

MD2Plus

Guide to library for handling MD2 file format, rev. 2

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About MD2Plus

MD2Plus is library providing elemental support for loading, displaying and animating MD2 models in OpenGL based applications. It requires active OpenGL context for performing all of its commands.

What are the main features?

- Loading MD2 files and skinning them with BMP textures
- Skin texture might have different resolution than the original one
- Drawing both key frames and interpolated frames
- Looping animations
- Optimization for small memory footprint of multiple instances of the same model with unique animation

Library is provided with source code for PowerBASIC for Windows, v9.

Basic concepts

MD2 is file format used for the first time in Id Software Quake 2 first person shooter, and it was successfully adopted in other games later. MD2 is binary format, which contains key frames of multiple animations. This approach allows artists to do their job in the animation designer program, while programmers can take care just about playing the already defined animations.

Before any calls to MD2Plus commands, it is necessary to have OpenGL context created already.

MD2Plus allows you to load unlimited number of MD2 models to slots. Slots are simple identifiers represented by integer numbers greater than zero.

When you load first model, complete data for given type of model are allocated to memory, key frames are precomputed to OpenGL coordinates and texture is uploaded.

Then for each particular model of the same kind, only current animation and frame are stored, and of course pointer to that general purpose data.

This approach allows use of big number of model clones with very low memory consumption.

Before you quit your application, you should delete all models.

Loading models

MD2Plus currently supports just one command to load model.

MD2_Load

Description

MD2_Load loads model to specified slot and prepares it for rendering.

Syntax

```
MD2_Load(slot, md2FileName, skinFileName)
```

Parameter name	Type	Description
slot	Integer value	Slot number by which model will be referenced Must be integer number in range 1 to approximately 2 milliards
md2FileName	String	Full path to MD2 file
skinFileName	String	Full path to skin file

Returns

Non zero value in case of error.

Remarks

Currently only BMP skins are supported, this will be enhanced in future releases.

Do not forget to delete model using MD2_Delete or MD2_DeleteAll commands.

Example

```
' Following will load MD2 model to slot 1  
MD2_Load(1, "c:\Monster.md2", "c:\Monster.bmp")
```

Rendering models and their poses

You can render model in static pose by specifying particular frame you wish to render, or you can cycle any interval of frames which represents animation loop.

MD2_Draw

Description

Draws key frame, or interpolation between two consequent frames of given model.

Syntax

```
MD2_Draw(slot, frameNumber)
```

Parameter name	Type	Description
slot	Integer value	Slot number by which model will be referenced Must be integer number in range 1 to approximately 2 milliards
frameNumber	Value	Pass positive integer value for drawing key frame. Pass floating point number to get interpolation between two frames.

Remarks

You cannot specify frameNumber bigger than number of frames in the model. To retrieve frame count, use MD2_GetFrameCount function.

MD2_LockAnimRange

Description

Sets range of frames used for animation.

Syntax

```
MD2_LockAnimRange(slot, frameFrom, frameTo)
```

Parameter name	Type	Description
slot	Integer value	Slot number by which model will be referenced Must be integer number in range 1 to approximately 2 milliards
frameFrom	Integer value	Frame with which the animation starts
frameTo	Integer value	Frame with which the animation ends

Remarks

To display animation set up via this function, use MD2_DrawAnim instead of MD2_Draw.

To advance animation, but not render it, use MD2_AdvanceAnim.

When animation range is not locked, you cannot use MD2_AdvanceAnim and MD2_DrawAnim.

MD2_LockAnimRangeByName

Description

Sets range of frames used for animation.

Syntax

```
MD2_LockAnimRangeByName(slot, animationName)
```

Parameter name	Type	Description
slot	Integer value	Slot number by which model will be referenced Must be integer number in range 1 to approximately 2 milliards
animationName	String	Animation name

Returns

Non zero value in case animation is not present in specified model.

Remarks

When your model contains 3 frames for animation of walking:

walk01, walk02 and walk03

just pass “walk” as animation name string, and command will properly set the frame interval.

Animation name parameter must not contain numbers, just characters of English alphabet.

When animation range is not locked, you cannot use MD2_AdvanceAnim and MD2_DrawAnim.

MD2_UnLockAnimRange

Description

Deactivates animation range set by MD2_LockAnimRange or MD2_LockAnimRangeByName.

Syntax

```
MD2_UnLockAnimRange(slot)
```

Parameter name	Type	Description
slot	Integer value	Slot number by which model will be referenced Must be integer number in range 1 to approximately 2 milliards

Remarks

When animation range is not locked, you cannot use MD2_AdvanceAnim and MD2_DrawAnim.

MD2_AdvanceAnim

Description

Advances actual frame of animation by specified amount.

Syntax

```
MD2_AdvanceAnim(slot, amount)
```

Parameter name	Type	Description
slot	Integer value	Slot number by which model will be referenced Must be integer number in range 1 to approximately 2 milliards
amount	Value	Amount by which the actual frame increases

Remarks

When the actual frame should exceed upper boundary of locked animation range, it smoothly interpolates back to the first frame.



It is strongly recommended to synchronize amount to value of current frame rate to assure same animation speed on all computers.

When animation range is not locked, you cannot use this function.

MD2_DrawAnim

Description

Advances actual frame of animation by specified amount and renders the model in new pose.

Syntax

```
MD2_DrawAnim(slot, amount)
```

Parameter name	Type	Description
slot	Integer value	Slot number by which model will be referenced Must be integer number in range 1 to approximately 2 milliards
amount	Value	Amount by which the actual frame increases

Remarks

When the actual frame should exceed upper boundary of locked animation range, it smoothly interpolates back to the first frame.



It is strongly recommended to synchronize amount to value of current frame rate to assure same animation speed on all computers.

When animation range is not locked, you cannot use this function.

Deleting models

It is necessary to delete models before your program quits. Deleting must be done before OpenGL context of your application is released. When you simply wish to delete all resources, use MD2_DeleteAll, when you need to delete particular model, use MD2_Delete.

MD2_Delete

Description

Deletes given model.

Syntax

```
MD2_Delete(slot)
```

Parameter name	Type	Description
slot	Integer value	Slot number by which model will be referenced Must be integer number in range 1 to approximately 2 milliards

Remarks

Use this function before loading new model to already used slot.

MD2_DeleteAll

Description

Deletes all model loaded by the library.

Syntax

```
MD2_DeleteAll
```

Remarks



Do not forget to call this function before program ends.

Informational functions

Following functions provide basic information on loaded models.

MD2_GetFrameCount

Description

Returns number of frames used in given model.

Syntax

```
numFrames = MD2_GetFrameCount(slot)
```

Parameter name	Type	Description
slot	Integer value	Slot number by which model will be referenced Must be integer number in range 1 to approximately 2 milliards

Returns

Number of frames of animation.

Remarks

This function is useful when using MD2_Draw, to check highest frame number you can display.
Lowest frame number is always 1.

MD2_GetFrameList

Description

Returns string containing names of frames used in given model, separated by comma.

Syntax

```
frameList = MD2_GetFrameList(slot)
```

Parameter name	Type	Description
slot	Integer value	Slot number by which model will be referenced Must be integer number in range 1 to approximately 2 milliards

Returns

Comma delimited list of frame names.

Remarks

This function is useful when checking supported animations.

Supported languages

Library is designed to be used by ThinBasic and PowerBasic programmers. To use the library simply put DLL in the same folder as your program and in the code include file MD2Plus.inc.

ThinBasic

Library is designed to be compatible with ThinBasic scripts using TBGL module.

Website: <http://www.thinbasic.com/>

PowerBasic

Library has been tested with PowerBasic for Windows, v9 and GLFW OpenGL framework.

Website: <http://www.powerbasic.com/>