57
- 5.10.5 Constructor(s as string) 58

5.10.7 Equal(other as NSSizeMBS) as boolean

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Whether two sizes are equal.

5.10.8 Operator_Convert as String

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Converts the object to string.

Example:

```
Var p as new NSSizeMBS(1,2)
MsgBox p // shows { 1, 2 }
```

5.10.9 String as String

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Returns the string representation of this size object.

Example:

```
Var p as new NSSizeMBS(1,2)
MsgBox p.String // shows { 1, 2 }
```

5.10.10 Zero as NSSizeMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: Returns a size with all values being zero.

5.10.11 Properties

5.10.12 Handle as Ptr

Plugin Version: 16.1, Platform: macOS, Targets: All.

Function: The pointer to the internal data structure.

Notes: May be useful for passing to declares requiring a NSSize*.

Size of structure is 8 bytes for 32-bit (two singles) and 16 bytes for 64-bit (two doubles).

(Read only property)

5.10.13 Height as Double

Plugin Version: 9.1, Platform: macOS, Targets: All.

Function: The height of this size.

Notes: (Read and Write property)

5.10.14 Width as Double

Plugin Version: 9.1, Platform: macOS, Targets: All.

Function: The width of this size.

Notes: (Read and Write property)

Chapter 6

CoreImage

6.1 class NSAffineTransformMBS

6.1.1 class NSAffineTransformMBS

Plugin Version: 7.3, Platform: macOS, Targets: All.

Function: A class for transformation.

Notes: As being used by CoreImage and by the NS* classes, it is a free plugin class requiring no registration.

Blog Entries

- [MBS Xojo Plugins, version 20.2pr2](#)
- [Tip of the day: Rotate image with CoreImage](#)
- [CocoaBase needs MacOSXCG](#)
- [MBS REALbasic plug-in 9.6](#)

6.1.2 Methods

6.1.3 appendTransform(transform as NSAffineTransformMBS)

Plugin Version: 7.3, Platform: macOS, Targets: All.

Function: Transforms the transformation by applying the given transform on the current one.

6.1.4 CGAffineTransformToNSAffineTransform(CGAffineTransform as Variant) as NSAffineTransformMBS

Plugin Version: 15.1, Platform: macOS, Targets: All.

Function: Converts NSAffineTransformMBS to CGAffineTransformMBS.

Example:

```
Var n as new NSAffineTransformMBS(1,2,3,4,5,6)
Var c as CGAffineTransformMBS = NSAffineTransformMBS.NSAffineTransformToCGAffineTransform(n)
Var r as NSAffineTransformMBS = NSAffineTransformMBS.CGAffineTransformToNSAffineTransform(c)
```

Break // check in debugger

Notes: To reduce plugin interdependencies, the parameter is declared as Variant and not as CGAffineTransformMBS.

6.1.5 Constructor

Plugin Version: 7.3, Platform: macOS, Targets: All.

Function: The constructor to create a new transformation.

Notes: On success the handle property will not be 0.

See also:

- 6.1.6 Constructor(m11 as Double, m12 as Double, m21 as Double, m22 as Double, tx as Double, ty as Double) 62
- 6.1.7 Constructor(transform as NSAffineTransformMBS) 62

6.1.6 Constructor(m11 as Double, m12 as Double, m21 as Double, m22 as Double, tx as Double, ty as Double)

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: Creates a new NSAffineTransformMBS based on the given values.

See also:

- 6.1.5 Constructor 62
- 6.1.7 Constructor(transform as NSAffineTransformMBS) 62

6.1.7 Constructor(transform as NSAffineTransformMBS)

Plugin Version: 7.3, Platform: macOS, Targets: All.

Function: Creates a new transformation based on the values of an existing transformation.

Notes: On success the handle property will not be 0.

See also:

- 6.1.5 Constructor 62
- 6.1.6 Constructor(m11 as Double, m12 as Double, m21 as Double, m22 as Double, tx as Double, ty as Double) 62

6.1.8 `getValues`(byref m11 as Double, byref m12 as Double, byref m21 as Double, byref m22 as Double , byref tx as Double, byref tY as Double)

Plugin Version: 7.3, Platform: macOS, Targets: All.

Function: Copies all the values from the internal matrix.

6.1.9 `invert`

Plugin Version: 7.3, Platform: macOS, Targets: All.

Function: Inverts the transformation.

6.1.10 `NSAffineTransformToCGAffineTransform`(NSAffineTransform as NSAffineTransformMBS) as Variant

Plugin Version: 15.1, Platform: macOS, Targets: All.

Function: Converts NSAffineTransformMBS to CGAffineTransformMBS.

Example:

```
Var n as new NSAffineTransformMBS(1,2,3,4,5,6)
Var c as CGAffineTransformMBS = NSAffineTransformMBS.NSAffineTransformToCGAffineTransform(n)
Var r as NSAffineTransformMBS = NSAffineTransformMBS.CGAffineTransformToNSAffineTransform(c)
```

`Break // check in debugger`

Notes: To reduce plugin interdependencies, the result is declared as Variant and not as CGAffineTransformMBS.

6.1.11 `Operator_Convert` as String

Plugin Version: 20.2, Platform: macOS, Targets: All.

Function: Returns stringValue.

6.1.12 Operator__Multiply(other as NSAffineTransformMBS) as NSAffineTransformMBS

Plugin Version: 20.2, Platform: macOS, Targets: All.

Function: Multiplies both matrix where self is on the left side.

6.1.13 Operator__MultiplyRight(other as NSAffineTransformMBS) as NSAffineTransformMBS

Plugin Version: 20.2, Platform: macOS, Targets: All.

Function: Multiplies both matrix where self is on the right side.

6.1.14 prependTransform(transform as NSAffineTransformMBS)

Plugin Version: 7.3, Platform: macOS, Targets: All.

Function: Transforms the transformation by applying the given transform on the current one.

6.1.15 rotateByDegrees(angle as Double)

Plugin Version: 7.3, Platform: macOS, Targets: All.

Function: Rotates transformation by the given angle in degrees.

Example:

```
Var t as new NSAffineTransformMBS
t.rotateByDegrees 90 // rotate by 90 degrees
```

6.1.16 rotateByRadians(angle as Double)

Plugin Version: 7.3, Platform: macOS, Targets: All.

Function: Rotates transformation by the given angle in radians.

Example:


```
const pi=3.14159265
Var t as new NSAffineTransformMBS
t.rotateByDegrees pi // roatet by 180 degrees
```

6.1.17 scale(scale as Double)

Plugin Version: 7.3, Platform: macOS, Targets: All.

Function: Scales the transformation.

Example:

```
Var t as new NSAffineTransformMBS
t.scale 2.0 // double size
```

See also:

- 6.1.18 scale(scaleX as Double, scaleY as Double)

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6.1.18 scale(scaleX as Double, scaleY as Double)

Plugin Version: 7.3, Platform: macOS, Targets: All.

Function: Scales transformation.

Example:

```
Var t as new NSAffineTransformMBS
t.scale 1,2
```

See also:

- 6.1.17 scale(scale as Double)

65

6.1.19 setValues(m11 as Double, m12 as Double, m21 as Double, m22 as Double, tx as Double, tY as Double)

Plugin Version: 7.3, Platform: macOS, Targets: All.

Function: Sets all the values from the internal matrix.

6.1.20 transform as NSAffineTransformMBS

Plugin Version: 12.5, Platform: macOS, Targets: All.

Function: Creates and returns a new `NSAffineTransform` object initialized to the identity matrix.

Example:

```
Var a as NSAffineTransformMBS = NSAffineTransformMBS.transform  
MsgBox str(a.m11)+", "+str(a.m12)+", "+str(a.m21)+", "+str(a.m22)+", "+str(a.tx)+", "+str(a.ty)
```

Notes: This matrix transforms any point to the same point.

6.1.21 `transformBezierPath(NSBezierPath as Variant) as Variant`

Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

Function: Transforms a bezier path with current transformation.

6.1.22 `transformPoint(byref x as Double, byref y as Double)`

Plugin Version: 7.3, Platform: macOS, Targets: All.

Function: Transforming the given point.

6.1.23 `transformSize(byref width as Double, byref height as Double)`

Plugin Version: 7.3, Platform: macOS, Targets: All.

Function: Transforming the given size.

6.1.24 `translate(deltaX as Double, deltaY as Double)`

Plugin Version: 7.3, Platform: macOS, Targets: All.

Function: Translates by the given delta.

6.1.25 Properties

6.1.26 `Data as MemoryBlock`

Plugin Version: 15.1, Platform: macOS, Targets: All.

Function: The transform data structure.

Example:

```
Var n as new NSAffineTransformMBS(1,2,3,4,5,6)
```

```
Var m as MemoryBlock = n.Data
```

```
Break // check in debugger
```

Notes: Returns a copy of the structure as memoryblock.
Can be set with memoryblock of right size and content.

Due to CoreGraphics using 32bit floats in 32bit app, you need to use SingleValue there in the memoryblock which has a size of 24 bytes.

For 64-bit application, the sizes double and you need to use DoubleValue.
(Read and Write property)

6.1.27 Handle as Integer

Plugin Version: 20.2, Platform: macOS, Targets: All.

Function: The internal object reference.

Notes: (Read only property)

6.1.28 m11 as Double

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: The matrix value at position 1/1.

Notes: (Read only property)

6.1.29 m12 as Double

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: The matrix value at position 1/2.

Notes: (Read only property)

6.1.30 m21 as Double

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: The matrix value at position 2/1.

Notes: (Read only property)

6.1.31 m22 as Double

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: The matrix value at position 2/2.

Notes: (Read only property)

6.1.32 StringValue as String

Plugin Version: 20.2, Platform: macOS, Targets: All.

Function: The string representation.

Notes: (Read only property)

6.1.33 tx as Double

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: The translate X value.

Notes: (Read only property)

6.1.34 ty as Double

Plugin Version: 9.6, Platform: macOS, Targets: All.

Function: The translate Y value.

Notes: (Read only property)

Chapter 7

iCloud

7.1 class NSSortDescriptorMBS

7.1.1 class NSSortDescriptorMBS

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: The cocoa class for sort descriptions.

Example:

```
Var n as new NSSortDescriptorMBS("Hello", true)
MsgBox str(n.key)
```

Notes: An instance of NSSortDescriptor describes a basis for ordering objects by specifying the property to use to compare the objects, the method to use to compare the properties, and whether the comparison should be ascending or descending. Instances of NSSortDescriptor are immutable.

You construct an instance of NSSortDescriptor by specifying the key path of the property to be compared, the order of the sort (ascending or descending), and (optionally) a selector to use to perform the comparison. The three-argument constructor allows you to specify other comparison selectors such as caseInsensitiveCompare: and localizedCompare:. Sorting raises an exception if the objects to be sorted do not respond to the sort descriptor's comparison selector.

Note: Many of the descriptions of NSSortDescriptor methods refer to "property key". This, briefly, is a string (key) that identifies a property (an attribute or relationship) of an object. You can find a discussion of this terminology in "Object Modeling" in Cocoa Fundamentals Guide and in Key-Value Coding Programming Guide.

There are a number of situations in which you can use sort descriptors, for example:

- To sort an array (an instance of NSArray or NSMutableArray—see `sortedArrayUsingDescriptors` and `sortUsingDescriptors`)
- To directly compare two objects (see `compareObject` method)
- To specify how the elements in a table view should be arranged (see `sortDescriptors`)
- To specify how the elements managed by an array controller should be arranged (see `sortDescriptors`)
- If you are using Core Data, to specify the ordering of objects returned from a fetch request (see `sortDescriptors`)

Blog Entries

- [MBS Xojo Plugins, version 17.1pr5](#)
- [MBS Xojo / Real Studio Plugins, version 14.2pr10](#)
- [More notes](#)
- [MBS Real Studio Plugins, version 11.3pr10](#)

7.1.2 Methods

7.1.3 `compareObject(obj1 as variant, obj2 as variant)` as Integer

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: Compares two objects.

Notes: Returns 1, -1 or 0 (zero for equal).

7.1.4 `Constructor(key as string, ascending as boolean)`

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Initializes an NSSortDescriptor object initialized with a given property key path and sort order, and with the default comparison selector.

Example:

```
Var n as new NSSortDescriptorMBS("Hello", true)
MsgBox str(n.key)
```

Notes: `key`: The property key to use when performing a comparison. In the comparison, the property is accessed using key-value coding.

`ascending`: True if the receiver specifies sorting in ascending order, otherwise false.

On success the handle property is not zero.

Available in Mac OS X v10.3 and later.

If you implement the Compare event, we use it on OS X 10.6 and newer.

See also:

- 7.1.5 Constructor(key as string, ascending as boolean, SelectorName as String)

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7.1.5 Constructor(key as string, ascending as boolean, SelectorName as String)

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: Initializes an NSSortDescriptor object initialized with a given property key path and sort order, and with the default comparison selector.

Notes: key: The property key to use when performing a comparison. In the comparison, the property is accessed using key-value coding.

ascending: True if the receiver specifies sorting in ascending order, otherwise false.

On success the handle property is not zero.

Please pass valid name of a selector for the objects. Wrong selector causes trouble, e.g. "localizedCompare:".

Available in Mac OS X v10.3 and later.

See also:

- 7.1.4 Constructor(key as string, ascending as boolean)

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7.1.6 reversedSortDescriptor as NSSortDescriptorMBS

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Returns a copy of the receiver with the sort order reversed.

Example:

```
Var n as NSSortDescriptorMBS
```

```
n = NSSortDescriptorMBS.sortDescriptorWithKey("Hello", true)
```

```
Var x as NSSortDescriptorMBS = n.reversedSortDescriptor
```

```
MsgBox x.key+" "+str(x.ascending)
```

7.1.7 sortDescriptorWithKey(key as string, ascending as boolean) as NSSortDescriptorMBS

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Creates and returns an NSSortDescriptor with the specified key and ordering.

Example:

Var n as NSSortDescriptorMBS

```
n = NSSortDescriptorMBS.sortDescriptorWithKey("Hello", true)
MsgBox n.key
```

Notes: key: The property key to use when performing a comparison. In the comparison, the property is accessed using key-value coding.

ascending: True if the receiver specifies sorting in ascending order, otherwise false.

Returns an NSSortDescriptorMBS object initialized with the specified key and ordering.
Available in Mac OS X 10.3 and newer.

7.1.8 sortDescriptorWithKeyComparator(key as string, ascending as boolean, Comparator as NSComparatorDelegateMBS, tag as Variant = nil) as NSSortDescriptorMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: Creates and returns an NSSortDescriptor object initialized to do with the given ordering and comparator delegate.

Notes: key: The property key to use when performing a comparison. In the comparison, the property is accessed using key-value coding (see Key-Value Coding Programming Guide).

ascending: true if the receiver specifies sorting in ascending order, otherwise false.

Comparator: the comparator to use with delegate declaration "NSComparatorDelegateMBS(obj1 as Variant, obj2 as Variant, tag as Variant) as Integer".

7.1.9 sortDescriptorWithKeyWithCaseInsensitiveCompare(key as string, ascending as boolean) as NSSortDescriptorMBS

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Creates and returns an NSSortDescriptor with the specified key and ordering.

Example:

Var n as NSSortDescriptorMBS

```
n = NSSortDescriptorMBS.sortDescriptorWithKeyWithCaseInsensitiveCompare("Hello", true)
MsgBox n.key
```

Notes: key: The property key to use when performing a comparison. In the comparison, the property is accessed using key-value coding.

ascending: True if the receiver specifies sorting in ascending order, otherwise false.

Returns an NSSortDescriptorMBS object initialized with the specified key and ordering. With case insensitive string comparison.

Available in Mac OS X 10.3 and newer.

7.1.10 sortDescriptorWithKeyWithCompare(key as string, ascending as boolean) as NSSortDescriptorMBS

Plugin Version: 14.2, Platform: macOS, Targets: All.

Function: Creates and returns an NSSortDescriptor with the specified key and ordering.

Example:

```
Var n as NSSortDescriptorMBS
```

```
n = NSSortDescriptorMBS.sortDescriptorWithKeyWithCompare("Hello", true)
MsgBox n.key
```

Notes: key: The property key to use when performing a comparison. In the comparison, the property is accessed using key-value coding.

ascending: True if the receiver specifies sorting in ascending order, otherwise false.

Returns an NSSortDescriptorMBS object initialized with the specified key and ordering. Uses selector "compare:".

Available in Mac OS X 10.3 and newer.

See also:

- 7.1.11 sortDescriptorWithKeyWithCompare(key as string, ascending as boolean, Options as Integer) as NSSortDescriptorMBS 73

7.1.11 sortDescriptorWithKeyWithCompare(key as string, ascending as boolean, Options as Integer) as NSSortDescriptorMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: Creates and returns an NSSortDescriptor with the specified key and ordering.

Example:

```
Var n as NSSortDescriptorMBS
```

```
n = NSSortDescriptorMBS.sortDescriptorWithKeyWithCompare("Hello", true)
MsgBox n.key
```

Notes: key: The property key to use when performing a comparison. In the comparison, the property is accessed using key-value coding.

ascending: True if the receiver specifies sorting in ascending order, otherwise false.

Returns an `NSSortDescriptorMBS` object initialized with the specified key and ordering. Uses selector `”compare:options:”`.

Please pass options for `NSString` comparison. e.g. `NSNumericSearch`

Available in Mac OS X 10.3 and newer.

See also:

- 7.1.10 `sortDescriptorWithKeyWithCompare(key as string, ascending as boolean) as NSSortDescriptorMBS` 73

7.1.12 `sortDescriptorWithKeyWithLocalizedCaseInsensitiveCompare(key as string, ascending as boolean) as NSSortDescriptorMBS`

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: Creates and returns an `NSSortDescriptor` with the specified key and ordering.

Example:

```
Var n as NSSortDescriptorMBS
```

```
n = NSSortDescriptorMBS.sortDescriptorWithKeyWithLocalizedCaseInsensitiveCompare(”Hello”, true)
MsgBox n.key
```

Notes: key: The property key to use when performing a comparison. In the comparison, the property is accessed using key-value coding.

ascending: True if the receiver specifies sorting in ascending order, otherwise false.

Returns an `NSSortDescriptorMBS` object initialized with the specified key and ordering. With localized string comparison. With case insensitive string comparison.

Available in Mac OS X 10.3 and newer.

7.1.13 `sortDescriptorWithKeyWithLocalizedCompare(key as string, ascending as boolean) as NSSortDescriptorMBS`

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Creates and returns an `NSSortDescriptor` with the specified key and ordering.

Example:

```
Var n as NSSortDescriptorMBS
```

```
n = NSSortDescriptorMBS.sortDescriptorWithKeyWithLocalizedCompare(”Hello”, true)
MsgBox n.key
```

Notes: key: The property key to use when performing a comparison. In the comparison, the property is accessed using key-value coding.

ascending: True if the receiver specifies sorting in ascending order, otherwise false.

Returns an NSSortDescriptorMBS object initialized with the specified key and ordering. With localized string comparison.

Available in Mac OS X 10.3 and newer.

7.1.14 sortDescriptorWithKeyWithSelector(key as string, ascending as boolean, SelectorName as String) as NSSortDescriptorMBS

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: Creates and returns an NSSortDescriptor with the specified selector, key and ordering.

Notes: key: The property key to use when performing a comparison. In the comparison, the property is accessed using key-value coding.

ascending: True if the receiver specifies sorting in ascending order, otherwise false.

Returns an NSSortDescriptorMBS object initialized with the specified key and ordering.

Please pass valid name of a selector for the objects. Wrong selector causes trouble, e.g. "localizedCompare:".

Available in Mac OS X 10.3 and newer.

7.1.15 Properties

7.1.16 ascending as boolean

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Returns a Boolean value that indicates whether the receiver specifies sorting in ascending order.

Example:

```
Var n as new NSSortDescriptorMBS("Hello", true)
MsgBox str(n.ascending)
```

Notes: (Read only property)

7.1.17 Handle as Integer

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: The internal handle to the NSSortDescriptor object.

Notes: (Read and Write property)

7.1.18 key as string

Plugin Version: 11.3, Platform: macOS, Targets: All.

Function: Returns the receiver's property key path.

Example:

```
Var n as new NSSortDescriptorMBS("Hello", true)
MsgBox str(n.key)
```

Notes: This key path specifies the property that is compared during sorting.
(Read only property)

7.1.19 selector as String

Plugin Version: 17.1, Platform: macOS, Targets: All.

Function: The selector used to sort.

Notes: (Read only property)

7.1.20 Events

7.1.21 Comparator(obj1 as Variant, obj2 as Variant) as Integer

Plugin Version: 17.1, Platform: macOS, Targets: .

Function: The compare event.

7.1.22 Delegates

7.1.23 NSComparatorDelegateMBS(obj1 as Variant, obj2 as Variant, tag as variant) as Integer

Plugin Version: 18.5, Platform: macOS, Targets: All.

Function: The delegate for use with sortDescriptorWithKeyComparator method.

Chapter 8

QuickTime

8.1 class QTAudioChannelDescriptionMBS

8.1.1 class QTAudioChannelDescriptionMBS

Plugin Version: 11.3, Platforms: macOS, Windows, Targets: All.

Function: The description for an audio channel.

Blog Entries

- [MBS Real Studio Plugins, version 11.3pr8](#)

8.1.2 Properties

8.1.3 ChannelFlags as UInt32

Plugin Version: 11.3, Platforms: macOS, Windows, Targets: Desktop only.

Function: Flags that control the interpretation of Coordinates.

Notes: (Read and Write property)

8.1.4 ChannelLabel as UInt32

Plugin Version: 11.3, Platforms: macOS, Windows, Targets: Desktop only.

Function: The AudioChannelLabel that describes the channel.

Notes: (Read and Write property)

8.1.5 Coordinates(index as Integer) as Double

Plugin Version: 11.3, Platforms: macOS, Windows, Targets: Desktop only.

Function: An ordered triple that specifies a precise speaker location.

Notes: Index from 0 to 2.

(Read and Write computed property)

8.1.6 Constants

Coordinates array Indexes

| Constant | Value | Description |
|------------------------------------|-------|---|
| kAudioChannelCoordinates_Azimuth | 0 | For spherical coordinates, 0 is front center, positive is right, negative is left. This is measured in degrees. |
| kAudioChannelCoordinates_BackFront | 1 | For rectangular coordinates, negative is back and positive is front. |
| kAudioChannelCoordinates_Distance | 2 | For spherical coordinates, the units are described by flags. |
| kAudioChannelCoordinates_DownUp | 2 | For rectangular coordinates, negative is below ground level, 0 is ground level, and positive is above ground level. |
| kAudioChannelCoordinates_Elevation | 1 | For spherical coordinates, +90 is zenith, 0 is horizontal, -90 is nadir. measured in degrees. |
| kAudioChannelCoordinates_LeftRight | 0 | For rectangular coordinates, negative is left and positive is right. |

Channel Coordinate Flags

| Constant | Value | Description |
|---|-------|---|
| kAudioChannelFlags_AllOff | 0 | All flags off. |
| kAudioChannelFlags_Meters | 4 | Set to indicate the units are in meters, clear to indicate the units are in feet. This flag applies to the unit cube or unit sphere. |
| kAudioChannelFlags_RectangularCoordinates | 1 | The channel is specified by the cartesian coordinates of the speaker. This flag is mutually exclusive with kAudioChannelFlags_SphericalCoordinates. |
| kAudioChannelFlags_SphericalCoordinates | 2 | The channel is specified by the spherical coordinates of the speaker. This flag is mutually exclusive with kAudioChannelFlags_RectangularCoordinates. |

Channel Label Constants

| Constant | Value | Description |
|---|------------|---|
| kAudioChannelLabel_Ambisonic_W | 200 | |
| kAudioChannelLabel_Ambisonic_X | 201 | |
| kAudioChannelLabel_Ambisonic_Y | 202 | |
| kAudioChannelLabel_Ambisonic_Z | 203 | |
| kAudioChannelLabel_Center | 3 | |
| kAudioChannelLabel_CenterSurround | 9 | WAVE: "Back Center" or plain "Rear Surround" |
| kAudioChannelLabel_CenterSurroundDirect | 44 | back center, non diffuse |
| kAudioChannelLabel_ClickTrack | 304 | |
| kAudioChannelLabel_DialogCentricMix | 43 | |
| kAudioChannelLabel_Discrete | 400 | |
| kAudioChannelLabel_Discrete_0 | &h10000 | |
| kAudioChannelLabel_Discrete_1 | &h10001 | |
| kAudioChannelLabel_Discrete_10 | &h1000A | |
| kAudioChannelLabel_Discrete_11 | &h1000B | |
| kAudioChannelLabel_Discrete_12 | &h1000C | |
| kAudioChannelLabel_Discrete_13 | &h1000D | |
| kAudioChannelLabel_Discrete_14 | &h1000E | |
| kAudioChannelLabel_Discrete_15 | &h1000F | |
| kAudioChannelLabel_Discrete_2 | &h10002 | |
| kAudioChannelLabel_Discrete_3 | &h10003 | |
| kAudioChannelLabel_Discrete_4 | &h10004 | |
| kAudioChannelLabel_Discrete_5 | &h10005 | |
| kAudioChannelLabel_Discrete_6 | &h10006 | |
| kAudioChannelLabel_Discrete_65535 | &h1FFFF | |
| kAudioChannelLabel_Discrete_7 | &h10007 | |
| kAudioChannelLabel_Discrete_8 | &h10008 | |
| kAudioChannelLabel_Discrete_9 | &h10009 | |
| kAudioChannelLabel_ForeignLanguage | 305 | |
| kAudioChannelLabel_Haptic | 45 | |
| kAudioChannelLabel_HeadphonesLeft | 301 | |
| kAudioChannelLabel_HeadphonesRight | 302 | |
| kAudioChannelLabel_HearingImpaired | 40 | |
| kAudioChannelLabel_Left | 1 | |
| kAudioChannelLabel_LeftCenter | 7 | |
| kAudioChannelLabel_LeftSurround | 5 | WAVE: "Back Left" |
| kAudioChannelLabel_LeftSurroundDirect | 10 | WAVE: "Side Left" |
| kAudioChannelLabel_LeftTotal | 38 | matrix encoded 4 channels |
| kAudioChannelLabel_LeftWide | 35 | |
| kAudioChannelLabel_LFE2 | 37 | |
| kAudioChannelLabel_LFEScreen | 4 | |
| kAudioChannelLabel_Mono | 42 | |
| kAudioChannelLabel_MS_Mid | 204 | |
| kAudioChannelLabel_MS_Side | 205 | |
| kAudioChannelLabel_Narration | 41 | |
| kAudioChannelLabel_RearSurroundLeft | 33 | |
| kAudioChannelLabel_RearSurroundRight | 34 | |
| kAudioChannelLabel_Right | 2 | |
| kAudioChannelLabel_RightCenter | 8 | |
| kAudioChannelLabel_RightSurround | 6 | WAVE: "Back Right" |
| kAudioChannelLabel_RightSurroundDirect | 11 | WAVE: "Side Right" |
| kAudioChannelLabel_RightTotal | 39 | matrix encoded 4 channels |
| kAudioChannelLabel_RightWide | 36 | |
| kAudioChannelLabel_TopBackCenter | 17 | |
| kAudioChannelLabel_TopBackLeft | 16 | |
| kAudioChannelLabel_TopBackRight | 18 | |
| kAudioChannelLabel_TopCenterSurround | 12 | |
| kAudioChannelLabel_Unknown | &hFFFFFFFF | Unknown or unspecified other use. |
| kAudioChannelLabel_Unused | 0 | Channel is present, but has no intended use or destination. |

8.2 class QTAudioChannelLayoutMBS

8.2.1 class QTAudioChannelLayoutMBS

Plugin Version: 11.3, Platforms: macOS, Windows, Targets: All.

Function: The class is used to specify channel layouts in files and hardware.

Notes: This class does not use QuickTime functions as it only wraps data structures. And it can be used with Mac App Store and AVFoundation.

Some channel abbreviations used for the constants:

- L - left
- R - right
- C - center
- Ls - left surround
- Rs - right surround
- Cs - center surround
- Rls - rear left surround
- Rrs - rear right surround
- Lw - left wide
- Rw - right wide
- Lsd - left surround direct
- Rsd - right surround direct
- Lc - left center
- Rc - right center
- Ts - top surround
- Vhl - vertical height left
- Vhc - vertical height center
- Vhr - vertical height right
- Lt - left matrix total. for matrix encoded stereo.
- Rt - right matrix total. for matrix encoded stereo.

Blog Entries

- [MBS Real Studio Plugins, version 11.3pr8](#)

8.2.2 Methods

8.2.3 GetNumberOfChannels(layoutTag as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Windows, Targets: Desktop only.

Function: Function to get the number of channels out of an AudioChannelLayoutTag.

Notes: The low 16 bits of an AudioChannelLayoutTag gives the number of channels except for kAudioChannelLayoutTag_UseChannelDescriptions and kAudioChannelLayoutTag_UseChannelBitmap.

8.2.4 Memory as Memoryblock

Plugin Version: 13.0, Platforms: macOS, Windows, Targets: Desktop only.

Function: Returns the audio channel layout as memoryblock, so you can pass it for declares.

8.2.5 Properties

8.2.6 ChannelBitmap as UInt32

Plugin Version: 11.3, Platforms: macOS, Windows, Targets: Desktop only.

Function: If ChannelLayoutTag is set to kAudioChannelLayoutTag_UseChannelBitmap, this field is the channel usage bitmap.

Notes: (Read and Write property)

8.2.7 ChannelLayoutTag as UInt32

Plugin Version: 11.3, Platforms: macOS, Windows, Targets: Desktop only.

Function: The AudioChannelLayoutTag that indicates the layout.

Notes: (Read and Write property)

8.2.8 NumberChannelDescriptions as UInt32

Plugin Version: 11.3, Platforms: macOS, Windows, Targets: Desktop only.

Function: The number of items in the ChannelDescriptions array.

Notes: (Read and Write property)

8.2.9 ChannelDescriptions(index as Integer) as QTAudioChannelDescription-MBS

Plugin Version: 11.3, Platforms: macOS, Windows, Targets: Desktop only.

Function: An array of AudioChannelDescriptions that describe the layout.

Notes: Index from 0 to NumberChannelDescriptions-1.

(Read and Write computed property)

8.2.10 Constants

Channel Bitmap Constants

| Constant | Value | Description |
|---------------------------------------|--------|--------------------------|
| kAudioChannelBit_Center | 4 | |
| kAudioChannelBit_CenterSurround | 256 | WAVE: "Back Center" |
| kAudioChannelBit_Left | 1 | |
| kAudioChannelBit_LeftCenter | 64 | |
| kAudioChannelBit_LeftSurround | 16 | WAVE: "Back Left" |
| kAudioChannelBit_LeftSurroundDirect | 512 | WAVE: "Side Left" |
| kAudioChannelBit_LFEScreen | 8 | |
| kAudioChannelBit_Right | 2 | |
| kAudioChannelBit_RightCenter | 128 | |
| kAudioChannelBit_RightSurround | 32 | WAVE: "Back Right" |
| kAudioChannelBit_RightSurroundDirect | 1024 | WAVE: "Side Right" |
| kAudioChannelBit_TopBackCenter | 65536 | |
| kAudioChannelBit_TopBackLeft | 32768 | |
| kAudioChannelBit_TopBackRight | 131072 | |
| kAudioChannelBit_TopCenterSurround | 2048 | |
| kAudioChannelBit_VerticalHeightCenter | 8192 | WAVE: "Top Front Center" |
| kAudioChannelBit_VerticalHeightLeft | 4096 | WAVE: "Top Front Left" |
| kAudioChannelBit_VerticalHeightRight | 16384 | WAVE: "Top Front Right" |

AAC layout constants

| Constant | Value | Description |
|---|----------|------------------------|
| kAudioChannelLayoutTag_AAC_3_0 | &h720003 | C L R |
| kAudioChannelLayoutTag_AAC_4_0 | &h740004 | C L R Cs |
| kAudioChannelLayoutTag_AAC_5_0 | &h780005 | C L R Ls Rs |
| kAudioChannelLayoutTag_AAC_5_1 | &h7C0006 | C L R Ls Rs Lfe |
| kAudioChannelLayoutTag_AAC_6_0 | &h8D0006 | C L R Ls Rs Cs |
| kAudioChannelLayoutTag_AAC_6_1 | &h8E0007 | C L R Ls Rs Cs Lfe |
| kAudioChannelLayoutTag_AAC_7_0 | &h8F0007 | C L R Ls Rs Rls Rrs |
| kAudioChannelLayoutTag_AAC_7_1 | &h7F0008 | C Lc Rc L R Ls Rs Lfe |
| kAudioChannelLayoutTag_AAC_Octagonal | &h900008 | C L R Ls Rs Rls Rrs Cs |
| kAudioChannelLayoutTag_AAC_Quadraphonic | &h6C0004 | L R Ls Rs |

AC3 layout constants

| Constant | Value | Description |
|----------------------------------|----------|--------------|
| kAudioChannelLayoutTag_AC3_1_0_1 | &h950002 | C LFE |
| kAudioChannelLayoutTag_AC3_2_1_1 | &h990004 | L R Cs LFE |
| kAudioChannelLayoutTag_AC3_3_0 | &h960003 | L C R |
| kAudioChannelLayoutTag_AC3_3_0_1 | &h980004 | L C R LFE |
| kAudioChannelLayoutTag_AC3_3_1 | &h970004 | L C R Cs |
| kAudioChannelLayoutTag_AC3_3_1_1 | &h9A0005 | L C R Cs LFE |

General layout constants

| Constant | Value | Description |
|---|------------|--|
| kAudioChannelLayoutTag_Ambisonic_B_Format | &h6B0004 | W, X, Y, Z |
| kAudioChannelLayoutTag_Binaural | &h6A0002 | Binaural stereo (left, right) |
| kAudioChannelLayoutTag_Cube | &h700008 | left, right, rear left, rear right, top left, top right, t |
| kAudioChannelLayoutTag_DiscreteInOrder | &h930000 | Needs to be ORed with the actual number of chan |
| kAudioChannelLayoutTag_Hexagonal | &h6E0006 | L R Ls Rs C Cs – 60 degree speaker separation |
| kAudioChannelLayoutTag_MatrixStereo | &h670002 | A matrix encoded stereo stream (Lt, Rt) |
| kAudioChannelLayoutTag_MidSide | &h680002 | mid/side recording |
| kAudioChannelLayoutTag_Mono | &h640001 | a standard mono stream |
| kAudioChannelLayoutTag_Octagonal | &h6F0008 | L R Ls Rs C Cs Lw Rw – 45 degree speaker separa |
| kAudioChannelLayoutTag_Pentagonal | &h6D0005 | L R Ls Rs C – 72 degree speaker separation |
| kAudioChannelLayoutTag_Quadraphonic | &h6C0004 | L R Ls Rs – 90 degree speaker separation |
| kAudioChannelLayoutTag_Stereo | &h650002 | A standard stereo stream (L R) - implied playback |
| kAudioChannelLayoutTag_StereoHeadphones | &h660002 | A standard stereo stream (L R) - implied headpho |
| kAudioChannelLayoutTag_Unknown | &hFFFF0000 | needs to be ORed with the actual number of chan |
| kAudioChannelLayoutTag_UseChannelBitmap | &h10000 | Use the bitmap to define the mapping. |
| kAudioChannelLayoutTag_UseChannelDescriptions | 0 | Use the array of AudioChannelDescriptions to defi |
| kAudioChannelLayoutTag_XY | &h690002 | Coincident mic pair (often 2 figure 8's) |

symmetrical layouts layout constants for AudioUnit usage

| Constant | Value | Description |
|------------------------------------|----------|-------------|
| kAudioChannelLayoutTag_AudioUnit_4 | &h6C0004 | |
| kAudioChannelLayoutTag_AudioUnit_5 | &h6D0005 | |
| kAudioChannelLayoutTag_AudioUnit_6 | &h6E0006 | |
| kAudioChannelLayoutTag_AudioUnit_8 | &h6F0008 | |

surround-based layout constants for AudioUnit usage

| Constant | Value | Description |
|--|----------|-------------------------|
| kAudioChannelLayoutTag_AudioUnit_5_0 | &h760005 | L R Ls Rs C |
| kAudioChannelLayoutTag_AudioUnit_5_1 | &h790006 | L R C LFE Ls Rs |
| kAudioChannelLayoutTag_AudioUnit_6_0 | &h8B0006 | L R Ls Rs C Cs |
| kAudioChannelLayoutTag_AudioUnit_6_1 | &h7D0007 | L R C LFE Ls Rs Cs |
| kAudioChannelLayoutTag_AudioUnit_7_0 | &h8C0007 | L R Ls Rs C Rls Rrs |
| kAudioChannelLayoutTag_AudioUnit_7_0_Front | &h940007 | L R Ls Rs C Lc Rc |
| kAudioChannelLayoutTag_AudioUnit_7_1 | &h800008 | L R C LFE Ls Rs Rls Rrs |
| kAudioChannelLayoutTag_AudioUnit_7_1_Front | &h7E0008 | L R C LFE Ls Rs Lc Rc |

DTS layout constants

| Constant | Value | Description |
|----------------------------------|----------|-----------------------------|
| kAudioChannelLayoutTag_DTS_3_1 | &hA80004 | C L R LFE |
| kAudioChannelLayoutTag_DTS_4_1 | &hA90005 | C L R Cs LFE |
| kAudioChannelLayoutTag_DTS_6_0_A | &hAA0006 | Lc Rc L R Ls Rs |
| kAudioChannelLayoutTag_DTS_6_0_B | &hAB0006 | C L R Rls Rrs Ts |
| kAudioChannelLayoutTag_DTS_6_0_C | &hAC0006 | C Cs L R Rls Rrs |
| kAudioChannelLayoutTag_DTS_6_1_A | &hAD0007 | Lc Rc L R Ls Rs LFE |
| kAudioChannelLayoutTag_DTS_6_1_B | &hAE0007 | C L R Rls Rrs Ts LFE |
| kAudioChannelLayoutTag_DTS_6_1_C | &hAF0007 | C Cs L R Rls Rrs LFE |
| kAudioChannelLayoutTag_DTS_6_1_D | &hB60007 | C L R Ls Rs LFE Cs |
| kAudioChannelLayoutTag_DTS_7_0 | &hB00007 | Lc C Rc L R Ls Rs |
| kAudioChannelLayoutTag_DTS_7_1 | &hB10008 | Lc C Rc L R Ls Rs LFE |
| kAudioChannelLayoutTag_DTS_8_0_A | &hB20008 | Lc Rc L R Ls Rs Rls Rrs |
| kAudioChannelLayoutTag_DTS_8_0_B | &hB30008 | Lc C Rc L R Ls Cs Rs |
| kAudioChannelLayoutTag_DTS_8_1_A | &hB40009 | Lc Rc L R Ls Rs Rls Rrs LFE |
| kAudioChannelLayoutTag_DTS_8_1_B | &hB50009 | Lc C Rc L R Ls Cs Rs LFE |

DVD defined layout Constants

| Constant | Value | Description |
|-------------------------------|----------|-----------------|
| kAudioChannelLayoutTag_DVD_0 | &h640001 | C (mono) |
| kAudioChannelLayoutTag_DVD_1 | &h650002 | L R |
| kAudioChannelLayoutTag_DVD_10 | &h880004 | L R C LFE |
| kAudioChannelLayoutTag_DVD_11 | &h890005 | L R C LFE Cs |
| kAudioChannelLayoutTag_DVD_12 | &h790006 | L R C LFE Ls Rs |
| kAudioChannelLayoutTag_DVD_13 | &h730004 | L R C Cs |
| kAudioChannelLayoutTag_DVD_14 | &h750005 | L R C Ls Rs |
| kAudioChannelLayoutTag_DVD_15 | &h880004 | L R C LFE |
| kAudioChannelLayoutTag_DVD_16 | &h890005 | L R C LFE Cs |
| kAudioChannelLayoutTag_DVD_17 | &h790006 | L R C LFE Ls Rs |
| kAudioChannelLayoutTag_DVD_18 | &h8A0005 | L R Ls Rs LFE |
| kAudioChannelLayoutTag_DVD_19 | &h760005 | L R Ls Rs C |
| kAudioChannelLayoutTag_DVD_2 | &h830003 | L R Cs |
| kAudioChannelLayoutTag_DVD_20 | &h7A0006 | L R Ls Rs C LFE |
| kAudioChannelLayoutTag_DVD_3 | &h840004 | L R Ls Rs |
| kAudioChannelLayoutTag_DVD_4 | &h850003 | L R LFE |
| kAudioChannelLayoutTag_DVD_5 | &h860004 | L R LFE Cs |
| kAudioChannelLayoutTag_DVD_6 | &h870005 | L R LFE Ls Rs |
| kAudioChannelLayoutTag_DVD_7 | &h710003 | L R C |
| kAudioChannelLayoutTag_DVD_8 | &h730004 | L R C Cs |
| kAudioChannelLayoutTag_DVD_9 | &h750005 | L R C Ls Rs |

EAC layout constants

| Constant | Value | Description |
|-----------------------------------|----------|-------------------------|
| kAudioChannelLayoutTag_EAC3_6_1_A | &h9D0007 | L C R Ls Rs LFE Cs |
| kAudioChannelLayoutTag_EAC3_6_1_B | &h9E0007 | L C R Ls Rs LFE Ts |
| kAudioChannelLayoutTag_EAC3_6_1_C | &h9F0007 | L C R Ls Rs LFE Vhc |
| kAudioChannelLayoutTag_EAC3_7_1_A | &hA00008 | L C R Ls Rs LFE Rls Rrs |
| kAudioChannelLayoutTag_EAC3_7_1_B | &hA10008 | L C R Ls Rs LFE Lc Rc |
| kAudioChannelLayoutTag_EAC3_7_1_C | &hA20008 | L C R Ls Rs LFE Lsd Rsd |
| kAudioChannelLayoutTag_EAC3_7_1_D | &hA30008 | L C R Ls Rs LFE Lw Rw |
| kAudioChannelLayoutTag_EAC3_7_1_E | &hA40008 | L C R Ls Rs LFE Vhl Vhr |
| kAudioChannelLayoutTag_EAC3_7_1_F | &hA50008 | L C R Ls Rs LFE Cs Ts |
| kAudioChannelLayoutTag_EAC3_7_1_G | &hA60008 | L C R Ls Rs LFE Cs Vhc |
| kAudioChannelLayoutTag_EAC3_7_1_H | &hA70008 | L C R Ls Rs LFE Ts Vhc |
| kAudioChannelLayoutTag_EAC_6_0_A | &h9B0006 | L C R Ls Rs Cs |
| kAudioChannelLayoutTag_EAC_7_0_A | &h9C0007 | L C R Ls Rs Rls Rrs |

MPEG defined layout Constants

| Constant | Value | Description |
|---|----------|-------------------------|
| kAudioChannelLayoutTag_Emagic_Default_7_1 | &h810008 | L R Ls Rs C LFE Lc Rc |
| kAudioChannelLayoutTag_MPEG_1_0 | &h640001 | C |
| kAudioChannelLayoutTag_MPEG_2_0 | &h650002 | L R |
| kAudioChannelLayoutTag_MPEG_3_0_A | &h710003 | L R C |
| kAudioChannelLayoutTag_MPEG_3_0_B | &h720003 | C L R |
| kAudioChannelLayoutTag_MPEG_4_0_A | &h730004 | L R C Cs |
| kAudioChannelLayoutTag_MPEG_4_0_B | &h740004 | C L R Cs |
| kAudioChannelLayoutTag_MPEG_5_0_A | &h750005 | L R C Ls Rs |
| kAudioChannelLayoutTag_MPEG_5_0_B | &h760005 | L R Ls Rs C |
| kAudioChannelLayoutTag_MPEG_5_0_C | &h770005 | L C R Ls Rs |
| kAudioChannelLayoutTag_MPEG_5_0_D | &h780005 | C L R Ls Rs |
| kAudioChannelLayoutTag_MPEG_5_1_A | &h790006 | L R C LFE Ls Rs |
| kAudioChannelLayoutTag_MPEG_5_1_B | &h7A0006 | L R Ls Rs C LFE |
| kAudioChannelLayoutTag_MPEG_5_1_C | &h7B0006 | L C R Ls Rs LFE |
| kAudioChannelLayoutTag_MPEG_5_1_D | &h7C0006 | C L R Ls Rs LFE |
| kAudioChannelLayoutTag_MPEG_6_1_A | &h7D0007 | L R C LFE Ls Rs Cs |
| kAudioChannelLayoutTag_MPEG_7_1_A | &h7E0008 | L R C LFE Ls Rs Lc Rc |
| kAudioChannelLayoutTag_MPEG_7_1_B | &h7F0008 | C Lc Rc L R Ls Rs LFE |
| kAudioChannelLayoutTag_MPEG_7_1_C | &h800008 | L R C LFE Ls Rs Rls Rrs |
| kAudioChannelLayoutTag_SMPTE_DTV | &h820008 | L R C LFE Ls Rs Lt Rt |

(kAudioChannelLayoutTag_ITU_5_1 plus a matrix en

ITU defined layout Constants

| Constant | Value | Description |
|----------------------------------|----------|-------------------------|
| kAudioChannelLayoutTag_ITU_1_0 | &h640001 | C |
| kAudioChannelLayoutTag_ITU_2_0 | &h650002 | L R |
| kAudioChannelLayoutTag_ITU_2_1 | &h830003 | L R Cs |
| kAudioChannelLayoutTag_ITU_2_2 | &h840004 | L R Ls Rs |
| kAudioChannelLayoutTag_ITU_3_0 | &h710003 | L R C |
| kAudioChannelLayoutTag_ITU_3_1 | &h730004 | L R C Cs |
| kAudioChannelLayoutTag_ITU_3_2 | &h750005 | L R C Ls Rs |
| kAudioChannelLayoutTag_ITU_3_2_1 | &h790006 | L R C LFE Ls Rs |
| kAudioChannelLayoutTag_ITU_3_4_1 | &h800008 | L R C LFE Ls Rs Rls Rrs |

TMH layout constants

| Constant | Value | Description |
|--------------------------------------|----------|--|
| kAudioChannelLayoutTag_TMH_10_2_full | &h920015 | TMH_10_2_std plus: Lc Rc HI VI Haptic |
| kAudioChannelLayoutTag_TMH_10_2_std | &h910010 | L R C Vhc Lsd Rsd Ls Rs Vhl Vhr Lw Rw Csd Cs LFE1 LF |

Chapter 9

Registration

9.1 module MBS

9.1.1 module MBS

Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: The module with version details.

Notes: Those constants can be used in `#if` conditions.

9.1.2 Methods

9.1.3 Target as string

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the target where the plugin was compiled for.

Example:

```
MsgBox mbs.Target
```

Notes: Can be Win32, Linux, Carbon, Carbon-PPC or Cocoa.

9.1.4 Constants

Constants

| Constant | Value | Description |
|--------------------------|---------------------------------|--|
| BuildNumber | 21161 | The build number |
| CompileDate | "Nov 11 2024" | The compilation date |
| CompileTime | "09:24:23" | The compilation time |
| ComputerName | "MyMacM3" | The computer name |
| Copyright | "©2024 by Monkeybread Software" | Using this constant in your application indicates that the application is using the plugin |
| Day | 11 | The day of the month |
| HasAudioPlugin | true | The day the plugin was compiled |
| HasAVFoundationPlugin | true | Can be used in applications |
| HasBarcodePlugin | true | Whether the plugin is available |
| HasCanonEOSDigitalPlugin | false | True if the Mac OS version is 10.15 or later |
| HasChartDirectorPlugin | true | Whether the plugin is available |
| HasCocoaBasePlugin | false | True if the Mac OS version is 10.15 or later |
| HasCocoaControlsPlugin | false | Whether the plugin is available |
| HasCocoaExtrasPlugin | false | True if the Mac OS version is 10.15 or later |
| HasCocoaPlugin | false | Whether the plugin is available |
| HasCompressionPlugin | true | True if the Mac OS version is 10.15 or later |
| HasComputerControlPlugin | true | Whether the plugin is available |
| HasControlsPlugin | false | True if the Mac OS version is 10.15 or later |
| HasCUPSPlugin | false | Whether the plugin is available |
| HasCURLPlugin | true | True if the Mac OS version is 10.15 or later |
| HasDataTypesPlugin | true | Whether the plugin is available |
| HasDirectShowPlugin | false | True if the Mac OS version is 10.15 or later |
| HasDonglePlugin | true | Whether the plugin is available |
| HasDynaPDFPlugin | true | True if the Mac OS version is 10.15 or later |
| HasEncryptionPlugin | true | Whether the plugin is available |
| HasGIFPlugin | false | True if the Mac OS version is 10.15 or later |
| HasGraphicsMagickPlugin | true | Whether the plugin is available |
| HasImageMagickPlugin | false | True if the Mac OS version is 10.15 or later |

9.2 Globals

9.2.1 LogoMBS(size as Integer = 0, WithAlphaChannel as boolean = false) as Picture

Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the MBS logo picture.

Example:

```
window1.Backdrop = LogoMBS(500)
```

Notes: Best size is 500 pixel.

This function exists to provide a sample picture for examples.

If WithAlphaChannel is true and alpha channel pictures are supported, the plugin returns a picture with alpha channel. (Cocoa, Windows or Linux target on Xojo 2011r4).

Due to a bug in console runtime from Real Software this function can only produce useful pictures with 500 pixel size in console or web applications.

Blog Entries

- [Send text message in iOS Xojo App](#)
- [Send email message in iOS Xojo App](#)
- [Change brightness saturation and hue by Magick](#)
- [Sending email via gmail](#)
- [Four ways to save picture as Tiff in Xojo](#)
- [JPEGs to Movie](#)
- [Show download in a new tab](#)
- [Xojo 64-bit notes](#)
- [MBS Real Studio Plugins, version 11.3fc](#)
- [REAL Studio 2010r3](#)

Xojo Developer Magazine

- [22.5, page 90: An Overview of Overlays, Using Overlays with MBS by Stefanie Juchmes-Simonis](#)
- [22.5, pages 86 to 88: An Overview of Overlays, Using Overlays with MBS by Stefanie Juchmes-Simonis](#)
- [20.2, pages 82 to 83: Wifi QR Code, Embedding your Wifi password in a QR code by Stefanie Juchmes](#)
- [19.6, pages 68 to 69: Fun with GraphicsMagick, Cool methods from the GImageMBS class by Stefanie Juchmes](#)
- [18.2, page 68: Drawing PDFs, Draw in a PDF like in a Graphics element by Stefanie Juchmes](#)

9.2.2 MBSPluginCompileDate as string

Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Compilation date of the plugins.

Example:

```
MsgBox MBSPluginCompileDate
```

Notes: e.g. "Aug 27 2006"

Actually the compilation date of the Version Plugin part which defines this function.

9.2.3 MBSPluginCompileTime as string

Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Compilation Time of the plugins.

Example:

```
MsgBox MBSPluginCompileTime
```

Notes: e.g. "19:40:16"

Actually the compilation date of the Version Plugin part which defines this function.

9.2.4 MBSPluginVersion as string

Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns a version string from the plugin.

Example:

```
MsgBox "Build with Xojo "+RBVersionString+" and "+MBSPluginVersion
```

Notes: You can show that in your about box so your users can tell you which plugin they use.

9.2.5 RegisterMBSPlugin(name as string, product as string, enddate as Integer, serial as string) as boolean

Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The function to register the plugins.

Example:

```
const name = "Joe Smith"  
const serialnumber = "123456"  
const enddate = 200710  
  
if not RegisterMBSPlugin(name, "MBS Complete", enddate, serialnumber) then  
  msgBox "something wrong with the serial number of the plugins!"  
end if
```

Notes: Returns true if name and serial number is accepted.

While you are running your project in Xojo (or Xojo) you don't need to register, but if you compile for any target, you should or nice popup windows will show that the app is not registered.

Register in an application subclass to make registering as early as possible.

In case you get this message: "RegisterMBSPlugin()", giving the message "This item conflicts with another item of the same name" you have something else in your plugins folder, e.g. a html file.

Possible reasons for this failing:

- The calculations you make on the strings or serial number do not create the same value on every machine (Intel vs. PPC, e.g. endian problems)
- You use MBS functions before calling registration function (e.g. you register in window.open event and use the plugin for a control.)
- You mix different plugin versions in your Xojo folder.

This function works only for 2015 and newer serial numbers.

9.2.6 SetRegistrationMessageMBS(ID as Integer, message as string)

Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Defines what messages to show.

Example:

```
SetRegistrationMessageMBS(0, "This application is broken. Please reinstall!")
```

Notes: ID currently can only be 0 and is reserved for future flags.

Currently this changes the message which is shown if plugins of different versions are found.

This typically happens if installers mix old and new libraries in an app and the user should be asked to reinstall the application.

Blog Entries

- [MBS Xojo / Real Studio Plugins, version 14.2pr9](#)

Chapter 10

System

10.1 module BuildConstantsMBS

10.1.1 module BuildConstantsMBS

Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: A module with build constants for you.

Example:

```
MsgBox BuildConstantsMBS.DateTime
```

Notes: This module provides the date and time when the plugin was loaded to the Xojo IDE. You can use this constant to know in your application when it was built. Not exactly, but within a few hours exact.

The examples above show when this page was rendered with our documentation tool.

Blog Entries

- [MBS REALbasic Plugins, version 10.6pr8](#)
- [Build Time Constants](#)

10.1.2 Constants

Constants

| Constant | Value | Description |
|----------|----------------------------|--|
| Date | "11.11.2024" | The constant for the date. Format is dd.mm.yyyy like 24.12.2010. This is the date when the plugin was loaded to the Xojo IDE. You can use this constant to know in your application when it was built. Not exactly, but within a few hours exact. |
| DateTime | "Mon Nov 11 10:04:32 2024" | The constant for the date and time. This is the time when the plugin was loaded to the Xojo IDE. You can use this constant to know in your application when it was built. Not exactly, but within a few hours exact. |
| Day | 11 | The day. |
| Hour | 10 | The hour. |
| Minute | 4 | The minute. |
| Month | 11 | The month. |
| Second | 32 | The second. |
| Time | "10: 4:32" | The constant for the time. Format is like hh:mm:ss like 11:22:33. This is the time when the plugin was loaded to the Xojo IDE. You can use this constant to know in your application when it was built. Not exactly, but within a few hours exact. |
| Year | 2024 | The year. |

10.2 Globals

10.2.1 InstallSystemExceptionHandlerMBS(Message as string = "")

Plugin Version: 10.4, Platforms: macOS, Linux, Targets: All.

Function: Installs an exception handler to show a message dialog with custom message before the app crashes.

Example:

```
InstallSystemExceptionHandlerMBS "My message"
```

Notes: If message is empty, the default message is "An unhandled C++ exception occurred. The application will now quit. A common reason for this is simply running out of memory."

The plugin allocates some memory which we release later to make sure there is free memory for the message box.

On Windows this method does not work as currently we use static runtime on Windows which does not allow the plugin to access the runtime inside the RB framework.

Blog Entries

- [About InstallSystemExceptionHandlerMBS](#)

10.3 class GlobalExceptionHandlerMBS

10.3.1 class GlobalExceptionHandlerMBS

Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Installs an exception handler to show a message dialog with custom message before the app crashes.

Notes: The plugin allocates some memory which we release later to make sure there is free memory for the message box.

On Windows this method does not work as currently we use static runtime on Windows which does not allow the plugin to access the runtime inside the RB framework.

Blog Entries

- [Xojo Tips and Tricks](#)
- [MBS REALbasic Plugins, version 10.6pr2](#)

10.3.2 Events

10.3.3 GotException

Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: .

Function: Called when an unhandled C++ exception was raised.

Notes: Your application is in a very instable state when this event is called. Don't do much here and quit soon with `ExitMBS/AbortMBS`.

Chapter 11

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Chapter 12

The FAQ

12.0.1 Can anyone help me convert seconds to time in this format hh:mm:ss?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Sure, here's a routine I use (which has an advantage over the previously-posted Date-based solution in that you don't have to rely on the creation of an object – all that happens is some division and string concatenation):

Example:

```
Function SecsToTimeString(timeInSecs as Integer, padHours as boolean, padMinutes as boolean) as string
// Given an amount time (in seconds), generates a string representing that amount
// of time. The padHours and padMinutes parameters determine whether to display
// hours and minutes if their values are zero.
```

```
// Examples:
// timeInSecs = 90, padHours = true; returns "00:01:30"
// timeInSecs = 1, padHours = false, padMinutes = true; returns "00:01"
// timeInSecs = 3601, padMinutes = false; returns "01:00:01"
```

```
Var hours, minutes, seconds as Integer
Var hoursString, minutesString as string
```

```
hours = timeInSecs / 3600
minutes = (timeInSecs mod 3600) / 60
seconds = timeInSecs mod 60
```

```
if hours = 0 then
if padHours then
hoursString = "00:"
else
hoursString = ""
end if
```

```

else
hoursString = Format(hours, "##\:")
end if
if minutes = 0 then
if hours <>0 or padMinutes then
minutesString = "00:"
else
minutesString = ""
end if
else
minutesString = Format(minutes, "00\:")
end if

return hoursString + minutesString + Format(seconds, "00")
End Function

```

Notes: (from the rb mailinglist)

12.0.2 Do you have plugins for Android?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Since there is no plugin SDK for Android, we have no way to make a plugin for Android.

Notes: We support macOS, Windows, Linux and iOS.

12.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use functions from NSColor to get proper highlight color in RGB:

Example:

```

Function ProperHighlightColor(active as Boolean) As Color
#if TargetCocoa
Var theColor As NSColorMBS
If active Then
theColor = NSColorMBS.alternateSelectedControlColor
Else
theColor = NSColorMBS.secondarySelectedControlColor
End If

```

```

Var rgbColor As NSColorMBS = theColor.colorUsingColorSpaceName(NSColorSpaceMBS.NSCalibratedRGB-
BColorSpace)

```

```

If rgbColor <>Nil Then
Var red as Integer = rgbColor.redComponent * 255.0
Var green as Integer = rgbColor.greenComponent * 255.0
Var blue as Integer = rgbColor.blueComponent * 255.0
Return RGB(red, green, blue)
Else
Return HighlightColor
End If
#else
return HighlightColor
#endif
End Function

```

Notes: As you see we convert color to Calibrated RGB for best results.
See also:

- 12.0.4 How to catch delete key? 109
- 12.0.5 How to convert cmyk to rgb? 110
- 12.0.6 How to delete a folder? 111
- 12.0.7 How to detect if CPU is 64bit processor? 112
- 12.0.8 How to query variant type string for a variant? 113
- 12.0.9 How to refresh a htmlviewer on Windows? 114

12.0.4 How to catch delete key?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The following is the code in keydown event catches delete or backspace keys.

Example:

```

Function KeyDown(Key As String) As Boolean
if asc(key) = 8 or asc(key) = 127 then
MsgBox "Delete"
Return true
end if
End Function

```

See also:

- 12.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 108
- 12.0.5 How to convert cmyk to rgb? 110
- 12.0.6 How to delete a folder? 111

- 12.0.7 How to detect if CPU is 64bit processor? 112
- 12.0.8 How to query variant type string for a variant? 113
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12.0.5 How to convert cmyk to rgb?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

The following is the code to convert cmyk values to an RGB color datatype.

It's just a basic estimate of the color values. If you are looking for completely color accurate solution, this is not it. It should work for most people. :)

Example:

```
Function CMYKToRGB(c as Integer, m as Integer, y as Integer, k as Integer) As color
// converts c,m,y,k values (0-100) to color data type RGB
// place this in a method. Supply C,M,Y,K values-
// it returns color datatype
```

```
Var color_RGB as color
Var r, g, b as Integer

r=255-round(2.55*(c+k))
if r<0 then
r=0
end if
g=255-round(2.55*(m+k))
if g<0 then
g=0
end if
b=255-round(2.55*(y+k))
if b<0 then
b=0
end if

color_RGB=RGB(r,g,b)

return color_RGB

End Function
```

Notes:

(from the rb mailinglist)

See also:

| | |
|---|-----|
| | 111 |
| • 12.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? | 108 |
| • 12.0.4 How to catch delete key? | 109 |
| • 12.0.6 How to delete a folder? | 111 |
| • 12.0.7 How to detect if CPU is 64bit processor? | 112 |
| • 12.0.8 How to query variant type string for a variant? | 113 |
| • 12.0.9 How to refresh a htmlviewer on Windows? | 114 |

12.0.6 How to delete a folder?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The following is the code that deletes a folder recursively.

Example:

```

Sub deletefolder(f as folderitem)
  Var files(-1) as FolderItem

  if f=nil then Return

  // delete single file
  if f.Directory=false then
    f.Delete
  Return
  end if

  // get a list of all items in that folder
  Var i,c as Integer
  c=F.Count
  for i=1 to c
    files.Append f.TrueItem(i)
  next

  // delete each item
  for each fo as FolderItem in files
    if fo=nil then
      ' ignore
    elseif fo.Directory then
      deletefolder fo
    fo.delete
    else ' file
      fo.Delete
    end if
  next

  f.Delete

```

End Sub

See also:

- 12.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 108
- 12.0.4 How to catch delete key? 109
- 12.0.5 How to convert cmyk to rgb? 110
- 12.0.7 How to detect if CPU is 64bit processor? 112
- 12.0.8 How to query variant type string for a variant? 113
- 12.0.9 How to refresh a htmlviewer on Windows? 114

12.0.7 How to detect if CPU is 64bit processor?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Via CPUID you can ask CPU:

Example:

```
Var c as new CPUIDMBS
```

```
if c.Flags(CPUIDMBS.kFeatureLM) then
MsgBox "64-bit CPU"
else
MsgBox "32-bit CPU"
end if
```

Notes: Should work on all intel compatible CPUs.

See also:

- 12.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 108
- 12.0.4 How to catch delete key? 109
- 12.0.5 How to convert cmyk to rgb? 110
- 12.0.6 How to delete a folder? 111
- 12.0.8 How to query variant type string for a variant? 113
- 12.0.9 How to refresh a htmlviewer on Windows? 114

12.0.8 How to query variant type string for a variant?

Plugin Version: 20.5, Platforms: macOS, Linux, Windows.

Answer: The following example function returns type string for variant.

Example:

```
Public Function VariantTypeString(v as Variant) as string
// Xojo's VarType doesn't know Unsigned integers
'Dim type As Integer = VarType(v)

// MBS VarType can detect unsigned integer
Var type As Integer = GetVariantTypeMBS(v)

Var IsArray As Boolean = BitwiseAnd(type, Variant.TypeArray) = Variant.TypeArray

// type without array
type = BitwiseAnd(type, Bitwise.OnesComplement(Variant.TypeArray))

// build a dictionary to map types on first call
Static TypeMap As Dictionary
If TypeMap = Nil Then
TypeMap = New Dictionary
TypeMap.Value(Variant.TypeBoolean) = "Boolean"
TypeMap.Value(Variant.TypeCFStringRef) = "CFStringRef"
TypeMap.Value(Variant.TypeColor) = "Color"
TypeMap.Value(Variant.TypeCString) = "CString"
TypeMap.Value(Variant.TypeCurrency) = "Currency"
TypeMap.Value(Variant.TypeDate) = "Date"
TypeMap.Value(Variant.TypeDateTime) = "DateTime"
TypeMap.Value(Variant.TypeDouble) = "Double"
TypeMap.Value(Variant.TypeInt32) = "Int32"
TypeMap.Value(Variant.TypeInt64) = "Int64"
TypeMap.Value(Variant.TypeInteger) = "Integer"
TypeMap.Value(Variant.TypeNil) = "Nil"
TypeMap.Value(Variant.TypeObject) = "Object"
TypeMap.Value(Variant.TypeOSType) = "OSType"
TypeMap.Value(Variant.TypePString) = "PString"
TypeMap.Value(Variant.TypePtr) = "Ptr"
TypeMap.Value(Variant.TypeSingle) = "Single"
TypeMap.Value(Variant.TypeString) = "String"
TypeMap.Value(Variant.TypeStructure) = "Structure"
TypeMap.Value(Variant.TypeText) = "Text"
TypeMap.Value(Variant.TypeWindowPtr) = "WindowPtr"
TypeMap.Value(Variant.TypeWString) = "WString"

// MBS extra types
TypeMap.Value(Variant.TypeInt32+100) = "UInt32"
TypeMap.Value(Variant.TypeInt64+100) = "UInt64"
```

End If

```
// lookup type

#if DebugBuild then
If Not TypeMap.HasKey(type) Then
Break // missing type
End If
#endif

If IsArray Then
Return "Array of " + TypeMap.Lookup(type,"?")
Else
Return TypeMap.Lookup(type,"?")
End If
End Function
```

See also:

- 12.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 108
- 12.0.4 How to catch delete key? 109
- 12.0.5 How to convert cmyk to rgb? 110
- 12.0.6 How to delete a folder? 111
- 12.0.7 How to detect if CPU is 64bit processor? 112
- 12.0.9 How to refresh a htmlviewer on Windows? 114

12.0.9 How to refresh a htmlviewer on Windows?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can ask the browser to reload the website with this code line:

Example:

```
call htmlViewer1.IERunJavaScriptMBS("javascript:document.location.reload()")
```

See also:

- 12.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 108
- 12.0.4 How to catch delete key? 109
- 12.0.5 How to convert cmyk to rgb? 110
- 12.0.6 How to delete a folder? 111

- 12.0.7 How to detect if CPU is 64bit processor? 115
 - 12.0.8 How to query variant type string for a variant? 112
-
- 12.0.8 How to query variant type string for a variant? 113

12.0.10 Is there an example for vector graphics in Xojo?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Try this example inside the paint event of a window:

Example:

```
Var v as Group2D
Var r as RectShape
Var s as StringShape
```

```
const pi=3.14
```

```
s=new StringShape
s.Text="Hello World!"
s.TextFont="Geneva"
s.TextSize=24
s.FillColor=rgb(0,0,255)
s.Italic=true
s.y=5
s.x=0
```

```
r=new RectShape
```

```
r.X=0
r.y=0
r.Height=100
r.Width=180
r.BorderColor=rgb(255,0,0)
r.FillColor=rgb(0,255,0)
r.BorderWidth=5
r.Border=50
```

```
v=new Group2d
v.Append r
v.Append s
v.Rotation=pi*-20.0/180.0
v.x=150
v.y=150
```

```
g.DrawObject v
```

12.0.11 Picture functions do not preserve resolution values?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, the picture functions return pictures with no/default resolution values.

Example:

```
Var l as Picture = LogoMBS(500)
```

```
l.HorizontalResolution = 300
```

```
l.VerticalResolution = 300
```

```
Var r as Picture = l.Rotate90MBS
```

```
MsgBox str(r.HorizontalResolution)+" x "+str(r.VerticalResolution)
```

```
r.HorizontalResolution = l.HorizontalResolution
```

```
r.VerticalResolution = l.VerticalResolution
```

```
MsgBox str(r.HorizontalResolution)+" x "+str(r.VerticalResolution)
```

Notes: So please fix them yourself after calling a function.

Maybe in the future this changes, but currently you can't really set this easily from plugin code.

12.0.12 A toolbox call needs a rect - how do I give it one?

Plugin Version: all, Platforms: macOS, Windows.

Answer: Fill a memoryblock like this:

Example:

```
Var MB As Memoryblock
```

```
MB = NewMemoryBlock(8)
```

```
MB.Short(0) = window1.Top
```

```
MB.Short(2) = window1.Left
```

```
MB.Short(4) = window1.Height+window1.Top // bottom
```

```
MB.Short(6) = window1.Width+window1.Left // right
```

12.0.13 API client not supported?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: If you get this exception message on `SQLConnectionMBS.Connect`, we may have a problem.

Notes: First case is that the given thing is not supported (e.g. MS SQL directly on Mac).
 Second case is that the plugin compilation went wrong and the support for the database was not linked into the plugin. Like MySQL missing or MS SQL on Windows missing. In that case please contact us to fix the plugin.

12.0.14 Can I access Access Database with Java classes?

Plugin Version: all, Platform: Windows.

Answer: You can use ucanaccess to access databases created with Microsoft

Example:

```

Var options(-1) as string

// load all the jar files we have in a folder called java:

Var appFolder as FolderItem = GetFolderItem("")

Var count as Integer = appFolder.Parent.Child("java").Count
Var libjs() as string
For i as Integer = 1 to count
Var f As FolderItem = appFolder.Parent.Child("java").item(i)
If f <> Nil and f.Exists Then
libjs.append f.NativePath+";"
End If
Next

// now init virtual machine
Var library as string = Join(libjs, "")
Var vm as new JavaVMMBS(library)

if vm.Handle = 0 then
MsgBox "Failed to initialize virtual machine"
else
// now make a new database connection with ucanaccess
Var d as new JavaDatabaseMBS(vm,"net.ucanaccess.jdbc.UcanaccessDriver")
Var DbFile as FolderItem = appFolder.Parent.Child("Database11.accdb")
Var j as JavaConnectionMBS = d.getConnection("jdbc:ucanaccess://" + DbFile.NativePath)

// select and show values
Var r as JavaResultSetMBS = j.MySelectSQL("Select * From test")
while r.NextRecord
MsgBox r.getString("FirstName") + " " + r.getString("LastName")
wend

end if

```

Exception e as JavaExceptionMBS
 MsgBox e.message+" **errorcode:** "+str(e.ErrorNumber)

Notes: see website:
<http://ucanaccess.sourceforge.net/site.html>

12.0.15 Can I create PDF from Xojo Report using DynaPDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, we have a graphics class integration for DynaPDF.

Notes: Since MBS Plugin in version 19.2, we can integrate reports with Xojo.

12.0.16 Can I use AppleScripts in a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, but they run on the server, not on the client.

Example:

Var a as new AppleScriptMBS

```
// query my application name
a.Compile "tell application ""System Events"" to return name of current application"
```

```
// run
a.Execute
```

```
// show result
label1.text = a.Result
```

```
// shows something like "My Application.fcgi.debug"
```

Notes: This can be useful to control the server from remote, if and only if the your sever is running Mac OS X.

12.0.17 Can I use graphics class with DynaPDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Sorry, no. We can't provide a graphics subclass from plugin.

Notes: The is a feature request to allow graphics subclasses:

Feedback case 11391: [feedback://showreport?report_id=11391](https://feedback.xojo.com/showreport?report_id=11391)

12.0.18 Can I use sockets on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, but they run on the server, not on the client.

Notes: You can use `HTTPSocket`, `SMTPSocket`, `POP3Socket`, `SMTPSecureSocket`, `SecurePOP3Socket`, `EasyTCPSocket`, `EasyUDPSocket`, `AutoDiscovery`, our Bonjour classes or our `CURL*` classes. But all of them work on the server, not on the client.

This means if you search for a printer with Bonjour, you can find the printers in the local network on your server hosting site. Using `SMTPSocket` may be a good idea for sending emails from the server like notifications.

12.0.19 Can I use your ChartDirector plugin on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, our ChartDirector plugin works just fine on the Xojo Web Edition.

Example:

```
// The data for the pie chart
Var data(-1) as Double=array(55.0, 18.0, 25.0, 22.0, 18.0, 30.0, 35.0)

// The labels for the pie chart, Words are choosen random to check font!
Var labels(-1) as string=array("Germany", "Italy", "France", "Spain", "UK", "Poland", "Russia")

// The colors to use for the sectors
Var colors(-1) as Integer

colors.Append &h66aaee
colors.Append &heebb22
colors.Append &hbbsbbb
colors.Append &h8844ff

if TargetLinux then
  CDBaseChartMBS.SetFontSearchPath "/usr/share/fonts/truetype/msttcorefonts"
end if

// Create a PieChart object of size 360 x 300 pixels
Var c as new CDPieChartMBS(700, 600)

c.setBackground(c.linearGradientColor(0, 0, 0, c.getHeight(), &h0000cc, &h000044))
```

```

c.setRoundedFrame(&hffffff, 16)
Var tt as CDTextBoxMBS = c.addTitle("ChartDirector Demonstration", "timesbi.ttf", 18)
tt.setMargin(0, 0, 16, 0)
tt.setFontColor(&hFFFFFF)

// Set the center of the pie at (180, 140) and the radius to 100 pixels
c.setPieSize 350,300,150
// Set the sector colors
c.setColors(c.kDataColor, colors)

// Draw the pie in 3D with a pie thickness of 20 pixels
c.set3D(20)

Var t as CDTextBoxMBS = c.setLabelStyle("arialbd.ttf", 10, &h000000)
t.setBackground(CDPieChartMBS.kSameAsMainColor, CDPieChartMBS.kTransparent, CDPieChartMBS.soft-
Lighting(CDPieChartMBS.kRight, 0))
t.setRoundedCorners(8)

// Use local gradient shading for the sectors, with 5 pixels wide
// semi-transparent white (bbffffff) borders
c.setSectorStyle(CDPieChartMBS.kLocalGradientShading, &hbbffffff, 0)

// Set the pie data and the pie labels
c.setData data,labels
call c.setLabelStyle "arialbd.ttf",18

Var pic as picture = c.makeChartPicture
Var wp as new WebPicture(pic, Picture.FormatJPEG) // JPEG makes it smaller and faster

ImageView1.Picture=wp

```

Notes: Be aware that our plugin produces pictures for you, which you assign to ImageViews. Transferring those pictures takes time, so you can optimize that with using WebPicture class. There you can decide between different compressions to improve speed (use JPEG instead of PNG).

e.g. if you use ubuntu, you can install the ttf-mscorefonts-installer package and call this method with `"/usr/share/fonts/truetype/msttcorefonts"` as the path. No backslash on the end of a path, please.

12.0.20 Can I use your DynaPDF plugin on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, our DynaPDF plugin works just fine on the Xojo Web Edition.

Notes: PDF files are created on the server. You may want to offer a preview to the user which uses reduced resolution images to reduce the time to download the PDF.

See our Create PDF example for the Xojo Web Edition.

12.0.21 Can I use your plugin controls on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: No.

12.0.22 Can you get an unique machine ID?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: There is nothing like an unique machine ID.

Notes: 1:

You can use the MAC IDs of the network interfaces.

This can be changed by the user with software tools.

And the list of network interfaces changes if user reorder the interfaces.

2:

You can use the system folder creation date/time.

This may stay equal after cloning machines or after migration to new PC.

3:

You can use the Mac Serialnumber.

Mac only and it can happen that a Mac does not have a serial number.

4:

You can use the x86 CPU ID.

This is x86 CPU only and does not avoid running on the same CPU in different PCs.

12.0.23 ChartDirector: Alignment Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Alignment Specification

Notes: In many ChartDirector objects, you may specify the alignment of the object's content relative to its boundary. For example, for a TextBox object, you may specify the text's alignment relative to the box

boundary by using `TextBox.setAlignment`.

The `ChartDirector` API defines several constants for the alignment options.

ConstantValueDescription

| | | |
|---------------------------|----|--|
| <code>BottomLeft</code> | 1 | The leftmost point on the bottom line. |
| <code>BottomCenter</code> | 2 | The center point on the bottom line. |
| <code>BottomRight</code> | 3 | The rightmost point on the bottom line. |
| <code>Left</code> | 4 | The leftmost point on the middle horizontal line. |
| <code>Center</code> | 5 | The center point on the middle horizontal line. |
| <code>Right</code> | 6 | The rightmost point on the middle horizontal line. |
| <code>TopLeft</code> | 7 | The leftmost point on the top line. |
| <code>TopCenter</code> | 8 | The center point on the top line. |
| <code>TopRight</code> | 9 | The rightmost point on the top line. |
| <code>Bottom</code> | 2 | The center point on the bottom line. Same as <code>BottomCenter</code> . |
| <code>Top</code> | 8 | The center point on the top line. Same as <code>TopCenter</code> . |
| <code>TopLeft2</code> | 10 | An alternative top-left position used in <code>Axis.setTitlePos</code> for axis title positioning only. For a vertical axis, <code>TopLeft2</code> refers to the left of the top side, while <code>TopLeft</code> refers to the top of the left side. The reverse applies for a horizontal axis. |
| <code>TopRight2</code> | 11 | An alternative top-right position used in <code>Axis.setTitlePos</code> for axis title positioning only. For a vertical axis, <code>TopRight2</code> refers to the right of the top side, while <code>TopRight</code> refers to the top of the right side. The reverse applies for a horizontal axis. |
| <code>BottomLeft2</code> | 12 | An alternative bottom-left position used in <code>Axis.setTitlePos</code> for axis title positioning only. For a vertical axis, <code>BottomLeft2</code> refers to the left of the bottom side, while <code>BottomLeft</code> refers to the bottom of the left side. The reverse applies for a horizontal axis. |
| <code>BottomRight2</code> | 13 | An alternative bottom-right position used in <code>Axis.setTitlePos</code> for axis title positioning only. For a vertical axis, <code>BottomRight2</code> refers to the right of the bottom side, while <code>BottomRight</code> refers to the bottom of the right side. The reverse applies for a horizontal axis. |

12.0.24 ChartDirector: Color Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: `ChartDirector: Color Specification`

Notes: Many functions in the `ChartDirector` API accept colors as parameters. `ChartDirector` supports colors specified in web and HTML compatible ARGB format, in which ARGB refers to the Alpha transparency, Red, Green and Blue components of the color.

In addition to ARGB colors, ChartDirector supports "dynamic" colors. A dynamic color is a color that changes depending on the position of the pixels. The "dynamic" colors that ChartDirector supports include "pattern colors", "metal colors", "gradient colors", "zone colors" and "dash line colors".

ChartDirector supports specifying colors indirectly using "palette colors". When a "palette color" is used, the color is specified as an index to a palette. The actual color is looked up from the palette. ARGB Color ARGB color consists of 4 components - alpha transparency, red, green and blue. The four components are encoded as a 32-bit number, with each component occupying 8 bits. In hexadecimal notation, it is AAR-RGGBB, where AA, RR, GG and BB are the alpha transparency, red, green and blue components.

Each component ranges from 00 - FF (0 - 255), representing its intensity. For example, pure red color is 00FF0000, pure green color is 0000FF00, and pure blue color is 000000FF. White color is 00FFFFFF, and black color is 00000000.

Most programming language requires you to put special prefix in front of hexadecimal characters. For C++, the prefix is "0x". For example, the syntax for the hexadecimal number 00FFFFFF is 0x00FFFFFF, or simply 0xFFFFFF.

For the alpha transparency component, a zero value means the color is not transparent at all. This is equivalent to traditional RGB colors. A non-zero alpha transparency means the color is partially transparent. The larger the alpha transparency, the more transparent the color will be. If a partially transparent color is used to draw something, the underlying background can still be seen.

For example, 80FF0000 is a partially transparent red color, while 00FF0000 is a non-transparent red color.

Note that ChartDirector's ARGB color is web and HTML compatible. For example, red is FF0000, the same as in HTML. There are many resources on the web that provide tables in which you can click a color and it will show its HTML color code. These color codes can be used in ChartDirector.

If alpha transparency is FF (255), the color is totally transparent. That means the color is invisible. It does not matter what the RGB components are. So in ChartDirector, only one totally transparent color is used - FF000000. All other colors of the form FFnnnnnn are reserved to represent palette colors and dynamic colors, and should not be interpreted as the normal ARGB colors.

The totally transparent color FF000000 is often used in ChartDirector to disable drawing something. For example, if you want to disable drawing the border of a rectangle, you can set the border color to totally transparent.

For convenience, ChartDirector defines a constant called `Transparent`, which is equivalent to `FF000000`. `Pattern Color`

A pattern color is a dynamic color that changes according to a 2D periodic pattern. When it is used to fill an area, the area will look like being tiled with a wallpaper pattern.

Pattern colors are created using `BaseChart.patternColor`, `BaseChart.patternColor2`, `DrawArea.patternColor` and `DrawArea.patternColor2`. The `patternColor` method creates pattern colors using an array of colors as a bitmap. The `patternColor2` method creates pattern colors by loading the patterns from image files.

These methods return a 32-bit integer acting as a handle to the pattern color. The handle can be used in any `ChartDirector` API that expects a color as its input. **Metal Color**

A metal color is a color of which the brightness varies smoothly across the chart surface as to make the surface look shiny and metallic. `ChartDirector` supports using any color as the base color of the metal color. In particular, using yellow and grey as the base colors will result in metal colors that look gold and silver.

Metal colors are most often used as background colors of charts. They are created using `CDBaseChartMBS.metalColor`, `CDBaseChartMBS.goldColor` and `CDBaseChartMBS.silverColor`. The first method allows you to specify an arbitrary base color. The second and third methods use yellow and grey as the base colors, resulting in gold and silver metal colors.

These methods return a 32-bit integer acting as a handle to the gradient color. The handle can be used in any `ChartDirector` API that expects a color as its input. **Gradient Color**

A gradient color is a color that changes progressively across a direction.

Gradient colors are created using `BaseChart.gradientColor`, `BaseChart.gradientColor2`, `DrawArea.gradientColor` and `DrawArea.gradientColor2`. The `gradientColor` method creates a 2-point gradient color that changes from color A to color B. The `gradientColor2` method creates a multi-point gradient colors that changes from color A to B to C

These methods return a 32-bit integer acting as a handle to the gradient color. The handle can be used in any `ChartDirector` API that expects a color as its input.

One common use of multi-point gradient colors is to define colors that have metallic look and feel. Please refer to `DrawArea.gradientColor2` for details. **Dash Line Colors**

A dash line color is a color that switches on and off periodically. When used to draw a line, the line will appear as a dash line.

Dash line colors are created using `BaseChart.dashLineColor` and `DrawArea.dashLineColor`. They accept a line color and a dash pattern code as arguments, and return a 32-bit integer acting as a handle to the dash line color. The handle can be used in any `ChartDirector` API that expects a color as its input. **Zone Colors**

A zone color is for XY charts only. It is a color that automatically changes upon reaching a data threshold value along the x-axis or y-axis. Zone colors are created using `Layer.xZoneColor`, `Layer.yZoneColor`, `XYChart.xZoneColor` or `XYChart.yZoneColor`. **Palette Colors**

Palette colors are colors of the format `FFFFnnnn`, where the least significant 16 bits (`nnnn`) are the index to the palette. A palette is simply an array of colors. For a palette color, the actual color is obtained by looking up the palette using the index. For example, the color `FFFF0001` is the second color in the palette (first color is index 0).

The colors in the palette can be ARGB colors or "dynamic" colors (pattern, gradient and dash line colors).

The first eight palette colors have special significance. The first three palette colors are the background color, default line color, and default text color of the chart. The 4th to 7th palette colors are reserved for future use. The 8th color is a special dynamic color that is equal to the data color of the "current data set".

The 9th color (index = 8) onwards are used for automatic data colors. For example, in a pie chart, if the sector colors are not specified, ChartDirector will automatically use the 9th color for the first sector, the 10th color for the second sector, and so on. Similarly, for a multi-line chart, if the line colors are not specified, ChartDirector will use the 9th color for the first line, the 10th color for the second line, and so on.

The ChartDirector API defines several constants to facilitate using palette colors.

ConstantValueDescription

| | | |
|-----------------|---------------------|---|
| Palette | FFFF0000 | The starting point of the palette. The first palette color is (Palette + 0). The nth palette color is (Palette + n - 1). |
| BackgroundColor | FFFF0000 | The background color. |
| LineColor | FFFF0001 | The default line color. |
| TextColor | FFFF0002 | The default text color. |
| [Reserved] | FFFF0003 - FFFF0006 | These palette positions are reserved. Future versions of ChartDirector may use these palette positions for colors that have special significance. |
| SameAsMainColor | FFFF0007 | A dynamic color that is equal to the data color of the current data set. This color is useful for objects that are associated with data sets. For example, in a pie chart, if the sector label background color is SameAsMainColor, its color will be the same as the corresponding sector color. |
| DataColor | FFFF0008 | The starting point for the automatic data color allocation. |

When a chart is created, it has a default palette. You may modify the palette using BaseChart.setColor, BaseChart.setColors, or BaseChart.setColors2.

The advantages of using palette colors are that you can change the color schemes of the chart in one place. ChartDirector comes with several built-in palettes represented by the following predefined constants.

ConstantDescription

| | |
|---------------------|---|
| defaultPalette | An array of colors representing the default palette. This palette is designed for drawing charts on white backgrounds (or lightly colored backgrounds). |
| whiteOnBlackPalette | An array of colors useful for drawing charts on black backgrounds (or darkly colored backgrounds). |
| transparentPalette | An array of colors useful drawing charts on white backgrounds (or lightly colored backgrounds). The data colors in this palette are all semi-transparent. |

12.0.25 ChartDirector: Font Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Font Specification

Notes: Font Name

In ChartDirector, the font name is simply the file name that contains the font. For example, under the Windows platform, the "Arial" font is "arial.ttf", while the "Arial Bold" font is "arialbd.ttf".

NOTE: Mac OS X Specific Information

In Mac OS X, in addition to ".ttf", ChartDirector also supports Mac OS X font file formats, such as Font Suitcase files and Datafork files (.dfont). These files often contain multiple fonts. For example, the "GillSans.dfont" file contains 6 fonts.

So in addition to the file name, an index is needed to determine the font. The index is specified by appending a " | " character to the font name, followed by the index number. For example, the third font in "GillSans.dfont" is denoted as "GillSans.dfont | 2". (Note: The first font starts at 0.) If no index number is provided, the first font is assumed.

ChartDirector also supports using Mac OS X Font Manager names. For example, one may use "Gill Sans Light Italic" instead of using "GillSans.dfont | 1" as the font name. However, the Mac OS X Font Manager is active only if someone has logged into the Mac GUI console, so this method is only recommended for developing applications that run on the GUI console.

The sample programs that come with ChartDirector are designed to run on all operating systems, so they use generic font file names (eg. "arial.ttf") instead of Mac OS X specific names. To allow them to run on Mac OS X, ChartDirector on Mac OS X has a built-in table to map common font file names to Mac OS X font names:

"arial.ttf", "arialbd.ttf", "ariali.ttf" and "arialbi.ttf" are mapped to "Arial | 0" (Arial), "Arial | 1" (Arial Bold), "Arial | 2" (Arial Italic) and "Arial | 3" (Arial Bold Italic)

"times.ttf", "timesbd.ttf", "timesi.ttf" and "timesbi.ttf" are mapped to "Times New Roman | 0" (Times New Roman), "Times New Roman | 1" (Times New Roman Bold), "Times New Roman | 2" (Times New Roman Italic) and "Times New Roman | 3" (Times New Roman Bold Italic)

"cour.ttf", "courbd.ttf", "couri.ttf" and "courbi.ttf" are mapped to "Courier New | 0" (Courier New), "Courier New | 1" (Courier New Bold), "Courier New | 2" (Courier New Italic) and "Courier New | 3" (Courier New Bold Italic)

Font Location

ChartDirector on Windows does not come with any font files. It relies on the operating system's font files in the "[windows] \Fonts" directory. To see what fonts are installed in your operating system and their file names, use the File Explorer to view that directory.

ChartDirector on Windows will also search for the font files in the "fonts" subdirectory (if it exists) under the directory where the ChartDirector DLL "chartdir.dll" is installed. This is useful for private fonts. Also, for some especially secure web servers, the web anonymous user may not have access to the "[windows] \Fonts" directory. In this case, you may copy the font files to the above subdirectory.

ChartDirector on Mac OS X relies on operating system font files in "/Library/Fonts" and "/System/Library/Fonts".

ChartDirector on Linux, FreeBSD and Solaris assume the fonts files are in the "fonts" subdirectory under the directory where the ChartDirector shared object "libchartdir.so" is installed. ChartDirector on Linux, FreeBSD and Solaris come with a number of font files in the "fonts" subdirectory.

To keep the download size small, ChartDirector on Linux, FreeBSD and Solaris only come with some commonly used fonts. You may download additional fonts from the Internet. In particular, the Microsoft fonts at

http://sourceforge.net/project/showfiles.php?group_id=34153&release_id=105355

is highly recommended. Please refer to

<http://www.microsoft.com/typography/faq/faq8.htm>

on how you could use the fonts legally in your system.

ChartDirector supports True Type fonts (.ttf), Type 1 fonts (.pfa and .pfb) and Windows bitmap fonts (.fon). On Mac OS X, ChartDirector also supports Font Suitcase and Datafork (.dfont) files. On Linux, FreeBSD and Solaris, ChartDirector also supports Portable Compiled Fonts (.pcf fonts).

If you want ChartDirector to search other directories for the font files, you may list the directories in an environment variable called "FONTSPATH".

If you specify an absolute path name for the font file, ChartDirector will use the absolute path name and will not search other directories.

Artificial Boldening and Italicizing

Whereas most popular font comes with different styles for "normal", "bold", "italic" and "bold italic", some fonts only come with one style (the normal style). For example, the Monotype Corsiva font that comes with MS Office only has the normal style (mtcorsva.ttf). For these cases, you may append the "Bold" and/or "Italic" words after the font file name (separated with a space) to ask ChartDirector to artificially bolden and/or italicize the font. For example, you may specify the font name as "mtcorsva.ttf Bold".

Font List
Instead of specifying a single font file as the font name, you may specify a list of font files as the font name, separated by semi-colons. This is useful when using international characters that are only available in some fonts.

For example, if you would like to use the Arial font ("arial.ttf") for western characters, and the MingLiu font "mingliu.ttc" for Chinese characters (since the Arial font does not have Chinese characters), you may specify the font name as "arial.ttf;mingliu.ttc". In this case, ChartDirector will try the Arial font first. If it cannot find a certain character there, it will try the MingLiu font.

Indirect Font Names

ChartDirector supports several special keywords for specifying the font name indirectly. When these keywords are used as font names, ChartDirector will look up the actual font names from a font table. The keywords are as follows:

KeywordsDescription

| | |
|--------------|--|
| "normal" | This default normal font, which is the first font in the font table. This is initially mapped to "arial.ttf" (Arial). |
| "bold" | The default bold font, which is the second font in the font table. This is initially mapped to "arialbd.ttf" (Arial Bold). |
| "italic" | The default italic font, which is the third font in the font table. This is initially mapped to "ariali.ttf" (Arial Italic). |
| "boldItalic" | The default bold-italic font, which is the fourth font in the font table. This is initially mapped to "arialbi.ttf" (Arial Bold Italic). |
| "fontN" | The (N + 1)th font in the font table (the first font is "font0"). |

The font table can be modified using `BaseChart.setFontTable` or `DrawArea.setFontTable`.

The advantage of using indirect font names is that you can change the fonts in your charts in one place.

Font Index
Most font files contain one font. However, it is possible a font file contains multiple fonts (that is, a font collection). For example, in True Type fonts, font files with extension ".ttc" may represent a font collection.

If a font file contains multiple font, the font index can be used to specify which font to use. By default, the font index is 0, which means the first font in the font file will be used.

Font Size
The font size decides how big a font will appear in the image. The font size is expressed in a font unit called points. This is the same unit used in common word processors.

Instead of specifying font size, some ChartDirector API (eg. `TextBox.setFontSize`) allow you to specify font height and font width separately. You may use different point sizes for font height and font width to create special effects.

Font Color
This is the color to draw the font. (See [Color Specification](#) on how colors are represented in ChartDirector.)

Font Angle
This is the angle in degrees by which the font should be rotated anti-clockwise.

Vertical Layout
By default, text are laid out horizontally, with characters being drawn from left to right.

ChartDirector also supports vertical layout, with characters being drawn from top to bottom. For example, you may use `BaseChart.addText` to add text that are laid out vertically. Vertical layout is common for oriental languages such as Chinese, Japanese and Korean.

12.0.26 ChartDirector: Mark Up Language

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Mark Up Language

Notes: ChartDirector Mark Up Language (CDML) is a language for including formatting information in text strings by marking up the text with tags.

CDML allows a single text string to be rendered using multiple fonts, with different colors, and even embed images in the text. **Font Styles**

You can change the style of the text by using CDML tags. For example, the line:

```
<*font=timesi.ttf,size=16,color=FF0000>Hello <*font=arial.ttf,size=12,color=8000*>world!
```

will result in the following text rendered:

In general, all tags in CDML are enclosed by `<*` and `*>`. Attributes within the tags determine the styles of the text following the tags within the same block.

If you want to include `<*` in text without being interpreted as CDML tags, use `«*` as the escape sequence.

The following table describes the supported font style attributes in CDML. See **Font Specification** for details on various font attributes.

AttributeDescription

| | |
|-----------|---|
| font | Starts a new style section, and sets the font name. You may use this attribute without a value (that is, use "font" instead of "font=arial.ttf") to create a new style section without modifying the font name. |
| size | The font size. |
| width | The font width. This attribute is used to set the font width and height to different values. If the width and height are the same, use the size attribute. |
| height | The font height. This attribute is used to set the font width and height to different values. If the width and height are the same, use the size attribute. |
| color | The text color in hex format. |
| bgColor | The background color of the text in hex format. |
| underline | The line width of the line used to underline the following characters. Set to 0 to disable underline. |
| sub | Set the following text to be in subscript style. This attribute does not need to have a value. (You may use "sub" as the attribute instead of "sub=1".) |
| super | Set the following text to be in superscript style. |

Set the following text to be in superscript style. This attribute does not need to have a value. (You may use "super" as the attribute instead of "super=1".)

| | |
|-----------|--|
| xoffset | Draw the following the text by shifting the text horizontally from the original position by the specified offset in pixels. |
| yoffset | Draw the following the text by shifting the text vertically from the original position by the specified offset in pixels. |
| advance | Move the cursor forward (to the right) by the number of pixels as specified by the value this attribute. |
| advanceTo | Move the cursor forward (to the right) to the position as specified by the value this attribute. The position is specified as the number of pixels to the right of the left border of the block. If the cursor has already passed through the specified position, the cursor is not moved. |

Note that unlike HTML tags, no double or single quotes are used in the tags. It is because CDML tags are often embedded as string literals in source code. The double or single quotes, if used, will conflict with the string literal quotes in the source code. Therefore in CDML, no quotes are necessary and they must not be used.

Also, unlike HTML tags, CDML uses the comma character as the delimiter between attributes. It is because certain attributes may contain embed spaces (such as the font file name). So space is not used as the delimiter and the comma character is used instead.

Note the font attribute above starts a new style section, while other attributes just modify the current style section. You may use `<*/font*>` to terminate a style section, which will restore the font styles to the state before the style section.

Blocks and Lines
In CDML, a text string may contain multiple blocks. A block may contain multiple lines of text by separating them with new line characters ("`\n`") or with `<*br*>`. The latter is useful for programming languages that cannot represent new line characters easily.

For example, the line:

```
<*size=15*><*block*><*color=FF*>BLOCK<*br*>ONE<*/*>and <*block*><*color=FF00*>BLOCK<*br*>TWO
```

will result in the following text rendered:

The above example contains a line of text. The line contains two blocks with the characters " and " in between. Each block in turn contains two lines. The blocks are defined using `<*block*>` as the start tag and `<*/*>` as the end tag.

When a block ends, font styles will be restored to the state before entering the block.
Embedding Images
CDML supports embedding images in text using the following syntax:

`<*img=my_image_file.png*>`
 where `my_image_file.png` is the path name of the image file.

For example, the line:

`<*size=20*>A <*img=sun.png*>day`
 will result in the following text rendered:

ChartDirector will automatically detect the image file format using the file extension, which must either png, jpg, jpeg, gif, wbmp or wmp (case insensitive).

Please refer to `BaseChart.setSearchPath` or `DrawArea.setSearchPath` on the directory that ChartDirector will search for the file.

The `<*img*>` tag may optionally contain width and height attributes to specify its pixel width and height. In this case, ChartDirector will stretch or compress the image if necessary to the required width and height. Blocks Attributes

CDML supports nesting blocks, that is, a block can contain other sub-blocks. Attributes are supported in the `<*block*>` tag to control the alignment and orientation of the sub-blocks. The `<*img=my_image_file.png*>` is treated as a block for layout purposes.

For example, the line:

`<*block,valign=absmiddle*><*img=molecule.png*><*block*>Hydrazino\nMolecule<*/*><*/*>`
 will result in the following text rendered:

The the above starts `<*block,valign=absmiddle*>` which specifies its content should align with each others in the vertical direction using the absolute middle alignment. The block contains an image, followed by a space characters, and then another block which has two lines of text.

The following table describes the supported attributes inside `<*block*>` tag:

AttributeDescription

The value `baseline` means the baseline of sub-blocks should align with the baseline of the block. The baseline is the underline position of text. This is normal method of aligning text, and is the default in CDML. For images or blocks that are rotated, the baseline is the same as the bottom.

The value `top` means the top line of sub-blocks should align with the top line of the block.

| | |
|-------------|--|
| width | The width of the block in pixels. By default, the width is automatically determined to be the width necessary for the contents of the block. If the width attribute is specified, it will be used as the width of the block. If the width is insufficient for the contents, the contents will be wrapped into multiple lines. |
| height | The height of the block in pixels. By default, the height is automatically determined to be the height necessary for the contents of the block. If the height attribute is specified, it will be used as the height of the block. |
| maxwidth | The maximum width of the block in pixels. If the content is wider than maximum width, it will be wrapped into multiple lines. |
| truncate | The maximum number of lines of the block. If the content requires more than the maximum number of lines, it will be truncated. In particular, if truncate is 1, the content will be truncated if it exceeds the maximum width (as specified by maxwidth or width) without wrapping. The last few characters at the truncation point will be replaced with "...". |
| linespacing | The spacing between lines as a ratio to the default line spacing. For example, a line spacing of 2 means the line spacing is two times the default line spacing. The default line spacing is the line spacing as specified in the font used. |
| bgColor | The background color of the block in hex format. |
| valign | The vertical alignment of sub-blocks. This is for blocks that contain sub-blocks. Supported values are baseline, top, bottom, middle and absmiddle. |

The value bottom means the bottom line of sub-blocks should align with the bottom line of the block.

The value middle means the middle line of sub-blocks should align with the the middle line of the block. The middle line is the middle position between the top line and the baseline.

The value absmiddle means the absolute middle line of sub-blocks should align with the absolute middle line of the block. The absolute middle line is the middle position between the top line and the bottom line.

halign The horizontal alignment of lines. This is for blocks that contain multiple lines. Supported values are left, center and right.

The value left means the left border of each line should align with the left border of the block. This is the default.

The value center means the horizontal center of each line should align with the horizontal center of the block.

The value right means the right border of each line should align with the right border of the block.

angle Rotate the content of the block by an angle. The angle is specified in degrees in counter-clockwise direction.

12.0.27 ChartDirector: Parameter Substitution and Formatting

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Parameter Substitution and Formatting

Notes: ChartDirector charts often contain a lot of text strings. For example, sector labels in pie charts, axis labels for x and y axes, data labels for the data points, HTML image maps, etc, are all text strings.

ChartDirector uses parameter substitution to allow you to configure precisely the information contained in the text and their format.

Format Strings

In parameter substitution, format strings are used to specify the entities to be include into labels and how to format numbers and dates.

For example, when drawing a pie chart with side label layout, the default sector label format string is:

```
" { label } ( { percent } %)"
```

When the sector label is actually drawn, ChartDirector will replace " { label } " with the sector name, and " { percent } " with the sector percentage. So the above label format will result is a sector label similar to "ABC (34.56%)".

You may change the sector label format by changing the format string. For example, you may change it to:

```
" { label } : US$ { value | 2 } K ( { percent } %)"
```

The sector label will then become something like "ABC: US\$ 123.00 (34.56%)".

In general, in ChartDirector parameter substitution, parameters enclosed by curly brackets will be substituted with their actual values when creating the texts.

For parameters that are numbers or dates/times, ChartDirector supports a special syntax in parameter substitution to allow formatting for these values. Please refer to the Number Formatting and Date/Time Formatting sections below for details.

Parameter Expressions

ChartDirector supports numeric expressions in format strings. They are denoted by enclosing the expression with curly brackets and using "=" as the first character. For example:

```
"USD { value } (Euro { = { value } *0.9 } )"
```

In the above, " { value } " will be substituted with the actual value of the sector. The expression " { = { value } *0.9 } " will be substituted with the actual value of the sector multiplied by 0.9.

ChartDirector parameter expressions support operators "+", "-", "*", "/", "%" (modulo) and "^" (exponentiation). Operators "*", "/", "%", "^" is computed first, followed by "+" and "-". Operators of the same precedence are computed from left to right). Parenthesis "(" and ")" can be used to change the computation order.

Parameters for Pie Charts

The following table describes the parameters available for pie charts.

| Parameter | Description |
|-------------|--|
| sector | The sector number. The first sector is 0, while the nth sector is (n-1). |
| dataSet | Same as { sector } . See above. |
| label | The text label of the sector. |
| dataSetName | Same as { label } . See above. |
| value | The data value of the sector. |
| percent | The percentage value of the sector. |
| fieldN | The (N + 1)th extra field. For example, { field0 } means the first extra field. An extra field is an array of custom elements added using BaseChart.addExtraField or BaseChart.addExtraField2. |

Parameters for All XY Chart Layers

The followings are parameters that are apply to all XY Chart layers in general. Some layer types may have additional parameters (see below).

Note that certain parameters are inapplicable in some context. For example, when specifying the aggregate label of a stacked bar chart, the { dataSetName } parameter is inapplicable. It is because a stacked bar is composed of multiple data sets. It does not belong to any particular data set and hence does not have a data set name.

{ fieldN } means the extra field is indexed by the data point number. The Pth data point corresponds to the Pth element of the extra field.

Additional Parameters for Line Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for Trend Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for Box-Whisker Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for HLOC and CandleStick Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for Vector Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Parameters for All Polar Layers

The followings are parameters that are apply to all Polar Chart layers in general. Some layer types may have additional parameters (see below).

{ fieldN } means the extra field is indexed by the data point number. The Pth data point corresponds to the Pth element of the extra field.

Additional Parameters for PolarVector Layers

The followings are parameters that are in additional to the parameters for all Polar Chart layers.

Parameters for Axis

The following table describes the parameters available for pie charts.

Number Formatting

For parameters that are numbers, ChartDirector supports a number of formatting options in parameter substitution.

For example, if you want a numeric field { value } to have a precision of two digits to the right of the decimal point, use ',' (comma) as the thousand separator, and use '.' (dot) as the decimal point, and you may use { value | 2, . } . The number 123456.789 will then be displayed as 123,456.79.

For numbers, the formatting options are specified using the following syntax:

```
{ [ param ] | [ a ] [ b ] [ c ] [ d ] }
```

where:

If this field starts with "E" or "e", followed by a number, it means formatting the value using scientific notation with the specified number of decimal places. If the "E" or "e" is not followed by a number, 3 is assumed.

For example, { value | E4 } will format the value 10.3 to 1.0300E+1, and { value | e4 } will format the same value to 1.0300e+1.

If this field starts with "G" or "g", followed by a number, it means formatting the value using the scientific notation only if the value is large and requires more than the specified number of digits, or the value is less than 0.001. If scientific notation is used, the number following "G" or "g" also specifies the number of significant digits to use. If the "G" or "g" is not followed by a number, 4 is assumed.

For example, consider the format string { value | G4 } . The value 10 will be formatted to 10. The value 100000 will be formatted to 1.000E+5. Similarly, for { value | g4 } , the value 10 will be formatted to 10, while the value 100000 will be formatted to 1.000e+5.

If you skip this argument, ChartDirector will display the exact value using at most 6 decimal places.

You may skip [b] [c] [d] . In this case, the default will be used.

Date/Time Formatting

For parameters that are dates/times, the formatting options can be specified using the following syntax:

```
{ [ param ] | [ datetime_format_string ] }
```

where [datetime_format_string] must start with an english character (A-Z or a-z) that is not "G", "g", "E" or "e", and may contain any characters except ' ' . (If it starts with "G", "g", "E" or "e", it will be considered as a number format string.)

Certain characters are substituted according to the following table. Characters that are not substituted will be copied to the output.

For example, a parameter substitution format of { value | mm-dd-yyyy } will display a date as something similar to 09-15-2002. A format of { value | dd/mm/yy hh:nn:ss a } will display a date as something similar to 15/09/02 03:04:05 pm.

If you want to include characters in the format string without substitution, you may enclose the characters in single or double quotes.

For example, the format { value | mmm '<*color=dd0000*>'yyyy } will display a date as something like Jan <*color=dd0000*>2005 (the <*color=dd0000*> is a CDML tag to specify red text color). Note that the <*color=dd0000*> tag is copied directly without substitution, even it contains "dd" which normally will

be substituted with the day of month.

Escaping URL/HTML/CDML characters

Parameter substitution is often used to create HTML image maps. In HTML, some characters has special meanings and cannot be used reliably. For example, the '>' is used to represent the end of an HTML tag.

Furthermore, if the field happens to be used as an URL, characters such as '?', '&' and '+' also have special meanings.

By default, ChartDirector will escape template fields used in URL and query parameters when generating image maps. It will modify URL special characters to the URL escape format "%XX" (eg. "?" will become "%3F"). After that, it will modify HTML special characters to the HTML escape format "&#nn;" (eg. ">" will become ">"). Similarly, it will escape other attributes in the image map using HTML escape format (but not URL escape format).

In addition to escaping HTML and URL special characters, ChartDirector will also remove CDML fields in creating image maps. It is because CDML is only interpreted in ChartDirector, should not be useful outside of ChartDirector (such as in browser tool tips).

In some cases, you may not want ChartDirector to escape the special characters. For example, if the parameters have already been escaped before passing to ChartDirector, you may want to disable ChartDirector from escaping them again.

ChartDirector supports the following special fields to control the escape methods - "{ escape_url }", "{ noescape_url }", "{ escape_html }", "{ noescape_html }", "{ escape_cdml }" and "{ noescape_cdml }". These fields enable/disable the escape methods used in the template fields that follow them.

12.0.28 ChartDirector: Shape Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Shape Specification

Notes: Several ChartDirector API accept shape specification as arguments. For example, BarLayer.setBarShape and BarLayer.setBarShape2 can be used to specify shapes of bars in bar charts, while DataSet.setDataSymbol, DataSet.setDataSymbol4, PolarLayer.setDataSymbol and PolarLayer.setDataSymbol4 can be used to specify shapes for data symbols.

Note that in addition to shapes, in many cases ChartDirector also accepts images or custom draw objects for data representation. For example, see DataSet.setDataSymbol2, DataSet.setDataSymbol3, PolarLayer.setDataSymbol2 and PolarLayer.setDataSymbol3.

Built-In Shapes

Built-in shapes are specified as integers. The integers can be explicit constants, or can be generated by a `ChartDirector` method for parameterized shapes. For example, a circle is represented by an explicit constant `CircleShape (=7)`. On the other hand, the number representing a polygon depends on the number of sides the polygon has, so it is generated by using the `PolygonShape` method, passing in the number of sides as argument.

The following table illustrates the various `ChartDirector` shapes:

Custom Shapes

In `ChartDirector`, custom shapes are specified as an array of integers `x0, y0, x1, y1, x2, y2 ...` representing the coordinates of the vertices of the custom polygonal shape.

The polygon should be defined with a bounding square of 1000 x 1000 units, in which the x-axis is from -500 to 500 going from left to right, and the y-axis is from 0 to 1000 going from bottom to top.

`ChartDirector` will automatically scale the polygon so that 1000 units will become to the pixel size as requested by the various `ChartDirector` API.

As an example, the shape of the standard diamond shape in `ChartDirector` is represented as an array with 8 numbers:

```
0, 0, 500, 500, 0, 1000, -500, 500
```

12.0.29 Copy styled text?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: How to quickly copy styled text from one textarea to another?

Example:

```
#if TargetWin32 then
TextArea1.WinRTFDataMBS = TextArea2.WinRTFDataMBS
#elseif TargetMacOS then
TextArea1.NSTextViewMBS.textStorage.setAttributedString TextArea2.NSTextViewMBS.textStorage
#else
TextArea1.StyledText = TextArea2.StyledText
#endif
```

Notes: The code above uses special plugin functions on Mac and Windows and falls back to framework for Linux.

12.0.30 Do you have code to validate a credit card number?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can check the checksum to tell if a credit card number is not valid.

Example:

```

Var strNumber As String
Var nLength as Integer
Var nValue as Integer
Var nChecksum as Integer
Var nIndex as Integer

strNumber = EditField1.Text
nLength = Len(strNumber)
nChecksum = 0

For nIndex = 0 To nLength - 2
nValue = Val(Mid(strNumber, nLength - (nIndex + 1), 1)) * (2 - (nIndex Mod 2))
If nValue <10 Then
nChecksum = nChecksum + nValue
Else
nChecksum = nChecksum + (nValue - 9)
End If
Next

If Val(Mid(strNumber, Len(strNumber), 1)) = (10 - (nChecksum Mod 10)) Mod 10 Then
MsgBox("The credit card number looks valid")
Else
MsgBox("The credit card number is invalid")
End IF

```

Notes: Here's some code that will validate the checksum for a credit card. It works for Visa, MasterCard, American Express and Discover. Not sure about others, but I imagine they use the same basic algorithm. Of course, this doesn't actually mean that the credit card is valid, it's only useful for helping the user catch typos.

The above code doesn't have any error checking and it expects that the credit card number will be entered without spaces, dashes or any other non-numeric characters. Addressing those issues will be an exercise left to the reader. :)

(From Mike Stefanik)

12.0.31 Do you have plugins for X-Rite EyeOne, eXact or i1Pro?

Plugin Version: all.

Answer: Our EyeOne plugin is available on request for licensees of the X-Rite SDKs.

Notes: Please first go to X-Rite and get a SDK license.
Then we can talk about the plugin.

12.0.32 Does SQL Plugin handle stored procedures with multiple result sets?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, the plugin can work with multiple recordsets.

Notes: You need to use SQLCommandMBS class. When you get back results, you use FetchNext to walk over all records in the first result set. Then you simply start again with FetchNext to get the second record set.

Even the RecordSet functions should work, just use them twice to get all records from both record sets.

12.0.33 Does the plugin home home?

Plugin Version: all, Platform: macOS.

Answer: Yes, we like to know who is using the plugin, so the plugin may contact our server.

Example:

none.

Notes: Please note that this does not affect your users as the plugin will only do this in the IDE and the relevant plugin part is never included in your applications.

The plugin if used for some hours, does contact our server to provide statistical data about Xojo version and OS versions. This way we know what versions are used. We can return the version number of the current plugin which may be visible in future versions somehow. And we transmit partial licenses data so we can track use of illegal license keys.

If you do not like to have this, you can block Xojo IDE from contacting our website via your Firewall.

Blocking the transfer will not disable the plugin or change the features.

Or contact us for a plugin version which explicitly does not contain this feature.

12.0.34 folderitem.absolutePath is limited to 255 chars. How can I get longer ones?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Paths on a Mac are not unique, so use them only to display them to the user.

Example:

```

Function AbsolutePath(f as FolderItem) As String
Var s as string
Var nf as FolderItem
nf = f
s = ""
while nf<>nil
s = nf.name + "." + s
nf = nf.parent
wend
Return s
End Function

```

12.0.35 Has anyone played round with using CoreImage to do things like add dissolve transitions say when changing from one tab to another within a window?

Platform: macOS.

Answer: This code implements animations for a tabpanel change:

Example:

```

// in a tabpanel.change event:

Var r as CGSTransitionRequestMBS
Var co as new CGSConnectionMBS
Var cw as CGSWindowMBS
Var ct as CGSTransitionMBS
static OldTab as Integer

cw=co.CGSWindow(window1)
If cw = Nil Then
return // 10.3...
End If
r=new CGSTransitionRequestMBS
r.TransitionType=r.CGSFlip
r.HasBackGround=false
r.HasBackColor=false
r.Win=cw
// watch the value of the clicked tab versus the last tab
if tabpanel1.Value=0 or tabpanel1.Value <OldTab then
r.TransitionOption=r.CGSLeft
ct=co.NewTransition(r)
if ct<>Nil then
Refresh
ct.Invoke(1)

```

```

ct.Wait(1)
ct.Release
else
MsgBox "Error creating the transition."
end if
else
r.TransitionOption=r.CGSRight
ct=co.NewTransition(r)
if ct<>Nil then
Refresh
ct.Invoke(1)
ct.Wait(1)
ct.Release
else
MsgBox "Error creating the transition."
end if
end if
// Keep track of the last tab clicked
OldTab = tabpanel1.Value

```

Notes: See CGS* classes for more details.

12.0.36 How about Plugin support for older OS X?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We support in general Mac OS X 10.5 and newer.

Notes: All the 64-bit plugins on Mac require OS X 10.7.

Intel 32-bit plugins on Mac require OS X 10.5 or newer.

Currently the ChartDirector 6, GraphicsMagick and GameKit plugins requires Mac OS X 10.6.
Also for SQL Plugin the built in SQLite library requires 10.6.

12.0.37 How can I detect whether an Intel CPU is a 64bit CPU?

Plugin Version: all.

Answer: Look on the CPU family returned by sysctl:

Example:

Function is64bit() As Boolean

```
#if TargetLittleEndian
```

```

Var m as MemoryBlock = NewMemoryBlock(8)
Var family as Integer
Var s as string

m=SystemControlNameToMIBMBS("hw.cpufamily")
m=SystemControlMBS(m)

if m<>nil then
m.LittleEndian=True
family=m.Long(0)

const CPUFAMILY_INTEL_6_14 = &h73d67300 /* "Intel Core Solo" and "Intel Core Duo" (32-bit
Pentium-M with SSE3) */
const CPUFAMILY_INTEL_6_15 = &h426f69ef /* "Intel Core 2 Duo" */
const CPUFAMILY_INTEL_6_23 = &h78ea4fbc /* Penryn */
const CPUFAMILY_INTEL_6_26 = &h6b5a4cd2 /* Nehalem */

Select case family
case CPUFAMILY_INTEL_6_14
Return false
case CPUFAMILY_INTEL_6_15
Return true
case CPUFAMILY_INTEL_6_23
Return true
case CPUFAMILY_INTEL_6_26
Return true
// newer CPUs may be missing here
end Select

end if

#endif

Return false

Exception
Return false
End Function

```

Notes: This code is written for Mac OS X where you only have a limited number of possible CPUs.

12.0.38 How can I disable the close box of a window on Windows?

Plugin Version: all, Platform: Windows.

Answer: The following code will remove the close item from the system menu of the window.

Example:

```

#if TargetWin32 then
Declare Function GetSystemMenu Lib "user32" (hwnd as Integer, bRevert as Integer) as Integer
Declare Function RemoveMenu Lib "user32" (hMenu as Integer, nPosition as Integer, wFlags as Integer) as Integer
Var hSysMenu as Integer
hSysMenu = GetSystemMenu(me.WinHWND, 0)
RemoveMenu hSysMenu, &HF060, &H0
#endif

```

Notes: The window may not be updated directly.

12.0.39 How can I get all the environment variables from Windows?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Example:

```

#if targetWin32
declare function GetEnvironmentStrings Lib "kernel32" () as ptr
Var m as memoryBlock
Var n as Integer

m=GetEnvironmentStrings()

n=0
do
msgBox m.cstring(n)
while m.byte(n)<>0
n=n+1
wend
n=n+1
loop until m.byte(n)=0
#endif

```

Notes: The MBS Plugin has an EnvironmentMBS class for this.

12.0.40 How can i get similar behavior to Roxio Toast or iTunes where clicking a 'burn' button allows the next inserted blank CD-R to bypass the Finder and be accepted by my application?

Plugin Version: all, Platform: macOS.

Answer: You need to get a media reservation.

Example:

```
Var d as DRDeviceMBS // get a device
d.AcquireMediaReservation
```

Notes: Use the plugin function AcquireMediaReservation and later release it using ReleaseMediaReservation.

See plugin examples on how to use it and check Apples DiscRecording framework documentation for more details.

12.0.41 How can I get text from a PDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Crossplatform you can use DynaPDF Pro.

Notes: On Mac OS X you can also use PDFKit for the same job.

While DynaPDF Pro gives you each bit of text with rotation, font information and encoding details, PDFKit gives you only the text string for a PDF page.

12.0.42 How can I get text from a Word Document?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: to get the text string from a doc file, use the NSAttributedStringMBS class.

Notes: The NSAttributedStringMBS class is Mac OS X only and we have currently no solution for Windows or Linux.

Use the NSAttributedStringMBS.initWithDocFormat(data as string) as boolean method.

12.0.43 How can I get the item string for a given file creator?

Plugin Version: all.

Answer: Try this function:

Example:

```

Sub pullNativeDocs(aCREA As string)
  Var result as Integer
  Var m, k as memoryBlock
  Var f as folderItem
  Var newType as string
  Var anIcon As picture
  Var ofs as Integer

  Declare Function GetFileTypesThatAppCanNativelyOpen Lib "Carbon" (appVRefNumHint as Short, appSignature as OSType, nativeTypes as Ptr) as Short Inline68K("701CABFC")
  Declare Function GetDocumentKindString Lib "Carbon" (docVRefNum as Short, docType as OSType, docCreator as OSType, kindString as ptr) as Short Inline68K("7016ABFC")

  listBox1.deleteAllRows

  m = newMemoryBlock(1024)
  result = GetFileTypesThatAppCanNativelyOpen(Volume(0).MacVRefNum, aCREA, m)
  if result <> 0 then
    listBox1.addRow "<Not found.>"
  return
end if

do
  if m.byte(ofs*4) = 0 then
    exit
  else
    newType = m.OSTypeMBS(ofs*4)
    listBox1.addRow newType
    k = newMemoryBlock(64)
    result = GetDocumentKindString(Volume(0).MacVRefNum, newType, aCREA, k)
    if result = 0 then
      listBox1.cell(ofs,1) = k.pString(0)
      ofs = ofs + 1
    else
      listBox1.cell(ofs,1) = "(unknown)"
    end if
  end if
end if
loop

End Sub

```

Notes: Change "Translation" to "CarbonLib" for Mac OS X.

12.0.44 How can I launch an app using it's creator code?

Plugin Version: all, Platform: macOS.

Answer: Send an AppleEvent "odoc" with the creator code to the Finder ("MACS"):

Example:

```
Function LaunchByCreator(C As String) As Boolean
Var A As AppleEvent
A = NewAppleEvent("aevt","odoc","MACS")
A.ObjectSpecifierParam("—") = GetUniqueIDObjectDescriptor("appf",nil,C)
return A.Send
End Function
```

12.0.45 How can I learn what shared libraries are required by a plugin on Linux?

Plugin Version: all, Platform: macOS.

Answer: Please use the ldd command in the terminal.

Notes: You build an app on any platform, but for Linux.

For the resulting .so files in the libs folder, you can run the ldd command with the library path as parameter. It shows you references lib files and you can make sure you have those installed.

This is a sample run of our graphicsmagick plugin:

```
cs@Ubuntu32:
textasciitilde /MeinProgramm/MeinProgramm Libs$ ldd libMBSGraphicsMagickPlugin17744.so
linux-gate.so.1 =>(0xb76ee000)
libdl.so.2 =>/lib/i386-linux-gnu/libdl.so.2 (0xb6f0e000)
libgtk-x11-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgtk-x11-2.0.so.0 (0xb6aa6000)
libpthread.so.0 =>/lib/i386-linux-gnu/libpthread.so.0 (0xb6a8a000)
libstdc++.so.6 =>/usr/lib/i386-linux-gnu/libstdc++.so.6 (0xb69a5000)
libm.so.6 =>/lib/i386-linux-gnu/libm.so.6 (0xb6979000)
libgcc_s.so.1 =>/lib/i386-linux-gnu/libgcc_s.so.1 (0xb695b000)
libc.so.6 =>/lib/i386-linux-gnu/libc.so.6 (0xb67b1000)
/lib/ld-linux.so.2 (0xb76ef000)
libgdk-x11-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgdk-x11-2.0.so.0 (0xb6701000)
libpangocairo-1.0.so.0 =>/usr/lib/i386-linux-gnu/libpangocairo-1.0.so.0 (0xb66f4000)
libX11.so.6 =>/usr/lib/i386-linux-gnu/libX11.so.6 (0xb65c0000)
libXfixes.so.3 =>/usr/lib/i386-linux-gnu/libXfixes.so.3 (0xb65ba000)
libatk-1.0.so.0 =>/usr/lib/i386-linux-gnu/libatk-1.0.so.0 (0xb659a000)
libcairo.so.2 =>/usr/lib/i386-linux-gnu/libcairo.so.2 (0xb64ce000)
libgdk_pixbuf-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgdk_pixbuf-2.0.so.0 (0xb64ad000)
libgio-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgio-2.0.so.0 (0xb6356000)
libpangoft2-1.0.so.0 =>/usr/lib/i386-linux-gnu/libpangoft2-1.0.so.0 (0xb632a000)
libpango-1.0.so.0 =>/usr/lib/i386-linux-gnu/libpango-1.0.so.0 (0xb62e0000)
```

```

libfontconfig.so.1 =>/usr/lib/i386-linux-gnu/libfontconfig.so.1 (0xb62ab000)
libgobject-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgobject-2.0.so.0 (0xb625c000)
libglib-2.0.so.0 =>/lib/i386-linux-gnu/libglib-2.0.so.0 (0xb6163000)
libXext.so.6 =>/usr/lib/i386-linux-gnu/libXext.so.6 (0xb6151000)
libXrender.so.1 =>/usr/lib/i386-linux-gnu/libXrender.so.1 (0xb6147000)
libXinerama.so.1 =>/usr/lib/i386-linux-gnu/libXinerama.so.1 (0xb6142000)
libXi.so.6 =>/usr/lib/i386-linux-gnu/libXi.so.6 (0xb6132000)
libXrandr.so.2 =>/usr/lib/i386-linux-gnu/libXrandr.so.2 (0xb6129000)
libXcursor.so.1 =>/usr/lib/i386-linux-gnu/libXcursor.so.1 (0xb611e000)
libXcomposite.so.1 =>/usr/lib/i386-linux-gnu/libXcomposite.so.1 (0xb611a000)
libXdamage.so.1 =>/usr/lib/i386-linux-gnu/libXdamage.so.1 (0xb6115000)
libfreetype.so.6 =>/usr/lib/i386-linux-gnu/libfreetype.so.6 (0xb607b000)
libxcb.so.1 =>/usr/lib/i386-linux-gnu/libxcb.so.1 (0xb605a000)
libpixmap-1.so.0 =>/usr/lib/i386-linux-gnu/libpixmap-1.so.0 (0xb5fc2000)
libpng12.so.0 =>/lib/i386-linux-gnu/libpng12.so.0 (0xb5f98000)
libxcb-shm.so.0 =>/usr/lib/i386-linux-gnu/libxcb-shm.so.0 (0xb5f93000)
libxcb-render.so.0 =>/usr/lib/i386-linux-gnu/libxcb-render.so.0 (0xb5f89000)
libz.so.1 =>/lib/i386-linux-gnu/libz.so.1 (0xb5f73000)
libgmodule-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgmodule-2.0.so.0 (0xb5f6e000)
libselinux.so.1 =>/lib/i386-linux-gnu/libselinux.so.1 (0xb5f4f000)
libresolv.so.2 =>/lib/i386-linux-gnu/libresolv.so.2 (0xb5f36000)
libexpat.so.1 =>/lib/i386-linux-gnu/libexpat.so.1 (0xb5f0c000)
libffi.so.6 =>/usr/lib/i386-linux-gnu/libffi.so.6 (0xb5f05000)
libpcre.so.3 =>/lib/i386-linux-gnu/libpcre.so.3 (0xb5ec9000)
librt.so.1 =>/lib/i386-linux-gnu/librt.so.1 (0xb5ec0000)
libXau.so.6 =>/usr/lib/i386-linux-gnu/libXau.so.6 (0xb5ebb000)
libXdmcp.so.6 =>/usr/lib/i386-linux-gnu/libXdmcp.so.6 (0xb5eb4000)
cs@Ubuntu32:
textasciitilde /MeinProgramm/MeinProgramm Libs$

```

As you see all library have been found and their load address is printed behind the na,e. If a library is missing, you usually see the address missing there or being zero.

12.0.46 How can I validate an email address?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can try this code:

Example:

```

Var re As RegEx
re = New RegEx
Var rm As RegExMatch

```

```

re.SearchPattern = " [a-z0-9!#$%&'*/+=?^_`' { | }
textasciitilde - ]+(?:\. [a-z0-9!#$%&'*/+=?^_`' { | }

```

```

textasciitilde - ] +)*@(?: [ a-z0-9 ] (?: [ a-z0-9- ] * [ a-z0-9 ] )?\.)+ [ a-z0-9 ] (?: [ a-z0-9- ] * [ a-z0-9 ] )?)"
rm = re.Search(editField1.Text)

if rm = Nil Then
StaticText2.text = editField1.Text + " not valid email"
Else
StaticText2.Text = editField1.Text + " is valid"
End if

```

Notes: Adapted from:
<http://www.regular-expressions.info/email.html>

12.0.47 How do I decode correctly an email subject?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The following code can be used to decode an email subject including several encodings including Base 64.

Example:

```

Var src as string // input

Var theRegex as Regex
Var theRegexMatch as RegexMatch
Var result, infoCharset, encodedPart as string
Var theStart as Integer

if instr(src, "=?") >0 then
theRegex = new Regex
theRegex.Options.Greedy = false
theRegex.searchPattern = "(.*)=\?(.+)\?(Q | B)\?(.+)\?="
theRegexMatch = theRegex.search(src)
while theRegexMatch <>nil
theStart = theRegexMatch.subExpressionStartB(0) + len(theRegexMatch.subExpressionString(0))

result = result + theRegexMatch.subExpressionString(1)
infoCharset = theRegexMatch.subExpressionString(2)
encodedPart = theRegexMatch.subExpressionString(4)
if theRegexMatch.subExpressionString(3) = "B" then
encodedPart = DecodeBase64(encodedPart)
elseif theRegexMatch.subExpressionString(3) = "Q" then
encodedPart = DecodeQuotedPrintable(encodedPart)
end if
if right(result, 1) = " " then
result = mid(result, 1, len(result)-1)

```

```

end if
encodedPart = encodedPart.DefineEncoding(GetInternetTextEncoding(infoCharset))
result = result + encodedPart

theRegex.SearchStartPosition = theStart
theRegexMatch = theRegex.search()
wend

result = result + mid(src, theStart+1)

else
result = src
end if
// theRegexMatch = theRegex.search

msgbox result

```

Notes: May not look nice depending on the controls used.
This is no longer needed when using MimeEmailMBS class which decodes for you.

12.0.48 How do I enable/disable a single tab in a tabpanel?

Plugin Version: all, Platform: macOS.

Answer: Use the TabpanelEnabledMBS method.

Example:

```
TabpanelEnabledMBS(tabpanel1, 1, false)
```

Notes: Use Carbon for MachO and CarbonLib for Mac Carbon and AppearanceLib for Mac OS Classic as library.

For Cocoa, please use enabled property of NSTabViewItemMBS class.

12.0.49 How do I find the root volume for a file?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Try this function:

Example:

```

Function GetRootVolume(f as FolderItem) as FolderItem
Var root, dum as folderItem
if f <> nil then
root = f // f might be the volume

```

```

do
dum = root.parent
if dum <>nil then
root = dum
end if
loop until dum = nil
return root
end if
End Function

```

12.0.50 How do I get the current languages list?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```

Var p as new CFPREFERENCESMBS
Var a as CFArrayMBS
Var s as CFStringMBS
Var o as CFOBJECTMBS
Var sa(-1) as string

o=p.CopyAppValue("AppleLanguages",".GlobalPreferences")

if o<>Nil then
a=CFArrayMBS(o)

Var i,c as Integer

c=a.Count-1
for i=0 to c
o=a.Item(i)

if o isa CFStringMBS then
s=CFStringMBS(o)
sa.Append s.str
end if
next
end if

MsgBox Join(sa,EndOfLine)

```

Notes: On Mac OS X you can get the list of current languages like this list:

de
en
ja
fr
es
it
pt
pt-PT
nl
sv
nb
da
fi
ru
pl
zh-Hans
zh-Hant
ko

Which has German (de) on the top for a German user.
This code has been tested on Mac OS X 10.5 only.

12.0.51 How do I get the Mac OS Version?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```
Var i as Integer
if system.gestalt("sysv", i) then
//do this in an 'If' in case you don't get any value back at all and system.gestalt returns boolean
if i = &h750 then //If OS is 7.5
//do stuff
elseif i = &h761 then //If OS is 7.6.1
//do stuff
end if
end if
```

Notes: The MBS Plugin has a function `SystemInformationMBS.OSVersionString` for this.

12.0.52 How do I get the printer name?

Plugin Version: all.

Answer: For Mac OS Classic see the code below and for Mac OS X use the Carbon Print Manager Classes from the MBS Plugin.

Example:

```
Var s as String
Var i as Integer
```

```
s=app.ResourceFork.GetResource("STR",-8192)
if s<>"" then
i=ascb(leftb(s,1))
s=mid(s,2,i)
```

```
MsgBox s
end if
```

Notes: A note from Craig Hoyt:

After looking at your example I had a little deja-vu experience. Several years ago I played around with this same code in FutureBasic. I discovered that it did not and still doesn't provide the 'Printer Name', it does return the print driver name. If it returns 'LaserWriter 8' as the print driver you can look into this file and get the 'PAPA' resource #-8192 to get the actual Printer Name. Unfortunately this does not hold true for other printers. My Epson and HP Printers (the Epson has an Ethernet Card and the HP is USB) do not provide this info in their drivers. As far as I can tell it only returns the name by polling the printer itself.

12.0.53 How do I make a metal window if RB does not allow me this?

Plugin Version: all, Platform: macOS.

Answer: The following declare turns any window on Mac OS X 10.2 or newer into a metal one.

Example:

```
declare sub ChangeWindowAttributes lib "Carbon" (win as windowptr, a as Integer, b as Integer)

ChangeWindowAttributes window1,256,0
```

Notes: May not look nice depending on the controls used.

12.0.54 How do I make a smooth color transition?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

I'd like to show in a report some bars, which start with color A and end with color B.

The color change should be very smooth.

My problem: If I would start from 255,0,0 and end by 0,0,0, I would have 255 different colors. If the bars are longer than 255 pixels, would this look nice?

Example:

```
// Window.Paint:
Sub Paint(g As Graphics)
  Var w,w1,x,p as Integer
  Var c1,c2,c as color
  Var p1,p2 as Double

  c1=rgb(255,0,0) // start color
  c2=rgb(0,255,0) // end color

  w=g.Width
  w1=w-1

  for x=0 to w1
    p1=x/w1
    p2=1.0-p1

    c=rgb(c1.red*p1+c2.red*p2, c1.green*p1+c2.green*p2, c1.blue*p1+c2.blue*p2)

    g.ForeColor=c
    g.DrawLine x,0,x,g.Height

  next
End Sub
```

Notes:

Try the code above in a window paint event handler.

12.0.55 How do I read the applications in the dock app?

Plugin Version: all, Platform: macOS.

Answer: Use CFPREFERENCESMBS class like in this example:

Example:

```
// Reads file names from persistent dock applications and puts them into the list

Var pref as new CFPREFERENCESMBS

Var persistentapps as CFStringMBS = NewCFStringMBS("persistent-apps")
Var ApplicationID as CFStringMBS = NewCFStringMBS("com.apple.dock")
Var tiledata as CFStringMBS = NewCFStringMBS("tile-data")
Var filelabel as CFStringMBS = NewCFStringMBS("file-label")

// get the array of persistent applications from dock preferences
Var o as CFOBJECTMBS = pref.CopyValue(persistentapps, ApplicationID, pref.kCFPreferencesCurrentUser,
pref.kCFPreferencesAnyHost)

if o isa CFArrayMBS then
  Var a as CFArrayMBS = CFArrayMBS(o)

  // walk over all items in array
  Var c as Integer = a.Count-1
  for i as Integer = 0 to c

    // get dictionary describing item
    o = a.Item(i)

    if o isa CFDictionaryMBS then
      Var d as CFDictionaryMBS = CFDictionaryMBS(o)

      // and pick tile data dictionary
      o = d.Value(tiledata)
      if o isa CFDictionaryMBS then
        d = CFDictionaryMBS(o)

        // and pick there the file label
        o = d.Value(filelabel)
        if o isa CFStringMBS then
          // and display it
          Var name as string = CFStringMBS(o).str
          List.AddRow name
        end if
      end if
    end if
  next
end if
```

```
else
MsgBox "Failed to read dock preferences."
end if
```

Notes: You can use the `CFPreferencesMBS.SetValue` to change a value and `CFPreferencesMBS.Synchronize` to write the values to disc. You may need to restart the `Dock.app` if you modified things.

12.0.56 How do I truncate a file?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: In a `binarystream` you can set the `length` property to truncate.

12.0.57 How do update a Finder's windows after changing some files?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```
Var f as folderitem // some file
Var ae as appleevent
ae=newappleevent("fndr","fupd","MACS")
ae.folderitemparam("—")=f
if not ae.send then
//something went wrong
end if
```

Notes: The `folderitem.finderupdate` from the MBS Plugin does something like this.

12.0.58 How to access a USB device directly?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: First, it depends on the device.

Notes: Some devices can be talked directly from user mode code, but some require a kernel driver.

For some devices you can use plugins to access them like:

- Audio and Video sources using the `QTGrabberClassMBS`

- Mass storage devices using the folderitem class.
- Serial devices using the System.SerialPort function.
- HID USB devices can be used with MacHIDMBS, WinHIDMBS or LinuxHIDInterface class.
- Any USB device may be used with MacUSBMBS or WinUSBMBS classes.

In general it is always the best to take the most high level access to have others do the work for the details.

12.0.59 How to add icon to file on Mac?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use FolderItem.AddCustomIcon or NSWorkspaceMBS.setIcon functions.

Notes: Please close any open stream for the file you want to add an icon.

12.0.60 How to ask the Mac for the Name of the Machine?

Plugin Version: all, Platform: macOS.

Answer: Using Apple Events you can use this code:

Example:

Function Computername() *As string*

Var theEvent *as* AppleEvent

Var err *as* boolean

theEvent = newAppleEvent("mchn","getd","MACS")

err = theEvent.send

return theevent.ReplyString

End Function

Notes: Code above is for Mac OS 9!

Also the MBS Plugin has a function for this which may be faster and work also on Macs without Filesharing (which handles this event).

12.0.61 How to automatically enable retina in my apps?

Plugin Version: all, Platform: macOS.

Answer: You can run a build script on each build with this code:

Example:

```
Var App As String = CurrentBuildLocation + "/" + CurrentBuildAppName + ".app"
Call DoShellCommand("/usr/bin/defaults write " + App + "/Contents/Info ""NSHighResolutionCapable""
YES")
```

Notes: This will set the NSHighResolutionCapable flag to YES.

12.0.62 How to avoid leaks with Cocoa functions?

Plugin Version: all, Platform: macOS.

Answer: You can try this code on Mac OS X:

Example:

```
// in a Timer Action event:
Sub Action()
static LastPool as NSAutoreleasePoolMBS = nil
static CurrentPool as NSAutoreleasePoolMBS = nil

LastPool = CurrentPool
CurrentPool = new NSAutoreleasePoolMBS
End Sub
```

Notes: With Xojo 2009r4 the code above should not be needed as Xojo runtime does automatically handle the NSAutoreleasePools for you. For older Xojo versions you need to use code with a timer with the action event above to avoid memory leaks.

Please do not use Xojo 2009r4 and newer with plugins before version 9.5. You can get crashes there which typically show a line with a objc_msgSend call.

12.0.63 How to avoid trouble connecting to oracle database with SQL Plugin?

Plugin Version: all, Platform: macOS.

Answer: For oracle the most important thing is to point the plugin to the libraries from oracle.

Notes: In environment variables, the paths like ORACLE_HOME must be defined.

On Mac OS X you also need to define DYLD_LIBRARY_PATH to point to the dylib files from oracle.

For that you need to modify /etc/launchd.conf for Mac OS X 10.8 and newer.

In older versions those variables in .MacOSX/environment.plist file in user's home.

Another way for the case you bundle things inside your app is to use the LSEnvironment key in info.plist. In info.plist it looks like this:

```
<key>LSEnvironment</key>
<dict>
<key>test</key>
<string>Hello World</string>
</dict>
```

12.0.64 How to avoid ___NSAutoreleaseNoPool console messages in threads?

Plugin Version: all, Platform: macOS.

Answer: You need to use your own NSAutoreleasePool on a thread like this:

Example:

```
sub MyThread.run
  Var pool as new NSAutoreleasePoolMBS
  // do work here

  pool=nil
end sub
```

Notes: For more details read here:

http://developer.apple.com/mac/library/documentation/Cocoa/Reference/Foundation/Classes/NSAutoreleasePool_Class/Reference/Reference.html

12.0.65 How to bring app to front?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Mac you can use this code:

Example:

```
// First way:
app.FrontMostMBS = true

// second way:
Var p as new ProcessMBS
p.GetCurrentProcess
p.FrontProcess = true

// third way:
NSApplicationMBS.sharedApplication.activateIgnoringOtherApps(true)
```

```
// for Windows:
RemoteControlMBS.WinBringWindowToTop
```

Notes: This will bring a Mac app to the front layer.

12.0.66 How to bring my application to front?

Plugin Version: all, Platform: macOS.

Answer: This makes SimpleText (Code ttxt) to the frontmost application:

Example:

```
Var A As AppleEvent
A = NewAppleEvent("misc", "actv", "")
If Not A.Send then
Beep
end if
```

Notes: (Code is Mac only)

12.0.67 How to catch Control-C on Mac or Linux in a console app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use SignalHandlerMBS class for this.

Example:

```
// watch for Control-C on Mac
call SignalHandlerMBS.SetFlagHandler(2)

Var ende as boolean = false
do
if SignalHandlerMBS.IsFlagSet(2) then
Print "Flag 2 set. Existing..."
ende = true
end if

DoEvents 1
loop until ende
```

Notes: The signal is caught, a flag is set and you can ask later in your normal application flow for the result.

12.0.68 How to change name of application menu?

Plugin Version: all, Platforms: macOS, Windows.

Answer: Use this code to change the application menu name on Mac OS X:

Example:

```
Var mb as new MenubarMBS
Var m as MenuMBS = mb.item(1) // 1 is in my tests the app menu
if m<>Nil then
m.MenuTitle = "Hello World"
end if
```

Notes: This code is for Carbon only.

12.0.69 How to change the name in the menubar of my app on Mac OS X?

Plugin Version: all, Platform: macOS.

Answer:

You mean it screws up if the file name of the bundle itself is different than the name of the executable file in the MacOS folder within the bundle? If so, you should find something like this within your Info.plist file (or the 'plst' resource that the RB IDE builds for you):

```
<key>CFBundleExecutable</key>
<string>Executable file name here</string>
```

Just make sure that file name matches.

However, if your question involves how you can change the name of the app that appears in the menu and the dock, that's different. You can make this name different from the file name by changing the CFBundleName key:

```
<key>CFBundleName</key>
<string>Name for menu here</string>
```

Note that if you use my free AppBundler program, this second part is taken care of for you – just fill in a custom name in the right field.

You can find AppBundler (from Thomas Reed) at <http://www.bitjuggler.com/products/appbundler/> .

12.0.70 How to check if a folder/directory has subfolders?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this to check all items in a folder:

Example:

```
Function HasSubFolder(folder as FolderItem) As Boolean
  Var c as Integer = folder.Count
```

```
  for i as Integer = 1 to c
    Var item as FolderItem = folder.TrueItem(i)
```

```
    if item<>Nil and item.Directory then
      Return true
    end if
  next
```

```
End Function
```

Notes: We use trueitem() here to avoid resolving alias/link files.
Also we check for nil as we may not have permission to see all items.
And if one is a directory, we return without checking the rest.

12.0.71 How to check if Macbook runs on battery or AC power?

Plugin Version: all, Platform: macOS.

Answer: Please use our IOPowerSourcesMBS class like this:

Example:

```
Function PowerSourceState() as Integer
  Var p as new IOPowerSourcesMBS
```

```
  // check all power sources
  Var u as Integer = p.Count-1
  for i as Integer = 0 to u
    Var d as CFDictionaryMBS = p.Item(i)
    if d<>nil then
      // check if they have a power source state key:
      Var o as CFObjectMBS = d.Value(NewCFStringMBS("Power Source State"))
      if o isa CFStringMBS then
        Var s as string = CFStringMBS(o).str
```

```
      MsgBox s
```

```
      if s = "AC Power" then
```

```

Return 1
elseif s = "Battery Power" then
Return 2
end if
end if
end if
next
Return 0 // unknown
End Function

```

Notes: If you want to check the CFDictionaryMBS content, simply use a line like "dim x as dictionary = d.dictionary" and check the contents in the debugger.

12.0.72 How to check if Microsoft Outlook is installed?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: If you need Outlook for Scripting, you should simply check registry for the required Outlook.Application class:

Example:

```

Function OutlookInstalled() As Boolean
#if TargetWin32 then

try
Var r as new RegistryItem("HKEY_CLASSES_ROOT\Outlook.Application\CLSID", false)

Return true

catch r as RegistryAccessErrorException
// not installed
Return false

end try

#else

// Windows only, so false on other platforms
Return false

#endif

End Function

```

12.0.73 How to check on Mac OS which country or language is currently selected?

Plugin Version: all, Platform: macOS.

Answer: The code below returns a country value.

Example:

Var result as Integer

IF TargetMacOS THEN

CONST smScriptLang = 28

CONST smSystemScript = -1

DECLARE FUNCTION GetScriptManagerVariable LIB "Carbon" (selector as Integer) as Integer

DECLARE FUNCTION GetScriptVariable LIB "Carbon" (script as Integer, selector as Integer) as Integer

result=GetScriptVariable(smSystemScript, smScriptLang)

END IF

Notes: Returns values like:

For more values, check "Script.h" in the frameworks.

12.0.74 How to code sign my app with plugins?

Plugin Version: all, Platform: macOS.

Answer: When you try to code sign the application with plugin dylibs on Mac OS X, you may see error message that there is actually a signature included.

Notes: Please use the -f command line parameter with codesign utility to overwrite our MBS signature. We sign our plugins for MacOS, iOS and Windows to make sure they have not been modified.

In terminal, you do like this:

```
cd <Path to folder of app>
```

```
xattr -cr <Appname>.app
```

```
codesign -f -s "Developer ID Application: <Your Name>" <Appname>.app/Contents/Frameworks/*.dylib
```

```
codesign -f -s "Developer ID Application: <Your Name>" <Appname>.app/Contents/Frameworks/*.framework
```

```
codesign -f -s "Developer ID Application: <Your Name>" <Appname>.app
```

Please use the name of your certificate (See keychain), the name of your app and the path to the app folder.
 If you have helper apps you need to sign them first.
 You can use a build step to automatically sign your app on build.

12.0.75 How to collapse a window?

Plugin Version: all, Platform: macOS.

Answer: Use this function (Mac only):

Example:

```
Sub CollapseRBwindow(w as window, CollapseStatus as boolean)
  Var state, err as Integer
  Var wh as MemoryBlock
```

```
Declare Function CollapseWindow Lib "Carbon" (window as Integer, collapse as Integer) as Integer
```

```
IF CollapseStatus THEN
  state = 1
ELSE
  state = 0
END IF
```

```
err = CollapseWindow(w.MacWindowPtr, state)
```

```
End Sub
```

Notes: Also the MBS Plugin has a window.collapsedmbs property you can set.
 For Windows the MBS Plugin has a window.isiconicmbs property.

12.0.76 How to compare two pictures?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can try this code:

Example:

```
Function ComparePictures(p as picture, q as picture) as Integer
  Var r, u as RGBSurface
  Var x, y, n, m, h, w as Integer
  Var w1, w2, h1, h2, d1, d2 as Integer
  Var c1, c2 as color
```

```

h1=p.Height
h2=q.Height
w1=p.Width
w2=q.Width
d1=p.Depth
d2=q.Depth

if d1<>d2 then
Return 1
elseif w1<>w2 then
return 2
elseif h1<>h2 then
Return 3
else
r=p.RGBSurface
u=q.RGBSurface

if r=nil or u=nil then
Return -1
else
h=h1-1
w=w1-1
m=min(w,h)

for n=0 to m
c1=r.Pixel(n,n)
c2=u.Pixel(n,n)
if c1<>c2 then
Return 4
end if
next

for y=0 to h
for x=0 to w
c1=r.Pixel(x,y)
c2=u.Pixel(x,y)
if c1<>c2 then
Return 5
end if
next
next

// 0 for equal
// -1 for error (no RGBsurface)
// 1 for different depth
// 2 for different width
// 3 for different height
// 4 for different pixels (fast test)

```

```
// 5 for different pixels (slow test)
end if
end if
```

```
Exception
Return -1
End Function
```

Notes: Remember that this only works on bitmap pictures, so the picture.BitmapMBS function may be useful.

12.0.77 How to compile PHP library?

Plugin Version: all, Platform: macOS.

Answer: You have to download the source code and compile a static version of the library.

Notes: This instructions were written based on PHP 5.2.6 on Mac OS X:

- Best take a new Mac with current Xcode version installed.
- Download the source code archive. e.g. "php-5.2.6.tar.bz2"
- Expand that archive on your harddisc.
- Open terminal window
- change directory to the php directory. e.g. "cd /php-5.2.6"
- execute this two lines to define the supported CPU types and the minimum Mac OS X version:
- export CFLAGS="-arch ppc -arch i386 -mmacosx-version-min=10.3"
- export CXXFLAGS="-arch ppc -arch i386 -mmacosx-version-min=10.3"
- the command "./configure help" does show the configure options.
- use configure with a line like this:
- ./configure --enable-embed --with-curl --enable-ftp --enable-zip --enable-sockets --enable-static --enable-soap --with-zlib --with-bz2 --enable-exif --enable-bcmath --enable-calendar
- start the compilation with "make all"
- other option is to use "make install" which first does the same as "make all" and than does some installation scripts.
- you may get an error about a duplicate symbole __yytext. Search the file "zend_ini_scanner.c", search a line with "char *yytext;" and change it to "extern char *yytext;".

- On the end you get a lot of error messages, but you have a working library (named libphp5.so) file in the invisible ".libs" folder inside your php source folder.

Possible problems and solutions:

- If the path to your files has spaces, you can get into trouble. e.g. "/RB Plugins/PHP" is bad as files will be searched sometimes in "/RB".
- If you have in /usr/local/lib libraries which conflict with the default libraries, you can get into trouble.
- If you installed some open source tools which compiled their own libraries, you can get into conflicts.
- if you have to reconfigure or after a problem, you may need to use "make clean" before you start "make all" again.

Feel free to install additional libraries and add more packages to the configure line.

12.0.78 How to convert a BrowserType to a String with WebSession.Browser?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this:

Example:

```
Function GetBrowserName(s as WebSession.BrowserType) As string
Select case s
case WebSession.BrowserType.Android
Return "Andriod"
case WebSession.BrowserType.Blackberry
Return "Blackberry"
case WebSession.BrowserType.Chrome
Return "Chrome"
case WebSession.BrowserType.ChromeOS
Return "ChromeOS"
case WebSession.BrowserType.Firefox
Return "Firefox"
case WebSession.BrowserType.InternetExplorer
Return "InternetExplorer"
case WebSession.BrowserType.Opera
Return "Opera"
case WebSession.BrowserType.Safari
Return "Safari"
case WebSession.BrowserType.SafariMobile
Return "SafariMobile"
case WebSession.BrowserType.Unknown
Return "Unknown"
```



```

else
Return "Unkown: "+str(integer(s))
end Select

```

End Function

12.0.79 How to convert a EngineType to a String with WebSession.Engine?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this:

Example:

```

Function GetRenderingEngineName(s as WebSession.EngineType) As string
Select case s
case WebSession.EngineType.Gecko
Return "Gecko"
case WebSession.EngineType.Presto
Return "Presto"
case WebSession.EngineType.Trident
Return "Trident"
case WebSession.EngineType.Unknown
Return "Unknown"
case WebSession.EngineType.WebKit
Return "WebKit"
else
Return "Unkown: "+str(integer(s))
end Select

```

End Function

12.0.80 How to convert a PlatformType to a String with WebSession.Platform?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this:

Example:

```

Function GetPlatformName(s as WebSession.PlatformType) As string
Select case s
case WebSession.PlatformType.Blackberry
Return "Blackberry"
case WebSession.PlatformType.iPad
Return "iPad"
case WebSession.PlatformType.iPhone

```

```

Return "iPhone"
case WebSession.PlatformType.iPodTouch
Return "iPodTouch"
case WebSession.PlatformType.Linux
Return "Linux"
case WebSession.PlatformType.Macintosh
Return "Macintosh"
case WebSession.PlatformType.PS3
Return "PS3"
case WebSession.PlatformType.Unknown
Return "Unknown"
case WebSession.PlatformType.WebOS
Return "WebOS"
case WebSession.PlatformType.Wii
Return "Wii"
case WebSession.PlatformType.Windows
Return "Windows"
else
Return "Unkown: "+str(integer(s))
end Select

```

End Function

12.0.81 How to convert a text to iso-8859-1 using the TextEncoder?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

This code can help you although it's not perfect.

You need to set lc to the current color you use.

Example:

```

Var outstring as string
Var theMac, thePC as textencoding
Var Mac2PC as textconverter

theMac = getTextEncoding(0) // MacRoman
thePC = getTextEncoding(&h0201) // ISOLatin1

Mac2PC = getTextConverter(theMac, thePC)
// if you wanted to do the opposite just create a converter
// PC2Mac = getTextConverter(thePC, theMac)

outstring = Mac2PC.convert("Bj√rn, this text should be converted")
Mac2PC.clear

```

Notes:

You have to call `Mac2PC.clear` after every conversion to reset the encoding engine. See also newer `TextConverterMBS` class.

12.0.82 How to convert ChartTime back to Xojo date?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We have this example code:

Example:

```
Function ChartTimeToDate(ChartTime as Double) As date
static diff as Double = 0.0
```

```
if diff = 0.0 then
Var d2 as Double = CDBaseChartMBS.chartTime(2015, 1, 1)
Var da as new date(2015, 1, 1)
Var ts as Double = da.TotalSeconds
```

```
diff = ts - d2
end if
```

```
Var d as new date
d.TotalSeconds = diff + ChartTime
```

```
Return d
End Function
```

Notes: As you see we calculate the difference in base date from Date and ChartTime and later use difference to convert.

12.0.83 How to convert line endings in text files?

Plugin Version: all, Platform: macOS.

Answer: You can simply read file with `TextInputStream` and write with new line endings using `TextOutputStream` class.

Example:

```
Var inputfile as FolderItem = SpecialFolder.Desktop.Child("test.txt")
Var outputfile as FolderItem = SpecialFolder.Desktop.Child("output.txt")
Var it as TextInputStream = TextInputStream.Open(inputfile)
Var ot as TextOutputStream = TextOutputStream.Create(outputfile)
```

```

ot.Delimiter = EndOfLine.Windows // new line ending
while not it.EOF
ot.WriteLine it.ReadLine
wend

```

Notes: TextInputStream will read any input line endings and with delimiter property in TextOutputStream you can easily define your new delimiter.

12.0.84 How to convert picture to string and back?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use this plugin functions:

Notes: JPEG:

```

JPEGStringToPictureMBS(buf as string) as picture
JPEGStringToPictureMBS(buf as string,allowdamaged as Boolean) as picture
PictureToJPEGStringMBS(pic as picture,quality as Integer) as string

```

PNG:

```

PictureToPNGStringMBS(pic as picture, gamma as single) as string
PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single) as string
PictureToPNGStringMBS(pic as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as string
PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as string
PNGStringToPictureMBS(data as string, gamma as single) as picture
PNGStringToPNGPictureMBS(data as string, gamma as single) as PNGpictureMBS

```

Tiff:

```

TIFFStringToPictureMBS(data as string) as picture
TIFFStringToTiffPictureMBS(data as string) as TiffPictureMBS

```

BMP:

```

BMPStringtoPictureMBS(data as string) as picture
Picture.BMPDataMBS(ResolutionValueDPI as Integer=72) as string

```

GIF:

```
GifStringToGifMBS(data as string) as GIFMBS
GifStringToPictureMBS(data as string) as Picture
```

12.0.85 How to copy an array?

Plugin Version: all, Platform: macOS.

Answer: You can use a function like this to copy an array:

Example:

```
Function CopyArray(a() as Double) as Double()
Var r() as Double
for each v as Double in a
r.Append v
next
Return r
End Function
```

Notes: If needed make several copies of this method with different data types, not just double.
For a deep copy of an array of objects, you need to change code to also make a copy of those objects.

12.0.86 How to copy a dictionary?

Plugin Version: all, Platform: macOS.

Answer: You can use a function like this to copy a dictionary:

Example:

```
Function CopyDictionary(d as Dictionary) As Dictionary
Var r as new Dictionary
for each key as Variant in d.keys
r.Value(key) = d.Value(key)
next
Return r
End Function
```

Notes: If needed make several copies of this method with different data types, not just double.
For a deep copy of a dictionary of objects, you need to change code to also make a copy of those objects.

12.0.87 How to copy parts of a movie to another one?

Plugin Version: all, Platforms: macOS, Windows.

Answer: The code below copies ten seconds of the snowman movie to the dummy movie starting at the 5th second.

Example:

```

Var f as FolderItem
Var md as EditableMovie
Var ms as EditableMovie

f=SpecialFolder.Desktop.Child("Our First Snowman.mov")
ms=f.OpenEditableMovie

ms.SelectionStartMBS=5
ms.SelectionLengthMBS=10

f=SpecialFolder.Desktop.Child("dummy.mov")
md=f.CreateMovie

msgbox str(md.AddMovieSelectionMBS(ms))

```

Notes: If result is not 0, the method fails.

12.0.88 How to create a birthday like calendar event?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```

// start a connection to the calendar database
Var s as new CalCalendarStoreMBS

// needed for the error details
Var e as NSErrorMBS

Var r as CalRecurrenceRuleMBS = CalRecurrenceRuleMBS.initYearlyRecurrence(1, nil) // repeat every
year without end

Var a as new CalAlarmMBS // add alarm
a.action = a.CalAlarmActionDisplay
a.relativeTrigger = -3600*24 // 24 Hours before

// create a new calendar
Var c as new CalEventMBS

```

```

Var d as new date(2011, 04, 20) // the date

Var calendars() as CalCalendarMBS = s.calendars

// set properties
c.Title="Test Birthday"
c.startDate=d
c.recurrenceRule = r
c.calendar=calendars(0) // add to first calendar
c.addAlarm(a)
c.endDate = d
c.isAllDay = true

// save event
call s.saveEvent(c,s.CalSpanAllEvents, e)
if e<>nil then
MsgBox e.localizedDescription
else
MsgBox "New event was created."
end if

```

Notes: This adds an event to iCal for the given date with alarm to remember you and repeats it every year.

12.0.89 How to create a GUID?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the UUIDMBS class for this.

12.0.90 How to create a Mac picture clip file?

Plugin Version: all, Platform: Windows.

Answer: You can use code like this one.

Example:

```

Var f As FolderItem
Var p As Picture

f=SpecialFolder.Desktop.Child("Test.pictClipping")
if f=nil then Return

```

```
p=new Picture(300,200,32) 'Make a sample picture
p.Graphics.ForeColor=RGB(0,255,255)
p.Graphics.FillOval 0,0,99,99
p.Graphics.ForeColor=RGB(255,0,0)
p.Graphics.DrawOval 0,0,99,99
```

Var r As ResourceFork 'ResourceFork is needed for a clip file

```
// Please define a file type Any
r=f.CreateResourceFork("Any")
```

```
// get PICT data using plugin function
Var pictdata as string = p.PicHandleDataMBS
r.AddResource(pictdata,"PICT",256,"Picture")
```

Var m as new MemoryBlock(8)

```
m.LittleEndian = false
m.Int16Value(0) = 0
m.Int16Value(2) = 0
m.Int16Value(4) = p.Width
m.Int16Value(6) = p.Height
```

```
r.AddResource(m,"RECT",256,"")
```

'Values taken from a sample file and irrelevant to the problem

```
Var data as string = DecodeBase64("AQAAAAAAAAAAAAAAAAACAFRDRVIAAAAABAAAAAAAAAAAAABUQ0IQAAAAA")
r.AddResource(data,"drag",128,"") 'ditto
r.Close
```

Notes: In general Apple has deprecated this, but a few application still support clippings.

12.0.91 How to create a PDF file in Xojo?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Check our DynaPDF plugin and the examples.

Notes: An alternative can be to use the CoreGraphics and Cocoa functions on Mac OS X. For Windows, we can only suggest our DynaPDF plugin.

12.0.92 How to create EmailAttachment for PDF Data in memory?

Plugin Version: all, Platform: macOS.

Answer: You can use code like the one below:

Example:

```
Function EmailAttachmentFromPDFData(PDFData as string, filename as string) As EmailAttachment
Var a as new EmailAttachment
```

```
a.data = EncodeBase64(PDFData, 76)
a.ContentEncoding = "base64"
a.MIMETYPE = "application/pdf"
a.MacType = "PDF "
a.MacCreator = "prvw"
a.Name = filename
```

Return a

End Function

Notes: Compared to sample code from Xojo documentation, we set the mime type correct for PDF. The MacType/MacCreator codes are deprecated, but you can still include them for older Mac email clients. "prvw" is the creator code for Apple's preview app.

12.0.93 How to create PDF for image files?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use DynaPDF like this:

Example:

```
Function CreatePrintPDF(jpgFiles() as folderitem, pdfFile as FolderItem, PageWidth as Integer, PageHeight
as Integer) As Boolean
// have files?
If pdfFile = Nil Then Return False
If jpgFiles = Nil Then Return False

If jpgFiles.Ubound < 0 Then Return False

// new DynaPDF
Var pdf As New MyDynapdfMBS

// page width/height in MilliMeter
Var pdfWidth as Integer = PageWidth * 72 / 25.4
Var pdfHeight as Integer = PageHeight * 72 / 25.4

// put your license here
Call pdf.SetLicenseKey "Starter"

// create pdf
```

```

Call pdf.CreateNewPDF pdfFile

// set a couple of options
Call pdf.SetPageCoords(MyDynaPDFMBS.kpcTopDown)
Call pdf.SetResolution(300)
Call pdf.SetUseTransparency(False)
Call pdf.SetSaveNewImageFormat(False)
Call pdf.SetGStateFlags(MyDynaPDFMBS.kgfUseImageColorSpace, False)
Call pdf.SetJPEGQuality(100)

// set page size
Call pdf.SetBBox(MyDynaPDFMBS.kpbMediaBox, 0, 0, pdfWidth, pdfHeight)
Call pdf.SetPageWidth(pdfWidth)
Call pdf.SetPageHeight(pdfHeight)

// append pages with one image per page
For i as Integer = 0 To jpgFiles.Ubound
Call pdf.Append
Call pdf.InsertImageEx(0, 0, pdfWidth, pdfHeight, jpgFiles(i), 1)
Call pdf.EndPage
Next

// close
Call pdf.CloseFile

Return True
End Function

```

Notes: This is to join image files in paper size to a new PDF.
e.g. scans in A4 into an A4 PDF.

12.0.94 How to CURL Options translate to Plugin Calls?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Below a few tips on how to translate command line CURL calls to plugin calls.

Notes: `curl -vX PUT http://localhost:5984/appserials/78569238475/DocumentRegister.docx?rev=3-25634563456 -data-binary @DocumentRegister.docx -H "Content-Type: application/msword"`

- The option -v means verbose. You can use OptionVerbose and listen for messages in the DebugMessage event.
- The option -X PUT means we want to do a HTTP PUT Request. So set OptionPut to true. Also you will want to set OptionUpload to true as you upload data.
- We have the URL which you put into OptionURL property.

- The `-data-binary` option tells CURL to pass the given data. With the `@` before the data, it is interpreted as a file name, so the data is read from the given file. You'll need to open this file and pass data with the Read event as needed. (See CURLS ftp file upload example project)
- The last option `-H` specifies an additional header for the upload. Pass this additional header with the `SetOptionHTTPHeader` method.

```
curl -X PUT http://127.0.0.1:5984/appserials/f2f4e540bf8bb60f61cfd4328001c59 -d '{ "type": "Product", "description": "Application Serial", "acronym": "AppSerial", "dateAdded": "2011-03-21 14:57:36" } '
```

- Option `-X PUT` like above.
- Pass the URL again in `OptionURL`
- This time data is passed in command line for CURL. You'd put this data in the quotes into a string and make it available in the Read event. (See CURLS ftp upload example project)

12.0.95 How to delete file with ftp and curl plugin?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can set post/pre quotes to have ftp commands executed before or after the download/upload.

Example:

```
Var d as CURLMBS // your curl object
```

```
// delete file
```

```
Var ws() As String
```

```
ws.Append "DELE Temp.txt"
```

```
d.SetOptionPostQuote(ws)
```

Notes: Use `SetOptionPostQuote`, `SetOptionPreQuote` or `SetOptionQuote`.

The ftp commands you pass here are native ftp commands and not the commands you use with ftp applications. To delete use `DELE` and the file path.

12.0.96 How to detect display resolution changed?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Mac OS X simply listen for display changed notifications.

Notes: Use the "Distribution Notification Center.rbp" example project as a base and use it to listen to notifications with the name "O3DeviceChanged".

12.0.97 How to detect retina?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use `Window.BackingScaleFactorMBS` to query the factor.

Example:

```
msgbox str(window1.BackingScaleFactorMBS)
```

12.0.98 How to disable force quit?

Plugin Version: all, Platform: macOS.

Answer:

Please visit this website and get the control panel for Mac OS 9 there:

<http://www3.sk.sympatico.ca/tinyjohn/DFQ.html>

For Mac OS X use the MBS Plugin with the `SetSystemUIModeMBS` method.

Notes:

Please use `presentationOptions` in `NSApplicationMBS` for Cocoa applications.

12.0.99 How to disable the error dialogs from Internet Explorer on javascript errors?

Plugin Version: all, Platform: Windows.

Answer: You can use this code in the `htmlviewer` open event:

Example:

```
if targetwin32 then
htmlviewer1._ole.Content.value("Silent") = True
end if
```

Notes: This disables the error dialogs from Internet Explorer.

12.0.100 How to display a PDF file in Xojo?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Mac OS X you can use `CoreGraphics` or `PDFKit` to display a PDF.

Notes: An alternative can be to load the PDF into a `htmlviewer` so the PDF plugin can display it.

On Windows you may need to use the Acrobat ActiveX control from Adobe or launch Acrobat Reader.

12.0.101 How to do a lottery in RB?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Try this function:

Example:

```

Sub Lotto(max as Integer,count as Integer,z() as Integer)
// Lotto count numbers of max put into the array z beginning at index 0
Var n(0) as Integer ' all the numbers
Var m as Integer ' the highest field in the current array
Var i,a,b,d as Integer ' working variables

'fill the array with the numbers
m=max-1
redim n(m)

for i=0 to m
n(i)=i+1
next

' unsort them by exchanging random ones
m=max*10
for i=1 to m
a=rnd*max
b=rnd*max

d=n(a)
n(a)=n(b)
n(b)=d
next

' get the first count to the dest array
m=count-1
redim z(m)
for i=0 to m
z(i)=n(i)
next

'sort the result
z.sort
End Sub

Sub Open()
// Test it

```



```

ox=x
oy=y

x=x+dx
y=y+dy

if b then
g.DrawLine ox,oy,x,y
end if

b=not b
wend

End Sub

```

Notes: It would be possible to add this to the plugin, but I think it's better if you do it in plain Xojo code, so it even works on Windows.

12.0.104 How to draw a nice antialiased line?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

This code can help you although it's not perfect.
You need to set lc to the current color you use.

Example:

```

Sub drawLine(xs as Integer, ys as Integer, xe as Integer, ye as Integer, face as RGBSurface, lineColor as
color)
Var intX, intY, count, n, xDiff, yDiff as Integer
Var v, v1, floatX, floatY, xx, yy, xStep, yStep as Double
Var c as color

const st=1.0

xDiff=xe-xs
yDiff=ye-ys
count=max(abs(xDiff), abs(yDiff))
xStep=xDiff/count
yStep=yDiff/count
xx=xs
yy=ys
for n=1 to count
intX=xx

```

```

intY=yy
floatX=xx-intX
floatY=yy-intY

v=(1-floatX)*(1-floatY)*st
v1=1-v
c=face.pixel(intX, intY)
face.pixel(intX, intY)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)
v=floatX*(1-floatY)*st
v1=1-v
c=face.pixel(intX+1, intY)
face.pixel(intX+1, intY)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)
v=(1-floatX)*floatY*st
v1=1-v
c=face.pixel(intX, intY+1)
face.pixel(intX, intY+1)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)
v=floatX*floatY*st
v1=1-v
c=face.pixel(intX+1, intY+1)
face.pixel(intX+1, intY+1)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)

xx=xx+xStep
yy=yy+yStep
next

```

End Sub

Notes:

PS: st should be 1 and face should be a RGBSurface or a Graphics object.

12.0.105 How to dump java class interface?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: In terminal you can use "javap -s <classname>" to display the class with the method names and parameters.

Notes: For example show ResultSet class: javap -s java.sql.ResultSet

12.0.106 How to duplicate a picture with mask or alpha channel?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this function:

Example:

```

Function Duplicate(extends p as Picture) As Picture
  #if RBVersion >= 2011.04 then
  if p.HasAlphaChannel then

    // create nw picture and copy content:
    Var q as new Picture(p.Width, p.Height)
    q.Graphics.DrawPicture p,0,0

  Return q

  end if
  #endif

  // create new picture
  Var q as new Picture(p.Width, p.Height, 32)

  // get mask
  Var oldMask as Picture = p.mask(false)
  if oldMask = nil then
    // no mask, so simple copy
    q.Graphics.DrawPicture p,0,0
    Return q
  end if

  // remove mask
  p.mask = nil

  // copy picture and mask
  q.Graphics.DrawPicture p, 0, 0
  q.mask.Graphics.DrawPicture oldMask,0,0

  // restore mask
  p.mask = oldmask

  Return q
End Function

```

Notes: Simply copy it to a module and call it like this: q = p.duplicate.

The code above works with old Xojo versions because of the #if even if your RS version does not support alpha channel pictures. This way it's future proof.

12.0.107 How to enable assistive devices?

Plugin Version: all, Platform: macOS.

Answer: You can use AppleScript code like below:

Notes: tell application "System Events"
activate

```
set UI elements enabled to true
```

```
return UI elements enabled
end tell
```

You can run this with AppleScriptMBS class.

12.0.108 How to encrypt a file with Blowfish?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this:

Example:

```
Var fi as FolderItem = SpecialFolder.Desktop.Child("test.xojo_binary_project")
Var fo as FolderItem = SpecialFolder.Desktop.Child("test.encrypted")
```

```
// read input
Var bi as BinaryStream = BinaryStream.Open(fi)
Var si as string = bi.Read(bi.Length)
bi.Close

// encrypt
Var so as string = BlowfishMBS.Encrypt("MyKey",si)

// write output
Var bo as BinaryStream = BinaryStream.Create(fo)
bo.Write so
bo.Close
```

Notes: Of course you can decrypt same way, just use Decrypt function and of course swap files.

12.0.109 How to extract text from HTML?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use both RemoveHTMLTagsMBS and DecodingFromHTMLMBS like this:

Example:

```

Var html as string = "<p><B>Gr&uuml;&szlig;e</B></P>"
Var htmltext as string = RemoveHTMLTagsMBS(html)
Var text as string = DecodingFromHTMLMBS(htmltext)

```

MsgBox text // shows: Gr√üë

Notes: You can use it together with RemoveHTMLTagsMBS to remove html tags. What you get will be the text without tags.

DecodingFromHTMLMBS turns HTML escapes back to unicode characters. Like ä to √§.

12.0.110 How to find empty folders in a folder?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Try this code:

Example:

```

Var folder as folderitem // your folder

Var c as Integer = folder.count
for i as Integer = 1 to c
  Var item as folderitem = folder.trueitem(i)
  if item = nil then
    // ignore
  elseif item.directory then
    // folder
    if item.count = 0 then
      // found empty folder
    end if
  end if
end if
next

```

12.0.111 How to find iTunes on a Mac OS X machine fast?

Plugin Version: all, Platform: macOS.

Answer: You can try Launch Services.

Example:

```

Var f as FolderItem

f=LaunchServicesFindApplicationForInfoMBS("hook","com.apple.iTunes","iTunes.app")

MsgBox f.NativePath

```

12.0.112 How to find network interface for a socket by it's name?

Plugin Version: all, Platform: macOS.

Answer: You can use our plugin to build a lookup table.

Example:

```
Function FindNetworkInterface(name as string) As NetworkInterface
name = name.trim

if name.len = 0 then Return nil

// search by IP/MAC
Var u as Integer = System.NetworkInterfaceCount-1
for i as Integer = 0 to u
Var n as NetworkInterface = System.GetNetworkInterface(i)
if n.IPAddress = name or n.MACAddress = name then
Return n
end if
next

// use MBS Plugin to build a mapping
Var interfaces() as NetworkInterfaceMBS = NetworkInterfaceMBS.AllInterfaces
Var map as new Dictionary

for each n as NetworkInterfaceMBS in interfaces
Var IPv4s() as string = n.IPv4s
Var IPv6s() as string = n.IPv6s

for each IPv4 as string in IPv4s
map.Value(IPv4) = n.Name
next
for each IPv6 as string in IPv6s
map.Value(IPv6) = n.Name
next
if n.MAC<>"" then
map.Value(n.MAC) = n.Name
end if
next

// now search interfaces by name, IPv4 or IPv6
for i as Integer = 0 to u
Var n as NetworkInterface = System.GetNetworkInterface(i)
if map.Lookup(n.IPAddress, "") = name then
Return n
end if

if map.Lookup(n.MACAddress, "") = name then
Return n
```

```
end if
next
```

End Function

Notes: The code above uses a lookup table build using NetworkInterfaceMBS class to find the network interface by name.

12.0.113 How to find version of Microsoft Word?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this:

Example:

```
// find Word
Var f as FolderItem = LaunchServicesFindApplicationForInfoMBS("", "com.microsoft.Word", "")

// open bundle
Var c as new NSBundleMBS(f)

// read info
Var d as Dictionary = c.infoDictionary

// show version
MsgBox d.Lookup("CFBundleVersion", "")
```

Notes: Older versions of Word can be found with creator code "MSWD".

12.0.114 How to fix CURL error 60/53 on connecting to server?

Plugin Version: all, Platform: macOS.

Answer: You probably connect with SSL and you have no valid certificate.

Example:

```
Var d as new CURLSMBS

// Disable SSL verification
d.OptionSSLVerifyHost = 0 // don't verify server
d.OptionSSLVerifyPeer = 0 // don't proofs certificate is authentic

// With SSL Verification:
Var cacert as FolderItem = Getfolderitem("cacert.pem")
```

```
d.OptionCAInfo = cacert.NativePath
d.OptionSSLVerifyHost = 2 // verify server
d.OptionSSLVerifyPeer = 1 // proofs certificate is authentic
```

Notes: You can either use the code above to disable the SSL verification and have no security. Or you use the cacert file and enable the verification. Than you only get a connection if the server has a valid certificate.

see also:

<http://curl.haxx.se/ca/>

12.0.115 How to format double with n digits?

Plugin Version: all, Platform: macOS.

Answer: You can use the FormatMBS function for this.

Example:

```
Var d as Double = 123.4567890
listbox1.AddRow FormatMBS("%f", d)
listbox1.AddRow FormatMBS("%e", d)
listbox1.AddRow FormatMBS("%g", d)

listbox1.AddRow FormatMBS("%5.5f", d)
listbox1.AddRow FormatMBS("%5.5e", d)
listbox1.AddRow FormatMBS("%5.5g", d)

d = 0.000000123456
listbox1.AddRow FormatMBS("%f", d)
listbox1.AddRow FormatMBS("%e", d)
listbox1.AddRow FormatMBS("%g", d)

listbox1.AddRow FormatMBS("%5.5f", d)
listbox1.AddRow FormatMBS("%5.5e", d)
listbox1.AddRow FormatMBS("%5.5g", d)
```

Notes: see FormatMBS for details.

In general %f is normal style, %e is scientific and %g is whichever gives best result for given space.

12.0.116 How to get a time converted to user time zone in a web app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the WebSession.GMTOffset property.

Example:

```
Sub Open()
// current date on server
Var d as new date
Var s as string = d.LongTime

// adjust to client GMT offset
d.GMTOffset = d.GMTOffset + Session.GMTOffset

Var t as string = D.LongTime

MsgBox s+EndOfLine+t
End Sub
```

12.0.117 How to get an handle to the frontmost window on Windows?

Plugin Version: all, Platform: Windows.

Answer: This function returns a handle for the frontmost window:

Example:

```
Function GetForegroundWindowHandle() as Integer
#if targetwin32 then
declare function GetForegroundWindow Lib "user32.dll" as Integer
Return GetForegroundWindow()
#endif
End Function
```

12.0.118 How to get CFAbsoluteTime from date?

Plugin Version: all, Platforms: macOS, Windows.

Answer: Use code like this:

Example:

```
Var d as new date
Var t as CFTimeZoneMBS = SystemCFTimeZoneMBS
Var g as new CFGregorianCalendarMBS
g.Day = d.Day
g.Month = d.Month
g.Year = d.Year
g.Minute = d.Minute
g.Hour = d.Hour
g.Second = d.Second
```

```
Var at as CFAbsoluteTimeMBS = g.AbsoluteTime(t)
Var x as Double = at.Value
```

```
MsgBox str(x)
```

Notes: As you see we need a timezone and put the date values in a gregorian date record. Now we can query absolute time for the given timezone.

12.0.119 How to get client IP address on web app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the `WebSession.RemoteAddress` property.

Example:

```
Sub Open()
Title = Session.RemoteAddress
End Sub
```

12.0.120 How to get fonts to load in charts on Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use the `SetFontSearchPath` method in the `CDBaseChartMBS` class to specify where your fonts are.

Example:

```
if TargetLinux then
CDBaseChartMBS.SetFontSearchPath "/usr/share/fonts/truetype;/usr/share/fonts/truetype/msttcorefonts"
else
// on Mac and Windows we use system fonts.
end if

// also you can later switch default fonts:

Var Chart as CDBaseChartMBS // your chart

#If TargetARM And TargetLinux Then
// use specific fonts on Linux on Raspberry Pi
Call Chart.setDefaultFonts("/usr/share/fonts/truetype/piboto/PibotoLt-Regular.ttf", "/usr/share/fonts/truetype/piboto/Pi
#EndIf
```

Notes: On macOS, iOS and Windows, the fonts are loaded from the system's font folder.

e.g. if you use ubuntu, you can install the ttf-mscorefonts-installer package and call this method with `"/usr/share/fonts/truetype/msttcorefonts"` as the path. No backslash on the end of a path, please.

12.0.121 How to get fonts to load in DynaPDF on Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use the `AddFontSearchPath` method in the `DynaPDFMBS` class to specify where your fonts are.

Example:

```
Var d as new DynaPDFMBS
if TargetLinux then
call d.AddFontSearchPath "/usr/share/fonts/truetype", true
else
// on Mac and Windows we use system fonts.
end if
```

Notes: On Mac OS X and Windows, the fonts are loaded from the system's font folder.

e.g. if you use ubuntu, you can install the ttf-mscorefonts-installer package and call this method with `"/usr/share/fonts/truetype/msttcorefonts"` as the path. No backslash on the end of a path, please.

12.0.122 How to get GMT time and back?

Plugin Version: all, Platform: macOS.

Answer: You can use the `date` class and the `GMTOffset` property.

Example:

```
// now
Var d as new date

// now in GMT
Var e as new date
e.GMTOffset = 0

// show
MsgBox str(d.TotalSeconds, "0.0")+ " " +str(e.TotalSeconds, "0.0")

Var GMTTimeStamp as Double = e.TotalSeconds

// restore
```

```
Var f as new date
```

```
// add GMT offset here
f.TotalSeconds = GMTTimeStamp + f.GMTOffset*3600
// because here it's removed
f.GMTOffset = f.GMTOffset
```

```
MsgBox d.ShortTime+" ("&str(d.GMTOffset)&") "&str(d.TotalSeconds,"0.0")+EndOfLine+_
e.ShortTime+" ("&str(e.GMTOffset)&") "&str(e.TotalSeconds,"0.0")+EndOfLine+_
f.ShortTime+" ("&str(f.GMTOffset)&") "&str(f.TotalSeconds,"0.0")
```

Notes: It's sometimes a bit tricky with the date class as setting one property often changes the others.

12.0.123 How to get good crash reports?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Check this website from the webkit website:

Notes: <http://webkit.org/quality/crashlogs.html>

12.0.124 How to get list of all threads?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use the runtime module like in this function:

Example:

```
Function Threads() As Thread()
#pragma DisableBackgroundTasks
Var t() as Thread

Var o as Runtime.ObjectIterator=Runtime.IterateObjects
While o.MoveNext
if o.Current isa Thread then
t.Append thread(o.current)
end if
Wend

Return t
End Function
```

Notes: This returns an array of all thread objects currently in memory.

The pragma is important here as it avoids thread switches which may cause a thread to be created or deleted.

12.0.125 How to get parameters from webpage URL in Xojo Web Edition?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the Webpage.ParametersReceived event.

Example:

```
Sub ParametersReceived(Variables As Dictionary)
for each key as Variant in Variables.keys
MsgBox key+" ->" +Variables.Value(key)
next
End Sub
```

Notes: The text encodings of this strings is not defined in Xojo 2010r5. Please use DefineEncoding.

12.0.126 How to get the color for disabled textcolor?

Plugin Version: all, Platform: macOS.

Answer: Ask the appearance manager:

Example:

```
Function GetThemeTextColor(inColor as Integer, inDepth as Integer, inColorDev as Boolean) As Color
declare function GetThemeTextColor lib "Carbon" (inColor as Integer, inDepth as Integer, inColorDev as
Boolean, outColor as Ptr) as Integer

Var i as Integer
Var col as MemoryBlock

col = newMemoryBlock(6)

i = GetThemeTextColor(inColor, inDepth, inColorDev, col)

return RGB(col.UShort(0)\256, col.UShort(2)\256, col.UShort(4)\256)
End Function
```

Notes: The color for this is:

```
const kThemeTextColorDialogInactive = 2.
```

```
c = GetThemeTextColor(kThemeTextColorDialogInactive, Screen(0).Depth, true)
```

For Mac OS X you should use "CarbonLib" instead of "AppearanceLib" ...

12.0.127 How to get the current free stack space?

Plugin Version: all, Platform: macOS.

Answer: You can something like the code below:

Example:

```
Sub ShowStackSize()
  Var threadid as Integer
  Var size as Integer

  declare function GetCurrentThread lib "Carbon" (byref threadid as Integer) as short
  declare function ThreadCurrentStackSize lib "Carbon" (threadid as Integer, byref size as Integer) as short

  if GetCurrentThread(threadid)=0 then
  if 0=ThreadCurrentStackSize(threadid,size) then
  MsgBox str(size)
  end if
  end if
End Sub
```

Notes: For Mac OS 9, use "ThreadLib" instead of "CarbonLib". You can use #if if you like for that.

12.0.128 How to get the current timezone?

Plugin Version: all, Platforms: macOS, Windows.

Answer:

You can use the TimeZoneMBS class or the CFTimeZoneMBS class.

Or code like below:

Example:

```
Function GMTOffsetInMinutes() as Integer
  // Returns the offset of the current time to GMT in minutes.
  // supports Mac OS and Windows, but not Linux yet (let me know if
  // you have code for that, please)
  //
  // Note that the offset is not always an even multiple of 60, but
  // there are also half hour offsets, even one 5:45h offset

  // This version by Thomas Tempelmann (rb@tempel.org) on 25 Nov 2005
  // with a fix that should also make it work with future Intel Mac targets.
  //
  // Using code from various authors found on the RB NUG mailing list

  Var result, bias, dayLightbias as Integer
```

```

Var info as memoryBlock
Var offset as Integer

#if targetMacOS then

Declare Sub ReadLocation lib "Carbon" (location As ptr)

info = NewMemoryBlock(12)
ReadLocation info
if false then
// bad, because it does not work on Intel Macs:
'offset = info.short(9) * 256 + info.byte(11)
else
offset = BitwiseAnd (info.long(8), &hFFFFFF)
end

offset = info.short(9) * 256 + info.byte(11)
offset = offset \60
return offset

#endif

#if targetWin32 then

Declare Function GetTimeZoneInformation Lib "Kernel32" ( tzInfoPointer as Ptr ) as Integer
// returns one of
// TIME_ZONE_ID_UNKNOWN 0
// - Note: e.g. New Delhi (GMT+5:30) and Newfoundland (-3:30) return this value 0
// TIME_ZONE_ID_STANDARD 1
// TIME_ZONE_ID_DAYLIGHT 2

info = new MemoryBlock(172)
result = GetTimeZoneInformation(info)

bias = info.Long(0)
// note: the original code I found in the NUG archives used Long(84) and switched to Long(0)
// only for result=1 and result=2, but my tests found that Long(0) is also the right value for result=0

if result = 2 then
daylightBias = info.long(168)
end if
offset = - (bias + dayLightbias)
return offset

#endif

End Function

```

12.0.129 How to get the current window title?

Plugin Version: all, Platform: macOS.

Answer: The code below returns the current window title for the frontmost window on Mac OS X if Accessibility services are

Example:

```

Function CurrentWindowTitle() As string
// your application needs permissions for accessibility to make this work!

Var SystemWideElement,FocusedApplicationElement,FocusedWindowElement as AXUIElementMBS
Var FocusedApplication,FocusedWindow,Title as AXValueMBS
Var s as String
Var cs as CFStringMBS

SystemWideElement=AccessibilityMBS.SystemWideAXUIElement
if SystemWideElement<>nil then
FocusedApplication=SystemWideElement.AttributeValue(AccessibilityMBS.kAXFocusedApplicationAttribute)
if FocusedApplication.Type=AccessibilityMBS.kAXUIElementMBSTypeID then
FocusedApplicationElement=new AXUIElementMBS
FocusedApplicationElement.Handle=FocusedApplication.Handle
FocusedApplicationElement.RetainObject

FocusedWindow=FocusedApplicationElement.AttributeValue(AccessibilityMBS.kAXFocusedWindowAttribute)

if FocusedWindow<>nil and AccessibilityMBS.kAXUIElementMBSTypeID=FocusedWindow.Type then

FocusedWindowElement=new AXUIElementMBS
FocusedWindowElement.Handle=FocusedWindow.Handle
FocusedWindowElement.RetainObject

Title=FocusedWindowElement.AttributeValue(AccessibilityMBS.kAXTitleAttribute)
if Title<>nil and Title.Type=kCFStringMBSTypeID then
cs=new CFStringMBS
cs.handle=Title.Handle
cs.RetainObject
Return cs.str
end if
end if
end if
end if
End Function

```

12.0.130 How to get the cursor blink interval time?

Plugin Version: all, Platform: macOS.

Answer: On Mac OS you can use GetCaretTime from the toolbox.

Example:

```
declare function GetCaretTime lib "Carbon" () as Integer
```

```
MsgBox str(GetCaretTime())+" ticks"
```

Notes: 60 ticks make one second.

12.0.131 How to get the list of the current selected files in the Finder?

Plugin Version: all, Platform: macOS.

Answer:

Use the AppleScript like this one:

```
tell application "finder"
return selection
end tell
```

Which translates into this AppleEvent:

```
Process("Finder").SendAE "core,getd,'—':obj { form:prop, want:type(prop), seld:type(sele), from:'null'() }
"
```

and as Xojo code it looks like this:

Example:

```
Var ae as appleEvent
Var o1 as appleEventObjectSpecifier
Var f as folderItem
Var aList as appleEventdescList
Var i as Integer
Var dateiname as string

// setup the AppleEvent
o1=getpropertyObjectDescriptor( nil, "sele")
ae= newappleEvent("core", "getd", "MACS")
ae.objectSpecifierParam("—")=o1
```

```

// send it
if ae.send then
// got the list
alist=ae.replyDescList

// now show the list of filename into an editfield:

for i=1 to alist.count
f=alist.folderItem(i)

dateiname=f.name
// editfield1 with property "multiline=true"!
editfield1.text=editfield1.text + dateiname + chr(13)
next
end if

```

12.0.132 How to get the Mac OS system version?

Plugin Version: all, Platform: macOS.

Answer: The following code queries the value and displays the version number:

Example:

```

Var first as Integer
Var second as Integer
Var third as Integer
Var l as Integer

if System.Gestalt("sysv",l) then

Third=Bitwiseand(l,15)
second=Bitwiseand(l\16,15)
first=Bitwiseand(l\256,15)+10*Bitwiseand(l\256\16,15)
end if

if First>=10 then
msgbox "Mac OS X "+str(First)+" "+str(Second)+" "+str(third)
else
msgbox "Mac OS "+str(First)+" "+str(Second)+" "+str(third)
end if

```

12.0.133 How to get the Mac OS Version using System.Gestalt?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```

Var s As String
Var b As Boolean
Var i, resp as Integer

// Systemversion
b = System.Gestalt("sysv", resp)
If b then
s = Hex(resp)
For i =Len(s)-1 DownTo 1
s=Left(s,i)+" "+Mid(s,i+1)
Next
MsgBox "Systemversion: Mac OS " + s
end if

```

Notes: The MBS Plugin has a SystemInformationMBS.OSVersionString function for this.

12.0.134 How to get the screensize excluding the task bar?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Notes: Use the Screen class with the available* properties.

12.0.135 How to get the size of the frontmost window on Windows?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Notes: Make yourself a class for the WindowRect with four properties:

```

Bottom as Integer
Left as Integer
Right as Integer
Top as Integer

```

Add the following method to your class:

```

Sub GetWindowRect(windowhandle as Integer)
Var err as Integer
Var mem as memoryBlock

```

```
#if targetwin32 then
Declare Function GetWindowRect Lib "user32.dll" (hwnd as Integer, ipRect As Ptr) as Integer
```

```
mem = newmemoryBlock(16)
err = GetWindowRect(windowhandle, mem)
Left = mem.long(0)
Top = mem.Long(4)
Right = mem.Long(8)
Bottom = mem.Long(12)
#endif
End Sub
```

Good to use for the MDI Master Window!

12.0.136 How to get the source code of a HTMLViewer?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```
// for Windows:
```

```
msgbox HTMLViewer1.IEHTMLTextMBS
```

```
// for MacOS with WebKit 2.x:
```

```
msgbox HTMLViewer1.WKWebViewMBS.HTMLText
```

12.0.137 How to get Xojo apps running Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You need to install some require packages.

Notes: You need CUPS as well as GTK packages. On 64 bit systems also the ia32-libs package.

Please note that you need a x86 compatible Linux. So no PPC, Power, ARM or other CPUs.

12.0.138 How to handle really huge images with GraphicsMagick or ImageMagick?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Sometimes it may be better to use an extra application to process images.

Notes: A typical 32 bit app made with Xojo can use around 1.8 GB on Windows and 3 GB on Mac OS X. Some images may be huge, so that processing them causes several copies of the image to be in memory. With a 500 MB image in memory, doing a scale or rotation may require a temp image. So with source, temp and dest images with each 500 MB plus your normal app memory usage, you may hit the limit of Windows with 1.8 GB.

In that case it may be worth running a tool like gm in the shell class. gm is the command line version of GraphicsMagick. There you can run the 64 bit version which is not limited in memory like your own application. Also you can monitor progress and keep your app responsive.

12.0.139 How to handle tab key for editable cells in listbox?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this function:

Example:

```
Function HandleTabInList(list as listbox, row as Integer, column as Integer, key as String) As Boolean
// Handle tab character in Listbox.CellKeyDown event
```

```
Select case asc(key)
case 9
if Keyboard.AsyncShiftKey then
// back

// look for column left
for i as Integer = column-1 downto 0
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next
```

```
// not found, so look in row before
row = row - 1
if row >= 0 then
for i as Integer = list.ColumnCount-1 downto 0
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
```

```

end if
next
end if
else
// forward

// look for column right
for i as Integer = column+1 to list.ColumnCount-1
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next

// not found, so look in row below
row = row + 1
if row <list.ListCount then
for i as Integer = 0 to list.ColumnCount-1
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next
end if
end if
end Select
End Function

```

Notes: You call it from CellKeyDown event like this:

```

EventHandler Function CellKeyDown(row as Integer, column as Integer, key as String) As Boolean
if HandleTabInList(me, row, column, key) then Return true
End EventHandler

```

As you see in the code, we handle tab and shift + tab for moving back and forward. Also we wrap to previous/next row if needed. Feel free to extend this to wrap from last to first row or create a new row for editing.

12.0.140 How to hard link MapKit framework?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Our MapKit classes weak link the framework. If you need hard linking it for the App Store, you can add this method to a class:

Example:

```

Sub ReferenceMapKit()
// just put this in window or app class

#if TargetMachO and Target64Bit then
Declare sub testing Lib "MapKit" Selector "test" (id as ptr)
testing(nil)
#endif

End Sub

```

Notes: No need to call the method.
Just having it in a window or app, will cause the compiler to hard link the framework.

12.0.141 How to have a PDF downloaded to the user in a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use a WebHTMLViewer control and load the PDF file with the PDF plugin from the browser.

Example:

```

Var CurrentFile as WebFile // a property of the WebPage

// define the PDF file
CurrentFile = new WebFile
CurrentFile.Filename = "test.pdf"
CurrentFile.MIMEType = "application/pdf"
CurrentFile.Data = "some pdf data" // MyDynaPDF.GetBuffer
CurrentFile.ForceDownload = true

// start the download
showurl(CurrentFile.url)

```

Notes: See our Create PDF example for the Xojo Web Edition.

12.0.142 How to hide all applications except mine?

Platform: macOS.

Answer: The code below will on Mac OS hide all applications except your one:

Example:

```

Var p as new ProcessMBS

```

```
p.GetFirstProcess
do
if not p.FrontProcess then
p.Visible=false
end if
loop until not p.GetNextProcess
```

12.0.143 How to hide script errors in HTMLViewer on Windows?

Plugin Version: all, Platform: Windows.

Answer: Set Internet Explorer to silent mode with code like this:

Example:

```
htmlviewer1._ole.Content.value("Silent") = True
```

Notes: Simply put this code in the open event of your htmlviewer control (using me instead of htmlviewer1).

12.0.144 How to hide the grid/background/border in ChartDirector?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: If you want to hide something in a chart, simply assign the kTransparent constant as color.

12.0.145 How to hide the mouse cursor on Mac?

Plugin Version: all, Platform: macOS.

Answer: Try this declare:

Example:

```
Declare Sub HideCursor Lib "Carbon" () Inline68K("A852")
```

```
HideCursor
```

Notes: The MBS Plugin has this function and supports it on Windows, too.

12.0.146 How to insert image to NSTextView or TextArea?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: With NSTextViewMBS you can use this code to insert file:

Example:

```
// insert a file to textview

Public Sub InsertFile(textview as NSTextViewMBS, f as FolderItem)
// read to file
Var b as BinaryStream = BinaryStream.Open(f)
Var s as string = b.Read(b.Length)

// build wrapper
Var fileWrapper as NSFileWrapperMBS = NSFileWrapperMBS.initRegularFileWithContents(s)
fileWrapper.preferredFilename = f.name

// make attachment
Var fileAttachment as new NSTextAttachmentMBS(fileWrapper)
Var attributedString as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithAttachment(fileAttachment)

// add to a NSTextViewMBS
textview.insertText attributedString

End Sub
```

Notes: For TextArea you can query the underlying NSTextViewMBS object via TextArea.NSTextViewMBS method.

12.0.147 How to jump to an anchor in a htmlviewer?

Plugin Version: all, Platforms: macOS, Windows.

Answer: You can use javascript to change the current window's location.

Example:

```
// load website
htmlviewer1.LoadURL "http://www.monkeybreadsoftware.net/addressbook-abpersonmbs.shtml"

// later jump to anchor named "16":

if TargetWin32 then
call HTMLViewer1.IERunJavaScriptMBS "window.location = ""#16""
end if
```

12.0.148 How to keep a movieplayer unclickable?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: To keep the user away from clicking on a playing Movie you can just drop a Canvas in front of the Movieplayer and take the clicks there.

Example:

```
Function Canvas1.MouseDown(X as Integer, Y as Integer) as boolean
return true // take it and do nothing
End Function
```

12.0.149 How to keep my web app from using 100% CPU time?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Linux and MacOS you can use renice command in the terminal. On Windows use the task manager to reduce priority.

Notes: If you launch your app with nohup on Linux or Mac OS X like this from the terminal or a script:

```
nohup /webapps/MyApp/MyApp &
```

you can simply have a second line saying this:

```
renice 20 $ !
```

which tells the system to lower priority to lowest value for the latest background process.

12.0.150 How to kill a process by name?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can kill a process (or application) by name if you loop over all the processes and kill the one you need.

Example:

```
Var p as new ProcessMBS
p.GetfirstProcess ' get first
do
if p.name = "TextEdit" then
call p.KillProcess
Return
end if
```



```
loop until not p.GetNextProcess
```

Notes: You may want to check the result of killProcess function. Not every user is allowed to kill every application.

12.0.151 How to know how many CPUs are present?

Plugin Version: all, Platform: macOS.

Answer: Try this function:

Example:

```
Function GetCPUCount() as Integer
Declare Function MPProcessors Lib "Carbon" () as Integer
```

```
Return MPProcessors()
End Function
```

Notes: Your app will then need that library to launch on Classic. To avoid this the MBS plugin checks if this library is available and return 1 if it's not available.

12.0.152 How to know the calling function?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Mac you can use a helper function like this this code:

Example:

```
Public Function CallingFunction() as string
// Query name of calling function of a function

#pragma BreakOnExceptions false

try

// raise a dummy exception
Var r as new NilObjectException
raise r

catch x as NilObjectException

// get stack
Var stack() as string = x.Stack
```

```
// pick function name and return
Var name as string = stack(2)
Return name
```

```
end try
End Function
```

Notes: You need to include function names in your application.

12.0.153 How to launch an app using it's creator code?

Plugin Version: all, Platform: macOS.

Answer: Send an AppleEvent "oapp" with the creator code to the Finder ("MACS"):

Example:

```
Var a as AppleEvent
Var creator as string

creator = "MSIE" ' here the Internet Explorer

a = NewAppleEvent("aevt", "odoc", "MACS")
a.Timeout = -1

a.ObjectSpecifierParam("—") = GetUniqueIDObjectDescriptor("appf", nil, creator)

if not a.send then
msgBox "An error has occured"
else
end if
```

12.0.154 How to launch disc utility?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use this code:

Example:

```
Var f as FolderItem = LaunchServicesFindApplicationForInfoMBS("", "com.apple.DiskUtility", "")

if f<>Nil then
f.Launch
end if
```

Notes: This works even if people renamed the disc utility or moved it to another folder.

12.0.155 How to make a lot of changes to a REAL SQL Database faster?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You may try to embed your changes to the database between two transaction calls.

Example:

```
Var db as Database // some database

db.SQLExecute "BEGIN TRANSACTION"
// Do some Stuff
db.SQLExecute "END TRANSACTION"
```

Notes: This can increase speed by some factors.

12.0.156 How to make a NSImage object for my retina enabled app?

Plugin Version: all, Platform: macOS.

Answer: You can use code like this:

Example:

```
Function NewRetinaImage(pic as Picture, mask as Picture = nil) As NSImageMBS
// first make a NSImageMBS from it
Var n as new NSImageMBS(pic, mask)

// now set to half the size, so we have 2x pixels for the image
n.size = new NSSizeMBS(n.width/2, n.height/2)

// and return
Return n
End Function
```

Notes: The thing to do is to have 2x the pixels, but assign a size to the image which gives it the right size in points.

You can pass the NSImageMBS from here to NSMenuItemMBS. For Retina displays, the full resolution is used. For others it will be reduced.

12.0.157 How to make a window borderless on Windows?

Plugin Version: all, Platform: Windows.

Answer: Try this declares:

Example:

```
// Sets window to borderless popup type, and sets its initial dimensions.
// Call this method, then Win32SetBorderlessPos, and then RB's Show
// method. Use RB Frame type 7 (Global Floating Window).

Const SWP_NOMOVE = &H2
Const SWP_FRAMECHANGED = &H20
Const HWND_TOPMOST = -1
Const GWL_STYLE = -16
Const WS_POPUPWINDOW = &H80880000

Var styleFlags as Integer

#If TargetWin32 Then

Declare Function SetWindowLong Lib "user32" Alias "SetWindowLongA" (hwnd as Integer, nIndex as Integer, dwNewLong as Integer) as Integer
Declare Function SetWindowPos Lib "user32" (hwnd as Integer, hWndInstertAfter as Integer, x as Integer, y as Integer, cx as Integer, cy as Integer, flags as Integer) as Integer

styleFlags = SetWindowLong( w.WinHWND, GWL_STYLE, WS_POPUPWINDOW )
styleFlags = BitwiseOr( SWP_FRAMECHANGED, SWP_NOMOVE )
styleFlags = SetWindowPos( w.WinHWND, HWND_TOPMOST, 0, 0, wd, ht, styleFlags )

#EndIf
```

12.0.158 How to make an alias using AppleEvents?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```
Sub MakeAlias(folder as folderitem, target as folderitem, aliasname as string)
Var ev as AppleEvent
Var myResult as boolean
Var properties as AppleEventRecord

ev = NewAppleEvent("core", "crel", "MACS")
ev.MacTypeParam("kocl") = "alis"
ev.FolderItemParam("to ") = target
```

```

ev.FolderItemParam("insh") = folder

properties=new AppleEventRecord
properties.StringParam("pnam")=aliasname

ev.RecordParam("prdt")=properties

myResult = ev.send
// true on success, false on error
End Sub

```

Notes: Call it like this:

```
MakeAlias SpecialFolder.Desktop, SpecialFolder.Desktop.Child("Gif Copy.rb"), "test.rb alias"
```

Seems to not work on Mac OS X 10.6

12.0.159 How to make AppleScripts much faster?

Plugin Version: all, Platform: macOS.

Answer: use "ignoring application responses" like in this example:

```

Notes: on run { fn, fpx, fpy }
ignoring application responses
tell app "Finder" to set the position of folder fn to fpx, fpy
end ignoring
end run

```

12.0.160 How to make double clicks on a canvas?

Plugin Version: all, Platform: macOS.

Answer:

Update: Newer Xojo versions support DoubleClick event, so you don't need this code.

Here's my tip from the tips list on how to add a double-click event to the Canvas control. The technique could easily be used for a window or any Rectcontrol:

Because of its built-in drawing methods, the Canvas control is often used to create custom interface controls. But while the Canvas control has event handlers for most mouse events, it doesn't have an event handler for DoubleClick events. Fortunately, you can add a double-click event handler to a Canvas control easily. Basically, you're going to create a new class based on Canvas and add a double-click event to that. You can

then use the new class anytime you need a Canvas with a double-click event.

To create a new Canvas class with a DoubleClick event handler, do this:

1. Add a new class to your project.
2. Set the Super property of the new class to "Canvas".
3. Change the name of this new class to "DoubleClickCanvas".

A double-click occurs when two clicks occur within the users double-click time (set in the Mouse control panel on both Macintosh and Windows) and within five pixels of each other. So, you'll need a few properties to store when and where the last click occurred.

4. Add a new property with the following declaration and mark it as private: lastClickTicks as Integer
5. Add a new property with the following declaration and mark it as private: lastClickX as Integer
6. Add a new property with the following declaration and mark it as private: lastClickY as Integer

Since the Canvas control doesn't have a DoubleClick event, you will need to add one.

7. Add a new event to your class by choosing New Event from the Edit menu and enter "DoubleClick" as the event name.

Double-clicks occur on MouseUp. In order for the mouseUp event to fire, you must return True in the MouseDown event.

8. In the MouseDown event, add the following code:
Return True

In the MouseUp event, you will need to determine what the users double-click time is. This value is represented on both the Mac and Windows in ticks. A tick is 1/60th of a second. Since there isn't a built-in function for this, you'll need to make a toolbox call. The mouseUp event code below makes the appropriate toolbox call for both Macintosh and Windows. It then compares the time of the users last click to the time of the current click and compares the location of the users last click to the location of the current click.

9. Add the following code to the MouseUp event:

```
Var doubleClickTime, currentClickTicks as Integer

#if targetMacOS then
Declare Function GetDbfTime Lib "Carbon" () as Integer
doubleClickTime = GetDbfTime()
#endif
```

```

#if targetWin32 then
Declare Function GetDoubleClickTime Lib "User32.DLL" () as Integer
doubleClickTime = GetDoubleClickTime()/60 // convert to ticks from milliseconds
#endif

currentClickTicks = ticks
//if the two clicks happened close enough together in time
if (currentClickTicks - lastClickTicks) <= doubleClickTime then
//if the two clicks occurred close enough together in space
if abs(X - lastClickX) <= 5 and abs(Y - LastClickY) <= 5 then
DoubleClick //a double click has occurred so call the event
end if
end if
lastClickTicks = currentClickTicks
lastClickX = X
lastClickY = Y

```

10. Now to test out your new DoubleClickCanvas, drag the class from the Project window to a window in your project to create an instance of it.

11. Double-click on the canvas you just added to your window to open the Code Editor. Notice that the canvas has a DoubleClick event handler. In this event handler, add the following code:

BEEP

12.0.161 How to make my Mac not sleeping?

Plugin Version: all, Platform: macOS.

Answer: Just inform the Mac OS about some system activity with code like this:

Example:

```
Sub UpdateSystemActivity()
```

```

#if TargetCarbon
declare function myUpdateSystemActivity lib "Carbon" alias "UpdateSystemActivity" (activity as Integer)
as short

```

```

const OverallAct = 0 // Delays idle sleep by small amount */
const UsrActivity = 1 // Delays idle sleep and dimming by timeout time */
const NetActivity = 2 // Delays idle sleep and power cycling by small amount */
const HDActivity = 3 // Delays hard drive spindown and idle sleep by small amount */
const IdleActivity = 4 // Delays idle sleep by timeout time */

```

```
Var e as Integer
```

```
e=myUpdateSystemActivity(UsrActivity)

// you may react on an error if e is not 0 after the call.

#endif
End Sub
```

Notes: You may use another constant if you prefer some different behavior. Call it maybe every second.

12.0.162 How to make my own registration code scheme?

Plugin Version: all, Platform: Windows.

Answer: There are excellent articles about how to make a registration code scheme, but you can also simply use our RegistrationEngineMBS class.

Notes: If you need a license text, why not use the one from Xojo as a starting point?

12.0.163 How to make small controls on Mac OS X?

Plugin Version: all, Platform: macOS.

Answer: You can try this code on Mac OS X:

Example:

```
/*
 * Use the control's default drawing variant. This does not apply to
 * Scroll Bars, for which Normal is Large.
 */
const kControlSizeNormal = 0

/*
 * Use the control's small drawing variant. Currently supported by
 * the Check Box, Combo Box, Radio Button, Scroll Bar, Slider and Tab
 * controls.
 */
const kControlSizeSmall = 1

/*
 * Use the control's small drawing variant. Currently supported by
 * the Indeterminate Progress Bar, Progress Bar and Round Button
 * controls.
 */
```



```

const kControlSizeLarge = 2

'/*
' * Control drawing variant determined by the control's bounds. This
' * ControlSize is only available with Scroll Bars to support their
' * legacy behavior of drawing differently within different bounds.
' */
const kControlSizeAuto = &hFFFF

const kControlSizeTag = "size"

declare function SetControlData lib "Carbon" (controlhandle as Integer, part as short, tagname as OS-
Type, size as Integer, data as ptr) as short

Var m as MemoryBlock

m=NewMemoryBlock(2)
m.UShort(0)=kControlSizeSmall

Title=str(SetControlData(CheckBox1.Handle, 0, kControlSizeTag, 2, m))

```

12.0.164 How to mark my Mac app as background only?

Plugin Version: all, Platform: macOS.

Answer: You can run a build script on each build with this code:

Example:

```

Var App As String = CurrentBuildLocation + "/" + CurrentBuildAppName + ".app"
Call DoShellCommand("/usr/bin/defaults write " + App + "/Contents/Info ""NSUIElement"" YES")

```

Notes: This will set the NSUIElement flag to YES.

12.0.165 How to move a file or folder to trash?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like below:

Example:

```

Function MoveToTrash(f as FolderItem) As Boolean
#If TargetMacOS then
Var r as FolderItem
Var e as Integer = MacFileOperationMBS.MoveObjectToTrashSync(f, r, MacFileOperationMBS.kFSFile-
OperationDefaultOptions)

```

```

if e = 0 then
Return true // Ok
end if

#elseif TargetWin32 then
Var w as new WindowsFileCopyMBS

Var flags as Integer = w.FileOperationAllowUndo + w.FileOperationNoErrorUI + w.FileOperationSilent
+ w.FileOperationNoConfirmation
if w.FileOperationDelete(f, flags) then
Return true // OK
end if

flags = w.FileOperationNoErrorUI + w.FileOperationSilent + w.FileOperationNoConfirmation
if w.FileOperationDelete(f, flags) then
Return true // OK
end if
#else
// Target not supported
break
Return false
#endif
End Function

```

Notes: If you want to move a file to trash, you could use `f.movefileto f.trashfolder`, but that will overwrite existing files in the trash. You can use our `MacFileOperationMBS` class to move a file on Mac to the trash. And it uses the same code as the Finder, so files are renamed when the same name is already in use in the trash:

On Windows we use `WindowsFileCopyMBS` class.
Requires Mac OS X 10.5.

12.0.166 How to move an application to the front using the creator code?

Plugin Version: all, Platform: macOS.

Answer: This makes SimpleText (Code ttxt) to the frontmost application:

Example:

```

Var a as appleevent

a=newappleEvent("misc","actv","ttxt")

if a.send then

```

```
end if
```

Notes: (Code is Mac only)

12.0.167 How to move file with ftp and curl plugin?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can set post/pre quotes to have ftp commands executed before or after the download/upload.

Example:

```
Var d as CURLMBS // your curl object
```

```
// rename/move file
```

```
Var ws() As String
```

```
ws.Append "RNFR Temp.txt"
```

```
ws.append "RNT0 MyFile.txt"
```

```
d.SetOptionPostQuote(ws)
```

Notes: Use SetOptionPostQuote, SetOptionPreQuote or SetOptionQuote.

The ftp commands you pass here are native ftp commands and not the commands you use with ftp applications. So rename is two commands. First RNFR to tell where to rename from and second RNT0 with the new file name. To delete use DELE and the file path.

12.0.168 How to normalize string on Mac?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like below:

Example:

```
Function Normalize(t as string) As string
```

```
const kCFStringNormalizationFormD = 0 // Canonical Decomposition
```

```
const kCFStringNormalizationFormKD = 1 // Compatibility Decomposition
```

```
const kCFStringNormalizationFormC = 2 // Canonical Decomposition followed by Canonical Composition
```

```
const kCFStringNormalizationFormKC = 3 // Compatibility Decomposition followed by Canonical Composition
```

```
Var s as CFStringMBS = NewCFStringMBS(t)
```

```
Var m as CFMutableStringMBS = s.Normalize(kCFStringNormalizationFormD)
```

```
Return m.str
```

```
End Function
```

Notes: This uses Apple's CFString functions to normalize unicode variants.

12.0.169 How to obscure the mouse cursor on Mac?

Plugin Version: all, Platform: macOS.

Answer: Try this declare:

Example:

```
Declare Sub ObscureCursor Lib "Carbon" ()
```

```
ObscureCursor
```

Notes: The MBS Plugin has this function, but it's not supported for Windows.

12.0.170 How to open icon file on Mac?

Plugin Version: all, Platform: macOS.

Answer: Use the NSImageMBS class like this:

Example:

```
Var f as FolderItem = SpecialFolder.Desktop.Child("test.ico")
```

```
Var n as new NSImageMBS(f)
```

```
window1.Backdrop = n.CopyPictureWithMask
```

12.0.171 How to open PDF in acrobat reader?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```
Var pdf as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
```

```
// open PDF in Acrobat Reader on Mac:
```

```
// find app
```

```
Var bundleID as string = "com.adobe.Reader"
```

```
Var app as FolderItem = LaunchServicesFindApplicationForInfoMBS("", bundleID, "")
```

```

if app<>nil then

// launch app with parameters

Var docs() as FolderItem
docs.Append pdf

Var param as new LaunchServicesLaunchParameterMBS
param.Defaults = true
param.Application = app

Var x as FolderItem = LaunchServicesOpenXMBS(docs, param)

// on failure, simply launch it
if x = nil then
pdf.Launch(true)
end if

else
pdf.Launch(true)
end if

```

Notes: On Windows, simply use pdf.launch or WindowsShellExecuteMBS.

12.0.172 How to open printer preferences on Mac?

Plugin Version: all, Platform: macOS.

Answer: You can use our OpenMacOSXPreferencesPaneMBS function like this:

Example:

```

Var e as Integer = OpenMacOSXPreferencesPaneMBS("PrintAndFax")
if 0 = e then
MsgBox "OK"
elseif e = -43 then
MsgBox "File not found."
else
MsgBox "Error: "+str(e)
end if

```

12.0.173 How to open special characters panel on Mac?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We have functions for that in Cocoa and Carbon.

Example:

```
Var a as new NSApplicationMBS
a.orderFrontCharacterPalette
```

Notes: For Cocoa, you can use `orderFrontCharacterPalette` method in `NSApplicationMBS` class.

Or simply for Carbon and Cocoa the `ShowCharacterPaletteMBS` method.

12.0.174 How to optimize picture loading in Web Edition?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the `WebPicture` class.

Notes: Take your picture and create a `WebPicture` object. Store this `WebPicture` in a property of the `WebPage`, `Session` or `app` (as global as possible). On the first time you use this picture on an user session, the browser will load it. Second time you use it, the browser will most likely pick it from the cache.

Having pictures in `App` or some module reuses the same picture for all sessions which reduces memory footprint.

This does not work well with pictures you change very often or use only for one webpage on one user.

If you like to see an example, check our `Map` example.

12.0.175 How to parse XML?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this:

Example:

```
Var s as string = "<test><test /></test>"
```

```
try
Var x as new XmlDocument(s)
MsgBox "OK"
catch xe as XmlException
MsgBox "invalid XML"
end try
```

Notes: If you got an exception, you have a parse error.

12.0.176 How to play audio in a web app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use the HTML5 audio tag and control it with javascript.

Notes: This is just another example app I made today. It plays a christmas song. The audio file is provided by the application to the server, so no external web server is needed and this application can run stand alone. To compile and run you need Xojo 2010r5.

In the open event we search the audio files and open them as binarystreams. We create the two webfile objects. Those webfiles are part of the app class, so we have them globally. There we set the data with the content of our streams. We also define file names and mime types. They are needed so browser know what we have here:

```
audioFileM4V = new WebFile
audioFileM4V.Data = bM.Read(BM.Length)
audioFileM4V.Filename = "music.m4a"
audioFileM4V.MIMEType = "audio/m4a"
```

```
audioFileOGG = new WebFile
audioFileOGG.Data = bO.Read(BO.Length)
audioFileOGG.Filename = "music.ogg"
audioFileOGG.MIMEType = "audio/ogg"
```

Next in the open event of the webpage we have a PageSource control. The location is set to be before content. In the open event we define the html code for this. First we pick the URLs for the audio files. Than we build the html to use the audio tag. As you see, we give it an ID for later use and have it preload automatically. If you add an autoplay tag, you can have the audio play right away. Inside the audio tag we have two sources so we provide audio for both Firefox (OGG) and Safari (MPEG4). Finally we have a text to display if HTML5 audio tag is not supported.

You can set the source in the EditSource event:

```
Var urlo as string = app.audioFileOGG.URL
Var urlm as string = app.audioFileM4V.URL
me.Source = "<audio id=""mymusic"" preload=""auto""><source src="""+urlo+""" type=""audio/ogg""
/><source src="""+urlm+""" type=""audio/mpeg"" />Your browser does not support the audio ele-
ment.</audio>"
```

Next in the Play button we execute code to play the audio. This is a short javascript code which searches in the html document for the element with the ID "mymusic" which is the ID of our audio tag above. Once we got the object, we call it's play method to start playback.

```
me.ExecuteJavaScript("document.getElementById('mymusic').play();")
```

same for pause:

```
me.ExecuteJavaScript("document.getElementById('mymusic').pause();")
```

and finally for changing volume:

```
me.ExecuteJavaScript("document.getElementById('mymusic').volume="+str(me.Value/100.0)+"");")
```

12.0.177 How to pretty print xml?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the XML Transform method with the right XLS.

Notes: Learn more here:

<http://docs.xojo.com/index.php/XMLDocument.Transform>

12.0.178 How to print to PDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: This code below shows how to redirect printing to a PDF file on Mac OS X.

Example:

```
// get Xojo printer setup
Var p as new PrinterSetup

// now put it into NSPrintInfo to manipulate
Var n as new NSPrintInfoMBS
n.SetupString = p.SetupString

// change destination to file
Var f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
n.SetSaveDestination(f)

// move back
p.SetupString = n.SetupString

// and print as usual
Var g as Graphics = OpenPrinter(p)
g.DrawString "Hello World", 20, 20
```


Notes: And you can use normal graphics class for that.

12.0.179 How to query Spotlight's Last Open Date for a file?

Plugin Version: all, Platform: macOS.

Answer: You can use a MDItemMBS objec to query this value:

Example:

```
Function LastOpenedDate(Extends F As FolderItem, DefaultOtherDates As Boolean = True) As Date
#If TargetMacOS Then
Var xMDItem as New MDItemMBS(F)
Var xDate as Variant

If xMDItem <>Nil Then
xDate = xMDItem.GetAttribute(xMDItem.kMDItemLastUsedDate).DateValue
If xDate IsA Date Then Return xDate
Else
If xDate <>Nil Then Break
End If
#EndIf

If DefaultOtherDates Then
If F.ModificationDate <>Nil Then Return F.ModificationDate
If F.CreationDate <>Nil Then Return F.CreationDate
End If
End Function
```

Notes: Thanks for Josh Hoggan for this example code.

12.0.180 How to quit windows?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Example:

```
#if targetwin32 then
Var i1,i2,r as Integer
declare function ExitWindowsEx lib "user32" (uFlags as Integer, dwReserved as Integer) as Integer
i1 = 2
i2 = 0
r = ExitWindowsEx(i1,i2)
if r<>0 then
' Error()
```

```
end if
```

```
#endif
```

Notes: uFlags parameters:

```
'4 = EWX_Force
'0 = EWX_Logoff
'2 = EWX_Reboot
'1 = EWX_shutdown, should shut down computer
```

Also check the ExitWindowsMBS method.

12.0.181 How to read a CSV file correctly?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: With all the rules for quotes and delimiters, you can simply use the SplitCommaSeparatedValuesMBS method in our plugins like this:

Example:

```
Var f as FolderItem = SpecialFolder.Desktop.Child("test.csv")
Var t as TextInputStream = f.OpenAsTextFile

while not t.EOF
Var s as string = t.ReadLine(encodings.ASCII)

Var items() as string = SplitCommaSeparatedValuesMBS(s, ";", """")

List.AddRow ""
Var u as Integer = UBound(items)
for i as Integer = 0 to u
List.Cell(List.LastIndex,i) = items(i)
next

wend
```

Notes: Please make sure you choose the right text encoding.

12.0.182 How to read the command line on windows?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Example:

```
#if targetwin32 then
Var line as string
Var mem as MemoryBlock

Declare Function GetCommandLineA Lib "kernel32" () As Ptr

mem=GetCommandLineA()
s=mem.cstring(0)

#endif
```

Notes: Newer Xojo versions have a system.commandline property.

12.0.183 How to render PDF pages with PDF Kit?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Example:

```
// choose a file
Var f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")

// open it as PDF Document
Var sourceFile as New PDFDocumentMBS(f)

if sourceFile.handle <>0 then // it is a PDF file

// get upper bound of pages
Var c as Integer = sourceFile.pageCount-1

// from first to last page
for n as Integer = 0 to c

// pick that page
Var page as PDFPageMBS = sourceFile.pageAtIndex(n)

// render to image
Var p as NSImageMBS = page.Render

// and convert to RB picture and display
Backdrop = p.CopyPictureWithMask
```

```
next
```

```
end if
```

Notes: PDFKit works only on Mac OS X.

12.0.184 How to restart a Mac?

Plugin Version: all, Platform: macOS.

Answer: Ask the Finder via Apple Events:

Example:

```
Var ae as appleevent
ae=newappleEvent("FNDR","rest","MACS")
if not ae.send then
msgBox "The computer couldn't be restarted."
end if
```

12.0.185 How to resume ftp upload with curl plugin?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: CURL supports that and you simply need to set the right options.

Notes: First of course OptionUpload must be true. Second OptionFTPAppend must be true so the OptionResumeFrom is used. Store there (or in OptionResumeFromLarge) your start value.

Don't forget to implement the read event and return data there as requested.

12.0.186 How to rotate a PDF page with CoreGraphics?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: This code opens a PDF and draws the first page into a new PDF with 90-∞ rotation.

Example:

```
// Rotate a PDF page

// our files
Var sourcefile as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
Var destfile as FolderItem = SpecialFolder.Desktop.Child("rotated.pdf")

// open PDF
Var pdf as CGPDFDocumentMBS = sourcefile.OpenAsCGPDFDocumentMBS
```

```

// query media size of first page
Var r as CGRectMBS = pdf.MediaBox(1)

// create new PDF
Var c as CGContextMBS = destfile.NewCGPDFDocumentMBS(r,"title","Author","Creator")

// create rotated rectangle
Var nr as new CGRectMBS(0,0,r.Height,r.Width)

// create new page
c.BeginPage nr
c.SaveGState

const pi = 3.14159265

// rotate by 90-∞
c.RotateCTM pi*1.5

// fix origin
c.TranslateCTM -r.width,0

// draw PDF
c.DrawCGPDFDocument pdf,r,1

// cleanup
c.RestoreGState
c.EndPage

c = nil

// show in PDF viewer
destfile.Launch

```

Notes: This code is Mac only as it needs CoreGraphics.

12.0.187 How to rotate image with CoreImage?

Plugin Version: all, Platform: macOS.

Answer: Use the code like the one below:

Example:

```

// Rotate image with CoreImage

// load image

```

```

Var f as FolderItem = SpecialFolder.Desktop.Child("test.png")
Var image as new CIIImageMBS(f)

// rotate 45 degree
Var n as new NSAffineTransformMBS
n.rotateByDegrees(45)

Var TransformFilter as new CIFilterAffineTransformMBS
TransformFilter.inputImage = image
TransformFilter.inputTransform = n

// get result
Var resultImage as CIIImageMBS = TransformFilter.outputImage

// for saving to file
Var outputImage as NSImageMBS = resultImage.RenderNSImage(false)

f = SpecialFolder.Desktop.Child("output.png")
Var b as BinaryStream = BinaryStream.Create(f, true)
b.Write outputImage.PNGRepresentation

// as Xojo picture object for display
Var pic as Picture = outputImage.CopyPictureWithMask

Backdrop = pic

```

12.0.188 How to run a 32 bit application on a 64 bit Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Install 32 bit compatibility libraries.

Notes: The package is called ia32-libs for ubuntu (and others).

Some applications need to be run on a 32 bit system as they need some hardware related libraries. Like libUSB or libHID for USB devices.

12.0.189 How to save HTMLViewer to PDF with landscape orientation?

Plugin Version: all, Platform: macOS.

Answer: You can use NSPrintInfoMBS to change the options for PrintToPDFFile function.

Example:

```

// make it landscape
Var n as NSPrintInfoMBS = NSPrintInfoMBS.sharedPrintInfo
n.orientation = n.NSLandscapeOrientation

```

```
// save html to file
Var f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
call HTMLViewer1.PrintToPDFFileMBS(f,10,30,10,30)
```

Notes: You may want to reset options later.
This code is only for Mac OS X.

12.0.190 How to save RTFD?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: With NSTextViewMBS you can use this code to save to RTFD:

Example:

```
// save text as RTFD including image attachments
Var f as FolderItem = GetSaveFolderItem(FileTypes1.ApplicationRtf, "test.rtf")

if f = nil then Return

Var a as NSAttributedStringMBS = textView.textStorage
Var w as NSFileWrapperMBS = a.RTFDFileWrapperFromRange(0, a.length, DocumentAttributes)

Var e as NSErrorMBS
if w.writeToFile(f, e) then

else
MsgBox e.LocalizedDescription
end if
```

Notes: For TextArea you can query the underlying NSTextViewMBS object via TextArea.NSTextViewMBS method.

12.0.191 How to save RTFD?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: How to load PDF to htmlviewer on desktop?

Example:

```
Public Sub LoadPDFData(viewer as HTMLViewer, PDFData as string)
Var base64string As String = EncodeBase64(PDFData)

// remove line endings to make it a big line
```

```

base64string = ReplaceLineEndings(base64string, "")

// build data URL
// https://en.wikipedia.org/wiki/Data_URI_scheme
Var dataURL As String = "data:application/pdf;base64," + base64string

// show in webviewer
HTMLViewer1.LoadURL(dataURL)

// may not work everywhere due to URL length limit
// for Web projects, use WebFile instead!
End Sub

```

Notes: This avoids a temporary file, which may also work.
For Web Apps, please use WebFile.

12.0.192 How to scale a picture proportionally with mask?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: For a proportional scaling, we calculate the new picture size relative to the target maximum size.

Example:

```

Function ProportinalScaledWithMask(extends pic as Picture, Width as Integer, Height as Integer) As Pic-
ture
// Calculate scale factor

Var faktor as Double = min( Height / Pic.Height, Width / Pic.Width)

// Calculate new size
Var w as Integer = Pic.Width * faktor
Var h as Integer = Pic.Height * faktor

// create new picture
Var NewPic as new Picture(w,h,32)

// check if we have a mask and clear it
Var m as picture = pic.mask(False)
pic.mask = nil

// draw picture in the new size
NewPic.Graphics.DrawPicture Pic, 0, 0, w, h, 0, 0, Pic.Width, Pic.Height

if m <>nil then
// restore mask and scale it
pic.mask = m

```



```
NewPic.mask.Graphics.DrawPicture m, 0, 0, w, h, 0, 0, Pic.Width, Pic.Height
end if
```

```
// return result
Return NewPic
End Function
```

Notes: This version handles mask. As you see we actually have to remove mask in order to copy the picture part correctly.

12.0.193 How to scale a picture proportionally?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: For a proportional scaling, we calculate the new picture size relative to the target maximum size.

Example:

```
Function ProportionalScaled(extends pic as Picture, Width as Integer, Height as Integer) As Picture
// Calculate scale factor

Var faktor as Double = min( Height / Pic.Height, Width / Pic.Width)

// Calculate new size
Var w as Integer = Pic.Width * faktor
Var h as Integer = Pic.Height * faktor

// create new picture
Var NewPic as new Picture(w,h,32)

// draw picture in the new size
NewPic.Graphics.DrawPicture Pic, 0, 0, w, h, 0, 0, Pic.Width, Pic.Height

// return result
Return NewPic
End Function
```

Notes: This does not handle mask, but you can scale the mask the same way and assign it to the new picture.
(see other FAQ entry with mask)

12.0.194 How to scale/resize a CImageMBS?

Plugin Version: all, Platform: Windows.

Answer: Use the CIFilterLanczosScaleTransform filter to scale down a picture to a specific size.

Example:

```

Var pic As Picture = LogoMBS(500)
Var image As CImageMBS = CImageMBS.imageWithPicture(pic)

Var filter As New CIFilterLanczosScaleTransformMBS

Const targetWidth = 600.0
Const targetHeight = 400.0

Var scale As Double = targetHeight / image.Extent.Height
Var aspect As Double = targetWidth / (image.Extent.Width * scale)

filter.inputImage = image
filter.inputScale = scale
filter.inputAspectRatio = aspect

Var result As Picture = filter.outputImage.RenderPicture

Backdrop = result

```

Notes: This is same code as our scaleTo convenience method.

12.0.195 How to scale/resize a picture?

Plugin Version: all, Platform: Windows.

Answer: There are several ways to scale or resize a picture. The easiest way may be the ScaleMBS function in the Picture class.

Example:

```

Var Original,Scaled as Picture

Original=LogoMBS(500)
Scaled=Original.ScaleMBS(100,100,true)

```

Notes: The plugin ways:

- GraphicsMagick can scale/resize.
- CoreImage scale filter may result in the fastest and best images on Mac OS X 10.4.
- NSImageMBS can scale, but is Mac OS X only.
- CGImageMBS can scale, but is Mac OS X only.

- CImageMBS can scale, but is Mac OS X only.
- QuickTime Graphics exporter and importer can be connected to scale. (this was used more often a few years ago)
- ImageMagick can scale very nice and crossplatform. But the ImageMagick libraries are big.
- The picture.ScaleMBS function is self written and results in equal output on Mac, Windows and Linux without any additional libraries installed.
- Picture.ScalingMBS does crossplatform scaling with several modes.

with pure Xojo:

- make a new picture and draw the old one with new size inside.

12.0.196 How to search with regex and use unicode codepoints?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can specify unicode characters in search string with backslash x and digits.

Example:

```
Var r as RegExMbs
Var s as string
Var c as Integer
```

```
s="123 √§√√° ABC 456"
```

```
r=new RegExMBS
if r.Compile("√.") then
c=r.Execute(s,0)
MsgBox str(c)+" "+str(r.Offset(0))+" "+str(r.Offset(1))
// shows: 1 4 10
// 1 for ubound of the offset array
// 4 for 4 bytes before the matched pattern
// 10 for the 10 bytes before the end of the matched pattern
end if
```

```
r=new RegExMBS
if r.Compile("\xF6.") then // finds √ using Unicode codepoint
c=r.Execute(s,0)
MsgBox str(c)+" "+str(r.Offset(0))+" "+str(r.Offset(1))
// shows: 1 4 10
// 1 for ubound of the offset array
// 4 for 4 bytes before the matched pattern
// 10 for the 10 bytes before the end of the matched pattern
end if
```

12.0.197 How to see if a file is invisible for Mac OS X?

Plugin Version: all, Platform: macOS.

Answer: Try this function:

Example:

```
Function Invisible(F As FolderItem) As Boolean
Var TIS As TextInputStream
Var S,All As String
Var I as Integer
Var g as folderitem
```

```
If Left(F.Name,1)="." or not f.visible Then
Return True
End If
```

```
g=F.Parent.Child(".hidden")
If g.Exists Then
TIS=g.OpenAsTextFile
if tis<>Nil then
All=TIS.ReadAll
For I=1 to CountFields(All,Chr(11))
S=NthField(All, Chr(11), I)
If S=F.name Then
Return True
End If
Next
end if
End if
End Function
```

12.0.198 How to set cache size for SQLite or REALSQLDatabase?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You use the pragma cache_size command on the database.

Example:

```
// set cache size to 20000 pages which is about 20 MB for default page size
Var db as REALSQLDatabase
db.SQLExecute "PRAGMA cache_size = 20000"
```

Notes: Default cache size is 2000 pages which is not much.

You get best performance if whole database fits in memory.

At least you should try to have a cache big enough so you can do queries in memory.

You only need to call this pragma command once after you opened the database.

12.0.199 How to set the modified dot in the window?

Plugin Version: all, Platform: macOS.

Answer: Try this declares:

Example:

```
window1.ModifiedMBS=true
```

12.0.200 How to show a PDF file to the user in a Web Application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use a WebHTMLViewer control and load the

Example:

```
Var CurrentFile as WebFile // a property of the WebPage

// define the PDF file
CurrentFile = new WebFile
CurrentFile.Filename = "test.pdf"
CurrentFile.MIMEType = "application/pdf"
CurrentFile.Data = "some pdf data" // MyDynaPDF.GetBuffer

// load into html viewer
HTMLViewer1.URL = CurrentFile.URL
```

Notes: See our Create PDF example for the Xojo Web Edition.

12.0.201 How to show Keyboard Viewer programmatically?

Platform: macOS.

Answer: Use Xojo or AppleScript to launch the KeyboardViewerServer.app.

Example:

```
Var a as new AppleScriptMBS
Var text as string
Var lines(-1) as string

lines.append "set theApplication to ""KeyboardViewerServer""
lines.append "set thePath to ""/System/Library/Components/KeyboardViewer.component/Contents/Shared-
Support/KeyboardViewerServer.app"""
```

```

lines.append ""
lines.append "set POSIXPath to ((POSIX file thePath) as string)"
lines.append "tell application ""System Events"" to set isRunning to 0 <(count (application processes whose
name is theApplication))"
lines.append "if isRunning then tell application POSIXPath to quit"
lines.append "delay 0.15"
lines.append ""
lines.append "ignoring application responses"
lines.append " tell application POSIXPath to run"
lines.append "end ignoring"

```

```
text=join(lines,EndOfLine.macintosh)
```

```

a.Compile text
a.Execute

```

Notes: AppleScript code:

```

set theApplication to "KeyboardViewerServer"
set thePath to "/System/Library/Components/KeyboardViewer.component/Contents/SharedSupport/Key-
boardViewerServer.app"

```

```

set POSIXPath to ((POSIX file thePath) as string)
tell application "System Events" to set isRunning to 0 <(count (application processes whose name is theAp-
plication))
if isRunning then tell application POSIXPath to quit
delay 0.15

```

```

ignoring application responses
tell application POSIXPath to run
end ignoring

```

12.0.202 How to show the mouse cursor on Mac?

Plugin Version: all, Platform: macOS.

Answer: Try this declare:

Example:

```
Declare Sub ShowCursor Lib "Carbon" ()
```

```
ShowCursor
```

Notes: The MBS Plugin has this function and supports it on Windows, too.

12.0.203 How to shutdown a Mac?

Plugin Version: all, Platform: macOS.

Answer: Ask the Finder via Apple Events:

Example:

```
Var ae as appleevent
ae=newappleEvent("FNDR","shut","MACS")
if not ae.send then
msgBox "The computer couldn't be shutdown."
end if
```

Notes: Or toolbox call (Attention: This method will stop the computer immediatly: No document asked to be saved, all applications quitting without knowing).

```
Declare Sub ShutDwnPower Lib "Carbon" ()
ShutDwnPower
```

12.0.204 How to sleep a Mac?

Plugin Version: all, Platform: macOS.

Answer: Ask the Finder via Apple Events:

Example:

```
Var ae as appleevent
ae=newappleEvent("FNDR","slep","MACS")
if not ae.send then
msgBox "The computer doesn't want to sleep."
end if
```

12.0.205 How to speed up rasterizer for displaying PDFs with DynaPDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Here a few speed tips:

Notes:

- Use the DynaPDFRasterizerMBS function instead of our render functions.

- Reuse DynaPDFRasterizerMBS as long as the target picture size doesn't change.
- Import only the PDF pages you want to display.
- Let DynaPDF do zooming, rotating or other effects instead of you change it.

12.0.206 How to use PDFLib in my RB application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The PDFlib plugin was discontinued in favor of our DynaPDF plugin.

Notes: If you need help to move, please contact us.

12.0.207 How to use quotes in a string?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Just double them.

Example:

```
msgbox "This String contains ""quotes"""
```

12.0.208 How to use Sybase in Web App?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use our MBS Xojo SQL Plugin to connect to a Sybase Database in your web application.

Notes: If you see db.Connect giving the error message "cs_ctx_alloc ->CS_MEM_ERROR", than some things are not setup right for Sybase.

The Apache process may not have all the SYBASE environment variables being set when the CGI was launched.

Adding these lines to /etc/httpd/conf/httpd.conf stopped the faux memory errors for us:

```
SetEnv LD_LIBRARY_PATH /opt/sybase/OCS-15_0/lib:/opt/sybase/OCS-15_0/lib3p64:/opt/sybase/OCS-15_0/lib3p:  
SetEnv SYBROOT /opt/sybase  
SetEnv SYBASE_OCS /opt/sybase  
SetEnv SYBASE /opt/sybase
```


12.0.209 How to use the Application Support folder?

Plugin Version: all, Platform: macOS.

Answer:

I was saving a registration code for an app to the Preference folder. People on the list have suggested that it would be better in the ApplicationSupportFolder. How do I save the file called CWWPrefs into that folder using MBS?

I have checked for examples and the docs but can't see how to apply it

```
//f = SpecialFolder.Preferences.child("CWWPrefs")
f = ApplicationSupportFolderMBS(-32768)
```

Example:

```
Var folder,file as FolderItem
```

```
folder = createApplicationSupportFolderMBS(-32763)
```

```
if folder=nil then
// Some very old Mac OS Versions may not support it
// or the plugin may fail for any reason
folder=SpecialFolder.Preferences
end if
```

```
file=folder.Child("CWWPrefs")
```

```
MsgBox file.NativePath
```

Notes:

You may not be able to write there with a normal user account!

12.0.210 How to use the IOPMCopyScheduledPowerEvents function in Xojo?

Plugin Version: all, Platform: macOS.

Answer: You can use the following code which does this using the SoftDeclareMBS class.

Example:

```
Sub Open()
Var c as CFDateMBS
Var t as CFAbsoluteTimeMBS
```

```

// get current date
c=NewCFDateMBS

// in absolute time (seconds since x)
t=c.AbsoluteTime

// add 600 seconds (= 10 Minutes)
t.Value=t.Value+600

// Make a Date from it
c=t.Date

// Schedule the event
// 0 on success
// E00002C1 for missing root rights
Title=hex(schedulePowerEvent(c, "wake"))

// Just for information, display the scheduled stuff
CFShowMBS CopyScheduledPowerEvents
End Sub

Function CopyScheduledPowerEvents() As cfarrayMBS
Var s as SoftDeclareMBS
Var m as MemoryBlock

s=new SoftDeclareMBS

if s.LoadLibrary("IOKit.framework") then
if s.LoadFunction("IOPMCopyScheduledPowerEvents") then
if s.CallFunction(0,nil) then
Return NewCFArrayMBSHandle(s.Result,true)
else
MsgBox "Failed to Call IOPMCopyScheduledPowerEvents."
end if
else
MsgBox "Failed to load IOPMCopyScheduledPowerEvents."
end if
else
MsgBox "Failed to load IOKit."
end if

Return nil
End Function

Function SchedulePowerEvent(time_to_wake as CFDateMBS, Type as CFStringMBS) as Integer
Var s as SoftDeclareMBS
Var m as MemoryBlock

```

```

'/*
' * Types of power event
' * These are potential arguments to IOPMSchedulePowerEvent().
' * These are all potential values of the kIOPMPowerEventTypeKey in the CFDictionaryes
' * returned by IOPMCopyScheduledPowerEvents().
' */
'/*!
'@define kIOPMAutoWake
'@abstract Value for scheduled wake from sleep.
' */
'#define kIOPMAutoWake "wake"
,

'/*!
'@define kIOPMAutoPowerOn
'@abstract Value for scheduled power on from off state.
' */
'#define kIOPMAutoPowerOn "poweron"
,

'/*!
'@define kIOPMAutoWakeOrPowerOn
'@abstract Value for scheduled wake from sleep, or power on. The system will either wake OR
'power on, whichever is necessary.
' */
,

'#define kIOPMAutoWakeOrPowerOn "wakepoweron"
'/*!
'@define kIOPMAutoSleep
'@abstract Value for scheduled sleep.
' */
,

'#define kIOPMAutoSleep "sleep"
'/*!
'@define kIOPMAutoShutdown
'@abstract Value for scheduled shutdown.
' */
,

'#define kIOPMAutoShutdown "shutdown"

s=new SoftDeclareMBS

if s.LoadLibrary("IOKit.framework") then
if s.LoadFunction("IOPMSchedulePowerEvent") then

m=NewMemoryBlock(12)
m.Long(0)=time_to_wake.handle
m.Long(4)=0 // nil
m.Long(8)=type.Handle

```

```

if s.CallFunction(3,m) then
Return s.Result
end if
end if
end if

```

End Function

Notes: Requires Mac OS X and to execute root rights.

12.0.211 How to validate a GUID?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use this function below which uses a regular expression to verify that the string is a valid UUID/GUID:

Example:

```

Function IsGUID(guid as string) As Boolean
Var r as new RegEx

```

```

r.SearchPattern = "^(\{ { 0,1 } ( [ 0-9a-fA-F ] ) { 8 } -( [ 0-9a-fA-F ] ) { 4 } -( [ 0-9a-fA-F ] ) { 4 }
-( [ 0-9a-fA-F ] ) { 4 } -( [ 0-9a-fA-F ] ) { 12 } \} { 0,1 } )$"

```

```

Return r.Search(guid)<>nil
End Function

```

Notes: Simply parsing the GUID with CFUUIDMBS does not give the same result as CFUUIDMBS will also take a string like "DDDD".

12.0.212 How to walk a folder hierarchie non recursively?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this one:

Example:

```

Sub Walk(folder as FolderItem)
Var folders() as FolderItem

```

```

folders.Append folder

```

```

while UBound(folders)>=0

```

```

Var currentFolder as FolderItem = folders.pop

Var c as Integer = currentFolder.Count
for i as Integer = 1 to c
Var item as FolderItem = currentFolder.TrueItem(i)

if item = Nil then
// no permission
elseif item.Visible then // only visible

if item.Directory then
folders.Append item
else
// work with file here
end if

end if

next

wend
End Sub

```

Notes: As you see we go with a long loop which runs until we don't have more folders to process.

We ignore items we can't access due to permission limits.

And we only work visible items.

If you like, check `folderitem.isBundleMBS` on item to handle packages and applications better on Mac OS X.

12.0.213 I got this error: PropVal, QDPictMBS.Name (property value), Type mismatch error. Expected CGDataProviderMBS, but got Variant, Name:QDPictMBS

Plugin Version: all, Platform: macOS.

Answer: The plugins MacOSX and MacOSXCF belong together. If you use one part, please also install the other part.

Notes: We splitted the plugin because the Xojo IDE on Windows crashed on compilation.

12.0.214 I registered the MBS Plugins in my application, but later the registration dialog is shown.

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: There are two main reasons.

Notes: 1. you may use the plugin before registering them. This is often the case if you register in a window open event and use the plugin in a control open event.

On the console on Mac OS X or Windows, you may see a message like this "MBS Plugins were used by the application before the RegisterMBSPlugin function was called. Please fix this in your code!".

2. you may have mixed different plugin versions which are not compatible.

In this case you can see a message "Internal plugin registration error." on the console on Mac OS X. Newer plugins may show a message dialog reporting this. Older version simply think they are not registered.

If the installer just merges old and new applications, users may have libraries of older and newer plugin versions in the libs folder. If your application loads the wrong version, the registration fails.

If you use remote debugging, make sure you clear the temporary files there, too. Otherwise you may have old DLLs on your hard disc which may disturb your application.

You can run into issues if you use your registration code on different places of your app. Please register only once in app.open (or app Constructor). If you have several codes, simply call them one after the other.

Also check that you only call RegisterMBSPlugin with valid serial number. If you later call RegisterMBSPlugin with Demo like in example code above, you remove the license.

Next check if you can clear the Xojo caches and that helps. This includes the Xojo Scratch folder and the Plugins & Project caches. Simply locate those folders and delete them. For Windows look in hidden AppData folder in your user folder. For Mac, please check `~/Library/Caches` and your temp folders.

Finally make sure you use the right serial number. Not an older one or a misspelled one.

12.0.215 I want to accept Drag & Drop from iTunes

Plugin Version: all, Platform: macOS.

Answer: You need to accept AcceptMacDataDrop "itun" and Handle the DropObject.

Example:

```
Sub Open()
window1.AcceptMacDataDrop "itun"
End Sub
```

```
Sub DropObject(obj As DragItem)
Var s as string
```

```

Var f as folderItem
Var d as CFDictionaryMBS
Var o as CFObjectMBS
Var key as CFStringMBS
Var dl as CFDictionaryListMBS
Var i,c as Integer
Var u as CFURLMBS
Var file as FolderItem

if obj.MacDataAvailable("itun") then
s = obj.MacData("itun")

// Parse XML
o=NewCFObjectMBSFromXML(NewCFBinaryDataMBSStr(s))

// Make dictionary
if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)

// get Tracks Dictionary
key=NewCFStringMBS("Tracks")
o=d.Value(key)

if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)
dl=d.List

// Walk over all entries in the Tracks dictionary
c=dl.Count-1
for i=0 to c
o=dl.Value(i)

if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)

key=NewCFStringMBS("Location")
o=d.Value(key)
if o isa CFStringMBS then
u=NewCFURLMBS CFStringMBS(CFStringMBS(o),nil)

file=u.file
if file<>nil then
MsgBox file.NativePath
end if
end if
end if
next
end if

```

```

end if
end if
End Sub

```

Notes: The code above inside a window on Xojo 5.5 with MBS Plugin 5.3 will do it nice and show the paths.

12.0.216 I'm drawing into a listbox but don't see something.

Plugin Version: all.

Answer: If you draw this in a listbox cellbackground, you need to draw on the correct position

Example:

```

Function CellBackgroundPaint(g As Graphics, row as Integer, column as Integer) As Boolean
Var f as FolderItem
f=SpecialFolder.Desktop
f.DrawWideIconMBS(g,listbox1.left,listbox1.top+row*20,16)
Return true
End Function

```

Notes: Try this in a listbox. The Graphics object there has a clipping and an offset which the plugin doesn't know about.

12.0.217 I'm searching for a method or so to move a window from position x.y to somewhere else on the screen.

Platform: macOS.

Answer:

The code I produced in RB isn't smooth enough. Is there a call in MBS, if not, can it be done? The speed of it has to be like the show of a DrawerWindow.

Try the declare below for Carbon. With WindowLib it will work on Mac OS 8.5 and newer.

Notes:

See Window.Transition functions.

12.0.218 If I use one of your plug-ins under windows, would this then impose the use of dll after compilation or my would my compiled soft still be a stand-alone single file software?

Platforms: macOS, Linux, Windows.

Answer: Stand alone.

Notes: Xojo compiles all used plugins into the application binary.

Some plugin parts need external dlls but you will find that in the documentation. (e.g. pdflib for some classes)

12.0.219 Is the fn key on a powerbook keyboard down?

Plugin Version: all, Platform: macOS.

Answer: I am unable to figure out how or if it is possible to detect if the fn key is down on a powerbook keyboard. Is it possible?

Example:

' [Window.Open Event of a blank project](#):

Var i as Integer

```
for i=0 to 127
if keyboard.asynckeydown(i) then
title=str(i) // found
return
end if
next
title="" // not found
```

Notes: This test application shows the keycode (decimal) 63 for the fn key.

12.0.220 Is there a case sensitive Dictionary?

Plugin Version: all.

Answer: The MBS Plugin has several classes which can work as a replacement.

Notes: First you could use VariantToVariantHashMapMBS or VariantToVariantOrderedMapMBS.

If you know that all keys are Strings or Integers only, you can use the specialized classes which are a little bit faster due to avoiding variants:

IntegerToIntegerHashMapMBS class

IntegerToIntegerOrderedMapMBS class

IntegerToStringHashMapMBS class

IntegerToStringOrderedMapMBS class
 IntegerToVariantHashMapMBS class
 IntegerToVariantOrderedMapMBS class
 StringToStringHashMapMBS class
 StringToStringOrderedMapMBS class
 StringToVariantHashMapMBS class
 StringToVariantOrderedMapMBS class

12.0.221 Is there a way to use the MBS plugin to get only the visible item and folder count on a volume?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use the DirectorySizeMBS class for this as in the example below:

Example:

```
Var d as DirectorySizeMBS
```

```
d=new DirectorySizeMBS
```

```
// volume(1) as my boot volume is very full
if d.update(volume(1),true,0) then
MsgBox str(d.VisibleItemCount)+" visible items, "+str(d.HiddenItemCount)+" invisible items."
end if
```

Notes: Complete Question: Is there a way to use the MBS plugin to get only the visible item and folder count on a volume? The FileCount and FolderCount properties of VolumeInformationMBS seem to provide the total # of items including invisible items such as .DS_Store and more importantly .Trashes which is causing me a great amount of difficulty during a recursive scan of a volume. I've got a progress bar which uses the total of the filecount and foldercount properties as the maximum value, but my routine needs to filter out all invisible items, as it is creating a catalog of a volume for archiving purposes. Any thoughts how I could get accurate number.

12.0.222 Is there an easy way I can launch the Displays preferences panel?

Plugin Version: all, Platform: macOS.

Answer: Use the code below:

Example:

```
Var error as Integer
```

```
error=OpenMacOSXPreferencesPaneMBS("Displays")
if error<>0 then
MsgBox "Failed to launch QuickTime System Preferences panel."
end if
```

12.0.223 List of Windows Error codes?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We have a list of windows error codes on our website.

Notes: <http://www.monkeybreadsoftware.de/xojo/winerror.shtml>

12.0.224 Midi latency on Windows problem?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The issue is system related, not a problem with RB or the plugin.

Notes: Two things will adversely affect the timing:

(1) latency of the software synthesizer output driver. The default Windows wavetable synthesizer has considerable latency. I don't know how many milliseconds, but it is noticeable.

(2) latency of the digital audio output driver. Different systems have different drivers for different audio hardware. My Dell laptop has a minimum 15ms latency in the audio driver.

These two things put together were causing a very sluggish MIDI response. I was able to verify these as the culprits by routing MIDI directly out of RB into a sample player, which only introduces the latency of (2) and does not include latency of (1).

I don't know how widely known are these facts, if not then you may want to add this information to the documentation, since Windows programmers using the MIDI plugin may not know those problems, and might mistakenly blame your plugin, as I did :) Sorry about that!

(From Aaron Andrew Hunt)

12.0.225 My Xojo Web App does not launch. Why?

Plugin Version: all, Platform: macOS.

Answer: Here is a list of checks to do for linux apache installations with Xojo or Xojo Web applications:

Notes: Just a list of checks to do for linux apache installations:

- You have 64bit linux? Than you need 32 bit compatibility libraries.
- The folder of your app is writable? Set permissions to 777.
- The cgi script is executable? Set permissions to 755.
- The app file itself is executable? Set permissions to 755.
- You uploaded cgi file as text, so it has unix line endings? (this often gives error "Premature end of script headers" in apache log)
- You uploaded config.cfg file and made it writable? Set permissions to 666.
- Your apache allows execution of cgi scripts? You enabled cgi for apache and uncommented addhandler command for CGI on a new apache installation?
- You uploaded the app file and libraries as binary files? Upload as text breaks them.
- You did upload the libs folder?
- You don't have code in app.open, session.open and other events which crashes app right at launch?
- You don't have a print command in your app.open event? (see feedback case 23817)
- You allowed htaccess file to overwrite permissions?

12.0.226 SQLiteDatabase not initialized error?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Before you can use SQLiteDatabaseMBS, it must be initialized.

Example:

```
Var d as new SQLiteDatabaseMBS
```

Notes: This happens normally when you use "new SQLiteDatabaseMBS".

But if you just have a SQLConnectionMBS and get a recordset there, the initialization may not have happened, yet.

So please simply add a line "dim d as new SQLiteDatabaseMBS" to your app.open code after registration, so the plugin part can initialize and late provide recordsets.

12.0.227 Textconverter returns only the first x characters. Why?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

Some older Xojo versions limit the Textconverter to around 1024 characters in input and output. This should be fixed with RB5.

Notes:

Xojo seems not to support Textconverters at all on Windows.

12.0.228 The type translation between CoreFoundation/Foundation and Xojo data types.

Plugin Version: all, Platform: macOS.

Answer: The plugin does conversion between Cocoa/Carbon data types and native Xojo data types. The following list help you knowing what the current plugins support:

Notes: Cocoa NSObject to Variant:

```

nil ->nil
NSDictionary ->Dictionary
NSData ->MemoryBlock
NSString ->String
NSAttributedString ->NSAttributedStringMBS
NSDate ->Date
NSNumber ->double/integer/Int64/UInt64/UInt32/Boolean
NSURL ->String
NSValue with NSRect ->NSRectMBS
NSValue with NSPoint ->NSPointMBS
NSValue with NSSize ->NSSizeMBS
NSValue with NSRange ->NSRangeMBS
NSValue with QTTime ->QTTimeMBS
NSValue with QTTimeRange ->QTTimeRangeMBS
NSArray ->Array of Variant
QuartzFilter ->QuartzFilterMBS

```

- ->*MBS

Variant to Cocoa NSObject:

```

nil ->nil
Dictionary ->NSDictionary
Boolean ->NSNumber
Integer ->NSNumber
Color ->NSColor
Int64 ->NSNumber
Single ->NSNumber
Double ->NSNumber

```

Date ->NSDate
MemoryBlock ->NSData
String ->NSString
NSImageMBS ->NSImage
NSAttributedStringMBS ->NSAttributedString
NSColorMBS ->NSColor
NSRectMBS ->NSValue with NSRect
NSSizeMBS ->NSValue with NSSize
NSPointMBS ->NSValue with NSPoint
NSRangeMBS ->NSValue with NSRange
NSBurnMBS ->NSBurn
NSViewMBS ->NSView
NSFontMBS ->NSFont
NSParagraphStyleMBS ->NSParagraphStyle
NSAttributedStringMBS ->NSAttributedString
WebPolicyDelegateMBS ->WebPolicyDelegate
WebUIDelegateMBS ->WebUIDelegate
WebFrameLoadDelegateMBS ->WebFrameLoadDelegate
WebResourceLoadDelegateMBS ->WebResourceLoadDelegate
NSIndexSetMBS ->NSIndexSet
QTTimeMBS ->QTTime
QTTimeRangeMBS ->QTTimeRange
Array of Variant ->NSArray
Array of String ->NSArray
CFStringMBS ->NSString
CFNumberMBS ->NSNumber
CFDataMBS ->NSData
CFURLMBS ->NSURL
CFArrayMBS ->NSArray
CFDictionaryMBS ->NSDictionary
CFBinaryDataMBS ->NSDate

Carbon CTypeRef to Variant:

CFDictionaryRef ->Dictionary
CFStringRef ->String
CFDataRef ->String
CFURL ->String
CFNumber ->Integer/Double/Int64
CFArray ->Array
CFDate ->date
nil ->nil
CGColorSpace ->CGColorSpaceMBS
CGColor ->CGColorMBS
CGImage ->CGImageMBS
CF* ->CF*MBS

Variant to Carbon CTypeRef:

Dictionary ->CFDictionaryRef
 Boolean ->CFBooleanRef
 Color ->CFNumberRef
 Integer ->CFNumberRef
 Int64 ->CFNumberRef
 Single ->CFNumberRef
 Double ->CFNumberRef
 String ->CFStringRef
 Color ->CGColorRef
 Date ->CFDateRef
 nil ->nil
 Memoryblock ->CFDataRef
 FolderItem ->CFURLRef
 Dictionary ->CFDictionaryRef
 Array of Variant/String/Date/Double/Single/Int64/Integer ->CFArray
 CGRectMBS ->CGRect as CFDataRef
 CGSizeMBS ->CGSize as CFDataRef
 CGPointMBS ->CGPoint as CFDataRef
 CGColorMBS ->CGColor
 CGColorSpaceMBS ->CGColorSpace
 CGImageMBS ->CGImage
 CGDataConsumerMBS ->CGDataConsumer
 CGDataProviderMBS ->CGDataProvider
 CF*MBS ->CF*

Strings without encodings should be put into dictionaries as memoryblocks.

12.0.229 Uploaded my web app with FTP, but it does not run on the server!

Plugin Version: all, Platform: Windows.

Answer: If you see errors like a simple "Segmentation Fault" on Linux or some other wired errors, you may want to check your FTP upload mode. It must be binary for web apps. ASCII mode corrupts the application.

12.0.230 What classes to use for hotkeys?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use CarbonHotKeyMBS class on Mac and WindowsKeyFilterMBS on Windows.

Notes: CarbonHotKeyMBS will also work fine in Cocoa apps.

12.0.231 What do I need for Linux to get picture functions working?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: In order to get our plugins working on Linux systems without GUI, the plugin loads graphics libraries dynamically.

Notes: To get it working, the plugin tries to load gtk with this paths:

- libgtk-x11-2.0.so”
- libgtk-x11-2.0.so.0”
- /usr/lib/libgtk-x11-2.0.so”
- /usr/lib32/libgtk-x11-2.0.so”
- /usr/lib/libgtk-x11-2.0.so.0”
- /usr/lib32/libgtk-x11-2.0.so.0”

gdk is loaded with this paths:

- libgdk-x11-2.0.so”
- libgdk-x11-2.0.so.0”
- /usr/lib/libgdk-x11-2.0.so”
- /usr/lib32/libgdk-x11-2.0.so”
- /usr/lib/libgdk-x11-2.0.so.0”
- /usr/lib32/libgdk-x11-2.0.so.0”

For the paths without explicit path, the system will search in /lib, /usr/lib and all directories in the LD_LIBRARY_PATH environment variable.

12.0.232 What does the NAN code mean?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

12.0.233 What font is used as a 'small font' in typical Mac OS X apps?

Plugin Version: all, Platform: macOS.

Answer:

Xojo 4.5 has a constant "SmallSystem" to use for a font name.
For older versions try this code:

Example:

```
Sub GetThemeFont(fontType as Integer, ByRef fontName as String, ByRef fontSize as Integer, ByRef
fontStyle as Integer)
Var err as Integer
Var theFont, theFontSize, theFontStyle as MemoryBlock

const smSystemScript = -1

Declare Function GetThemeFont Lib "Carbon" (inFontID as Integer, inScript as Integer, outFontName
as Ptr, outFontSize as Ptr, outStyle as Ptr) as Integer

theFont = NewMemoryBlock(256) //Str255
theFontSize = NewMemoryBlock(2) //SInt16
theFontStyle = NewMemoryBlock(1) //Style

err = GetThemeFont(fontType, smSystemScript, theFont, theFontSize, theFontStyle)

if err = 0 then
fontName = theFont.PString(0)
fontSize = theFontSize.UShort(0)
fontStyle = theFontStyle.Byte(0)
else
fontName = ""
fontSize = 0
fontStyle = 0
end if
End Sub
```

12.0.234 What is last plugin version to run on Mac OS X 10.4?

Plugin Version: all, Platform: Windows.

Answer: Last Version with 10.4 support is version 15.4.

Notes: With version 15.4 you can build applications for OS X 10.4 and newer.

For Version 16.0 we disabled 10.4 and moved minimum to 10.5. We may be able to enable it again to build a version of 16.x, but may need to charge for this by hour.

12.0.235 What is last plugin version to run on PPC?

Plugin Version: all, Platform: Windows.

Answer: Last Version with PPC is 15.4.

Notes: With version 15.4 you can build PPC applications for OS X 10.4 and newer.

For Version 16.0 we disabled PPC. We may be able to enable it again to build a PPC version of 16.x, but may need to charge for this by hour.

12.0.236 What is last version of the plugins for macOS 32-bit?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use version 23.0 or older.

Notes: We stopped including 32-bit code for macOS in version 23.1.

Please use older versions if you use an old Xojo.

Xojo 2017r3 and newer load our 64-bit plugins.

12.0.237 What is the difference between Timer and WebTimer?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Timer is server side and WebTimer client side.

Notes: Timer is the normal timer class in Xojo. It runs on the server. On the client side the WebTimer runs on the client. It triggers a request to the server to perform the action. So a WebTimer is good to keep the connection running and the website updated regularly. A timer on the server is good to make regular jobs like starting a database backup every 24 hours.

12.0.238 What is the list of Excel functions?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Below a list of function names known by LibXL.

Notes: LibXL parses the functions and writes tokens to the excel file. So even if Excel can do more functions, we can only accept the ones known by LibXL.

ABS, ABSREF, ACOS, ACOSH, ACTIVE.CELL, ADD.BAR, ADD.COMMAND, ADD.MENU, ADD.TOOLBAR, ADDRESS, AND, APP.TITLE, AREAS, ARGUMENT, ASC, ASIN, ASINH, ATAN, ATAN2, ATANH, AVEDEV, AVERAGE, AVERAGEA, BAHTTEXT, BETADIST, BETAINV, BINOMDIST, BREAK, CALL, CALLER, CANCEL.KEY, CEILING, CELL, CHAR, CHECK.COMMAND, CHIDIST, CHIINV, CHITEST,

CHOOSE, CLEAN, CODE, COLUMN, COLUMNS, COMBIN, CONCATENATE, CONFIDENCE, CORREL, COS, COSH, COUNT, COUNTA, COUNTBLANK, COUNTIF, COVAR, CREATE.OBJECT, CRITBINOM, CUSTOM.REPEAT, CUSTOM.UNDO, DATE, DATEDIF, DATESTRING, DATEVALUE, DAVERAGE, DAY, DAYS360, DB, DBCS, DCOUNT, DCOUNTA, DDB, DEGREES, DELETE.BAR, DELETE.COMMAND, DELETE.MENU, DELETE.TOOLBAR, Deref, DEVSQ, DGET, DIALOG.BOX, DIRECTORY, DMAX, DMIN, DOCUMENTS, DOLLAR, DPRODUCT, DSTDEV, DSTDEVP, DSUM, DVAR, DVARP, ECHO, ELSE, ELSE.IF, ENABLE.COMMAND, ENABLE.TOOL, END.IF, ERROR, ERROR.TYPE, EVALUATE, EVEN, EXACT, EXEC, EXECUTE, EXP, EXPONDIST, FACT, FALSE, FCLOSE, FDIST, FILES, FIND, FINDB, FINV, FISHER, FISHERINV, FIXED, FLOOR, FOPEN, FOR, FOR.CELL, FORECAST, FORMULA.CONVERT, FPOS, FREAD, FREADLN, FREQUENCY, FSIZE, FTEST, FV, FWRITE, FWRITELN, GAMMADIST, GAMMAINV, GAMMALN, GEOMEAN, GET.BAR, GET.CELL, GET.CHART.ITEM, GET.DEF, GET.DOCUMENT, GET.FORMULA, GET.LINK.INFO, GET.MOVIE, GET.NAME, GET.NOTE, GET.OBJECT, GET.PIVOT.FIELD, GET.PIVOT.ITEM, GET.PIVOT.TABLE, GET.TOOL, GET.TOOLBAR, GET.WINDOW, GET.WORKBOOK, GET.WORKSPACE, GETPIVOTDATA, GOTO, GROUP, GROWTH, HALT, HARMEAN, HELP, HLOOKUP, HOUR, HYPERLINK, HYPGEOMDIST, IF, INDEX, INDIRECT, INFO, INITIATE, INPUT, INT, INTERCEPT, IPMT, IRR, ISBLANK, ISERR, ISERROR, ISLOGICAL, ISNA, ISNONTEXT, ISNUMBER, ISPMT, ISREF, ISTEXT, ISTHAIDIGIT, KURT, LARGE, LAST.ERROR, LEFT, LEFTB, LEN, LENB, LINDIST, LINKS, LN, LOG, LOG10, LOGEST, LOGINV, LOGNORMDIST, LOOKUP, LOWER, MATCH, MAX, MAXA, MDETERM, MEDIAN, MID, MIDB, MIN, MINA, MINUTE, MINVERSE, MIRR, MMULT, MOD, MODE, MONTH, MOVIE.COMMAND, N, NA, NAMES, NEGBINOMDIST, NEXT, NORMDIST, NORMINV, NORMSDIST, NORMSINV, NOT, NOTE, NOW, NPER, NPV, NUMBERSTRING, ODD, OFFSET, OPEN.DIALOG, OPTIONS.LISTS.GET, OR, PAUSE, PEARSON, PERCENTILE, PERCENTRANK, PERMUT, PHONETIC, PI, PIVOT.ADD.DATA, PMT, POISSON, POKE, POWER, PPMT, PRESS.TOOL, PROB, PRODUCT, PROPER, PV, QUARTILE, RADIANS, RAND, RANK, RATE, REFTTEXT, REGISTER, REGISTER.ID, RELREF, RENAME.COMMAND, REPLACE, REPLACEB, REPT, REQUEST, RESET.TOOLBAR, RESTART, RESULT, RESUME, RETURN, RIGHT, RIGHTB, ROMAN, ROUND, ROUNDBAHTDOWN, ROUNDBAHTUP, ROUNDDOWN, ROUNDUP, ROW, ROWS, RSQ, RTD, SAVE.DIALOG, SAVE.TOOLBAR, SCENARIO.GET, SEARCH, SEARCHB, SECOND, SELECTION, SERIES, SET.NAME, SET.VALUE, SHOW.BAR, SIGN, SIN, SINH, SKEW, SLN, SLOPE, SMALL, SPELLING.CHECK, SQRT, STANDARDIZE, STDEV, STDEVA, STDEVP, STDEVPA, STEP, STEYX, SUBSTITUTE, SUBTOTAL, SUM, SUMIF, SUMPRODUCT, SUMSQ, SUMX2MY2, SUMX2PY2, SUMXMY2, SYD, T, TAN, TANH, TDIST, TERMINATE, TEXT, TEXT.BOX, TEXTREF, THAIDAYOFWEEK, THAIDIGIT, THAIMONTHOFYEAR, THAINUMSOUND, THAINUMSTRING, THAISTRINGLENGTH, THAIYEAR, TIME, TIMEVALUE, TINV, TODAY, TRANSPOSE, TREND, TRIM, TRIMMEAN, TRUE, TRUNC, TTEST, TYPE, UNREGISTER, UPPER, USDOLLAR, USERDEFINED, VALUE, VAR, VARA, VARP, VARPA, VDB, VIEW.GET, VLOOKUP, VOLATILE, WEEKDAY, WEIBULL, WHILE, WINDOW.TITLE, WINDOWS, YEAR and ZTEST.

12.0.239 What is the replacement for PluginMBS?

Plugin Version: all, Platform: macOS.

Answer: Use the SoftDeclareMBS class to load libraries dynamically.

12.0.240 What to do on Xojo reporting a conflict?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

I get an error like "This item conflicts with another item of the same name" when using one of the plugin functions.

Xojo just wants to tell you that you dropped something in the plugins folder what is not a plugin.

Notes:

Some users dropped the examples, the documentation or other files into the plugins folder. Don't do it.

12.0.241 What to do with a NSImageCacheException?

Plugin Version: all, Platforms: macOS, Windows.

Answer: You need to add exception handlers for NSExcptionMBS in order to catch this exception.

Notes: You may also add code to write the stack of the exception into a log file for later locating the error source.

A NSImage has several image representations in memory. So basicly you pass in the base image and for whatever size an image is needed, the NSImage class will create a cache image representation of the requested size so on the next query it can use that cache for the same requested size.

12.0.242 What to do with MySQL Error 2014?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can get this error on MySQL if you have a recordset open while you create another one.

12.0.243 What to do with SQL Plugin reporting Malformed string as error?

Plugin Version: all, Platform: macOS.

Answer: Please make sure the table and/or database fields have a text encoding set.

Notes: For Firebird our plugin tries to use UTF-8 encoding if possible and to correctly convert between various tables, the tables and their fields need to have a text encoding defined.

e.g. if the text field in the table is windows-1252 and the other ISO 8859-5, then the Firebird database can convert them to UTF-8 and deliver texts to the plugin.

If encoding is set to none, it may get confused for non-ascii text.

12.0.244 Where is CGGetActiveDisplayListMBS?

Plugin Version: all, Platform: Windows.

Answer: This is now CGDisplayMBS.GetActiveDisplayList.

12.0.245 Where is CGGetDisplaysWithPointMBS?

Plugin Version: all, Platform: Windows.

Answer: This is now CGDisplayMBS.GetDisplaysWithPoint.

12.0.246 Where is CGGetDisplaysWithRectMBS?

Plugin Version: all, Platform: Windows.

Answer: This is now CGDisplayMBS.GetDisplaysWithRect.

12.0.247 Where is CGGetOnlineDisplayListMBS?

Plugin Version: all, Platform: Windows.

Answer: This is now CGDisplayMBS.GetOnlineDisplayList.

12.0.248 Where is GetObjectClassNameMBS?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use this replacement method:

Example:

```
Function GetObjectClassNameMBS(o as Object) As string
  Var t as Introspection.TypeInfo = Introspection.GetType(o)
  Return t.FullName
End Function
```

Notes: GetObjectClassNameMBS was removed from the plugins.

12.0.249 Where is NetworkAvailableMBS?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We removed NetworkAvailableMBS some versions ago. It was not working right and basically it's not useful. If you want to check whether you have a network, then do a DNS resolve:

Example:

```
// two independent domain names
const domain1 = "www.google.com"
const domain2 = "www.macs.w.de"

// resolve IPs
Var ip1 as string = DNSNameToAddressMBS(Domain1)
Var ip2 as string = DNSNameToAddressMBS(Domain2)

// if we got IPs and not the same IPs (error/login pages)
if len(ip1)=0 or len(ip2)=0 or ip1=ip2 then
MsgBox "no connection"
else
MsgBox "have connection"
end if
```

Notes: This way you can detect whether you got something from DNS. And you can make sure that a DNS redirection to a login page won't catch you.

12.0.250 Where is StringHeight function in DynaPDF?

Plugin Version: all, Platform: Windows.

Answer: Use the function GetFTextHeight or GetFTextHeightEx.

Notes: Be aware that GetFTextHeight works with format commands and you may want to escape your text if you don't use them.

12.0.251 Where is XLSDocumentMBS class?

Plugin Version: all, Platform: macOS.

Answer: This class has been removed in favor of XLBookMBS class.

Notes: These classes have been removed: XLSCellMBS, XLSDocumentMBS, XLSFormatRecordMBS, XLSMergedCellsMBS, XLSRowMBS and XLSSheetMBS.

12.0.252 Where to get information about file formats?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

Please visit this web page:
<http://www.wotsit.org>

12.0.253 Where to register creator code for my application?

Plugin Version: all, Platform: macOS.

Answer:

Register at Apple:
<http://developer.apple.com/dev/cftype/information.html>

12.0.254 Which Mac OS X frameworks are 64bit only?

Plugin Version: all, Platform: macOS.

Answer: Some frameworks from Mac OS X do not support 32 bit applications, so we can't provide plugins for Xojo until 64bit target is available.

Notes: For Mac OS X 10.8:

- Accounts
- EventKit
- GLKit
- Social

and in 10.9:

- Accounts
- AVKit
- EventKit
- GameController
- GLKit

- MapKit
- MediaLibrary
- Social
- SpriteKit

In general Apple makes all new frameworks being 64 bit only.

12.0.255 Which plugins are 64bit only?

Plugin Version: all, Platform: macOS.

Answer: Some of our plugins work only in 64 bit modes as operation systems do not provide 32 bit code.

Notes: This effects currently: EventKit, Accounts, Social frameworks from Apple and our matching plugins.

12.0.256 Why application doesn't launch because of a missing ddraw.dll!?

Plugin Version: all, Platform: Windows.

Answer: Some RB versions require that you install DirectX from Microsoft on your Windows.

12.0.257 Why application doesn't launch because of a missing shlwapi.dll!?

Plugin Version: all, Platform: Windows.

Answer: Some RB versions require that you install the Internet Explorer from Microsoft on your Windows.

Notes: This bug is for several older Windows 95 editions.

12.0.258 Why do I hear a beep on keydown?

Plugin Version: all, Platform: Windows.

Answer: When the user presses a key, RB goes through all keydown event handlers till on returns true.

Notes: If no keydown event handler returns true for the key, a beep is performed.

12.0.259 Why does folderitem.item return nil?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Because Xojo fails to make a folderitem for you. Reason may be an alias file which can't be resolved or simply that you don't have enough access rights to read the folder content.

Notes: A more rarely reason is that the directory changed and the file with the given index or name does no longer exist.

12.0.260 Why doesn't showurl work?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

There are three main reasons:

1. showurl is not supported by Xojo in 68k applications.
2. there is now application defined for the protocol (e.g. http) in the Internet Control panel.
3. You don't have Internet Config installed.

You can use the InternetConfigMBS class to check for this stuff.

12.0.261 Why don't the picture functions not work on Linux?

Plugin Version: all, Platform: macOS.

Answer: Please make sure libcairo is installed.

Notes: For accessing pictures on Linux, the MBS Plugin relays on the cairo library. Please install the package if you don't have it already.

Our plugin looks for library called libcairo.so or libcairo.so.2.

12.0.262 Why have I no values in my chart?

Plugin Version: all, Platforms: macOS, Windows.

Answer: You have no data points visible, there may be several reasons:

Notes: For example one of the data values may be infinite or invalid.

Or the scaling may be out of range, so you simply see nothing.

12.0.263 Will application size increase with using plugins?

Plugin Version: all, Platform: Windows.

Answer: All plugins used by your application will be included in the application.

Notes: If you use no plugins, your application will not change size.

And if you use one class from the plugins, your application size will increase by a few kilobytes.

The documentation of the plugins include a list of all plugin parts and their sizes for the different platforms.

12.0.264 XLS: Custom format string guidelines

Plugin Version: all, Platform: macOS.

Answer: You have to download the source code and compile a static version of the library.

Notes: Up to four sections of format codes can be specified. The format codes, separated by semicolons, define the formats for positive numbers, negative numbers, zero values, and text, in that order. If only two sections are specified, the first is used for positive numbers and zeros, and the second is used for negative numbers. If only one section is specified, it is used for all numbers. Four sections example:

```
#,###.00_); [ Red ] (#,###.00);0.00;"sales "@
```

The following table describes the different symbols that are available for use in custom number formats.

Specify colors

To set the text color for a section of the format, type the name of one of the following eight colors in square brackets in the section. The color code must be the first item in the section.

Instead of using the name of the color, the color index can be used, like this [Color3] for Red. Valid numeric indexes for color range from 1 to 56, which reference by index to the legacy color palette.

Specify conditions

To set number formats that will be applied only if a number meets a specified condition, enclose the condition in square brackets. The condition consists of a comparison operator and a value. Comparison operators include: = Equal to; >Greater than; <Less than; >= Greater than or equal to, <= Less than or equal to, and <>Not equal to. For example, the following format displays numbers that are less than or equal to 100 in a red font and numbers that are greater than 100 in a blue font.

```
[ Red ] [ <=100 ] ; [ Blue ] [ >100 ]
```

If the cell value does not meet any of the criteria, then pound signs ("##") are displayed across the width of the cell.

Dates and times

Examples

12.0.265 Xojo doesn't work with your plugins on Windows 98.

Plugin Version: all, Platform: Windows.

Answer: Please upgrade your Windows version.

**12.0.266 Xojo or my RB application itself crashes on launch on Mac OS Classic.
Why?**

Plugin Version: all.

Answer:

You may check if the application has enough memory to be loaded.

RB should have on Mac OS Classic more than 20 MB of RAM.

I preferred to use 50 MB and for an application a 10 MB partition is a good way to start.

| Parameter | Description |
|---------------|--|
| x | The x value of the data point. For an enumerated x-axis (see <code>Axis.setLabels</code> on what is an enumerated axis), the first data point is 0, and the nth data point is (n-1). |
| xLabel | The bottom x-axis label of the data point. |
| x2Label | The top x-axis label of the data point. |
| value | The value of the data point. |
| accValue | The sum of values of all data points that are in the same x position and same data group as the current data point, and with data set number less than or equal to the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart. |
| totalValue | The sum of values of all data points that are in the same x position and same data group as the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart. |
| percent | The percentage of the data point based on the total value of all data points that are in the same x position and same data group as the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart. |
| accPercent | The accumulated percentage of the data point based on the total value of all data points that are in the same x position and same data group as the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart. |
| gpercent | The percentage of the data point based on the total value of all data points in a layer. |
| dataSet | The data set number to which the data point belongs. The first data set is 0. The nth data set is (n-1). |
| dataSetName | The name of the data set to which the data point belongs. |
| dataItem | The data point number within the data set. The first data point is 0. The nth data point is (n-1). |
| dataGroup | The data group number to which the data point belongs. The first data group is 0. The nth data group is (n-1). |
| dataGroupName | The name of the data group to which the data point belongs. |
| layerId | The layer number to which the data point belongs. The first layer is 0. The nth layer is (n-1). |
| fieldN | The (N + 1)th extra field. For example, { field0 } means the first extra field. An extra field is an array of custom elements added using <code>Layer.addExtraField</code> , <code>Layer.addExtraField2</code> , <code>BaseChart.addExtraField</code> or <code>BaseChart.addExtraField2</code> . |

| | |
|------------|--|
| diFieldN | Same as fieldN. See above. |
| dsFieldN | Similar to fieldN, except that dsFieldN means the extra field is indexed by data set number. The Pth data set corresponds to the Pth element of the extra field. |
| dsdiFieldN | Similar to fieldN, except that dsdiFieldN means the extra fields are indexed by both the data set number and data point number. The Pth data item of the Qth data set corresponds to the Pth element of the (N + Q)th extra field. |

| Parameter | Description |
|-----------|---|
| zx | The symbol scale in the x dimension. Applicable for layers with symbol scales set by <code>LineStyle.setSymbolScale</code> . |
| zy | The symbol scale in the y dimension. Applicable for layers with symbol scales set by <code>LineStyle.setSymbolScale</code> . |
| z | The symbol scale without distinguishing the dimension to use. Applicable for layers with symbol scales set by <code>LineStyle.setSymbolScale</code> . |

| Parameter | Description |
|-----------|--|
| slope | The slope of the trend line. |
| intercept | The y-intercept of the trend line. |
| corr | The correlation coefficient in linear regression analysis. |
| stderr | The standard error in linear regression analysis. |

| Parameter | Description |
|-----------|--|
| top | The value of the top edge of the box-whisker symbol. |
| bottom | The value of the bottom edge of the box-whisker symbol. |
| max | The value of the maximum mark of the box-whisker symbol. |
| min | The value of the minimum mark of the box-whisker symbol. |
| med | The value of the median mark of the box-whisker symbol. |

| Parameter | Description |
|-----------|------------------|
| high | The high value. |
| low | The low value. |
| open | The open value. |
| close | The close value. |

| Parameter | Description |
|-----------|------------------------------|
| dir | The direction of the vector. |
| len | The length of the vector. |

| | |
|-------------|---|
| Parameter | Description |
| radius | The radial value of the data point. |
| value | Same as { radius } . See above. |
| angle | The angular value of the data point. |
| x | Same as { angle } . See above. |
| label | The angular label of the data point. |
| xLabel | Same as { label } . See above. |
| name | The name of the layer to which the data point belongs. |
| dataSetName | Same as { name } . See above. |
| i | The data point number. The first data point is 0. The nth data point is (n-1). |
| dataItem | Same as { i } . See above. |
| z | The symbol scale. Applicable for layers with symbol scales set by Polar-Layer.setSymbolScale. |
| fieldN | The (N + 1)th extra field. For example, { field0 } means the first extra field. An extra field is an array of custom elements added using Layer.addExtraField, Layer.addExtraField2, BaseChart.addExtraField or BaseChart.addExtraField2. |
| diFieldN | Same as fieldN. See above. |
| dsFieldN | Similar to fieldN, except that dsFieldN means the extra field is indexed by layer index. The Pth layer corresponds to the Pth element of the extra field. |
| dsdiFieldN | Similar to fieldN, except that dsdiFieldN means the extra fields are indexed by both the data set number and data point number. The Pth data item of the Qth layer corresponds to the Pth element of the (N + Q)th extra field. |
| Parameter | Description |
| dir | The direction of the vector. |
| len | The length of the vector. |
| Parameter | Description |
| value | The axis value at the tick position. |
| label | The axis label at the tick position. |
| Parameter | Description |
| [param] | The name of the parameter |
| [a] | If this field a number, it specifies the number of decimal places (digits to the right of the decimal point). |

| | |
|---|---|
| [b] | The thousand separator. Should be a non-alphanumeric character (not 0-9, A-Z, a-z). Use ' '. |
| textasciitilde ' for no thousand separator. The default is ' '. | |
| textasciitilde ', which can be modified using BaseChart.setNumberFormat. | |
| [c] | The decimal point character. The default is '.', which can be modified using BaseChart.setNumberFormat. |
| [d] | The negative sign character. Use ' '. |
| textasciitilde ' for no negative sign character. The default is '-', which can be modified using BaseChart.setNumberFormat. | |

| Parameter | Description |
|-----------|---|
| yyyy | The year in 4 digits (e.g. 2002) |
| yyy | The year showing only the least significant 3 digits (e.g. 002 for the year 2002) |
| yy | The year showing only the least significant 2 digits (e.g. 02 for the year 2002) |
| y | The year showing only the least significant 1 digits (e.g. 2 for the year 2002) |
| mmm | The month formatted as its name. The default is to use the first 3 characters of the english month name (Jan, Feb, Mar ...). The names can be configured using BaseChart.setMonthNames. |
| mm | The month formatted as 2 digits from 01 - 12, adding leading zero if necessary. |
| m | The month formatted using the minimum number of digits from 1 - 12. |
| MMM | The first 3 characters of the month name converted to upper case. The names can be configured using BaseChart.setMonthNames. |
| MM | The first 2 characters of the month name converted to upper case. The names can be configured using BaseChart.setMonthNames. |
| M | The first character of the month name converted to upper case. The names can be configured using BaseChart.setMonthNames. |
| dd | The day of month formatted as 2 digits from 01 - 31, adding leading zero if necessary. |
| d | The day of month formatted using the minimum number of digits from 1 - 31. |
| w | The name of the day of week. The default is to use the first 3 characters of the english day of week name (Sun, Mon, Tue ...). The names can be configured using BaseChart.setWeekDayNames. |
| hh | The hour of day formatted as 2 digits, adding leading zero if necessary. The 2 digits will be 00 - 23 if the 'a' option (see below) is not specified, otherwise it will be 01 - 12. |
| h | The hour of day formatted using the minimum number of digits. The digits will be 0 - 23 if the 'a' option (see below) is not specified, otherwise it will be 01 - 12. |
| nn | The minute formatted as 2 digits from 00 - 59, adding leading zero if necessary. |
| n | The minute formatted using the minimum number of digits from 00 - 59. |
| ss | The second formatted as 2 digits from 00 - 59, adding leading zero if necessary. |
| s | The second formatted using the minimum number of digits from 00 - 59. |
| a | Display either 'am' or 'pm', depending on whether the time is in the morning or afternoon. The text 'am' and 'pm' can be modified using BaseChart.setAMPM. |

| Shape Id | Value | Description |
|-----------------------|------------|---|
| SquareShape | 1 | Square shape. See (1, 1) above. |
| DiamondShape | 2 | Diamond shape. See (2, 1) above. |
| TriangleShape | 3 | Triangle shape pointing upwards. See (3, 1) above. |
| RightTriangleShape | 4 | Triangle shape pointing rightwards. See (4, 1) above. |
| LeftTriangleShape | 5 | Triangle shape pointing leftwards. See (5, 1) above. |
| InvertedTriangleShape | 6 | Triangle shape pointing downwards. See (1, 2) above. |
| CircleShape | 7 | Circle shape. See (2, 2) above. |
| StarShape | [Method] | Star shapes of various points. See (2, 3), (2, 4), (2, 5), (3, 1), (3, 2), (3, 3), (3, 4), (3, 5) above for stars with 3 to 10 points. |
| PolygonShape | [Method] | Polygon shapes symmetrical about a vertical axis with a vertex at the top center position. See (4, 1), (4, 3), (4, 5), (5, 1) for polygons of 5 to 8 sides. |
| Polygon2Shape | [Method] | Polygon shapes symmetrical about a vertical axis but without any vertex at the top center position. See (4, 2), (4, 4) for polygons of 5 and 6 sides. |
| CrossShape | [Method] | '+' shapes. See (5, 2), (5, 3), (5, 4), (5, 5), (6, 1), (6, 2), (6, 3) for '+' shape with arm width of 0.1 - 0.7. |
| Cross2Shape | [Method] | 'X' shapes. See (6, 4), (6, 5), (7, 1), (7, 2), (7, 3), (7, 4), (7, 5) for 'X' shapes with arm width of 0.1 - 0.7. |

| | | |
|-----------------|----|--|
| langEnglish | 0 | Roman script |
| langFrench | 1 | Roman script |
| langGerman | 2 | Roman script |
| langItalian | 3 | Roman script |
| langDutch | 4 | Roman script |
| langSwedish | 5 | Roman script |
| langSpanish | 6 | Roman script |
| langDanish | 7 | Roman script |
| langPortuguese | 8 | Roman script |
| langNorwegian | 9 | Roman script |
| langHebrew | 10 | Hebrew script |
| langJapanese | 11 | Japanese script |
| langArabic | 12 | Arabic script |
| langFinnish | 13 | Roman script |
| langGreek | 14 | Greek script using smRoman script code |
| langIcelandic | 15 | modified smRoman/Icelandic script |
| langMaltese | 16 | Roman script |
| langTurkish | 17 | modified smRoman/Turkish script |
| langCroatian | 18 | modified smRoman/Croatian script |
| langTradChinese | 19 | Chinese (Mandarin) in traditional characters |
| langUrdu | 20 | Arabic script |
| langHindi | 21 | Devanagari script |
| langThai | 22 | Thai script |
| langKorean | 23 | Korean script |

| Nan | Meaning |
|-----|---|
| 1 | Invalid square root (negative number, usually) |
| 2 | Invalid addition (indeterminate such as infinity + (-infinity)) |
| 4 | Invalid division (indeterminate such as 0/0) |
| 8 | Invalid multiplication (indeterminate such as 0*infinity) |
| 9 | Invalid modulo such as (a mod 0) |
| 17 | Try to convert invalid string to a number like val("x7") |
| 33 | Invalid argument in a trig function |
| 34 | Invalid argument in an inverse trig function |
| 36 | Invalid argument in a log function |
| 37 | Invalid argument in Pow function |
| 38 | Invalid argument in toolbox financial function |
| 40 | Invalid argument in hyperbolic function |
| 42 | Invalid argument in a gamma function |

| Symbol | Description and result |
|-----------------|--|
| 0 | Digit placeholder. For example, if the value 8.9 is to be displayed as 8.90, use the format #.00 |
| # | Digit placeholder. This symbol follows the same rules as the 0 symbol. However, the application shall not display extra zeros when the number typed has fewer digits on either side of the decimal than there are # symbols in the format. For example, if the custom format is #.##, and 8.9 is in the cell, the number 8.9 is displayed. |
| ? | Digit placeholder. This symbol follows the same rules as the 0 symbol. However, the application shall put a space for insignificant zeros on either side of the decimal point so that decimal points are aligned in the column. For example, the custom format 0.0? aligns the decimal points for the numbers 8.9 and 88.99 in a column. |
| . (period) | Decimal point. |
| % | Percentage. If the cell contains a number between 0 and 1, and the custom format 0% is used, the application shall multiply the number by 100 and add the percentage symbol in the cell. |
| , (comma) | Thousands separator. The application shall separate thousands by commas if the format contains a comma that is enclosed by number signs (#) or by zeros. A comma that follows a placeholder scales the number by one thousand. For example, if the format is #.0,, and the cell value is 12,200,000 then the number 12.2 is displayed. |
| E- E+ e- e+ | Scientific format. The application shall display a number to the right of the "E" symbol that corresponds to the number of places that the decimal point was moved. For example, if the format is 0.00E+00, and the value 12,200,000 is in the cell, the number 1.22E+07 is displayed. If the number format is #0.0E+0, then the number 12.2E+6 is displayed. |
| \$ -+/():space | Displays the symbol. If it is desired to display a character that differs from one of these symbols, precede the character with a backslash (\). Alternatively, enclose the character in quotation marks. For example, if the number format is (000), and the value 12 is in the cell, the number (012) is displayed. |
| \ | Display the next character in the format. The application shall not display the backslash. For example, if the number format is 0\!, and the value 3 is in the cell, the value 3! is displayed. |
| * | Repeat the next character in the format enough times to fill the column to its current width. There shall not be more than one asterisk in one section of the format. If more than one asterisk appears in one section of the format, all but the last asterisk shall be ignored. For example, if the number format is 0*x, and the value 3 is in the cell, the value 3xxxxxx is displayed. The number of x characters that are displayed in the cell varies based on the width of the column. |
| _ (underline) | Skip the width of the next character. This is useful for lining up negative and positive values in different cells of the same column. For example, the number format _(0.0_);(0.0) aligns the numbers 2.3 and -4.5 in the column even though the negative number is enclosed by parentheses. |
| "text" | Display whatever text is inside the quotation marks. For example, the format 0.00 "dollars" displays 1.23 dollars when the value 1.23 is in the cell. |
| @ | Text placeholder. If text is typed in the cell, the text from the cell is placed in the format where the at symbol (@) appears. For example, if the number format is "Bob "@ Smith" (including quotation marks), and the value "John" is in the cell, the value Bob John Smith is displayed. |

[Black] [Green] [White] [Blue] [Magenta] [Yellow] [Cyan] [Red]

| To display | As | Use this code |
|--------------|------------------|---------------|
| Months | 1-12 | m |
| Months | 01-12 | mm |
| Months | Jan-Dec | mmm |
| Months | January-December | mmmm |
| Months | J-D | mmmmm |
| Days | 1-31 | d |
| Days | 01-31 | dd |
| Days | Sun-Sat | ddd |
| Days | Sunday-Saturday | dddd |
| Years | 00-99 | yy |
| Years | 1900-9999 | yyyy |
| Hours | 0-23 | h |
| Hours | 00-23 | hh |
| Minutes | 0-59 | m |
| Minutes | 00-59 | mm |
| Seconds | 0-59 | s |
| Seconds | 00-59 | ss |
| Time | 4 AM | h AM/PM |
| Time | 4:36 PM | h:mm AM/PM |
| Time | 4:36:03 P | h:mm:ss A/P |
| Time | 4:36:03.75 | h:mm:ss.00 |
| Elapsed time | 1:02 | [h] :mm |
| Elapsed time | 62:16 | [mm] :ss |
| Elapsed time | 3735.80 | [ss] .00 |

| To display | As | Use this code |
|------------|---------|---------------|
| 1234.59 | 1234.6 | #####.# |
| 8.9 | 8.900 | #.000 |
| .631 | 0.6 | 0.# |
| 12 | 12.0 | #.0# |
| 1234.568 | 1234.57 | #.0# |
| 44.398 | 44.398 | ???.??? |
| 102.65 | 102.65 | ???.??? |
| 2.8 | 2.8 | ???.??? |
| 5.25 | 5 1/4 | # ??/?? |
| 5.3 | 5 3/10 | # ??/?? |
| 12000 | 12,000 | #,### |
| 12000 | 12 | #, |
| 12400000 | 12.4 | 0.0,, |