MBS Mac Plugin Documentation

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0.1 Introduction

This is the PDF version of the documentation for the Xojo (Real Studio) Plug-in from Monkeybread Software Germany. Plugin part: MBS Mac Plugin

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Chapter 5

Alias

5.1 class AliasInfoMBS

5.1.1 class AliasInfoMBS

Plugin Version: 5.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A class for information about an alias.
Example:

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("Development")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "alias points to "+a.TargetName+" in path "+a.PathString+" of volume "+a.VolumeName
```

Notes:

Only for Mac OS X.
This is for resource fork based alias files.
Newer OS X version use the newer bookmark format, so please use CFBookmarkMBS module there.

5.1.2 Methods

5.1.3 Constructor

Plugin Version: 5.4, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A dummy constructor used only for automatic plugin testing.
See also:

- 5.1.4 Constructor(AliasHandle as Integer) 66

5.1.4 Constructor(AliasHandle as Integer)

Plugin Version: 5.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The constructor: Loads object properties with information about the alias inside the Alias Handle.
Notes: Check Lasterror code to see whether it was successfull.
See also:

- 5.1.3 Constructor 66

5.1.5 InfoForAliasData(data as string) as AliasInfoMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Query information for alias data.
Example:

```
dim folder as FolderItem = SpecialFolder.Desktop
dim m as new MacAliasMBS
dim error as Integer = m.Create(nil, folder)
if error = 0 then
dim data as string = m.GetRecord
dim info as AliasInfoMBS = AliasInfoMBS.InfoForAliasData(data)
MsgBox info.PathString
else
MsgBox "Failed to create the alias. Error "+str(error)
end if
```

Notes: Returns nil on any error.

5.1.6 InfoForSaveInfo(data as string) as AliasInfoMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Query information about alias in SaveInfo.

Example:

```
dim folder as FolderItem = SpecialFolder.Desktop
dim SaveInfo as string = folder.GetSaveInfo(nil, FolderItem.SaveInfoDefaultMode)
dim info as AliasInfoMBS = AliasInfoMBS.InfoForSaveInfo(SaveInfo)
MsgBox info.PathString
```

Notes:

This is for saveinfo data returns by GetSaveInfo function in folderitem class.
Returns nil on any error.

5.1.7 Properties

5.1.8 FileCreator as String

Plugin Version: 5.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The file creator code.
Example:

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("IMG_0793.jpg")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "FileCreator: "+a.FileCreator // shows Mac OS creator code like GKON
```

Notes: (Read only property)

5.1.9 FilesystemID as Integer

Plugin Version: 5.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The file system ID of the target file system.
Notes: (Read only property)

5.1.10 FileType as String

Plugin Version: 5.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The file type code.
Example:

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("IMG_0793.jpg")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "FileType: "+a.FileType // shows Mac OS creator code like JPEG
```

Notes: (Read only property)

5.1.11 Flags as Integer

Plugin Version: 5.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Which properties do have valid content.
Notes:

some contants:

AliasInfoNone	= & h00000000	no valid info
AliasInfoVolumeCreateDate	= & h00000001	volume creation date is valid
AliasInfoTargetCreateDate	= & h00000002	target creation date is valid
AliasInfoFinderInfo	= & h00000004	file type and creator are valid
AliasInfoIsDirectory	= & h00000008	isDirectory boolean is valid
AliasInfoIDs	= & h00000010	parentDirID and nodeID are valid
AliasInfoFSInfo	= & h00000020	filesystemID and signature are valid
AliasInfoVolumeFlags	= & h00000040	volumeIsBootVolume, volumeIsAutomounted, volumeIsEjectable and volumeHasPersistentFileIDs are valid

(Read only property)

5.1.12 IsDirectory as Boolean

Plugin Version: 5.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Whether the target item is a directory or not.
Example:

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("IMG_0793.jpg")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS
```

```
// show info
MsgBox "IsDirectory: "+str(a.IsDirectory)
```

Notes: (Read only property)

5.1.13 LastError as Integer

Plugin Version: 13.4, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The last error code.
Notes: (Read only property)

5.1.14 NodeID as Integer

Plugin Version: 5.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The node ID of the target file.
Notes: (Read only property)

5.1.15 ParentDirID as Integer

Plugin Version: 5.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The Directory ID of the parent directory.
Notes: (Read only property)

5.1.16 PathString as String

Plugin Version: 5.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The POSIX path to target.
Example:

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("IMG_0793.jpg")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "TargetName: "+a.PathString // shows target file path
```

Notes: (Read only property)

5.1.17 Signature as Integer

Plugin Version: 5.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The signature of the target file system.
Notes: (Read only property)

5.1.18 TargetCreateDate as Double

Plugin Version: 5.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Target file creation date.
Notes:

Value should be in absolute seconds.
(Read only property)

5.1.19 TargetName as String

Plugin Version: 5.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name of the target item.
Example:

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("IMG_0793.jpg")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "TargetName: "+a.TargetName // shows target file name
```

Notes: (Read only property)

5.1.20 VolumeCreateDate as Double

Plugin Version: 5.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The creation date of the target volume.

Notes: (Read only property)

5.1.21 VolumeHasPersistentFileIDs as Boolean

Plugin Version: 5.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The target volume has persistent file IDs, so the NodeID and parentDirID are useable.
Example:

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("IMG_0793.jpg")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "VolumeHasPersistentFileIDs: "+str(a.VolumeHasPersistentFileIDs)
```

Notes: (Read only property)

5.1.22 VolumeIsAutomounted as Boolean

Plugin Version: 5.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Whether the volume is automounted.
Notes:

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("IMG_0793.jpg")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "VolumeIsAutomounted: "+str(a.VolumeIsAutomounted)
```

(Read only property)

5.1.23 VolumeIsBootVolume as Boolean

Plugin Version: 5.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Whether the target volume is bootable.
Example:

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("IMG_0793.jpg")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "VolumeIsBootVolume: "+str(a.VolumeIsBootVolume)
```

Notes: (Read only property)

5.1.24 VolumeIsEjectable as Boolean

Plugin Version: 5.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Whether the target file is on an ejectable volume.
Example:

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("IMG_0793.jpg")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "VolumeIsEjectable: "+str(a.VolumeIsEjectable)
```

Notes: (Read only property)

5.1.25 VolumeName as String

Plugin Version: 5.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name of the volume the target resides on.
Example:

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("IMG_0793.jpg")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
```

```
MsgBox "VolumeName: "+a.VolumeName // shows target volume name
```

Notes: (Read only property)

5.1.26 Constants

5.1.27 kAliasInfoFinderInfo = 4

Plugin Version: 13.4. **Function:** One of the flag constants.
Notes: File type and creator are valid.

5.1.28 kAliasInfoFSInfo = 32

Plugin Version: 13.4. **Function:** One of the flag constants.
Notes: FilesystemID and signature are valid.

5.1.29 kAliasInfoIDs = 16

Plugin Version: 13.4. **Function:** One of the flag constants.
Notes: ParentDirID and nodeID are valid.

5.1.30 kAliasInfoIsDirectory = 8

Plugin Version: 13.4. **Function:** One of the flag constants.
Notes: IsDirectory boolean is valid.

5.1.31 kAliasInfoNone = 0

Plugin Version: 13.4. **Function:** One of the flag constants.
Notes: No valid info.

5.1.32 kAliasInfoTargetCreateDate = 2

Plugin Version: 13.4. **Function:** One of the flag constants.
Notes: Target creation date is valid.

5.1.33 kAliasInfoVolumeCreateDate = 1

Plugin Version: 13.4. **Function:** One of the flag constants.
Notes: Volume creation date is valid.

5.1.34 kAliasInfoVolumeFlags = 64

Plugin Version: 13.4. **Function:** One of the flag constants.
Notes: VolumeIsBootVolume, volumeIsAutomounted, volumeIsEjectable and volumeHasPersistentFileIDs are valid.

5.2 class MacAliasMBS

5.2.1 class MacAliasMBS

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Gives access to Aliases on Mac.
Example:

```
// Store the reference to a FolderItem in a Binary File

Dim alias as MacAliasMBS
dim t,f as FolderItem
Dim bf as BinaryStream, s as String
t=SpecialFolder.Desktop.Child("test")
bf = t.CreateBinaryFile("") // open your binary file here
f = SpecialFolder.Desktop // the FolderItem you want to save
alias = new MacAliasMBS
if alias.Create(nil, f) = 0 then
s = alias.GetRecord
bf.WriteLong LenB(s) // this saves the length of the record
bf.Write s // this saves the record itself
end
bf.Close

// Retrieve the reference to a FolderItem from a Binary File

dim l as Integer

t=SpecialFolder.Desktop.Child("test")
bf = t.OpenAsBinaryFile(false) // open your binary file here
alias = new MacAliasMBS
l = bf.ReadLong
alias.SetRecord bf.Read(l)
f = alias.Resolve(nil, alias.attemptMount)
if alias.needsUpdate then
if alias.Update(nil, f) = 1 then
// ... you might want to save the updated alias in your file here
end
end
// f now describes the FolderItem again.
// It may not be existing any more, however, so here's a check for that:
if not f.exists then
msgBox "oops! the file is not available any more. Select a new one, please"
//... let the user locate the file
end
```

Notes:

This Plugin implements a new Class for handling Mac OS Alias Records.

AliasRecords are like FolderItems, but can be made persistent: You can convert a FolderItem into a AliasRecord and store that AliasRecord in a file (like your Preferences file). Later you can retrieve that information again and convert it back into a FolderItem.

AliasRecords also appear inside Alias Files, that are usually created by the Finder. The enclosed sample application (Alias Mgr Plugin Demo.) shows how to create and resolve such Alias Files.

Additional Background Information
The purpose of the class is to store paths to files and/or folders between runs of a RB application.
To store a path to a file/folder in an RB app, currently your only option is to get the abolute path as a string, and store that string in a file, usually your preferences file.
However, there is problem with using this technique: If, between runs of your app, the user changes the path of the file by moving it, or by renaming the file or any of its parent folders (including the volume name), your app will fail to locate the file next time
it is looking for it.
Fortunately, at least in Mac OS, there is a solution to this, which helps you to track your files in such a case. This is done by using Alias Records: they are the basic data structure that is also used in Alias Files as created and used in the Finder.
This class attempts to give the flexibility of Alias Records to your RB apps.

The meaning of the Relative path
When no relative path is specified, then the file is only located by its folder hierarchy down to the root of the volume. However, if a relative path is given, then the file is optionally located relative to that point.
So, if you locate files relatively to some folder, like the folder your application is in, you should specify your app's folder as the relative path so that the target is even found easily when the user moved the whole folder including your app and its related files. This is even more important when using this Alias class under Windows than under Mac OS (if files are moved in Mac OS, they often still can be found even without the help of the original folder hierarchy, while this is not possible under Windows 9x).

For Mac OS X 10.6 or newer, please also check CFBookmarkMBS module.

5.2.2 Methods

5.2.3 AliasInfo as AliasInfoMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Queries alias info for the alias.
Example:

```
dim m as new MacAliasMBS
dim f as FolderItem = SpecialFolder.Desktop
```

```
if m.Create(nil, f) = 0 then
dim info as AliasInfoMBS = m.AliasInfo

MsgBox info.TargetName + EndOfLine + info.VolumeName + EndOfLine + info.PathString
end if
```

5.2.4 close

Plugin Version: 3.4, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The destructor.
Notes:

There is no need to call this method except you want to free all resources of this object now without waiting for Realbasic to do it for you.
(e.g. some Realbasic versions crash on Windows if there are plugin objects not closed.)

5.2.5 Create(relPath as FolderItem, target as FolderItem, isDirectory as boolean = false) as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Creates an AliasRecord for a given file or folder.
Example:

```
dim m as new MacAliasMBS

dim e as Integer = m.Create(nil, SpecialFolder.Desktop.Child("test.txt"), true)

// shows -43 as we created alias for non existing file
MsgBox str(e)
MsgBox m.AliasInfo.TargetName
```

Notes:

Returns zero if successful, otherwise a negative Mac OS error code.

Version 16.0 can create alias for non existing files. In that case you can tell with function isDirectory whether the target should be a directory. Still returns fnfErr (-43) if file doesn't exist but the alias will still be created.

5.2.6 CreateAliasFromPath(targetPath as string, fromFilePath as String = "", isDirectory as boolean = false) as Integer

Plugin Version: 16.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Creates an alias given a POSIX style utf-8 path to the target.
Example:

```
dim m as new MacAliasMBS

dim e as Integer = m.CreateAliasFromPath("/Users/test", "", true)

// shows -43 as we created alias for non existing file
MsgBox str(e)
MsgBox m.AliasInfo.TargetName
```

Notes:

Returns OS error code.

If the target file does not exist but the path up to the leaf does then fnfErr (-43) will be returned but the alias will still be created.

fromFilePath: The starting point for a relative search.
targetPath: POSIX style UTF-8 path to target.
IsDirectory: On input, if target does not exist, a flag to indicate whether or not the target is a directory.

5.2.7 CreateFSRef(relPath as memoryblock, target as memoryblock) as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Creates an AliasRecord for a given file or folder.
Notes:

The two memoryblocks are FSRefs which you can get by Folderitem.FSRef.
Returns zero if successful, otherwise a negative Mac OS error code.

5.2.8 CreateMinimal(target as FolderItem, isDirectory as boolean = false) as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Creates an AliasRecord for a given file or folder. Returns zero if successful, otherwise a negative Mac OS error code.
Notes:

Minimal creates an alias without path, so it is smaller.

Version 16.0 can create alias for non existing files. In that case you can tell with function isDirectory whether the target should be a directory. Still returns fnfErr (-43) if file doesn't exist but the alias will still be created.

5.2.9 CreateMinimalFSRef(target as memoryblock) as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Creates a minimal AliasRecord for a given file or folder.
Notes:

The memoryblock is a FSRefs which you can get by Folderitem.FSRef.
Returns zero if successful, otherwise a negative Mac OS error code.

5.2.10 GetRecord as String

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the AliasRecord in a String so that you can store it in a file, and pass it SetRecord for re-creating the AliasRecord (this string might contain any byte values, including zeros, so you can not display it or store it in a text file - you have to store it in a binary file or in a resource, instead!).
Notes: Attention: The length of the String is not fixed! When the Alias changes, its length usually changes, too. If you want to save this string into a binary file, you must also save its current length so that you know how much bytes to retrieve if you read it back from the file later. An easier way to store Aliases in a file is by using the Resource Manager. The sample code "FolderItems in Preferences.rbp" shows how to accomplish this.

5.2.11 PathString as String

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Queries path of the alias.
Example:

```
dim m as new MacAliasMBS
dim f as FolderItem = SpecialFolder.Desktop

if m.Create(nil, f) = 0 then
MsgBox m.PathString
end if
```

5.2.12 Resolve(relPath as FolderItem, mode as Integer) as FolderItem

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Converts an AliasRecord back into a FolderItem. For values to the mode parameter see the class constants or pass in 0 for default searching (will not attempt to mount unavailable volumes).
Notes: After calling this method, the property needsUpdate tells you whether the target has been renamed or moved, which suggests that you call Update in order to reflect the change in the AliasRecord. See the demo "FolderItems in Preferences.rbp" for an example.

5.2.13 SetRecord(record as String)

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Use this method to revive an AliasRecord with the string you inquired from GetRecord earlier.

5.2.14 TargetName as String

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Queries target name of the alias.
Example:

```
dim m as new MacAliasMBS
dim f as FolderItem = SpecialFolder.Desktop

if m.Create(nil, f) = 0 then
MsgBox m.TargetName
end if
```

5.2.15 Update(relPath as FolderItem, target as FolderItem) as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Updates an already created AliasRecord. Returns either a negative Mac OS error code, zero if the update didn't actually change the AliasRecord, or one if the record was changed (in this case you might want to update your record of the alias if you had stored it in a file).

5.2.16 VolumeName as String

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Queries volume name of the alias.
Example:

```
dim m as new MacAliasMBS
dim f as FolderItem = SpecialFolder.Desktop

if m.Create(nil, f) = 0 then
MsgBox m.VolumeName
end if
```

5.2.17 Properties

5.2.18 needsUpdate as boolean

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Does the Alias Record need no Update?
Notes:

after having called Resolve successfullly, this property indicates whether the AliasRecord is still up to date:
true: the target of the Alias is still at the same location where it was last seen.
false: the target has been moved or renamed. The Update method should be invoked.
(Read only property)

5.2.19 Constants

5.2.20 allVols=8

Plugin Version: 7.7. **Function:** One of the constants to use in Resolve.
Notes:

search on multiple volumes
This is the old constant name used for compatibility to older Realbasic code.
Use BitwiseOr or Bitwise.Or to combine this constants values.

5.2.21 attemptMount=1

Plugin Version: 7.7. **Function:** One of the constants to use in Resolve.
Notes:

mount the volume automatically
This is the old constant name used for compatibility to older Realbasic code.
Use BitwiseOr or Bitwise.Or to combine this constants values.

5.2.22 exhaustive=& h200

Plugin Version: 7.7. **Function:** One of the constants to use in Resolve.
Notes:

search further
This is the old constant name used for compatibility to older Realbasic code.
Use BitwiseOr or Bitwise.Or to combine this constants values.

5.2.23 kARMMountVol=1

Plugin Version: 7.7. **Function:** One of the constants to use in Resolve.
Notes:

mount the volume automatically
Use BitwiseOr or Bitwise.Or to combine this constants values.

5.2.24 kARMMultVols=8

Plugin Version: 7.7. **Function:** One of the constants to use in Resolve.
Notes:

search on multiple volumes
Use BitwiseOr or Bitwise.Or to combine this constants values.

5.2.25 kARMNoUI=2

Plugin Version: 7.7. **Function:** One of the constants to use in Resolve.
Notes:

no user interface allowed during resolution
Use BitwiseOr or Bitwise.Or to combine this constants values.

5.2.26 kARMSearch=& h100

Plugin Version: 7.7. **Function:** One of the constants to use in Resolve.
Notes:

search quickly
Use BitwiseOr or Bitwise.Or to combine this constants values.

5.2.27 kARMSearchMore=& h200

Plugin Version: 7.7. **Function:** One of the constants to use in Resolve.
Notes:

search further
Use BitwiseOr or Bitwise.Or to combine this constants values.

5.2.28 kARMSearchRelFirst=& h400

Plugin Version: 7.7. **Function:** One of the constants to use in Resolve.
Notes:

search target on a relative path first
Use BitwiseOr or Bitwise.Or to combine this constants values.

5.2.29 kARMTryFileIDFirst=& h800

Plugin Version: 7.7. **Function:** One of the constants to use in Resolve.
Notes:

search by file id before path
Use BitwiseOr or Bitwise.Or to combine this constants values.

5.2.30 noDialogs=2

Plugin Version: 7.7. **Function:** One of the constants to use in Resolve.
Notes:

no user interface allowed during resolution
This is the old constant name used for compatibility to older Realbasic code.
Use BitwiseOr or Bitwise.Or to combine this constants values.

5.2.31 relFirst=& h400

Plugin Version: 7.7. **Function:** One of the constants to use in Resolve.
Notes:

search target on a relative path first
This is the old constant name used for compatibility to older Realbasic code.
Use BitwiseOr or Bitwise.Or to combine this constants values.

Chapter 6

Apple Script

6.1 class AppleScriptErrorMBS

6.1.1 class AppleScriptErrorMBS

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A class for detailed error information.
Example:

```
// a simply example using the AppleScriptErrorMBS class:

dim s As new AppleScriptMBS
dim ASErr As AppleScriptErrorMBS

dim text As string = "seet x to 1" // intentional error

s.Compile text

if s.LastError<>0 Then
dim errorMsg As String = "Compile error: " + str(s.Lasterror) + EndOfLine
ASErr = s.Error
MsgBox errorMsg + "Details: " + ASErr.BriefMessage
end if
```

6.1.2 Properties

6.1.3 AppName as String

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name of the application.
Notes:

Value is "" if no application is used (e.g. on compiling).
(Read and Write property)

6.1.4 AppSerial as MemoryBlock

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The application serial number.
Notes:

Nil if no application is used.
You can create a ProcessMBS class using this serial.s
(Read and Write property)

6.1.5 BriefMessage as String

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The brief error message.
Example:

```
dim ASErr as AppleScriptErrorMBS
MsgBox "Details: " + ASErr.BriefMessage
```

Notes: (Read and Write property)

6.1.6 Errorcode as Integer

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The error code.
Example:

```
dim a as new AppleScriptMBS

a.Compile "hello"
a.Execute
```

```
MsgBox str(a.Error.Errorcode) // -2753
```

Notes: (Read and Write property)

6.1.7 ErrorCodeAvailable as Boolean

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** whether the error code is known in the ErrorCode property.
Example:

```
dim a as new AppleScriptMBS

a.Compile "hello"
a.Execute

MsgBox str(a.Error.ErrorCodeAvailable)
```

Notes:

The error code property may be 0, but still there may be an error.
(Read and Write property)

6.1.8 Message as String

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The error message.
Example:

```
dim a as new AppleScriptMBS

a.Compile "hello"
a.Execute

MsgBox a.Error.Message
```

Notes: (Read and Write property)

6.1.9 RangeAvailable as Boolean

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** whether the rangestart and rangeend properties have valid values.
Example:

```
dim a as new AppleScriptMBS

a.Compile "hello"
a.Execute

MsgBox str(a.error.RangeAvailable)+": "+str(a.error.RangeStart)+"-"+str(a.error.RangeEnd)
```

Notes: (Read and Write property)

6.1.10 RangeEnd as Integer

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The end of the source text range.
Example:

```
dim a as new AppleScriptMBS

a.Compile "hello"
a.Execute

MsgBox str(a.error.RangeAvailable)+": "+str(a.error.RangeStart)+"-"+str(a.error.RangeEnd)
```

Notes: (Read and Write property)

6.1.11 RangeStart as Integer

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The start of the source text range.
Example:

```
dim a as new AppleScriptMBS

a.Compile "hello"
a.Execute

MsgBox str(a.error.RangeAvailable)+": "+str(a.error.RangeStart)+"-"+str(a.error.RangeEnd)
```

Notes: (Read and Write property)

6.2 class AppleScriptMBS

6.2.1 class AppleScriptMBS

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A class for compiling and executing Apple Scripts in RB.
Example:

```
dim a as new AppleScriptMBS
dim lines(-1) as string

lines.Append "tell application ""Finder"""
lines.Append " activate"
lines.Append " display dialog ""Now is "" & (current date)"
lines.Append "end tell"

a.Compile Join(lines, EndOfLine.Macintosh)
a.Execute
```

Deprecated: This item is deprecated and should no longer be used. You can use NSAppleScriptMBS instead.

6.2.2 Methods

6.2.3 close

Plugin Version: 3.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: No. **Function:** The destructor.
Example:

```
dim a as new AppleScriptMBS
// later
a.close
```

Notes:

There is no need to call this method except you want to free all resources of this object now without waiting for Realbasic to do it for you.
(e.g. some Realbasic versions crash on Windows if there are plugin objects not closed.)

6.2.4 Compile(text as string)

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Compiles the given source code.
Example:

```
// the code below workarounds a limitation in AppleScript on processing unicode strings

dim theScript as new AppleScriptMBS
dim scripttext as string
dim chars(-1) as string
dim n as string
dim i,c as Integer

const text="Hello World" // add unicode characters here!

c=len(text)
for i=1 to c
n=hex(asc(mid(text,i,1)))
while len(n)<4
n="0"+n
wend
chars.Append n
next

scripttext="display dialog (sdata utxt"+join(chars,"")+"t as Unicode text)"

MsgBox scripttext

// must use unicode to avoid error -1753
scripttext=ConvertEncoding(scripttext,encodings.UTF16)
theScript.UnicodeText=true
theScript.compile ScriptText
theScript.execute
```

Notes:

Lasterror is set.
Text should be in MacRoman or UTF16 text encoding for best results.

6.2.5 CountScriptProperties as Integer

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the number of properties in the script.
Example:

```
dim s as String
dim a as AppleScriptMBS
dim i,c,cc as Integer
dim z,t as String

s=s+"property hello : ""Hallo Leute"""+chr(13)
s=s+"property just : ""Just a test"""+chr(13)
s=s+"display dialog hello"+chr(13)
s=s+"return just"+chr(13)

MsgBox "The script:"+chr(13)+s
a=new AppleScriptMBS

a.Compile s

MsgBox str(a.CountScriptProperties)+" properties"
```

Notes: Lasterror is set.

6.2.6 Error as AppleScriptErrorMBS

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: No. **Function:** Returns an AppleScriptError object for details error information.
Example:

```
dim a as AppleScriptMBS
dim e as AppleScriptErrorMBS
a=new AppleScriptMBS

a.Compile "tell application ""Finder"""+chr(13)+"open file ""test"""+chr(13)+"end tell"+chr(13)

// You may check for errors here.

a.Execute

e=a.Error

// in a breakpoint you can see an error message here.
```

Notes:

Returns nil on any error.
The returned object may be empty.

The error information is changed whenever you compile or execute.

6.2.7 Execute

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Runs the current script.
Example:

```
dim a as new AppleScriptMBS

a.Compile "beep"
a.Execute
```

Notes:

Lasterror is set.
If you use this method, please make sure your own Application's HandleAppleEvent method doesn't block executing by returning true for unknown events.

6.2.8 ExecuteEvent(eventname as string, parameters() as string)

Plugin Version: 3.4, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Executes an event inside the current script with the given parameters.
Example:

```
dim a as new AppleScriptMBS
dim lines(-1) as string

lines.append "on test(a,b,c)"
lines.append "display dialog a"
lines.append "display dialog b"
lines.append "display dialog c"
lines.append "end test"

a.Compile join(lines,EndOfLine.Macintosh)
a.Execute

dim s(2) as string
s(0)="Hello"
s(1)="World"
s(2)="!"

a.ExecuteEvent("test",s)
```

Notes:

The eventname must be the name of the event in pure ASCII or MacRoman encoding (and lowercase!).
The parameters can be unicode. The array is based on 0, so string in parameters(0) is the first parameter.

Lasterror is set.

6.2.9 Result as string

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The result of the executed script as a string.
Example:

```
dim a as new AppleScriptMBS

a.Compile "return ""hello"""
a.Execute

MsgBox a.Result
```

Notes:

Returns "" on any error.

If unicode is enabled, this string is unicode (UTF16).

6.2.10 ResultAsStringArray as string()

Plugin Version: 9.6, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The result of the executed script as a string array.
Example:

```
dim a as new AppleScriptMBS

a.Compile "return { ""Hello"", ""World"" } "
a.Execute

MsgBox join(a.ResultAsStringArray,EndOfLine) // Shows Hello World in two lines

a.Compile "tell application ""Mail""" +EndOfLine.Macintosh+"return name of every mailbox" +EndOfLine.Mac-
```

```
intosh+"end tell"
a.Execute

MsgBox join(a.ResultAsStringArray,EndOfLine) // shows your Mailboxes
```

Notes:

On any error the array is empty.
If unicode is enabled, this strings are unicode (UTF16).

6.2.11 ResultDisplayString as string

Plugin Version: 9.6, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The result of the executed script as a string.
Example:

```
dim a as new AppleScriptMBS

a.Compile "return ""hello"""
a.Execute

MsgBox a.ResultDisplayString
```

Notes:

This is the same as Result, but a flag is set to tell AppleScript that the string is for display to a human. So it may not be good for input to the AppleScript compiler.

Returns "" on any error.
If unicode is enabled, this string is unicode (UTF16).

6.2.12 ScriptProperty(index as Integer) as string

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name of the property with the given index.
Example:

```
dim s as String
dim a as AppleScriptMBS
dim i,c,cc as Integer
dim z,t as String
```

```
s=s+"property hello : ""Hallo Leute"""+chr(13)
s=s+"property just : ""Just a test"""+chr(13)
s=s+"display dialog hello"+chr(13)
s=s+"return just"+chr(13)

MsgBox "The script:"+chr(13)+s
a=new AppleScriptMBS

a.Compile s

c=a.CountScriptProperties

cc=c-1
for i=0 to cc
z=a.ScriptProperty(i)
if z<>"" then
if i=0 then
t=z
elseif i=cc then
t=t+" and "+z
else
t=t+", "+z
end if
end if
next

MsgBox str(c)+" properties in the script: "+t

t=a.ScriptProperty(0)
z=a.ScriptPropertyValue(t)
MsgBox "Value of the property named "+t+" is: "+z

a.ScriptPropertyValue(t)="Hello World!"

z=a.ScriptPropertyValue(t)
MsgBox "The new value of the property named "+t+" is: "+z

a.Execute

MsgBox "The result is: "+a.Result
```

Notes:

Index is from 0 to CountScriptProperties-1.
Lasterror is set.

6.2.13 Source as string

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Decompiles the current script and returns the source code.
Example:

```
dim a as new AppleScriptMBS

a.compile "beep"

MsgBox a.Source
```

6.2.14 SourceTextStyle as string

Plugin Version: 3.3, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Decompiles the current script and returns the source code text style.
Example:

```
dim a as new AppleScriptMBS

a.compile "beep"

EditField1.SetTextAndStyle a.Source, a.SourceTextStyle
```

Notes: Doesn't work for unicode text.

6.2.15 Properties

6.2.16 CanUnicodeText as Boolean

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** True if AppleScript can handle Unicode text.
Example:

```
dim a as new AppleScriptMBS

MsgBox str(a.CanUnicodeText)
```

Notes:

This property is set to true if AppleScript 1.3 or newer is installed.

(AppleScript 1.3 was introduced around the time of Mac OS 8.6)
(Read only property)

6.2.17 Handle as Integer

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The handle of the used AppleScript component.
Example:

```
dim a as new AppleScriptMBS
MsgBox str(a.Handle)
```

Notes: (Read and Write property)

6.2.18 Lasterror as Integer

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The last error code.
Example:

```
dim a as new AppleScriptMBS
MsgBox str(a.Lasterror)
```

Notes:

Value is 0 for successfull and -1 if function is not available.
All other values are normal Mac OS error codes.

Some common error codes for this class:

(Read and Write property)

6.2.19 ResultID as Integer

Plugin Version: 9.6, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The internal result ID for the current script.
Example:

```
dim a as new AppleScriptMBS
```

OSASystemError	-1750	
OSAInvalidID	-1751	
OSABadStorageType	-1752	
OSAScriptError	-1753	
OSABadSelector	-1754	
OSASourceNotAvailable	-1756	
OSANoSuchDialect	-1757	
OSADataFormatObsolete	-1758	
OSADataFormatTooNew	-1759	
OSACorruptData	-1702	
OSARecordingIsAlreadyOn	-1732	
OSAComponentMismatch	-1761	Parameters are from 2 different components
OSACantOpenComponent	-1762	Can't connect to scripting system with that ID
OSACantCoerce	-1700	Signaled when a value can't be coerced to the desired type.
OSACantAccess	-1728	Signaled when an object is not found in a container
OSACantAssign	-10006	Signaled when an object cannot be set in a container.
OSAGeneralError	-2700	Signaled by user scripts or applications when no actual error code is to be returned.
OSADivideByZero	-2701	Signaled when there is an attempt to divide by zero
OSANumericOverflow	-2702	Signaled when integer or real value is too large to be represented
OSACantLaunch	-2703	Signaled when application can't be launched or when it is remote and program linking is not enabled
OSAAppNotHighLevelEventAware	-2704	Signaled when an application can't respond to AppleEvents
OSACorruptTerminology	-2705	Signaled when an application's terminology resource is not readable
OSAStackOverflow	-2706	Signaled when the runtime stack overflows
OSAInternalTableOverflow	-2707	Signaled when a runtime internal data structure overflows
OSADataBlockTooLarge	-2708	Signaled when an intrinsic limitation is exceeded for the size of a value or data structure.
OSACantGetTerminology	-2709	
OSACantCreate	-2710	

```
a.Compile "return ""hello"""
a.Execute

MsgBox str(a.ResultID)
```

Notes:

May be useful for Toolbox calls.
(Read and Write property)

6.2.20 ScriptID as Integer

Plugin Version: 9.6, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The internal script ID for the current script.
Example:

```
dim a as new AppleScriptMBS

a.compile "beep"

MsgBox str(a.ScriptID)
```

Notes:

May be useful for Toolbox calls.
(Read and Write property)

6.2.21 UnicodeText as Boolean

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** True if you want to use unicode.
Example:

```
dim a as AppleScriptMBS

a=new AppleScriptMBS
a.UnicodeText=true

dim s as string="tell application ""iTunes""" +chr(13)+"set rating of (track ""Flintstones "") to 40"+chr(13)+"end tell"
a.compile ConvertEncoding(s,Encodings.UTF16)
MsgBox str(a.Lasterror)

a.Execute
MsgBox str(a.Lasterror)

MsgBox a.Result
```

Notes:

If this property is true, all functions try to get strings as 16 bit Unicode strings.
Strings you pass which are in 16 bit Unicode are passed in Unicode to AppleScript.
You may get trouble if the strings you give this class are not in the system encoding (MacRoman?) or 16 bit Unicode. UTF8 will not work!
(Read and Write property)

6.2.22 Binary as string

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The binary representation of the current compiled script.
Example:

```
// create our own compiled AppleScript file

dim a as AppleScriptMBS
dim b as BinaryStream
dim f as FolderItem
dim r as ResourceFork

a=new AppleScriptMBS

// compile a simply applescript:
a.Compile "beep"

// Mac OS X format
f=GetFolderItem("My Apple Script X")

b=f.CreateBinaryFile("applescript")
b.Write a.Binary
b.Close

// Mac OS 9 format
f=GetFolderItem("My Apple Script 9")

r=f.CreateResourceFork("applescript")
r.AddResource a.Binary,"scpt",128,""
r.Close
```

Notes:

You can save and load this value to store scripts.
Lasterror is set.
(Read and Write computed property)

6.2.23 ScriptPropertyValue(name as string) as string

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The value of a script property.
Example:

```
Sub NewEmailinMail(subject as string, body as string, sender as string, receiver as string)
// make a new email in Apple Mail using AppleScript

dim lines(-1) as string


lines.append ""
lines.append "property MySubject : ""My Subject"""
lines.append "property MyBody : ""My Body"""
lines.append "property MyReceiver : ""test@test.test"""
lines.append "property MySender : ""test@test.test"""
lines.append ""
lines.append "tell application ""Mail"""
lines.append " activate"
lines.append " set NewMail to make new outgoing message with properties { visible:true, subject:MySubject,
content:MyBody } "
lines.append " "
lines.append " tell NewMail"
lines.append " make new to recipient at beginning of to recipients with properties { address:MyReceiver } "
lines.append " end tell"
lines.append " "
lines.append " set the sender of NewMail to MySender"
lines.append "end tell"

dim a as new AppleScriptMBS

a.Compile Join(lines,EndOfLine.Macintosh)

// Change encoding
subject = ConvertEncoding(subject, encodings.MacRoman)
body = ConvertEncoding(body, encodings.MacRoman)
sender = ConvertEncoding(sender, encodings.MacRoman)
receiver = ConvertEncoding(receiver, encodings.MacRoman)

// replace line endoings
subject = ReplaceLineEndings(subject, EndOfLine.Macintosh)
body = ReplaceLineEndings(body, EndOfLine.Macintosh)
sender = ReplaceLineEndings(sender, EndOfLine.Macintosh)
receiver = ReplaceLineEndings(receiver, EndOfLine.Macintosh)

// set properties in Script
a.ScriptPropertyValue("MySubject")=subject
a.ScriptPropertyValue("MyBody")=body
a.ScriptPropertyValue("MySender")=sender
a.ScriptPropertyValue("MyReceiver")=receiver

a.Execute
End Sub
```

Notes:

If name or value are UTF16 encoding, than the plugin passes UTF16. Else it passes the bytes and AppleScript may assume MacRoman encoding.
(Read and Write computed property)

6.2.24 Events

6.2.25 Periodic as Integer

Plugin Version: 7.7, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** This event is called periodical on long operations like Compile or Execute.
Notes: Return 0 to continue or some other value to report an error.

Chapter 7

Catalog Search

7.1 class CatSearchMBS

7.1.1 class CatSearchMBS

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Allows you to search fast on your harddisk.
Example:

```
dim cs as new CatSearchMBS

if cs.Search(volume(0), true) then

// set search params

cs.Name = "REALbasic"
cs.PartialName = true

dim response as Integer
do
response = cs.SearchNext
if response = 0 then // still searching

if cs.Result<>nil then // did we find something?
Listbox1.AddRow cs.Result.Name

if Listbox1.ListCount = 100 then
Return // stop after 100 entries
end if
end if

end
```

```
loop until response <0
end if
```

Notes:

Depending on what and how you want to search, you can decide whether MDQueryMBS or CatSearchMBS is the better choice.

This class implements the PBCatSearch function of the Mac OS File Manager. This is a very fast routine to find specific types of files on a volume. The MacOS tool Sherlock (aka Find File) uses this function to its quick search on local volumes.

There are some restrictions to CatSearchMBS: Is it not supported on every volume! Whether it is supported or not depents on the File System format used on the Volume: HFS, HFS+ and most File Servers support it, while Floppy Disks, ISO 9660 and UDF formatted disks, used on some CDs and on most DVD-ROMs, might not support it.

This version of this plugin can now handle those cases where CatSearchMBS is not supported, too: If a volume does not support CatSearchMBS, you can choose to fall back to the classic recursive directory search, which is much slower, but gives you the same results.

(This new feature is achieved by using a C library called "MoreFiles", written by Jim Luther, one of Apple's File System "gurus".)

7.1.2 Methods

7.1.3 close

Plugin Version: 3.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: No. **Function:** The destructor.
Notes:

There is no need to call this method except you want to free all resources of this object now without waiting for Realbasic to do it for you.
(e.g. some Realbasic versions crash on Windows if there are plugin objects not closed.)

7.1.4 Search(volume as FolderItem, allowRecursiveSearch as Boolean) as Boolean

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Initializes the Search engine.
Notes:

Call this to initiate a search a volume. If the returned value is false, then an error has occured (either there

is not enough free memory or the volume wasn't valid). If the returned value is true, everything is okay.

The volume parameter can be anything that identifies the volume, including any file or folder on it.

If allowRecursiveSearch is true and the volume is a folder you search only the folder on this volume, but using recursive directory search.

The allowRecursiveSearch parameter determines whether the search shall use the slower recursive directory scan method if the volume does not support CatSearchMBS. If you pass false for a volume that does not support CatSearchMBS, this method will fail, and return false.

Update: Newer plugin versions (4.x?) allow to search folders if allowRecursiveSearch=true.

7.1.5 SearchNext as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Searches for the next machting file
Example:

```
// Here's an example of a proper search loop:

dim cs as CatSearchMBS
// ....

dim response as Integer
do
If UserCancelled then
exit
end
response = cs.SearchNext
if response = 0 then
// ... read cs.result and process the found item
end
loop until response <0
```

Notes:

Once the search criteria has been set, call this function repeatedly as long as it returns non-negative values. Once the result is negative, the search is finished and CatSearchClose should be called.

These are the possible non-negative return values:

0	a match has been found, and the found item can be inquired by calling Result.
1	a certain amount of time has passed (see ResponseTimeout). You can ignore this result and continue to search.
2	files or folders were added or removed to the volume. You may ignore this error by simply continuing the search.
-39 (eofErr)	end of search, no more matches

7.1.6 Properties

7.1.7 BackupDateEnd as Integer

Plugin Version: 3.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The end of the backup date search range.
Notes:

This value is an unsigned integer. If you assign a double from a date totalseconds property, please move it to the matching range like in the example project "Find stuff from today".
(Read and Write property)

7.1.8 BackupDateStart as Integer

Plugin Version: 3.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The start of the backup date search range.
Notes:

This value is an unsigned integer. If you assign a double from a date totalseconds property, please move it to the matching range like in the example project "Find stuff from today".
(Read and Write property)

7.1.9 CreationDateEnd as Integer

Plugin Version: 3.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The end of the creation date search range.
Notes:

This value is an unsigned integer. If you assign a double from a date totalseconds property, please move it to the matching range like in the example project "Find stuff from today".
(Read and Write property)

7.1.10 CreationDateStart as Integer

Plugin Version: 3.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The start of the creation date search range.
Notes:

This value is an unsigned integer. If you assign a double from a date totalseconds property, please move it to the matching range like in the example project "Find stuff from today".
(Read and Write property)

7.1.11 creator as String

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:**

dim c as CatSearchMBS
c.Creator="ttxt"
' will look for files created by the SimpleText application.
Notes:

The above Creator property allows you to specifiy the search criteria. Without setting any property from this class, a search will find nothing.

Note: If you set one of this properties, all criterias must match to get a match back from a call to SearchNext.
(Read and Write property)

7.1.12 FileFlags as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The file flags to search for.
Example:

```
dim c as CatSearchMBS
c.FileFlags=& H4000 // Invisible
c.FileFlagsMask=& H4000 // only look on the invisible flag
```

Notes:

The above FileFlags property allows you to specifiy the search criteria. Without setting any property from this class, a search will find nothing.

Note: If you set one of this properties, all criterias must match to get a match back from a call to SearchNext.

There is a FileFlags and a FileFlagsMask property which must be used together: bits set in FileFlagsMask

specifiy which bits of FileFlags shall be tested. Those bits will then be compared to the corresponding bits of the files' (and folders') flags on the searched volume. If they are identical, you have a match.

The meaning of the flags are as follows (you can use BitwiseOr or + to combine them):

bit 15,	value & H8000:	isAlias
bit 14	value & H4000:	isInvisible
bit 13,	value & H2000:	hasBundle (has a BNDL resource)
bit 12,	value & H1000:	nameLocked
bit 11,	value & H0800:	isStationary
bit 10,	value & H0400:	hasCustomIcon
bit 8,	value & H0100:	hasBeenInited (Finder has seen the file since it has been created)
bit 7,	value & H0080:	hasNoINITs (there is no INIT rsrc in the Extension file)
bit 6,	value & H0040:	isShared
bits 1-3,	value & H000E:	color (as a 3-bit value from 0-7)

For example, to find only invisible files, use & H4000 for the FileFlagsMask and the same value for the FileFlags, or to find only visible files, use the same FileFlagsMask, but 0 for the FileFlags. To find stationaries that do not have a custom icon, use & H0C00 (=& H0800+& H0400) for the FileFlagsMask and & H0800 for the FileFlags.
(Read and Write property)

7.1.13 FileFlagsMask as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The file flags mask to search for.
Example:

```
dim c as CatSearchMBS
c.FileFlags=& H4000 // Invisible
c.FileFlagsMask=& H4000 // only look on the invisible flag
```

Notes:

The above FileFlagsMask property allows you to specifiy the search criteria. Without setting any property from this class, a search will find nothing.

Note: If you set one of this properties, all criterias must match to get a match back from a call to SearchNext.

There is a FileFlags and a FileFlagsMask property which must be used together: bits set in FileFlagsMask specifiy which bits of FileFlags shall be tested. Those bits will then be compared to the corresponding bits of the files' (and folders') flags on the searched volume. If they are identical, you have a match.

The meaning of the flags are as follows (you can use BitwiseOr or + to combine them):

bit 15,	value & H8000:	isAlias
bit 14	value & H4000:	isInvisible
bit 13,	value & H2000:	hasBundle (has a BNDL resource)
bit 12,	value & H1000:	nameLocked
bit 11,	value & H0800:	isStationary
bit 10,	value & H0400:	hasCustomIcon
bit 8,	value & H0100:	hasBeenInited (Finder has seen the file since it has been created)
bit 7,	value & H0080:	hasNoINITs (there is no INIT rsrc in the Extension file)
bit 6,	value & H0040:	isShared
bits 1-3,	value & H000E:	color (as a 3-bit value from 0-7)

For example, to find only invisible files, use & H4000 for the FileFlagsMask and the same value for the FileFlags, or to find only visible files, use the same FileFlagsMask, but 0 for the FileFlags. To find stationaries that do not have a custom icon, use & H0C00 (=& H0800+& H0400) for the FileFlagsMask and & H0800 for the FileFlags.
(Read and Write property)

7.1.14 FileType as String

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The file type to look for.
Example:

```
dim c as CatSearchMBS
c.FileType="TEXT"
' will look for plain Text files.
```

Notes:

The above Creator property allows you to specifiy the search criteria. Without setting any property from this class, a search will find nothing.

Note: If you set one of this properties, all criterias must match to get a match back from a call to SearchNext.
(Read and Write property)

7.1.15 LogicalDataForkSizeEnd as UInt64

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The maximum logical data fork file size.
Example:

```
dim c as CatSearchMBS
c.LogicalDataForkSizeStart=0
c.LogicalDataForkSizeEnd=102400 // search for files <= 100 KB.
```

Notes:

You can assign -1 to have no upper limit.
(Read and Write property)

7.1.16 LogicalDataForkSizeStart as UInt64

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The minimum logical data fork file size.
Example:

```
dim c as CatSearchMBS
c.LogicalDataForkSizeStart=0
c.LogicalDataForkSizeEnd=102400 // search for files <= 100 KB.
```

Notes: (Read and Write property)

7.1.17 LogicalResForkSizeEnd as UInt64

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The maximum logical resource fork file size.
Example:

```
dim c as CatSearchMBS
c.LogicalResForkSizeStart=0
c.LogicalResForkSizeEnd=102400 // search for files <= 100 KB.
```

Notes:

You can assign -1 to have no upper limit.
(Read and Write property)

7.1.18 LogicalResForkSizeStart as UInt64

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The minimum logical resource fork file size.

Example:

```
dim c as CatSearchMBS
c.LogicalResForkSizeStart=0
c.LogicalResForkSizeEnd=102400 // search for files <= 100 KB.
```

Notes: (Read and Write property)

7.1.19 ModificationDateEnd as Integer

Plugin Version: 3.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The end of the modification date search range.
Notes:

This value is an unsigned integer. If you assign a double from a date totalseconds property, please move it to the matching range like in the example project "Find stuff from today".
(Read and Write property)

7.1.20 ModificationDateStart as Integer

Plugin Version: 3.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The start of the modification date search range.
Notes:

This value is an unsigned integer. If you assign a double from a date totalseconds property, please move it to the matching range like in the example project "Find stuff from today".
(Read and Write property)

7.1.21 name as String

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Set's the name for the search.
Example:

```
dim c as CatSearchMBS
c.Name="Apple"
c.partialname=true
```

Notes:

The above name property allows you to specifiy the search criteria. Without setting any property from this class, a search will find nothing.

Note: If you set one of this properties, all criterias must match to get a match back from a call to SearchNext.

If you pass true to the partialname property, you'll get a match any time the item's name contains the searched name. Otherwise, the intire name must match.

This property is encoded with system encoding. You need to convert strings from an editfield in RB 5 to match the system encoding which is not UTF8.
(Read and Write property)

7.1.22 PartialName as boolean

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** whether or not the name property contains only a partial file name.
Example:

```
dim c as CatSearchMBS
c.Name="Apple"
c.partialname=true
```

Notes:

If you pass true to the partialname property, you'll get a match any time the item's name contains the searched name. Otherwise, the intire name must match.
(Read and Write property)

7.1.23 PhysicalDataForkSizeEnd as UInt64

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The maximum physical data fork file size.
Example:

```
dim c as CatSearchMBS
c.PhysicalDataForkSizeStart=0
c.PhysicalDataForkSizeEnd=102400 // search for files <= 100 KB.
```

Notes:

You can assign -1 to have no upper limit.
(Read and Write property)

7.1.24 PhysicalDataForkSizeStart as UInt64

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The minimum physical data fork file size.
Example:

```
dim c as CatSearchMBS
c.PhysicalDataForkSizeStart=0
c.PhysicalDataForkSizeEnd=102400 // search for files <= 100 KB.
```

Notes: (Read and Write property)

7.1.25 PhysicalResForkSizeEnd as UInt64

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The maximum physical resource fork file size.
Example:

```
dim c as CatSearchMBS
c.PhysicalResForkSizeStart=0
c.PhysicalResForkSizeEnd=102400 // search for files <= 100 KB.
```

Notes:

You can assign -1 to have no upper limit.
(Read and Write property)

7.1.26 PhysicalResForkSizeStart as UInt64

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The minimum physical resource fork file size.
Example:

```
dim c as CatSearchMBS
c.PhysicalResForkSizeStart=0
c.PhysicalResForkSizeEnd=102400 // search for files <= 100 KB.
```

Notes: (Read and Write property)

7.1.27 ResponseTimeout as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Sets the timeout for the search.
Example:

```
dim c as CatSearchMBS
c.ResponseTimeout=1000 // one second
```

Notes:

Sets the maximum time that may pass before SearchNext shall return even if no item has been found yet. The default is 15ms.

If you set the timeout to 0, then SearchNext will only return if an item has been found or if the search is finished.

Background:

Searching for a file or folder, especially if the volume does not support CatSearchMBS, can take a lot of time. While the search is in progress, you might want the user to give still access to your app's user interface. If SearchNext would only return once an item is found, the user interface might not be responsive for several seconds, up to minutes. RB's threads would not help here. To solve this, SearchNext returns in timely intervals even when it has nothing found yet. At that time, RB can respond to any user interaction, if necessary. This happens then automatically. All you have to do is to call SearchNext again.
(Read and Write property)

7.1.28 Result as folderitem

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the current file and returns nil if none was found.
Notes:

After CatSearchNext has returned zero, this functions returns the found item else nil.
(Read and Write property)

7.1.29 UsedCatSearchForLastSearch as Boolean

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** whether the last search used the fast catalog search or the slow directory search.
Notes: (Read and Write property)

7.1.30 UseIndexedSearch as Boolean

Plugin Version: 3.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: No. **Function:** Forces the class to use indexed search.
Notes: (Read and Write property)

Chapter 8

Clipboard

8.1 class ClipboardMBS

8.1.1 class ClipboardMBS

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** A clipboard class for Mac OS.
Notes:

For all datatypes, the available function is faster than the size function. And the both functions are faster than the getter function.

This is older Carbon API. You may want to prefer NSPasteboardMBS class with new projects.
Only available in Mac 32 bit applications. Will not be ported to 64 bit.

8.1.2 Methods

8.1.3 AddData(FlavorType as string,data as string)

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Adds data to the scrap.

8.1.4 AddText(Text as string)

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Adds text to the scrap.

8.1.5 AddUnicodeText(Text as string)

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Adds unicode text to the clipboard.
Notes: UTF16 encoded strings only.

8.1.6 clear

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Clears the clipboard.
Notes: You must clear before you add something.

8.1.7 close

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The destructor.
Notes:

There is no need to call this method except you want to free all resources of this object now without waiting for Realbasic to do it for you.
(e.g. some Realbasic versions crash on Windows if there are plugin objects not closed.)

8.1.8 DataAvailable(FlavorType as string) as boolean

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Whether data is available.

8.1.9 DataSize(FlavorType as string) as Integer

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the byte size of the selected data.

8.1.10 GetData(FlavorType as string) as string

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the data of a given type.
Example:

```
// Take PICT data from clipboard
```

```
dim c as ClipboardMBS
dim s as string

c=new ClipboardMBS

if c.DataAvailable("PICT") then

s=c.GetData("PICT")

if s<>"" then
Backdrop=BuildPictureWithPicHandleDataMBS(s)
end if
end if
```

8.1.11 GetText as string

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns text from the clipboard.

8.1.12 GetUnicodeText as string

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the unicode text from the scrap.
Notes: UTF16 encoded strings only.

8.1.13 PictAvailable as boolean

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Whether a pict handle picture is on the clipboard.

8.1.14 ScrapFlavorCount as Integer

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The number of flavor in the clipboard.
Example:

```
dim clip as ClipboardMBS
dim i,c,c1,c2 as Integer
dim s as string
```

```
clip=new ClipboardMBS

c=clip.ScrapFlavorCount

s=str(c)+" types: "

c1=c-1
c2=c-2

for i=0 to c2
s=S+clip.ScrapFlavorType(i)+", "
next

if c>0 then
s=S+clip.ScrapFlavorType(c1)
end if

MsgBox s
```

Notes: Calling this function recreates the internal flavor list in the Realbasic clipboard object.

8.1.15 ScrapFlavorFlags(index as Integer) as Integer

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the flags of the given flavor.
Notes:

Index goes from 0 to count-1.
Returns 0 on any error.

Flags are a combination of type values:
1 - private data (Sender only)
2 - translated data

8.1.16 ScrapFlavorType(index as Integer) as string

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the type of the given flavor.
Notes:

Index goes from 0 to count-1.

Returns "" on any error.

8.1.17 TextAvailable as boolean

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Whether text is available.

8.1.18 TextSize as Integer

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The length of the text available on the clipboard.

8.1.19 UnicodeTextAvailable as boolean

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Whether unicode text is available.
Notes: UTF16 encoded strings only.

8.1.20 UnicodeTextSize as Integer

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The length of the unicode text.
Notes: UTF16 encoded strings only.

8.1.21 Properties

8.1.22 Handle as Integer

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The handle to the clipboard.
Notes:

Carbon only.
(Read only property)

Chapter 9

ColorSync

9.1 Globals

9.1.1 ColorsyncAvailableMBS as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns true if ColorSync is installed on this computer.

9.1.2 CountColorSyncCMMInfoMBS as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns how many CMMs were found.
Notes:

Will return 0 if you don't call LoadColorsyncProfiles before.
Requires ColorSync 2.6 or newer.

9.1.3 CountColorSyncProfileInfoMBS as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns how many Profiles were found in the folder "Colorsync profiles".
Notes: Will return 0 if you don't call LoadColorsyncProfiles before.

9.1.4 CreateColorSyncBitmapMBS(p as picture,dontcopy as boolean) as ColorSyncBitmapMBS

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Creates a bitmap matching the picture.
Notes:

If the parameter dontcopy is true the ColorSyncBitmapMBS refers to the original data from the picture and any change of them is seen in the picture. Inside the ColorSyncBitmapMBS object a reference to this picture is kept, so it is not destroyed by Realbasic if you don't need it anymore. The memoryblock of the data property is pointing to the original data of the picture.

If dontcopy is false then the pixels are copied into a new memoryblock which is later stored in the data property of the bitmap object.

This function was designed to test the MatchBitmap functions.
The PixelSize property of the bitmap is set to 32 as a good guess.
Does not support Cocoa. In Cocoa, please use CGBitmapContext and CGColorSpace classes for ColorSync.

9.1.5 GetColorSyncCMMInfoMBS(index as Integer) as ColorSyncCMMInfoMBS

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns details about the CMM with the specified index.
Notes:

Index is 0 based.
Will return nil if you don't call LoadColorsyncProfiles before.
Requires ColorSync 2.6 or newer.

9.1.6 GetColorSyncProfileInfoMBS(index as Integer) as ColorSyncProfileInfoMBS

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns details about the profiles in the folder "Colorsync profiles".
Notes:

Index is 0 based.
Will return nil if you don't call LoadColorsyncProfiles before.

9.1.7 GetDisplayColorSyncProfileMBS(index as UInt32) as ColorSyncProfileMBS

Plugin Version: 8.6, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the system colorsync profile.
Example:

```
dim p as colorSyncProfileMBS

p=GetDisplayColorSyncProfileMBS(0)

msgBox p.Name
```

Notes:

Index is zero based.
Returns nil on any error.
Deprecated by Apple in OS X 10.6. Please move to use NSScreenMBS and NSColorSpaceMBS.

9.1.8 GetSystemColorSyncProfileMBS as ColorSyncProfileMBS

Plugin Version: 8.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the system colorsync profile.
Example:

```
dim p as colorSyncProfileMBS

p=getsystemColorSyncProfileMBS

msgBox p.Name
```

Notes:

Returns nil on any error.
Deprecated by Apple in OS X 10.6. Please move to use NSScreenMBS and NSColorSpaceMBS.

9.1.9 LaunchColorsyncControlPanelMBS

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Launches the control panel for ColorSync.

9.1.10 LoadColorsyncProfilesMBS

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Call this to load the information about the colorsync profiles.
Notes:

You can call this function at any time to update.
If you have ColorSync 2.6 or newer the list of CMMs is also loaded.

9.1.11 OpenColorSyncProfileMBS(data as string) as ColorSyncProfileMBS

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Opens a color sync profile which is in memory inside a string.
Example:

```
// create some profile
dim p as LCMS2ProfileMBS = LCMS2ProfileMBS.CreateSRGBProfile

// save to string in memory
dim s as string = p.SaveProfileToString

// and open with colorsync
dim c as ColorSyncProfileMBS = OpenColorSyncProfileMBS(s)

// show name
MsgBox c.Name
```

9.2 class ColorSyncBitmapMBS

9.2.1 class ColorSyncBitmapMBS

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A class for the bitmaps for ColorSync.
Notes:

If you can use a Realbasic picture, but if you can't (e.g. if you use CMYK data) you can use this class and set all properties as you like. They are not checked by the plugin so listen to the error codes of MatchBitmap. See the ColorSpaceType for the Color space constants.

9.2.2 Properties

9.2.3 ColorSpaceType as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The color space in which the colors of the bitmap image are specified.
Notes:

The constants for the ColorSpace:

cmNoSpace	& h0000
cmRGBSpace	& h0001
cmCMYKSpace	& h0002
cmHSVSpace	& h0003
cmHLSSpace	& h0004
cmYXYSpace	& h0005
cmXYZSpace	& h0006
cmLUVSpace	& h0007
cmLABSpace	& h0008
cmReservedSpace1	& h0009
cmGraySpace	& h000A
cmReservedSpace2	& h000B
cmGamutResultSpace	& h000C
cmNamedIndexedSpace	& h0010
cmMCFiveSpace	& h0011
cmMCSixSpace	& h0012
cmMCSevenSpace	& h0013
cmMCEightSpace	& h0014
cmAlphaPmulSpace	& h0040
cmAlphaSpace	& h0080
cmRGBASpace	cmRGBSpace + cmAlphaSpace
cmGrayASpace	cmGraySpace + cmAlphaSpace
cmRGBAPmulSpace	cmRGBASpace + cmAlphaPmulSpace
cmGrayAPmulSpace	cmGrayASpace + cmAlphaPmulSpace

Discussion

This enumeration defines constants for color spaces which can specify color values for a bitmap image. As a rule, these constants include a packing format, defined in "Color Packing for Color Spaces". You can use these constants to set the space field of the CMBitmapMBS type definition identifies the color space in which the colors of the bitmap image are specified, as described in "Abstract Color Space Constants".

Color Packing for Color Spaces:

(Read and Write property)

9.2.4 Data as memoryblock

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A memoryblock with the bitmap's binary data.
Notes: (Read and Write property)

9.2.5 height as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The height of the bit image, that is, the number of rows in the image.
Notes: (Read and Write property)

9.2.6 PixelSize as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The number of bits per pixel.
Notes:

The pixel size should correspond to the packing size specified in the space field. This requirement is not enforced as of ColorSync version 2.5, but it may be enforced in future versions.
(Read and Write property)

9.2.7 PixmapHandle as Integer

Plugin Version: 10.5, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The internal handle of the picture bitmap.
Notes:

Only when the bitmap is linked to a REALbasic picture.
(Read only property)

9.2.8 RowBytes as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The bytes of one row of pixels of the bitmap.
Notes:

If you have a 32bit RGB bitmap with 200 pixels width you get 200*32/8 or 800 bytes per row.
(Read and Write property)

9.2.9 width as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The width of the bit image, that is, the number of pixels in a row.
Notes: (Read and Write property)

cmGray8Space	10250	
cmGray16Space	10	A luminance color space with a single 16-bit component, gray.
cmGray16LSpace	16394	
cmGrayA16Space	8330	
cmGrayA32Space	138	A luminance color space with two components, a gray component followed by an alpha channel component. Each component value is 16 bits.
cmGrayA32LSpace	16522	
cmGrayA16PmulSpace	8394	
cmGrayA32PmulSpace	202	
cmGrayA32LPmulSpace	16586	
cmRGB16Space	1281	An RGB color space composed of red, green, and blue components whose values are packed with 5 bits of storage per component. The storage size for a color value expressed in this color space is 16 bits, with the high-order bit not used.
cmRGB16LSpace	17665	
cmRGB565Space	1537	
cmRGB565LSpace	17921	
cmRGB24Space	8449	An RGB color space composed of red, green, and blue components whose values are packed with 8 bits of storage per component. The storage size for a color value expressed in this color space is 24 bits.
cmRGB32Space	2049	An RGB color space composed of red, green, and blue components whose values are packed with 8 bits of storage per component. The storage size for a color value expressed in this color space is 32 bits, with bits 24-31 not used.
cmRGB48Space	10497	An RGB color space composed of red, green, and blue components whose values are packed with 16 bits of storage per component. The storage size for a color value expressed in this color space is 48 bits.
cmRGB48LSpace	26881	
cmARGB32Space	6273	An RGB color space composed of red, green, and blue color value components preceded by an alpha channel component whose values are packed with 8 bits of storage per component. The storage size for a color value expressed in this color space is 32 bits.
cmARGB64Space	14977	
cmARGB64LSpace	31361	
cmRGBA32Space	2177	An RGB color space composed of red, green, and blue color value components, followed by an alpha channel component. Values are packed with 8 bits of storage per component. The storage size for a color value expressed in this color space is 32 bits.
cmRGBA64Space	10881	
cmRGBA64LSpace	27265	
cmARGB32PmulSpace	6337	
cmARGB64PmulSpace	15041	
cmARGB64LPmulSpace	31425	
cmRGBA32PmulSpace	2241	
cmRGBA64PmulSpace	10945	
cmRGBA64LPmulSpace	27329	
cmCMYK32Space	2050	A CMYK color space composed of cyan, magenta, yellow, and black components whose values are packed with 8 bits of storage per component. The storage size for a color value expressed in this color space is 32 bits.
cmCMYK64Space	10754	A CMYK color space composed of cyan, magenta, yellow, and black components whose values are packed with 16 bits of storage per component. The storage size for a color value expressed in this color space is 64 bits.
cmCMYK64LSpace	27138	
cmHSV32Space	2563	An HSV color space composed of hue, saturation, and value components whose values are packed with 10 bits of storage per component. The storage size for a color value expressed in this color space is 32 bits, with the high-order 2 bits not used.
cmHLS32Space	2564	An HLS color space composed of hue, lightness, and saturation components whose values are packed with 10 bits of storage per component. The storage size for a color value expressed in this color space is 32 bits, with the high-order 2 bits not used.
cmYXY32Space	2565	A Yxy color space composed of Y, x, and y components whose values are packed with 10 bits of storage per component. The storage size for a color value expressed in this color space is 32 bits, with the high-order 2 bits not used.
cmXYZ24Space	8454	
cmXYZ32Space	2566	An XYZ color space composed of X, Y, and Z components whose values are packed with 10 bits per component. The storage size for a color value expressed

cmNoColorPacking	&h0000	This constant is not used for ColorSync bitmaps.
cmAlphaSpace	&h0080	An alpha channel component is added to the color value.
cmWord5ColorPacking	&h0500	The color values for three 5-bit color channels are stored consecutively in a 16-bit word, with the highest order bit unused.
cmLong8ColorPacking	&h0800	The color values for three or four 8-bit color channels are stored consecutively in a 32-bit long. For three channels, this constant is combined with either cmAlphaFirstPacking or cmAlphaLastPacking to indicate whether the unused eight bits are located at the beginning or end.
cmLong10ColorPacking	&h0a00	The color values for three 10-bit color channels are stored consecutively in a 32-bit long, with the two highest order bits unused.
cmAlphaFirstPacking	&h1000	An alpha channel is added to the color value as its first component.
cmOneBitDirectPacking	&h0600	One bit is used as the pixel format. This storage format is used by the resulting bitmap pointed to by the resultBitMap field of the CWCheckBitMap function (page 3-123); the bitmap must be only 1 bit deep.
cmAlphaLastPacking	&h0000	
cm24_8ColorPacking	&h2100	The color values for three 8-bit color channels are stored in consecutive bytes, for a total of 24 bits.
cm32_8ColorPacking	&h0800	The color values for four 8-bit color channels are stored in consecutive bytes, for a total of 32 bits.
cm40_8ColorPacking	&h2200	The color values for five 8-bit color channels are stored in consecutive bytes, for a total of 40 bits.
cm48_8ColorPacking	&h2300	The color values for six 8-bit color channels are stored in consecutive bytes, for a total of 48 bits.
cm56_8ColorPacking	&h2400	The color values for seven 8-bit color channels are stored in consecutive bytes, for a total of 56 bits.
cm64_8ColorPacking	&h2500	The color values for eight 8-bit color channels are stored in consecutive bytes, for a total of 64 bits.
cm32_16ColorPacking	&h2600	The color values for two 16-bit color channels are stored in a 32-bit word.
cm32_32ColorPacking	&h2700	The color value for a 32-bit color channel is stored in a 32-bit word.

9.3 class ColorSyncCMMInfoMBS

9.3.1 class ColorSyncCMMInfoMBS

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A class for informations about a CMM known to the operation system.
Notes: Requires ColorSync 2.6 or newer.

9.3.2 Properties

9.3.3 Description as String

Plugin Version: 3.3, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The description string for this CMM as a string.
Notes:

If DescriptionUnicode is not "", it's returned, else DescriptionASCII.
Requires ColorSync 2.6 or newer.
(Read only property)

9.3.4 DescriptionASCII as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The description string for this CMM as ASCII string.
Notes:

Requires ColorSync 2.6 or newer.
(Read only property)

9.3.5 DescriptionUnicode as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The description string for this CMM as an Unicode string.
Notes:

Only useful on REALbasic 4.5 or later.
Requires ColorSync 2.6 or newer.
(Read only property)

9.3.6 Name as String

Plugin Version: 3.3, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name string for this CMM as a string.
Notes:

If NameUnicode is not "", it's returned, else NameASCII.
Requires ColorSync 2.6 or newer.
(Read only property)

9.3.7 NameASCII as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name string for this CMM as ASCII string.
Notes:

Requires ColorSync 2.6 or newer.
(Read only property)

9.3.8 NameUnicode as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name string for this CMM as Unicode string.
Notes:

Only useful on REALbasic 4.5 or later.
Requires ColorSync 2.6 or newer.
(Read only property)

9.3.9 Type as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The Type Code for this CMM.
Notes:

Requires ColorSync 2.6 or newer.
(Read only property)

9.3.10 Vendor as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The Vendor Code for this CMM.
Notes:

Requires ColorSync 2.6 or newer.
(Read only property)

9.3.11 Version as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The Version Code for this CMM.
Notes:

Requires ColorSync 2.6 or newer.
(Read only property)

9.4 class ColorSyncProfileInfoMBS

9.4.1 class ColorSyncProfileInfoMBS

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A class for informations about a profile file known to the operation system.
Deprecated: This item is deprecated and should no longer be used.

9.4.2 Methods

9.4.3 OpenProfile as ColorSyncProfileMBS

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Opens this profile.

9.4.4 Properties

9.4.5 className as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The class of the profile's device.
Notes:

Possible values:

"scnr"	An input device profile defined for a scanner.
"mntr"	A display device profile defined for a monitor.
"prtr"	An output device profile defined for a printer.
"link"	A device link profile.
"abst"	An abstract profile.
"spac"	A color space profile.
"nmcl"	A named color space profile.

Renamed in Plugin version 3.3 to "classname" instead of "class".
(Read only property)

9.4.6 DataColorSpace as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The color space signature of the profile's device.
Notes:

Possible values:

"XYZ "	The XYZ data color space.
"Lab "	The L*a*b* data color space.
"Luv "	The L*u*v* data color space.
"Yxy "	The Yxy data color space.
"RGB "	The RGB data color space.
"sRGB"	The RGB data color space.
"GRAY"	The Gray data color space.
"HSV "	The HSV data color space.
"HLS "	The HLS data color space.
"CMYK"	The CMYK data color space.
"CMY "	The CMY data color space.
"MCH5"	The five-channel multichannel (HiFi) data color space.
"MCH6"	The six-channel multichannel (HiFi) data color space.
"MCH7"	The seven-channel multichannel (HiFi) data color space.
"MCH8"	The eight-channel multichannel (HiFi) data color space.

Other values whitout a defition from Apple:

"3CLR", "4CLR", "5CLR", "6CLR", "7CLR", "8CLR", "NAME", "9CLR", "ACLR", "BCLR", "CCLR", "DCLR", "ECLR", "FCLR".
(Read only property)

9.4.7 Location as ColorSyncProfileLocationMBS

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The location of the profile as a ColorSyncProfileLocationMBS object.
Notes: (Read only property)

9.4.8 ManufacturerDate as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A code for the date where the manufacturer made this profile.
Notes: (Read only property)

9.4.9 ManufacturerID as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The ID of the manufacturer.
Notes: (Read only property)

9.4.10 ManufacturerModel as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The model code of the manufacturer.
Notes: (Read only property)

9.4.11 ManufacturerSerialNumber as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The serial number from the manufacturer for this device.
Notes: (Read only property)

9.4.12 name as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name of the profile.
Notes: (Read only property)

9.4.13 Platform as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The signature of the platform for this profile.
Notes:

"APPL"	Apple.
"MSFT"	Microsoft
"SUNW"	Sun.
"SGI "	Silicon graphics.
"TGNT"	Taligent

(Read only property)

9.4.14 PreferredCMM as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The code for the preferred ColorMatchingModul of this profile.
Notes:

Most times you'll get "appl" for Apple.
(Read only property)

9.4.15 ScriptCode as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The scriptcode for the name of the string.
Notes: (Read only property)

9.4.16 Version as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The version of the profile format.
Notes:

The first 8 bits indicate the major version number, followed by 8 bits indicating the minor version number. The following 2 bytes are reserved.

The profile version number is not tied to the version of the ColorSync Manager. Profile formats and their versions are defined by the ICC. For example, a major version change may indicate the addition of new required tags to the profile format; a minor version change may indicate the addition of new optional tags.
(Read only property)

9.5 class ColorSyncProfileLocationMBS

9.5.1 class ColorSyncProfileLocationMBS

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A class for the location of a profile.

9.5.2 Properties

9.5.3 Data as MemoryBlock

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The memoryblock for this location if it is memory-based.
Notes:

This memory is generated as a wrapper to the original data in memory. So if you have created the profile using a memoryblock this is not your original block, but a copy of it pointing to the same data in memory.
(Read and Write property)

9.5.4 FilePath as String

Plugin Version: 10.4, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The file path for the location.
Notes:

Only valid with type=5.
(Read and Write property)

9.5.5 isFile as Boolean

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Is the profile read from a file?
Notes: (Read and Write property)

9.5.6 isMemory as Boolean

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Is the profile read from a memory block?
Notes: (Read and Write property)

9.5.7 Path as folderitem

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The folderitem for this location if it is disk-based.
Notes: (Read and Write property)

9.5.8 Type as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The type of location where the profile is from.
Notes:

Possible values:

0	profile is temporary
1	profile is disk-based
2	profile in relocatable memory
3	profile in nonrelocatable memory
4	profile is accessed by procedure
5	profile is path-based
6	profile is buffer-based

(Read and Write property)

9.6 class ColorSyncProfileMBS

9.6.1 class ColorSyncProfileMBS

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A class for an opened profile.
Deprecated: This item is deprecated and should no longer be used. **Notes:** For newer apps, better use CSProfileMBS or LCMS2ProfileMBS classes instead.

9.6.2 Methods

9.6.3 Copy(target as folderitem) as ColorSyncProfileMBS

Plugin Version: 3.3, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Creates a copy of the profile at the given file specification.
Notes:

Target uses FSSpec so it's limited to 31 characters for the filename, but you can of course rename the file after creating it.

Requires ColorSync 2.0 or newer.

9.6.4 CountElements as UInt32

Plugin Version: 10.5, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Counts the elements in the profile.
Example:

```
dim fi as FolderItem = GetFolderItem("/system/Library/ColorSync/Profiles/Generic RGB Profile.icc", folderitem.PathTypeShell)
dim ip as ColorSyncProfileMBS = fi.OpenAsColorSyncProfileMBS

MsgBox str(ip.CountElements) // shows 11
```

Notes: Lasterror is set.

9.6.5 Description as string

Plugin Version: 10.5, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The localized description of the profile.

Example:

```
dim fi as FolderItem = GetFolderItem("/system/Library/ColorSync/Profiles/Generic RGB Profile.icc", folderitem.PathTypeShell)
dim ip as ColorSyncProfileMBS = fi.OpenAsColorSyncProfileMBS

MsgBox ip.Description
```

Notes: Lasterror is set.

9.6.6 ICCData as string

Plugin Version: 10.5, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the ICC Data of the profile.
Example:

```
dim fi as FolderItem = GetFolderItem("/system/Library/ColorSync/Profiles/Generic RGB Profile.icc", folderitem.PathTypeShell)
dim ip as ColorSyncProfileMBS = fi.OpenAsColorSyncProfileMBS

MsgBox str(lenb(ip.ICCData)) // shows len in bytes
```

Notes:

You can use this data and write it into an *.ICC file or embed it in a picture file.
Requires Mac OS X 10.4.

9.6.7 MD5 as string

Plugin Version: 10.5, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The MD5 checksum of this profile.
Example:

```
dim fi as FolderItem = GetFolderItem("/system/Library/ColorSync/Profiles/Generic RGB Profile.icc", folderitem.PathTypeShell)
dim ip as ColorSyncProfileMBS = fi.OpenAsColorSyncProfileMBS

MsgBox EncodingToHexMBS(ip.MD5)
```

Notes:

Returns a binary string. To get the hex number for displaying, use EncodingToHexMBS.
Lasterror is set.

9.6.8 Modified as boolean

Plugin Version: 10.5, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Whether the profile has been modified.
Example:

```
dim fi as FolderItem = GetFolderItem("/system/Library/ColorSync/Profiles/Generic RGB Profile.icc", folderitem.PathTypeShell)
dim ip as ColorSyncProfileMBS = fi.OpenAsColorSyncProfileMBS

MsgBox str(ip.Modified) // shows false
```

Notes: Lasterror is set.

9.6.9 Name as String

Plugin Version: 3.3, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the name of the profile.
Notes:

Returns the first name property which is not "" in this order:
1. unicode encoded name
2. MacRoman encoded name
3. ASCII encoded name

9.6.10 ProfileElementMemory(tag as string) as Memoryblock

Plugin Version: 3.4, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the profile element with the given tag.
Notes:

Tag must be a 4 letter string.
Returns nil on any error.

e.g. cmMediaBlackPointTag = "bkpt" and cmMediaWhitePointTag = "wtpt".

9.6.11 ProfileElementString(tag as string) as string

Plugin Version: 3.4, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the profile element with the given tag.
Notes:

Tag must be a 4 letter string.
Returns "" on any error.

9.6.12 RefCount as Integer

Plugin Version: 10.5, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The reference count for this profile.
Example:

```
dim fi as FolderItem = GetFolderItem("/system/Library/ColorSync/Profiles/Generic RGB Profile.icc", folderitem.PathTypeShell)
dim ip as ColorSyncProfileMBS = fi.OpenAsColorSyncProfileMBS

MsgBox str(ip.RefCount) // shows 1
```

Notes:

While the ColorSyncProfileMBS object has a reference count, the ProfileRef handle has a reference count, too.
So if RefCount is 1, your ColorSyncProfileMBS object is the only owner and can modify the profile without disturbing other application parts.
Lasterror is set.

9.6.13 Save as boolean

Plugin Version: 3.3, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Saves the profile back to disc.
Notes: Requires ColorSync 2.6 or newer.

9.6.14 Validate as boolean

Plugin Version: 3.3, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Validates whether the profile works with the installed CMMs.
Notes: Requires ColorSync 2.6 or newer.

9.6.15 Properties

9.6.16 Handle as Integer

Plugin Version: 3.4, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The handle of the profile.
Notes:

May be useful for declares.
(Read only property)

9.6.17 Lasterror as Integer

Plugin Version: 10.5, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The last error code.
Notes:

Zero is for no error. -1 is a plugin error, normally with wrong parameters, no handle or not supported.
(Read only property)

9.6.18 Location as ColorSyncProfileLocationMBS

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The location of the profile as a ColorSyncProfileLocationMBS object.
Notes: (Read only property)

9.6.19 NameASCII as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name of the profile as an ASCII string (7bit).
Notes:

Requires ColorSync 2.6 or newer.
(Read only property)

9.6.20 NameMac as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name of the profile as a Mac string.
Notes:

Requires ColorSync 2.6 or newer.
(Read only property)

9.6.21 NameUnicode as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name of the profile as a Unicode string.
Notes:

Only useful on REALbasic 4.5 or later.
Requires ColorSync 2.6 or newer.
(Read only property)

9.7 class ColorSyncProfileSetItemMBS

9.7.1 class ColorSyncProfileSetItemMBS

Plugin Version: 10.5, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** This class is used for the ColorSyncWorldMBS constructor to create a color transformation with specifing rendering intents and the CMM engine.

9.7.2 Properties

9.7.3 profile as ColorSyncProfileMBS

Plugin Version: 10.5, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The profile you want to use.
Notes: (Read and Write property)

9.7.4 renderingIntent as Integer

Plugin Version: 10.5, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The rendering intent.
Notes: (Read and Write property)

9.7.5 transformTag as Integer

Plugin Version: 10.5, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The transform tag.
Notes: (Read and Write property)

9.7.6 Constants

9.7.7 cmAbsoluteColorimetric = 3

Plugin Version: 10.5. **Function:** One of the rendering intent constants.
Notes: Absolute Colorimetric

9.7.8 cmPerceptual = 0

Plugin Version: 10.5. **Function:** One of the rendering intent constants.
Notes: Perceptual

9.7.9 cmRelativeColorimetric = 1

Plugin Version: 10.5. **Function:** One of the rendering intent constants.
Notes: Relative Colormetric

9.7.10 cmSaturation = 2

Plugin Version: 10.5. **Function:** One of the rendering intent constants.
Notes: Saturation

9.7.11 kDeviceToPCS = 1

Plugin Version: 10.5. **Function:** One of the transform constants.

9.7.12 kNoTransform = 0

Plugin Version: 10.5. **Function:** One of the transform constants.

9.7.13 kPCSToDevice = 2

Plugin Version: 10.5. **Function:** One of the transform constants.

9.7.14 kPCSToPCS = 3

Plugin Version: 10.5. **Function:** One of the transform constants.

9.7.15 kUseAtoB = 1

Plugin Version: 10.5. **Function:** One of the transform constants.

9.7.16 kUseBtoA = 2

Plugin Version: 10.5. **Function:** One of the transform constants.

9.7.17 kUseBtoB = 3

Plugin Version: 10.5. **Function:** One of the transform constants.

9.7.18 kUseProfileIntent = -1

Plugin Version: 10.5. **Function:** One of the rendering intent constants.

9.8 class ColorSyncWorldMBS

9.8.1 class ColorSyncWorldMBS

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A class for a Colorsync world. **Deprecated:** This item is deprecated and should no longer be used. **Notes:**

A ColorSyncWorldMBS is an object which holds two profiles to match pictures between.

Possible error codes from Colorsync:

noErr	0	No error
cmProfileError	-170	There is something wrong with the content of the profile
cmMethodError	-171	An error occurred during the CMM arbitration process that determines the CMM to use
cmMethodNotFound	-175	CMM not present
cmProfileNotFound	-176	Responder error
cmProfilesIdentical	-177	Profiles are the same
cmCantConcatenateError	-178	Profiles can't be concatenated
cmCantXYZ	-179	CMM does not handle XYZ color space
cmCantDeleteProfile	-180	Responder error
cmUnsupportedDataType	-181	Responder error
cmNoCurrentProfile	-182	Responder error
cmElementTagNotFound	-4200	The tag you specified is not in the specified profile
cmIndexRangeErr	-4201	Tag index out of range
cmFatalProfileErr	-4203	Returned from File Manager while updating a profile file in response to CMUpdateProfile; profile content may be corrupted.
cmInvalidProfileLocation	-4205	Operation not supported for this profile location
cmInvalidSearch	-4206	Bad search handle
cmSearchError	-4207	Internal error occurred during profile search
cmInvalidColorSpace	-4209	Profile color space does not match bitmap type
cmInvalidSrcMap	-4210	Source pixel map or bitmap was invalid
cmInvalidDstMap	-4211	Destination pix/bit map was invalid
cmNoGDevicesError	-4212	Begin matching or end matching–no graphics devices available
cmInvalidProfileComment	-4213	Bad profile comment during drawpicture
cmRangeoverFlow	-4214	One or more output color value overflows in color conversion; all input color values will be converted and the overflow will be clipped
cmCantCopyModifiedV1Profile	-4215	It is illegal to copy version 1.0 profiles that have been modified
cmNamedColorNotFound	-4216	The specified named color was not found in the specified profile
cmCantGamutCheckError	-4217	Gamut checking not supported by this color world–that is, the color world does not contain a gamut table because it was built with gamut checking turned off

9.8.2 Methods

9.8.3 Constructor(CMM as Integer, flags as Integer, flagsMask as Integer, profiles() as ColorSyncProfileSetItemMBS)

Plugin Version: 10.5, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Creates a new ColorSync World from the given profile list.
Example:

```
dim fi as FolderItem = GetFolderItem("/system/Library/ColorSync/Profiles/Generic RGB Profile.icc", folderitem.PathTypeShell)
dim fo as FolderItem = GetFolderItem("/system/Library/ColorSync/Profiles/Generic CMYK Profile.icc", folderitem.PathTypeShell)

dim ip as ColorSyncProfileMBS = fi.OpenAsColorSyncProfileMBS
dim op as ColorSyncProfileMBS = fo.OpenAsColorSyncProfileMBS

dim si as new ColorSyncProfileSetItemMBS
si.profile = ip
si.renderingIntent = si.cmPerceptual
si.transformTag = si.kDeviceToPCS

dim so as new ColorSyncProfileSetItemMBS
so.profile = op
so.renderingIntent = si.cmPerceptual
so.transformTag = si.kPCSToDevice

dim a(-1) as ColorSyncProfileSetItemMBS
a.Append si
a.Append so

dim cw as new ColorSyncWorldMBS(ColorSyncWorldMBS.kDefaultCMMSignature, 0, 0, a)

if cw.Handle = 0 then
MsgBox "Failed to setup color world."
else
MsgBox "Success."
end if
```

Notes: Lasterror is set.
See also:

- 9.8.4 Constructor(profiles() as ColorSyncProfileMBS) 154
- 9.8.5 Constructor(source as ColorSyncProfileMBS, destination as ColorSyncProfileMBS) 154

9.8.4 Constructor(profiles() as ColorSyncProfileMBS)

Plugin Version: 10.5, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Creates a new ColorSync World from an array of profiles.
Notes:

Requires Colorsync 3.0 or newer.
Lasterror is set.
See also:

- 9.8.3 Constructor(CMM as Integer, flags as Integer, flagsMask as Integer, profiles() as ColorSyncProfileSetItemMBS) 153
- 9.8.5 Constructor(source as ColorSyncProfileMBS, destination as ColorSyncProfileMBS) 154

9.8.5 Constructor(source as ColorSyncProfileMBS, destination as ColorSyncProfileMBS)

Plugin Version: 10.5, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Creates a new ColorSync World from two profiles.
Notes: Lasterror is set.
See also:

- 9.8.3 Constructor(CMM as Integer, flags as Integer, flagsMask as Integer, profiles() as ColorSyncProfileSetItemMBS) 153
- 9.8.4 Constructor(profiles() as ColorSyncProfileMBS) 154

9.8.6 GetCMMSignature as UInt32

Plugin Version: 10.5, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Queries the CMM signature for this colorsync setup.
Example:

```
dim fi as FolderItem = GetFolderItem("/system/Library/ColorSync/Profiles/Generic RGB Profile.icc", folderitem.PathTypeShell)
dim fo as FolderItem = GetFolderItem("/system/Library/ColorSync/Profiles/Generic CMYK Profile.icc", folderitem.PathTypeShell)

dim ip as ColorSyncProfileMBS = fi.OpenAsColorSyncProfileMBS
dim op as ColorSyncProfileMBS = fo.OpenAsColorSyncProfileMBS

dim cw as new ColorSyncWorldMBS(ip,op)

MsgBox StringFromOSTypeMBS(cw.GetCMMSignature) // shows appl for Apple's ColorSync
```

9.8.7 MatchBitmap(source as ColorSyncBitmapMBS, dest as ColorSyncBitmapMBS)

Plugin Version: 10.5, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Convert this bitmap between profiles.
Notes:

See the Class notes for possible error codes returned.
If source and destination are the same, only pass one of them.
Lasterror is set.
See also:

- 9.8.8 MatchBitmap(sourcedest as ColorSyncBitmapMBS) 155

9.8.8 MatchBitmap(sourcedest as ColorSyncBitmapMBS)

Plugin Version: 10.5, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Convert this bitmap between profiles.
Notes:

Short version of MatchBitmap where source and destination are only one bitmap.
Lasterror is set.
See also:

- 9.8.7 MatchBitmap(source as ColorSyncBitmapMBS, dest as ColorSyncBitmapMBS) 155

9.8.9 MatchPicture(p as picture)

Plugin Version: 10.5, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Convert this picture between profiles.
Notes:

Not supported for Cocoa target.
See the Class notes for possible error codes returned.
Lasterror is set.

9.8.10 Properties

9.8.11 Handle as Integer

Plugin Version: 3.4, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The handle of the colorsync world.
Notes:

May be useful for declares.
(Read only property)

9.8.12 Lasterror as Integer

Plugin Version: 10.5, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The last error code.
Notes: (Read only property)

9.8.13 Constants

9.8.14 cmBestMode = & h00020000

Plugin Version: 10.5. **Function:** One of the constants for the quality options.
Notes: Best Mode.

9.8.15 cmBlackPointCompensation = 4

Plugin Version: 10.5. **Function:** One of the constants for the flags.
Notes: 0 do not apply Black Point Compensation, 4 apply.

9.8.16 cmBlackPointCompensationMask = 4

Plugin Version: 10.5. **Function:** One of the constants for the flags.
Notes: If bit 2 is 1 then CMM will enable Black Point Compensation if applicable.

9.8.17 cmCMSReservedFlagsMask = & hFFFF0000

Plugin Version: 10.5. **Function:** One of the constants for the flags.
Notes: These bits of the flags field are defined and reserved by CMS vendor.

9.8.18 cmDraftMode = & h00010000

Plugin Version: 10.5. **Function:** One of the constants for the quality options.
Notes: Draft Mode.

9.8.19 cmEmbeddedMask = 1

Plugin Version: 10.5. **Function:** One of the constants for the flags.
Example:

```
dim flags as Integer // your flags
if bitwiseand(flags, ColorSyncWorldMBS.cmEmbeddedMask) = 1 then
MsgBox "set"
end if
```

Notes: Whether to use embeded profile or not.

9.8.20 cmEmbeddedProfile = 0

Plugin Version: 10.5. **Function:** One of the constants for the flags.

9.8.21 cmEmbeddedUse = 2

Plugin Version: 10.5. **Function:** One of the constants for the flags.
Example:

```
dim flags as Integer // your flags
if bitwiseand(flags, ColorSyncWorldMBS.cmEmbeddedUseMask) = ColorSyncWorldMBS.cmEmbeddedUse
then
MsgBox "set"
end if
```

9.8.22 cmEmbeddedUseMask = 2

Plugin Version: 10.5. **Function:** One of the constants for the flags.
Example:

```
dim flags as Integer // your flags
if bitwiseand(flags, ColorSyncWorldMBS.cmEmbeddedUseMask) = ColorSyncWorldMBS.cmEmbeddedUse
then
MsgBox "set"
end if
```

Notes: Whether to allow embeded profile or not.

9.8.23 cmGamutCheckingMask = & h00080000

Plugin Version: 10.5. **Function:** One of the constants for the flags.
Notes: If bit 19 is 0 then create gamut checking info, if 1 then no gamut checking info.

9.8.24 cmICCReservedFlagsMask = & h0000FFFF

Plugin Version: 10.5. **Function:** One of the constants for the flags.
Notes: These bits of the flags field are defined and reserved by ICC

9.8.25 cmInterpolationMask = & h00040000

Plugin Version: 10.5. **Function:** One of the constants for the flags.
Notes: if bit 18 is 0 then interpolation, if 1 then lookup only.

9.8.26 cmNormalMode = & h00000000

Plugin Version: 10.5. **Function:** One of the constants for the quality options.
Notes: Normal Mode.

9.8.27 cmQualityMask = & h00030000

Plugin Version: 10.5. **Function:** One of the constants for the flags.
Example:

```
dim flags as Integer // your flags
if bitwiseand(flags, ColorSyncWorldMBS.cmQualityMask) = ColorSyncWorldMBS.cmBestMode then
MsgBox "Best Mode."
end if
```

Notes: if bits 16-17 is 0 then normal, if 1 then draft, if 2 then best.

9.8.28 kAdobeCMMSignature = & h41444245

Plugin Version: 10.5. **Function:** One of the signature constants.
Notes: Use Adobe's CMM. Works only if Adobe CMM is installed.

9.8.29 kAppleCMMSignature = & h6170706C

Plugin Version: 10.5. **Function:** One of the signature constants.
Notes: Use Apple's CMM.

9.8.30 kDefaultCMMSignature = & h6170706C

Plugin Version: 10.5. **Function:** One of the signature constants.
Notes: The default = Apple.

Chapter 10

Controls

10.1 class ClickThroughMBS

10.1.1 class ClickThroughMBS

Plugin Version: 11.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** A class to have windows in a Carbon application support click through in Real Studio.
Example:

```
dim c as new ClickThroughMBS(window1, ClickThroughMBS.kActivateAndHandleClick)
```

Deprecated: This item is deprecated and should no longer be used.

10.1.2 Methods

10.1.3 Constructor(target as window, mode as Integer)

Plugin Version: 11.0, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a new ClickThrough object and attaches the given window to it.
Example:

```
dim c as new ClickThroughMBS(window1, ClickThroughMBS.kActivateAndHandleClick)
```

Notes:

Sets the mode property with the given value.
Lasterror is set.

The plugin does not keep a reference to the target window to avoid circular references. So you should keep this ClickThroughMBS referenced through a window property so it lives as long as the window.

Works only on Carbon and not on Cocoa.

10.1.4 Properties

10.1.5 Lasterror as Integer

Plugin Version: 11.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The last error code.
Notes: (Read only property)

10.1.6 Mode as Integer

Plugin Version: 11.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The mode for the activation.
Notes:

Use the 4 constants defined in this class.
(Read only property)

10.1.7 Constants

10.1.8 kActivateAndHandleClick = 3

Plugin Version: 11.0. **Function:** One of the activation modes.
Notes: control wants to respond to the click, but only after the window has been activated.

10.1.9 kActivateAndIgnoreClick = 2

Plugin Version: 11.0. **Function:** One of the activation modes.
Notes: control doesn't want to respond directly to the click, but window should still be brought forward.

10.1.10 kDoNotActivateAndHandleClick = 1

Plugin Version: 11.0. **Function:** One of the activation modes.
Notes: let the control handle the click while the window is still in the background.

10.1.11 kDoNotActivateAndIgnoreClick = 0

Plugin Version: 11.0. **Function:** One of the activation modes.
Notes: probably never used. here for completeness.

10.2 class HIViewMBS

10.2.1 class HIViewMBS

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** A class to represent a native Carbon control on a Realbasic window.
Deprecated: This item is deprecated and should no longer be used. You can use NSViewMBS instead.
Notes:

Only used for some interface hacks like moving the scrollbars of an editfield.
Not available on Cocoa targets.

10.2.2 Methods

10.2.3 AccessibilityActionDescription(action as string) as string

Plugin Version: 10.5, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the action description string for a standard accessibility action.
Notes: This routine is useful if you are implementing an accessible object that implements a standard action and you want to make sure your object provides the same role action string that the a system-supplied object provides. This routine can provide action description strings for all actions that are used in the standard/system accessible objects on Mac OS X 10.4 and later. Once this routine is able to provide a description string for an action, it will continue to do so on subsequent system releases, even if the system no longer produces a standard accessible object that supports the action.

10.2.4 available as boolean

Plugin Version: 13.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Whether HIView is available.
Notes: Currently only true on Carbon target.

10.2.5 BoundsHeight as Double

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Height of the view bounds.
Notes: Returns the local bounds of a view. The local bounds are the coordinate system that is completely view-relative. A view's top left coordinate starts out at 0, 0. Most operations are done in these local coordinates. Moving a view is done via the frame instead.

10.2.6 BoundsLeft as Double

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Left of the view bounds.
Notes: Returns the local bounds of a view. The local bounds are the coordinate system that is completely view-relative. A view's top left coordinate starts out at 0, 0. Most operations are done in these local coordinates. Moving a view is done via the frame instead.

10.2.7 BoundsTop as Double

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Top of the view bounds.
Notes: Returns the local bounds of a view. The local bounds are the coordinate system that is completely view-relative. A view's top left coordinate starts out at 0, 0. Most operations are done in these local coordinates. Moving a view is done via the frame instead.

10.2.8 BoundsWidth as Double

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Width of the view bounds.
Notes: Returns the local bounds of a view. The local bounds are the coordinate system that is completely view-relative. A view's top left coordinate starts out at 0, 0. Most operations are done in these local coordinates. Moving a view is done via the frame instead.

10.2.9 CountSubviews as Integer

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Counts the number of subviews embedded in a view.
Notes: 0 on any error.

10.2.10 CreateImage as picture

Plugin Version: 8.3, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Creates a picture from the control.
Notes: Returns nil on any error.
See also:

- 10.2.11 CreateImage(byref x as Double, byref y as Double, byref width as Double, byref height as Double) as picture 166

10.2.11 CreateImage(byref x as Double, byref y as Double, byref width as Double, byref height as Double) as picture

Plugin Version: 8.3, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a picture from the control.
Notes:

Returns nil on any error.
In the double values, you will get the control rectangle within the picture returned.
See also:

- 10.2.10 CreateImage as picture 165

10.2.12 FirstSubview as HIViewMBS

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the first subview of a container.
Notes:

The first subview is the topmost subview in z-order.
Nil on any error.

10.2.13 FrameHeight as Double

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Height of frame of a view.
Notes: The frame is the bounds of a view relative to its parent's local coordinate system.

10.2.14 FrameLeft as Double

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Left of frame of a view.
Notes: The frame is the bounds of a view relative to its parent's local coordinate system.

10.2.15 FrameTop as Double

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Top of frame of a view.
Notes: The frame is the bounds of a view relative to its parent's local coordinate system.

10.2.16 FrameWidth as Double

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Width of frame of a view.
Notes: The frame is the bounds of a view relative to its parent's local coordinate system.

10.2.17 IndexedSubview(index as Integer) as HIViewMBS

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Get the Nth subview of a view.
Example:

```
Sub List(h as hiviewMBS, tab as string="")
dim i,c as Integer
dim t as string
dim s as HIViewMBS

ListBox1.AddRow tab+h.Kind
ListBox1.Cell(ListBox1.LastIndex,1)=h.Signature

c=h.CountSubviews
for i=1 to c
s=h.IndexedSubview(i)
list s,tab+" "
next
End Sub
```

Notes:

Instead of calling IndexedSubview repeatedly, it may be more efficient to iterate through the subviews of a view with calls FirstSubview and NextView.
Nil on any error.

Index is from 1 to count.

10.2.18 IsAccessibilityIgnored as Boolean

Plugin Version: 10.5, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Reports whether or not the given HIObject is marked as ignored for accessibility.
Notes: See the discussion of HIObjectSetAccessibilityIgnored for details on what it means to be accessibility ignored.

10.2.19 Kind as string

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** KInd of this view.
Notes: e.g. a scrollbar has "sbar", a slider has "sldr".

10.2.20 LastSubview as HIViewMBS

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the last subview of a container.
Notes:

The last subview is the bottommost subview in z-order.
Nil on any error.

10.2.21 LatentlyVisible as Boolean

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns whether or not a view is latently visible.
Notes: The view's visibility is also affected by the visibility of its parents; if any parent view is invisible, this view is considered invisible as well. LatentlyVisible returns whether a view is latently visible, even if its parents are invisible.

10.2.22 MoveBy(dx as Double, dy as Double)

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Moves a view by a certain distance, relative to its current location.
Notes: This affects a view's frame, but not its bounds.

10.2.23 NextView as HIViewMBS

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the next view after the one given, in z-order.
Notes: Nil on any error.

10.2.24 PreviousView as HIViewMBS

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the previous view before the one given, in z-order.

Notes: Nil on any error.

10.2.25 SetAccessibilityIgnored(value as Boolean)

Plugin Version: 10.5, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Marks an HIObject as ignored (or not) for the purposes of the accessibility APIs.
Notes:

An HIObject that is ignored for accessibility will never be shown to an assistive application that uses the accessibility APIs to examine an interface. Your application's accessibility implementation can (and should) still report an ignored HIObject as usual. Carbon's accessibility engine will automatically prune any ignored HIObjects out of the data that is shown to an assistive application.
By default, an HIObject is *not* accessibility ignored.

10.2.26 SetAuxiliaryAccessibilityDescriptionAttribute(identifier as UInt64, value as string)

Plugin Version: 10.5, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Associates an additional accessibility description attribute with a UIElement that is used to represent a given HIObject or a part thereof.
Notes:

This routine lets your application provide the name of and data for an accessibility attribute that you want to add to the UIElement used to represent a given HIObject-identifier pair. Normally, accessibility attributes can only be supplied dynamically via Carbon Events, but this routine allows you to supply them statically.

When an accessibility attribute Carbon Event is handled by the HIObject with a given identifier, the toolbox automatically
supplies the names and/or values of any auxiliary attributes associated with that HIObject- identifier pair.

This routine is particularly useful for supplying values for the kAXDescriptionAttribute, kAXTitleUIElementAttribute, AXServesAsTitleUIElementAttribute, kAXLinkedUIElementsAttribute and other attributes whose value is specific to the layout and
usage of your application.

This routine only allows you to associate attributes whose values never change. If you need to supply attributes whose values are determined dynamically or whose values are settable, you must install the normal accessibility Carbon Event handlers.

The auxiliary attribute store is consulted during the HIObject's default handling of the accessibility attribute Carbon Events.
This means that any programmatic handling of a given accessibility attribute will have a chance to override

or block the consultation of the store. The general rule is that if the toolbox or a Carbon Event handler can provide the attribute value some other way, the store will not be consulted.

self: The HIObject part of the object-identifier pair to which the attribute data is associated.
Identifier: The 64-bit identifier part of the object-identifier pair to which the attribute data is associated. When you want to associate the attribute data to the HIObject as a whole – such as when you want to give a description attribute to a push button – you should pass zero in this parameter.

Value: The description text.

10.2.27 Signature as string

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Signature of this view.
Notes: Most times "appl" for Apple Inc.

10.2.28 Superview as HIViewMBS

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns a view's parent view.
Notes: Nil on any error.

10.2.29 Properties

10.2.30 Handle as Integer

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The handle of the hiview control.
Notes: (Read and Write property)

10.2.31 DrawingEnabled as Boolean

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Turns control drawing on or off.
Notes:

You can use this to ensure that no drawing events are sent to the control. Even Draw1Control will not draw! NeedsDisplay is also rendered useless when drawing is off.

(Read and Write computed property)

10.2.32 Maximum as Integer

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The maximum value of this control.
Notes:

Sliders and Scrollbars do use this property.
(Read and Write computed property)

10.2.33 Minimum as Integer

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The minimum value of this control.
Notes:

Sliders and Scrollbars do use this property.
(Read and Write computed property)

10.2.34 NeedsDisplay as Boolean

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Whether this control needs to be redrawn soon.
Notes:

Marks a view as needing to be completely redrawn, or completely valid. If the view is not visible, or is obscured completely by other views, no action is taken.
(Read and Write computed property)

10.2.35 Text as String

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The text of the view.
Notes:

The "text" of the view is the text that will be displayed when drawing the view.
(Read and Write computed property)

10.2.36 Value as Integer

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The value of the view.
Example:

```
dim s as HIViewMBS
'... fill s with hiview
slider1.Value=s.Value
```

Notes: (Read and Write computed property)

10.2.37 ViewSize as Integer

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** View's view size.
Notes:

The view size is the size of the content to which a view's display is proportioned. Most commonly used to set the proportional size of a scroll bar's thumb indicator.
(Read and Write computed property)

10.2.38 Visible as Boolean

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Whether this view is visible.
Notes:

Hides or shows a view. Marks the area the view will occupy or used to occupy as needing to be redrawn later.

Note that Visible returns a view's effective visibility, which is determined both by the view's own visibility and the visibility of its parent views. If a parent view is invisible, then this view is considered to be invisible also.

Latent visibility can be determined with LatentlyVisible.
(Read and Write computed property)

10.3 class TabPanel

10.3.1 class TabPanel

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Extends the TabPanel control inside Realbasic.

10.4 Globals

10.4.1 TabpanelCountMBS(theTabpanel as Tabpanel) as Integer

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Returns the number of pages on a tabpanel.
Example:

```
dim i,c as Integer

c=TabpanelCountMBS(TabPanel1)

for i=0 to c
TabpanelEnabledMBS TabPanel1,i,false
next
```

Notes:

This function does currently not work with the Mac Cocoa target of REALbasic. If you need it, please send in a feature request.

You can do the same with PanelCount property in newer Real Studio versions.

10.4.2 TabpanelEnabledMBS(theTabpanel as Tabpanel, index as Integer, value as boolean)

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Enables or disables a tabpanel.
Example:

```
dim i,c as Integer

c=TabpanelCountMBS(TabPanel1)

for i=0 to c
TabpanelEnabledMBS TabPanel1,i,false
next
```

Notes:

Index is from 1 to count.
Make sure the disabled tab panel is not used while you disable it.
You may need to call refresh to redraw the tabpanel.

PS: Can't find a way to disable tabs on Windows. Any hint is welcome.

This function works only on Carbon targets.
For Cocoa, please use enabled property of NSTabViewItemMBS class.

Chapter 11

Currency, Date and Time Format

11.1 class DateFormatMBS

11.1.1 class DateFormatMBS

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The date format settings on Mac OS. **Deprecated:** This item is deprecated and should no longer be used. **Notes:**

This class is from old Mac OS 9 and Apple does no longer support it at 100% .
It seems like they have preset settings which they return if you use this class, so you will see differences to the right values.
Use the newer NSLocaleMBS class, please.

11.1.2 Methods

11.1.3 close

Plugin Version: 4.0, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** The destructor. **Notes:**

There is no need to call this method except you want to free all resources of this object now without waiting for Realbasic to do it for you.
(e.g. some Realbasic versions crash on Windows if there are plugin objects not closed.)

11.1.4 DayName(index as Integer) as string

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The names of the day. **Notes:** Sunday is index 0 and Saturday index 6.

11.1.5 LongDateFormatString as string

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The format string for the long date.
Notes:

A combination of "day", "month", "year", "day of month" and "day of week".
e.g. "day/month/year" in Germany and "month/day/year" in USA.

11.1.6 LongDateSeparator(index as Integer) as string

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The separator for the long date.
Notes: Index from 0 to 4.

11.1.7 MonthName(index as Integer) as string

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The names of the month.
Notes: January is index 0 and December index 11.

11.1.8 Properties

11.1.9 AbbreviationLength as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The number of characters to which month and day names should be abbreviated when abbreviation is desired.
Notes: (Read only property)

11.1.10 LeadingZeroForDay as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Use a leading zero for day?
Notes: (Read only property)

11.1.11 LongDateFormat as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Use a leading zero for day?
Notes:

The byte that indicates the order of long date elements. If the byte value of the field is neither 0 (which specifies an order of day/month/year) nor $ FF (which specifies an order of month/day/year), then its value is divided into 4 fields of 2 bits each. The least significant bit field (bits 0 and 1) corresponds to the first element in the long date format, whereas the most significant bit field (bits 6 and 7) specifies the last (fourth) element in the format. You can use the following predefined constants to set each bit field to the appropriate value.

Constant	Value	Explanation
longDay	0	Day of the month
longWeek	1	Day of the week
longMonth	2	Month
longYear	3	Year

Note that these constants represent values for the 2-bit field, and are neither masks nor bit numbers. For example, suppose you wanted long dates to appear in this order: day of the week, day of the month, month, and year. You would set the value of longDateFmt like this:

longDateFmt :=
longWeek*1 { sets bits 0 and 1 }
+ LongDay*4 { sets bits 2 and 3 }
+ longMonth*16 { sets bits 4 and 5 }
+ longYear*64; { sets bits 6 and 7 }
(Read only property)

11.1.12 Ok as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Are the settings ok?
Notes:

If you make a new instance of the class the values are placed into this object and ok shows you if this worked. So ok is false on Windows.
(Read only property)

11.1.13 SuppressDayOfMonth as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Suppress day of month?
Notes: (Read only property)

11.1.14 SuppressDayOfWeek as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Suppress day name?
Notes: (Read only property)

11.1.15 SuppressMonth as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Suppress month?
Notes: (Read only property)

11.1.16 SuppressYear as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Suppress year?
Notes: (Read only property)

11.2 class NumberFormatMBS

11.2.1 class NumberFormatMBS

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The number format settings on Mac OS. **Deprecated:** This item is deprecated and should no longer be used. **Notes:**

This class is from old Mac OS 9 and Apple does no longer support it at 100% .
It seems like they have preset settings which they return if you use this class, so you will see differences to the right values.
Use the newer NSLocaleMBS class, please.

11.2.2 Methods

11.2.3 close

Plugin Version: 4.0, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** The destructor. **Notes:**

There is no need to call this method except you want to free all resources of this object now without waiting for Realbasic to do it for you.
(e.g. some Realbasic versions crash on Windows if there are plugin objects not closed.)

11.2.4 Properties

11.2.5 CurrencyFormatFlags as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The string used for the currency. **Notes:**

Part of the currency format definition. The four least significant bits are unused. The four most significant bits are Boolean values. Bit 7 determines whether there is a leading integer zero; for example, a 1 in this field specifies a format like 0.23, whereas a 0 specifies .23.
Bit 6 determines whether there are trailing decimal zeros; for example, a 1 in this field specifies a format like 325.00, whereas a 0 specifies 325. Bit 5 determines whether to use a minus sign or parentheses to denote a negative currency amount; for example,
a 1 in this field specifies a format like -0.45, whereas a 0 specifies (0.45). Bit 4 determines whether the currency symbol trails or leads; for example, a value of 1 in this field specifies a format like the $ 3.00 used in the United States, whereas a value of 0 specifies the
3 DM. used in Germany.

You can use the following predefined constants as masks to set or test the bits in the currFmt field:

Constant	Value	Explanation
currSymLead	16	Currency symbol leads
currNegSym	32	Use minus sign for negative
currTrailingZ	64	Use trailing decimal zeros
currLeadingZ	128	Use leading integer zero

(Read only property)

11.2.6 CurrencySymbol as string

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The string used for the currency.
Notes:

One to three characters long.
(Read only property)

11.2.7 CurrencySymbolLeads as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Currency symbol leads?
Notes:

See CurrencyFormatFlags for details.
(Read only property)

11.2.8 DateOrder as string

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The order of day, month and year for short day.
Notes:

e.g. dmy for Germany.
(Read only property)

11.2.9 DateSeparator as string

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The 1-byte character that separates the different parts of the date.
Notes:

For example, in the United States this character is a slash (12/3/46), in Italy it is a hyphen (3-12-46), and in Japan it is a decimal point (46.12.3)
(Read only property)

11.2.10 DecimalPoint as string

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The string used for decimal separator.
Notes:

One character long.
(Read only property)

11.2.11 EveningPrefix as string

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The Prefix for the time in the evening.
Notes: (Read only property)

11.2.12 EveningSuffix as string

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The Suffix for the time in the evening.
Notes:

e.g. "PM" in the USA.
(Read only property)

11.2.13 Inches as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Are we using inches system?
Notes: (Read only property)

11.2.14 LeadingZeroForHours as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Use leading zero for hours?
Notes:

See TimeFormat for details.
(Read only property)

11.2.15 LeadingZeroForMinutes as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Use leading zero for minutes?
Notes:

See TimeFormat for details.
(Read only property)

11.2.16 LeadingZeroForSeconds as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Use leading zero for seconds?
Notes:

See TimeFormat for details.
(Read only property)

11.2.17 ListSeparator as string

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The string used for list separator.
Notes:

One character long.
(Read only property)

11.2.18 Metric as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Are we using metric system?
Notes: (Read only property)

11.2.19 MorningPrefix as string

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The Prefix for the time in the morning.
Notes: (Read only property)

11.2.20 MorningSuffix as string

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The Suffix for the time in the morning.
Notes:

e.g. "AM" in the USA.
(Read only property)

11.2.21 Ok as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Are the settings ok?
Notes:

If you make a new instance of the class the values are placed into this object and ok shows you if this worked. So ok is false on Windows.
(Read only property)

11.2.22 ShortDateFormatFlags as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The flags for the short date format.
Notes:

The five least significant bits are unused. The three most significant bit fields are Boolean values that determine whether to show the century, and whether to show leading zeros in month and day numbers. For example, if the first bit is set to 1 it specifies a date format like 10/21/1917, and set to 0 specifies the format 10/21/17. The second bit set to 1 specifies a format like 05/23/84, and set to 0 specifies the format 5/23/84. The third bit set to 1 specifies a format like 12/03/46, and set to 0 specifies the format 12/3/46.

To set or test the bits in the shrtDateFmt field, you can use the following predefined constants as masks:

Constant	Value	Explanation
dayLdingZ	32	Show leading zero for day
mntLdingZ	64	Show leading zero for month
century	128	Show century

(Read only property)

11.2.23 ShowCentury as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Show century?
Notes:

See ShortDateFormatFlags for details.
(Read only property)

11.2.24 ShowLeadingZeroForDay as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Show leading zero for day?
Notes:

See ShortDateFormatFlags for details.
(Read only property)

11.2.25 ShowLeadingZeroForMonth as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Show leading zero for month?
Notes:

See ShortDateFormatFlags for details.
(Read only property)

11.2.26 ThousandSeparator as string

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The string used for thousand separator.
Notes:

One character long.
(Read only property)

11.2.27 TimeCycle as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Indicates the time cycle.
Example:

```
dim n as new NumberFormatMBS

MsgBox str(n.TimeCycle) // 0 for Germany
```

Notes:

Indicates the time cycle–that is, whether to use 12 or 24 hours as the basis of time, and whether to consider midnight and noon to be 12:00 or 0:00. You can use the following predefined constants to specify the time cycle:

(Read only property)

Constant	Value	Explanation
timeCycle24	0	Use 24-hour format (midnight = 0:00)
timeCycleZero	1	Use A.M./P.M. format (midnight and noon = 0:00)
timeCycle12	255	Use A.M./P.M. format (midnight and noon = 12:00)

11.2.28 TimeFormat as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The time format flags.
Notes:

Indicates whether to show leading zeros in time representation. Bit 5 determines whether there are leading zeros in seconds; for example, a value of 1 in this field specifies a format like 11:15:05, whereas a 0 specifies the format 11:15:5. Bit 6 determines whether there are leading zeros in minutes; for example, a value of 1 in this field specifies a format like 10:05, whereas a 0 specifies the format 10:5. Bit 7 determines whether there are leading zeros in hours; for example, a value of 1 in this field specifies a format like 09:15, whereas a 0 specifies the format 9:15.

You can use the following predefined constants as masks for setting or testing bits in the time format field:

Constant	Value	Explanation
secLeadingZ	32	Use leading zero for seconds
minLeadingZ	64	Use leading zero for minutes
hrLeadingZ	128	Use leading zero for hours

(Read only property)

11.2.29 TimeSeparator as string

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The string used for time separator.
Notes:

The 1-byte character that is the time separator (for example, the colon).
(Read only property)

11.2.30 UseLeadingIntegerZero as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Use leading integer zero?
Notes:

See CurrencyFormatFlags for details.
(Read only property)

11.2.31 UseNegativeSymbolForCurrency as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Use minus sign for negative?
Notes:

See CurrencyFormatFlags for details.
(Read only property)

11.2.32 UseTrailingDecimalZero as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Use trailing decimal zeros?
Notes:

See CurrencyFormatFlags for details.
(Read only property)

Chapter 12

Drag & Drop

12.1 class DragFolderItemMBS

12.1.1 class DragFolderItemMBS

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** A class for a Drag folderitem.
Notes:

This class is only for Carbon applications, not Cocoa!
While the drag classes compile for Web Edition, they run on the server, so they have no effect on the client browser!

12.1.2 Methods

12.1.3 close

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** The destructor.
Notes:

There is no need to call this method except you want to free all resources of this object now without waiting for Realbasic to do it for you.
(e.g. some Realbasic versions crash on Windows if there are plugin objects not closed.)

12.1.4 Properties

12.1.5 File as FolderItem

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Creates a folderitem for this file reference.
Notes:

As RB does some caching for folderitems you may get better performance if you check the file reference by type & creator before you ask for this folderitem.
(Read and Write property)

12.1.6 Finderflags as Integer

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The finder flags for this file.
Notes:

Finder flags:
Any flag reserved or not specified should be set to 0.

Useful constants:

kIsOnDesk	& h0001	Files and folders (System 6)
kColor	& h000E	Files and folders, 3 bits for colors.
kReserved1	& h0020	Reserved for future use
kIsShared	& h0040	Files only (Applications only). If clear, the application needs to write to its resource fork, and therefore cannot be shared on a server.
kHasNoINITs	& h0080	Files only (Extensions/Control Panels only). This file contains no INIT resource
kHasBeenInited	& h0100	Files only, Clear if the file contains desktop database, resources ('BNDL', 'FREF', 'open', 'kind'...) that have not been added yet. Set only by the Finder, Reserved for folders - make sure this bit is cleared for folders.
kReserved2	& h0200	Reserved for future use
kHasCustomIcon	& h0400	Files and folders
kIsStationery	& h0800	Files only
kNameLocked	& h1000	Files and folders
kHasBundle	& h2000	Files only
kIsInvisible	& h4000	Files and folders
kIsAlias	& h8000	Files only

(Read and Write property)

12.1.7 MacCreator as String

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The Mac creator code for this file.
Notes: (Read and Write property)

12.1.8 MacType as String

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The Mac type code for this file.
Notes: (Read and Write property)

12.2 class DragItemMBS

12.2.1 class DragItemMBS

Plugin Version: 3.4, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A class for a DragItem.
Notes:

This class is only for Carbon applications, not Cocoa!
A dragitem is built using several items. Each item has it's ID and may contain several data types.

While the drag classes compile for Web Edition, they run on the server, so they have no effect on the client browser!

12.2.2 Methods

12.2.3 AddFlavorDataAsMemory(ID as Integer, type as Integer, data as memoryblock)

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Adds data to the drag item.
Notes:

Type is a normal flavortype like e.g. "TEXT" (use StringToOSTypeMBS).
ID is an user choosen ID and data the data you want to add.
Lasterror is set.
Done use ID=0 because some applications like the Finder will ignore this ID.
See also:

- 12.2.4 AddFlavorDataAsMemory(ID as Integer, type as Integer, data as memoryblock, OnlyPrivate as boolean) 192

12.2.4 AddFlavorDataAsMemory(ID as Integer, type as Integer, data as memoryblock, OnlyPrivate as boolean)

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Adds (public or private) data to the drag item.
Notes:

Type is a normal flavortype like e.g. "TEXT" (use StringToOSTypeMBS).
ID is an user choosen ID and data the data you want to add.
Lasterror is set.
Done use ID=0 because some applications like the Finder will ignore this ID.
See also:

• 12.2.3 AddFlavorDataAsMemory(ID as Integer, type as Integer, data as memoryblock) 192

12.2.5 AddFlavorDataAsString(ID as Integer, type as Integer, data as string)

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Adds data to the drag item.
Example:

```
dim d as new DragItemMBS

if d.Create then

dim t as Integer = OSTypeFromStringMBS("TEXT")

d.AddFlavorDataAsString 1, t, "Hello World"

MsgBox str(D.ItemCount)+" item"
end if
```

Notes:

Type is a normal flavortype like e.g. "TEXT" (use OSTypeFromStringMBS).
ID is an user choosen ID and data the data you want to add.
Lasterror is set.
Done use ID=0 because some applications like the Finder will ignore this ID.
See also:

• 12.2.6 AddFlavorDataAsString(ID as Integer, type as Integer, data as string, OnlyPrivate as boolean) 193

12.2.6 AddFlavorDataAsString(ID as Integer, type as Integer, data as string, OnlyPrivate as boolean)

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Adds (public or private) data to the drag item.
Notes:

Type is a normal flavortype like e.g. "TEXT" (use StringToOSTypeMBS).
ID is an user choosen ID and data the data you want to add.
Lasterror is set.
Done use ID=0 because some applications like the Finder will ignore this ID.
See also:

• 12.2.5 AddFlavorDataAsString(ID as Integer, type as Integer, data as string) 193

12.2.7 AddFlavorFileReference(ID as Integer, file as DragFolderItemMBS)

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Adds a folderitem to the drag item.
Notes:

Lasterror is set.
ID is an user choosen ID.
Done use ID=0 because some applications like the Finder will ignore this ID.
See also:

- 12.2.8 AddFlavorFileReference(ID as Integer, file as DragFolderItemMBS, OnlyPrivate as boolean) 194

12.2.8 AddFlavorFileReference(ID as Integer, file as DragFolderItemMBS, OnlyPrivate as boolean)

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Adds a folderitem to the drag item.
Example:

```
dim d as DragItemMBS
dim f as DragFolderItemMBS

f=new DragFolderItemMBS
f.File=SpecialFolder.Desktop
f.MacCreator=SpecialFolder.Desktop.MacCreator
f.MacType=SpecialFolder.Desktop.MacType

d=new DragItemMBS
if d.create then
d.AddFlavorFileReference(1,f)

d.FlavorFileReference(1)=f
if d.Lasterror<>0 then
MsgBox str(d.Lasterror)
else
MsgBox d.FlavorFileReference(1).MacCreator
end if
end if
```

Notes:

Lasterror is set.
ID is an user choosen ID.
If OnlyPrivate is true, the folderitem is only visible to your own application.
Done use ID=0 because some applications like the Finder will ignore this ID.

See also:

- 12.2.7 AddFlavorFileReference(ID as Integer, file as DragFolderItemMBS) 194

12.2.9 close

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** The destructor.
Notes:

There is no need to call this method except you want to free all resources of this object now without waiting for Realbasic to do it for you.
(e.g. some Realbasic versions crash on Windows if there are plugin objects not closed.)

12.2.10 Create as boolean

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Creates a new drag object handle.
Notes: On success, lasterror is 0 and handle not 0.
See also:

- 12.2.11 Create(PasteboardRef as Integer) as boolean 195

12.2.11 Create(PasteboardRef as Integer) as boolean

Plugin Version: 13.5, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Creates a new drag object handle.
Notes:

PasteboardRef is a PasteboardRef, e.g. created with PasteboardCreate function.
On success, lasterror is 0 and handle not 0.
See also:

- 12.2.10 Create as boolean 195

12.2.12 DragAllowableActions as Integer

Plugin Version: 9.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Gets the actions the drag sender has allowed the receiver to perform.
Notes:

These are not requirements, but they highly suggested actions which allows the drag receiver to improve harmony across the system. The allowable actions received are always those local to the caller's process.

Lasterror is set.

12.2.13 FlavorCount(ID as Integer) as Integer

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Counts the different flavors in one item.
Example:

```
dim d as new DragItemMBS

if d.Create then

dim t as Integer = OSTypeFromStringMBS("TEXT")

d.AddFlavorDataAsString 1, t, "Hello World"

MsgBox str(D.FlavorCount(1))+" flavor"
end if
```

Notes:

Returns 0 on any error.
Lasterror is set.

12.2.14 FlavorDataFlags(ID as Integer, type as Integer) as Integer

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the flags for a specified flavor.
Notes:

You can check lasterror after calling this to see whether the flavor is available.
ID must be a valid item ID.
Lasterror is set.

Possible values:

flavorSenderOnly	1	flavor is available to sender only
flavorSenderTranslated	2	flavor is translated by sender
flavorNotSaved	4	flavor should not be saved
flavorSystemTranslated	512	flavor is translated by system
flavorDataPromised	1024	flavor data is promised by sender

12.2.15 FlavorFileReferenceAvailable(ID as Integer) as boolean

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns true if given drag item contains a file reference.

12.2.16 FlavorMovieAvailable(ID as Integer) as boolean

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns true if given drag item contains a movie handle.

12.2.17 FlavorPicture(ID as Integer) as Picture

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns a picture if one is found.
Notes: Returns nil on any error.

12.2.18 FlavorPictureAvailable(ID as Integer) as boolean

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns true if given drag item contains a picture handle.

12.2.19 FlavorSoundAvailable(ID as Integer) as boolean

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns true if given drag item contains a sound handle.

12.2.20 FlavorTextAvailable(ID as Integer) as boolean

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns true if given drag item contains text.

12.2.21 FlavorTextStyle(ID as Integer) as string

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns text style data if present in this drag item.

12.2.22 FlavorTextStyleAvailable(ID as Integer) as boolean

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns true if given drag item contains text styles.

12.2.23 FlavorType(ID as Integer, index as Integer) as Integer

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the flavor type of the specified flavor.
Notes: Value may be the number of e.g. StringToOSTypeMBS("TEXT")

12.2.24 FlavorUnicodeTextAvailable(ID as Integer) as boolean

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns true if given drag item contains an unicode text.

12.2.25 HasLeftSenderWindow as boolean

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Drag has left the source window since Drag has started.

12.2.26 InsideSenderApplication as boolean

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Drag is occurring within the sender application.

12.2.27 InsideSenderWindow as boolean

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Drag is occurring within the sender window.

12.2.28 IsDroppedToTrash as boolean

Plugin Version: 8.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** True if the item has been dropped on the trash.
Notes:

Only valid after the dragging has finished.
Requires Mac OS X 10.2.

12.2.29 ItemCount as Integer

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The number of items in the dragitem.
Notes:

Lasterror is set.
Returns 0 on any error.

12.2.30 ItemGetRect(ID as Integer, byref left as Integer, byref top as Integer, byref width as Integer, byref height as Integer)

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Gets the rectangle for a given item.
Notes: Lasterror is set.

12.2.31 ItemID(index as Integer) as Integer

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The ID of the item with the given index.
Notes:

Lasterror is set.
Returns 0 on any error.

12.2.32 ItemSetRect(ID as Integer, left as Integer, top as Integer, width as Integer, height as Integer)

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Sets the rectangle for a given item.
Notes: Lasterror is set.

12.2.33 ModifiersCurrent as Integer

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The modifiers from the keyboard at the current time.
Notes:

Values:

cmdKey	256	set if Command key down
shiftKey	512	set if Shift key down
alphaLock	1024	set if Caps Lock key down
optionKey	2048	set if Option key down
controlKey	4096	set if Control key down
rightshiftKey	8192	set if right Shift key down
rightoptionKey	16384	set if right Option key down
rightcontrolKey	32768	set if right Control key down

Lasterror is set.

12.2.34 ModifiersMouseDown as Integer

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The modifiers from the keyboard at the time the mouse was going down.
Notes:

Values:

cmdKey	256	set if Command key down
shiftKey	512	set if Shift key down
alphaLock	1024	set if Caps Lock key down
optionKey	2048	set if Option key down
controlKey	4096	set if Control key down
rightshiftKey	8192	set if right Shift key down
rightoptionKey	16384	set if right Option key down
rightcontrolKey	32768	set if right Control key down

Lasterror is set.

12.2.35 ModifiersMouseUp as Integer

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The modifiers from the keyboard at the time the mouse was going up.
Notes:

Values:

cmdKey	256	set if Command key down
shiftKey	512	set if Shift key down
alphaLock	1024	set if Caps Lock key down
optionKey	2048	set if Option key down
controlKey	4096	set if Control key down
rightshiftKey	8192	set if right Shift key down
rightoptionKey	16384	set if right Option key down
rightcontrolKey	32768	set if right Control key down

Lasterror is set.

12.2.36 MouseGlobalPinnedX as Integer

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The current pinned mouse location in global screen coordinates.
Notes: The value will be (0, 0) if the drag is not yet used. After a drag completes, the drop location is returned. The pinned mouse location is the mouse location that is used to draw the drag region on the screen. The pinned mouse location is different from the mouse location when the cursor is being constrained in either dimension by a tracking handler.

12.2.37 MouseGlobalPinnedY as Integer

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The current pinned mouse location in global screen coordinates.
Notes: The value will be (0, 0) if the drag is not yet used. After a drag completes, the drop location is returned. The pinned mouse location is the mouse location that is used to draw the drag region on the screen. The pinned mouse location is different from the mouse location when the cursor is being constrained in either dimension by a tracking handler.

12.2.38 MouseOriginX as Integer

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The initial mouse position.

Notes: Lasterror is set.

12.2.39 MouseOriginY as Integer

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The initial mouse position.
Notes: Lasterror is set.

12.2.40 MouseX as Integer

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The current mouse location in global screen coordinates.
Notes: The value will be (0, 0) if the drag is not yet used. After a drag completes, the drop location is returned.

12.2.41 MouseY as Integer

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The current mouse location in global screen coordinates.
Notes: The value will be (0, 0) if the drag is not yet used. After a drag completes, the drop location is returned.

12.2.42 SetDragAllowableActions(actions as Integer, Local as boolean)

Plugin Version: 9.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Sets the actions the receiver of the drag is allowed to perform.
Notes:

These are not requirements, but they highly suggested actions which allows the drag receiver to improve harmony across the system. The caller may select whether these drag actions apply to a local or remote process.

Local: A boolean value allowing the drag sender to distinguish between those drag actions allowable by the local receiver versus a remote one.

Lasterror is set.

12.2.43 SetDragCGImage(CGImageHandle as Integer, ImageOffsetX as single, ImageOffsetY as single, flags as Integer)

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Sets the drag image. **Notes:**

ImageOffsetX and ImageOffsetY is the place inside the image where the mouse cursor is (negative value).

Values for flags:

kDragStandardTranslucency	0	65% image translucency (standard)
kDragDarkTranslucency	1	50% image translucency
kDragDarkerTranslucency	2	25% image translucency
kDragOpaqueTranslucency	3	0% image translucency (opaque)

Lasterror is set.
The cgimage is retained, so you don't need to keep a reference around.

12.2.44 SetDragImage(pic as picture, OffsetX as Integer, OffsetY as Integer, flags as Integer)

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Sets the drag image. **Notes:**

Values for flags:

kDragStandardTranslucency	0	65% image translucency (standard)
kDragDarkTranslucency	1	50% image translucency
kDragDarkerTranslucency	2	25% image translucency
kDragOpaqueTranslucency	3	0% image translucency (opaque)

Lasterror is set.
The image must be one made using NewPicture (a bitmap image) and it must be kept until the drag is finished. (Don't loose it!)

12.2.45 SetDragImageWithRegion(pic as picture, OffsetX as Integer, OffsetY as Integer, flags as Integer, regionhandle as Integer)

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Same as SetDragImage, but with an additional region handle.

12.2.46 SetDragPicture(pic as picture, ImageOffsetX as single, ImageOffsetY as single, flags as Integer)

Plugin Version: 8.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Sets the drag image. **Notes:**

This is the same method as SetDragCGImage, but it takes REALbasic picture.
Supports transparency.

ImageOffsetX and ImageOffsetY is the place inside the image where the mouse cursor is (negative value).

Values for flags:

kDragStandardTranslucency	0	65% image translucency (standard)
kDragDarkTranslucency	1	50% image translucency
kDragDarkerTranslucency	2	25% image translucency
kDragOpaqueTranslucency	3	0% image translucency (opaque)

Lasterror is set.

12.2.47 StartDrag(MouseX as Integer, MouseY as Integer, MouseModifiers as Integer, Left as Integer, Top as Integer, Width as Integer, Height as Integer)

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Starts dragging. **Notes:**

The plugin is not perfect with dragging as it does not have as much control as RB itself has over events.

Values:

cmdKey	256	set if Command key down
shiftKey	512	set if Shift key down
alphaLock	1024	set if Caps Lock key down
optionKey	2048	set if Option key down
controlKey	4096	set if Control key down
rightshiftKey	8192	set if right Shift key down
rightoptionKey	16384	set if right Option key down
rightcontrolKey	32768	set if right Control key down

12.2.48 Properties

12.2.49 Handle as Integer

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The handle of the DragRef.
Notes:

Maybe useful for toolbox calls.
(Read and Write property)

12.2.50 Lasterror as Integer

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The last error code reported.
Notes: (Read and Write property)

12.2.51 Release as Boolean

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Whether the destructor will release the handle.
Notes: (Read and Write property)

12.2.52 DragDropAction as Integer

Plugin Version: 9.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The action performed by the receiver of the drag.
Notes:

More than one action may have been performed.

Lasterror is set.
(Read and Write computed property)

12.2.53 FlavorDataAsMemory(ID as Integer, type as Integer) as memoryblock

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Get and set flavor data.
Notes: (Read and Write computed property)

12.2.54 FlavorDataAsString(ID as Integer, type as Integer) as string

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Get and set flavor data.
Notes: (Read and Write computed property)

12.2.55 FlavorFileReference(ID as Integer) as DragFolderItemMBS

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns a file reference if one is inside the drag item.
Notes:

Returns nil on any error.
Value is setable in plugin version 4.2.
(Read and Write computed property)

12.2.56 FlavorText(ID as Integer) as string

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns text data if present in this drag item.
Notes: (Read and Write computed property)

12.2.57 Constants

12.2.58 kDragActionAlias=2

Plugin Version: 9.2. **Function:** One of the drag action constants.
Notes:

The drag action constants define, in a general way, what actions a drag should or has performed. Some drag actions enforce a mode of operation while others are flexible suggestions.

Suggests the data contained within the drag can be/is shared.

12.2.59 kDragActionAll=& hFFFFFFFF

Plugin Version: 9.2. **Function:** One of the drag action constants.
Notes:

The drag action constants define, in a general way, what actions a drag should or has performed. Some drag actions enforce a mode of operation while others are flexible suggestions.

All of the above drag actions are allowed.

12.2.60 kDragActionCopy=1

Plugin Version: 9.2. **Function:** One of the drag action constants.
Notes:

The drag action constants define, in a general way, what actions a drag should or has performed. Some drag actions enforce a mode of operation while others are flexible suggestions.

Suggests the data contained within the drag can be/was copied.

12.2.61 kDragActionDelete=32

Plugin Version: 9.2. **Function:** One of the drag action constants.
Notes: The drag action constants define, in a general way, what actions a drag should or has performed. Some drag actions enforce a mode of operation while others are flexible suggestions.

12.2.62 kDragActionGeneric=4

Plugin Version: 9.2. **Function:** One of the drag action constants.
Notes:

The drag action constants define, in a general way, what actions a drag should or has performed. Some drag actions enforce a mode of operation while others are flexible suggestions.

Suggests the drag action is can be defined by the drag destination or was not defined by the drag destination.

12.2.63 kDragActionMove=16

Plugin Version: 9.2. **Function:** One of the drag action constants.
Notes: The drag action constants define, in a general way, what actions a drag should or has performed. Some drag actions enforce a mode of operation while others are flexible suggestions.

12.2.64 kDragActionNothing=0

Plugin Version: 9.2. **Function:** One of the drag action constants.
Notes:

The drag action constants define, in a general way, what actions a drag should or has performed. Some drag actions enforce a mode of operation while others are flexible suggestions.

Suggests nothing should be/was done with the data in a drag. When set as an allowable action for remote drags, the drag will not be sent to apps other than the sender.

12.2.65 kDragActionPrivate=8

Plugin Version: 9.2. **Function:** One of the drag action constants.
Notes:

The drag action constants define, in a general way, what actions a drag should or has performed. Some drag actions enforce a mode of operation while others are flexible suggestions.

Suggests the drag action should be negotiated privately between the drag source and destination.

12.3 class DragReceiverMBS

12.3.1 class DragReceiverMBS

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** A class for a drag receiver.
Notes:

This class is only for Carbon applications, not Cocoa!
Whenever you drop something on a window and the Drag Tracker accepted the DragItem, your DragReceiver will get it finally.
While the drag classes compile for Web Edition, they run on the server, so they have no effect on the client browser!

12.3.2 Methods

12.3.3 AttachWindow(win as window) as boolean

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Attaches this object to the given window.
Notes:

Returns true on success.
You can only attach to one object to one window at once.
You can pass nil to attach to all of your windows.

12.3.4 AttachWindowHandle(win as Integer) as boolean

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Attaches this object to the window given using the window handle.
Example:

```
dim d as DragReceiverMBS // your receiver
dim b as boolean
b=d.AttachWindowHandle(MyOverlayWindow.handle)
```

Notes:

Returns true on success.
You can only attach to one object to one window at once.
You can pass 0 to attach to all of your windows.

12.3.5 close

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** The destructor.
Notes:

There is no need to call this method except you want to free all resources of this object now without waiting for Realbasic to do it for you.
(e.g. some Realbasic versions crash on Windows if there are plugin objects not closed.)

12.3.6 Properties

12.3.7 WindowHandle as Integer

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The handle of the used window.
Notes:

0 if not attached to a window.
(Read only property)

12.3.8 Events

12.3.9 Received(drag as DragItemMBS) as boolean

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Called whenever someone dropped something on your window and the DragTracker accepted it.
Notes: Return true if you accept the given drag item.

12.4 class DragTrackerMBS

12.4.1 class DragTrackerMBS

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** A class for a drag tracker.
Notes:

This class is only for Carbon applications, not Cocoa!
Whenever something is dragged over a window, the Drag Manager calls all registered Drag Tracker to ask them whether the window can accept the given DragItem.

While the drag classes compile for Web Edition, they run on the server, so they have no effect on the client browser!

12.4.2 Methods

12.4.3 AttachWindow(win as window) as boolean

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Attaches this object to the given window.
Notes:

Returns true on success.
You can only attach to one object to one window at once.
You can pass nil to attach to all of your windows.

12.4.4 AttachWindowHandle(win as Integer) as boolean

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Attaches this object to the window given using the window handle.
Example:

```
dim d as DragTrackerMBS // your tracker
dim b as boolean
b=d.AttachWindowHandle(MyOverlayWindow.handle)
```

Notes:

Returns true on success.
You can only attach to one object to one window at once.
You can pass 0 to attach to all of your windows.

12.4.5 close

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** The destructor.
Notes:

There is no need to call this method except you want to free all resources of this object now without waiting for Realbasic to do it for you.
(e.g. some Realbasic versions crash on Windows if there are plugin objects not closed.)

12.4.6 Properties

12.4.7 WindowHandle as Integer

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The handle of the used window.
Notes:

0 if not attached to a window.
(Read only property)

12.4.8 Events

12.4.9 Dragging(message as Integer, drag as DragItemMBS) as boolean

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The user is dragging over the window.
Notes:

Values for message:

1 Enter Handler
2 Enter Window
3 Inside Window
4 Leave Window
5 Leave Handler

While running inside the RB IDE your application may not receive all events.
Return true if you accept the given drag item.

Chapter 13

Files

13.1 class FinderSelectionMBS

13.1.1 class FinderSelectionMBS

Plugin Version: 8.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** A class to query the Finder for the current selection.
Example:

```
dim f as new FinderSelectionMBS
dim i,n as Integer
dim a(-1) as string
dim g as FolderItem

f.GetSelection
if f.LastError=0 then
n=f.CountItems

for i=1 to n
g=f.Item(i)
if g<>nil then
a.Append g.DisplayName
end if
next
end if

MsgBox Join(a,EndOfLine)
```

13.1.2 Methods

13.1.3 CountItems as Integer

Plugin Version: 8.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the number of items in the Finder selection.
Example:

```
dim f as new FinderSelectionMBS

f.GetSelection
MsgBox str(F.CountItems)
```

Notes: Returns 0 on any error.

13.1.4 GetSelection

Plugin Version: 8.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Asks the Finder for the current selection.
Example:

```
dim f as new FinderSelectionMBS

f.GetSelection
```

Notes: Lasterror is set.

13.1.5 Item(index as Integer) as folderitem

Plugin Version: 8.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the item with the given index.
Example:

```
dim f as new FinderSelectionMBS

f.GetSelection
MsgBox f.Item(1).DisplayName // display first item's name
```

Notes:

Index is from 1 to count.
Lasterror is set.

13.1.6 Properties

13.1.7 LastError as Integer

Plugin Version: 8.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The last error code reported.
Example:

```
dim f as new FinderSelectionMBS

f.GetSelection
MsgBox str(F.LastError)
```

Notes:

A Mac OS error code.
(Read and Write property)

13.2 class Folderitem

13.2.1 class Folderitem

Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** One of Realbasic's base classes.
Notes: Handles access to files.

13.2.2 Methods

13.2.3 AFPUserNameMBS as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the user name of the volume the folderitem points to.
Deprecated: This item is deprecated and should no longer be used. **Notes:**

Useful to see which name someone used to mount the volume.
Apple didn't implemented this function for Mac OS X 10.1.4. Maybe for a later one?

This function is deprecated and will not be supported for future 64bit targets.

13.2.4 AliasInfoMBS as AliasInfoMBS

Plugin Version: 5.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Alias information about the folderitem if it is an alias file.
Example:

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("Development")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "alias points to "+a.TargetName+" in path "+a.PathString+" of volume "+a.VolumeName
```

Notes: Returns nil on any error.

13.2.5 ColorSyncCountImageProfilesMBS as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Use this function to obtain a count of the number of embeded profiles for a given image.
Notes:

Returns 0 if the function fails for any reason.
Requires ColorSync 2.6 or newer.

13.2.6 ColorSyncEmbedImageMBS(target as folderitem,replace as boolean,Profile as ColorSyncProfileMBS) as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** This function will embed an image with an ICC profile.
Notes:

If target is a file, it specifies the resulting image. If this parameter is a folder, it specifies the location of the resulting image which will have the same name as the original file. If this parameter is nil, the original file is modified.
If a file with the same name already exists, it will be replaced if this parameter replace is set to true.
Returns false if the function fails for any reason.
Requires ColorSync 2.6 or newer.

13.2.7 ColorSyncGetImageProfileMBS(index as Integer) as ColorSyncProfileMBS

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Use this function to obtain a specific embeded profile for a given image.
Notes:

Returns nil if the function fails for any reason.
Requires ColorSync 2.6 or newer.

13.2.8 ColorSyncImageColorSpaceMBS as string

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** What color space does this picture use?
Example:

```
dim file as FolderItem
msgbox file.ColorSyncImageColorSpaceMBS
```

Notes:

Possible values:

"XYZ "	The XYZ data color space.
"Lab "	The L*a*b* data color space.
"Luv "	The L*u*v* data color space.
"Yxy "	The Yxy data color space.
"RGB "	The RGB data color space.
"sRGB"	The RGB data color space.
"GRAY"	The Gray data color space.
"HSV "	The HSV data color space.
"HLS "	The HLS data color space.
"CMYK"	The CMYK data color space.
"CMY "	The CMY data color space.
"MCH5"	The five-channel multichannel (HiFi) data color space.
"MCH6"	The six-channel multichannel (HiFi) data color space.
"MCH7"	The seven-channel multichannel (HiFi) data color space.
"MCH8"	The eight-channel multichannel (HiFi) data color space.

Other values whitout a defition from Apple:

"3CLR", "4CLR", "5CLR", "6CLR", "7CLR", "8CLR", "NAME", "9CLR", "ACLR", "BCLR", "CCLR", "DCLR", "ECLR", "FCLR".

Requires ColorSync 2.6 or newer.

13.2.9 ColorSyncLinkImageMBS(target as folderitem,replace as boolean,quality as Integer,linkprofile as ColorSyncProfileMBS,linkintent as Integer) as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Use this function to match an image file with a device link profile.
Notes:

If target is a file, it specifies the resulting image. If this parameter is a folder, it specifies the location of the resulting image which will have the same name as the original file. If this parameter is nil, the original file is modified.
If a file with the same name already exists, it will be replaced if this parameter replace is set to true.
Returns false if the function fails for any reason.

Quality values:

cmNormalMode	0	This is the default setting. Normal mode indicates that the CMM should use its default method to compromise between performance and resource requirements.
cmDraftMode	1	Draft mode indicates that the CMM should sacrifice quality, if necessary, to minimize resource requirements. Note that the default CMM currently produces the same results for both normal and draft mode.
cmBestMode	2	Best mode indicates that the CMM should maximize resource usage to ensure the highest possible quality.

Intent values:

cmPerceptual	0	All the colors of a given gamut can be scaled to fit within another gamut. This intent is best suited to realistic images, such as photographic images.
cmRelativeColorimetric	1	The colors that fall within the gamuts of both devices are left unchanged. This intent is best suited to logo images.
cmSaturation	2	The relative saturation of colors is maintained from gamut to gamut. This intent is best suited to bar graphs and pie charts in which the actual color displayed is less important than its vividness.
cmAbsoluteColorimetric	3	This approach is based on a device-independent color space in which the result is an idealized print viewed on a ideal type of paper having a large dynamic range and color gamut.

Requires ColorSync 2.6 or newer.

13.2.10 ColorSyncMatchImageMBS(target as folderitem,replace as boolean,quality as Integer,sourceprofile as ColorSyncProfileMBS,sourceintent as Integer,destprofile as ColorSyncProfileMBS) as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Use this function to color match an image file.
Example:

```
dim f,gg as FolderItem
dim fo,fi as FolderItem
dim ip,op as ColorSyncProfileMBS
dim cw as ColorSyncWorldMBS
dim b as Boolean

gg=SpecialFolder.Desktop.truechild("aaa")
f=SpecialFolder.Desktop.Child("mdchen2.tif")
```

```
fo=GetFolderItem("Generic RGB Profile.icc")
fi=GetFolderItem("Generic CMYK Profile.icc")

ip = fi.OpenAsColorSyncProfileMBS
op = fo.OpenAsColorSyncProfileMBS
cw = new ColorSyncWorldMBS(ip,op)

b=f.ColorSyncMatchImageMBS(gg,true,0,ip,0,op)

window1.backdrop=gg.openaspicture
```

Notes:

If target is a file, it specifies the resulting image. If this parameter is a folder, it specifies the location of the resulting image which will have the same name as the original file. If this parameter is nil, the original file is modified.
If a file with the same name already exists, it will be replaced if this parameter replace is set to true.
Returns false if the function fails for any reason.

Quality values:

cmNormalMode	0	This is the default setting. Normal mode indicates that the CMM should use its default method to compromise between performance and resource requirements.
cmDraftMode	1	Draft mode indicates that the CMM should sacrifice quality, if necessary, to minimize resource requirements. Note that the default CMM currently produces the same results for both normal and draft mode.
cmBestMode	2	Best mode indicates that the CMM should maximize resource usage to ensure the highest possible quality.

Intent values:

cmPerceptual	0	All the colors of a given gamut can be scaled to fit within another gamut. This intent is best suited to realistic images, such as photographic images.
cmRelativeColorimetric	1	The colors that fall within the gamuts of both devices are left unchanged. This intent is best suited to logo images.
cmSaturation	2	The relative saturation of colors is maintained from gamut to gamut. This intent is best suited to bar graphs and pie charts in which the actual color displayed is less important than its vividness.
cmAbsoluteColorimetric	3	This approach is based on a device-independent color space in which the result is an idealized print viewed on a ideal type of paper having a large dynamic range and color gamut.

Requires ColorSync 2.6 or newer.

13.2.11 ColorSyncProofImageMBS(target as folderitem,replace as boolean,quality as Integer,sourceprofile as ColorSyncProfileMBS,sourceintent as Integer,destprofile as ColorSyncProfileMBS,proofprofile as ColorSyncProfileMBS) as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Use this function to proof an image file.
Notes:

If target is a file, it specifies the resulting image. If this parameter is a folder, it specifies the location of the resulting image which will have the same name as the original file. If this parameter is nil, the original file is modified.
If a file with the same name already exists, it will be replaced if this parameter replace is set to true.
Returns false if the function fails for any reason.

Quality values:

cmNormalMode	0	This is the default setting. Normal mode indicates that the CMM should use its default method to compromise between performance and resource requirements.
cmDraftMode	1	Draft mode indicates that the CMM should sacrifice quality, if necessary, to minimize resource requirements. Note that the default CMM currently produces the same results for both normal and draft mode.
cmBestMode	2	Best mode indicates that the CMM should maximize resource usage to ensure the highest possible quality.

Intent values:

cmPerceptual	0	All the colors of a given gamut can be scaled to fit within another gamut. This intent is best suited to realistic images, such as photographic images.
cmRelativeColorimetric	1	The colors that fall within the gamuts of both devices are left unchanged. This intent is best suited to logo images.
cmSaturation	2	The relative saturation of colors is maintained from gamut to gamut. This intent is best suited to bar graphs and pie charts in which the actual color displayed is less important than its vividness.
cmAbsoluteColorimetric	3	This approach is based on a device-independent color space in which the result is an idealized print viewed on a ideal type of paper having a large dynamic range and color gamut.

Requires ColorSync 2.6 or newer.

13.2.12 ColorSyncSetImageProfileMBS(target as folderitem,replace as boolean,index as Integer,profile as ColorSyncProfileMBS) as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Use this function to set a specific embeded profile for a given image.
Notes:

If target is a file, it specifies the resulting image. If this parameter is a folder, it specifies the location of the resulting image which will have the same name as the original file. If this parameter is nil, the original file is modified.
If a file with the same name already exists, it will be replaced if this parameter replace is set to true.
Returns false if the function fails for any reason.
Requires ColorSync 2.6 or newer.

13.2.13 ColorSyncUnembedImageMBS(target as folderitem,replace as boolean) as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** This function will remove any ICC profiles embeded in an image.
Notes:

If target is a file, it specifies the resulting image. If this parameter is a folder, it specifies the location of the resulting image which will have the same name as the original file. If this parameter is nil, the original file is modified.
If a file with the same name already exists, it will be replaced if this parameter replace is set to true.
Returns false if the function fails for any reason.
Requires ColorSync 2.6 or newer.

13.2.14 ColorSyncValidImageMBS as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Is this a valid image for ColorSync?
Notes:

Return values:

0	Windows
1	No ColorSync 2.6 or newer
2	Not valid
3	Valid

You can look in the folder ColorSyncScriptingFolder which picture formates are supported. In Mac OS X

10.1.5 there are TIFF, JPEG and GIF.

(The ColorSyncScriptingFolder function is part of the MBS Plugin)

Requires ColorSync 2.6 or newer.

13.2.15 CountMBS as Integer

Plugin Version: 3.2, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: No. **Function:** Returns the number of items in this folder.
Example:

```
dim f as FolderItem = SpecialFolder.Desktop
MsgBox str(F.Count)+" vs. "+str(F.CountMBS)
```

Deprecated: This item is deprecated and should no longer be used. You can use folderitem.Count instead.
Notes:

The count property of the REALbasic folderitem class is cached.
So if you create a file, the count property may not update.

If you need a more up to date value, you can use the CountMBS function to return the value the Mac OS system software returns.
On any error (e.g. invalid folderitem) the function returns 0.

Windows support added in 4.2dr2.

13.2.16 CreatorAppMBS as FolderItem

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the application that would be launched if you'd call the above Launch method, or NIL if no appropriate app can be located.
Example:

```
dim docfile as folderitem // your document file
dim appfile as folderitem
appfile=docfile.CreatorAppMBS
```

Notes:

This function doesn't work with bundles and should be only used on Mac OS 9.

Use Launch service functions on Mac OS X.
See also:

- 13.2.17 CreatorAppMBS(creatorCode as String) as FolderItem 226

13.2.17 CreatorAppMBS(creatorCode as String) as FolderItem

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a folderitem to the Application which created this file for the given creator code on the volume of the folderitem.
Example:

```
dim myvolume as folderitem // your volume
dim theFile as folderitem // your file
dim appfile as folderitem
dim ok as boolean
dim inFront as Boolean


appfile=myvolume.CreatorAppMBS("iCAB")
' or
ok = theFile.OpenWithAppMBS(myvolume.CreatorAppMBS("RSED"), inFront)
```

Notes:

Returns the application that would be launched if you'd call the above Launch method and if the file had the specified creator code. Returns NIL if no appropriate app can be located.

This method allows you to open a document with a creator code that you specify instead of having to locate the application by your own. Here's an example on how to open any file with ResEdit (whose creator code is 'RSED'):

This function doesn't work with bundles and should be only used on Mac OS 9.
Use Launch service functions on Mac OS X.
See also:

- 13.2.16 CreatorAppMBS as FolderItem 225

13.2.18 EjectVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer

Plugin Version: 10.3, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** This routine ejects the volume specified by folderitem.
Example:

```
dim disk as FolderItem

dim c as Integer = VolumeCount-1
for i as Integer = 0 to c
dim v as FolderItem = volume(i)
if v.Name = "testvolume" then
disk = v
exit
end if
next

if disk = nil then
MsgBox "Please change the name in this code."
else
dim pid as Integer
dim e as Integer = disk.EjectVolumeMBS(false, pid)

if e=0 then
msgBox "Volume unmounted."
else

if pid=0 then
msgBox "Failed to unmount with error: "+str(e)
else
dim name as string
dim p as new ProcessMBS // from Util plugin
p.GetFirstProcess

do
if p.ProcessID = pid then
name = p.Name
end if
loop until not p.GetNextProcess

if len(name)>0 then
msgBox "Failed to unmount with error: "+str(e)
else
MsgBox "Failed to unmount."+EndOfLine+EndOfLine+"The application "+name+" is still using this vol-
ume."+EndOfLine+"Error: "+str(e)
end if

end if
end if
end if
```

Notes:

If the volume cannot be ejected the pid of the process which denied the unmount will be returned in the dissenter parameter. This routine returns after the eject is complete. Ejecting a volume will result in the unmounting of other volumes on the same device.

force: Specify true if you want the volume forcibly unmounted. Force unmounting a volume will very likely result in data loss since the volume will be ejected even if there are open files on it. This option should be reserved for situations such as the backing store for a volume is gone (so the data is lost regardless).
dissenterPID: Optionally, pid of the process which denied the unmount if the unmount is denied.

Returns a Mac OS error code. 0 means no error and -1 is a plugin error if the function can't be called. -47 is returned if the disc is in use.

PS: Seems like on my tests the pid is not set by Apple.

13.2.19 FlushVolumeMBS as Integer

Plugin Version: 3.3, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Asks the Mac OS to flush all write buffers to the disc.

13.2.20 GetFileAttributeMBS as Integer

Console & Web: Yes, Mac: No, Win: No, Linux: No. **Function:** Get the file attributes for the folderitem to the given value. Returns a negative if there is an error.
Notes:

Returns the flAttrib of a file. If you pass in a non-existing file or a folder, a negative error code is returned instead.
The flAttrib is a set of bits with the following meaning:

bit 0,	value 1	file is locked
bit 2,	value 4	resource fork is open
bit 3,	value 8	data fork is open
bit 4,	value 16	item is a directory
bit 7,	value 128	file (one or both forks) is open

(See GetFileFlags for an example on how to check the bits)

On Mac OS X the information whether a file is open is not available.

13.2.21 GetFileFlagsMBS as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Get the file flags for a folderitem.
Example:

```
// For example, testing for a file being invible works like this:
dim fdFlags as Integer
dim fileIsInvisible as boolean
dim f as FolderItem // file

fdFlags = f.GetFileFlagsMBS
if fdFlags <0 then
' ... oops, an error occured
else
fileIsInvisible = BitwiseAnd (fdFlags, & H4000) <>0
end
```

Notes:

Returns the fdFlags of a file. If you pass in a non-existing file or a folder, a negative error code is returned instead.

The fdFlags is a set of bits with the following meaning:

bit 15	value & H8000	isAlias
bit 14	value & H4000	isInvisible
bit 13	value & H2000	hasBundle (has a BNDL resource)
bit 12	value & H1000	nameLocked
bit 11	value & H0800	isStationary
bit 10	value & H0400	hasCustomIcon
bit 8	value & H0100	hasBeenInited (Finder has seen the file since it has been created)
bit 7	value & H0080	hasNoINITs (there is no INIT rsrc in the Extension file)
bit 6	value & H0040	isShared
bits 1-3	value & H000E	color (as a 3-bit value from 0-7)

13.2.22 GetFolderFlagsMBS as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Get the folder flags for the folderitem to the given value. Returns a negative if there is an error.
Notes:

Returns the frFlags of a folder. If you pass in a non-existing folder, a negative error code is returned instead. The frFlags are similar to the fdFlags (see GetFileFlags), but only a subset of them is used with folders.

13.2.23 GetVolumeRefMBS as Integer

Plugin Version: 16.4, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the volume reference number.
Notes: Returns zero in case of error.

13.2.24 IsEjectableVolumeMBS as Boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns true if the file is on a ejectable volume.
Example:

```
dim bool as Boolean
dim f as FolderItem = volume(0)

bool=f.IsEjectableVolumeMBS
```

Notes:

If false is returned it may also be possible that the function is not available (on Mac OS X 10.2) or doesn't make sense. So the volume may be ejectable even if false is returned.

For remote volumes, the eject flag is not set from Apple. That makes sense as those volume are not physically ejected, but just unmounted. So check IsOnRemoteVolumeMBS, too.

13.2.25 IsOnRemoteVolumeMBS as Boolean

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns true if the file is on a remote volume.

13.2.26 KindMBS as string

Console & Web: Yes, Mac: Yes, Win: Yes, Linux: No. **Function:** Returns a string about the kind of the document.
Example:

```
dim s as string
dim file as FolderItem = SpecialFolder.Desktop

s=file.KindMBS

MsgBox s
```

Notes:

e.g. for a Realbasic document on Mac OS X "REALbasic Document" or on Mac OS 9 something like "REALbasic 4.0.2fc6 Mac OS X Document".

This text may be localized.
Added Windows support in 12.4 plugins.

13.2.27 LaunchMBS(inFront as Boolean) as Boolean

Console & Web: Yes, Mac: Yes, Win: Yes, Linux: No. **Function:** Launches a file.
Notes:

In Realbasic 4.5 Realsoftware introduces a new Launch variant: "Launch(inFront)". To be compatible I renamed the old Launch method to MBSLaunch and added a Launch method which is compatible to Realbasic's.

The return value is true if no immediate error occured. It would be false, for instance, if the FolderItem object does not exists, is a folder, or is not allowed to be opened (can happen with files on network volumes, as well as in Mac OS X environments).
Added Windows support in version 3.4.

13.2.28 MacCopyObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** This routine will copy the source object into the destination directory.
Notes:

The source object can be a file or directory.

self: The source object to copy.
DestinationFolder: The destination directory for the copy.
DestinationName: The name for the new object in the destination directory. Pass "" to use the source object

name.
result: Upon successful completion a ref to the newly created object. If source is a directory then target will be the corresponding object in the destination directory.
options: One or more FSFileOperation flags

Requires Mac OS X 10.4.

Use this constants:

kFSFileOperationDefaultOptions	0	Use the default options - no overwrite, fail if any source item cannot be read, cross volume moves OK.
kFSFileOperationOverwrite	1	Replace an item in the destDir that has the same name as an item being moved/copied there.
kFSFileOperationSkipSourcePermissionErrors	2	Skip items that cannot be read and continue copying/moving instead of failing the operation.
kFSFileOperationDoNotMoveAcrossVolumes	4	Do not perform a copy/delete to move an item across volume boundries - fail the operation instead.
kFSFileOperationSkipPreflight	8	Skip the preflight for a directory move/copy. This will limit the status information that can be returned since the totals will not be calculated.

Returns a Mac OS error code. Error code -1 is from the plugin for invalid parameters or the function not being availanle.

13.2.29 MacIsHardLinkedMBS as boolean

Plugin Version: 9.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Whether the file is a hard link.
Notes:

If two directory entries point to the same hard disc space, you have a file which has two directory entries, but only one storage.

This function returns true for files in a Time Machine backup which did not change since the last backup and share their disc space with the other backups.

13.2.30 MacMoveObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** This routine will move the source object into the destination directory.
Notes:

The source object can be a file or directory. If a destName is provided then the object will be renamed as

well as moved. By default a move across volumes will result in a copy and deletion of the original source. The kFSFileOperationDoNotMoveAcrossVolumes flag will cause cross volume moves to do nothing and return an error.

self: The source object to copy.
DestinationFolder: The destination directory for the copy.
DestinationName: The name for the new object in the destination directory. Pass "" to use the source object name.
result: Upon successful completion a ref to the newly created object. If source is a directory then target will be the corresponding object in the destination directory.
options: One or more FSFileOperation flags

Requires Mac OS X 10.4.

Use this constants:

kFSFileOperationDefaultOptions	0	Use the default options - no overwrite, fail if any source item cannot be read, cross volume moves OK.
kFSFileOperationOverwrite	1	Replace an item in the destDir that has the same name as an item being moved/copied there.
kFSFileOperationSkipSourcePermissionErrors	2	Skip items that cannot be read and continue copying/moving instead of failing the operation.
kFSFileOperationDoNotMoveAcrossVolumes	4	Do not perform a copy/delete to move an item across volume boundries - fail the operation instead.
kFSFileOperationSkipPreflight	8	Skip the preflight for a directory move/copy. This will limit the status information that can be returned since the totals will not be calculated.

Returns a Mac OS error code. Error code -1 is from the plugin for invalid parameters or the function not being availanle.

13.2.31 MacMoveObjectToTrashMBS(byref Result as folderitem, Options as Integer) as Integer

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** This routine will move the source object into the trash.
Notes:

The source object can be a file or directory. If the volume the source object resides on does not support a trash folder then this call will return an error (this is the same circumstance that triggers the delete immediately behavior in the Finder).

self: The source object to move to the trash.
result: Upon successful completion a ref the object in the trash. If source is a directory then target will be the corresponding object in the destination directory.

options: One or more FSFileOperation flags

Requires Mac OS X 10.5.

Use this constants:

kFSFileOperationDefaultOptions	0	Use the default options - no overwrite, fail if any source item cannot be read, cross volume moves OK.
kFSFileOperationOverwrite	1	Replace an item in the destDir that has the same name as an item being moved/copied there.
kFSFileOperationSkipSourcePermissionErrors	2	Skip items that cannot be read and continue copying/moving instead of failing the operation.
kFSFileOperationDoNotMoveAcrossVolumes	4	Do not perform a copy/delete to move an item across volume boundries - fail the operation instead.
kFSFileOperationSkipPreflight	8	Skip the preflight for a directory move/copy. This will limit the status information that can be returned since the totals will not be calculated.

Returns a Mac OS error code. Error code -1 is from the plugin for invalid parameters or the function not being availanle.

13.2.32 MacNodeIDMBS as UInt32

Plugin Version: 9.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The node ID for this file or folder.

13.2.33 MacParentDirectoryIDMBS as UInt32

Plugin Version: 9.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The parent directory node ID for this file or folder.

13.2.34 MacResolveNodeIDMBS(NodeID as UInt32) as folderitem

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Resolves a NodeID by searching for a folderitem on the volume with given NodeID.
Example:

```
// get a volume
dim f as FolderItem = volume(0)

// test with desktop
dim d as FolderItem= SpecialFolder.Desktop
```

```
// query node
dim NodeID as UInt32 = d.MacNodeIDMBS

// and search back
dim dest as FolderItem = f.MacResolveNodeIDMBS(nodeid)

MsgBox dest.AbsolutePath
```

Notes:

NodeIDs may not be supported on all volumes.
Returns nil on any error.

13.2.35 OpenAsColorSyncProfileMBS as ColorSyncProfileMBS

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Opens the file as a ColorSync profile.

13.2.36 OpenWithAppMBS(TheApplication as FolderItem, inFront as Boolean) as Boolean

Console & Web: Yes, Mac: Yes, Win: Yes, Linux: No. **Function:** Opens a file using the given application.
Notes:

Similar to Launch (see Folderitem.Launch), with the additional option to specify the application that should be used to open the FolderItem object. Passing nil in the app parameter is functionally identical to calling Launch.

Works with Graphicconverter, but not with Preview!?
Added Windows support in version 3.4.

13.2.37 SetFileFlagsMBS(flags as Integer) as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Set the file flags for the folderitem to the given value. Returns 0 if okay.
Example:

```
dim f as FolderItem
dim err, fdFlags as Integer

// For example, clearing a file's hasCustomIcon flag works like this:
```

```
fdFlags = f.GetFileFlagsMBS
if fdFlags >= 0 then
err = f.SetFileFlagsMBS(BitExclMBS(fdFlags, 10))
if err <>0 then
// ... oops, an error occured
// (for instance, the disk could be write protected)
end
end
```

Notes:

Sets the fdFlags of a file. Returns an error code (or zero if no error occured). Possible error conditions include "disk is write protected" and "file not found".
When changing flags of a file, use GetFileFlags to get the original flags, then clear or set the flags by using BitwiseAnd and BitwiseOr and call SetFileFlags to set the new flags.

13.2.38 SetFolderFlagsMBS(flags as Integer) as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Set the folder flags for the folderitem to the given value. Returns 0 if okay.
Example:

```
Dim f As FolderItem = GetFolderItem("test") // some folder
If f.SetFolderFlagsMBS(BitwiseOr(f.GetFolderFlagsMBS, 4)) <>0 Then
MsgBox "Can't set label to green."
End If
```

Notes:

Sets the frFlags of a folder. Returns an error code (or zero if no error occured). Possible error conditions include "disk is write protected" and "folder not found".
When changing flags of a folder, use GetFolderFlags to get the original flags, then clear or set the flags by using BitwiseAnd and BitwiseOr and call SetFolderFlags to set the new flags.

with values 2, 4 and 8 in the flags, you control the label color in Finder. Example code above uses 4 which is green by default.

13.2.39 UnMountVolumeMBS(force as boolean = false) as Integer

Plugin Version: 10.3, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** This routine unmounts the volume specified by the folderitem.

Example:

```
dim disk as FolderItem

dim c as Integer = VolumeCount-1
for i as Integer = 0 to c
dim v as FolderItem = volume(i)
if v.Name = "monikajuchmes" then
disk = v
exit
end if
next

if disk = nil then
MsgBox "Please change the name in this code."
else
dim e as Integer = disk.UnMountVolumeMBS

if e=0 then
msgBox "Volume unmounted."
else
msgBox "There was an error!"
end if
end if
```

Notes:

If the volume cannot be unmounted the pid of the process which denied the unmount will be returned in the dissenterPID parameter.
This routine returns after the unmount is complete.

force: Specify true if you want the volume forcibly unmounted. Force unmounting a volume will very likely result in data loss since the volume will be ejected even if there are open files on it. This option should be reserved for situations such as the backing store for a volume is gone (so the data is lost regardless).
dissenterPID: Optionally, pid of the process which denied the unmount if the unmount is denied.

Returns a Mac OS error code. 0 means no error and -1 is a plugin error if the function can't be called. -47 is returned if the disc is in use.
See also:

13.2.40 UnMountVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer

Plugin Version: 10.3, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** This routine unmounts the volume specified by the folderitem.
Example:

```
dim disk as FolderItem

dim c as Integer = VolumeCount-1
for i as Integer = 0 to c
dim v as FolderItem = volume(i)
if v.Name = "testvolume" then
disk = v
exit
end if
next

if disk = nil then
MsgBox "Please change the name in this code."
else
dim pid as Integer
dim e as Integer = disk.UnMountVolumeMBS(false, pid)

if e=0 then
msgBox "Volume unmounted."
else

if pid=0 then
msgBox "Failed to unmount with error: "+str(e)
else
dim name as string
dim p as new ProcessMBS // from Util plugin
p.GetFirstProcess

do
if p.ProcessID = pid then
name = p.Name
end if
loop until not p.GetNextProcess

if len(name)>0 then
msgBox "Failed to unmount with error: "+str(e)
else
MsgBox "Failed to unmount."+EndOfLine+EndOfLine+"The application "+name+" is still using this volume."+EndOfLine+"Error: "+str(e)
end if
```

```
end if
end if
end if
```

Notes:

If the volume cannot be unmounted the pid of the process which denied the unmount will be returned in the dissenterPID parameter.
This routine returns after the unmount is complete.

force: Specify true if you want the volume forcibly unmounted. Force unmounting a volume will very likely result in data loss since the volume will be ejected even if there are open files on it. This option should be reserved for situations such as the backing store for a volume is gone (so the data is lost regardless).
dissenterPID: Optionally, pid of the process which denied the unmount if the unmount is denied.

Returns a Mac OS error code. 0 means no error and -1 is a plugin error if the function can't be called. -47 is returned if the disc is in use.

PS: Seems like on my tests the pid is not set by Apple.
See also:

- 13.2.39 UnMountVolumeMBS(force as boolean = false) as Integer 236

13.2.41 VolGetFolderItemIDMBS(createFileIDs as Boolean = true) as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the unique FileID or DirID of a FolderItem.
Notes:

Returns the unique FileID or DirID of a FolderItem. This ID is unique over all items on the same volume. The value 2 always identifies the root directory, all negative values and positive ones above 15 are used for user-created files and folders, while the values 3-15 are used internally by the File System (for the Desktop Database, for example).
If the item does not exists, 0 (zero) is returned instead.

IDs for Folders can always be resolved back to a FolderItem using VolResolveID, while resolving FileIDs only works when they've previously been created explicitly. To create a resolvable FileID, pass true to the createFileIDs parameter. But be aware that if the FileID can not be created (because the disk is locked or because the File System Format does not support it), the call will fail and a zero will be returned!

So, if you are just interested in reading the FileID, pass false to the second parameter. This will not fail even there hasn't been created a resolvable ID for that file yet.

13.2.42 VolSupportsCatSearchMBS as Boolean

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns true if this volume supports Catalog Search which only HFS(+) volumes does for now.
Example:

```
dim v as folderitem
v=volume(0) // boot volume
if v.VolSupportsCatSearchMBS then
msgbox "CatSearchMBS class will be fast!"
end if
```

Notes: Returns true if the volume is valid and supports the CatSearchMBS functions. Returns false otherwise. From this you can tell whether a search will be fast or slow when using CatSearchOpen with the "allowRecursiveSearch" parameter set to true.

13.2.43 VolumeInformationMBS as VolumeInformationMBS

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a VolumeInformationMBS object with detailed information about the volume where the folderitem's file is located on.
Notes: May return nil on errors.

13.2.44 Properties

13.2.45 CommentMBS as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The comment for that file.
Example:

```
dim f as folderitem // your file
f.CommentMBS="Hello world!"
```

Notes:

The comment is limited in Mac OS 9 to 200 chars. (The actual length depends on the file system.)
(Starting with plugin version 3.4 the Carbon code also reads and writes the Classic comment.)
On Realbasic 5.x the plugin version 3.4 converts the string to MacRoman encoding for the Classic comment.
This function sends an AppleEvent to the Finder. It may take some milliseconds.
(on Mac OS X)

Querying comment is not thread safe.

(Read and Write computed property)

13.2.46 FinderLabelMBS as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the color code for the file.
Example:

file.FinderLabelMBS=2

Notes:

The file label is a number between 0 and 7 to give the file a color.
Used in the Classic Finder for labels (and on Mac OS X for Finder replacement or Finder extending utilities)
On reading the value you can get negative values like -43 if the file is not found.

To know labels and colors, please use NSWorkspaceMBS.fileLabelColors and NSWorkspaceMBS.fileLabels methods.
(Read and Write computed property)

13.3 Globals

13.3.1 NewFolderItemMBS(vRefNum as Integer, parID as Integer, name as String) as FolderItem

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Creates a FolderItem from a specified volume, the item's directory ID and its name.
Notes: The vRefNum with value -1 is the boot volume on Mac OS.

13.3.2 NewVolumeFolderItemMBS(vRefNum as Integer) as FolderItem

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Creates a FolderItem from a specified volume based on the volume reference number.
Example:

```
dim f as folderItem

f=NewVolumeFolderItemMBS(-1)
msgBox f.absolutePath
```

Notes:

The vRefNum with value -1 is the boot volume on Mac OS.

Pass in the vRefNum of any mounted volume and it returns the Volume as a FolderItem.
Returns nil if the vRefNum was invalid.

13.3.3 VolResolveIDMBS(volume as FolderItem, id as Integer) as FolderItem

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:**

return a FolderItem for a passed FileID or DirID. If the item can not be resolved, nil is returned instead. The first parameter specified the volume where you want to resolve the ID on.
Example:

```
dim f,g as folderItem
f=SpecialFolder.Desktop
g=VolResolveIDMBS(f,f.MacDirID)
msgBox f.absolutePath
```

Notes: This function returns a FolderItem for a passed FileID or DirID. If the item can not be resolved, nil

is returned instead.
See also:

- 13.3.4 VolResolveIDMBS(vRefNum as Integer, id as Integer) as FolderItem 243

13.3.4 VolResolveIDMBS(vRefNum as Integer, id as Integer) as FolderItem

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:**

return a FolderItem for a passed FileID or DirID. If the item can not be resolved, nil is returned instead.
The first parameter specified the volume where you want to resolve the ID on.
Example:

```
dim f,g as folderItem
f=SpecialFolder.Desktop
g=VolResolveIDMBS(f.macVRefNum,f.MacDirID)
msgBox f.absolutePath
```

Notes:

This function returns a FolderItem for a passed FileID or DirID. If the item can not be resolved, nil is returned instead.
The first parameter specified the volume where you want to resolve the ID on.There is a bug in RB which may say "type mistmatch error" in RB. Than use the other variant of that function.
See also:

- 13.3.3 VolResolveIDMBS(volume as FolderItem, id as Integer) as FolderItem 242

13.3.5 PackCursResourceMBS(content as picture, mask as picture, mousex as Integer, mousey as Integer) as string

Plugin Version: 13.0, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Creates the content of a Cursor resource for Mac OS based on the given pictures.
Example:

```
dim c as Picture = NewPicture(16,16,32)
c.Graphics.ForeColor=rgb(0,0,0)
c.Graphics.drawOval 0,0,16,16

dim m as Picture = NewPicture(16,16,32)
m.Graphics.ForeColor=rgb(0,0,0)
m.Graphics.FillOval 0,0,16,16
m.Graphics.ForeColor=rgb(255,255,255)
m.Graphics.FillOval 4,4,8,8
```

```
dim f as FolderItem = GetTemporaryFolderItem

// please pass valid file type for CreateResourceFork!
dim r as ResourceFork = f.CreateResourceFork("special/any")

dim s as string = PackCursResourceMBS(c,m,7,7)

r.AddResource s,"CURS",128,""

dim cur as MouseCursor = r.getCursor(128)
window1.MouseCursor=Cur
Canvas1.MouseCursor=cur

r.Close
f.Delete // delete the file
```

Notes:

Returns the CURS resource data as string.
Please use 32bit depth picture made with newpicture.
Only useful for Mac Carbon targets.

13.4 class MacFileOperationMBS

13.4.1 class MacFileOperationMBS

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** This class allows you to perform asynchronous file operations on Mac OS X 10.4 like copy and move.
Notes: Available in Mac OS X 10.4.

13.4.2 Methods

13.4.3 Cancel

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Cancels the specified FSFileOperation.
Notes: Lasterror is set.

13.4.4 CopyObject(Item as folderitem, DestinationFolder as folderitem, DestinationName as string, Options as Integer, statusChangeInterval as Double)

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** This routine will start an asynchronous copy of the object specified by Item to the directory specified by DestinationFolder.
Notes:

If DestinationName is provided then the new object will be renamed to DestinationName. If DestinationName is empty then the name of the source object will be used.

You will receive StatusChanged events.

Options: One or more FSFileOperation flags
statusChangeInterval: The minimum time between callbacks within a single stage of an operation in seconds.

13.4.5 CopyObjectSync(SourceItem as folderitem, DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer

Plugin Version: 9.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** This routine will copy the source object into the destination directory.
Notes:

The source object can be a file or directory.

self: The source object to copy.
DestinationFolder: The destination directory for the copy.
DestinationName: The name for the new object in the destination directory. Pass "" to use the source object name.
result: Upon successful completion a ref to the newly created object. If source is a directory then target will be the corresponding object in the destination directory.
options: One or more FSFileOperation flags

Requires Mac OS X 10.4.

Use this constants:

Returns a Mac OS error code. Error code -1 is from the plugin for invalid parameters or the function not being availanle.

kFSFileOperationDefaultOptions	0	Use the default options - no overwrite, fail if any source item cannot be read, cross volume moves OK.
kFSFileOperationOverwrite	1	Replace an item in the destDir that has the same name as an item being moved/copied there.
kFSFileOperationSkipSourcePermissionErrors	2	Skip items that cannot be read and continue copying/moving instead of failing the operation.
kFSFileOperationDoNotMoveAcrossVolumes	4	Do not perform a copy/delete to move an item across volume boundries - fail the operation instead.
kFSFileOperationSkipPreflight	8	Skip the preflight for a directory move/copy. This will limit the status information that can be returned since the totals will not be calculated.

13.4.6 MoveObject(Item as folderitem, DestinationFolder as folderitem, DestinationName as string, Options as Integer, statusChangeInterval as Double)

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** This routine will start an asynchronous move of the object specified by source to the directory specified by DestinationFolder.
Notes:

If DestinationName is provided then the new object will be renamed to destName. If DestinationName is empty then the name of the source object will be used.

By default a move across volumes will result in a copy and deletion of the original source. The kFSFileOperationDoNotMoveAcrossVolumes flag will cause cross volume moves to do nothing and return an error.

Options: One or more FSFileOperation flags
statusChangeInterval: The minimum time between callbacks within a single stage of an operation in seconds.

13.4.7 MoveObjectSync(SourceItem as folderitem, DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer

Plugin Version: 9.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** This routine will move the source object into the destination directory.
Notes:

The source object can be a file or directory. If a destName is provided then the object will be renamed as well as moved. By default a move across volumes will result in a copy and deletion of the original source. The kFSFileOperationDoNotMoveAcrossVolumes flag will cause cross volume moves to do nothing and return an error.

self: The source object to copy.
DestinationFolder: The destination directory for the copy.
DestinationName: The name for the new object in the destination directory. Pass "" to use the source object name.

result: Upon successful completion a ref to the newly created object. If source is a directory then target will be the corresponding object in the destination directory.
options: One or more FSFileOperation flags

Requires Mac OS X 10.4.

Use this constants:

kFSFileOperationDefaultOptions	0	Use the default options - no overwrite, fail if any source item cannot be read, cross volume moves OK.
kFSFileOperationOverwrite	1	Replace an item in the destDir that has the same name as an item being moved/copied there.
kFSFileOperationSkipSourcePermissionErrors	2	Skip items that cannot be read and continue copying/moving instead of failing the operation.
kFSFileOperationDoNotMoveAcrossVolumes	4	Do not perform a copy/delete to move an item across volume boundries - fail the operation instead.
kFSFileOperationSkipPreflight	8	Skip the preflight for a directory move/copy. This will limit the status information that can be returned since the totals will not be calculated.

Returns a Mac OS error code. Error code -1 is from the plugin for invalid parameters or the function not being availanle.

13.4.8 MoveObjectToTrash(Item as folderitem, Options as Integer, statusChangeInterval as Double)

Plugin Version: 9.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** This routine will start an asynchronous move of the object specified by source to the trash.
Notes:

If the volume the source object resides on does not support a trash folder then the operation will return an error (this is the same circumstance that triggers the delete immediately behavior in the Finder).

Options: One or more FSFileOperation flags
statusChangeInterval: The minimum time between callbacks within a single stage of an operation in seconds.

13.4.9 MoveObjectToTrashSync(SourceItem as folderitem, byref Result as folderitem, Options as Integer) as Integer

Plugin Version: 9.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** This routine will move the source object into the trash.
Notes:

The source object can be a file or directory. If the volume the source object resides on does not support a

trash folder then this call will return an error (this is the same circumstance that triggers the delete immediately behavior in the Finder).

self: The source object to move to the trash.
result: Upon successful completion a ref the object in the trash. If source is a directory then target will be the corresponding object in the destination directory.
options: One or more FSFileOperation flags

Requires Mac OS X 10.5.

Use this constants:

kFSFileOperationDefaultOptions	0	Use the default options - no overwrite, fail if any source item cannot be read, cross volume moves OK.
kFSFileOperationOverwrite	1	Replace an item in the destDir that has the same name as an item being moved/copied there.
kFSFileOperationSkipSourcePermissionErrors	2	Skip items that cannot be read and continue copying/moving instead of failing the operation.
kFSFileOperationDoNotMoveAcrossVolumes	4	Do not perform a copy/delete to move an item across volume boundries - fail the operation instead.
kFSFileOperationSkipPreflight	8	Skip the preflight for a directory move/copy. This will limit the status information that can be returned since the totals will not be calculated.

Returns a Mac OS error code. Error code -1 is from the plugin for invalid parameters or the function not being availanle.

See WindowsFileCopyMBS for similar function for Windows.

13.4.10 Status as MacFileOperationStatusMBS

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** This routine returns the current status of an FileOperation.
Notes:

Lasterror is set.
Returns nil on any error.

13.4.11 Properties

13.4.12 Handle as Integer

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The internal handle.
Notes: (Read and Write property)

13.4.13 LastError as Integer

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The last error code.
Notes:

Users report that you get error -50 (parameter error) if you reuse a file operation object for a new operation.
So maybe create a new instance for each operation?
(Read and Write property)

13.4.14 Events

13.4.15 StatusChanged(status as MacFileOperationStatusMBS)

Plugin Version: 9.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** This event is called whenever the status changed.

13.4.16 Constants

13.4.17 kFSFileOperationDefaultOptions=0

Plugin Version: 9.2. **Function:** One of the file operation flags.
Notes: Use the default options - no overwrite, fail if any source item cannot be read, cross volume moves OK.

13.4.18 kFSFileOperationDoNotMoveAcrossVolumes=4

Plugin Version: 9.2. **Function:** One of the file operation flags.
Notes: Do not perform a copy/delete to move an item across volume boundries - fail the operation instead.

13.4.19 kFSFileOperationOverwrite=1

Plugin Version: 9.2. **Function:** One of the file operation flags.
Notes: Replace an item in the destDir that has the same name as an item being moved/copied there.

13.4.20 kFSFileOperationSkipPreflight=8

Plugin Version: 9.2. **Function:** One of the file operation flags.
Notes: Skip the preflight for a directory move/copy. This will limit the status information that can be returned since the totals will not be calculated.

13.4.21 kFSFileOperationSkipSourcePermissionErrors=2

Plugin Version: 9.2. **Function:** One of the file operation flags.
Notes: Skip items that cannot be read and continue copying/moving instead of failing the operation.

13.4.22 kFSOperationStageComplete=3

Plugin Version: 9.2. **Function:** One of the constants for the stage.
Notes: Operation is done.

13.4.23 kFSOperationStagePreflighting=1

Plugin Version: 9.2. **Function:** One of the constants for the stage.
Notes: Operation is calulating sizes and number of items involved in the operation.

13.4.24 kFSOperationStageRunning=2

Plugin Version: 9.2. **Function:** One of the constants for the stage.
Notes: Operation is in progress.

13.4.25 kFSOperationStageUndefined=0

Plugin Version: 9.2. **Function:** One of the constants for the stage.
Notes: Operation has not started yet.

13.5 class MacFileOperationStatusMBS

13.5.1 class MacFileOperationStatusMBS

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** This class represents the status of a file operation.
Notes: Available in Mac OS X 10.4.

13.5.2 Properties

13.5.3 BytesComplete as Int64

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The number of bytes that have been moved/copied by this operation at the time the status call was made.
Notes:

During the preflight stage this value represents the currently known number of bytes that will be copied/moved.
Value is -1 if undefined.
(Read only property)

13.5.4 BytesRemaining as Int64

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The number of bytes that remain to be moved/copied by this operation at the time the status call was made.
Notes:

Value is -1 if undefined.
This value is not available for a directory operation if kFSFileOperationSkipPreflight was specified.
(Read only property)

13.5.5 CurrentItem as FolderItem

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A folderitem to item operation is currently processing.
Notes:

If the operation is complete then currentItem refers to the target item (the new item corresponding to the source item in the destination directory).
(Read and Write property)

13.5.6 Error as Integer

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The error code.
Notes:

Either noErr (0) or an error value which caused the operation to fail.
(Read and Write property)

13.5.7 Handle as Integer

Plugin Version: 16.5, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Queries internal object reference.
Example:

```
dim status as MacFileOperationStatusMBS // your status object
dim d as CFDictionaryMBS = CFDictionaryMBS.dictionaryWithHandle(status.Handle)
dim dd as Dictionary = d.Dictionary
Break
```

Notes:

Value is a CFDictionaryRef reference.
(Read and Write property)

13.5.8 ObjectsComplete as Int64

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The number of objects that have been moved/copied by this operation at the time the status call was made.
Notes:

Value is -1 if undefined.
During the preflight stage this value represents the currently known number of objects that will be copied/moved.
(Read only property)

13.5.9 ObjectsRemaining as Int64

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The number of objects that remain to be moved/copied by this operation at the time the status call was made
Notes:

Value is -1 if undefined.

This value is not available for a directory operation if kFSFileOperationSkipPreflight was specified.
(Read only property)

13.5.10 Stage as Integer

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Current stage of the operation.
Notes:

See this constants for possible values:
kFSOperationStageComplete
kFSOperationStagePreflighting
kFSOperationStageRunning
kFSOperationStageUndefined
(Read and Write property)

13.5.11 Throughput as Int64

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The current throughput for the operation in bytes per second.
Notes:

Value is -1 if undefined.
(Read only property)

13.5.12 TotalBytes as Int64

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The total number of bytes that will be moved/copied by this operation.
Notes:

This value is not available for a directory operation if kFSFileOperationSkipPreflight was specified.
Value is -1 if undefined.
(Read only property)

13.5.13 TotalObjects as Int64

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The total number of objects that will be moved/copied by this operation.
Notes:

Value is -1 if undefined.
This value is not available for a directory operation if kFSFileOperationSkipPreflight was specified.
(Read only property)

13.5.14 TotalUserVisibleObjects as Int64

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The total number of user visibleobjects that will be moved/copied by this operation.
Notes:

Value is -1 if undefined.

This value is not available for a directory operation if kFSFileOperationSkipPreflight was specified. A packaged application is one user visible object even though it is made up of multiple files and directories.
(Read only property)

13.5.15 UserVisibleObjectsComplete as Int64

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The number of user visible objects that have been moved/copied by this operation at the time the status call was made.
Notes:

Value is -1 if undefined.

During the preflight stage this value represents the currently known number of objects that will be copied/moved. A packaged application is one user visible object even though it is made up of multiple files and directories.
(Read only property)

13.5.16 UserVisibleObjectsRemaining as Int64

Plugin Version: 9.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The number of user visible objects that remain to be moved/copied by this operation at the time the status call was made
Notes:

Value is -1 if undefined.

This value is not available for a directory operation if kFSFileOperationSkipPreflight was specified. A packaged application is one user visible object even though it is made up of multiple files and directories.
(Read only property)

13.6 class ResourceForkMBS

13.6.1 class ResourceForkMBS

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** This class is for reading/writing resource forks on Mac.
Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.Create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"
```

Notes:

It is a replacement for ResourceFork class in Real Studio which has been removed for Cocoa and Console targets in Real Studio version 2012r2.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

13.6.2 Methods

13.6.3 AddResource(Data as Memoryblock, ResourceType as String, ID as Integer, Name as String)

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Adds a resource of the Type specified, using the Name and ID specified and fills it with the Data specified.
Notes: We added this method to avoid extra conversion from memoryblock to string when adding data.
See also:

- 13.6.4 AddResource(Data as String, ResourceType as String, ID as Integer, Name as String) 255

13.6.4 AddResource(Data as String, ResourceType as String, ID as Integer, Name as String)

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Adds a resource of the Type specified, using the Name and ID specified and fills it with the Data specified.
Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.Create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"
```

See also:

- 13.6.3 AddResource(Data as Memoryblock, ResourceType as String, ID as Integer, Name as String) 255

13.6.5 Close

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Closes the open resource fork.
Notes: The resource fork will be closed automatically when the instance is destroyed.

13.6.6 Constructor

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The private constructor.

13.6.7 Create(file as folderitem, UseDataFork as boolean = false) as ResourceForkMBS

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Creates a new ResourceFork.
Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.Create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"
```

Notes:

If the file has a resource fork, it is deleted first.
If the file does not exist, it is created.
Returns nil on any error.
If UseDataFork is true, the resources are read/write from data fork.

13.6.8 GetIndResource(ResourceType as String, index as Integer) As String

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the specified resource as a string.
Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"

dim s as string = r.GetIndResource("TEXT", 0)
MsgBox s
```

Notes: Index is zero based.

13.6.9 GetNamedResource(ResourceType as String, Name as String) As String

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the specified resource as a string.
Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"

dim s as string = r.GetNamedResource("TEXT", "just a test")
MsgBox s
```

13.6.10 GetResource(ResourceType as String, ID as Integer) As String

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the specified resource as a string.
Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"

dim s as string = r.GetResource("TEXT", 128)
```

```
MsgBox s
```

13.6.11 GetResourceMemory(ResourceType as String, ID as Integer) As Memoryblock

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns the specified resource as a Memoryblock.
Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"

dim s as MemoryBlock = r.GetResourceMemory("TEXT", 128)
MsgBox s
```

13.6.12 Open(file as folderitem, Write as boolean, UseDataFork as boolean = false) as ResourceForkMBS

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Opens the resource fork of the FolderItem.
Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.Open(f, false)
MsgBox str(r.TypeCount)+" types in file"
```

Notes:

If the FolderItem has no resource fork, OpenResourceFork returns Nil.
Access to the resourcefork is supported only on Macintosh.
If UseDataFork is true, the resources are read/write from data fork.

13.6.13 RemoveResource(ResourceType as String, ID as Integer)

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Removes the specified resource from the resource fork.
Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.Create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"
MsgBox str(r.TypeCount)+" resources"
r.RemoveResource "TEXT", 128
MsgBox str(r.TypeCount)+" resources"
```

13.6.14 ResourceCount(ResourceType as String) as Integer

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the number of resources of the specified type.
Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"

MsgBox str(r.ResourceCount("TEXT")) // shows 1
```

13.6.15 ResourceID(ResourceType as String, index as Integer) as Integer

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the resource ID as an Integer based on the Type and Index passed.
Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.Create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"

MsgBox str(r.ResourceID("TEXT", 0)) // shows 128
```

Notes: This list is zero-based.

13.6.16 ResourceName(ResourceType as String, index as Integer) As String

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the resource name as a string based on the Type and the zero-based index to that type.
Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.Create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"

MsgBox r.ResourceName("TEXT", 0)
```

13.6.17 ResourceSizeOnDisk(ResourceType as String, ID as Integer) as Integer

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Queries the size on disk for a given resource.
Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.Create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"
MsgBox str(r.ResourceSizeOnDisk("TEXT", 128))+" bytes"
```

13.6.18 ResourceType(index as Integer) As String

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the resource type as a string based on the Index passed.
Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"

MsgBox r.ResourceType(0)
```

Notes: This list is zero-based.

13.6.19 UniqueID(ResourceType as String) as Integer

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Finds an unique ID for a given resource type.
Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.create(f)

MsgBox str(R.UniqueID("TEXT"))
```

13.6.20 Properties

13.6.21 Handle as Integer

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The internal handle to the resource fork.
Notes: (Read only property)

13.6.22 LastError as Integer

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The last error code.
Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.Open(f, false) // open read only

r.AddResource "Hello World", "TEXT", 128, "just a test"
MsgBox str(R.LastError) // shows -61, write permission error
```

Notes:

All methods set this property.
(Read and Write property)

13.6.23 Modified as Boolean

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Whether the resource fork has been modified by you.

Notes: (Read only property)

13.6.24 TypeCount as Integer

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The number of resource types present in the resource fork.
Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"

MsgBox str(r.TypeCount) // shows 1
```

Notes: (Read only property)

13.6.25 Writable as Boolean

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Whether the resourcefork was opened writable.
Notes: (Read only property)

13.6.26 ResourceAttributes(ResourceType as String, ID as Integer) as Integer

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Get or set all resource attributes together.
Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.Create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"

MsgBox str(r.ResourceAttributes("TEXT", 128))
// shows 2 which means it has been changed and need to be written to disk soon
```

Notes: (Read and Write computed property)

13.6.27 ResourceLocked(ResourceType as String, ID as Integer) as boolean

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Used to get and set the locked attribute of the resource.
Notes: (Read and Write computed property)

13.6.28 ResourcePreload(ResourceType as String, ID as Integer) as boolean

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Used to get and set the Preload attribute of the resource.
Notes: (Read and Write computed property)

13.6.29 ResourceProtected(ResourceType as String, ID as Integer) as boolean

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Used to get and set the Protected attribute of the resource.
Notes: (Read and Write computed property)

13.6.30 ResourcePurgeable(ResourceType as String, ID as Integer) as boolean

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Used to get and set the Purgeable attribute of the resource.
Notes: (Read and Write computed property)

13.6.31 ResourceSysHeap(ResourceType as String, ID as Integer) as boolean

Plugin Version: 13.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Used to get and set the SysHeap attribute of the resource.
Notes: (Read and Write computed property)

13.7 class VolumeInformationMBS

13.7.1 class VolumeInformationMBS

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Detailed information on Mac volumes.
Notes: This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

13.7.2 Methods

13.7.3 Constructor

Plugin Version: 16.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The private constructor.

13.7.4 Properties

13.7.5 Blocksize as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The size of an allocation block, in bytes.
Notes:

This field is only appropriate for volume formats (such as HFS and HFS Plus) that allocate space in fixed-size pieces; other volume formats may not have a similar concept, and may set this field to zero.
(Read only property)

13.7.6 DataForkClumpSize as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Default data fork clump size.
Notes:

When a fork is automatically grown as it is written, the File Manager attempts to allocate space that is a multiple of the clump size. This field is zero for volume formats that don't support the notion of a clump size.
(Read only property)

13.7.7 DefaultVolume as boolean

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Is this the default volume?
Notes:

Not supported if LimitedInformation is false.
(This property requires Mac OS 9 or newer)
(Read only property)

13.7.8 DriveNumber as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The drive number for the drive (drive queue element) associated with the volume.
Notes: (Read only property)

13.7.9 DriverRefNum as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The driver reference number for the drive (drive queue element) associated with the volume.
Notes: (Read only property)

13.7.10 FileCount as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The total number of files on the volume, or 0 if unknown.
Notes: (Read only property)

13.7.11 FilesOpen as boolean

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Are there files open on this volume?
Notes:

For the boot volume false!?
Not supported if LimitedInformation is false.
(This property requires Mac OS 9 or newer)
(Read only property)

13.7.12 FileSystemID as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Identifies the filesystem implementation that is handling the volume; this is zero for HFS and HFS Plus volumes.
Notes: (Read only property)

13.7.13 FolderCount as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The total number of folders on the volume, or 0 if unknown. Note that no root directory counts.
Notes: (Read only property)

13.7.14 freeBlocks as Int64

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The number of unused allocation blocks on the volume.
Notes:

This field is only appropriate for volume formats (such as HFS and HFS Plus) that allocate space in fixed-size pieces; other volume formats may not have a similar concept, and may set this field to zero.
(Read only property)

13.7.15 Freebytes as Int64

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The number of bytes of free space on the volume.
Notes:

On Mac OS versions before 9.0, this returns never a number bigger than 2 GBytes, even if the disc is bigger.
(Read only property)

13.7.16 HardwareLocked as boolean

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** is the volume locked by hardware?
Notes:

Not supported if LimitedInformation is false.
(This property requires Mac OS 9 or newer)
(Read only property)

13.7.17 LimitedInformation as boolean

Plugin Version: 3.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** True if some properties are not filled.
Notes:

Not all values are supported on Mac OS 8.6
(Read only property)

13.7.18 Name as String

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name of the volume.
Notes:

The name is returned in 16bit Unicode.
RB 4.5 should know how to handle that.
(Read only property)

13.7.19 NextAllocation as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A hint for where to start searching for free space during an allocation.
Notes:

This field is only appropriate for volume formats (such as HFS and HFS Plus) that allocate space in fixed-size pieces; other volume formats may not have a similar concept, and may set this field to zero.
(Read only property)

13.7.20 NextCatalogID as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The next unused catalog node ID.
Notes:

Some volume formats (such as HFS and HFS Plus) use a monotonically increasing number for the catalog node ID (i.e. File ID or Directory ID) of newly created files and directories. For those volume formats, the nextCatalogID is the next file/directory ID that will be assigned. For other volume formats, this field will be zero.
(Read only property)

13.7.21 ResourceForkClumpSize as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Default resource fork clump size.
Notes:

When a fork is automatically grown as it is written, the File Manager attempts to allocate space that is a multiple of the clump size. This field is zero for volume formats that don't support the notion of a clump size.
(Read only property)

13.7.22 Root as Folderitem

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A folderitem to the root of this volume.
Notes:

Not supported if LimitedInformation is false.
(This property requires Mac OS 9 or newer)
(Read only property)

13.7.23 RootFSRef as memoryblock

Plugin Version: 3.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The root folderitem as FSRef packed into a memoryblock.
Notes: (Read only property)

13.7.24 Signature as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** This field is used to distinguish between volume formats supported by a single filesystem implementation.
Notes:

Example values:

```
HFS    & h4244   "BD"
HFS+   & h482B   "H+"
```

(Read only property)

13.7.25 SoftwareLocked as boolean

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** is the volume locked by software?
Notes:

Not supported if LimitedInformation is false.
(This property requires Mac OS 9 or newer)
(Read only property)

13.7.26 Totalblocks as Int64

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The total number of allocation blocks on the volume.
Notes:

This field is only appropriate for volume formats (such as HFS and HFS Plus) that allocate space in fixed-size pieces; other volume formats may not have a similar concept, and may set this field to zero.
(Read only property)

13.7.27 Totalbytes as Int64

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The size of the volume in bytes.
Notes:

On Mac OS versions before 9.0, this returns never a number bigger than 2 GBytes, even if the disc is bigger.
(Read only property)

Chapter 14

Graphics & Pictures

14.1 class Graphics

14.1.1 class Graphics

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Extends Realbasic's Graphics Class.

14.1.2 Methods

14.1.3 clearArcMBS(left as Integer,top as Integer,width as Integer,height as Integer,start as Integer,arc as Integer)

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Clears an Arc inside the rectangle. **Deprecated:** This item is deprecated and should no longer be used. **Notes:** This function is QuickDraw based. It will not be supported in the future when Realbasic uses more and more Quartz drawing functions.

14.1.4 clearOvalMBS(left as Integer,top as Integer,width as Integer,height as Integer)

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Clears the oval inside the rectangle. **Deprecated:** This item is deprecated and should no longer be used. **Notes:** This function is QuickDraw based. It will not be supported in the future when Realbasic uses more and more Quartz drawing functions.

14.1.5 clearRoundRectMBS(left as Integer,top as Integer,width as Integer,height as Integer, arcwidth as Integer, archeight as Integer)

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Clears the round rectangle inside the rectangle.
Deprecated: This item is deprecated and should no longer be used. **Notes:** This function is QuickDraw based. It will not be supported in the future when Realbasic uses more and more Quartz drawing functions.

14.1.6 DrawArcMBS(left as Integer,top as Integer,width as Integer,height as Integer,start as Integer,arc as Integer)

Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Draws an Arc inside the rectangle.
Example:

```
g.DrawArcMBS 0,0,100,100,5,300
```

Notes:

left, top, width and height are the circle bounds and start and end the degrees from where to where you want the circle line to be drawn.

This function is QuickDraw based. It will not be supported in the future when Realbasic uses more and more Quartz drawing functions.

14.1.7 FillArcMBS(left as Integer,top as Integer,width as Integer,height as Integer,start as Integer,arc as Integer)

Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Fills an Arc inside the rectangle.
Example:

```
g.FillArcMBS 0,0,100,100,5,300
```

Notes:

left, top, width and height are the circle bounds and start and end the degrees from where to where you want the circle line to be drawn.

This function is QuickDraw based. It will not be supported in the future when Realbasic uses more and more Quartz drawing functions.

14.1.8 InvertArcMBS(left as Integer,top as Integer,width as Integer,height as Integer,start as Integer,arc as Integer)

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Inverts an Arc inside the rectangle.
Deprecated: This item is deprecated and should no longer be used. **Notes:** This function is QuickDraw based. It will not be supported in the future when Realbasic uses more and more Quartz drawing functions.

14.1.9 InvertOvalMBS(left as Integer,top as Integer,width as Integer,height as Integer)

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Inverts the oval inside the rectangle.
Deprecated: This item is deprecated and should no longer be used. **Notes:** This function is QuickDraw based. It will not be supported in the future when Realbasic uses more and more Quartz drawing functions.

14.1.10 InvertRectMBS(left as Integer,top as Integer,width as Integer,height as Integer)

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Inverts the graphics rectangle.
Deprecated: This item is deprecated and should no longer be used. **Notes:**

Changed in MBS Plugin 2.7. Old function was a function and named Invert.
This function is QuickDraw based. It will not be supported in the future when Realbasic uses more and more Quartz drawing functions.

14.1.11 InvertRoundRectMBS(left as Integer,top as Integer,width as Integer,height as Integer, arcwidth as Integer, archeight as Integer)

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Inverts the round rectangle inside the rectangle.
Deprecated: This item is deprecated and should no longer be used. **Notes:** This function is QuickDraw based. It will not be supported in the future when Realbasic uses more and more Quartz drawing functions.

14.1.12 ScrollMBS(left as Integer, top as Integer, width as Integer, height as Integer, dx as Integer, dy as Integer)

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Scrolls the graphics object.
Deprecated: This item is deprecated and should no longer be used. **Notes:** This function is QuickDraw based. It will not be supported in the future when Realbasic uses more and more Quartz drawing functions.

14.2 class MacPictMBS

14.2.1 class MacPictMBS

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** A class for creating Mac PICT vector pictures.
Example:

```
dim g as Graphics // where to draw
dim pi as MacPictMBS

pi=new MacPictMBS

pi.CreatePicture(200,200)
pi.ForeColor=rgb(255,0,0)
pi.Moveto 0,0
pi.Lineto 200,200

pi.ForeColor=rgb(0,0,0)
pi.Moveto 20,20
pi.DrawText "Hello World"

pi.TextSize=4
pi.DrawString "This is a 4x scaled vector graphic!",20,60

pi.ForeColor=rgb(0,0,255)
pi.Paintoval 10,50,1,1

pi.drawpicture g,0,0,pi.Width*4,pi.Height*4
```

Deprecated: This item is deprecated and should no longer be used. **Notes:**

Use this class if you want to draw vector graphic which user can copy to the clipboard and edit e.g. in AppleWorks.
This class has been deprecated by Apple.

This class is deprecated as Apple deprecated the QuickDraw framework. This class will not work on 64 bit targets.

14.2.2 Methods

14.2.3 close

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** The destructor.
Notes:

There is no need to call this method except you want to free all resources of this object now without waiting for Realbasic to do it for you.
(e.g. some Realbasic versions crash on Windows if there are plugin objects not closed.)

14.2.4 ClosePicture

Plugin Version: 5.4, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Closes the current drawing.

14.2.5 CopyPicture as Integer

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Put the image on the clipboard.
Notes:

After calling this the picture is closed, no more drawing commands are accepted, but you can still draw the picture or make a REALbasic picture.
A Mac OS Error code is returned. (0 if successfull, -1 if function is not available, e.g. on Windows).

14.2.6 CreatePicture(width as Integer, height as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Creates a new picture with the given size.
Notes:

A new picture is created at 72dpi.
All following drawing commands are added to the picture, so don't use the graphics class!

14.2.7 Drawline(x1 as Integer, y1 as Integer, x2 as Integer, y2 as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Draws a line between the given positions.
Example:

```
dim g as MacPictMBS // your picture
dim x1,x2,y1,y2 as Integer

// same as:

g.moveto x1,y1
g.lineto x2,y2
```

14.2.8 Drawpicture(g as graphics,x as Integer, y as Integer, w as Integer, h as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Put the image on the clipboard.
Notes:

After calling this the picture is closed, no more drawing commands are accepted, but you can still copy the picture to the clipboard or make a REALbasic picture.
Drawpicture draws on Mac fine, but on Windows all over the screen.

14.2.9 DrawpictureIntoGWorld(GWorldHandle as Integer,x as Integer, y as Integer, w as Integer, h as Integer)

Plugin Version: 5.4, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Draws the picture into a GWorld handle.
Notes:

Works on Mac and Windows.
Drawpicture draws on Mac fine, but on Windows all over the screen.

14.2.10 DrawString(s as string, x as Integer, y as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Draws a string on the given position.
Notes: Make sure this string is ASCII or MacRoman. Unicode strings won't work.

14.2.11 DrawText(s as string)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Draws a string on the current position.

Notes: Make sure this string is ASCII or MacRoman. Unicode strings won't work.

14.2.12 EraseArc(x as Integer, y as Integer, w as Integer, h as Integer, startangle as Integer, endangle as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Erases the arc.

14.2.13 EraseOval(x as Integer, y as Integer, w as Integer, h as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Erases the oval.

14.2.14 ErasePoly(points() as Integer)

Plugin Version: 5.4, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Erases a polygon. **Notes:** The array must contain points. First x, second y.

14.2.15 EraseRect(x as Integer, y as Integer, w as Integer, h as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Erases the rectangle.

14.2.16 EraseRoundRect(x as Integer, y as Integer, w as Integer, h as Integer, ow as Integer, oh as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Erases the round rectangle.

14.2.17 FrameArc(x as Integer, y as Integer, w as Integer, h as Integer, startangle as Integer, endangle as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Draws the frame for this arc.

14.2.18 FrameOval(x as Integer, y as Integer, w as Integer, h as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Draws the frame for this oval.

14.2.19 FramePoly(points() as Integer)

Plugin Version: 5.4, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Frames a polygon. **Notes:** The array must contain points. First x, second y.

14.2.20 FrameRect(x as Integer, y as Integer, w as Integer, h as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Draws the frame for this rectangle.

14.2.21 FrameRoundRect(x as Integer, y as Integer, w as Integer, h as Integer, ow as Integer, oh as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Draws the frame for this round rectangle.

14.2.22 HidePen

Plugin Version: 5.4, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Hides the pen.

14.2.23 InvertArc(x as Integer, y as Integer, w as Integer, h as Integer, startangle as Integer, endangle as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Inverts the arc.

14.2.24 InvertOval(x as Integer, y as Integer, w as Integer, h as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Inverts the oval.

14.2.25 InvertPoly(points() as Integer)

Plugin Version: 5.4, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Inverts a polygon.
Notes: The array must contain points. First x, second y.

14.2.26 InvertRect(x as Integer, y as Integer, w as Integer, h as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Inverts the rectangle.

14.2.27 InvertRoundRect(x as Integer, y as Integer, w as Integer, h as Integer, ow as Integer, oh as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Inverts the round rectangle.

14.2.28 Line(dh as Integer, dv as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Draws a line from the current position to the new position relative to the old.

14.2.29 LineTo(h as Integer, v as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Draws a line from the current position to the given absolute position.

14.2.30 MakePicture as picture

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Creates a REALbasic picture.
Notes:

After calling this the picture is empty, so you need to create a new picture.
REALbasic seems to raster the image to a bitmap.

14.2.31 Move(dh as Integer, dv as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Moves the pen to the given position relative to the current position.

14.2.32 MoveTo(h as Integer, v as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Moves the pen to the given position.

14.2.33 PaintArc(x as Integer, y as Integer, w as Integer, h as Integer, startangle as Integer, endangle as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Draws the arc.

14.2.34 PaintOval(x as Integer, y as Integer, w as Integer, h as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Draws the oval.

14.2.35 PaintPoly(points() as Integer)

Plugin Version: 5.4, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Paints a polygon. **Notes:** The array must contain points. First x, second y.

14.2.36 PaintRect(x as Integer, y as Integer, w as Integer, h as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Draws the rectangle.

14.2.37 PaintRoundRect(x as Integer, y as Integer, w as Integer, h as Integer, ow as Integer, oh as Integer)

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Draws the round rectangle.

14.2.38 PenNormal

Plugin Version: 5.4, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Resets the pen to normal state.

14.2.39 PenSize(width as Integer, height as Integer)

Plugin Version: 5.4, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Sets the pen size.

14.2.40 ShowPen

Plugin Version: 5.4, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Shows the pen.

14.2.41 StringWidth(s as string) as Integer

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Returns the width in pixel needed for a string.

14.2.42 Properties

14.2.43 Height as Integer

Plugin Version: 9.6, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** The height used in the constructor.
Notes: (Read only property)

14.2.44 PicHandle as Integer

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** The current handle for the picture.
Notes:

If PicHandle=0 then you can't draw anything because there is no picture.
(Read and Write property)

14.2.45 Width as Integer

Plugin Version: 9.6, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** The width used in the constructor.
Notes: (Read only property)

14.2.46 BackColor as color

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** The current background color.
Notes: (Read and Write computed property)

14.2.47 ForeColor as color

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** The current foreground color.
Notes: (Read and Write computed property)

14.2.48 PenHeight as Integer

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** The current pen height.
Notes: (Read and Write computed property)

14.2.49 PenWidth as Integer

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** The current pen width.
Notes: (Read and Write computed property)

14.2.50 PicHandleData as string

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Returns the data of the used pichandle as a string.
Example:

```
dim m as new MacPictMBS
```

```
m.CreatePicture 100, 100
m.Moveto 20, 20
m.Lineto 80, 80

dim data as string = m.PicHandleData
MsgBox str(lenb(data))+" bytes"

Backdrop = m.MakePicture
```

Notes:

Returns "" on any error.
Only the pict data. Not including the 512 byte header which the Graphicsexporter class creates in front of the data.
(Read and Write computed property)

14.2.51 PicHandleDataMemory as MemoryBlock

Plugin Version: 13.0, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Returns the data of the used pichandle as a memoryblock.
Example:

```
dim m as new MacPictMBS

m.CreatePicture 100, 100
m.Moveto 20, 20
m.Lineto 80, 80

dim data as Memoryblock = m.PicHandleDataMemory
MsgBox str(data.size)+" bytes"

Backdrop = m.MakePicture
```

Notes:

Returns nil on any error.
Only the pict data. Not including the 512 byte header which the Graphicsexporter class creates in front of the data.
(Read and Write computed property)

14.2.52 TextFace as Integer

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** The current text face.
Notes:

Values you can combine:

bold	1	Bold style
italic	2	Italic style
uline	4	Underlined style
outline	8	Outlined style
shadow	16	Shadowed style
condense	32	Condensed style
extend	64	Extended style

(Read and Write computed property)

14.2.53 TextMode as Integer

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** The current text mode.
Notes:

The TextMode procedure sets the transfer mode for drawing text in the current
graphics port. The transfer mode determines the interplay between what an application is drawing (the source) and what already exists on the display device (the destination), resulting in the text display.

There are two basic kinds of modes: pattern (pat) and source (src). Source is the kind that you use for drawing text. There are four basic Boolean operations: Copy, Or, Xor, and Bic (bit clear), each of which has an inverse variant in which the source is inverted before the transfer, yielding eight operations in all. Original QuickDraw supports these eight transfer modes. Color QuickDraw enables your application to achieve color effects within those basic transfer modes, and offers an additional set of transfer modes that perform arithmetic operations on the RGB values of the source and destination pixels. See the chapter "Color QuickDraw" in Inside Macintosh: Imaging for a complete discussion of the arithmetic transfer modes. Other transfer modes are grayishTextOr, transparent mode, and text mask mode.

Table shows the eight basic transfer modes and their effects on the destination pixels:

This is how color affects these transfer modes when the source pixels are either all black (all 1's) or white (all 0's).

Source	Action on the destination pixel	
	If black source	If white source
srcCopy	Force black	Force white
srcOr	Force black	Leave alone
srcXOr	Invert	Leave alone
srcBic	Force white	Leave alone
NotSrcCopy	Force white	Force black
NotSrcOr	Leave alone	Force black
NotSrcXOr	Leave alone	Invert
NotSrcBic	Leave alone	Force white

Copy
The Copy mode applies the foreground color to the black part of the source (the part containing 1's) and the background color to the white part of the source (the part containing 0's), and replaces the destination with the colored source.

Or
The Or mode applies the foreground color to the black part of the source and replaces the destination with the colored source. The white part of the source isn't transferred
to the destination. If the foreground is black, the drawing will be faster. Copying to a white background always reproduces the source image, regardless of the pixel depth.

Xor
The Xor mode complements the bits in the destination corresponding to the bits equal to 1 in the source. When used on a colored destination, the color of the inverted destination isn't defined.

Bic
The Bic mode applies the background color to the black part of the source and
replaces the destination with the colored source. The white part of the source isn't transferred to the destination. The black part of the source is erased, resulting in white
in the destination.

NotCopy
The NotCopy mode applies the foreground color to the white part of the source and the background color to the black part of the source, and replaces the destination with the colored source. It thus has the effect of reversing the foreground and background colors.

NotOr
The NotOr mode applies the foreground color to the white part of the source and replaces the destination with the colored source. The black part of the source isn't transferred to the destination. If the foreground is black, the drawing will be faster.

NotXor
The NotXor mode inverts the bits that are 0 in the source. When used on a colored destination, the color of the inverted destination isn't defined.

NotBic
The NotBic mode applies the background color to the white part of the source and replaces the destination with the colored source. The black part of the source isn't transferred to the destination.

The arithmetic transfer modes are addOver, addPin, subOver, subPin, adMax, adMin, and blend. For color, the arithmetic modes change the destination pixels by performing arithmetic operations on the source and destination pixels. Arithmetic transfer modes calculate pixel values by adding, subtracting, or averaging the RGB components of the source and destination pixels. They are most useful for 8-bit color, but they work on 4-bit and 2-bit color also. When the destination bitmap is one bit deep, the mode reverts to the basic transfer mode that best approximates the arithmetic mode requested.

The grayishTextOr transfer mode draws dimmed text on the screen. You can use it for black-and-white or color graphics ports. The grayishTextOr transfer mode is not considered a standard transfer mode because currently it is not stored in pictures, and printing with it is undefined. (It does not pass through the QuickDraw bottleneck routines.)

The transparent mode replaces the destination pixel with the source pixel if the source pixel isn't equal to the background color. This mode is most useful in 8-bit, 4-bit, or 2-bit color modes.

Note
Multibit fonts may have a specific color. Some transfer modes may not produce the desired results with a multibit font. However, the arithmetic modes, transparent mode, and hilite mode work equally well with single bit and multibit fonts. Multibit fonts draw quickly in srcOr mode only if the foreground is white. Single bit fonts draw quickly in srcOr mode only if the foreground is black. Grayscale fonts produce a spectrum of colors, rather than just the foreground and background colors. The following table shows transfer mode constants and
their selectors.

Table: Transfer mode constants and selectors:

(Read and Write computed property)

14.2.54 TextSize as Integer

Plugin Version: 2.8, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** The current text size.
Notes: (Read and Write computed property)

srcCopy	0	If the source is black, apply the foreground color to the destination; if the source is white, apply the background color; otherwise apply weighted portions of the foreground and background colors.
srcOr	1	If the source is black, apply the foreground color to the destination; if the source is white, do nothing; otherwise apply weighted portions of the foreground color.
srcXor	2	If the source is black, invert the destination (this operation is undefined for a colored destination). Otherwise, do nothing.
srcBic	3	If the source is black, apply the background color to the destination. If the source is white, do nothing. Otherwise, apply weighted portions of the background color.
notSrcCopy	4	If the source is white, apply the foreground color to the destination; if the source is black, apply the background color; otherwise apply weighted portions of the foreground and background colors.
notSrcOr	5	If the source is white, apply the foreground color to the destination; if the source is black, do nothing; otherwise apply weighted portions of the foreground color.
notSrcXor	6	If the source is white, invert the destination (this operation is undefined for a colored destination pixel). Otherwise, do nothing.
notSrcBic	7	If the source is white, apply the background color to the destination. If the source is black, do nothing. Otherwise, apply weighted portions of the background color.
Text dimming:		
grayishTextOr	49	Dim the destination. If in color, replace it with a blend of the foreground and background; if black-and-white, replace it with dithered black and white. This mode is used primarily for text.
Highlighting:		
hilite	50	Replace the background color with the highlight color.
Arithmetic modes:		
blend	32	Replace the destination with a blend of the source and destination colors. If the destination is a bitmap, this is the same as srcCopy.
addPin	33	Replace the destination with the sum of the source and destination, up to a maximum value. If the destination is a bitmap, this is the same as srcBic.
addOver	34	Replace the destination with the sum of the source and destination, but if the resulting red, green, or blue value exceeds 65536, then subtract 65536 from it. If the destination is a bitmap, this is the same as srcXor.
subPin	35	Replace the destination with the difference between the source and destination, but not less than a minimum value. If the destination is a bitmap, this is the same as srcOr.
addMax	37	Compare the source and destination, and replace the destination with the greater value of each of the red, green, and blue components. If the destination is a bitmap, this is the same as srcBic.
subOver	38	Replace the destination with the difference between the source and destination, but if the resulting red, green, or blue value is negative, then add 65536 to it. If the destination is a bitmap, this is the same as srcXor.
addMin	39	Compare the source and destination, and replace the destination with the lesser value of each of the red, green, and blue components. If the destination is a bitmap, this is the same as srcOr.
ditherCopy	64	Replace the destination with a dither mix of the source and destination.
Transparent mode:		
transparent	36	Replace the destination with the source if the source is not equal to the background.

14.3 Globals

14.3.1 NewColorPictureMBS(width as Integer, height as Integer, depth as Integer, temp as boolean) as Picture

Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Creates a new picture like RB's NewPicture.
Example:

```
dim p as picture
p=NewColorPictureMBS(1024,768,32,true)
```

Notes:

Supported color depth: 1, 2, 4, 8, 16, 24 and 32bits.
On Windows the function uses RB's NewPicture to create the picture.
If Temp=true the picture uses temporary memory on Mac OS Classic.
With MBS Plugin 3.1 the function always trys temporary memory first, so the temp parameter is no longer needed.

14.3.2 NewGrayPictureMBS(width as Integer, height as Integer, depth as Integer, temp as boolean) as Picture

Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** Creates a new gray picture like RB's NewPicture.
Example:

```
dim p as picture
p=NewGrayPictureMBS(1024,768,8,true)
```

Notes:

Supported color depth: 1, 2, 4, 8, 16, 24 and 32bits.
On Windows the function uses RB's NewPicture to create the picture.
If Temp=true the picture uses temporary memory on Mac OS Classic.
With MBS Plugin 3.1 the function always trys temporary memory first, so the temp parameter is no longer needed.

14.4 class Picture

14.4.1 class Picture

Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Extends Realbasic's Picture Class.

14.4.2 Methods

14.4.3 DrawPictureMaskMBS(source as picture,mask as picture,sLeft as Integer,sTop as Integer,sWidth as Integer,sHeight as Integer,dLeft as Integer,dTop as Integer,dWidth as Integer,dHeight as Integer) as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Draws a picture into another picture and uses a mask.
Deprecated: This item is deprecated and should no longer be used. **Notes:** Works only with BITMAP pictures.

14.4.4 DrawPictureMBS(source as picture,sLeft as Integer,sTop as Integer,sWidth as Integer,sHeight as Integer,dLeft as Integer,dTop as Integer,dWidth as Integer,dHeight as Integer,mode as Integer) as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Draws a picture into another picture.
Deprecated: This item is deprecated and should no longer be used. **Notes:**

The constants for mode:

Works only with GWorld pictures on Carbon targets.

14.4.5 GWorldPixelRowBytesMBS as Integer

Plugin Version: 8.7, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns a row byte size of a GWorld Picture.
Deprecated: This item is deprecated and should no longer be used. **Notes:**

Returns zero on any error.
Works only with Pictures made using a Gworld, e.g. using NewPicture() on Mac OS.

14.4.6 PicHandleDataMBS as string

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the picture data as PICT data.
Example:

```
dim p as Picture
dim s as string

p=LogoMBS(500)
Backdrop=p

s=p.PicHandleDataMBS

title= str(len(s))

EditField1.text=S
```

Deprecated: This item is deprecated and should no longer be used. **Notes:**

If the picture is not a PicHandle picture, it is first converted.
The resulting data may have a 512 byte header which must be removed if you want to put the data into the clipboard.
Returns "" on any error.

14.4.7 PicHandleMBS as picture

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Clones the picture as a PicHandle picture.
Example:

```
dim p as picture

p=newpicture(100,100,32)
p.graphics.drawline 0,0,100,100

imageWell1.Image=p.picHandleMBS
```

Deprecated: This item is deprecated and should no longer be used. **Notes:**

A Realbasic picture object may contain an icon, a bitmap, a picture handle or something else what Realbasic will support as a picture in the future.
This function return the picture as a pichandle picture so you can use it for an imagewell control.
Not sure if masks or transparency will work.

Returns nil on Cocoa, Windows and Linux targets.

14.4.8 Properties

14.4.9 GWorldPixelDataMBS as memoryblock

Plugin Version: 8.7, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns a memoryblock pointing to the pixels of a GWorld Picture.
Deprecated: This item is deprecated and should no longer be used. **Notes:**

Returns nil on any error.
Works only with Pictures made using a Gworld, e.g. using NewPicture() on Mac OS.
(Read and Write computed property)

srcCopy	0	If the source is black, apply the foreground color to the destination; if the source is white, apply the background color; otherwise apply weighted portions of the foreground and background colors.
srcOr	1	If the source is black, apply the foreground color to the destination; if the source is white, do nothing; otherwise apply weighted portions of the foreground color.
srcXor	2	If the source is black, invert the destination (this operation is undefined for a colored destination). Otherwise, do nothing.
srcBic	3	If the source is black, apply the background color to the destination. If the source is white, do nothing. Otherwise, apply weighted portions of the background color.
notSrcCopy	4	If the source is white, apply the foreground color to the destination; if the source is black, apply the background color; otherwise apply weighted portions of the foreground and background colors.
notSrcOr	5	If the source is white, apply the foreground color to the destination; if the source is black, do nothing; otherwise apply weighted portions of the foreground color.
notSrcXor	6	If the source is white, invert the destination (this operation is undefined for a colored destination pixel). Otherwise, do nothing.
notSrcBic	7	If the source is white, apply the background color to the destination. If the source is black, do nothing. Otherwise, apply weighted portions of the background color.
Text dimming:		
grayishTextOr	49	Dim the destination. If in color, replace it with a blend of the foreground and background; if black-and-white, replace it with dithered black and white. This mode is used primarily for text.
Highlighting:		
hilite	50	Replace the background color with the highlight color.
Arithmetic modes:		
blend	32	Replace the destination with a blend of the source and destination colors. If the destination is a bitmap, this is the same as srcCopy.
addPin	33	Replace the destination with the sum of the source and destination, up to a maximum value. If the destination is a bitmap, this is the same as srcBic.
addOver	34	Replace the destination with the sum of the source and destination, but if the resulting red, green, or blue value exceeds 65536, then subtract 65536 from it. If the destination is a bitmap, this is the same as srcXor.
subPin	35	Replace the destination with the difference between the source and destination, but not less than a minimum value. If the destination is a bitmap, this is the same as srcOr.
addMax	37	Compare the source and destination, and replace the destination with the greater value of each of the red, green, and blue components. If the destination is a bitmap, this is the same as srcBic.
subOver	38	Replace the destination with the difference between the source and destination, but if the resulting red, green, or blue value is negative, then add 65536 to it. If the destination is a bitmap, this is the same as srcXor.
addMin	39	Compare the source and destination, and replace the destination with the lesser value of each of the red, green, and blue components. If the destination is a bitmap, this is the same as srcOr.
ditherCopy	64	Replace the destination with a dither mix of the source and destination.
Transparent mode:		
transparent	36	Replace the destination with the source if the source is not equal to the background.

Chapter 15

Keychain

15.1 class KeychainItemMBS

15.1.1 class KeychainItemMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The class for a keychain item.
Example:

```
Const kDomain = "koingosw.com"
Const kUsername = "koingosoftware"
Const kPath = ""
Const kProtocol = "http"

Dim xPassword As MemoryBlock = "testpassword"
Dim xAdded As KeychainItemMBS

Dim dQuery as new Dictionary
dQuery.Value(KeychainManagerMBS.kSecAttrAuthenticationType) = KeychainManagerMBS.kSecAttrAuthenticationTypeHTMLForm
dQuery.Value(KeychainManagerMBS.kSecClass) = KeychainManagerMBS.kSecClassInternetPassword
If Len(kDomain) <>0 Then dQuery.Value(KeychainManagerMBS.kSecAttrServer) = kDomain
If Len(kUsername) <>0 Then dQuery.Value(KeychainManagerMBS.kSecAttrAccount) = kUsername
If Len(kProtocol) <>0 Then dQuery.Value(KeychainManagerMBS.kSecAttrProtocol) = kProtocol
dQuery.Value(KeychainManagerMBS.kSecAttrComment) = "default"
dQuery.Value(KeychainManagerMBS.kSecAttrDescription) = "Web form password"
dQuery.Value(KeychainManagerMBS.kSecAttrLabel) = kDomain + " (" + kUsername + ")"
dQuery.Value(KeychainManagerMBS.kSecValueData) = xPassword

If Not KeychainManagerMBS.AddItem(KeychainManagerMBS.Default,dQuery) Then
Break
```

```
End If
```

15.1.2 Methods

15.1.3 Delete

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Deletes a keychain item from the default keychain's permanent data store.
Notes: Lasterror is set.

15.1.4 ItemClass as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Queries the item class for this item.
Example:

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim keychain as KeychainMBS = nil // use default

dim item as KeychainItemMBS = KeychainManagerMBS.FindGenericItem(keychain, ServiceName, Username)
MsgBox item.itemclass // shows genp for generic password
```

Notes: Lasterror is set.

15.1.5 Keychain as KeychainMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the keychain object of a given keychain item.
Notes: Lasterror is set.

15.1.6 PersistentReference as Memoryblock

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Creates a persistent reference for a keychain item.
Notes:

Unlike normal references, a persistent reference may be stored on disk or passed between processes. You can convert a persistent reference into an ordinary keychain item reference (KeychainItemMBS) by calling the KeychainManagerMBS.ItemFromPersistentReference function.
Lasterror is set.

15.1.7 Properties

15.1.8 Handle as Integer

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The internal object reference.
Notes: (Read and Write property)

15.1.9 Lasterror as Integer

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The last error code returned by one of the methods.
Notes:

You can use KeychainManagerMBS.ErrorMessageString function to get a text message.
The error code -1 is set by plugin if function is missing or parameters are wrong.
(Read and Write property)

15.1.10 Account as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Convenience property to get/set the account attribute as UTF-8 text.
Example:

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim keychain as KeychainMBS = nil // use default

dim item as KeychainItemMBS = KeychainManagerMBS.FindGenericItem(keychain, ServiceName, Username)

MsgBox "Label: "+item.label+EndOfLine+_
"Comment: "+item.comment+EndOfLine+_
"Account: "+item.Account
```

Notes:

Lasterror is set.
(Read and Write computed property)

15.1.11 AttributeData(attributeName as string) as memoryblock

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Get or set an attribute as raw data (memoryblock).
Example:

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim keychain as KeychainMBS = nil // use default

dim item as KeychainItemMBS = KeychainManagerMBS.FindGenericItem(keychain, ServiceName, Username)

dim data as MemoryBlock = item.AttributeData(item.kSecCreationDateItemAttr)
dim text as string = DefineEncoding(data, encodings.UTF8)
MsgBox text
```

Notes:

Lasterror is set.
(Read and Write computed property)

15.1.12 AttributeText(attributeName as string) as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Get or set an attribute as an UTF-8 text.
Example:

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim keychain as KeychainMBS = nil // use default

dim item as KeychainItemMBS = KeychainManagerMBS.FindGenericItem(keychain, ServiceName, Username)

dim text as string = item.AttributeText(item.kSecCreationDateItemAttr)
MsgBox text
```

Notes:

Lasterror is set.
(Read and Write computed property)

15.1.13 Comment as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Convenience property to get/set the comment attribute as UTF-8 text.
Example:

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim keychain as KeychainMBS = nil // use default

dim item as KeychainItemMBS = KeychainManagerMBS.FindGenericItem(keychain, ServiceName, Username)

MsgBox "Label: "+item.label+EndOfLine+_
"Comment: "+item.comment+EndOfLine+_
"Account: "+item.Account
```

Notes:

Lasterror is set.
(Read and Write computed property)

15.1.14 Description as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Convenience property to get/set the description attribute as UTF-8 text.
Example:

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim keychain as KeychainMBS = nil // use default

dim item as KeychainItemMBS = KeychainManagerMBS.FindGenericItem(keychain, ServiceName, Username)
MsgBox item.Description
```

Notes:

Lasterror is set.

(Read and Write computed property)

15.1.15 Label as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Convenience property to get/set the label attribute as UTF-8 text.
Example:

```
dim items() as KeychainItemMBS = KeychainManagerMBS.AllItems(nil, KeychainManagerMBS.kSecGenericPasswordItemClass)
dim labels() as string

for each item as KeychainItemMBS in items
labels.append item.label
next

break // see array of labels
```

Notes:

Lasterror is set.
(Read and Write computed property)

15.1.16 Password as memoryblock

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Queries the password or sets a new one.
Example:

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim keychain as KeychainMBS = nil // use default

dim item as KeychainItemMBS = KeychainManagerMBS.FindGenericItem(keychain, ServiceName, Username)

dim passwordData as MemoryBlock = item.Password
dim password as string = DefineEncoding(passwordData, encodings.UTF8)
MsgBox Password
```

Notes:

Lasterror is set.
(Read and Write computed property)

15.1.17 Service as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Convenience property to get/set the service attribute as UTF-8 text.
Example:

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim keychain as KeychainMBS = nil // use default

dim item as KeychainItemMBS = KeychainManagerMBS.FindGenericItem(keychain, ServiceName, Username)
MsgBox item.Service
```

Notes:

Lasterror is set.
(Read and Write computed property)

15.1.18 Constants

15.1.19 kSecAccountItemAttr = "acct"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the account attribute.
You use this tag to set or get a string that represents the user account. It also applies to generic, Internet, and AppleShare password items. Keychain strings should use UTF-8 encoding.

15.1.20 kSecAddressItemAttr = "addr"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the address attribute.
You use this tag to set or get a value of type string that represents the AppleTalk zone name, or the IP or domain name that represents the server address. This is unique to AppleShare password attributes. Key-

chain strings should use UTF-8 encoding.

15.1.21 kSecAlias = "alis"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes: Indicates an alias.

15.1.22 kSecAuthenticationTypeItemAttr = "atyp"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the authentication type attribute.
You use this tag to set or get a value of type SecAuthenticationType that represents the Internet authentication scheme. For possible authentication values, see "Keychain Authentication Type Constants." This is unique to Internet password attributes.

15.1.23 kSecCertificateEncoding = "cenc"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes: Indicates a CSSM_CERT_ENCODING type.

15.1.24 kSecCertificateType = "ctyp"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes: Indicates a CSSM_CERT_TYPE type.

15.1.25 kSecCommentItemAttr = "icmt"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the comment attribute.
You use this tag to set or get a string value that represents a user-editable string containing comments for this item. Keychain strings should use UTF-8 encoding.

15.1.26 kSecCreationDateItemAttr = "cdat"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the creation date attribute.
You use this tag to get a string value that represents the date the item was created, expressed in Zulu Time format ("YYYYMMDDhhmmssZ"). This is the native format for stored time values in the CDSA specification (defined as CSSM_DB_ATTRIBUTE_FORMAT_TIME_DATE in the CSSM_DB_ATTRIBUTE_FORMAT enumeration, Section 17.2.6.). When specifying the creation date as input to a function (for example, SecKeychainSearchCreateFromAttributes), you may alternatively provide a numeric value of type UInt32 or SInt64, expressed as seconds since 01 January 1904.

15.1.27 kSecCreatorItemAttr = "crtr"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the creator attribute.
You use this tag to set or get a value of type FourCharCode that represents the item's creator.

15.1.28 kSecCrlEncoding = "crnc"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes: Indicates a CSSM_CRL_ENCODING type.

15.1.29 kSecCrlType = "crtp"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes: Indicates a CSSM_CRL_TYPE type.

15.1.30 kSecCustomIconItemAttr = "cusi"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the custom icon attribute.
Use of this attribute is deprecated. Custom icons for keychains are not supported in OS X.

15.1.31 kSecDescriptionItemAttr = "desc"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the description attribute.
You use this tag to set or get a string value that represents a user-visible string describing this particular kind of item, for example "disk image password". Keychain strings should use UTF-8 encoding.

15.1.32 kSecGenericItemAttr = "gena"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the generic attribute.
You use this tag to set or get a value of untyped bytes that represents a user-defined attribute. This is unique to generic password attributes.

15.1.33 kSecInvisibleItemAttr = "invi"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the invisible attribute.
You use this tag to set or get a value of type Boolean that indicates whether the item is invisible (that is, should not be displayed).

15.1.34 kSecLabelItemAttr = "labl"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the label attribute.
You use this tag to set or get a string value that represents a user-editable string containing the label for this item. Keychain strings should use UTF-8 encoding.

15.1.35 kSecModDateItemAttr = "mdat"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the modification date attribute.
You use this tag to get a string value that represents the date the item was created, expressed in Zulu Time format ("YYYYMMDDhhmmssZ"). This is the native format for stored time values in the CDSA specification (defined as CSSM_DB_ATTRIBUTE_FORMAT_TIME_DATE in the CSSM_DB_ATTRIBUTE_FORMAT enumeration, Section 17.2.6.). When specifying the creation date as input to a function (for example, SecKeychainSearchCreateFromAttributes), you may alternatively provide a numeric value of type UInt32 or SInt64, expressed as seconds since 01 January 1904.

15.1.36 kSecNegativeItemAttr = "nega"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the negative attribute.
You use this tag to set or get a value of type Boolean that indicates whether there is a valid password associated with this keychain item. This is useful if your application doesn't want a password for some particular service to be stored in the keychain, but prefers that it always be entered by the user. The item, which is typically invisible and with zero-length data, acts as a placeholder.

15.1.37 kSecPathItemAttr = "path"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the path attribute.
You use this tag to set or get a string value that represents the path. This is unique to Internet password attributes. Keychain strings should use UTF-8 encoding.

15.1.38 kSecPortItemAttr = "port"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the port attribute.
You use this tag to set or get a value of type UInt32 that represents the Internet port number. This is unique to Internet password attributes.

15.1.39 kSecProtocolItemAttr = "ptcl"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the protocol attribute.
You use this tag to set or get a value of type SecProtocolType that represents the Internet protocol. For possible protocol type values, see "Keychain Protocol Type Constants." This is unique to AppleShare and Internet password attributes.

15.1.40 kSecScriptCodeItemAttr = "scrp"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the script code attribute.
You use this tag to set or get a value of type ScriptCode that represents the script code for all strings. Use of this attribute is deprecated; string attributes should always be stored in UTF-8 encoding.

15.1.41 kSecSecurityDomainItemAttr = "sdmn"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the security domain attribute.
You use this tag to set or get a value that represents the Internet security domain. This is unique to Internet password attributes.

15.1.42 kSecServerItemAttr = "srvr"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the server attribute.
You use this tag to set or get a string that represents the Internet server's domain name or IP address. This is unique to Internet password attributes. Keychain strings should use UTF-8 encoding.

15.1.43 kSecServiceItemAttr = "svce"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the service attribute.
You use this tag to set or get a string that represents the service associated with this item, for example, "iTools". This is unique to generic password attributes. Keychain strings should use UTF-8 encoding.

15.1.44 kSecSignatureItemAttr = "ssig"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the server signature attribute.
You use this tag to set or get a value of type SecAFPServerSignature that represents the server signature block. This is unique to AppleShare password attributes.

15.1.45 kSecTypeItemAttr = "type"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the type attribute.
You use this tag to set or get a value of type FourCharCode that represents the item's type.

15.1.46 kSecVolumeItemAttr = "vlme"

Plugin Version: 13.1. **Function:** One of the keychain item attributes.
Notes:

Identifies the volume attribute.
You use this tag to set or get a string value that represents the AppleShare volume. This is unique to AppleShare password attributes. Keychain strings should use UTF-8 encoding.

15.2 module KeychainManagerMBS

15.2.1 module KeychainManagerMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The module for global keychain functions.
Example:

```
// build query
dim query as new Dictionary

dim domain as string = "test.test"
dim username as string = "testuser"

query.value( KeychainManagerMBS.kSecAttrServer ) = Domain
query.value( KeychainManagerMBS.kSecAttrAccount ) = Username
query.value( KeychainManagerMBS.kSecClass ) = KeychainManagerMBS.kSecClassInternetPassword
query.Value( KeychainManagerMBS.kSecMatchLimit ) = KeychainManagerMBS.kSecMatchLimitOne

// Build Dictionary with new values
dim newValues as new Dictionary
newValues.value( KeychainManagerMBS.kSecAttrComment ) = "Just a test"

// and update
if KeychainManagerMBS.UpdateItem(query, newValues) then
MsgBox "OK"
else
MsgBox "Failed."
end if
```

15.2.2 Methods

15.2.3 AddGenericPassword(keychain as KeychainMBS, serviceName as string, accountName as string, password as memoryblock) as KeychainItemMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Adds a new generic password to a keychain.
Example:

```
// add password with password in MemoryBlock
dim Password as string = "mysecret"
dim PasswordData as MemoryBlock = ConvertEncoding(Password, encodings.UTF8)
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
```

```
dim keychain as KeychainMBS = nil // use default

call KeychainManagerMBS.AddGenericPassword(keychain, ServiceName, Username, PasswordData)

dim e as Integer = KeychainManagerMBS.LastError
MsgBox str(e)+": "+KeychainManagerMBS.ErrorMessageString(e)
```

Notes:

keychain: A reference to the keychain in which to store a generic password. Pass nil to specify the default keychain.
serviceName: The service name.
accountName: The account name.
password: A buffer containing the password data to be stored in the keychain.

Returns the new keychain item.
Lasterror is set.

The result code errSecNoDefaultKeychain indicates that no default keychain could be found. The result code errSecDuplicateItem indicates that you tried to add a password that already exists in the keychain. The result code errSecDataTooLarge indicates that you tried to add more data than is allowed for a structure of this type. Call ErrorMessageString function to get a human-readable string explaining the result.

This function adds a new generic password to the specified keychain. Required parameters to identify the password are serviceName and accountName, which are application-defined strings.

You can use this function to add passwords for accounts other than the Internet. For example, you might add AppleShare passwords, or passwords for your database or scheduling programs.

This function sets the initial access rights for the new keychain item so that the application creating the item is given trusted access.

This function automatically calls the function Unlock to display the Unlock Keychain dialog box if the keychain is currently locked.
Available in OS X v10.2 and later.
See also:

- 15.2.4 AddGenericPassword(keychain as KeychainMBS, serviceName as string, accountName as string, password as string) as KeychainItemMBS 308

15.2.4 AddGenericPassword(keychain as KeychainMBS, serviceName as string, accountName as string, password as string) as KeychainItemMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Adds a new generic password to a keychain.
Example:

```
// add password with password in string
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim Password as string = "mysecret"
dim keychain as KeychainMBS = nil // use default

call KeychainManagerMBS.AddGenericPassword(keychain, ServiceName, Username, Password)

dim e as Integer = KeychainManagerMBS.LastError
MsgBox str(e)+": "+KeychainManagerMBS.ErrorMessageString(e)
```

Notes: Takes UTF-8 text from password string for the password. Else the same as AddGenericPassword with memoryblock.
See also:

- 15.2.3 AddGenericPassword(keychain as KeychainMBS, serviceName as string, accountName as string, password as memoryblock) as KeychainItemMBS 306

15.2.5 AddInternetPassword(keychain as KeychainMBS, serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string, password as memoryblock) as KeychainItemMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Adds a new Internet password to a keychain.
Notes:

keychain: A reference to the keychain in which to store an Internet password. Pass nil to specify the user's default keychain.
serverName: The server name.
securityDomain: The security domain. This parameter is optional. Pass "" if the protocol does not require it.
accountName: The account name.
path: The character string representing the path.
port: The TCP/IP port number. If no specific port number is associated with this password, pass 0.
protocol: The protocol associated with this password. See Protocol Type Constants for a description of possible values.
authenticationType: The authentication scheme used. See Keychain Authentication Type Constants for

a description of possible values. Pass the constant kSecAuthenticationTypeDefault, to specify the default authentication scheme.
password: A buffer containing the password data to be stored in the keychain.

Returns the new keychain item.
Lasterror is set.

This function adds a new Internet server password to the specified keychain. Required parameters to identify the password are serverName and accountName (you cannot pass "" for both parameters). In addition, some protocols may require an optional securityDomain when authentication is requested. This function optionally returns a reference to the newly added item.

This function sets the initial access rights for the new keychain item so that the application creating the item is given trusted access.

This function automatically calls the function Unlock to display the Unlock Keychain dialog box if the keychain is currently locked.
Available in OS X v10.2 and later.
See also:

- 15.2.6 AddInternetPassword(keychain as KeychainMBS, serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string, password as string) as KeychainItemMBS 309

15.2.6 AddInternetPassword(keychain as KeychainMBS, serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string, password as string) as KeychainItemMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Adds a new Internet password to a keychain.
Example:

```
// add password with password in string
dim serverName as string = "mytest.com"
dim Password as string = "mysecret"
dim PasswordData as MemoryBlock = ConvertEncoding(Password, encodings.UTF8)
dim keychain as KeychainMBS = nil // use default
dim securityDomain as string = "ftp://mytest.com"
dim accountName as string = "myusername"
dim path as string = "/test"
dim port as Integer = 22
dim protocol as string = KeychainManagerMBS.kSecAttrProtocolFTP
dim authenticationType as string = KeychainManagerMBS.kSecAttrAuthenticationTypeDefault
```

```
call KeychainManagerMBS.AddInternetPassword(keychain, serverName, securityDomain, accountName, path,
port, protocol, authenticationType, PasswordData)

dim e as Integer = KeychainManagerMBS.LastError
MsgBox str(e)+": "+KeychainManagerMBS.ErrorMessageString(e)
```

Notes:

See KeychainManagerMBS.AddInternetPassword for details.
The password is stored as data with UTF-8 encoding.
See also:

- 15.2.5 AddInternetPassword(keychain as KeychainMBS, serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string, password as memoryblock) as KeychainItemMBS 308

15.2.7 AddItem(Keychain as KeychainMBS, attributesDictionary as dictionary) as boolean

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Adds one or more items to a keychain.
Example:

```
dim a as new Dictionary

dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim Password as string = "mysecret"
dim PasswordData as MemoryBlock = ConvertEncoding(Password, encodings.UTF8)

a.value( KeychainManagerMBS.kSecAttrAccount ) = Username
a.value( KeychainManagerMBS.kSecAttrService ) = ServiceName
a.value( KeychainManagerMBS.kSecValueData ) = PasswordData
a.value( KeychainManagerMBS.kSecClass ) = KeychainManagerMBS.kSecClassGenericPassword

if KeychainManagerMBS.AddItem(nil, a) then
MsgBox "OK"
else
MsgBox "Failed."
end if
```

Notes: See other method variant for details.
See also:

- 15.2.8 AddItem(Keychain as KeychainMBS, attributesDictionary as dictionary, byref result as Variant) as boolean 311

15.2.8 AddItem(Keychain as KeychainMBS, attributesDictionary as dictionary, byref result as Variant) as boolean

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Adds one or more items to a keychain.
Example:

```
dim a as new Dictionary

dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim Password as string = "mysecret"
dim PasswordData as MemoryBlock = ConvertEncoding(Password, encodings.UTF8)

a.value( KeychainManagerMBS.kSecAttrAccount ) = Username
a.value( KeychainManagerMBS.kSecAttrService ) = ServiceName
a.value( KeychainManagerMBS.kSecValueData ) = PasswordData
a.value( KeychainManagerMBS.kSecClass ) = KeychainManagerMBS.kSecClassGenericPassword

dim r as Variant
if KeychainManagerMBS.AddItem(nil, a, r) then
dim item as KeychainItemMBS = r
MsgBox "OK"
else
MsgBox "Failed."
end if
```

Notes:

attributesDictionary: A dictionary containing an item class key-value pair ("Keychain Item Class Keys and Values") and optional attribute key-value pairs ("Attribute Item Keys and Values") specifying the item's attribute values.
result: Optional. On return, a reference to the newly added items. The exact type of the result is based on the values supplied in attributes, as discussed below.

Lasterror is set.

You specify attributes defining an item by adding key-value pairs to the attributes dictionary. To add multiple items to a keychain at once use the kSecUseItemList key (see section "Item List Key") with an array of items as its value. This is currently only supported for non-password items.

If you want the new keychain item to be shared among multiple applications, include the kSecAttrAccessGroup key in the attributes dictionary. The value of this key must be the name of a keychain access group to which all of the programs that will share this item belong.

When you use Xcode to create an application, Xcode adds an application-identifier entitlement to the application bundle. Keychain Services uses this entitlement to grant the application access to its own keychain items. You can also add a keychain-access-groups entitlement to the application and, in the entitlement property list file, specify an array of keychain access groups to which the application belongs. The property list file can have any name you like (for example, keychain-access-groups.plist). The Xcode build variable CODE_SIGN_ENTITLEMENTS should contain the SRCROOT relative path to the entitlement property list file. The property list file itself should be a dictionary with a top-level key called keychain-access-groups whose value is an array of strings. If you add such a property-list file to the application bundle, then the access group corresponding to the application-identifier entitlement is treated as the last element in the access groups array. If you do not include the kSecAttrAccessGroup key in the attributes dictionary when you call the AddItem function to add an item to the keychain, the function uses the first access group in the array by default. If there is no kSecAttrAccessGroup key in the attributes dictionary and there is no keychain-access-groups entitlement in the application bundle, then the access group of a newly created item is the value of the application-identifier entitlement.

For example, a development group in Apple might have the ID:

659823F3DC53.com.apple

and the application identifiers of their two applications might be:

659823F3DC53.com.apple.oneappleapp and

659823F3DC53.com.apple.twoappleapp

If both applications add a keychain-access-groups entitlement with one value in the array of access groups:

659823F3DC53.com.apple.netaccount

then both applications would add new keychain items to the 659823F3DC53.com.apple.netaccount access group by default and both applications would have access to keychain items in that group. In addition, each application would still have access to its own private keychain items: OneAppleApp would have access to items in keychain access group 659823F3DC53.com.apple.oneappleapp and TwoAppleApp would have access to items in 659823F3DC53.com.apple.twoappleapp.

Return types (”Search Results Constants”) are specified as follows:

To obtain the data of the added item as an object of type Memoryblock, specify the return type key kSecReturnData with a value of true.
To obtain all the attributes of the added item as objects of type Dictionary, specify kSecReturnAttributes with a value of true.
To obtain a reference to the added item of type KeychainItemMBS, SecKeyRef, SecCertificateRef, or SecIdentityRef), specify kSecReturnRef with a value of True. This is the default behavior if a return type is not explicitly specified.
To obtain a persistent reference to the added item (an object of type Memoryblock), specify kSecReturnPersistentRef with a value of True. Note that unlike normal references, a persistent reference may be stored on disk or passed between processes.
If more than one of these return types is specified, the result is returned as an object of type Dictionary containing all the requested data.

Available in OS X v10.6 and later.
See also:

- 15.2.7 AddItem(Keychain as KeychainMBS, attributesDictionary as dictionary) as boolean 310

15.2.9 AllItems(keychain as KeychainMBS, itemClass as string) as KeychainItemMBS()

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Queries all items.
Notes:

Keychain: If not nil, searches only this keychain.
ItemClass: The item class to find. For example kSecGenericPasswordItemClass.
Lasterror is set.
Returns array of keychain items.

15.2.10 CopyMatching(Query as dictionary, byref result as Variant) as boolean

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns one or more keychain items that match a search query, or copies attributes of specific keychain items.
Example:

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"

// Build query
dim query as new Dictionary

query.value( KeychainManagerMBS.kSecClass ) = KeychainManagerMBS.kSecClassGenericPassword
query.Value( KeychainManagerMBS.kSecReturnAttributes ) = true
query.Value( KeychainManagerMBS.kSecMatchLimit ) = KeychainManagerMBS.kSecMatchLimitOne
query.value( KeychainManagerMBS.kSecAttrAccount ) = Username
query.value( KeychainManagerMBS.kSecAttrService ) = ServiceName
```

```
// search the item and show values from attribute dictionary
dim r as Variant
if KeychainManagerMBS.CopyMatching(query, r) then
if r isa Dictionary then
dim d as Dictionary = r

// show values
MsgBox "Creation Date: "+d.value(KeychainManagerMBS.kSecAttrCreationDate).dateValue.shortdate
MsgBox "Modification Date: "+d.value(KeychainManagerMBS.kSecAttrModificationDate).dateValue.short-
date
end if
end if
```

Notes:

query: A dictionary containing an item class specification and optional attributes for controlling the search. See
result: On return, a reference to the found items. The exact type of the result is based on the search attributes supplied in the query, as discussed below.

Lasterror is set.

You specify attributes defining a search by adding key-value pairs to the query dictionary.

A typical query consists of:

- The class key ("Item Class Key Constant") and a class value constant ("Item Class Value Constants"), which specifies the class of items for which to search.
- One or more attribute key-value pairs ("Attribute Item Keys and Values"), which specify the attribute data to be matched.
- One or more search key-value pairs ("Search Keys"), which specify values that further refine the search.
- A return-type key-value pair ("Search Results Constants"), specifying the type of results you desire.

Return types ("Search Results Constants") are specified as follows:

- To obtain a reference (of type Memoryblock) to the data of a matching item, specify kSecReturnData with a value of true.
- To obtain a dictionary (of type Dictionary) containing the attributes of a matching item, specify kSecReturnAttributes with a value of true.

- To obtain a reference (of type KeychainItemMBS, SecKeyRef, SecCertificateRef, or SecIdentityRef) to a matching item, specify kSecReturnRef with a value of true.

- To obtain a persistent reference (of type Memoryblock) to a matching item, specify kSecReturnPersistentRef with a value of true. Note that unlike normal references, a persistent reference may be stored on disk or passed between processes.

- If more than one return type is specified (for example, kSecReturnRef and kSecReturnAttributes), the results are returned as a dictionary (that is, an object of type Dictionary) containing all the requested data.

By default, this function returns only the first match found. To obtain more than one matching item at a time, specify the search key kSecMatchLimit with a value greater than 1. The result will be an object of type Array containing up to that number of matching items.

Note: You cannot combine the kSecReturnData and kSecMatchLimitAll options when copying password items (items of class kSecInternetPasswordItemClass or kSecGenericPasswordItemClass), because copying each password item could require additional authentication. Instead, request a reference or persistent reference to the items, then request the data for only the specific passwords that you actually require.
By default, this function searches for items in the keychain. To instead provide your own set of items to be filtered by this search query, specify the search key kSecMatchItemList and provide as its value a Array containing items of type SecKeychainItemRef, SecKeyRef, SecCertificateRef, or SecIdentityRef. The objects in the provided array must all be of the same type.

To convert from persistent item references to normal item references, specify the search key kSecMatchItemList with a value that consists of an object of type array referencing an array containing one or more elements of type Memoryblock (the persistent references), and a return-type key of kSecReturnRef whose value is true. The objects in the provided array must all be of the same type.

When you use Xcode to create an application, Xcode adds an application-identifier entitlement to the application bundle. Keychain Services uses this entitlement to grant the application access to its own keychain items. You can also add a keychain-access-groups entitlement to the application and, in the entitlement property list file, specify an array of keychain access groups to which the application belongs. The property list file can have any name you like (for example, keychain-access-groups.plist). The Xcode build variable CODE_SIGN_ENTITLEMENTS should contain the SRCROOT relative path to the entitlement property list file. The property list file itself should be a dictionary with a top-level key called keychain-access-groups whose value is an array of strings. When you call the SecItemAdd function to add an item to the keychain, you can specify the access group to which that item should belong. By default, the SecItemCopyMatching function searches all the access groups to which the application belongs. However, you can add the kSecAttrAccessGroup key to the search dictionary to specify which access group to search for keychain items.

Availability
Available in OS X v10.6 and later.

15.2.11 CopyMatchingDictionaries(Query as dictionary) as Dictionary()

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns one or more keychain items that match a search query, or copies attributes of specific keychain items.
Example:

```
// Build query
dim query as new Dictionary

query.value( KeychainManagerMBS.kSecClass ) = KeychainManagerMBS.kSecClassGenericPassword
query.Value( KeychainManagerMBS.kSecReturnAttributes ) = true
query.Value( KeychainManagerMBS.kSecMatchLimit ) = KeychainManagerMBS.kSecMatchLimitAll

// search all items
dim dics() as Dictionary = KeychainManagerMBS.CopyMatchingDictionaries(query)

// pick first
dim dic as Dictionary = dics(0)

// and display
MsgBox "Service: "+dic.Value(KeychainManagerMBS.kSecAttrService)+EndOfLine+_
"Account: "+dic.Value(KeychainManagerMBS.kSecAttrAccount)
```

Notes: This is a variant of CopyMatching which uses kSecReturnAttributes to query array of dictionaries.

15.2.12 CopyMatchingItems(Query as dictionary) as KeychainItemMBS()

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns one or more keychain items that match a search query, or copies attributes of specific keychain items.
Example:

```
// Build query
dim query as new Dictionary

query.value( KeychainManagerMBS.kSecClass ) = KeychainManagerMBS.kSecClassGenericPassword
query.Value( KeychainManagerMBS.kSecMatchLimit ) = KeychainManagerMBS.kSecMatchLimitAll
query.Value( KeychainManagerMBS.kSecAttrAccount ) = "myusername"

// search all items
dim items() as KeychainItemMBS = KeychainManagerMBS.CopyMatchingItems(query)

if UBound(items) = -1 then
MsgBox "nothing found."
else
```

```
// pick first
dim item as KeychainItemMBS = items(0)

// and display
MsgBox "Service: "+item.Service+EndOfLine+"Account: "+item.Account
end if
```

Notes: This is a variant of CopyMatching which uses kSecReturnRef to query array of KeychainItemMBS.

15.2.13 Default as KeychainMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Retrieves the default keychain.
Example:

```
MsgBox KeychainManagerMBS.Default.Path
```

Notes: Lasterror is set.

15.2.14 DeleteItem(Query as Dictionary) as boolean

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Deletes items that match a search query.
Example:

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"

// Build query
dim query as new Dictionary

query.value( KeychainManagerMBS.kSecClass ) = KeychainManagerMBS.kSecClassGenericPassword
query.value( KeychainManagerMBS.kSecAttrAccount ) = Username
query.value( KeychainManagerMBS.kSecAttrService ) = ServiceName

// search the item and delete it

if KeychainManagerMBS.DeleteItem(query) then
MsgBox "Deleted"
else
MsgBox "Failed."
```

```
end if
```

Notes:

query: A dictionary containing an item class specification and optional attributes for controlling the search. Lasterror is set.

See the discussion section of the CopyMatching function for information about how to construct a search dictionary.

By default, this function deletes all items matching the specified query. You can change this behavior by specifying a key, as follows:

- To delete an item identified by a transient reference, specify the kSecMatchItemList search key with a reference returned by using the kSecReturnRef return type key in a previous call to the SecItemCopyMatching or SecItemAdd functions.
- To delete an item identified by a persistent reference, specify the kSecMatchItemList search key with a persistent reference returned by using the kSecReturnPersistentRef return type key to the SecItemCopyMatching or SecItemAdd functions.
- If more than one of these return keys is specified, the behavior is undefined.

Available in OS X v10.6 and later.

15.2.15 DomainDefault(domain as Integer) as KeychainMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Retrieves the default keychain from a specified preference domain.
Example:

```
dim SystemKeychain as KeychainMBS = KeychainManagerMBS.DomainDefault(KeychainManagerMBS.kSecPreferencesDomainSystem)
msgbox SystemKeychain.name
```

Notes:

domain: The preference domain from which you wish to retrieve the default keychain. See Preference Domain Constants for possible domain values.

Returns the keychain object of the default keychain in the specified preference domain.

Lasterror is set.

A preference domain is a set of security-related preferences, such as the default keychain and the current keychain search list. Use this function if you want to retrieve the default keychain for a specific preference domain. Use the KeychainManagerMBS.Default function if you want the default keychain for the current preference domain. See the PreferenceDomain function for a discussion of current and default preference domains.
Available in OS X v10.3 and later.

15.2.16 DomainSearchList(domain as Integer) as KeychainMBS()

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Retrieves the keychain search list for a specified preference domain.
Example:

```
dim SearchList() as KeychainMBS = KeychainManagerMBS.DomainSearchList(KeychainManagerMBS.kSecPref-
erencesDomainUser)
dim names() as String

for each k as KeychainMBS in SearchList
names.Append k.Name
next

MsgBox Join(names, EndOfLine)
```

Notes:

domain: The preference domain from which you wish to retrieve the keychain search list. See Preference Domain Constants for possible domain values.

Returns the keychain search list of the specified preference domain.
Lasterror is set.

A preference domain is a set of security-related preferences, such as the default keychain and the current keychain search list. Use this function if you want to retrieve the keychain search list for a specific preference domain. Use the SearchList function if you want the keychain search list for the current preference domain. See the PreferenceDomain function for a discussion of current and default preference domains.
Available in OS X v10.3 and later.

15.2.17 ErrorMessageString(error as Integer) as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string explaining the meaning of a security result code.
Notes:

status: A result code of type OSStatus or CSSM_RETURN, returned by a security or CSSM function.

Returns a human-readable string describing the result, or empty string if no string is available for the specified result code.
Available in OS X v10.5 and later.

15.2.18 FindGenericItem(keychain as KeychainMBS, serviceName as string, accountName as string) as KeychainItemMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Finds the first generic keychain item based on the attributes passed.
Example:

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim keychain as KeychainMBS = nil // use default

dim item as KeychainItemMBS = KeychainManagerMBS.FindGenericItem(keychain, ServiceName, Username)

MsgBox "Label: "+item.label+EndOfLine+_
"Comment: "+item.comment+EndOfLine+_
"Account: "+item.Account
```

Notes: Same as KeychainManagerMBS.FindGenericPassword, but returns item instead of password.

15.2.19 FindGenericPassword(keychain as KeychainMBS, serviceName as string, accountName as string, byref password as memoryblock) as KeychainItemMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Finds the first generic password based on the attributes passed.
Notes:

keychain: A reference to a single keychain, or nil to search the user's default keychain search list.
serviceName: The service name.
accountName: The account name.

password: A memoryblock that holds the password data.

Returns the item object of the generic password.
Lasterror is set.

This function finds the first generic password item that matches the attributes you provide. Most attributes are optional; you should pass only as many as you need to narrow the search sufficiently for your application's intended use. This function optionally returns a reference to the found item.

This function decrypts the password before returning it to you. If the calling application is not in the list of trusted applications, the user is prompted before access is allowed. If the access controls for this item do not allow decryption, the function returns the errSecAuthFailed result code.

This function automatically calls the function Unlock to display the Unlock Keychain dialog box if the keychain is currently locked.

15.2.20 FindInternetItem(keychain as KeychainMBS, serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string) as KeychainItemMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Finds the first Internet password item based on the attributes passed.
Notes: See KeychainManagerMBS.FindInternetPassword for details.

15.2.21 FindInternetPassword(keychain as KeychainMBS, serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string, byref password as memoryblock) as KeychainItemMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Finds the first Internet password based on the attributes passed.
Notes:

keychain: A single keychain or nil to search the user's default keychain search list.
serverName: The server name.
securityDomain: The security domain. This parameter is optional, as not all protocols require it. Pass "" if it is not required.
accountName: The account name.
path: The string representing the path.
port: The TCP/IP port number. Pass 0 to ignore the port number.

protocol: The protocol associated with this password. See Keychain Protocol Type Constants for a description of possible values.
authenticationType: The authentication scheme used. See Keychain Authentication Type Constants for a description of possible values. Pass the constant kSecAuthenticationTypeDefault, to specify the default authentication scheme.
password: On return, a memoryblock containing the password data.

Returns the item object of the Internet password.
Lasterror is set.

This function finds the first Internet password item that matches the attributes you provide. This function optionally returns a reference to the found item.

This function decrypts the password before returning it to you. If the calling application is not in the list of trusted applications, the user is prompted before access is allowed. If the access controls for this item do not allow decryption, the function returns the errSecAuthFailed result code.

This function automatically calls the function Unlock to display the Unlock Keychain dialog box if the keychain is currently locked.
Available in OS X v10.2 and later.

15.2.22 GetPassword(Query as dictionary, byref result as Memoryblock) as boolean

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns one keychain item that match a search query.
Example:

```
// build query
dim query as new Dictionary

dim ServiceName as string = "mytest"
dim Username as string = "myusername"

query.value( KeychainManagerMBS.kSecAttrAccount ) = Username
query.value( KeychainManagerMBS.kSecAttrService ) = ServiceName
query.value( KeychainManagerMBS.kSecClass ) = KeychainManagerMBS.kSecClassGenericPassword

// query password
dim passwordData as MemoryBlock
if KeychainManagerMBS.GetPassword(query, passwordData) then
// and show it
dim password as string = DefineEncoding(passwordData, Encodings.utf8)
MsgBox "OK: "+password
```

```
else
MsgBox "Failed."
end if
```

Notes:

This is a variant of CopyMatching which uses kSecReturnData to query the data of one keychain item. Returns password of first item found in result parameter. If you expect text, be sure to use DefineEncoding to define as encodings.UTF8.

15.2.23 ItemFromPersistentReference(data as memoryblock) as KeychainItemMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Provides a keychain item reference, given a persistent reference.
Notes:

Returns a keychain item reference for the item for which you provided a persistent reference.
Available in OS X v10.6 and later.

15.2.24 kSecAttrAccess as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

A SecAccessRef object describing the access control settings for this item.
Available in OS X v10.7 and later.

15.2.25 kSecAttrAccessControl as string

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Specifies a dictionary key whose value is SecAccessControl instance which contains access control conditions for item.
Notes:

Available on Mac OS X 10.10 and newer.
IMPORTANT: This attribute is mutually exclusive with kSecAttrAccess attribute.

15.2.26 kSecAttrAccessGroup as string

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Specifies a dictionary key whose value is a CFStringRef indicating which access group a item is in.
Notes:

Available on Mac OS X 10.9 and newer.
The access groups that a particular application has membership in are determined by two entitlements for that application. The application-identifier entitlement contains the application's single access group, unless there is a keychain-access-groups entitlement present. The latter has as its value a list of access groups; the first item in this list is the default access group. Unless a specific access group is provided as the value of kSecAttrAccessGroup when SecItemAdd is called, new items are created in the application's default access group. Specifying this attribute in SecItemCopyMatching, SecItemUpdate, or SecItemDelete calls limits the search to the specified access group (of which the calling application must be a member to obtain matching results.) To share keychain items between multiple applications, each application must have a common group listed in its keychain-access-groups entitlement, and each must specify this shared access group name as the value for the kSecAttrAccessGroup key in the dictionary passed to SecItem functions.

15.2.27 kSecAttrAccessible as string

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Specifies a dictionary key whose value indicates when your application needs access to an item's data.
Notes:

You should choose the most restrictive option that meets your application's needs to allow the system to protect that item in the best way possible. See the kSecAttrAccessible* methods for a list of values which can be specified.
IMPORTANT: This attribute is currently not supported for OS X keychain items, unless the kSecAttrSynchronizable attribute is also present. If both attributes are specified on either OS X or iOS, the value for the kSecAttrAccessible key may only be one whose name does not end with "ThisDeviceOnly", as those cannot sync to another device.

15.2.28 kSecAttrAccessibleAfterFirstUnlock as string

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the values for kSecAttrAccessible key.
Notes: Item data can only be accessed once the device has been unlocked after a restart. This is recommended for items that need to be accesible by background applications. Items with this attribute will migrate to a new device when using encrypted backups.

15.2.29 kSecAttrAccessibleAfterFirstUnlockThisDeviceOnly as string

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the values for kSecAttrAccessible key.
Notes:

Item data can only be accessed once the device has been unlocked after a restart.
This is recommended for items that need to be accessible by background applications. Items with this attribute will never migrate to a new device, so after a backup is restored to a new device these items will be missing.
Available on Mac OS X 10.9 and newer.

15.2.30 kSecAttrAccessibleAlways as string

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the values for kSecAttrAccessible key.
Notes:

Item data can always be accessed regardless of the lock state of the device. This is not recommended for anything except system use. Items with this attribute will migrate to a new device when using encrypted backups.
Available on Mac OS X 10.9 and newer.

15.2.31 kSecAttrAccessibleAlwaysThisDeviceOnly as string

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the values for kSecAttrAccessible key.
Notes:

Item data can always be accessed regardless of the lock state of the device. This option is not recommended for anything except system use. Items with this attribute will never migrate to a new device, so after a backup is restored to a new device, these items will be missing.
Available on Mac OS X 10.9 and newer.

15.2.32 kSecAttrAccessibleWhenPasscodeSetThisDeviceOnly as string

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the values for kSecAttrAccessible key.
Notes:

Item data can only be accessed while the device is unlocked. This is recommended for items that only need to be accessible while the application is in the foreground and requires a passcode to be set on the device. Items with this attribute will never migrate to a new device, so after a backup is restored to a new device,

these items will be missing. This attribute will not be available on devices without a passcode. Disabling the device passcode will cause all previously protected items to be deleted.
Available on Mac OS X 10.9 and newer.

15.2.33 kSecAttrAccessibleWhenUnlocked as string

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the values for kSecAttrAccessible key.
Notes:

Item data can only be accessed while the device is unlocked. This is recommended for items that only need be accesible while the application is in the foreground. Items with this attribute will migrate to a new device when using encrypted backups.
Available on Mac OS X 10.9 and newer.

15.2.34 kSecAttrAccessibleWhenUnlockedThisDeviceOnly as string

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the values for kSecAttrAccessible key.
Notes:

Item data can only be accessed while the device is unlocked. This is recommended for items that only need be accesible while the application is in the foreground. Items with this attribute will never migrate to a new device, so after a backup is restored to a new device, these items will be missing.
Available on Mac OS X 10.9 and newer.

15.2.35 kSecAttrAccount as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Account attribute key.
The corresponding value is of type String and contains an account name. Items of class kSecClassGenericPassword and kSecClassInternetPassword have this attribute.
Available in OS X v10.6 and later.

15.2.36 kSecAttrApplicationLabel as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.

Notes:

Application label attribute key.
The corresponding value is of type String and contains a label for this item. This attribute is different from the kSecAttrLabel attribute, which is intended to be human-readable. This attribute is used to look up a key programmatically; in particular, for keys of class kSecAttrKeyClassPublic and kSecAttrKeyClassPrivate, the value of this attribute is the hash of the public key.
Available in OS X v10.6 and later.

15.2.37 kSecAttrApplicationTag as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Private tag attribute key.
The corresponding value is of type Memoryblock and contains private tag data.
Available in OS X v10.6 and later.

15.2.38 kSecAttrAuthenticationType as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Authentication type attribute key.
The corresponding value is of type integer and denotes the authentication scheme for this item (see "Authentication Type Values").
Available in OS X v10.6 and later.

15.2.39 kSecAttrAuthenticationTypeDefault as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrAuthenticationType attribute key.
Notes:

The default authentication type.
Available in OS X v10.6 and later.

15.2.40 kSecAttrAuthenticationTypeDPA as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrAuthenticationType attribute key.
Notes:

Distributed Password authentication.
Available in OS X v10.6 and later.

15.2.41 kSecAttrAuthenticationTypeHTMLForm as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrAuthenticationType attribute key.
Notes:

HTML form based authentication.
Available in OS X v10.6 and later.

15.2.42 kSecAttrAuthenticationTypeHTTPBasic as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrAuthenticationType attribute key.
Notes:

HTTP Basic authentication.
Available in OS X v10.6 and later.

15.2.43 kSecAttrAuthenticationTypeHTTPDigest as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrAuthenticationType attribute key.
Notes:

HTTP Digest Access authentication.
Available in OS X v10.6 and later.

15.2.44 kSecAttrAuthenticationTypeMSN as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrAuthenticationType attribute key.
Notes:

Microsoft Network default authentication.
Available in OS X v10.6 and later.

15.2.45 kSecAttrAuthenticationTypeNTLM as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrAuthenticationType attribute key.
Notes:

Windows NT LAN Manager authentication.
Available in OS X v10.6 and later.

15.2.46 kSecAttrAuthenticationTypeRPA as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrAuthenticationType attribute key.
Notes:

Remote Password authentication.
Available in OS X v10.6 and later.

15.2.47 kSecAttrCanDecrypt as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Decryption attribute key.
The corresponding value is of type Boolean and indicates whether this cryptographic key can be used to decrypt data.
Available in OS X v10.6 and later.

15.2.48 kSecAttrCanDerive as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Derivation attribute key.
The corresponding value is of type Boolean and indicates whether this cryptographic key can be used to derive another key.

Available in OS X v10.6 and later.

15.2.49 kSecAttrCanEncrypt as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Encryption attribute key.
The corresponding value is of type Boolean and indicates whether this cryptographic key can be used to encrypt data.
Available in OS X v10.6 and later.

15.2.50 kSecAttrCanSign as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Signature attribute key.
The corresponding value is of type Boolean and indicates whether this cryptographic key can be used to create a digital signature.
Available in OS X v10.6 and later.

15.2.51 kSecAttrCanUnwrap as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Unwrap attribute key.
The corresponding value is of type Boolean and indicates whether this cryptographic key can be used to unwrap another key.
Available in OS X v10.6 and later.

15.2.52 kSecAttrCanVerify as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Signature verification attribute key.
The corresponding value is of type Boolean and indicates whether this cryptographic key can be used to verify a digital signature.
Available in OS X v10.6 and later.

15.2.53 kSecAttrCanWrap as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Wrap attribute key.
The corresponding value is of type Boolean and indicates whether this cryptographic key can be used to wrap another key.
Available in OS X v10.6 and later.

15.2.54 kSecAttrCertificateEncoding as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Certificate encoding attribute key.
The corresponding value is of type integer and denotes the certificate encoding (see the CSSM_CERT_ENCODING enumeration in cssmtype.h). Items of class kSecClassCertificate have this attribute. Read only.
Available in OS X v10.6 and later.

15.2.55 kSecAttrCertificateType as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Certificate type attribute key.
The corresponding value is of type integer and denotes the certificate type (see the CSSM_CERT_TYPE enumeration in cssmtype.h). Items of class kSecClassCertificate have this attribute. Read only.
Available in OS X v10.6 and later.

15.2.56 kSecAttrComment as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Comment attribute key.
The corresponding value is of type string and contains the user-editable comment for this item.
Available in OS X v10.6 and later.

15.2.57 kSecAttrCreationDate as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Creation date key.
The corresponding value is of type date and represents the date the item was created. Read only.
Available in OS X v10.6 and later.

15.2.58 kSecAttrCreator as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Creator attribute key.
The corresponding value is of type integer and represents the item's creator. This number is the unsigned integer representation of a four-character code (for example, 'aCrt').
Available in OS X v10.6 and later.

15.2.59 kSecAttrDescription as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Description attribute key.
The corresponding value is of type String and specifies a user-visible string describing this kind of item (for example, "Disk image password").
Available in OS X v10.6 and later.

15.2.60 kSecAttrEffectiveKeySize as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Effective number of bits attribute key.
The corresponding value is of type Integer and indicates the effective number of bits in this cryptographic key. For example, a DES key has a kSecAttrKeySizeInBits of 64, but a kSecAttrEffectiveKeySize of 56 bits.
Available in OS X v10.6 and later.

15.2.61 kSecAttrGeneric as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Generic attribute key.
The corresponding value is of type Memoryblock and contains a user-defined attribute. Items of class kSecClassGenericPassword have this attribute.
Available in OS X v10.6 and later.

15.2.62 kSecAttrIsInvisible as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Invisible attribute key.
The corresponding value is of type boolean and is true if the item is invisible (that is, should not be displayed).
Available in OS X v10.6 and later.

15.2.63 kSecAttrIsNegative as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Negative attribute key.
The corresponding value is of type Boolean and indicates whether there is a valid password associated with this keychain item. This is useful if your application doesn't want a password for some particular service to be stored in the keychain, but prefers that it always be entered by the user.

Available in OS X v10.6 and later.

15.2.64 kSecAttrIsPermanent as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Permanence attribute key.
The corresponding value is of type Boolean and indicates whether this cryptographic key is to be stored permanently.
Available in OS X v10.6 and later.

15.2.65 kSecAttrIssuer as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Issuer attribute key.
The corresponding value is of type Date and contains the X.500 issuer name of a certificate. Items of class kSecClassCertificate have this attribute. Read only.
Available in OS X v10.6 and later.

15.2.66 kSecAttrKeyClass as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Key class attribute key.
The corresponding value is of type CFTypeRef and specifies a type of cryptographic key. Possible values are listed in "Key Class Values." Read only.
Available in OS X v10.6 and later.

15.2.67 kSecAttrKeyClassPrivate as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrKeyClass attribute key.
Notes:

A private key of a public-private pair.
Available in OS X v10.6 and later.

15.2.68 kSecAttrKeyClassPublic as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrKeyClass attribute key.
Notes:

A public key of a public-private pair.
Available in OS X v10.6 and later.

15.2.69 kSecAttrKeyClassSymmetric as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrKeyClass attribute key.
Notes:

A private key used for symmetric-key encryption and decryption.
Available in OS X v10.6 and later.

15.2.70 kSecAttrKeySizeInBits as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Number of bits attribute key.
The corresponding value is of type Integer and indicates the total number of bits in this cryptographic key. Compare with kSecAttrEffectiveKeySize.
Available in OS X v10.6 and later.

15.2.71 kSecAttrKeyType as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Algorithm attribute key.
The corresponding value is of type integer and indicates the algorithm associated with this cryptographic key (see the CSSM_ALGORITHMS enumeration in cssmtype.h and "Key Type Values").

Available in OS X v10.6 and later.

15.2.72 kSecAttrKeyType3DES as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrKeyType attribute key.

15.2.73 kSecAttrKeyTypeAES as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrKeyType attribute key.
Notes:

AES algorithm.
Available in OS X v10.7 and later.

15.2.74 kSecAttrKeyTypeCAST as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrKeyType attribute key.
Notes:

CAST algorithm.
Available in OS X v10.7 and later.

15.2.75 kSecAttrKeyTypeDES as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrKeyType attribute key.
Notes:

DES algorithm.
Available in OS X v10.7 and later.

15.2.76 kSecAttrKeyTypeDSA as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrKeyType attribute key.
Notes:

DSA algorithm.
Available in OS X v10.7 and later.

15.2.77 kSecAttrKeyTypeEC as string

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrKeyType attribute key.
Notes:

Elliptic curve algorithm.
Available in OS X v10.9 and later.

15.2.78 kSecAttrKeyTypeECDSA as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrKeyType attribute key.
Notes:

Elliptic curve DSA algorithm.
Available in OS X v10.7 and later.

15.2.79 kSecAttrKeyTypeRC2 as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrKeyType attribute key.
Notes:

RC2 algorithm.
Available in OS X v10.7 and later.

15.2.80 kSecAttrKeyTypeRC4 as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrKeyType attribute key.
Notes:

RC4 algorithm.
Available in OS X v10.7 and later.

15.2.81 kSecAttrKeyTypeRSA as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrKeyType attribute key.
Notes:

RSA algorithm.
Available in OS X v10.6 and later.

15.2.82 kSecAttrLabel as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Label attribute key.
The corresponding value is of type String and contains the user-visible label for this item.
Available in OS X v10.6 and later.

15.2.83 kSecAttrModificationDate as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Modification date key.
The corresponding value is of type date and represents the last time the item was updated. Read only.
Available in OS X v10.6 and later.

15.2.84 kSecAttrPath as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Path attribute key.
The corresponding value is of type String and represents a path, typically the path component of the URL.
Items of class kSecClassInternetPassword have this attribute.
Available in OS X v10.6 and later.

15.2.85 kSecAttrPort as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Port attribute key.
The corresponding value is of type integer and represents an Internet port number. Items of class kSecClassInternetPassword have this attribute.
Available in OS X v10.6 and later.

15.2.86 kSecAttrPRF as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Pseudorandom function attribute. Possible values are described in "kSecAttrPRF Value Constants."
Available in OS X v10.7 and later.

15.2.87 kSecAttrPRFHmacAlgSHA1 as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Constants used for the kSecAttrPRF key in the parameters dictionary passed to KeyDeriveFromPassword.
Notes:

Use the SHA1 algorithm.
Available in OS X v10.7 and later.

15.2.88 kSecAttrPRFHmacAlgSHA224 as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Constants used for the kSecAttrPRF key in the parameters dictionary passed to KeyDeriveFromPassword.
Notes:

Use the SHA224 algorithm.
Available in OS X v10.7 and later.

15.2.89 kSecAttrPRFHmacAlgSHA256 as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Constants used for the kSecAttrPRF key in the parameters dictionary passed to KeyDeriveFromPassword.
Notes:

Use the SHA256 algorithm.
Available in OS X v10.7 and later.

15.2.90 kSecAttrPRFHmacAlgSHA384 as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Constants used for the kSecAttrPRF key in the parameters dictionary passed to KeyDeriveFromPassword.
Notes:

Use the SHA384 algorithm.
Available in OS X v10.7 and later.

15.2.91 kSecAttrPRFHmacAlgSHA512 as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Constants used for the kSecAttrPRF key in the parameters dictionary passed to KeyDeriveFromPassword.
Notes:

Use the SHA512 algorithm.
Available in OS X v10.7 and later.

15.2.92 kSecAttrProtocol as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Protocol attribute key.
The corresponding value is of type integer and denotes the protocol for this item (see "Protocol Values"). Items of class kSecClassInternetPassword have this attribute.
Available in OS X v10.6 and later.

15.2.93 kSecAttrProtocolAFP as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

AFP over TCP.
Available in OS X v10.6 and later.

15.2.94 kSecAttrProtocolAppleTalk as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

AFP over AppleTalk.
Available in OS X v10.6 and later.

15.2.95 kSecAttrProtocolDAAP as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

DAAP protocol.
Available in OS X v10.6 and later.

15.2.96 kSecAttrProtocolEPPC as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

Remote Apple Events.
Available in OS X v10.6 and later.

15.2.97 kSecAttrProtocolFTP as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

FTP protocol.
Available in OS X v10.6 and later.

15.2.98 kSecAttrProtocolFTPAccount as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

A client side FTP account.
Available in OS X v10.6 and later.

15.2.99 kSecAttrProtocolFTPProxy as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

FTP proxy.
Available in OS X v10.6 and later.

15.2.100 kSecAttrProtocolFTPS as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

FTP over TLS/SSL.
Available in OS X v10.6 and later.

15.2.101 kSecAttrProtocolHTTP as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

HTTP protocol.
Available in OS X v10.6 and later.

15.2.102 kSecAttrProtocolHTTPProxy as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

HTTP proxy.
Available in OS X v10.6 and later.

15.2.103 kSecAttrProtocolHTTPS as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

HTTP over TLS/SSL.
Available in OS X v10.6 and later.

15.2.104 kSecAttrProtocolHTTPSProxy as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

HTTPS proxy.
Available in OS X v10.6 and later.

15.2.105 kSecAttrProtocolIMAP as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

IMAP protocol.
Available in OS X v10.6 and later.

15.2.106 kSecAttrProtocolIMAPS as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

IMAP over TLS/SSL.
Available in OS X v10.6 and later.

15.2.107 kSecAttrProtocolIPP as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

IPP protocol.
Available in OS X v10.6 and later.

15.2.108 kSecAttrProtocolIRC as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

IRC protocol.
Available in OS X v10.6 and later.

15.2.109 kSecAttrProtocolIRCS as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

IRC over TLS/SSL.
Available in OS X v10.6 and later.

15.2.110 kSecAttrProtocolLDAP as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

LDAP protocol.
Available in OS X v10.6 and later.

15.2.111 kSecAttrProtocolLDAPS as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

LDAP over TLS/SSL.
Available in OS X v10.6 and later.

15.2.112 kSecAttrProtocolNNTP as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

NNTP protocol.
Available in OS X v10.6 and later.

15.2.113 kSecAttrProtocolNNTPS as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

NNTP over TLS/SSL.
Available in OS X v10.6 and later.

15.2.114 kSecAttrProtocolPOP3 as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

POP3 protocol.
Available in OS X v10.6 and later.

15.2.115 kSecAttrProtocolPOP3S as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

POP3 over TLS/SSL.
Available in OS X v10.6 and later.

15.2.116 kSecAttrProtocolRTSP as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

RTSP protocol.
Available in OS X v10.6 and later.

15.2.117 kSecAttrProtocolRTSPProxy as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

RTSP proxy.
Available in OS X v10.6 and later.

15.2.118 kSecAttrProtocolSMB as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

SMB protocol.
Available in OS X v10.6 and later.

15.2.119 kSecAttrProtocolSMTP as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

SMTP protocol.
Available in OS X v10.6 and later.

15.2.120 kSecAttrProtocolSOCKS as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

SOCKS protocol.
Available in OS X v10.6 and later.

15.2.121 kSecAttrProtocolSSH as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

SSH protocol.
Available in OS X v10.6 and later.

15.2.122 kSecAttrProtocolTelnet as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

Telnet protocol.
Available in OS X v10.6 and later.

15.2.123 kSecAttrProtocolTelnetS as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Values that can be used with the kSecAttrProtocol attribute key.
Notes:

Telnet over TLS/SSL.
Available in OS X v10.6 and later.

15.2.124 kSecAttrPublicKeyHash as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Public key hash attribute key.
The corresponding value is of type memoryblock and contains the hash of a certificate's public key. Items of class kSecClassCertificate have this attribute. Read only.
Available in OS X v10.6 and later.

15.2.125 kSecAttrRounds as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

The number of rounds for the pseudorandom function specified by kSecAttrPRF.
Available in OS X v10.7 and later.

15.2.126 kSecAttrSalt as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

A memoryblock object containing the salt to use for this key.
Available in OS X v10.7 and later.

15.2.127 kSecAttrSecurityDomain as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Security domain attribute key.
The corresponding value is of type String and represents the Internet security domain. Items of class kSecClassInternetPassword have this attribute.
Available in OS X v10.6 and later.

15.2.128 kSecAttrSerialNumber as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Serial number attribute key.
The corresponding value is of type Date and contains the serial number data of a certificate. Items of class kSecClassCertificate have this attribute. Read only.
Available in OS X v10.6 and later.

15.2.129 kSecAttrServer as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Server attribute key.
The corresponding value is of type String and contains the server's domain name or IP address. Items of class kSecClassInternetPassword have this attribute.
Available in OS X v10.6 and later.

15.2.130 kSecAttrService as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Service attribute key.
The corresponding value is a string of type String that represents the service associated with this item. Items of class kSecClassGenericPassword have this attribute.
Available in OS X v10.6 and later.

15.2.131 kSecAttrSubject as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Subject attribute key.
The corresponding value is of type CFDataRef and contains the X.500 subject name of a certificate. Items of class kSecClassCertificate have this attribute. Read only.
Available in OS X v10.6 and later.

15.2.132 kSecAttrSubjectKeyID as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Subject key ID attribute key.
The corresponding value is of type date and contains the subject key ID of a certificate. Items of class kSecClassCertificate have this attribute. Read only.

Available in OS X v10.6 and later.

15.2.133 kSecAttrSynchronizable as string

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Specifies a dictionary key whose value is a Boolean indicating whether the item in question can be synchronized.
Notes:

To add a new item which can be synced to other devices, or to obtain synchronizable results from a query, supply this key with a value of true. If the key is not supplied, or has a value of false, then no synchronizable items will be added or returned. A predefined value, kSecAttrSynchronizableAny, may be provided instead of true if both synchronizable and non-synchronizable results are desired.

IMPORTANT: Specifying the kSecAttrSynchronizable key has several caveats:

- Updating or deleting items using the kSecAttrSynchronizable key will affect all copies of the item, not just the one on your local device. Be sure that it makes sense to use the same password on all devices before deciding to make a password synchronizable.
- Only password items can currently be synchronized. Keychain syncing is not supported for certificates or cryptographic keys.
- Items stored or obtained using the kSecAttrSynchronizable key cannot specify SecAccessRef-based access control with kSecAttrAccess. If a password is intended to be shared between multiple applications, the kSecAttrAccessGroup key must be specified, and each application using this password must have a 'keychain-access-groups' entitlement with the specified access group value.
- Items stored or obtained using the kSecAttrSynchronizable key may not also specify a kSecAttrAccessible value which is incompatible with syncing (namely, those whose names end with "ThisDeviceOnly".)
- Items stored or obtained using the kSecAttrSynchronizable key cannot be specified by reference. You must pass kSecReturnAttributes and/or kSecReturnData to retrieve results; kSecReturnRef is currently not supported for synchronizable items.
- Persistent references to synchronizable items should be avoided; while they may work locally, they cannot be moved between devices, and may not resolve if the item is modified on some other device.
- When specifying a query that uses the kSecAttrSynchronizable key, search keys are limited to the item's class and attributes. The only search constant which may be used is kSecMatchLimit; other constants using the kSecMatch prefix are not supported at this time.

Available on Mac OS X 10.9 and newer.

15.2.134 kSecAttrSynchronizableAny as string

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Specifies that both synchronizable and non-synchronizable results should be returned from this query.
Notes:

This may be used as a value for the kSecAttrSynchronizable dictionary key in a call to SecItemCopyMatching, SecItemUpdate, or SecItemDelete.
Available on Mac OS X 10.9 and newer.

15.2.135 kSecAttrType as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the keychain item attribute keys.
Notes:

Type attribute key.
The corresponding value is of type integer and represents the item's type. This number is the unsigned integer representation of a four-character code (for example, 'aTyp').
Available in OS X v10.6 and later.

15.2.136 kSecClass as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Key constant used to set the item class value in a search dictionary.
Notes:

Dictionary key whose value is the item's class code.
Possible values for this key are listed in Item Class Value Constants.
Available in OS X v10.6 and later.

15.2.137 kSecClassCertificate as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the values used with the kSecClass key in a search dictionary.
Notes:

Certificate item.
The following attribute types ("Attribute Item Keys and Values") can be used with an item of this type:

kSecAttrAccessible
kSecAttrAccessGroup
kSecAttrCertificateType

kSecAttrCertificateEncoding
kSecAttrLabel
kSecAttrSubject
kSecAttrIssuer
kSecAttrSerialNumber
kSecAttrSubjectKeyID
kSecAttrPublicKeyHash

Available in OS X v10.7 and later.

15.2.138 kSecClassGenericPassword as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the values used with the kSecClass key in a search dictionary.
Notes:

Generic password item.

The following attribute types ("Attribute Item Keys and Values") can be used with an item of this type:

kSecAttrAccessible
kSecAttrAccessGroup
kSecAttrCreationDate
kSecAttrModificationDate
kSecAttrDescription
kSecAttrComment
kSecAttrCreator
kSecAttrType
kSecAttrLabel
kSecAttrIsInvisible
kSecAttrIsNegative
kSecAttrAccount
kSecAttrService
kSecAttrGeneric

Available in OS X v10.7 and later.

15.2.139 kSecClassIdentity as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the values used with the kSecClass key in a search dictionary.
Notes:

Identity item.

An identity is a certificate together with its associated private key. Because an identity is the combination of a private key and a certificate, this class shares attributes of both kSecClassKey and kSecClassCertificate.

Available in OS X v10.7 and later.

15.2.140 kSecClassInternetPassword as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the values used with the kSecClass key in a search dictionary.
Notes:

Internet password item.
The following attribute types ("Attribute Item Keys and Values") can be used with an item of this type:

kSecAttrAccessible
kSecAttrAccessGroup
kSecAttrCreationDate
kSecAttrModificationDate
kSecAttrDescription
kSecAttrComment
kSecAttrCreator
kSecAttrType
kSecAttrLabel
kSecAttrIsInvisible
kSecAttrIsNegative
kSecAttrAccount
kSecAttrSecurityDomain
kSecAttrServer
kSecAttrProtocol
kSecAttrAuthenticationType
kSecAttrPort
kSecAttrPath

Available in OS X v10.6 and later.

15.2.141 kSecClassKey as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** One of the values used with the kSecClass key in a search dictionary.
Notes:

Cryptographic key item.
The following attribute types ("Attribute Item Keys and Values") can be used with an item of this type:

kSecAttrAccessible
kSecAttrAccessGroup
kSecAttrKeyClass
kSecAttrLabel
kSecAttrApplicationLabel
kSecAttrIsPermanent
kSecAttrApplicationTag
kSecAttrKeyType
kSecAttrKeySizeInBits
kSecAttrEffectiveKeySize
kSecAttrCanEncrypt
kSecAttrCanDecrypt
kSecAttrCanDerive
kSecAttrCanSign
kSecAttrCanVerify
kSecAttrCanWrap
kSecAttrCanUnwrap

Available in OS X v10.7 and later.

15.2.142 kSecMatchCaseInsensitive as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used to set search attributes in a keychain search dictionary.
Notes:

Case sensitivity attribute key.
The corresponding value is of type Boolean. If this value is False, or if this attribute is not provided, then case-sensitive string matching is performed.
Available in OS X v10.6 and later.

15.2.143 kSecMatchDiacriticInsensitive as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used to set search attributes in a keychain search dictionary.
Notes:

Case sensitivity attribute key.
The corresponding value is of type Boolean. If this value is False, or if this attribute is not provided, then diacritic-sensitive string matching is performed.

Available in OS X v10.7 and later.

15.2.144 kSecMatchEmailAddressIfPresent as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used to set search attributes in a keychain search dictionary.
Notes:

Email address attribute key.
The corresponding value is of type string and contains an RFC822 email address. If provided, returned certificates or identities are limited to those that either contain the address or do not contain any email address.
Available in OS X v10.6 and later.

15.2.145 kSecMatchIssuers as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used to set search attributes in a keychain search dictionary.
Notes:

Issuers attribute key.
The corresponding value is of type array, where the array consists of X.500 names of type Memoryblock. If provided, returned certificates or identities are limited to those whose certificate chain contains one of the issuers provided in this list.
Available in OS X v10.6 and later.

15.2.146 kSecMatchItemList as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used to set search attributes in a keychain search dictionary.
Notes:

Item list attribute key.
To provide your own set of items to be filtered by a search query rather than searching the keychain, specify this search key in a call to the SecItemCopyMatching function with a value that consists of an object of type array where the array contains either KeychainItemMBS, SecKeyRef, SecCertificateRef, SecIdentityRef, or memoryblock items. The objects in the provided array must all be of the same type.
To convert from persistent item references to normal item references, specify this search key in a call to the CopyMatching function with a value of type array where the array contains one or more CFDataRef elements (the persistent references), and a return-type key of kSecReturnRef whose value is True.
To delete an item identified by a transient reference, specify the kSecMatchItemList search key in a call to the SecItemDelete function with a reference returned by using the kSecReturnRef return type key in a previous call to the CopyMatching or SecItemAdd functions.

To delete an item identified by a persistent reference, specify the kSecMatchItemList search key in a call to the SecItemDelete function with a persistent reference returned by using the kSecReturnPersistentRef return type key to the CopyMatching or SecItemAdd functions.
Available in OS X v10.6 and later.

15.2.147 kSecMatchLimit as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used to set search attributes in a keychain search dictionary.
Notes:

Match limit attribute key.
The corresponding value is of type Integer. If provided, this value specifies the maximum number of results to return or otherwise act upon. For a single item, specify kSecMatchLimitOne. To specify all matching items, specify kSecMatchLimitAll. The default behavior is function-dependent.
Available in OS X v10.6 and later.

15.2.148 kSecMatchLimitAll as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used to set search attributes in a keychain search dictionary.
Notes:

An unlimited number of results may be returned; used as a value for the kSecMatchLimit attribute key.
Available in OS X v10.6 and later.

15.2.149 kSecMatchLimitOne as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used to set search attributes in a keychain search dictionary.
Notes:

Results are limited to the first item found; used as a value for the kSecMatchLimit attribute key.
Available in OS X v10.6 and later.

15.2.150 kSecMatchPolicy as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used to set search attributes in a keychain search dictionary.
Notes:

Match policy attribute key.
The corresponding value is of type SecPolicyRef. If provided, returned certificates or identities must verify with this policy.
Available in OS X v10.6 and later.

15.2.151 kSecMatchSearchList as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used to set search attributes in a keychain search dictionary.
Example:

```
// We pass a keychain for searching only in this keychain
dim keychains() as KeychainMBS = KeychainManagerMBS.SearchList
dim keychain as KeychainMBS = keychains(1) // we pick second keychain
dim keychainname as string = keychain.name

// Build query
dim query as new Dictionary

query.value( KeychainManagerMBS.kSecClass ) = KeychainManagerMBS.kSecClassGenericPassword
query.Value( KeychainManagerMBS.kSecReturnAttributes ) = true
query.Value( KeychainManagerMBS.kSecMatchLimit ) = KeychainManagerMBS.kSecMatchLimitAll
query.Value( KeychainManagerMBS.kSecMatchSearchList ) = array(keychain)

// search all items
dim dics() as Dictionary = KeychainManagerMBS.CopyMatchingDictionaries(query)

// pick first
dim dic as Dictionary = dics(0)

// and display
MsgBox "Service: "+dic.Value(KeychainManagerMBS.kSecAttrService)+EndOfLine+_
"Account: "+dic.Value(KeychainManagerMBS.kSecAttrAccount)
```

Notes: Available in OS X v10.6 and later.

15.2.152 kSecMatchSubjectContains as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used to set search attributes in a keychain search dictionary.
Notes:

Subject attribute key.

The corresponding value is of type string. If provided, returned certificates or identities are limited to those whose subject contains this string.
Available in OS X v10.6 and later.

15.2.153 kSecMatchSubjectEndsWith as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used to set search attributes in a keychain search dictionary.
Notes:

Subject attribute key.
The corresponding value is of type String. If provided, returned certificates or identities are limited to those whose subject ends with this string.
Available in OS X v10.7 and later.

15.2.154 kSecMatchSubjectStartsWith as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used to set search attributes in a keychain search dictionary.
Notes:

Subject attribute key.
The corresponding value is of type String. If provided, returned certificates or identities are limited to those whose subject starts with this string.
Available in OS X v10.7 and later.

15.2.155 kSecMatchSubjectWholeString as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used to set search attributes in a keychain search dictionary.
Notes:

Subject attribute key.
The corresponding value is of type String. If provided, returned certificates or identities are limited to those whose subject is exactly equal to this string.
Available in OS X v10.7 and later.

15.2.156 kSecMatchTrustedOnly as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used to set search attributes in a keychain search dictionary.

Notes:

Trusted anchor attribute key.
The corresponding value is of type Boolean. If this attribute is provided with A value of True, only certificates that can be verified back to a trusted anchor are returned. If this value is False or the attribute is not provided, then both trusted and untrusted certificates may be returned.
Available in OS X v10.6 and later.

15.2.157 kSecMatchValidOnDate as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used to set search attributes in a keychain search dictionary.
Notes:

Valid-on-date attribute key.
The corresponding value is of type Date. If provided, returned keys, certificates or identities are limited to those that are valid for the given date. Pass a value of nil to indicate the current date.
Available in OS X v10.6 and later.

15.2.158 kSecMatchWidthInsensitive as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used to set search attributes in a keychain search dictionary.
Notes:

Case sensitivity attribute key.
The corresponding value is of type Boolean. If this value is False, or if this attribute is not provided, then width-sensitive string matching is performed (for example, the ASCII character a does not match the UTF-8 full-width letter a (U+FF41).
Available in OS X v10.7 and later.

15.2.159 kSecReturnAttributes as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used to specify the type of results that should be returned by the CopyMatching or AddItem function.
Notes:

Return attributes attribute key.
The corresponding value is of type Boolean. A value of True indicates that a dictionary of the (unencrypted) attributes of an item should be returned in the form of a Dictionary.
Available in OS X v10.6 and later.

15.2.160 kSecReturnData as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used to specify the type of results that should be returned by the CopyMatching or AddItem function.
Notes:

Return data attribute key.
The corresponding value is of type Boolean. A value of True indicates that the data of an item should be returned in the form of a Memoryblock. For keys and password items, data is secret (encrypted) and may require the user to enter a password for access.
Available in OS X v10.6 and later.

15.2.161 kSecReturnPersistentRef as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used to specify the type of results that should be returned by the CopyMatching or AddItem function.
Notes:

Return persistent reference attribute key. A persistent reference to a credential can be stored on disk for later use or passed to other processes.
The corresponding value is of type Boolean. A value of True indicates that a persistent reference to an item (Memoryblock) should be returned.
Available in OS X v10.6 and later.

15.2.162 kSecReturnRef as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used to specify the type of results that should be returned by the CopyMatching or AddItem function.
Notes:

Return reference attribute key.
The corresponding value is of type Boolean. A value of True indicates that a reference should be returned. Depending on the item class requested, the returned references may be of type KeychainItemMBS, SecKeyRef, SecCertificateRef, SecIdentityRef, or Memoryblock.
Available in OS X v10.6 and later.

15.2.163 kSecUseItemList as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Key used to specify a list of items to search or add.
Notes:

Item list key.

The corresponding value is of type CFArrayRef, where the array contains either KeychainItemMBS, SecKeyRef, SecCertificateRef, SecIdentityRef, or (for persistent item references) Memoryblock items. If provided, this array is treated as the set of all possible items to search (or to add if the function being called is AddItem). The items in the array must all be of the same type.
Available in OS X v10.6 and later.

15.2.164 kSecUseKeychain as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Key used to specify a list of items to search or add.
Notes:

Keychain reference key.
Specifies a SecKeychainRef object that references the keychain to which AddItem should add the provided items.
Available in OS X v10.7 and later.

15.2.165 kSecValueData as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used in the results dictionary for CopyMatching or Additem, indicating the type of values returned.
Notes:

Data attribute key. A persistent reference to a credential can be stored on disk for later use or passed to other processes.
The corresponding value is of type memoryblock. For keys and password items, the data is secret (encrypted) and may require the user to enter a password for access.
Available in OS X v10.6 and later.
You can specify zero or more of these types depending on the function you are calling.

15.2.166 kSecValuePersistentRef as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used in the results dictionary for CopyMatching or Additem, indicating the type of values returned.
Notes:

Persistent reference attribute key.
The corresponding value is of type CFDataRef. The bytes in this memoryblock can be stored by the caller and used on a subsequent invocation of the application (or even a different application) to retrieve the item referenced by it.
Available in OS X v10.6 and later.
You can specify zero or more of these types depending on the function you are calling.

15.2.167 kSecValueRef as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Keys used in the results dictionary for CopyMatching or Additem, indicating the type of values returned.
Notes:

Reference attribute key.
The corresponding value, depending on the item class requested, is of type KeychainItemMBS, SecKeyRef, SecCertificateRef, or SecIdentityRef.
Available in OS X v10.6 and later.
You can specify zero or more of these types depending on the function you are calling.

15.2.168 LockAll

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Locks all keychains belonging to the current user.
Notes:

Your application should not call this function unless you are responding to a user's request to lock a keychain. In general, you should leave the keychain unlocked so that the user does not have to unlock it again in another application.
Lasterror is set.

15.2.169 Open(file as folderitem) as KeychainMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Opens a keychain.
Example:

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.keychain")
dim k as KeychainMBS = KeychainManagerMBS.Open(file)

MsgBox k.Name
```

Notes:

You may use this function to retrieve a pointer to a keychain object given the path of the keychain. You do not need to close the keychain, but you should release the memory that the pointer occupies when you are finished with it.
Lasterror is set.
See also:

- 15.2.170 Open(path as string) as KeychainMBS

15.2.170 Open(path as string) as KeychainMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Opens a keychain.
Example:

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.keychain")
dim k as KeychainMBS = KeychainManagerMBS.Open(file.UnixpathMBS)

MsgBox k.Name
```

Notes:

You may use this function to retrieve a pointer to a keychain object given the path of the keychain. You do not need to close the keychain, but you should release the memory that the pointer occupies when you are finished with it.
Lasterror is set.
See also:

- 15.2.169 Open(file as folderitem) as KeychainMBS 363

15.2.171 PreferenceDomain as Integer

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Gets or sets the current keychain preference domain.
Example:

```
dim n as Integer = KeychainManagerMBS.PreferenceDomain
Select case n
case KeychainManagerMBS.kSecPreferencesDomainCommon
MsgBox "common"
case KeychainManagerMBS.kSecPreferencesDomainDynamic
MsgBox "dynamic"
case KeychainManagerMBS.kSecPreferencesDomainSystem
MsgBox "system"
case KeychainManagerMBS.kSecPreferencesDomainUser
MsgBox "user"
else
MsgBox "unknown"
end Select
```

Notes:

A preference domain is a set of security-related preferences, such as the default keychain and the current keychain search list. The default preference domain for system daemons (that is, for daemons running in the root session) is the system domain. The default preference domain for all other programs is the user

domain. Use the PreferenceDomain function to change the preference domain.

This function changes the preference domain for all subsequent function calls; for example, if you change from the system domain to the user domain and then call Lock specifying nil for the keychain, the function locks the default system keychain rather than the default user keychain. You might want to use this function, for example, when launching a system daemon from a user session so that the daemon uses system preferences rather than user
(Read and Write computed property)

15.2.172 SearchCreateFromAttributes(keychain as KeychainMBS, itemClass as string, AttributeKeys() as string, AttributeValues() as string) as KeychainSearchMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Creates a search object matching a list of zero or more attributes.
Example:

```
dim AttributeKeys() as string
dim AttributeValues() as string
dim keychain as KeychainMBS = nil // default

dim search as KeychainSearchMBS = KeychainManagerMBS.SearchCreateFromAttributes(keychain, "genp",
AttributeKeys, AttributeValues)
dim items() as KeychainItemMBS

dim item as KeychainItemMBS = search.NextItem
while item<>Nil
items.Append item
item = search.NextItem
wend

MsgBox str(UBound(items)+1)+" items found."
```

Notes:

keychains: An array of keychains to search, a single keychain, or nil to search the user's current keychain search list. Use the function SearchList to retrieve the user's default search list.
itemClass: The keychain item class. See "Keychain Item Class Constants" for valid constants.
AttributeKeys: List of zero or more keychain attribute keys to match.
AttributeValues: List of zero or more keychain attribute values to match.

Returns the current search object.
Lasterror is set.

Each item stored in the keychain contains data (such as a certificate), which is indexed by the item's attributes. You look up an item in a keychain by its attributes. If you find a match, you can then retrieve the item's data. Use the search object created by this function as input to the SecKeychainSearchCopyNext function to find a a keychain item.

To find and obtain data from a password keychain item, use the FindInternetPassword or FindGenericPassword function.
See also:

- 15.2.173 SearchCreateFromAttributes(keychains() as KeychainMBS, itemClass as string, AttributeKeys() as string, AttributeValues() as string) as KeychainSearchMBS 366

15.2.173 SearchCreateFromAttributes(keychains() as KeychainMBS, itemClass as string, AttributeKeys() as string, AttributeValues() as string) as KeychainSearchMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Creates a search object matching a list of zero or more attributes.
Example:

```
dim AttributeKeys() as string
dim AttributeValues() as string

dim keychains() as KeychainMBS

AttributeKeys.Append KeychainManagerMBS.kSecAttrAccount
AttributeValues.Append "myusername"
keychains = KeychainManagerMBS.DomainSearchList(KeychainManagerMBS.kSecPreferencesDomainUser)

dim search as KeychainSearchMBS = KeychainManagerMBS.SearchCreateFromAttributes(keychains, "genp",
AttributeKeys, AttributeValues)
dim items() as KeychainItemMBS

dim item as KeychainItemMBS = search.NextItem
while item<>Nil
items.Append item
item = search.NextItem
wend

MsgBox str(UBound(items)+1)+" items found."
```

Notes:

keychains: An array of keychains to search, a single keychain, or nil to search the user's current keychain

search list. Use the function SearchList to retrieve the user's default search list.
itemClass: The keychain item class. See "Keychain Item Class Constants" for valid constants.
AttributeKeys: List of zero or more keychain attribute keys to match.
AttributeValues: List of zero or more keychain attribute values to match.

Returns the current search object.
Lasterror is set.

Each item stored in the keychain contains data (such as a certificate), which is indexed by the item's attributes. You look up an item in a keychain by its attributes. If you find a match, you can then retrieve the item's data. Use the search object created by this function as input to the SecKeychainSearchCopyNext function to find a a keychain item.

To find and obtain data from a password keychain item, use the FindInternetPassword or FindGenericPassword function.
See also:

- 15.2.172 SearchCreateFromAttributes(keychain as KeychainMBS, itemClass as string, AttributeKeys() as string, AttributeValues() as string) as KeychainSearchMBS 365

15.2.174 SearchList as KeychainMBS()

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Retrieves a keychain search list.
Example:

```
dim SearchList() as KeychainMBS = KeychainManagerMBS.SearchList
dim names() as String

for each k as KeychainMBS in SearchList
names.Append k.Name
next

MsgBox Join(names, EndOfLine)
```

Notes:

Returns keychain search list.
Lasterror is set.

15.2.175 SetDomainDefault(domain as Integer, keychain as KeychainMBS)

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Sets the default keychain for a specified preference domain.
Notes:

domain: The preference domain for which you wish to set the default keychain.
keychain: A reference to the keychain you wish to set as default in the specified preference domain.

Lasterror is set.
A preference domain is a set of security-related preferences, such as the default keychain and the current keychain search list. Use this function if you want to set the default keychain for a specific preference domain. Use the SetDefault function if you want to set the default keychain for the current preference domain. See the PreferenceDomain function for a discussion of current and default preference domains.

15.2.176 SetDomainSearchList(domain as Integer, list() as KeychainMBS)

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Sets the keychain search list for a specified preference domain.
Notes:

domain: The preference domain for which you wish to set the default keychain search list. See "Keychain Preference Domain Constants"for possible domain values.
searchList: A keychain search list to set in the preference domain.

Lasterror is set.
A preference domain is a set of security-related preferences, such as the default keychain and the current keychain search list. Use this function if you want to set the keychain search list for a specific preference domain. Use the SetSearchList function if you want to set the keychain search list for the current preference domain. See the PreferenceDomain function for a discussion of current and default preference domains.

15.2.177 SetSearchList(list() as KeychainMBS)

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Specifies the list of keychains to use in the default keychain search list.
Notes:

searchList: An array of keychain references specifying the list of keychains to use in the default keychain search list. Passing an empty array clears the search list.

Lasterror is set.
The default keychain search list is used by several functions; see for example SearchCreateFromAttributes, FindInternetPassword, or FindGenericPassword. To obtain the current default keychain search list, use the

SearchList function.

The default keychain search list is displayed as the keychain list in the Keychain Access utility. If you use SetSearchList to change the keychain search list, the list displayed in Keychain Access changes accordingly.

15.2.178 UpdateItem(Query as Dictionary, attributesToUpdate as dictionary) as boolean

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Modifies items that match a search query.
Example:

```
// build query
dim query as new Dictionary

dim ServiceName as string = "mytest"
dim Username as string = "myusername"

query.value( KeychainManagerMBS.kSecAttrAccount ) = Username
query.value( KeychainManagerMBS.kSecAttrService ) = ServiceName
query.value( KeychainManagerMBS.kSecClass ) = KeychainManagerMBS.kSecClassGenericPassword

// Build Dictionary with new values
dim newValues as new Dictionary
newValues.value( KeychainManagerMBS.kSecAttrComment ) = "Just a test"

// and update
if KeychainManagerMBS.UpdateItem(query, newValues) then
MsgBox "OK"
else
MsgBox "Failed."
end if
```

Notes:

query: A dictionary containing an item class specification and optional attributes for controlling the search. Specify the items whose values you wish to change. See "Search Keys" for a description of currently defined search attributes.
attributesToUpdate: A dictionary containing the attributes whose values should be changed, along with the new values. Only real keychain attributes are permitted in this dictionary (no "meta" attributes are allowed.) See "Attribute Item Keys and Values" for a description of currently defined value attributes.

Lasterror is set.
See the discussion section of the CopyMatching function for information about how to construct a search

dictionary.

Available in OS X v10.6 and later.

15.2.179 UserInteractionAllowed as boolean

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Indicates whether Keychain Services functions that normally display a user interaction are allowed to do so.
Example:

```
MsgBox str(KeychainManagerMBS.UserInteractionAllowed)
KeychainManagerMBS.UserInteractionAllowed = false
MsgBox str(KeychainManagerMBS.UserInteractionAllowed)
```

Notes:

Lasterror is set.
A Boolean value indicating whether user interaction is permitted. If true, user interaction is allowed, and Keychain Services functions that display a user interface can do so as appropriate.
(Read and Write computed property)

15.2.180 Version as Integer

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Determines the version of Keychain Services installed on the user's system.
Example:

```
MsgBox str(KeychainManagerMBS.Version)
```

Notes:

Your application can call the Version function to find out which version of Keychain Services is installed on the user's system.
Lasterror is set.

15.2.181 Properties

15.2.182 LastError as Integer

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The last error code returned by one of the methods.
Notes:

You can use KeychainManagerMBS.ErrorMessageString function to get a text message.
The error code -1 is set by plugin if function is missing or parameters are wrong.
(Read only property)

15.2.183 Constants

15.2.184 ErrorAuthorizationFailed = -25293

Plugin Version: 13.1. **Function:** One of the error codes.
Notes: The user name or passphrase you entered is not correct.

15.2.185 ErrorDuplicatedItem = -25299

Plugin Version: 13.1. **Function:** One of the error codes.
Notes: The specified item already exists in the keychain.

15.2.186 ErrorFailedToAllocated = -108

Plugin Version: 13.1. **Function:** One of the error codes.
Notes: Failed to allocate memory.

15.2.187 ErrorFailedToDecode = -26275

Plugin Version: 13.1. **Function:** One of the error codes.
Notes: Unable to decode the provided data.

15.2.188 ErrorInteractionNotAllowed = -25308

Plugin Version: 13.1. **Function:** One of the error codes.
Notes: User interaction is not allowed.

15.2.189 ErrorInvalidParameter = -50

Plugin Version: 13.1. **Function:** One of the error codes.
Notes: Invalid Parameters.

15.2.190 ErrorNone = 0

Plugin Version: 13.1. **Function:** One of the error codes.
Notes: No error.

15.2.191 ErrorNotAvailable = -25291

Plugin Version: 13.1. **Function:** One of the error codes.
Notes: No keychain is available. You may need to restart your computer.

15.2.192 ErrorNotFound = -25300

Plugin Version: 13.1. **Function:** One of the error codes.
Notes: The specified item could not be found in the keychain.

15.2.193 kSecAppleSharePasswordItemClass = "ashp"

Plugin Version: 13.1. **Function:** Specifies a keychain item's class code.
Notes: Indicates that the item is an AppleShare password.

15.2.194 kSecGenericPasswordItemClass = "genp"

Plugin Version: 13.1. **Function:** Specifies a keychain item's class code.
Notes: Indicates that the item is a generic password.

15.2.195 kSecInternetPasswordItemClass = "inet"

Plugin Version: 13.1. **Function:** Specifies a keychain item's class code.
Notes: Indicates that the item is an Internet password.

15.2.196 kSecPreferencesDomainCommon = 2

Plugin Version: 13.1. **Function:** Defines constants for the keychain preference domains.
Notes:

Indicates the preferences are common to everyone.
Available in OS X v10.3 and later.

15.2.197 kSecPreferencesDomainDynamic = 3

Plugin Version: 13.1. **Function:** Defines constants for the keychain preference domains.
Notes:

Indicates a dynamic search list (typically provided by removable keychains such as smart cards).
Available in OS X v10.4 and later.

15.2.198 kSecPreferencesDomainSystem = 1

Plugin Version: 13.1. **Function:** Defines constants for the keychain preference domains.
Notes:

Indicates the system or daemon preference domain preferences.
Available in OS X v10.3 and later.

15.2.199 kSecPreferencesDomainUser = 0

Plugin Version: 13.1. **Function:** Defines constants for the keychain preference domains.
Notes:

Indicates the user preference domain preferences.
Available in OS X v10.3 and later.

15.3 class KeychainMBS

15.3.1 class KeychainMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The class for a keychain.

15.3.2 Methods

15.3.3 AddGenericPassword(serviceName as string, accountName as string, password as memoryblock) as KeychainItemMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Adds a new generic password to a keychain.
Notes: See AddGenericPassword in KeychainManagerMBS for details.
See also:

- 15.3.4 AddGenericPassword(serviceName as string, accountName as string, password as string) as KeychainItemMBS 374

15.3.4 AddGenericPassword(serviceName as string, accountName as string, password as string) as KeychainItemMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Adds a new generic password to a keychain.
Notes: See AddGenericPassword in KeychainManagerMBS for details.
See also:

- 15.3.3 AddGenericPassword(serviceName as string, accountName as string, password as memoryblock) as KeychainItemMBS 374

15.3.5 AddInternetPassword(serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string, password as memoryblock) as KeychainItemMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Adds a new Internet password to a keychain.
Notes: See KeychainManagerMBS.AddInternetPassword for details.
See also:

- 15.3.6 AddInternetPassword(serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string, password as string) as KeychainItemMBS 375

15.3.6 AddInternetPassword(serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string, password as string) as KeychainItemMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Adds a new Internet password to a keychain.
Notes: See KeychainManagerMBS.AddInternetPassword for details.
See also:

- 15.3.5 AddInternetPassword(serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string, password as memoryblock) as KeychainItemMBS 374

15.3.7 AllItems(itemClass as string) as KeychainItemMBS()

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Queries all items.
Notes:

Keychain: If not nil, searches only this keychain.
ItemClass: The item class to find. For example kSecGenericPasswordItemClass.
Lasterror is set.
Returns array of keychain items.

15.3.8 Delete

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Deletes one or more keychains from the default keychain search list, and removes the keychain itself if it is a file.
Notes:

Lasterror is set.

The keychain may be a file stored locally, a smart card, or retrieved from a network server using non-file-based database protocols. This function deletes the keychain only if it is a local file.

15.3.9 FindGenericItem(serviceName as string, accountName as string) as KeychainItemMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Finds the first generic keychain item based on the attributes passed.
Notes: See KeychainManagerMBS.FindGenericItem for details.

15.3.10 FindGenericPassword(serviceName as string, accountName as string, byref password as memoryblock) as KeychainItemMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Finds the first generic password based on the attributes passed.
Notes: See KeychainManagerMBS.FindGenericPassword for details.

15.3.11 FindInternetItem(serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string) as KeychainItemMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Finds the first Internet password item based on the attributes passed.
Notes: See KeychainManagerMBS.FindInternetPassword for details.

15.3.12 FindInternetPassword(serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string, byref password as memoryblock) as KeychainItemMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Finds the first Internet password based on the attributes passed.
Notes: See KeychainManagerMBS.FindInternetPassword for details.

15.3.13 IsUnlocked as boolean

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns true if keychain is unlocked.
Example:

```
MsgBox str(KeychainManagerMBS.Default.IsUnlocked)
```

Notes: Lasterror is set.

15.3.14 Lock

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Locks a keychain.
Notes:

Your application should not call this function unless you are responding to a user's request to lock a keychain. In general, you should leave the keychain unlocked so that the user does not have to unlock it again in another application.
Lasterror is set.

15.3.15 Name as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Determines the file name of a keychain.
Example:

MsgBox KeychainManagerMBS.Default.Name

Notes:

Similar to path, but name without file extension only.
Lasterror is set.

15.3.16 Path as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Determines the path of a keychain.
Example:

MsgBox KeychainManagerMBS.Default.Path

Notes:

Returns POSIX path of the keychain as a UTF-8 encoded string.
Lasterror is set.

15.3.17 SetDefault

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Sets the default keychain.
Notes:

Lasterror is set.
In most cases, your application should not need to set the default keychain, because this is a choice normally made by the user. You may call this function to change where a password or other keychain items are added, but since this is a user choice, you should set the default keychain back to the user specified keychain when you are done.

15.3.18 Status as Integer

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Retrieves status information of a keychain.
Example:

```
dim values() as string
dim DefaultKeychain as KeychainMBS = KeychainManagerMBS.Default
dim status as Integer = DefaultKeychain.status

if BitwiseAnd(status, KeychainMBS.StatusUnlocked) = KeychainMBS.StatusUnlocked then
values.Append "unlocked"
else
values.Append "locked"
end if

if BitwiseAnd(status, KeychainMBS.StatusReadable) = KeychainMBS.StatusReadable then
values.Append "readable"
else
values.Append "not readable"
end if

if BitwiseAnd(status, KeychainMBS.StatusWritable) = KeychainMBS.StatusWritable then
values.Append "writable"
else
values.Append "not writable"
end if

MsgBox Join(values, ", ")
```

Notes:

Lasterror is set.

This function retrieves the status of a specified keychain. You can use this function to determine if the keychain is unlocked, readable, or writable. Note that the lock status of a keychain can change at any time due to user or system activity. Because the system automatically prompts the user to unlock a keychain when necessary, you do not usually have to worry about the lock status of a keychain.

15.3.19 Unlock

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Unlocks a keychain.
Notes:

In most cases, your application does not need to call this function directly, since most Keychain Services functions that require an unlocked keychain do so for you. If your application needs to verify that a keychain is unlocked, call the function GetStatus.
Lasterror is set.
See also:

- 15.3.20 Unlock(password as string) 379

15.3.20 Unlock(password as string)

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Unlocks a keychain.
Notes:

password: The password to use.
In most cases, your application does not need to call this function directly, since most Keychain Services functions that require an unlocked keychain do so for you. If your application needs to verify that a keychain is unlocked, call the function GetStatus.
Lasterror is set.
See also:

- 15.3.19 Unlock 379

15.3.21 Properties

15.3.22 Handle as Integer

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The internal object reference.
Notes: (Read and Write property)

15.3.23 Lasterror as Integer

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The last error code returned by one of the methods.
Notes:

You can use KeychainManagerMBS.ErrorMessageString function to get a text message.
The error code -1 is set by plugin if function is missing or parameters are wrong.
(Read and Write property)

15.3.24 Settings as KeychainSettingsMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Obtains or sets a keychain's settings.
Example:

```
dim DefaultKeychain as KeychainMBS = KeychainManagerMBS.Default
dim settings as KeychainSettingsMBS = DefaultKeychain.Settings
MsgBox str(settings.useLockInterval)
```

Notes:

Lasterror is set.
(Read and Write computed property)

15.3.25 Constants

15.3.26 StatusReadable = 2

Plugin Version: 13.1. **Function:** One of the status constants.
Notes: Indicates the keychain is readable.

15.3.27 StatusUnlocked = 1

Plugin Version: 13.1. **Function:** One of the status constants.
Notes: Indicates the keychain is unlocked.

15.3.28 StatusWritable = 4

Plugin Version: 13.1. **Function:** One of the status constants.
Notes: Indicates the keychain is writable.

15.4 class KeychainSearchMBS

15.4.1 class KeychainSearchMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The class for a running keychain search.

15.4.2 Methods

15.4.3 NextItem as KeychainItemMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Finds the next keychain item matching the given search criteria.
Notes:

Returns object of the next matching keychain item, if any.

Each item stored in the keychain contains data (such as a certificate), which is indexed by the item's attributes. Use the SearchCreateFromAttributes function to specify attributes to search for. If the NextItem function finds a match, you can use the methods and properties on the item.

To find and obtain data from a password keychain item, use the FindInternetPassword or FindGenericPassword function.
Lasterror is set.

15.4.4 Properties

15.4.5 Handle as Integer

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The internal object reference.
Notes: (Read and Write property)

15.4.6 Lasterror as Integer

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The last error code returned by one of the methods.
Notes:

You can use KeychainManagerMBS.ErrorMessageString function to get a text message.

The error code -1 is set by plugin if function is missing or parameters are wrong.
(Read and Write property)

15.5 class KeychainSettingsMBS

15.5.1 class KeychainSettingsMBS

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The class for information about keychain settings.
Example:

```
dim DefaultKeychain as KeychainMBS = KeychainManagerMBS.Default
dim settings as KeychainSettingsMBS = DefaultKeychain.Settings
MsgBox str(settings.useLockInterval)
```

15.5.2 Properties

15.5.3 lockInterval as Integer

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** An unsigned 32-bit integer representing the number of seconds before the keychain locks. If you set useLockInterval to false, set lockInterval to INT_MAX to indicate that the keychain never locks.
Example:

```
dim SystemKeychain as KeychainMBS = KeychainManagerMBS.DomainDefault(KeychainManagerMBS.kSecPref-
erencesDomainSystem)
dim settings as KeychainSettingsMBS = SystemKeychain.Settings
MsgBox str(settings.lockInterval)
```

Notes: (Read and Write property)

15.5.4 lockOnSleep as Boolean

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A Boolean value indicating whether the keychain locks when the system sleeps.
Example:

```
dim DefaultKeychain as KeychainMBS = KeychainManagerMBS.Default
dim settings as KeychainSettingsMBS = DefaultKeychain.Settings
MsgBox str(settings.lockOnSleep)
```

Notes: (Read and Write property)

15.5.5 useLockInterval as Boolean

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A Boolean value indicating whether the keychain automatically locks after a certain period of time.
Example:

```
dim DefaultKeychain as KeychainMBS = KeychainManagerMBS.Default
dim settings as KeychainSettingsMBS = DefaultKeychain.Settings
MsgBox str(settings.useLockInterval)
```

Notes: (Read and Write property)

15.5.6 version as Integer

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** An unsigned 32-bit integer representing the keychain version.
Example:

```
dim DefaultKeychain as KeychainMBS = KeychainManagerMBS.Default
dim settings as KeychainSettingsMBS = DefaultKeychain.Settings
MsgBox str(settings.version)
```

Notes:

Is always 1.
(Read and Write property)

Chapter 16

Mac

16.1 Globals

16.1.1 AppearanceSmallFontMBS as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns which text font to use for small text output.
Example:

```
msgbox "The system small font is "+AppearanceSmallFontMBS
```

Notes:

Note that this function requires the Appearance Manager:
System 7.1 to 7.6.1 - use version 1.0.4 from Apple
Mac OS 8 and 8.1 - use version installed
Mac OS 8.5 and newer - the lib is in the system suitcase

16.1.2 AppearanceSmallFontSizeMBS as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns which text size to use for small text output.
Example:

```
msgbox "The small system font size is "+str(AppearanceSmallFontSizeMBS)
```

Notes:

Note that this function requires the Appearance Manager:
System 7.1 to 7.6.1 - use version 1.0.4 from Apple
Mac OS 8 and 8.1 - use version installed
Mac OS 8.5 and newer - the lib is in the system suitcase

16.1.3 AppearanceSystemFontMBS as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns which text font to use for normal text output.
Example:

```
Sub Open()
// Fill a listbox
listbox1.addrow "Systemfont"
listbox1.cell(listbox1.lastindex,1)=AppearanceSystemFontMBS
listbox1.cell(listbox1.lastindex,2)=str(AppearanceSystemFontSizeMBS)

listbox1.addrow "SmallSystemfont"
listbox1.cell(listbox1.lastindex,1)=AppearanceSmallFontMBS
listbox1.cell(listbox1.lastindex,2)=str(AppearanceSmallFontSizeMBS)

listbox1.addrow "Viewsfont"
listbox1.cell(listbox1.lastindex,1)=AppearanceViewsFontMBS
listbox1.cell(listbox1.lastindex,2)=str(AppearanceViewsFontSizeMBS)

End Sub
```

Notes:

Note that this function requires the Appearance Manager:
System 7.1 to 7.6.1 - use version 1.0.4 from Apple
Mac OS 8 and 8.1 - use version installed
Mac OS 8.5 and newer - the lib is in the system suitcase

16.1.4 AppearanceSystemFontSizeMBS as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns which text size to use for normal text output.
Example:

```
msgbox "The system font size is "+str(AppearanceSystemFontSizeMBS)
```

Notes:

Note that this function requires the Appearance Manager:
System 7.1 to 7.6.1 - use version 1.0.4 from Apple
Mac OS 8 and 8.1 - use version installed
Mac OS 8.5 and newer - the lib is in the system suitcase

16.1.5 AppearanceViewsFontMBS as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns which text font to use for list text output.
Example:

```
msgbox "The system list font is "+AppearanceViewsFontMBS
```

Notes:

Note that this function requires the Appearance Manager:
System 7.1 to 7.6.1 - use version 1.0.4 from Apple
Mac OS 8 and 8.1 - use version installed
Mac OS 8.5 and newer - the lib is in the system suitcase

16.1.6 AppearanceViewsFontSizeMBS as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns which text size to use for list text output.
Example:

```
msgbox "The system list font size is "+str(AppearanceViewsFontSizeMBS)
```

Notes:

Note that this function requires the Appearance Manager:
System 7.1 to 7.6.1 - use version 1.0.4 from Apple
Mac OS 8 and 8.1 - use version installed
Mac OS 8.5 and newer - the lib is in the system suitcase

16.2 class ICAppMBS

16.2.1 class ICAppMBS

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A description of a helper application.
Example:

```
// Launch Email application on Mac OS X:

dim i as InternetConfigMBS
dim a as ICAppMBS
dim f as FolderItem

i=new InternetConfigMBS("????")
a=i.ICHelperMailTo

f=LaunchServicesFindApplicationForInfoMBS(a.Creator,"","")
f.Launch
```

Deprecated: This item is deprecated and should no longer be used.

16.2.2 Properties

16.2.3 Binary as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The binary data of this object.
Notes:

You can read and write this property.
(Read and Write property)

16.2.4 creator as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The applications creator code.
Example:

```
// Launch Mail application on Mac OS 9:

dim i as InternetConfigMBS
dim a as ICAppMBS
```

```
dim f as FolderItem

i=new InternetConfigMBS("????")
a=i.ICHelperMailTo

f=volume(0).CreatorAppMBS(a.Creator)
f.Launch

// You may need to search on all volumes instead of only the first one.
```

Notes:

4 characters long.
(Read and Write property)

16.2.5 name as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Name of the application.
Notes:

Maximum 63 character.
(Read and Write property)

16.3 class ICFontMBS

16.3.1 class ICFontMBS

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** An Internet Config font specification.
Deprecated: This item is deprecated and should no longer be used.

16.3.2 Methods

16.3.3 close

Plugin Version: 4.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The destructor.
Notes:

There is no need to call this method except you want to free all resources of this object now without waiting for Realbasic to do it for you.
(e.g. some Realbasic versions crash on Windows if there are plugin objects not closed.)

16.3.4 Properties

16.3.5 bold as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Is text bold?
Notes: (Read and Write property)

16.3.6 condense as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Is text condensed?
Notes: (Read and Write property)

16.3.7 extend as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Is text extended?
Notes: (Read and Write property)

16.3.8 Fontname as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Name of the font. **Notes:** (Read and Write property)

16.3.9 Italic as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Is text italic? **Notes:** (Read and Write property)

16.3.10 outline as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Is text outlined? **Notes:** (Read and Write property)

16.3.11 shadow as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Is text shadowed? **Notes:** (Read and Write property)

16.3.12 Size as Integer

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Size of the font. **Notes:** (Read and Write property)

16.3.13 Underline as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Is text underlined? **Notes:** (Read and Write property)

16.4 class ICMapEntriesMBS

16.4.1 class ICMapEntriesMBS

Plugin Version: 2.8, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** An Internet Config file mappings.
Example:

```
// A testing example for an user to show how to add an entry, but it's not very good as it has only poor error checking:

dim i as InternetConfigMBS
dim Mapper as ICMapEntriesMBS
dim map as ICMapMBS

i=new InternetConfigMBS("RBv2")
if i.Available and i.BeginEditing(true) then
Map = New ICMapMBS
Map.CreatorAppName = "JustTestingApp"
Map.EntryName = "xyz"
Map.Extension = ".data"
Map.FileCreator = "Temp"
Map.FileType = "BINA"
Map.Flags = 0
Map.MIMEType = ""
Map.PostAppName = ""
Map.PostCreator = ""
Mapper = i.ICMappings

Mapper.AddItem Map

MsgBox str(Mapper.Lasterror)
MsgBox str(Mapper.Count)

i.ICMappings=mapper

Mapper = i.ICMappings
MsgBox str(Mapper.Count) // Still there?
if i.EndEditing then
end if
end if
```

Deprecated: This item is deprecated and should no longer be used.

16.4.2 Methods

16.4.3 AddItem(map as ICMapMBS)

Plugin Version: 2.8, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Adds a mapping to the mapping entries.
Notes:

Lasterror is set.
Works with Internet Config 2.5 and newer.

16.4.4 close

Plugin Version: 4.1, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The destructor.
Notes:

There is no need to call this method except you want to free all resources of this object now without waiting for Realbasic to do it for you.
(e.g. some Realbasic versions crash on Windows if there are plugin objects not closed.)

16.4.5 DeleteItem(pos as Integer)

Plugin Version: 2.8, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Deletes the mapping on the position.
Notes:

Tested, but returns always -50 for unknown reason.
Lasterror is set.
Works with Internet Config 2.5 and newer.

16.4.6 GetItem(index as Integer, byref pos as Integer, byref map as ICMapMBS)

Plugin Version: 2.8, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the mapping and it's position for the given index.
Notes:

Sets pos to 0 and map to nil on any error.
Lasterror is set.
Works with Internet Config 2.5 and newer.

16.4.7 MapFilename(filename as string) as ICMapMBS

Plugin Version: 2.8, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Searches the best matching Mapping for this filename.
Notes:

Returns nil on any error.
Lasterror is set.
Works with Internet Config 2.5 and newer.

16.4.8 MapTypeCreator(type as string, creator as string, filename as string) as ICMapMBS

Plugin Version: 2.8, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Finds the best matching mapping for this Type/Creator combination.
Notes:

Returns nil on any error.
Lasterror is set.
Works with Internet Config 2.5 and newer.
Filename is optional.

16.4.9 SetItem(pos as Integer, map as ICMapMBS)

Plugin Version: 2.8, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Sets the mapping on the given position to the given mapping value.
Notes:

Lasterror is set.
Works with Internet Config 2.5 and newer.

16.4.10 Properties

16.4.11 Count as Integer

Plugin Version: 2.8, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Counts the mappings inside this object.
Notes:

Returns 0 on any error.
Lasterror is set.
(Read only property)

16.4.12 Handle as Integer

Plugin Version: 2.8, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The handle to the data using for the mappings.
Notes: (Read and Write property)

16.4.13 ICInstance as Integer

Plugin Version: 2.8, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The used instance.
Notes: (Read and Write property)

16.4.14 Lasterror as Integer

Plugin Version: 2.8, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The last error code.
Notes:

Contains a Mac OS Error code.
0 if successfull, -1 if function is not available or parameter was bad (e.g. nil).

Known errors from Internet Config:

icPrefNotFoundErr	-666	preference not found (duh!)
icPermErr	-667	cannot set preference
icPrefDataErr	-668	problem with preference data
icInternalErr	-669	hmm, this is not good
icTruncatedErr	-670	more data was present than was returned
icNoMoreWritersErr	-671	you cannot begin a write session ecause someone else is already doing it
icNothingToOverrideErr	-672	no component for the override component to capture
icNoURLErr	-673	no URL found
icConfigNotFoundErr	-674	no configuration was found
icConfigInappropriateErr	-675	incorrect manufacturer code
icProfileNotFoundErr	-676	profile not found
icTooManyProfilesErr	-677	too many profiles in database

(Read and Write property)

16.5 class ICMapMBS

16.5.1 class ICMapMBS

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** An Internet Config file mapping.
Deprecated: This item is deprecated and should no longer be used.

16.5.2 Properties

16.5.3 CreatorAppName as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name of the application which creates such files.
Notes: (Read and Write property)

16.5.4 EntryName as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name of this file mapping entry.
Notes: (Read and Write property)

16.5.5 extension as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The extension for this file type.
Notes: (Read and Write property)

16.5.6 filecreator as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The files creator code.
Notes: (Read and Write property)

16.5.7 filetype as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The files type code.
Notes: (Read and Write property)

16.5.8 flags as Integer

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The flags for this file type.
Notes:

This are the bit masks for the flags:

1 If set, is a binary file.
2 If set, ResourceFork is significant (Mac file).
4 If set, Data fork is significant (always set I think).
8 If set, Post process with application specified in the post process

fields.

16 If set, Ignore for incoming files.
32 If set, Ignore for outgoing files.

So if you need a mapping where the file is:

Plain Text
Not a Mac file (resource fork insignificant)
Use for Incoming
Ignore for outgoing
Post Process with application

Then the integer value for the flag property would be 44.

I sincerely hope this helps you and / or your customers.
(This information was added to the help by Brian Rathbone)
(Read and Write property)

16.5.9 MIMEType as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The mime type for this file type.

Notes:

See also MimeTypeToFileExtensionMBS function.
(Read and Write property)

16.5.10 PostAppName as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name of the application used to postprocess this kind of file.
Notes: (Read and Write property)

16.5.11 postcreator as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The creator code of the application used to postprocess this kind of file.
Notes: (Read and Write property)

16.6 class ICStrListMBS

16.6.1 class ICStrListMBS

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A list of strings from Internet Config.
Deprecated: This item is deprecated and should no longer be used.

16.6.2 Methods

16.6.3 Item(index as Integer) as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the item with the given index.
Notes: Index from 0 to count-1.

16.6.4 Properties

16.6.5 count as Integer

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Count of strings inside this list.
Notes: (Read only property)

16.7 class InternetConfigMBS

16.7.1 class InternetConfigMBS

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Getting and setting Internet Config settings.
Deprecated: This item is deprecated and should no longer be used. **Notes:**

Works with Internet Config 2.5 and newer.

Key reserved for use by Internet Config (list made by Apple):

16.7.2 Methods

16.7.3 BeginEditing(wantwrite as boolean) as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Begins editing.
Notes:

For every call to BeginEditing you need one to EndEditing.
You need to use BeginEditing with wantwrite=true before changing any value.
And you should use BeginEditing if you want to read several values to speed up, because on every access a BeginEditing/EndEditing pair is called if you don't.
Works with Internet Config 2.5 and newer.

16.7.4 Constructor

Plugin Version: 5.4, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The constructor for this class.
Notes:

Same as other constructor except that "????" is used as creator code.
Works with Internet Config 2.5 and newer.
See also:

- 16.7.5 Constructor(creator as string) 402

16.7.5 Constructor(creator as string)

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The constructor for this class.
Notes:

You should pass the creator code of your application or "????".
Works with Internet Config 2.5 and newer.
See also:

- 16.7.4 Constructor 402

16.7.6 DefaultValue(key as string) as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the default value for this key.
Notes: Works with Internet Config 2.5 and newer.

16.7.7 DeleteKey(name as string) as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Deletes the given key.
Notes: Works with Internet Config 2.5 and newer.

16.7.8 EditPreferences(key as string) as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Asks Internet Config to open the control panel to edit this key.
Notes: Works with Internet Config 2.5 and newer.

16.7.9 EndEditing as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Ends editing.
Notes:

For every call to BeginEditing you need one to EndEditing.
Works with Internet Config 2.5 and newer.

16.7.10 Key(index as Integer) as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The key with the given index.
Notes:

Index is from 1 to count.
Works with Internet Config 2.5 and newer.

16.7.11 LaunchURL(url as string) as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Launches the URL using the matching helper application.
Notes:

Like ShowURL but can return an error.
Works with Internet Config 2.5 and newer.

16.7.12 MapFilename(filename as string) as ICMapMBS

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Finds the best matching mapping for this filename.
Notes: Works with Internet Config 2.5 and newer.

16.7.13 MapTypeCreator(type as string, creator as string, filename as string) as ICMapMBS

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Finds the best matching mapping for this Type/Creator combination.
Notes:

Filename is optional.
Works with Internet Config 2.5 and newer.

16.7.14 ParseURL(url as string) as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Parses the URL and returns a corrected version.
Notes:

Returns "" on any error.
Works with Internet Config 2.5 and newer.

16.7.15 SetValue(key as string, attribute as Integer, result as string) as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Asks Internet Config for a value.
Example:

```
dim i as InternetConfigMBS

i=new InternetConfigMBS("????")

if i.ICUseHTTPProxy then
MsgBox "use http proxy"
else
MsgBox "don't use http proxy"
end if

if i.SetValue("UseHTTPProxy",0,chr(1)) then
MsgBox "set value"
end if

if i.ICUseHTTPProxy then
MsgBox "use http proxy"
else
MsgBox "don't use http proxy"
end if

if i.SetValue("UseHTTPProxy",0,chr(0)) then
MsgBox "set value"
end if

if i.ICUseHTTPProxy then
MsgBox "use http proxy"
else
MsgBox "don't use http proxy"
end if
```

Notes:

Attributes:

Works with Internet Config 2.5 and newer.
result true if successfull.

16.7.16 Value(key as string, byref attribute as Integer,byref result as string)

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Asks Internet Config for a value.
Notes:

Attributes:

Works with Internet Config 2.5 and newer.
result is set to "" on any error.

16.7.17 Properties

16.7.18 Available as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Is Internet Config 2.5 available?
Notes:

Value is false on any error.
(Read only property)

16.7.19 CanRead as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Does your application have read access to this configuration?
Notes:

Returns false on any error.
(Read only property)

16.7.20 CanWrite as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Does your application have write access to this configuration?
Example:

```
dim i as internetConfigMBS

i = new internetConfigMBS("abcd")

if i.BeginEditing( false ) then
```

```
end

if i.canWrite then
msgBox "write"
end

if i.canRead then
msgBox "read"
end

if i.EndEditing then
end if
```

Notes:

Returns false on any error.
(Read only property)

16.7.21 Count as Integer

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The number of keys in this configuration.
Notes:

Returns 0 on any error.
(Read only property)

16.7.22 ICDocumentFont as ICFontMBS

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the font for the document.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is nil on any error.
(Read only property)

16.7.23 ICDownloadFolder as folderitem

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a folderitem to the download folder.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is nil on any error.
(Read only property)

16.7.24 ICEmail as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with the user's email address.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.25 ICFingerHost as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with the user's finger host name.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.26 ICFTPHost as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with the user's ftp host address.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.

(Read only property)

16.7.27 ICFTPProxyAccount as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with the user's ftp proxy account name.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.28 ICFTPProxyHost as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with the user's ftp proxy host name.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.29 ICFTPProxyPassword as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with the user's ftp proxy account password.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.30 ICFTPProxyUser as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with the user's ftp proxy user name.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.31 ICGopherHost as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with the user's gopher host name.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.32 ICGopherProxy as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with the user's gopher proxy host name.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.33 ICHelperHTTP as ICAppMBS

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** With application to use as a webbrowser.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is nil on any error.
(Read only property)

16.7.34 ICHelperMailTo as ICAppMBS

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** With application to use as an Email application.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is nil on any error.
(Read only property)

16.7.35 ICHelperNews as ICAppMBS

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** With application to use as a newsreader.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is nil on any error.
(Read only property)

16.7.36 ICHTTPProxyHost as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with the user's http proxy host name.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.37 ICInstance as Integer

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The handle to the used ICInstance.
Notes: (Read only property)

16.7.38 ICIRCHost as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with the user's irc host name.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.39 ICLDAPSearchbase as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with the user's LDAP search base.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.40 ICLDAPServer as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with the user's LDAP server.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.41 ICListFont as ICFontMBS

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the font for lists.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is nil on any error.

(Read only property)

16.7.42 ICMailAccount as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with the user's mail account name.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.43 ICMailHeaders as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with additional headers for emails.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.44 ICMailPassword as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with the user's mail password.
Example:

```
// Code for encoding or decoding the email password:

Function descramble(encoded as string) As String
dim i as Integer
dim unencoded as string

unencoded=""
for i=1 to len(encoded)
unencoded=unencoded+chr(bitwiseXor(asc(mid(encoded,i,1)),85+i))
next
return unencoded
End Function
```

// (From Carsten Friehe)

Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.45 ICMappings as ICMapEntriesMBS

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The file mappings.
Notes: (Read and Write property)

16.7.46 ICNewMailDialog as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** whether to display a new mail dialog.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is false on any error.
(Read only property)

16.7.47 ICNewMailFlashIcon as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** whether to display a flashing icon on receiving a new email.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is false on any error.
(Read only property)

16.7.48 ICNewMailPlaySound as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** whether to play a sound on receiving a new email.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is false on any error.
(Read only property)

16.7.49 ICNewMailSoundName as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name of the sound to play on receiving a new email.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.50 ICNewsAuthPassword as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with the user's news server password.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.51 ICNewsAuthUsername as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with the user's news server username.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.

(Read only property)

16.7.52 ICNewsHeaders as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with additional headers for news postings.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.53 ICNNTPHost as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with news server name.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.54 ICNoProxyDomains as ICStrListMBS

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A list for all the domain names where you don't need to use the proxy.
Example:

```
dim i as InternetConfigMBS
dim l as ICStrListMBS

i=new InternetConfigMBS

l=i.ICNoProxyDomains

// count
MsgBox str(l.Count)

// first item
MsgBox l.Item(0)
```

Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is nil on any error.
(Read only property)

16.7.55 ICNTPHost as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with network time server name.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.56 ICOrganization as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns a string with the name of the origanization.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.57 ICPrinterFont as ICFontMBS

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the font for printing text.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is nil on any error.
(Read only property)

16.7.58 ICQuotingString as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The string used to quote text.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.59 ICRealName as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The user's real name.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.60 ICRTSPProxyHost as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name of the RTSP proxy host.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.61 ICScreenFont as ICFontMBS

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the font for screen text.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is nil on any error.
(Read only property)

16.7.62 ICSignature as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The signature for new emails or newspostings.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.63 ICSMTPHost as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name of the send mail host.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.64 ICSnailMailAddress as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The user's snail mail address.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.65 ICSocksHost as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name of the socks host.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.

(Read only property)

16.7.66 ICTelnetHost as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name of the telnet host.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.67 ICUMichAll as ICStrListMBS

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The list with all UMichs.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.68 ICUMichPreferred as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name of the preferred UMich.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.69 ICUseFTPProxy as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Should we use the FTP proxy.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.70 ICUseGopherProxy as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Should we use the gopher proxy.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.71 ICUseHTTPProxy as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Should we use the http proxy.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.72 ICUsePassiveFTP as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Should we use passive FTP.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.73 ICUseRTSPProxy as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Should we use the RTSP proxy.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.74 ICUseSocks as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Should we use socks.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.75 ICWAISGateway as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The WAIS Gateway name.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.76 ICWebBackgroundColor as color

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A color for the background of websites.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.77 ICWebReadColor as color

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A color for read links.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.78 ICWebSearchPagePrefs as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The URL of the search site.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.79 ICWebTextColor as color

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A color for websites.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.80 ICWebUnderlineLinks as boolean

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Should links be underlined?
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.81 ICWebUnreadColor as color

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A color for unread links.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.82 ICWhoisHost as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The name of the whois host.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.83 ICWWWHomePage as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The user's web start page.
Notes:

This property is just there to make developing easier. If you want to change it, you need to use SetValue with the matching key.
Value is "" on any error.
(Read only property)

16.7.84 LongConfigName as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the long name for this configuration.
Notes:

Returns "" on any error. Only for displaying to the user. Maximum 255 characters long.
(Read only property)

16.7.85 Seed as Integer

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The change counter for the configuration.
Notes:

Update your values if this property changes its value.
(Read only property)

16.7.86 ShortConfigName as string

Plugin Version: 2.7, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the short name for this configuration.
Notes:

Returns "" on any error. Only for displaying to the user. Maximum 31 characters long.
(Read only property)

kICReservedKey	kICReservedKey”	STR# – formatted, list of Archie servers
kICArchieAll	ArchieAll”	PString – formatted, preferred Archie server
kICArchiePreferred	ArchiePreferred”	ICCharTable – Mac-to-Net and Net-to-Mac character translation
kICCharacterSet	CharacterSet”	ICFontRecord – font used for proportional text
kICDocumentFont	DocumentFont”	ICFileSpec – where to put newly downloaded files
kICDownloadFolder	DownloadFolder”	PString – user@host.domain, email address of user, ie return address
kICEmail	Email”	PString – host.domain, default FTP server
kICFTPHost	FTPHost”	PString – second level FTP proxy authorisation
kICFTPProxyAccount	FTPProxyAccount”	PString – host.domain
kICFTPProxyHost	FTPProxyHost”	PString – scrambled, password for FTPProxyUser
kICFTPProxyPassword	FTPProxyPassword”	PString – first level FTP proxy authorisation
kICFTPProxyUser	FTPProxyUser”	PString – host.domain, default finger server
kICFingerHost	FingerHost”	PString – host.domain, default Gopher server
kICGopherHost	GopherHost”	PString – host.domain, see note in Prog Docs
kICGopherProxy	GopherProxy”	PString – host.domain
kICHTTPProxyHost	HTTPProxyHost”	ICAppSpec – helpers for URL schemes
kICHelper	Helper”	PString – description for URL scheme
kICHelperDesc	HelperDesc”	ICAppSpecList – list of common helpers for URL schemes
kICHelperList	HelperList”	PString – host.domain, Internet Relay Chat server
kICIRCHost	IRCHost”	STR# – formatted, list of Info-Mac servers
kICInfoMacAll	InfoMacAll”	PString – formatted, preferred Info-Mac server
kICInfoMacPreferred	InfoMacPreferred”	PString – string LDAP thing
kICLDAPSearchbase	LDAPSearchbase”	PString – host.domain
kICLDAPServer	LDAPServer”	ICFontRecord – font used for lists of items (eg news article lists)
kICListFont	ListFont”	PString – host for MacSearch queries
kICMacSearchHost	MacSearchHost”	PString – user@host.domain, account from which to fetch mail
kICMailAccount	MailAccount”	TEXT – extra headers for mail messages
kICMailHeaders	MailHeaders”	PString – scrambled, password for MailAccount
kICMailPassword	MailPassword”	ICMapEntries – file type mapping, see documentation
kICMapping	Mapping”	PString – host.domain, NNTP server
kICNNTPHost	NNTPHost”	PString – host.domain, Network Time Protocol (NTP)
kICNTPHost	NTPHost”	Boolean
kICNewMailDialog	NewMailDialog”	Boolean – how to announce new mail
kICNewMailFlashIcon	NewMailFlashIcon”	Boolean
kICNewMailPlaySound	NewMailPlaySound”	PString
kICNewMailSoundName	NewMailSoundName”	PString – scrambled, password for NewsAuthUsername
kICNewsAuthPassword	NewsAuthPassword”	PString – user name for authorised news servers
kICNewsAuthUsername	NewsAuthUsername”	TEXT – extra headers for news messages
kICNewsHeaders	NewsHeaders”	STR# – list of domains not to be proxied
kICNoProxyDomains	NoProxyDomains”	PString – for X-Organization string
kICOrganization	Organization”	PString – host.domain, default Ph server
kICPhHost	PhHost”	TEXT – default response for finger servers
kICPlan	Plan”	ICFontRecord – font used to print ScreenFont
kICPrinterFont	PrinterFont”	PString – used to quote responses in news and mail
kICQuotingString	QuotingString”	PString – real name of user
kICRealName	RealName”	PString – RTSP Proxy Host
kICRTSPProxyHost	RTSPProxyHost”	PString – host.domain, SMTP server
kICSMTPHost	SMTPHost”	ICFontRecord – font used for monospaced text (eg news articles)
kICScreenFont	ScreenFont”	ICServices – TCP and IP port-to-name mapping
kICServices	Services”	TEXT – append to news and mail messages
kICSignature	Signature”	TEXT – preferred mailing address
kICSnailMailAddress	SnailMailAddress”	PString – host.domain, remember that host.domain format allows ”:port” and ” port”
kICSocksHost	SocksHost”	PString – host.domain, default Telnet address
kICTelnetHost	TelnetHost”	STR# – formatted, list of UMich servers
kICUMichAll	UMichAll”	PString – formatted, preferred UMich server
kICUMichPreferred	UMichPreferred”	Boolean
kICUseFTPProxy	UseFTPProxy”	Boolean
kICUseGopherProxy	UseGopherProxy”	Boolean
kICUseHTTPProxy	UseHTTPProxy”	Boolean – use PASV command for FTP transfers
kICUsePassiveFTP	UsePassiveFTP”	Boolean
kICUseRTSPProxy	UseRTSPProxy”	Boolean
kICUseSocks	UseSocks”	PString – no idea
kICWAISGateway	WAISGateway”	PString – URL, users default WWW page
kICWWWHomePage	WWWHomePage”	RGBColor – background colour for web pages
kICWebBackgroundColour	WebBackgroundColour”	RGBColor – colour for read links
kICWebReadColor	646F6777WebReadColor”	PString – URL, users default search page
kICWebSearchPagePrefs	WebSearchPagePrefs”	RGBColor – colour for normal text
kICWebTextColor	WebTextColor”	Boolean – whether to underline links
kICWebUnderlineLinks	646F6777WebUnderlineLinks”	RGBColor – colour for unread links
kICWebUnreadColor	646F6777WebUnreadColor”	PString – host.domain, default whois server
kICWhoisHost	WhoisHost”	

1 Locked (geschtzt)
2 Volatile (lschbar)

1 Locked (geschtzt)
2 Volatile (lschbar)

Chapter 17

Network

17.1 Globals

17.1.1 AFPLibraryPresentMBS as boolean

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns true if the AppleShareClient library was found.
Notes: Should be nearly impossible to get false here on Mac OS X.

17.1.2 AFPLibraryVersionMBS as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the version of the AppleShareClient library.
Notes: On Mac OS X it is Version 2 and on Mac OS 9 normally Version 1.

17.2 class AFPURLMBS

17.2.1 class AFPURLMBS

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A class for an Apple File Protocol URL
Deprecated: This item is deprecated and should no longer be used. **Notes:** With Mac OS X 10.6 the AppleClient framework is no longer present. So this class can't work well.

17.2.2 Methods

17.2.3 clear

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Clears all properties.
Deprecated: This item is deprecated and should no longer be used.

17.2.4 IsAFPURL as boolean

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Is the string in the URL property a valid URL?
Deprecated: This item is deprecated and should no longer be used. **Notes:** Requires Mac OS X or on Mac OS Classic the AppleShare system extension.

17.2.5 MakeURL

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Creates an URL from the values of this class.
Deprecated: This item is deprecated and should no longer be used. **Notes:** Requires Mac OS X or on Mac OS Classic the AppleShare system extension.

17.2.6 ParseURL

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Reads the URL property and fills all the other properties.
Deprecated: This item is deprecated and should no longer be used. **Notes:** Requires Mac OS X or on Mac OS Classic the AppleShare system extension.

17.2.7 ServerVolumes as AFPVolumesMBS

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Connects to the server and takes a list of the volumes on this server.
Deprecated: This item is deprecated and should no longer be used. **Notes:**

Requires Mac OS X or on Mac OS Classic the AppleShare system extension.
This method only uses the properties Server, Zone, UserAuthenticationModule, UserName and Password from this class.

17.2.8 Properties

17.2.9 lasterror as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The last error code reported.
Notes:

-1 if parameters are bad or function is not supported for the given platform.
0 if success, else a Mac OS error code.

AFP Protocol Errors:

AppleShare Client Errors:

(Read and Write property)

17.2.10 Password as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The password for this URL.
Notes: (Read and Write property)

17.2.11 Path as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The path for this URL.
Notes:

If you want to mount a path from a volume this is the Path.
(Read and Write property)

17.2.12 protocol as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The protocol for this URL.
Notes:

e.g. this can be "ip" for a TCP/IP based connection.
(Read and Write property)

17.2.13 server as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The server for this URL.
Notes:

e.g. "192.168.1.16" or "idisk.mac.com" or just "ibook".
(Read and Write property)

17.2.14 URL as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The URL including all the other values.
Notes: (Read and Write property)

17.2.15 UserAuthenticationModule as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The Module which will prove the password for this URL.
Notes:

Normally you don't care for that.

Apple Filing Protocol URLs

This section describes Apple Filing Protocol (AFP) URLs.

For both types of URLs (AppleTalk and TCP), the volume name is optional. If the volume name is not specified, the resolver should query the server for a list of exported volumes and present the list to the user for selection.

For both types of AFP URL, the following user authentication module (UAM) names are valid for the authtype portion of the URL:

- 'No User Authent' (used for "Guest" login)
- 'Cleartxt Passwrd' (the password is passed from the client to the server as clear text.
- 'Randum Exchange'
- '2-Way Randnum'
- 'DHCAST128'

If the client specifies an authtype whose value is ;AUTH=* , the client may select any authentication type supported by both client and server.

If the client supplies a user name but does not supply an authentication type, the client should use the most secure UAM supported by both client and server. For the current Macintosh resolver, the most secure UAM is "2-Way Randnum Exchange", which requires a password.

If the client does not specify a user name and authentication type, the "No User Authent" authentication type is used.

If the authtype specifies a UAM that the server does not support, the resolver should return UAM_NOT_SUPPORTED , but it may also continue the authentication process by using the most secure UAM supported both client and server.

For both types of AFP URL, if the name, password, or authtype portions of the URL contains unsafe or reserved characters, such as Double quotation marks (" ") or semicolons (;), the characters must be encoded as described in RFC 1738.
(Read and Write property)

17.2.16 UserName as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The user name for this URL.
Notes: (Read and Write property)

17.2.17 volume as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The volume for this URL.
Notes:

If you want to mount a volume this is the name for this volume.
(Read and Write property)

17.2.18 zone as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The Apple Talk zone for this URL.
Notes: (Read and Write property)

afpAccessDenied	-5000	Insufficient access privileges for operation
afpAuthContinue	-5001	Further information required to complete AFPLogin call
afpBadUAM	-5002	Unknown user authentication method specified
afpBadVersNum	-5003	Unknown AFP protocol version number specified
afpBitmapErr	-5004	Bitmap contained bits undefined for call
afpCantMove	-5005	Move destination is offspring of source, or root was specified
afpDenyConflict	-5006	Specified open/deny modes conflict with current open modes
afpDirNotEmpty	-5007	Cannot delete non-empty directory
afpDiskFull	-5008	Insufficient free space on volume for operation
afpEofError	-5009	Read beyond logical end-of-file
afpFileBusy	-5010	Cannot delete an open file
afpFlatVol	-5011	Cannot create directory on specified volume
afpItemNotFound	-5012	Unknown UserName/UserID or missing comment/APPL entry
afpLockErr	-5013	Some or all of requested range is locked by another user
afpMiscErr	-5014	Unexpected error encountered during execution
afpNoMoreLocks	-5015	Maximum lock limit reached
afpNoServer	-5016	Server not responding
afpObjectExists	-5017	Specified destination file or directory already exists
afpObjectNotFound	-5018	Specified file or directory does not exist
afpParmErr	-5019	A specified parameter was out of allowable range
afpRangeNotLocked	-5020	Tried to unlock range that was not locked by user
afpRangeOverlap	-5021	Some or all of range already locked by same user
afpSessClosed	-5022	Session closed*/
afpUserNotAuth	-5023	No AFPLogin call has successfully been made for this session
afpCallNotSupported	-5024	Unsupported AFP call was made
afpObjectTypeErr	-5025	File/Directory specified where Directory/File expected
afpTooManyFilesOpen	-5026	Maximum open file count reached
afpServerGoingDown	-5027	Server is shutting down
afpCantRename	-5028	AFPRename cannot rename volume
afpDirNotFound	-5029	Unknown directory specified
afpIconTypeError	-5030	Icon size specified different from existing icon size
afpVolLocked	-5031	Volume is Read-Only
afpObjectLocked	-5032	Object is M/R/D/W inhibited
afpContainsSharedErr	-5033	the folder being shared contains a shared folder
afpIDNotFound	-5034	
afpIDExists	-5035	
afpDiffVolErr	-5036	
afpCatalogChanged	-5037	
afpSameObjectErr	-5038	
afpBadIDErr	-5039	
afpPwdSameErr	-5040	Someone tried to change their password to the same password on a mantadory password change
afpPwdTooShortErr	-5041	The password being set is too short: there is a minimum length that must be met or exceeded
afpPwdExpiredErr	-5042	The password being used is too old: this requires the user to change the password before log-in can continue
afpInsideSharedErr	-5043	The folder being shared is inside a shared folder OR the folder contains a shared folder and is being moved into a shared folder OR the folder contains a shared folder and is being moved into the descendent of a shared folder.
afpInsideTrashErr	-5044	The folder being shared is inside the trash folder OR the shared folder is being moved into the trash folder OR the folder is being moved to the trash and it contains a shared folder
afpPwdNeedsChangeErr	-5045	The password needs to be changed
afpPwdPolicyErr	-5046	Password does not conform to servers password policy
afpAlreadyLoggedInErr	-5047	User has been authenticated but is already logged in from another machine (and that's not allowed on this server)
afpCallNotAllowed	-5048	The server knows what you wanted to do, but won't let you do it just now

afpBadDirIDType	-5060	
afpCantMountMoreSrvre	-5061	The Maximum number of server connections has been reached
afpAlreadyMounted	-5062	The volume is already mounted
afpSameNodeErr	-5063	An Attempt was made to connect to a file server running on the same machine

17.3 class AFPVolumesMBS

17.3.1 class AFPVolumesMBS

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A class for the volumes on an Apple File Sharing Server.
Deprecated: This item is deprecated and should no longer be used.

17.3.2 Methods

17.3.3 Count as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns how many volumes where found on the server.
Notes: Requires Mac OS X or on Mac OS Classic the AppleShare system extension.

17.3.4 Mount(volume as string) as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Mounts the volume.
Example:

```
dim i as Integer
dim v as AFPVolumesMBS
// get v filled

i=v.mount("volumename")
if i=0 then
msgBox "Error on mounting."
elseif i=1 then
msgBox "Mounting successfull."
elseif i=2 then
msgBox "Allready mounted."
elseif i=-1 then
msgBox "Something wrong or Windows."
end if
```

Notes:

Possible return values:

Requires Mac OS X or on Mac OS Classic the AppleShare system extension.

0	Error on mounting.
1	Mounting successfull.
2	Volume was allready mounted.
-1	Windows, volume="" or AppleShareClient library not found.

17.3.5 Sort

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Sorts the volume names alphabetically.
Notes: Requires Mac OS X or on Mac OS Classic the AppleShare system extension.

17.3.6 Volumename(index as Integer) as string

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns the name of the volume with this index.
Example:

```
dim v as AFPVolumesMBS
// get your volume

msgbox v.volumename(1) // first name
```

Notes:

1 based list.
Requires Mac OS X or on Mac OS Classic the AppleShare system extension.

17.3.7 Properties

17.3.8 lasterror as Integer

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The last error code reported.
Notes:

-1 if parameters are bad or function is not supported for the given platform.
0 if success, else a Mac OS error code.

AFP Protocol Errors:

AppleShare Client Errors:

(Read and Write property)

17.3.9 MountAtStartup(volume as string) as boolean

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** whether to mount the volume at system start.
Notes:

Seems to be not working on Mac OS X.

Requires Mac OS X or on Mac OS Classic the AppleShare system extension.
(Read and Write computed property)

afpAccessDenied	-5000	Insufficient access privileges for operation
afpAuthContinue	-5001	Further information required to complete AFPLogin call
afpBadUAM	-5002	Unknown user authentication method specified
afpBadVersNum	-5003	Unknown AFP protocol version number specified
afpBitmapErr	-5004	Bitmap contained bits undefined for call
afpCantMove	-5005	Move destination is offspring of source, or root was specified
afpDenyConflict	-5006	Specified open/deny modes conflict with current open modes
afpDirNotEmpty	-5007	Cannot delete non-empty directory
afpDiskFull	-5008	Insufficient free space on volume for operation
afpEofError	-5009	Read beyond logical end-of-file
afpFileBusy	-5010	Cannot delete an open file
afpFlatVol	-5011	Cannot create directory on specified volume
afpItemNotFound	-5012	Unknown UserName/UserID or missing comment/APPL entry
afpLockErr	-5013	Some or all of requested range is locked by another user
afpMiscErr	-5014	Unexpected error encountered during execution
afpNoMoreLocks	-5015	Maximum lock limit reached
afpNoServer	-5016	Server not responding
afpObjectExists	-5017	Specified destination file or directory already exists
afpObjectNotFound	-5018	Specified file or directory does not exist
afpParmErr	-5019	A specified parameter was out of allowable range
afpRangeNotLocked	-5020	Tried to unlock range that was not locked by user
afpRangeOverlap	-5021	Some or all of range already locked by same user
afpSessClosed	-5022	Session closed*/
afpUserNotAuth	-5023	No AFPLogin call has successfully been made for this session
afpCallNotSupported	-5024	Unsupported AFP call was made
afpObjectTypeErr	-5025	File/Directory specified where Directory/File expected
afpTooManyFilesOpen	-5026	Maximum open file count reached
afpServerGoingDown	-5027	Server is shutting down
afpCantRename	-5028	AFPRename cannot rename volume
afpDirNotFound	-5029	Unknown directory specified
afpIconTypeError	-5030	Icon size specified different from existing icon size
afpVolLocked	-5031	Volume is Read-Only
afpObjectLocked	-5032	Object is M/R/D/W inhibited
afpContainsSharedErr	-5033	the folder being shared contains a shared folder
afpIDNotFound	-5034	
afpIDExists	-5035	
afpDiffVolErr	-5036	
afpCatalogChanged	-5037	
afpSameObjectErr	-5038	
afpBadIDErr	-5039	
afpPwdSameErr	-5040	Someone tried to change their password to the same password on a mantadory password change
afpPwdTooShortErr	-5041	The password being set is too short: there is a minimum length that must be met or exceeded
afpPwdExpiredErr	-5042	The password being used is too old: this requires the user to change the password before log-in can continue
afpInsideSharedErr	-5043	The folder being shared is inside a shared folder OR the folder contains a shared folder and is being moved into a shared folder OR the folder contains a shared folder and is being moved into the descendent of a shared folder.
afpInsideTrashErr	-5044	The folder being shared is inside the trash folder OR the shared folder is being moved into the trash folder OR the folder is being moved to the trash and it contains a shared folder
afpPwdNeedsChangeErr	-5045	The password needs to be changed
afpPwdPolicyErr	-5046	Password does not conform to servers password policy
afpAlreadyLoggedInErr	-5047	User has been authenticated but is already logged in from another machine (and that's not allowed on this server)
afpCallNotAllowed	-5048	The server knows what you wanted to do, but won't let you do it just now

afpBadDirIDType	-5060	
afpCantMountMoreSrvre	-5061	The Maximum number of server connections has been reached
afpAlreadyMounted	-5062	The volume is already mounted
afpSameNodeErr	-5063	An Attempt was made to connect to a file server running on the same machine

Chapter 18

Notifications

18.1 class MacNotificationMBS

18.1.1 class MacNotificationMBS

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** A class to notifiy the user.

18.1.2 Methods

18.1.3 Show

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Starts the Notification.
Example:

```
dim n as MacNotificationMBS // in the window

n=new MacNotificationMBS // in the open event
n.message="Hello world"
n.show
```

18.1.4 Properties

18.1.5 FlashIcon as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Should the icon flash in the menubar?
Example:

```
dim n as MacNotificationMBS // in the window

n=new MacNotificationMBS // in the open event
n.message="Hello world"
n.FlashIcon=true
n.show
```

Notes: (Read and Write property)

18.1.6 IconID as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** An ID of a SICN Ressource in the app's ressources to use when flashing the icon.
Example:

```
dim n as MacNotificationMBS // in the window

n=new MacNotificationMBS // in the open event
n.message="Hello world"
n.flashicon=true
n.iconid=128
n.show
```

Notes: (Read and Write property)

18.1.7 mark as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Should the app be marked in the application menu?
Example:

```
dim n as MacNotificationMBS // in the window

n=new MacNotificationMBS // in the open event
n.message="Hello world"
n.mark=true
n.show
```

Notes: (Read and Write property)

18.1.8 Message as string

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The text to be displayed to the user.
Example:

```
dim n as MacNotificationMBS // in the window

n=new MacNotificationMBS // in the open event
n.message="Hello world"
n.show
```

Notes:

May be empty to just bounce the Icon in the dock.
(Read and Write property)

18.1.9 PlaySystemSound as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Plays the system sound when the dialog is shown.
Example:

```
dim n as MacNotificationMBS // in the window

n=new MacNotificationMBS // in the open event
n.PlaySystemSound=true
n.message="Hello world"
n.show
```

Notes:

other sounds will be supported in the next release.
(Read and Write property)

Chapter 19

Power

19.1 class WakeNotifierMBS

19.1.1 class WakeNotifierMBS

Plugin Version: 2.6, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Notification and statistics about sleeping off a Mac.
Notes:

For Mac OS X 10.5.6 you see the SleepDemand and the WakeUp events when your Mac sleeps and wakes up.

In the plugins is the WakeNotifierMBS class and the SleepNotificationMBS class. WakeNotifierMBS uses the API coming from Mac OS and it can delay sleep. SleepNotificationMBS works on the lower Next APIs.

19.1.2 Properties

19.1.3 CallEvents as boolean

Plugin Version: 2.6, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** whether or not to call the events of this class.
Notes:

Default is false.
(Read and Write property)

19.1.4 DisableSleep as boolean

Plugin Version: 2.6, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Diabled sleep if a sleep request comes?
Notes:

Not used if you have code in the SleepRequest event handler.
(Read and Write property)

19.1.5 HadSleeped as boolean

Plugin Version: 2.6, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Sleeped since last reset?
Notes:

You can set this value to false to reset it.
(Read and Write property)

19.1.6 LastSleepTime as Double

Plugin Version: 2.6, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Last time in absolute seconds when falled asleep.
Notes:

Changed type from integer to double in version 4.2.
Value is the same as in date.totalseconds.
(Read and Write property)

19.1.7 LastWakeTime as Double

Plugin Version: 2.6, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Last time in absolute seconds when waken up.
Notes:

Changed type from integer to double in version 4.2.
Value is the same as in date.totalseconds.
(Read and Write property)

19.1.8 SleepCount as Integer

Plugin Version: 2.6, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Count of sleep demands.
Notes: (Read only property)

19.1.9 SleepEventCount as Integer

Plugin Version: 2.6, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Counts how often the Power Manager calls the sleep notification function.
Notes:

For debugging so you know that sleep requests are handled.
(Read and Write property)

19.1.10 Valid as boolean

Plugin Version: 2.6, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Returns True if the sleep event handler could be installed.
Notes:

False, if no Power Manager is installed.
(Read only property)

19.1.11 WakeCount as Integer

Plugin Version: 2.6, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** Count of waking up.
Notes: (Read only property)

19.1.12 Events

19.1.13 SleepDemand

Plugin Version: 2.6, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Called just before falling asleep.

19.1.14 SleepRequest as boolean

Plugin Version: 2.6, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Can be go sleeping? **Notes:**

Return true to deny sleeping.
Returning nothing or false will put the Mac to sleep.

19.1.15 SleepRevoke

Plugin Version: 2.6, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Called when a sleep request was denied by an application or a device driver.

19.1.16 WakeUp

Plugin Version: 2.6, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Called when the Mac wakes up.

Chapter 20

Speech

20.1 class SpeechChannelMBS

20.1.1 class SpeechChannelMBS

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A SpeechMBS channel.
Example:

```
dim s as new SpeechMBS
dim c as SpeechChannelMBS = s.Voice(1).NewChannel

call c.Speak("Hello")

MsgBox str(c.TextBytesToSpeak)
```

Deprecated: This item is deprecated and should no longer be used. You can use NSSpeechSynthesizerMBS instead.

20.1.2 Methods

20.1.3 close

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** The destructor.
Notes:

There is no need to call this method except you want to free all resources of this object now without waiting for Realbasic to do it for you.
(e.g. some Realbasic versions crash on Windows if there are plugin objects not closed.)

20.1.4 ContinueSpeech as Boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Continue speaking.
Example:

```
dim c as SpeechChannelMBS // your channel

MsgBox str(C.ContinueSpeech)
```

Notes: Renamed from Continue to ContinueSpeech in v5.3 to fix a problem with Realbasic 2005r3.

20.1.5 PauseEndOfSentence as Boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Pauses speaking at the end of the current sentence.
Example:

```
dim c as SpeechChannelMBS // your channel

MsgBox str(C.PauseEndOfSentence)
```

20.1.6 PauseEndOfWord as Boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Pauses speaking at the end of the current word.
Example:

```
dim c as SpeechChannelMBS // your channel

MsgBox str(C.PauseEndOfWord)
```

20.1.7 PauseImmediate as Boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Pauses speaking.
Example:

```
dim c as SpeechChannelMBS // your channel

MsgBox str(C.PauseImmediate)
```

20.1.8 Reset

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Resets the SpeechMBS channel to some default values.
Example:

```
dim c as SpeechChannelMBS // your channel

c.reset
```

Notes: Resets e.g. pitchbase, pitchmodulation, volume, rate.

20.1.9 SetOutputFile(file as folderitem) as boolean

Plugin Version: 4.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Sets the destination file.
Example:

```
dim s as new SpeechMBS
dim c as SpeechChannelMBS = s.Voice(1).NewChannel
dim f as FolderItem = SpecialFolder.Desktop.Child("test.aiff")

call c.SetOutputFile(f)
call c.Speak("Hello")

MsgBox str(c.TextBytesToSpeak)
```

Notes:

Returns true on success and false on any error.
Requires Mac OS X 10.3.

20.1.10 Speak(s as string) as Boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Speak the given text.
Example:

```
dim s as new SpeechMBS
dim c as SpeechChannelMBS = s.Voice(1).NewChannel

MsgBox str(c.Speak("Hello"))
```

Notes: v5.1: Now encoding safe and stores result in lasterror property.

20.1.11 SpeechBusy as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns how much SpeechChannels are currently in use of you application.
Example:

```
dim c as SpeechChannelMBS // your channel

MsgBox str(c.SpeechBusy)
```

20.1.12 SpeechBusySystemWide as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns how much SpeechChannels are currently in use on this Mac.
Example:

```
dim c as SpeechChannelMBS // your channel

MsgBox str(c.SpeechBusySystemWide)
```

20.1.13 Stop as Boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Stops speaking.
Example:

```
dim c as SpeechChannelMBS // your channel

MsgBox str(c.Stop)
```

20.1.14 StopEndOfSentence as Boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Stops speaking at the end of the current sentence.
Example:

```
dim c as SpeechChannelMBS // your channel

MsgBox str(c.StopEndOfSentence)
```

20.1.15 StopEndOfWord as Boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Stops speaking at the end of the current word.
Example:

```
dim c as SpeechChannelMBS // your channel

MsgBox str(c.StopEndOfWord)
```

20.1.16 StopImmediate as Boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Stops speaking.
Example:

```
dim c as SpeechChannelMBS // your channel

MsgBox str(c.StopImmediate)
```

20.1.17 Properties

20.1.18 Lasterror as Integer

Plugin Version: 5.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The last error code.
Example:

```
dim c as SpeechChannelMBS // your channel

MsgBox str(c.Lasterror)
```

Notes:

A Mac OS error code.
from the plugin -1 is bad parameter and 0 is success.
(Read only property)

20.1.19 Paused as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Are we paused?
Example:

```
dim s as new SpeechMBS
dim c as SpeechChannelMBS = s.Voice(1).NewChannel

MsgBox str(c.Paused)
```

Notes: (Read only property)

20.1.20 PitchBase as Double

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The pich base used for speaking.
Example:

```
dim c as SpeechChannelMBS // your channel

MsgBox str(C.PitchBase)
```

Notes: (Read and Write property)

20.1.21 PitchModulation as Double

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The pich modulation used for speaking.
Example:

```
dim c as SpeechChannelMBS // your channel

MsgBox str(C.PitchModulation)
```

Notes: (Read and Write property)

20.1.22 Playing as boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Are we playing?
Example:

```
dim c as SpeechChannelMBS // your channel

MsgBox str(C.Playing)
```

Notes: (Read only property)

20.1.23 Rate as Double

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The rate used for speaking.
Example:

```
dim c as SpeechChannelMBS // your channel

MsgBox str(C.Rate)
```

Notes:

Normally around 175 words/minute.
(Read and Write property)

20.1.24 SpeakCharactersLiteral as Boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** whether to speak characters literal.
Example:

```
dim c as SpeechChannelMBS // your channel

MsgBox str(c.SpeakCharactersLiteral)
```

Notes:

Speaks Hello like "H-E-L-L-O"
(Read and Write property)

20.1.25 SpeakNumbersLiteral as Boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** whether to speak numbers literal.
Example:

```
dim c as SpeechChannelMBS // your channel

MsgBox str(c.SpeakNumbersLiteral)
```

Notes:

Speaks 11 not like "elven", but like "one, one".
(Read and Write property)

20.1.26 TextBytesToSpeak as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** How much text is left in the text buffer?
Example:

```
dim s as new SpeechMBS
dim c as SpeechChannelMBS = s.Voice(1).NewChannel

call c.Speak("Hello")

MsgBox str(c.TextBytesToSpeak)
```

Notes: (Read only property)

20.1.27 Voice as VoiceMBS

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The VoiceMBS used for that SpeechChannelMBS.
Example:

```
dim c as SpeechChannelMBS // your channel
```

```
MsgBox c.Voice.Name
```

Notes: (Read and Write property)

20.1.28 Volume as Double

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The current volume.
Example:

```
dim c as SpeechChannelMBS // your channel

MsgBox str(c.Volume)
```

Notes:

From 0 to 65535.
(Read and Write property)

20.2 class SpeechMBS

20.2.1 class SpeechMBS

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** The class for the Mac OS speech synthesizer.
Deprecated: This item is deprecated and should no longer be used. You can use NSSpeechSynthesizerMBS instead. **Notes:**

For Mac OS X you can also use the NSSpeechSynthesizerMBS class and for recognition the NSSpeechRecognizerMBS class.

You can try Speech with some declares, but your app won't start if the Speech extension is not installed. This plugin won't stop, but simply will just tell you that the Speech is not available, so you can react in your application.

20.2.2 Methods

20.2.3 close

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** The destructor.
Notes:

There is no need to call this method except you want to free all resources of this object now without waiting for Realbasic to do it for you.
(e.g. some Realbasic versions crash on Windows if there are plugin objects not closed.)

20.2.4 DefaultVoice as VoiceMBS

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the default VoiceMBS.
Example:

```
dim s as new SpeechMBS
dim v as VoiceMBS = s.DefaultVoice

MsgBox v.Name
```

20.2.5 Speak(s as string) as Boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Speaks a text using the default settings.
Example:

```
dim s as new SpeechMBS

call s.Speak("Hello")

MsgBox "you hear me?"
```

Notes:

Returns directly to caller.
Returns true if speaking is working.

v5.1: Now encoding safe and stores result in lasterror property.

20.2.6 SpeechBusy as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns how much SpeechChannels are currently in use of you application.
Example:

```
dim s as new SpeechMBS

MsgBox str(s.SpeechBusy)
```

20.2.7 SpeechBusySystemWide as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns how much SpeechChannels are currently in use on this Mac.
Example:

```
dim s as new SpeechMBS

MsgBox str(s.SpeechBusySystemWide)
```

20.2.8 Voice(index as Integer) as VoiceMBS

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the VoiceMBS with this number.
Example:

```
dim s as new SpeechMBS

MsgBox s.Voice(1).Name
```

Notes: Index is from 1 to VoiceCount.

20.2.9 Properties

20.2.10 Available as Boolean

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Is SpeechMBS available?
Notes: (Read only property)

20.2.11 Lasterror as Integer

Plugin Version: 5.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The last error code.
Notes:

A Mac OS error code.
from the plugin -1 is bad parameter and 0 is success.
(Read only property)

20.2.12 VersionMajor as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The major Version number.
Example:

```
dim s as SpeechMBS
s=new SpeechMBS
msgbox hex(s.VersionMajor)+".”+hex(s.versionMinor\16)+".”+hex(s.versionMinor mod 16)
```

Notes: (Read only property)

20.2.13 versionMinor as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The minor Version number.
Example:

```
dim s as SpeechMBS
s=new SpeechMBS
msgbox hex(s.VersionMajor)+"."+hex(s.versionMinor\16)+"."+hex(s.versionMinor mod 16)
```

Notes: (Read only property)

20.2.14 VersionRev as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The revision Version number.
Example:

```
dim s as new SpeechMBS

MsgBox str(s.VersionRev)
```

Notes: (Read only property)

20.2.15 VersionStage as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The Stage Version number.
Example:

```
dim s as new SpeechMBS

MsgBox str(s.VersionStage)
```

Notes:

Some constants:

(Read only property)

```
developStage    & h20
alphaStage      & h40
betaStage       & h60
finalStage      & h80
```

20.2.16 VoiceCount as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** How much voices are present?
Example:

```
dim s as new SpeechMBS

MsgBox str(s.VoiceCount)
```

Notes:

If you add or remove VoiceMBS files, please call this function as SpeechMBS can then recognice those changes.
(Read only property)

20.3 class VoiceMBS

20.3.1 class VoiceMBS

Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** This class represents a voice.
Example:

```
dim s as new SpeechMBS

MsgBox s.Voice(2).name
```

Deprecated: This item is deprecated and should no longer be used. You can use NSVoiceMBS instead.

20.3.2 Methods

20.3.3 close

Plugin Version: 3.4, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Function:** The destructor.
Notes:

There is no need to call this method except you want to free all resources of this object now without waiting for Realbasic to do it for you.
(e.g. some Realbasic versions crash on Windows if there are plugin objects not closed.)

20.3.4 NewChannel as SpeechChannelMBS

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Creates a new SpeechChannel using the given voice.
Example:

```
dim s as new SpeechMBS
dim c as SpeechChannelMBS = s.Voice(1).NewChannel

MsgBox str(c.Speak("Hello"))
```

Notes: Returns nil on any error.

20.3.5 Properties

20.3.6 age as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The approximate age in years of the individual represented by the VoiceMBS.
Example:

```
dim s as new SpeechMBS

MsgBox str(s.Voice(1).age)
```

Notes: (Read only property)

20.3.7 comment as string

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Additional text information about the VoiceMBS. The information might indicate how much memory the VoiceMBS requires. Some synthesizers use this field to store a phrase that can be spoken.
Example:

```
dim s as new SpeechMBS
MsgBox s.Voice(1).comment
```

Notes: (Read only property)

20.3.8 file as folderitem

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The file of this VoiceMBS.
Notes:

May be nil.
(Read only property)

20.3.9 gender as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The gender of this VoiceMBS.
Example:

```
dim s as new SpeechMBS

MsgBox str(s.Voice(1).gender)
```

Notes:

Some constants for this property:

kNeuter	0
kMale	1
kFemale	2

(Read only property)

20.3.10 language as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** A code that indicates the language of VoiceMBS output.
Example:

```
dim s as new SpeechMBS

MsgBox str(s.Voice(1).language)
```

Notes:

Language constants:

(Read only property)

20.3.11 name as string

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The name of this VoiceMBS.
Example:

```
dim s as new SpeechMBS
MsgBox s.Voice(1).name
```

Notes: (Read only property)

20.3.12 region as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** A code that indicates the region represented by the VoiceMBS.
Example:

```
dim s as new SpeechMBS

MsgBox str(s.Voice(1).region)
```

Notes:

Some region constants:

(Read only property)

20.3.13 ResID as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** There can be several voices in one file, but this VoiceMBS has this ResID.
Example:

```
dim s as new SpeechMBS

MsgBox str(s.Voice(1).ResID)
```

Notes: (Read only property)

20.3.14 script as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The script code of text that the VoiceMBS can process.
Example:

```
dim s as new SpeechMBS

MsgBox str(s.Voice(1).script)
```

Notes:

Script constants:

(Read only property)

20.3.15 version as Integer

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The version of this VoiceMBS.
Example:

```
dim s as new SpeechMBS

MsgBox str(s.Voice(1).Version)
```

Notes: (Read only property)

langEnglish	0	smRoman script
langFrench	1	smRoman script
langGerman	2	smRoman script
langItalian	3	smRoman script
langDutch	4	smRoman script
langSwedish	5	smRoman script
langSpanish	6	smRoman script
langDanish	7	smRoman script
langPortuguese	8	smRoman script
langNorwegian	9	smRoman script
langHebrew	10	smHebrew script
langJapanese	11	smJapanese script
langArabic	12	smArabic script
langFinnish	13	smRoman 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	smArabic script
langHindi	21	smDevanagari script
langThai	22	smThai script
langKorean	23	smKorean script
langLithuanian	24	smCentralEuroRoman script
langPolish	25	smCentralEuroRoman script
langHungarian	26	smCentralEuroRoman script
langEstonian	27	smCentralEuroRoman script
langLatvian	28	smCentralEuroRoman script
langSami	29	language of the Sami people of N. Scandinavia
langFaroese	30	modified smRoman/Icelandic script
langFarsi	31	modified smArabic/Farsi script
langPersian	31	Synonym for langFarsi
langRussian	32	smCyrillic script
langSimpChinese	33	Chinese (Mandarin) in simplified characters
langFlemish	34	smRoman script
langIrishGaelic	35	smRoman or modified smRoman/Celtic script (without dot above)
langAlbanian	36	smRoman script
langRomanian	37	modified smRoman/Romanian script
langCzech	38	smCentralEuroRoman script
langSlovak	39	smCentralEuroRoman script
langSlovenian	40	modified smRoman/Croatian script
langYiddish	41	smHebrew script
langSerbian	42	smCyrillic script
langMacedonian	43	smCyrillic script
langBulgarian	44	smCyrillic script
langUkrainian	45	modified smCyrillic/Ukrainian script
langByelorussian	46	smCyrillic script
langBelorussian	46	Synonym for langByelorussian
langUzbek	47	Cyrillic script
langKazakh	48	Cyrillic script
langAzerbaijani	49	Azerbaijani in Cyrillic script
langAzerbaijanAr	50	Azerbaijani in Arabic script
langArmenian	51	smArmenian script
langGeorgian	52	smGeorgian script
langMoldavian	53	smCyrillic script
langKirghiz	54	Cyrillic script
langTajiki	55	Cyrillic script
langTurkmen	56	Cyrillic script
langMongolian	57	Mongolian in smMongolian script
langMongolianCyr	58	Mongolian in Cyrillic script
langPashto	59	Arabic script

verUS	0	en_US
verFrance	1	Ffr_FR
verBritain	2	Ben_GB
verGermany	3	Dde_DE
verItaly	4	Tit_IT
verNetherlands	5	Nnl_NL
verFlemish	6	FN nl_BE Flemish (Dutch) for Belgium
verSweden	7	Ssv_SE
verSpain	8	Ees_ES Spanish for Spain
verDenmark	9	DK da_DK
verPortugal	10	PO pt_PT Portuguese for Portugal
verFrCanada	11	Cfr_CA French for Canada
verNorway	12	Hno_NO,nb_NOBokml
verIsrael	13	HB he_IL,iw_IL Hebrew
verJapan	14	Jja_JP
verAustralia	15	Xen_AU English for Australia
verArabic	16	AB ar Arabic for N Africa, Arabian peninsula, Levant
verFinland	17	Kfi_FI
verFrSwiss	18	SF fr_CH French Swiss
verGrSwiss	19	SD de_CH German Swiss
verGreece	20	GR el_GR Monotonic Greek (modern)
verIceland	21	IS is_IS
verMalta	22	MA mt_MT
verCyprus	23	CY _CY Greek or Turkish language? Checking...
verTurkey	24	TU tr_TR
verYugoCroatian	25	YUCroatian for Yugoslavia; now use verCroatia (68)
verNetherlandsComma	26	ID for KCHR resource - Dutch
verBelgiumLuxPoint	27	ID for KCHR resource - Belgium
verCanadaComma	28	ID for KCHR resource - Canadian ISO
verCanadaPoint	29	ID for KCHR resource - Canadian; now unused
vervariantPortugal	30	ID for resource; now unused
vervariantNorway	31	ID for resource; now unused
vervariantDenmark	32	ID for KCHR resource - Danish Mac Plus
verIndiaHindi	33	hi_IN Hindi for India
verPakistanUrdu	34	UR ur_PK Urdu for Pakistan
verTurkishModified	35	
verItalianSwiss	36	ST it_CH Italian Swiss
verInternational	37	ZenEnglish for international use
	38	is unassigned
verRomania	39	RO ro_RO
verGreecePoly	40	grcPolytonic Greek (classical)
verLithuania	41	LT lt_LT
verPoland	42	PL pl_PL
verHungary	43	MG hu_HU
verEstonia	44	EE et_EE
verLatvia	45	LV lv_LV
verSami	46	se
verFaroeIsl	47	FA fo_FO
verIran	48	PS fa_IR Persian/Farsi
verRussia	49	RS ru_RU Russian
verIreland	50	GA ga_IE Irish Gaelic for Ireland (without dot above)
verKorea	51	KH ko_KR
verChina	52	CH zh_CN Simplified Chinese
verTaiwan	53	TA zh_TW Traditional Chinese
verThailand	54	TH th_TH
verScriptGeneric	55	SSGeneric script system (no language or script)
verCzech	56	CZ cs_CZ
verSlovak	57	SL sk_SK
verFarEastGeneric	58	FEGeneric Far East system (no language or script)
verMagyar	59	Unused; see verHungary
verBengali	60	bn Bangladesh or India
verByeloRussian	61	BY be_BY

smRoman	0	
smJapanese	1	
smTradChinese	2	Traditional Chinese
smKorean	3	
smArabic	4	
smHebrew	5	
smGreek	6	
smCyrillic	7	
smRSymbol	8	Right-left symbol
smDevanagari	9	
smGurmukhi	10	
smGujarati	11	
smOriya	12	
smBengali	13	
smTamil	14	
smTelugu	15	
smKannada	16	Kannada/Kanarese
smMalayalam	17	
smSinhalese	18	
smBurmese	19	
smKhmer	20	Khmer/Cambodian
smThai	21	
smLao	22	
smGeorgian	23	
smArmenian	24	
smSimpChinese	25	Simplified Chinese
smTibetan	26	
smMongolian	27	
smEthiopic	28	
smGeez	28	Synonym for smEthiopic
smCentralEuroRoman	29	For Czech, Slovak, Polish, Hungarian, Baltic langs
smVietnamese	30	
smExtArabic	31	extended Arabic
smUninterp	32	uninterpreted symbols, e.g. PaletteMBS symbols
smUnicodeScript	& h7E	

Chapter 21

System

21.1 Globals

21.1.1 MacCountryCodeMBS as string

Plugin Version: 3.1, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the country code for
Example:

```
msgbox MacCountryCodeMBS // Shows DE in Germany.
```

Notes:

On any error returns "".
Requires Mac OS 8.6 or newer (or Mac OS X).
Fix in Plugin version 4.0 to no longer return random strings, but now you must accept that this function may fail on Mac if it has nothing to report. (unkown reason)

Chapter 22

Window

22.1 class Window

22.1.1 class Window

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Extends Realbasic's Window Class.
Example:

window1.HasNoTitleBarMBS = true

Notes: In Realbasic 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.

22.1.2 Methods

22.1.3 RootViewMBS as HIViewMBS

Plugin Version: 7.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the root view for a window.
Deprecated: This item is deprecated and should no longer be used. You can use NSViewMBS instead.
Notes:

Nil on any error.
Note that composite windows and non-composite windows have different view hierarchies.
Requires Mac OS X 10.2 to work.

Returns nil on Cocoa Windows.

22.1.4 Properties

22.1.5 WindowGroupMBS as WindowGroupMBS

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The window group of that window.
Notes:

Lasterror is set.
Keep the group reference when setting this value as the reference count is not retained.
(Read and Write computed property)

Chapter 23

Window Group

23.1 class WindowGroupMBS

23.1.1 class WindowGroupMBS

Plugin Version: 4.2, Console & Web: Yes, Mac: Yes, Win: No, Linux: No. **Function:** A class for a window group on Mac OS X.
Example:

```
// Creates a new group for two windows moving together:

static WinGroup as WindowGroupMBS

const kCGNormalWindowLevelKey=4
WinGroup=new WindowGroupMBS
WinGroup.Create(16+8+2+1)
WinGroup.Level=WinGroup.LevelForKey(kCGNormalWindowLevelKey)
window1.show
window1.WindowGroupMBS=WinGroup
window2.show
window2.WindowGroupMBS=WinGroup
```

Deprecated: This item is deprecated and should no longer be used. **Notes:** This class is Carbon only and not supported on Cocoa. For Cocoa you can check NSWindowMBS.addChildWindow method for similar functionality.

23.1.2 Methods

23.1.3 ChangeAttributes(setTheseAttributes as Integer, clearTheseAttributes as Integer)

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Changes the attributes of a window group.
Notes:

Lasterror is set.

These are attributes that may be applied to a window group:

kWindowGroupAttrSelectAsLayer	1	Makes the group behave somewhat as a layer of windows that move together. When any window in the group is brought to the front of the group, the entire group will also be brought to the front of the containing group's child hierarchy.
kWindowGroupAttrMoveTogether	2	The positions of the contents of this group with respect to each other cannot be changed. When one item moves, all other items are moved simultaneously.
kWindowGroupAttrLayerTogether	4	The z-order of the contents of this group with respect to each other cannot be changed. When one item changes z-order, all other items are moved simulataneously. For purposes of z-ordering, the group and all its subgroups are effectively treated as if they were a single window in the parent group of this group.
kWindowGroupAttrSharedActivation	8	The active state of the windows in this group is shared. The windows in the group are activated or deactivated according to the activation scope of the group, but when any window in the group changes activation, all other windows change to match.
kWindowGroupAttrHideOnCollapse	16	When any window in this group is collapsed, all other windows in this group are hidden. All subgroups of this group are also examined for the HideOnCollapse attribute, and any the windows of any subgroup with this attribute are also hidden. All windows will be shown again when the collapsed window is expanded.

23.1.4 Close

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The destructor.
Notes:

There is no need to call this method except you want to free all resources of this object now without waiting for Realbasic to do it for you.
(e.g. some Realbasic versions crash on Windows if there are plugin objects not closed.)

23.1.5 Create(attributes as Integer)

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Creates a new window group with specified attributes.
Notes:

Lasterror is set.

These are attributes that may be applied to a window group:

kWindowGroupAttrSelectAsLayer	1	Makes the group behave somewhat as a layer of windows that move together. When any window in the group is brought to the front of the group, the entire group will also be brought to the front of the containing group's child hierarchy.
kWindowGroupAttrMoveTogether	2	The positions of the contents of this group with respect to each other cannot be changed. When one item moves, all other items are moved simultaneously.
kWindowGroupAttrLayerTogether	4	The z-order of the contents of this group with respect to each other cannot be changed. When one item changes z-order, all other items are moved simulataneously. For purposes of z-ordering, the group and all its subgroups are effectively treated as if they were a single window in the parent group of this group.
kWindowGroupAttrSharedActivation	8	The active state of the windows in this group is shared. The windows in the group are activated or deactivated according to the activation scope of the group, but when any window in the group changes activation, all other windows change to match.
kWindowGroupAttrHideOnCollapse	16	When any window in this group is collapsed, all other windows in this group are hidden. All subgroups of this group are also examined for the HideOnCollapse attribute, and any the windows of any subgroup with this attribute are also hidden. All windows will be shown again when the collapsed window is expanded.

23.1.6 IsWindowContained(win as window) as boolean

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Indicates whether a window is contained within a group or any of its subgroups.
Notes: True for success.

23.1.7 LevelForKey(levelkey as Integer) as Integer

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the window level for the given level key.
Notes:

Some constants for the level keys

kCGBaseWindowLevelKey	0
kCGMinimumWindowLevelKey	1
kCGDesktopWindowLevelKey	2
kCGBackstopMenuLevelKey	3
kCGNormalWindowLevelKey	4
kCGFloatingWindowLevelKey	5
kCGTornOffMenuWindowLevelKey	6
kCGDockWindowLevelKey	7
kCGMainMenuWindowLevelKey	8
kCGStatusWindowLevelKey	9
kCGModalPanelWindowLevelKey	10
kCGPopUpMenuWindowLevelKey	11
kCGDraggingWindowLevelKey	12
kCGScreenSaverWindowLevelKey	13
kCGMaximumWindowLevelKey	14
kCGOverlayWindowLevelKey	15
kCGHelpWindowLevelKey	16
kCGUtilityWindowLevelKey	17
kCGDesktopIconWindowLevelKey	18
kCGNumberOfWindowLevelKeys	19

23.1.8 NextGroup as WindowGroupMBS

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the next group of a window group.
Notes: Returns nil on any error (e.g. if no next group is in the same parent group)

23.1.9 PreviousGroup as WindowGroupMBS

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the previous or previous group of a window group.
Notes: Returns nil on any error (e.g. if no previous group is in the same parent group)

23.1.10 ReleaseObject

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Releases a refcount on a window group. If the refcount goes to zero, the group is destroyed, and a refcount is released from all contained objects.
Notes:

Lasterror is set.
Make sure you clear the handle so the destructor will not release it again.

23.1.11 RetainCount as Integer

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Returns the refcount of a window group.

23.1.12 RetainObject

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Increments the refcount of a window group.
Notes: Lasterror is set.

23.1.13 SendBehind(behind as WindowGroupMBS)

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Changes the z-order of a group, if the group does not have the kWindowGroupAttributeLayerTogether attribute set.
Notes:

SendBehind currently requires that the group being moved and the behindGroup have the same parent group.

parameter behind: The group behind which to position the specified group.
Lasterror is set.

23.1.14 WindowGroupOfClass(classid as Integer)

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Like create, but looks up an existing window group instead of creating one.
Notes:

see macwindows.h (part of DevTools) for details.
Lasterror is set.

23.1.15 Properties

23.1.16 AttributeFlags as Integer

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The attributes for this window group.
Notes:

Lasterror is set.

These are attributes that may be applied to a window group:

kWindowGroupAttrSelectAsLayer	1	Makes the group behave somewhat as a layer of windows that move together. When any window in the group is brought to the front of the group, the entire group will also be brought to the front of the containing group's child hierarchy.
kWindowGroupAttrMoveTogether	2	The positions of the contents of this group with respect to each other cannot be changed. When one item moves, all other items are moved simultaneously.
kWindowGroupAttrLayerTogether	4	The z-order of the contents of this group with respect to each other cannot be changed. When one item changes z-order, all other items are moved simulataneously. For purposes of z-ordering, the group and all its subgroups are effectively treated as if they were a single window in the parent group of this group.
kWindowGroupAttrSharedActivation	8	The active state of the windows in this group is shared. The windows in the group are activated or deactivated according to the activation scope of the group, but when any window in the group changes activation, all other windows change to match.
kWindowGroupAttrHideOnCollapse	16	When any window in this group is collapsed, all other windows in this group are hidden. All subgroups of this group are also examined for the HideOnCollapse attribute, and any the windows of any subgroup with this attribute are also hidden. All windows will be shown again when the collapsed window is expanded.

Renamed Attributes parameter to AttributeFlags in plugin version 8.2.
(Read only property)

23.1.17 Count as Integer

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Counts the windows or groups contained in a group.
Notes:

Returns 0 on any error.
(Read only property)

23.1.18 Handle as Integer

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The handle of the window group.
Notes:

Data type is WindowGroupRef.
(Read and Write property)

23.1.19 Level as Integer

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Sets the CoreGraphics window group level of windows in a group.
Notes:

CoreGraphics windows (used to implement all windows in Carbon and Cocoa applications on Mac OS X) are divided into layers specified by a window level. Standard window levels are listed in the LevelForKey function documentation. By default, a new window group has a window level of kCGNormalWindowLevel. When a window is placed into a window group, its window level is determined by the window level of its "base group". This is the containing group that is a child of the root group. For example, if group A is a child of the root group, and group B is a child of group A, and window C is in group B, then window C's base group is group A, and group A's window level determines the level of window C. Setting level is only allowed changing the window level of groups that are children of the root group. It returns paramErr for other groups, since a group that is not a child of the root group is not a base group and changing its level has no effect. Changing the level of a group also changes the level of all windows currently contained by the group.

You can get level values using the LevelForKey function.
Lasterror is set.
(Read and Write property)

23.1.20 Name as String

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The name of the group.
Notes: (Read and Write property)

23.1.21 Release as Boolean

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** Whether the destructor should release the handle.
Notes: (Read and Write property)

23.1.22 Parent as WindowGroupMBS

Plugin Version: 4.2, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Function:** The window group that contains a group.
Notes:

Returns nil on any error.
(Read and Write computed property)

Chapter 24

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Chapter 25

The FAQ

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

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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"

dim hours, minutes, seconds as Integer
dim 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)

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

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can use functions from NSColor to get proper highlight color in RGB:
Example:

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

Dim rgbColor As NSColorMBS = theColor.colorUsingColorSpaceName(NSColorSpaceMBS.NSCalibratedRGBColorSpace)
If rgbColor <>Nil Then
Dim red as Integer = rgbColor.redComponent * 255.0
Dim green as Integer = rgbColor.greenComponent * 255.0
Dim 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:

- 25.0.3 How to catch delete key? 495
- 25.0.4 How to convert cmyk to rgb? 495
- 25.0.5 How to delete a folder? 497
- 25.0.6 How to detect if CPU if 64bit processor? 498
- 25.0.7 How to refresh a htmlviewer on Windows? 498

25.0.3 How to catch delete key?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 25.0.2 How do I get the proper highlight color on Mac OS X for active/inactive selection? 494
- 25.0.4 How to convert cmyk to rgb? 495
- 25.0.5 How to delete a folder? 497
- 25.0.6 How to detect if CPU if 64bit processor? 498
- 25.0.7 How to refresh a htmlviewer on Windows? 498

25.0.4 How to convert cmyk to rgb?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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


dim color_RGB as color
dim 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:

- 25.0.2 How do I get the proper highlight color on Mac OS X for active/inactive selection? 494
- 25.0.3 How to catch delete key? 495
- 25.0.5 How to delete a folder? 497
- 25.0.6 How to detect if CPU if 64bit processor? 498
- 25.0.7 How to refresh a htmlviewer on Windows? 498

25.0.5 How to delete a folder?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** The following is the code deletes a folder recursively.
Example:

```
Sub deletefolder(f as folderitem)
dim 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
dim 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
else ' file
fo.Delete
end if
next

f.Delete
End Sub
```

See also:

- 25.0.2 How do I get the proper highlight color on Mac OS X for active/inactive selection? 494
- 25.0.3 How to catch delete key? 495
- 25.0.4 How to convert cmyk to rgb? 495
- 25.0.6 How to detect if CPU if 64bit processor? 498
- 25.0.7 How to refresh a htmlviewer on Windows? 498

25.0.6 How to detect if CPU if 64bit processor?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Via CPUID you can ask CPU:
Example:

```
dim 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:

- 25.0.2 How do I get the proper highlight color on Mac OS X for active/inactive selection? 494
- 25.0.3 How to catch delete key? 495
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25.0.7 How to refresh a htmlviewer on Windows?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can ask the browser to reload the website with this code line:
Example:

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

See also:

- 25.0.2 How do I get the proper highlight color on Mac OS X for active/inactive selection? 494
- 25.0.3 How to catch delete key? 495
- 25.0.4 How to convert cmyk to rgb? 495
- 25.0.5 How to delete a folder? 497
- 25.0.6 How to detect if CPU if 64bit processor? 498

25.0.8 Is there an example for vector graphics in REALbasic?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Try this example inside the paint event of a window:
Example:

```
dim v as Group2D
dim r as RectShape
dim 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
```

25.0.9 Picture functions do not preserve resolution values?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Yes, the picture functions return pictures with no/default resolution values.

Example:

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

l.HorizontalResolution = 300
l.VerticalResolution = 300

dim 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.

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

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** Fill a memoryblock like this:
Example:

```
Dim 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
```

25.0.11 API client not supported?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

25.0.12 Can I access Access Database with Java classes?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** You can use ucanaccess to access databases created with Microsoft
Example:

```
dim options(-1) as string

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

dim appFolder as FolderItem = GetFolderItem("")

Dim count as Integer = appFolder.Parent.Child("java").Count
dim libjs() as string
For i as Integer = 1 to count
Dim 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
dim librery as string = Join(libjs, "")
dim vm as new JavaVMMBS(librery)

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

// select and show values
dim 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

25.0.13 Can I create PDF from Real Studio Report using DynaPDF?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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

25.0.14 Can I use AppleScripts in a web application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Yes, but they run on the server, not on the client.
Example:

```
dim 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.

25.0.15 Can I use graphics class with DynaPDF?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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

25.0.16 Can I use OGG with REALbasic?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** There is a QuickTime plugin for OGG which works with REALbasic.
Notes: That should be a solution for playback and recording on Mac and Windows.

25.0.17 Can I use sockets on a web application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Yes, but they run on the server, not on the client.
Notes:

You can use HTTPSocket, SMTPSocket, POP3Socket, SMTPSecureSocket, SecurePOP3Socket, EasyTCP-Socket, 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.

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

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Yes, our ChartDirector plugin works just fine on the Real Studio Web Edition.
Example:

```
// The data for the pie chart
dim 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!
dim labels(-1) as string=array("Germany","Italy","France","Spain","UK","Poland","Russia")

// The colors to use for the sectors
```

```
dim colors(-1) as Integer

colors.Append & h66aaee
colors.Append & heebb22
colors.Append & hbbbbbb
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
dim c as new CDPieChartMBS(700, 600)

c.setBackground(c.linearGradientColor(0, 0, 0, c.getHeight(), & h0000cc, & h000044))
c.setRoundedFrame(& hffffff, 16)
dim 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)

dim 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

dim pic as picture = c.makeChartPicture
dim 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. Tranfserring 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.

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

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Yes, our DynaPDF plugin works just fine on the Real Studio 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 Real Studio Web Edition.
http://www.monkeybreadsoftware.de/realbasic/webapps.shtml

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

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** No.

25.0.21 Can you get an unique machine ID?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

25.0.22 ChartDirector: Alignment Specification

Plugin Version: 8.2, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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

25.0.23 ChartDirector: Color Specification

Plugin Version: 8.2, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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-

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

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 all at. This is equivalent to traditional RGB colors. A non-zero alpha transparency means the 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 looks 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

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.

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.

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.

25.0.24 ChartDirector: Font Specification

Plugin Version: 8.2, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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 "FONTPATH".

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 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.

25.0.25 ChartDirector: Mark Up Language

Plugin Version: 8.2, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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

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 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.

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.

25.0.26 ChartDirector: Parameter Substitution and Formatting

Plugin Version: 8.2, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

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

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.

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 "& amps;# nn;" (eg. ">" will become "& amps;# 62;".). 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.

25.0.27 ChartDirector: Shape Specification

Plugin Version: 8.2, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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

25.0.28 Copy styled text?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

25.0.29 Do you have code to validate a credit card number?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can check the checksum to tell if a credit card number is not valid.
Example:

```
Dim strNumber As String
Dim nLength as Integer
Dim nValue as Integer
Dim nChecksum as Integer
Dim 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)

25.0.30 Do you have plugins for X-Rite EyeOne, eXact or i1Pro?

Plugin Version: all, Console & Web: No. **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.
Than we can talk about the plugin.

25.0.31 Does SQL Plugin handle stored procedures with multiple result sets?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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. Than 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.

25.0.32 Does the plugin home home?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

25.0.33 folderitem.absolutepath is limited to 255 chars. How can I get longer ones?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
Dim s as string
Dim nf as FolderItem
nf = f
s = ""
while nf<>nil
s = nf.name + ":" + s
nf = nf.parent
wend
Return s
```

```
End Function
```

25.0.34 Future of editablemovie class?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** In short, it will go away, so switch to plugin functions soon.
Notes:

The editableMovie class has been deprecated.
Deprecated means that Real Software will remove it someday, but as of today (and probably a few more years) the class will be available and running. Just not forever. The reason is that Apple deprecated the old QuickTime APIs and they are not available for 64 bit.
For 64 bit, you can move to our QTKit plugin.
We expect the old QuickTime classes in Real Studio and our plugins will continue to work in 32 bit applications. Even if editableMovie class is removed next year from Real Studio, our plugin still provides movie class extensions to do similar functions.

25.0.35 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?

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** This code implements animations for a tabpanel change:
Example:

```
// in a tabpanel.change event:

dim r as CGSTransitionRequestMBS
dim co as new CGSConnectionMBS
dim cw as CGSWindowMBS
dim 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.

25.0.36 How about Plugin support for older OS X?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

25.0.37 How can I detect whether an Intel CPU is a 64bit CPU?

Plugin Version: all, Console & Web: No. **Answer:** Look on the CPU family returned by sysctl:
Example:

```
Function is64bit() As Boolean

# if TargetLittleEndian

dim m as MemoryBlock = NewMemoryBlock(8)
dim family as Integer
dim 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.

25.0.38 How can I disable the close box of a window on Windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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
Dim hSysMenu as Integer
hSysMenu = GetSystemMenu(me.WinHWND, 0)
RemoveMenu hSysMenu, & HF060, & H0
# endif
```

Notes: The window may not be updated directly.

25.0.39 How can I get all the environment variables from Windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** Try this code:
Example:

```
# if targetWin32
declare function GetEnvironmentStrings Lib "kernel32" () as ptr
dim m as memoryBlock
dim 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.

25.0.40 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, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You need to get a media reservation.
Example:

```
dim 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.

25.0.41 How can I get text from a PDF?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

25.0.42 How can I get text from a Word Document?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

25.0.43 How can I get the item string for a given file creator?

Plugin Version: all, Console & Web: No. **Answer:** Try this function:
Example:

```
Sub pullNativeDocs(aCREA As string)
Dim result as Integer
Dim m, k as memoryBlock
Dim f as folderItem
Dim newType as string
Dim anIcon As picture
Dim 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
loop

End Sub
```

Notes: Change "Translation" to "CarbonLib" for Mac OS X.

25.0.44 How can I launch an app using it's creator code?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Send an AppleEvent "odoc" with the creator code to the Finder ("MACS"):
Example:

```
Function LaunchByCreator(C As String) As Boolean
Dim A As AppleEvent
A = NewAppleEvent("aevt","odoc","MACS")
A.ObjectSpecifierParam("----") = GetUniqueIDObjectDescriptor("appf",nil,C)
return A.Send
End Function
```

25.0.45 How can I learn what shared libraries are required by a plugin on Linux?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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)
libpixman-1.so.0 =>/usr/lib/i386-linux-gnu/libpixman-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.

25.0.46 How can I validate an email address?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can try this code:
Example:

```
Dim re As RegEx
re = New RegEx
Dim 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

25.0.47 How do I check if the QuickTime component for the JPEG exporting is available?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** If you want to know if the PictureToString functions will work, you may try this function:
Example:

```
Function IsQTJPEGExporerAvailable() As boolean
dim q as QTComponentInformationMBS

// search for QuickTime JPEG exporter codec
q=new QTComponentInformationMBS

while q.NextComponent
if q.Type="imco" and q.SubType="jpeg" then
Return true
end if
wend

Return false // not found
End Function
```

Notes:

It should work like this for other types like:
”tiff” ->TIFF
”PNTG” ->Mac Paint
”gif ” ->GIF
”WRLE” ->Windows BMP
”tga ” ->Targa
”png ” ->PNG
etc.

25.0.48 How do I check if the QuickTime component for the JPEG importing is available?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** If you want to know if the StringToPicture functions will work, you may try this function:
Example:

```
Function IsQTJPEGImporterAvailable() As boolean
dim q as QTComponentInformationMBS

// search for QuickTime JPEG importer codec
q=new QTComponentInformationMBS

while q.NextComponent
if q.Type=”imdc” and q.SubType=”jpeg” then
Return true
end if
wend

Return false // not found
End Function
```

Notes:

It should work like this for other types like:
”tiff” ->TIFF
”PNTG” ->Mac Paint
”gif ” ->GIF
”WRLE” ->Windows BMP
”tga ” ->Targa
”png ” ->PNG
etc.

25.0.49 How do I check if the QuickTime component for the Sequence grabber is available?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** If you want to know if the QTGrabberClass will work, you can use this code:
Example:

```
Function IsQTGrabberAvailable() As boolean
dim q as QTComponentInformationMBS

q=new QTComponentInformationMBS

while q.NextComponent
if q.Type="barg" then
Return true
end if
wend

Return false // not found
End Function
```

Notes: Don't forget that you need to check for each other component you use like the compression functions.

25.0.50 How do I decode correctly an email subject?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** The following code can be used to decode an email subject including several encodings including Base 64.
Example:

```
dim src as string // input

dim theRegex as Regex
dim theRegexMatch as RegexMatch
dim result, infoCharset, encodedPart as string
dim 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.

25.0.51 How do I enable/disable a single tab in a tabpanel?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

25.0.52 How do I find the root volume for a file?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Try this function:
Example:

```
Function GetRootVolume(f as FolderItem) as FolderItem
dim 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
```

25.0.53 How do I get the current languages list?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Try this code:
Example:

```
dim p as new CFPreferencesMBS
dim a as CFArrayMBS
dim s as CFStringMBS
dim o as CFObjectMBS
dim sa(-1) as string

o=p.CopyAppValue("AppleLanguages",".GlobalPreferences")

if o<>Nil then
a=CFArrayMBS(o)

dim 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.

25.0.54 How do I get the Mac OS Version?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Try this code:
Example:

```
dim 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.

25.0.55 How do I get the printer name?

Plugin Version: all, Console & Web: No. **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:

```
dim s as String
dim 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 if 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.

25.0.56 How do I make a metal window if RB does not allow me this?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

25.0.57 How do I make a smooth color transition?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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)
dim w,w1,x,p as Integer
dim c1,c2,c as color
dim 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.

25.0.58 How do I read the applications in the dock app?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Use CFPreferencesMBS class like in this example:
Example:

```
// Reads file names from persistent dock applications and puts them into the list

dim pref as new CFPreferencesMBS

dim persistentapps as CFStringMBS = NewCFStringMBS("persistent-apps")
dim ApplicationID as CFStringMBS = NewCFStringMBS("com.apple.dock")
dim tiledata as CFStringMBS = NewCFStringMBS("tile-data")
dim filelabel as CFStringMBS = NewCFStringMBS("file-label")

// get the array of persistent applications from dock preferences
dim o as CFObjectMBS = pref.CopyValue(persistentapps, ApplicationID, pref.kCFPreferencesCurrentUser,
pref.kCFPreferencesAnyHost)

if o isa CFArrayMBS then
dim a as CFArrayMBS = CFArrayMBS(o)

// walk over all items in array
dim 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
dim 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
dim name as string = CFStringMBS(o).str
List.AddRow name
```

```
end if
end if
end if

next

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.

25.0.59 How do I truncate a file?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** In a binarystream you can set the length property to truncate.

25.0.60 How do update a Finder's windows after changing some files?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Try this code:
Example:

```
dim f as folderitem // some file
dim 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.

25.0.61 How to access a USB device directly?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

25.0.62 How to add icon to file on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

25.0.63 How to ask the Mac for the Name of the Machine?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Using Apple Events you can use this code:
Example:

```
Function Computername() As string

dim theEvent as AppleEvent
dim 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).

25.0.64 How to automatically enable retina in my apps?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can run a build script on each build with this code:
Example:

```
Dim 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.

25.0.65 How to avoid leaks with Cocoa functions?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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 REALbasic 2009r4 the code above should not be needed as REALbasic runtime does automatically handle the NSAutoreleasePools for you. For older REALbasic versions you need to use code with a timer with the action event above to avoid memory leaks.

Please do not use REALbasic 2009r4 and newer with plugins before version 9.5. You can get crashes there which typically show a line with a objc_msgSend call.

25.0.66 How to avoid trouble connecting to oracle database with SQL Plugin?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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>

25.0.67 How to avoid __NSAutoreleaseNoPool console messages in threads?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You need to use your own NSAutoreleasePool on a thread like this:
Example:

```
sub MyThread.run
dim 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

25.0.68 How to bring app to front?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** On Mac you can use this code:
Example:

```
// First way:
app.FrontMostMBS = true

// second way:
dim 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.

25.0.69 How to bring my application to front?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** This makes SimpleText (Code ttxt) to the frontmost application:
Example:

```
Dim A As AppleEvent
A = NewAppleEvent("misc","actv","")
If Not A.Send then
Beep
end if
```

Notes: (Code is Mac only)

25.0.70 How to catch Control-C on Mac or Linux in a console app?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can use SignalHandlerMBS class for this.
Example:

```
// watch for Control-C on Mac
call SignalHandlerMBS.SetFlagHandler(2)

dim 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 catched, a flag is set and you can ask later in your normal application flow for the result.

25.0.71 How to change name of application menu?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** Use this code to change the application menu name on Mac OS X:
Example:

```
dim mb as new MenubarMBS
dim 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.

25.0.72 How to change the name in the menubar of my app on Mac OS X?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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/ .

25.0.73 How to check if a folder/directory has subfolders?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can use code like this to check all items in a folder:
Example:

```
Function HasSubFolder(folder as FolderItem) As Boolean
dim c as Integer = folder.Count

for i as Integer = 1 to c
dim 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.

25.0.74 How to check if Macbook runs on battery or AC power?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Please use our IOPowerSourcesMBS class like this:
Example:

```
Function PowerSourceState() as Integer
dim p as new IOPowerSourcesMBS

// check all power sources
dim u as Integer = p.Count-1
for i as Integer = 0 to u
dim d as CFDictionaryMBS = p.Item(i)
if d<>nil then
// check if they have a power source state key:
dim o as CFObjectMBS = d.Value(NewCFStringMBS("Power Source State"))
if o isa CFStringMBS then
dim 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.

25.0.75 How to check if Microsoft Outlook is installed?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
```

```
dim 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
```

25.0.76 How to check on Mac OS which country or language is currently selected?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** The code below returns a country value.
Example:

```
dim 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.

25.0.77 How to code sign my app with plugins?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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 Mac and Windows to make sure they have not been modified.

In terminal, you do like this:

cd <Path to folder of 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.

25.0.78 How to collapse a window?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Use this function (Mac only):
Example:

```
Sub CollapseRBwindow(w as window, CollapseStatus as boolean)
dim state, err as Integer
dim 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.

25.0.79 How to compare two pictures?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can try this code:
Example:

```
Function ComparePictures(p as picture,q as picture) as Integer
dim r,u as RGBSurface
dim x,y,n,m,h,w as Integer
dim w1,w2,h1,h2,d1,d2 as Integer
dim 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.

25.0.80 How to compile PHP library?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

25.0.81 How to convert a BrowserType to a String with WebSession.Browser?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
```

25.0.82 How to convert a EngineType to a String with WebSession.Engine?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
```

25.0.83 How to convert a PlatformType to a String with WebSession.Platform?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
```

25.0.84 How to convert a text to iso-8859-1 using the TextEncoder?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:**

This code can help you althrough it's not perfect.
You need to set lc to the current color you use.
Example:

```
dim outstring as string
dim theMac, thePC as textencoding
dim 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("Bjrn, this text should be converted")
Mac2PC.clear
```

Notes: You have to call Mac2PC.clear after every conversion to reset the encoding engine.

25.0.85 How to convert ChartTime back to Xojo date?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
dim d2 as Double = CDBaseChartMBS.chartTime(2015, 1, 1)
dim da as new date(2015, 1, 1)
dim ts as Double = da.TotalSeconds

diff = ts - d2
end if
```

```
dim 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.

25.0.86 How to convert line endings in text files?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can simply read file with TextInputStream and write with new line endings using TextOutputStream class.
Example:

```
dim inputfile as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim outputfile as FolderItem = SpecialFolder.Desktop.Child("output.txt")
dim it as TextInputStream = TextInputStream.Open(inputfile)
dim 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.

25.0.87 How to convert picture to string and back?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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

25.0.88 How to copy an array?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can use a function like this to copy an array:
Example:

```
Function CopyArray(a() as Double) as Double()
dim 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.

25.0.89 How to copy an dictionary?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can use a function like this to copy a dictionary:
Example:

```
Function CopyDictionary(d as Dictionary) As Dictionary
dim 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 an dictionary of objects, you need to change code to also make a copy of those objects.

25.0.90 How to copy parts of a movie to another one?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** The code below copies ten seconds of the snowman movie to the dummy movie starting at the 5th second.
Example:

```
dim f as FolderItem
dim md as EditableMovie
dim 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.

25.0.91 How to create a birthday like calendar event?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Try this code:
Example:

```
// start a connection to the calendar database
dim s as new CalCalendarStoreMBS

// needed for the error details
dim e as NSErrorMBS

dim r as CalRecurrenceRuleMBS = CalRecurrenceRuleMBS.initYearlyRecurrence(1, nil) // repeat every
year without end

dim a as new CalAlarmMBS // add alarm
a.action = a.CalAlarmActionDisplay
a.relativeTrigger = -3600*24 // 24 Hours before

// create a new calendar
dim c as new CalEventMBS

dim d as new date(2011, 04, 20) // the date

dim 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.

25.0.92 How to create a GUID?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Use the UUIDMBS class for this.

25.0.93 How to create a Mac picture clip file?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** You can use code like this one.
Example:

```
dim f As FolderItem
dim 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

dim 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
dim pictdata as string = p.PicHandleDataMBS
r.AddResource(pictdata,"PICT",256,"Picture")

dim 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
dim data as string = DecodeBase64("AQAAAAAAAAAAAAAAAAACAFRDRVIAAAABAAAAAAAAAABUQ0lQAAAAA
r.AddResource(data,"drag",128,"") 'ditto
r.Close
```

Notes: In general Apple has deprecated this, but a few application still support clippings.

25.0.94 How to create a PDF file in REALbasic?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

25.0.95 How to create EmailAttachment for PDF Data in memory?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can use code like the one below:
Example:

```
Function EmailAttachmentFromPDFData(PDFData as string, filename as string) As EmailAttachment
dim 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.

25.0.96 How to create PDF for image files?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
Dim pdf As New MyDynapdfMBS

// page width/height in MilliMeter
Dim pdfWidth as Integer = PageWidth * 72 / 25.4
Dim 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.

25.0.97 How to CURL Options translate to Plugin Calls?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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 intrepreted 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. Pas this additional header with the SetOptionHTTPHeader method.

curl -X PUT http://127.0.0.1:5984/appserials/f2f4e540bf8bb60f61cfcd4328001c59 -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)

25.0.98 How to delete file with ftp and curl plugin?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can set post/pre quotes to have ftp commands executed before or after the download/upload.
Example:

```
dim d as CURLMBS // your curl object

// delete file
dim 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.

25.0.99 How to detect display resolution changed?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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".

25.0.100 How to detect retina?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Please use Window.BackingScaleFactorMBS to query the factor.
Example:

```
msgbox str(window1.BackingScaleFactorMBS)
```

25.0.101 How to disable force quit?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

25.0.102 How to disable the error dialogs from Internet Explorer on javascript errors?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

25.0.103 How to display a PDF file in REALbasic?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

25.0.104 How to do a lottery in RB?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
dim n(0) as Integer ' all the numbers
dim m as Integer ' the highest field in the current array
dim 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

dim za(0) as Integer ' the array of the numbers

lotto 49,6,za ' 6 of 49 in Germany


' and display them
staticText1.text=str(za(0))+chr(13)+str(za(1))+chr(13)+str(za(2))+chr(13)+str(za(3))+chr(13)+str(za(4))+chr(13)+str(z
End Sub
```

25.0.105 How to do an asycron DNS lookup?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** use CFHostMBS class (Mac OS X only).
Notes:

REALbasic internal functions and plugin DNS functions are sycronized.

You can use DNSLookupThreadMBS class for doing them asyncron.

25.0.106 How to draw a dushed pattern line?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can try this code: **Example:**

```
// call like this: DrawDushedPatternLine g,0,0,width,height,10

Sub DrawDushedPatternLine(g as graphics,x1 as Integer,y1 as Integer,x2 as Integer,y2 as Integer, partlen as Integer)
dim x,y,ox,oy as Double
dim dx,dy as Double
dim w,h,d as Double
dim b as Boolean

w=x2-x1
h=y2-y1

d=sqrt(w*w+h*h)

dx=w/d*partlen
dy=h/d*partlen

b=true
x=x1
while (x<x2) and (y<y2)
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 Realbasic code, so it even works on Windows.

25.0.107 How to draw a nice antialiased line?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:**

This code can help you althrough 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)
dim intX, intY, count, n, xDiff, yDiff as Integer
dim v, v1, floatX, floatY, xx, yy, xStep, yStep as Double
dim 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.

25.0.108 How to draw with CGContextMBS using my own handle?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can try this code:
Example:

```
Soft Declare Function QDBeginCGContext Lib "Carbon" (port as Integer, ByRef contextHandle as Integer)
as Integer
dim contextRef as Integer
call QDBeginCGContext(g.handle(graphics.HandleTypeCGrafPtr), contextRef)
dim c as new CGContextMBS(contextRef)

c.BeginPath
c.SetLineWidth(3)
c.SetRGBFillColor(1,0,0,0.5)
c.FillRect(CGMakeRectMBS(0,0,100,100))
c.DrawPath(c.kCGPathFillStroke)
c.Flush // and so on

Soft Declare Function QDEndCGContext Lib "Carbon" (port as Integer, ByRef contextHandle as Inte-
ger) as Integer
dim h as Integer = c.Handle
call QDEndCGContext(g.handle(graphics.HandleTypeCGrafPtr), h)
c.Handle=0
```

Notes: Basicly you can provide your own handle to CGContextMBS. But if you do not set it back to 0 the CGContextMBS destructor will release the handle which can result into a crash. (if the reference count is wrong)

25.0.109 How to dump java class interface?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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

25.0.110 How to duplicate a picture with mask or alpha channel?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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:
dim q as new Picture(p.Width, p.Height)
q.Graphics.DrawPicture p,0,0

Return q

end if
# endif

// create new picture
dim q as new Picture(p.Width, p.Height, 32)

// get mask
dim 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 Real Studio versions because of the # if even if your RS version does not support alpha channel pictures. This way it's future proof.

25.0.111 How to enable assistive devices?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

25.0.112 How to encrypt a file with Blowfish?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can use code like this:
Example:

```
dim fi as FolderItem = SpecialFolder.Desktop.Child("test.xojo_binary_project")
dim fo as FolderItem = SpecialFolder.Desktop.Child("test.encrypted")

// read input
dim bi as BinaryStream = BinaryStream.Open(fi)
dim si as string = bi.Read(bi.Length)
bi.Close

// encrypt
dim so as string = BlowfishMBS.Encrypt("MyKey",si)

// write output
dim 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.

25.0.113 How to extract text from HTML?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Use both RemoveHTMLTagsMBS and DecodingFromHTMLMBS like this:
Example:

```
dim html as string = "<p><B>Gr& uuml;& szlig;e</B></P>"
dim htmltext as string = RemoveHTMLTagsMBS(html)
dim text as string = DecodingFromHTMLMBS(htmltext)

MsgBox text // shows: Gre
```

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 & auml; to .

25.0.114 How to find empty folders in a folder?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Try this code:
Example:

```
dim folder as folderitem // your folder

dim c as Integer = folder.count
for i as Integer = 1 to c
dim 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
next
```

25.0.115 How to find iTunes on a Mac OS X machine fast?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can try Launch Services.
Example:

```
dim f as FolderItem

f=LaunchServicesFindApplicationForInfoMBS("hook","com.apple.iTunes","iTunes.app")

MsgBox f.AbsolutePath
```

25.0.116 How to find network interface for a socket by it's name?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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
dim u as Integer = System.NetworkInterfaceCount-1
for i as Integer = 0 to u
dim 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
dim interfaces() as NetworkInterfaceMBS = NetworkInterfaceMBS.AllInterfaces
dim map as new Dictionary

for each n as NetworkInterfaceMBS in interfaces
dim IPv4s() as string = n.IPv4s
dim 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
dim 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.

25.0.117 How to find version of Microsoft Word?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can use code like this:
Example:

```
// find Word
dim f as FolderItem = LaunchServicesFindApplicationForInfoMBS("","com.microsoft.Word","")

// open bundle
dim c as new NSBundleMBS(f)

// read info
dim d as Dictionary = c.infoDictionary

// show version
MsgBox d.Lookup("CFBundleVersion","")
```

Notes: Older versions of Word can be found with creator code "MSWD".

25.0.118 How to fix CURL error 60/53 on connecting to server?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You probably connect with SSL and you have no valid certificate.
Example:

```
dim 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:
dim cacert as FolderItem = Getfolderitem("cacert.pem")
d.OptionCAInfo = cacert.UnixpathMBS
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/

25.0.119 How to format double with n digits?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can use the FormatMBS function for this.
Example:

```
dim 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.

25.0.120 How to get a time converted to user time zone in a web app?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Use the WebSession.GMTOffset property.
Example:

```
Sub Open()
// current date on server
dim d as new date
dim s as string = d.LongTime

// adjust to client GMT offset
d.GMTOffset = d.GMTOffset + Session.GMTOffset

dim t as string = D.LongTime

MsgBox s+EndOfLine+t
End Sub
```

25.0.121 How to get an handle to the frontmost window on Windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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
```

25.0.122 How to get CFAbsoluteTime from date?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** Use code like this:
Example:

```
dim d as new date
dim t as CFTimeZoneMBS = SystemCFTimeZoneMBS
dim g as new CFGregorianDateMBS
g.Day = d.Day
g.Month = d.Month
g.Year = d.Year
g.Minute = d.Minute
g.Hour = d.Hour
g.Second = d.Second

dim at as CFAbsoluteTimeMBS = g.AbsoluteTime(t)
dim 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.

25.0.123 How to get client IP address on web app?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Use the WebSession.RemoteAddress property.
Example:

```
Sub Open()
Title = Session.RemoteAddress
End Sub
```

25.0.124 How to get fonts to load in charts on Linux?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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"
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.

25.0.125 How to get fonts to load in DynaPDF on Linux?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Please use the AddFontSearchPath method in the DynaPDFMBS class to specify where your fonts are.
Example:

```
dim 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.

25.0.126 How to get GMT time and back?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can use the date class and the GMTOffset property.
Example:

```
// now
dim d as new date

// now in GMT
dim e as new date
e.GMTOffset = 0

// show
MsgBox str(d.TotalSeconds,"0.0")+" "+str(e.TotalSeconds, "0.0")

dim GMTTimeStamp as Double = e.TotalSeconds

// restore
dim 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.

25.0.127 How to get good crash reports?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Check this website from the webkit website:
Notes: http://webkit.org/quality/crashlogs.html

25.0.128 How to get list of all threads?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can use the runtime module like in this function:

Example:

```
Function Threads() As Thread()
# pragma DisableBackgroundTasks
dim t() as Thread

Dim 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.

25.0.129 How to get parameters from webpage URL in Real Studio Web Edition?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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 Real Studio 2010r5. Please use DefineEncoding.

25.0.130 How to get Real Studio apps running Linux?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You need to install some requuire 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.

25.0.131 How to get the color for disabled textcolor?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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

dim i as Integer
dim 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" ...

25.0.132 How to get the current free stack space?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can something like the code below:
Example:

```
Sub ShowStackSize()
dim threadid as Integer
dim size as Integer

declare function GetCurrentThread lib "Carbon" (byref threadid as Integer) as short
declare function ThreadCurrentStackSpace lib "Carbon" (threadid as Integer, byref size as Integer) as short

if GetCurrentThread(threadid)=0 then
if 0=ThreadCurrentStackSpace(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.

25.0.133 How to get the current timezone?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **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

dim result, bias, dayLightbias as Integer
dim info as memoryBlock
dim 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
```

25.0.134 How to get the current window title?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** The code below returns the current window title for the frontmost window on Mac OS X if Accessibilty services are

Example:

```
Function CurrentWindowTitle() As string
dim SystemWideElement,FocusedApplicationElement,FocusedWindowElement as AXUIElementMBS
dim FocusedApplication,FocusedWindow,Title as AXValueMBS
dim s as String
dim 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
```

25.0.135 How to get the cursor blink interval time?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

25.0.136 How to get the list of the current selected files in the Finder?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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 Realbasic code it looks like this:
Example:

```
dim ae as appleevent
dim o1 as appleeventObjectSpecifier
dim f as folderItem
dim aList as appleeventdescList
dim i as Integer
dim 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.folderItemItem(i)

dateiname=f.name
```

```
// editfield1 with property "mulitline=true"!
editfield1.text=editfield1.text + dateiname + chr(13)
next
end if
```

25.0.137 How to get the Mac OS system version?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** The following code queries the value and displays the version number:
Example:

```
dim first as Integer
dim second as Integer
dim third as Integer
dim 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
```

25.0.138 How to get the Mac OS Version using System.Gestalt?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Try this code:
Example:

```
Dim s As String
Dim b As Boolean
Dim 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.

25.0.139 How to get the screensize excluding the task bar?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** Try this code:
Notes: Use the Screen class with the available* properties.

25.0.140 How to get the size of the frontmost window on Windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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)
dim err as Integer
dim 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!

25.0.141 How to get the source code of a HTMLViewer?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Try this code:
Example:

```
// for Windows:

msgbox HTMLViewer1.IEHTMLTextMBS

// for Mac OS X:

msgbox HTMLViewer1.mainFrameMBS.dataSource.data
```

25.0.142 How to handle really huge images with GraphicsMagick or ImageMagick?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Sometimes it may be better to use an extra application to process images.
Notes:

A typical 32 bit app made with Xojo (Real Studio) 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.

25.0.143 How to handle tab key for editable cells in listbox?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

25.0.144 How to hard link MapKit framework?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

25.0.145 How to have a PDF downloaded to the user in a web application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can use a WebHTMLViewer control and load the PDF file with the PDF plugin from the browser.
Example:

```
dim 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 Real Studio Web Edition.

25.0.146 How to hide all applications except mine?

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** The code below will on Mac OS hide all applications except your one:
Example:

```
dim p as new ProcessMBS

p.GetFirstProcess
do
if not p.FrontProcess then
p.Visible=false
end if
loop until not p.GetNextProcess
```

25.0.147 How to hide script errors in HTMLViewer on Windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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).

25.0.148 How to hide the grid/background/border in ChartDirector?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** If you want to hide something in a chart, simply assign the kTransparent constant as color.

25.0.149 How to hide the mouse cursor on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

25.0.150 How to insert image to NSTextView or TextArea?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
dim b as BinaryStream = BinaryStream.Open(f)
dim s as string = b.Read(b.Length)

// build wrapper
dim fileWrapper as NSFileWrapperMBS = NSFileWrapperMBS.initRegularFileWithContents(s)
fileWrapper.preferredFilename = f.name

// make attachment
dim fileAttachment as new NSTextAttachmentMBS(fileWrapper)
dim attributedString as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithAttachment(fileAttachment)

// add to a NSTextViewMBS
textview.insertText attributedString

End Sub
```

Notes: For TextArea you can query the underlaying NSTextViewMBS object via TextArea.NSTextViewMBS method.

25.0.151 How to jump to an anchor in a htmlviewer?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **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"""
elseif TargetMacOS then
call HTMLViewer1.EvaluateJavaScriptMBS "window.location = ""# 16"""
else
// not supported
end if
```

25.0.152 How to keep a movieplayer unclickable?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
```

25.0.153 How to keep my web app from using 100% CPU time?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** On Linux and Mac OS X 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.

25.0.154 How to kill a process by name?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can kill a process (or application) by name if you loop over all the processes and kill the one you need.
Example:

```
dim 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.

25.0.155 How to know how many CPUs are present?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Try this function:
Example:

```
Function GetCPUCount() as Integer
Declare Function MPProcessors Lib "Carbon" () as Integer

Return MPProcessors()
End Function
```

Notes: Your app will than 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.

25.0.156 How to know if a movie is finished?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** This code can help you althrough it's not perfect:
Example:

```
Declare Function IsMovieDone Lib "QuickTime" (theMovie as Integer) as Integer

if IsMovieDone(moviePlayer1.movie.handle) <>0 then
//movie is finished
end if
```

Notes: But be carefull! It crashes sometimes for an unknown reason!?

25.0.157 How to know if QuickTime is installed on any target and can play MPEG 4 movies?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** Try this code:
Example:

```
dim q as QTComponentInformationMBS

q=new QTComponentInformationMBS

// "eat " = Movie importers
while q.NextComponentOfType("eat ")
if q.SubType="MP4 " then
MsgBox "found: "+q.Name+ " codec"
end if
wend
```

Notes: If you find a MP4 movie importing codec you can be sure that a MP4 movie can be opened.

25.0.158 How to know if QuickTime is installed on any target?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** Try this function:
Example:

```
Dim theEffect as QTEffect

theEffect=GetQTCrossFadeEffect

if theEffect = nil then
msgBox "QuickTime is not installed."
else
msgBox "Quicktime is installed."
end if
```

Notes: The problem with this code is that it checks only if the QuickTime part of the cross fade effect is available. Use the QTComponentInformationMBS to check for the features you really need.

25.0.159 How to know the calling function?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
dim r as new NilObjectException
raise r

catch x as NilObjectException

// get stack
dim stack() as string = x.Stack

// pick function name and return
dim name as string = stack(2)
Return name

end try
```

```
End Function
```

Notes: You need to include function names in your application.

25.0.160 How to launch an app using it's creator code?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Send an AppleEvent "oapp" with the creator code to the Finder ("MACS"):
Example:

```
Dim a as AppleEvent
dim 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
```

25.0.161 How to launch disc utility?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can use this code:
Example:

```
dim 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.

25.0.162 How to make a lot of changes to a REAL SQL Database faster?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You may try to embed your changes to the database between two transaction calls.
Example:

```
dim db as Database // some database

db.SQLExecute "BEGIN TRANSACTION"
// Do some Stuff
db.SQLExecute "END TRANSACTION"
```

Notes: This can increase speed by some factors.

25.0.163 How to make a NSImage object for my retina enabled app?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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
dim 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.

25.0.164 How to make a window borderless on Windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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

Dim 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
```

25.0.165 How to make an alias using AppleEvents?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Try this code:
Example:

```
Sub MakeAlias(folder as folderitem, target as folderitem, aliasname as string)
dim ev as AppleEvent
dim myResult as boolean
dim 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

25.0.166 How to make an application smaller?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:**

If you use an older copy of REALbasic, you should try to compile for 68k only instead of PPC. It's a little bit slower, but code is much smaller.

On any Mac OS target you can save your images as JPEG and drop the into your application. REALbasic will include them as JPEGs into the Mac applications (convert to BMP for Windows). This will make the resources of your application smaller, but requires that the user has QuickTime 2.5 or newer installed.

25.0.167 How to make AppleScripts much faster?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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
```

25.0.168 How to make double clicks on a canvas?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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:

```
dim doubleClickTime, currentClickTicks as Integer

# if targetMacOS then
Declare Function GetDblTime Lib "Carbon" () as Integer
doubleClickTime = GetDblTime()
# 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 occured close enough together in space
if abs(X - lastClickX) <= 5 and abs(Y - LastClickY) <= 5 then
DoubleClick //a double click has occured 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
```

25.0.169 How to make my Mac not sleeping?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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 */

dim 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.

25.0.170 How to make my own registration code scheme?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** There are excellent articles about how to make a registratin code scheme, but you can also simply use our RegistrationEngineMBS class.
Notes: If you need a license text, why not use the one from Real Studio as a starting point?

25.0.171 How to make small controls on Mac OS X?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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 OSType, size as Integer, data as ptr) as short

dim m as MemoryBlock

m=NewMemoryBlock(2)
m.UShort(0)=kControlSizeSmall

Title=str(SetControlData(CheckBox1.Handle, 0, kControlSizeTag, 2, m))
```

25.0.172 How to mark my Mac app as background only?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can run a build script on each build with this code:
Example:

```
Dim 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.

25.0.173 How to move a file or folder to trash?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Use code like below:
Example:

```
Function MoveToTrash(f as FolderItem) As Boolean
# if TargetMacOS then
dim r as FolderItem
dim e as Integer = MacFileOperationMBS.MoveObjectToTrashSync(f, r, MacFileOperationMBS.kFSFileOperationDefaultOptions)

if e = 0 then
Return true // Ok
end if

# elseif TargetWin32 then
dim w as new WindowsFileCopyMBS

dim 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.

25.0.174 How to move an application to the front using the creator code?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** This makes SimpleText (Code ttxt) to the frontmost application:
Example:

```
dim a as appleevent

a=newappleEvent("misc","actv","ttxt")

if a.send then
end if
```

Notes: (Code is Mac only)

25.0.175 How to move file with ftp and curl plugin?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can set post/pre quotes to have ftp commands executed before or after the download/upload.
Example:

```
dim d as CURLMBS // your curl object

// rename/move file
dim ws() As String
ws.Append "RNFR Temp.txt"
ws.append "RNTO 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 RNTO with the new file name. To delete use DELE and the file path.

25.0.176 How to normalize string on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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

dim s as CFStringMBS = NewCFStringMBS(t)
dim m as CFMutableStringMBS = s.Normalize(kCFStringNormalizationFormD)

Return m.str
End Function
```

Notes: This uses Apple's CFString functions to normalize unicode variants.

25.0.177 How to obscure the mouse cursor on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

25.0.178 How to open icon file on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Use the NSImageMBS class like this:
Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.ico")
dim n as new NSImageMBS(f)

window1.Backdrop = n.CopyPictureWithMask
```

25.0.179 How to open PDF in acrobat reader?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Try this code:
Example:

```
dim pdf as FolderItem = SpecialFolder.Desktop.Child("test.pdf")

// open PDF in Acrobat Reader on Mac:

// find app
dim bundleID as string = "com.adobe.Reader"
dim app as FolderItem = LaunchServicesFindApplicationForInfoMBS("", bundleID, "")

if app<>nil then

// launch app with parameters

dim docs() as FolderItem
docs.Append pdf

dim param as new LaunchServicesLaunchParameterMBS
param.Defaults = true
param.Application = app

dim 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.

25.0.180 How to open printer preferences on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can use our OpenMacOSXPreferencesPaneMBS function like this:
Example:

```
dim 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
```

25.0.181 How to open special characters panel on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** We have functions for that in Cocoa and Carbon.
Example:

```
dim 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.

25.0.182 How to optimize picture loading in Web Edition?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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:
http://www.monkeybreadsoftware.de/realbasic/webapps.shtml

25.0.183 How to parse XML?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can use code like this:
Example:

```
dim s as string = "<test><test /></test>"

try
dim 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.

25.0.184 How to play audio in a web app?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can use the HTML5 audio tag and control it with javscript.
Notes:

See our web apps here:
http://www.monkeybreadsoftware.de/realbasic/webapps.shtml

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 Real Studio 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:

dim urlo as string = app.audioFileOGG.URL
dim 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 element.</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)+";")

25.0.185 How to pretty print xml?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Use the XML Transform method with the right XLS.
Notes:

Learn more here:
http://docs.xojo.com/index.php/XMLDocument.Transform

25.0.186 How to print to PDF?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** This code below shows how to redirect printing to a PDF file on Mac OS X.
Example:

```
// get Xojo printer setup
dim p as new PrinterSetup

// now put it into NSPrintInfo to manipulate
dim n as new NSPrintInfoMBS
n.SetupString = p.SetupString

// change destination to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
n.SetSaveDestination(f)

// move back
p.SetupString = n.SetupString

// and print as usual
dim g as Graphics = OpenPrinter(p)
g.DrawString "Hello World", 20, 20
```

Notes: And you can use normal graphics class for that.

25.0.187 How to query Spotlight's Last Open Date for a file?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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
Dim xMDItem as New MDItemMBS(F)
Dim 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.

25.0.188 How to quit windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** Try this code:
Example:

```
# if targetwin32 then
dim 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.

25.0.189 How to read a CSV file correctly?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** With all the rules for quotes and delimiters, you can simply use the SplitCommaSeparatedValuesMBS method in our plugins like

this:
Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.csv")
dim t as TextInputStream = f.OpenAsTextFile

while not t.EOF
dim s as string = t.ReadLine(encodings.ASCII)

dim items() as string = SplitCommaSeparatedValuesMBS(s, ";", """")

List.AddRow ""
dim 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.

25.0.190 How to read the command line on windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** Try this code:
Example:

```
# if targetwin32 then
dim line as string
Dim mem as MemoryBlock

Declare Function GetCommandLineA Lib "kernel32" () As Ptr

mem=GetCommandLineA()
s=mem.cstring(0)

# endif
```

Notes: Newer Realbasic versions have a system.commandline property.

25.0.191 How to render PDF pages with PDF Kit?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** Try this code:
Example:

```
// choose a file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")

// open it as PDF Document
dim sourceFile as New PDFDocumentMBS(f)

if sourceFile.handle <>0 then // it is a PDF file

// get upper bound of pages
dim c as Integer = sourceFile.pageCount-1

// from first to last page
for n as Integer = 0 to c

// pick that page
dim page as PDFPageMBS = sourceFile.pageAtIndex(n)

// render to image
dim 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.

25.0.192 How to restart a Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Ask the Finder via Apple Events:
Example:

```
dim ae as appleevent
ae=newappleEvent("FNDR","rest","MACS")
if not ae.send then
msgBox "The computer couldn't be restarted."
end if
```

25.0.193 How to resume ftp upload with curl plugin?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

25.0.194 How to rotate a PDF page with CoreGraphics?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
dim sourcefile as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim destfile as FolderItem = SpecialFolder.Desktop.Child("rotated.pdf")

// open PDF
dim pdf as CGPDFDocumentMBS = sourcefile.OpenAsCGPDFDocumentMBS

// query media size of first page
dim r as CGRectMBS = pdf.MediaBox(1)

// create new PDF
dim c as CGContextMBS = destfile.NewCGPDFDocumentMBS(r,"title","Author","Creator")

// create rotated rectangle
dim 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.

25.0.195 How to rotate image with CoreImage?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Use the code like the one below:
Example:

```
// Rotate image with CoreImage

// load image
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim image as new CIImageMBS(f)

// rotate 45 degree
dim n as new NSAffineTransformMBS
n.rotateByDegrees(45)

dim TransformFilter as new CIFilterAffineTransformMBS
TransformFilter.inputImage = image
TransformFilter.inputTransform = n

// get result
dim resultImage as CIImageMBS = TransformFilter.outputImage

// for saving to file
dim outputImage as NSImageMBS = resultImage.RenderNSImage(false)

f = SpecialFolder.Desktop.Child("output.png")
dim b as BinaryStream = BinaryStream.Create(f, true)
```

```
b.Write outputImage.PNGRepresentation

// as Real Studio picture object for display
dim pic as Picture = outputImage.CopyPictureWithMask

Backdrop = pic
```

25.0.196 How to run a 32 bit application on a 64 bit Linux?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

25.0.197 How to save a quicktime movie as a reference movie?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** Example code is below:
Example:

```
// save as reference movie
dim f as FolderItem
dim m as movie

f=SpecialFolder.Desktop.Child("test.mov")
m=f.OpenAsMovie

f=SpecialFolder.Desktop.Child("new movie.mov")

msgbox str(m.SaveMBS(f,false,false))
```

25.0.198 How to save HTMLViewer to PDF with landscape orientation?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can use NSPrintInfoMBS to change the options for PrintToPDFFile function.
Example:

```
// make it landscape
dim n as NSPrintInfoMBS = NSPrintInfoMBS.sharedPrintInfo
```

```
n.orientation = n.NSLandscapeOrientation

// save html to file
dim 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.

25.0.199 How to save RTFD?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** With NSTextViewMBS you can use this code to save to RTFD:
Example:

```
// save text as RTFD including image attachments
dim f as FolderItem = GetSaveFolderItem(FileTypes1.ApplicationRtfd, "test.rtfd")

if f = nil then Return

dim a as NSAttributedStringMBS = textView.textStorage
dim w as NSFileWrapperMBS = a.RTFDFileWrapperFromRange(0, a.length, DocumentAttributes)

dim e as NSErrorMBS
if w.writeToFile(f, e) then

else
MsgBox e.LocalizedDescription
end if
```

Notes: For TextArea you can query the underlaying NSTextViewMBS object via TextArea.NSTextViewMBS method.

25.0.200 How to scale a picture proportionally with mask?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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

dim faktor as Double = min( Height / Pic.Height, Width / Pic.Width)

// Calculate new size
dim w as Integer = Pic.Width * faktor
dim h as Integer = Pic.Height * faktor

// create new picture
dim NewPic as new Picture(w,h,32)

// check if we have a mask and clear it
dim 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.

25.0.201 How to scale a picture proportionally?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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

dim faktor as Double = min( Height / Pic.Height, Width / Pic.Width)
```

```
// Calculate new size
dim w as Integer = Pic.Width * faktor
dim h as Integer = Pic.Height * faktor

// create new picture
dim 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)

25.0.202 How to scale/resize a picture?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** There are several ways to scale or resize a picture. The easiest way may be the ScaleMBS function in the Picture class.
Example:

```
dim Original,Scaled as Picture

Original=LogoMBS(500)
Scaled=Original.ScaleMBS(100,100,true)
```

Notes:

The plugin ways:
- The GWorld class which uses QuickTime. Includes nice Bicubic scaling with QuickTime 6.
- QTGraphicsImporterMBS and QTGraphicsExporterMBS 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.
- CIImageMBS 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 REALbasic:
- make a new picture and draw the old one with new size inside.

25.0.203 How to search with regex and use unicode codepoints?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can specify unicode characters in search string with backslash x and digits.
Example:

```
dim r as RegExMbs
dim s as string
dim 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
```

25.0.204 How to see if a file is invisible for Mac OS X?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Try this function:
Example:

```
Function Invisible(F As FolderItem) As Boolean
Dim TIS As TextInputStream
Dim S,All As String
Dim I as Integer
dim 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
```

25.0.205 How to set cache size for SQLite or REALSQLDatabase?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
dim 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.

25.0.206 How to set the modified dot in the window?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Try this declares:
Example:

```
window1.ModifiedMBS=true
```

25.0.207 How to show a PDF file to the user in a Web Application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can use a WebHTMLViewer control and load the
Example:

```
dim 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 Real Studio Web Edition.
http://www.monkeybreadsoftware.de/realbasic/webapps.shtml

25.0.208 How to show Keyboard Viewer programmatically?

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Use Realbasic or AppleScript to launch the KeyboardViewerServer.app.
Example:

```
dim a as new AppleScriptMBS
dim text as string
dim 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/KeyboardViewerServer.app"

set POSIXPath to ((POSIX file thePath) as string)
tell application "System Events" to set isRunning to 0 <(count (application processes whose name is theApplication))
if isRunning then tell application POSIXPath to quit
delay 0.15

ignoring application responses
tell application POSIXPath to run
end ignoring
```

25.0.209 How to show the mouse cursor on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Try this declare:
Example:

```
Declare Sub ShowCursor Lib "Carbon" ()

ShowCursor
```

Notes: The MBS Plugin has this function and supports it on Windows, too.

25.0.210 How to shutdown a Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Ask the Finder via Apple Events:
Example:

```
dim 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 immediataly: No document asked to be saved, all applications quitting without knowing).

```
Declare Sub ShutDwnPower Lib "Carbon" ()
ShutDwnPower
```

25.0.211 How to sleep a Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Ask the Finder via Apple Events:
Example:

```
dim ae as appleevent
ae=newappleEvent("FNDR","slep","MACS")
if not ae.send then
msgBox "The computer doesn't want to sleep."
end if
```

25.0.212 How to speed up rasterizer for displaying PDFs with DynaPDF?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

25.0.213 How to use PDFLib in my RB application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** The PDFlib plugin was discontinued in favor of our DynaPDF plugin.
Notes: If you need help to move, please contact us.

25.0.214 How to use quotes in a string?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Just double them.
Example:

```
msgbox "This String contains ""quotes""."
```

25.0.215 How to use Sybase in Web App?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Please use our MBS Real Studio 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

25.0.216 How to use the Application Support folder?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:**

I was saving a registration code for an app to the Preferencefolder.
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:

```
dim 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.UnixpathMBS
```

Notes: You may not be able to write there with a normal user account!

25.0.217 How to use the IOPMCopyScheduledPowerEvents function in Realbasic?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can use the following code which does this using the SoftDeclareMBS class.

Example:

```
Sub Open()
dim c as CFDateMBS
```

```
dim 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
dim s as SoftDeclareMBS
dim 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
dim s as SoftDeclareMBS
```

```
dim m as MemoryBlock

'/*
'* Types of power event
'* These are potential arguments to IOPMSchedulePowerEvent().
'* These are all potential values of the kIOPMPowerEventTypeKey in the CFDictionaries
'* 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.

25.0.218 How to validate a GUID?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
dim 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".

25.0.219 How to walk a folder hierarchie non recursively?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Use code like this one:
Example:

```
Sub Walk(folder as FolderItem)
dim folders() as FolderItem

folders.Append folder

while UBound(folders)>=0
```

```
dim currentFolder as FolderItem = folders.pop

dim c as Integer = currentFolder.Count
for i as Integer = 1 to c
dim 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.

25.0.220 I got this error: PropVal, QDPictMBS.Name (property value), Type mismatch error. Expected CGDataProviderMBS, but got Variant, Name:QDPictMBS

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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 Real Studio IDE on Windows crashed on compilation.

25.0.221 I registered the MBS Plugins in my application, but later the registration dialog is shown.

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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 tempory 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.

Finally make sure you use the right serial number. Not an older one or a misspelled one.

25.0.222 I want to accept Drag & Drop from iTunes

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You need to accept AcceptMacDataDrop "itun" and Handle the DropObject.
Example:

```
Sub Open()
window1.AcceptMacDataDrop "itun"
End Sub

Sub DropObject(obj As DragItem)
dim s as string
dim f as folderItem
```

```
dim d as CFDictionaryMBS
dim o as CFObjectMBS
dim key as CFStringMBS
dim dl as CFDictionaryListMBS
dim i,c as Integer
dim u as CFURLMBS
dim 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=NewCFURLMBSCFStringMBS(CFStringMBS(o),nil)

file=u.file
if file<>nil then
MsgBox file.UnixpathMBS
end if
end if
end if
next
end if
end if
```

```
end if
End Sub
```

Notes: The code above inside a window on Realbasic 5.5 with MBS Plugin 5.3 will do it nice and show the paths.

25.0.223 I'm drawing into a listbox but don't see something.

Plugin Version: all, Console & Web: No. **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
dim 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 cliping and an offset which the plugin doesn't know about.

25.0.224 I'm searching for a method or so to move a window from position x.y to somewhere else on the screen.

Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

25.0.225 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?

Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Stand alone.
Notes:

REALbasic 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)

25.0.226 Is the fn key on a powerbook keyboard down?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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:

dim 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.

25.0.227 Is there a case sensitive Dictionary?

Plugin Version: all, Console & Web: No. **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

25.0.228 Is there a way to use the MBS plugin to get only the visible item and folder count on a volume?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can use the DirectorySizeMBS class for this as in the example below:
Example:

```
dim 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.

25.0.229 Is there an easy way I can launch the Displays preferences panel?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Use the code below:
Example:

```
dim error as Integer

error=OpenMacOSXPreferencesPaneMBS("Displays")
if error<>0 then
MsgBox "Failed to launch QuickTime System Preferences panel."
end if
```

25.0.230 Is there an easy way I can launch the Quicktime preferences panel?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Use the code below:
Example:

```
dim error as Integer

error=OpenMacOSXPreferencesPaneMBS("QuickTime")
if error<>0 then
MsgBox "Failed to launch QuickTime System Preferences panel."
end if
```

25.0.231 List of Windows Error codes?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** We have a list of windows error codes on our website.
Notes: http://www.monkeybreadsoftware.de/xojo/winerror.shtml

25.0.232 Midi latency on Windows problem?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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)

25.0.233 My Xojo Web App does not launch. Why?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Here is a list of checks to do for linux apache installations with Xojo or Real Studio 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?

25.0.234 Pictures are not shown in my application. Why?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:**

On Mac OS Classic, please check the memory partition size which may be too low.
Else (most times on Windows) you are simple missing the part of QuickTime to load images.

25.0.235 Realbasic doesn't work with your plugins on Windows 98.

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** Upgrade your Windows version or complain to Realsoftware.

25.0.236 REALbasic or my RB application itself crashes on launch on Mac OS Classic. Why?

Plugin Version: all, Console & Web: No. **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 prefered to use 50 MB and for an application a 10 MB partition is a good way to start.

25.0.237 SQLDatabase not initialized error?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Before you can use SQLDatabaseMBS, it must be initialized.
Example:

```
dim d as new SQLDatabaseMBS
```

Notes:

This happens normally when you use "new SQLDatabaseMBS".
But if you just have a SQLConnectionMBS and get a recordset there, the initialization may not have happend, yet.
So please simply add a line "dim d as new SQLDatabaseMBS" to your app.open code after registration, so the plugin part can initialize and late provide recordsets.

25.0.238 Textconverter returns only the first x characters. Why?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:**

Some older REALbasic versions limit the Textconverter to around 1024 characters in input and output. This should be fixed with RB5.
Notes: REALbasic seems not to support Textconverters at all on Windows.

25.0.239 The type translation between CoreFoundation/Foundation and Realbasic data types.

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** The plugin does conversion between Cocoa/Carbon data types and native REALbasic 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 CFTypeRef 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 CFTypeRef:

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.

25.0.240 Uploaded my web app with FTP, but it does not run on the server!

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

25.0.241 What classes to use for hotkeys?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Please use CarbonHotKeyMBS class on Mac and WindowsKeyFilterMBS on Windows.
Notes: CarbonHotKeyMBS will also work fine in Cocoa apps.

25.0.242 What do I need for Linux to get picture functions working?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

25.0.243 What does the NAN code mean?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:**

25.0.244 What font is used as a 'small font' in typical Mac OS X apps?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:**

REALbasic 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)
dim err as Integer
dim 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
```

25.0.245 What is last plugin version to run on Mac OS X 10.4?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

25.0.246 What is last plugin version to run on PPC?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

25.0.247 What is the difference between Timer and WebTimer?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Time is server side and WebTimer client side.
Notes: Timer is the normal timer class in Real Studio. It runs on the server. On the 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.

25.0.248 What is the list of Excel functions?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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, LINEST, 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, REFTEXT, 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.

25.0.249 What is the replacement for PluginMBS?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Use the SoftDeclareMBS class to load libraries dynamically.

25.0.250 What to do on Realbasic reporting a conflict?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:**

I get an error like "This item conflicts with another item of the same name" when using one of the plugin functions.

REALbasic 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.

25.0.251 What to do with a NSImageCacheException?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** You need to add exception handlers for NSExceptionMBS 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.

25.0.252 What to do with MySQL Error 2014?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can get this error on MySQL if you have a recordset open while you create another one.

25.0.253 What ways do I have to ping?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** You have different ways
Notes:

1. Use the shell class and the ping utility.

2. Use the MBS Network Plugin and there the SuperSocket part:

a) On Windows the ICMPPingMBS works to ping.
b) On Mac OS X it uses OpenTransport and needs root rights. You need to use sudo to run this application. This does not work on Intel Macs, because the plugin is not endian safe.

3. The DarwinPingMBS.Ping method:

Compiled for Mac OS X Macho target it works as a syncronized ping method.
The Windows version had a bug and was fixed in plugin version 8.2pr4. So it works now.

4. The DarwinPingMBS.SimplePing method:

Works on Mac OS X Macho target.

But this method can be called from a thread to make it working in background.

25.0.254 Where is CGGetActiveDisplayListMBS?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** This is now CGDisplayMBS.GetActiveDisplayList.

25.0.255 Where is CGGetDisplaysWithPointMBS?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** This is now CGDisplayMBS.GetDisplaysWithPoint.

25.0.256 Where is CGGetDisplaysWithRectMBS?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** This is now CGDisplayMBS.GetDisplaysWithRect.

25.0.257 Where is CGGetOnlineDisplayListMBS?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** This is now CGDisplayMBS.GetOnlineDisplayList.

25.0.258 Where is GetObjectClassNameMBS?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Please use this replacement method:
Example:

```
Function GetObjectClassNameMBS(o as Object) As string
dim t as Introspection.TypeInfo = Introspection.GetType(o)
Return t.FullName
End Function
```

Notes: GetObjectClassNameMBS was removed from the plugins.

25.0.259 Where is NetworkAvailableMBS?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** We removed NetworkAvailableMBS some versions ago. It was not working right and basicly it's not useful. If you want to check whether you have a network, than do a DNS resolve:
Example:

```
// two independend domain names
const domain1 = "www.google.com"
const domain2 = "www.macsw.de"

// resolve IPs
dim ip1 as string = DNSNameToAddressMBS(Domain1)
dim 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.

25.0.260 Where is StringHeight function in DynaPDF?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

25.0.261 Where is XLSDocumentMBS class?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** This class has been removed in favor of XLBookMBS class.
Notes: This classes have been removed XLSCellMBS, XLSDocumentMBS, XLSFormatRecordMBS, XLSMergedCellsMBS, XLSRowMBS and XLSSheetMBS.

25.0.262 Where to get information about file formats?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:**

Please visit this web page:
http://www.wotsit.org

25.0.263 Where to register creator code for my application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:**

Register at Apple:
http://developer.apple.com/dev/cftype/information.html

25.0.264 Which Mac OS X frameworks are 64bit only?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

25.0.265 Which plugins are 64bit only?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

25.0.266 Why application doesn't launch because of a missing ddraw.dll!?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** Some RB versions require that you install DirectX from Microsoft on your Windows.

25.0.267 Why application doesn't launch because of a missing shlwapi.dll!?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

25.0.268 Why do I hear a beep on keydown?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

25.0.269 Why does folderitem.item return nil?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Because Realbasic 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.

25.0.270 Why doesn't showurl work?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:**

There are three main reasons:

1. showurl is not supported by REALbasic 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.

25.0.271 Why have I no values in my chart?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **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.

25.0.272 Will application size increase with using plugins?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

25.0.273 XLS: Custom format string guidelines

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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

Parameter	Description
x	The x value of the data point. For an enumerated x-axis (see Axis.setLabels 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 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 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 LineLayer.setSymbolScale.
zy	The symbol scale in the y dimension. Applicable for layers with symbol scales set by LineLayer.setSymbolScale.
z	The symbol scale without distinguishing the dimension to use. Applicable for layers with symbol scales set by LineLayer.setSymbolScale.

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 PolarLayer.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 adds 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,,