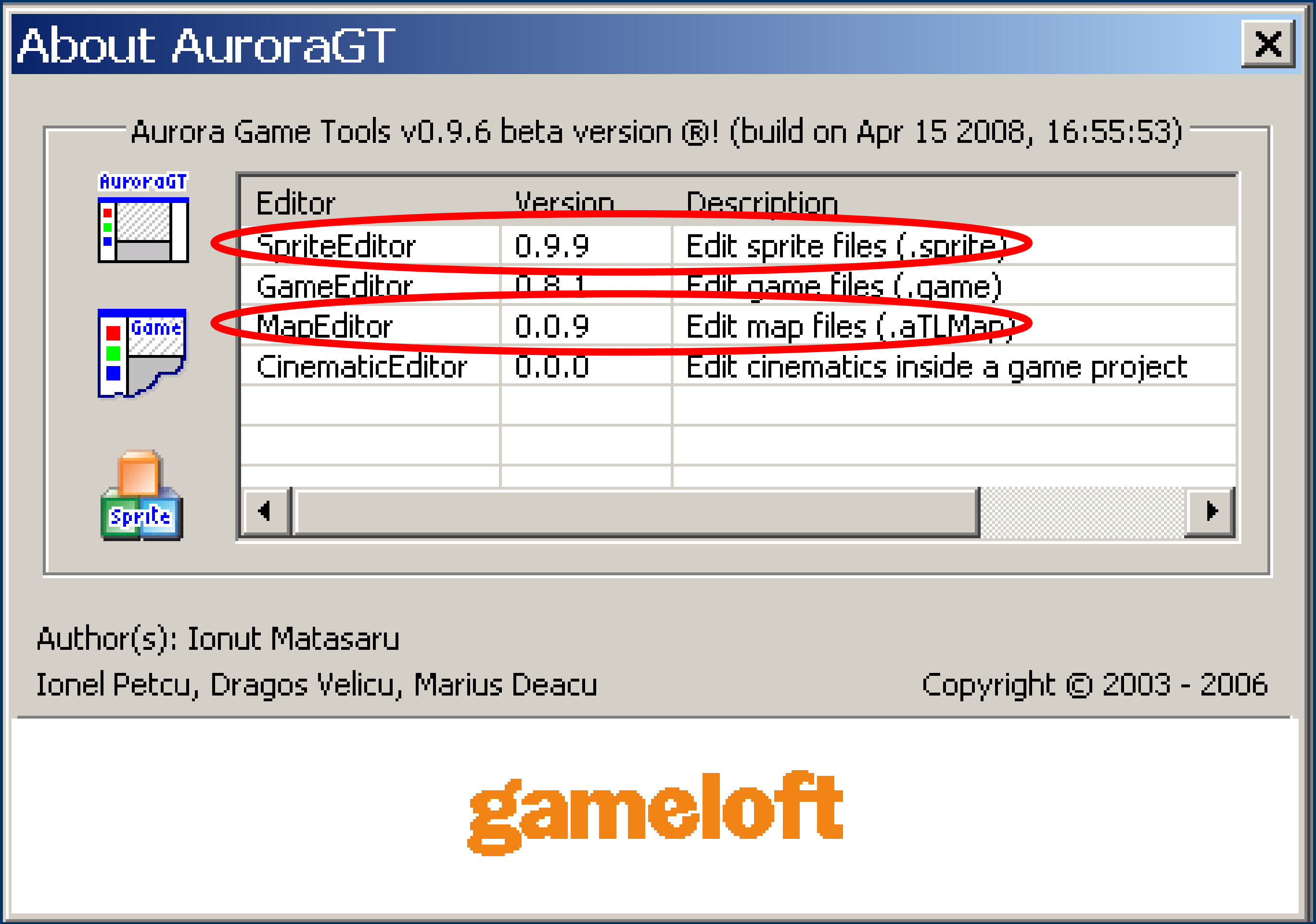
Unleashing Aurora GT

PART I – SpriteEditor & MapEditor: fundamentals

Version

27/02/08	Diego.Mercado@gameloft.com	0.0.2	Added Tileset editor
29/02/08	Diego.Mercado@gameloft.com	0.0.3	Modified gpl2act args, compound graphic & minor changes
10/03/08	Diego.Mercado@gameloft.com	1.0.0	Reorder some slides & minor changes
10/03/08	Diego.Mercado@gameloft.com	1.0.1	Added mask subdivision, MapEditor including isometric maps (r1006) & some optimizations
17/04/08	Diego.Mercado@gameloft.com	1.0.2	Added preview of an animation, more flags, support for non-indexed images and truecolor bmp & updated to r1093: support for more types (triangles & arcs), new bsprite's chunks, and some minor changes
22/04/08	Diego.Mercado@gameloft.com	1.0.3	Added Content & Contact Us pages
02/06/08	Diego.Mercado@gameloft.com	1.0.4	Fixed some bugs at the exporting sprite section
10/09/08	gaspar.deelias@gameloft.com	1.0.5	Splitted AuroraGT Workshop into several sessions (7)

Reference Version[1]


About AuroraGT

Aurora Game Tools v0.9.6 beta version ®! (build on Apr 15 2008, 16:55:53)

Editor	Version	Description
SpriteEditor	0.9.9	Edit sprite files (.sprite)
GameEditor	0.8.1	Edit game files (.game)
MapEditor	0.0.9	Edit map files (.aTLMap)
CinematicEditor	0.0.0	Edit cinematics inside a game project

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Ionel Petcu, Dragos Velicu, Marius Deacu

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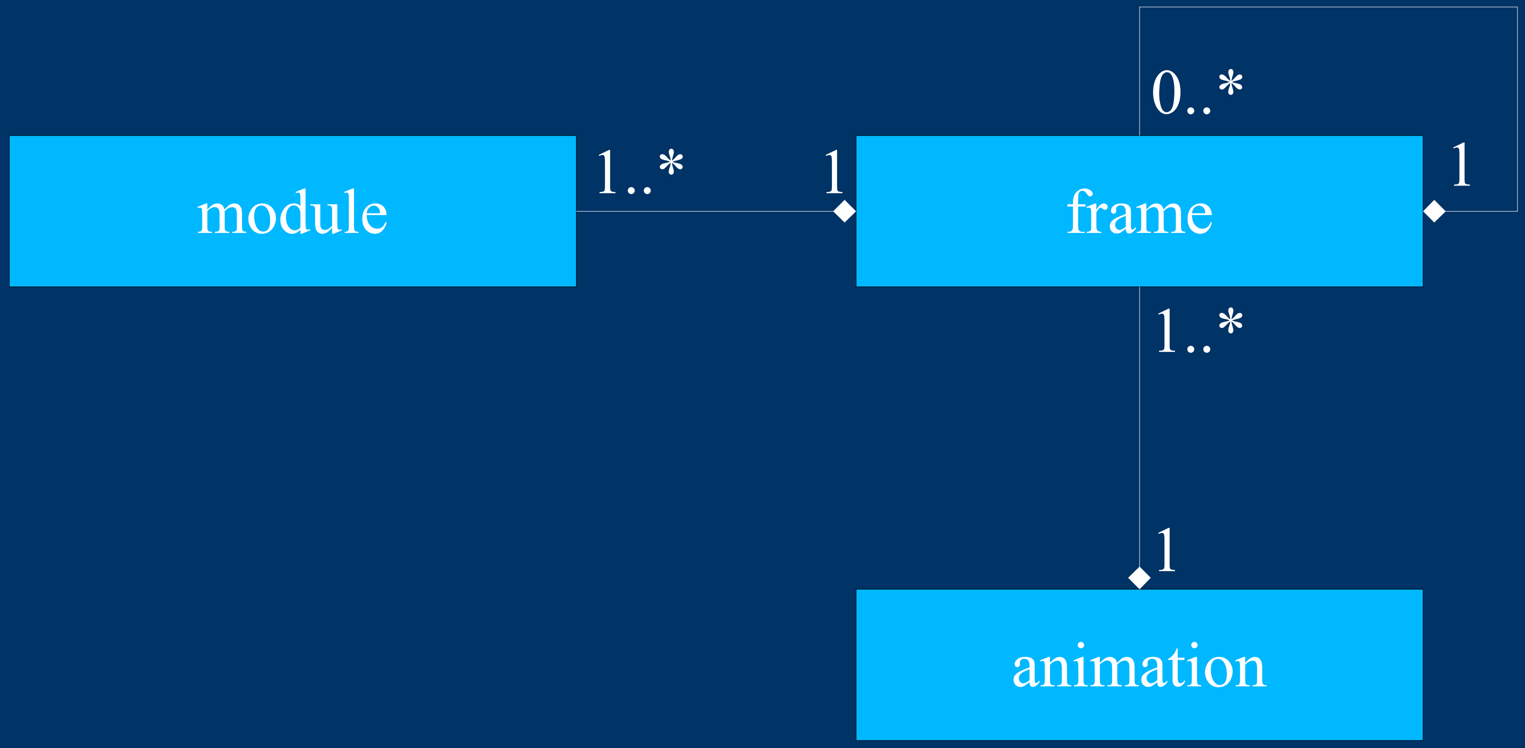
[1] `https://terminus.mdc.gameloft.org/vc/tools/AuroraGT` (r1093)

Content

AuroraGT

- **AuroraGT** (Aurora Game Tools)
  - Is:
    - A sprite editor
    - A game designing tool
  - It has 3 main different versions:
    - Normal (`AuroraGT.exe`)
    - Home-Edition (`AuroraGT_HE.exe`)
    - Unicode-Edition (`AuroraGT_unicode.exe`)
  - The extensions of its files are:
    - Sprites: `*.sprite`
    - Games: `*.game`
    - Maps: `*.aTLMap`

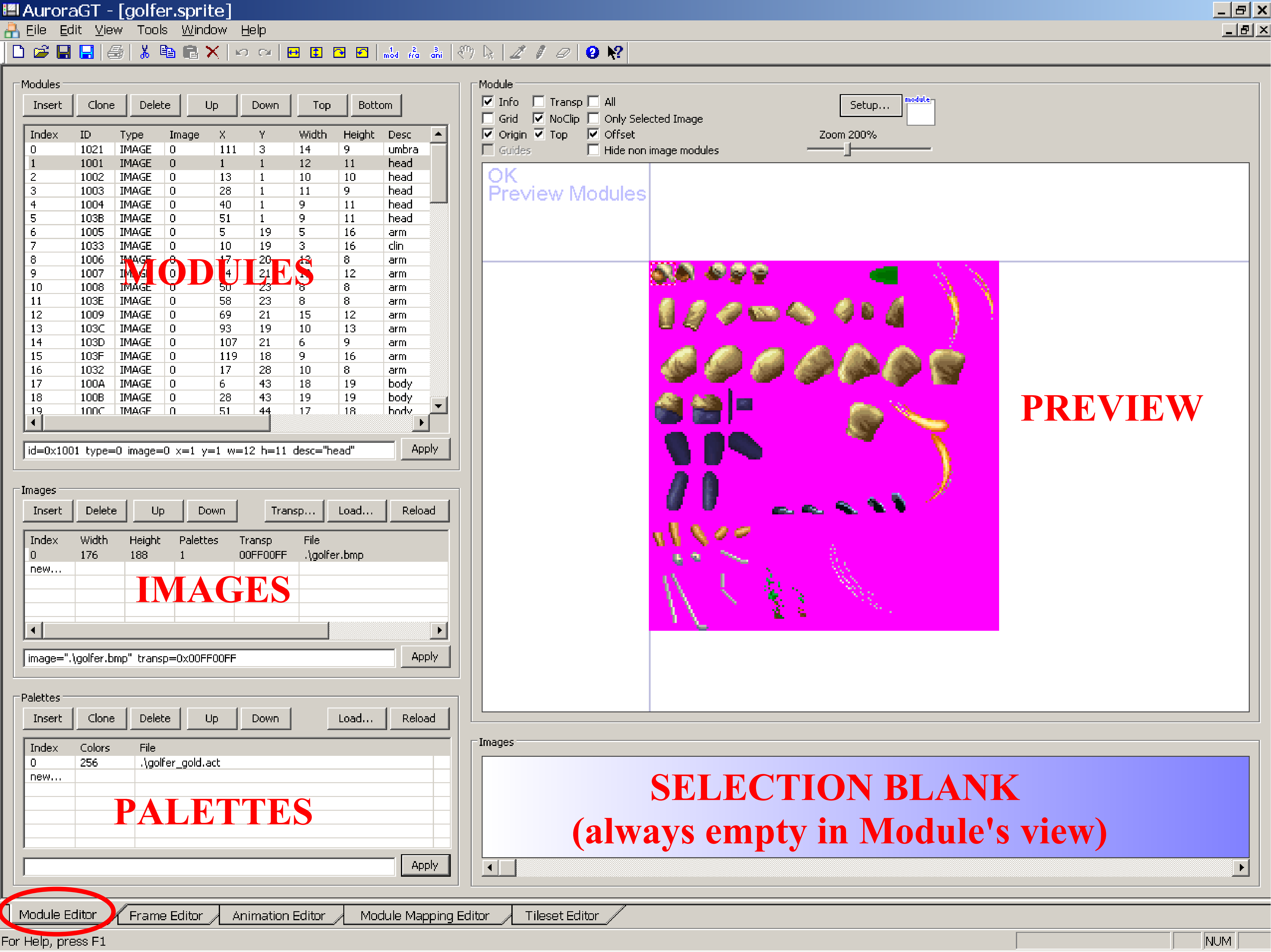
Sprite



Sprite

- Sprite
  - *"An independent graphic object controlled by its own bit plane (area of memory)"*
  - *"Is a two-dimensional/three-dimensional image or animation that is integrated into a larger scene"* (Wikipedia)

(1) Computer Desktop Encyclopedia
(2) Wikipedia


AuroraGT - [golfer.sprite]
File Edit View Tools Window Help
Modules
Insert Clone Delete Up Down Top Bottom
Module
Setup...
Images
Insert Delete Up Down Transp... Load... Reload
Palettes
Insert Clone Delete Up Down Load... Reload
Apply
OK
Preview Modules
MODULES
PREVIEW
IMAGES
PALETTES
SELECTION BLANK
(always empty in Module's view)
Module Editor
Frame Editor
Animation Editor
Module Mapping Editor
Tileset Editor
For Help, press F1
NUM

Index	ID	Type	Image	X	Y	Width	Height	Desc
0	1021	IMAGE	0	111	3	14	9	umbra
1	1001	IMAGE	0	1	1	12	11	head
2	1002	IMAGE	0	13	1	10	10	head
3	1003	IMAGE	0	28	1	11	9	head
4	1004	IMAGE	0	40	1	9	11	head
5	103B	IMAGE	0	51	1	9	11	head
6	1005	IMAGE	0	5	19	5	16	arm
7	1033	IMAGE	0	10	19	3	16	clin
8	1006	IMAGE	0	17	20	12	8	arm
9	1007	IMAGE	0	[illegible]	21	[illegible]	12	arm
10	1008	IMAGE	0	50	23	8	8	arm
11	103E	IMAGE	0	58	23	8	8	arm
12	1009	IMAGE	0	69	21	15	12	arm
13	103C	IMAGE	0	93	19	10	13	arm
14	103D	IMAGE	0	107	21	6	9	arm
15	103F	IMAGE	0	119	18	9	16	arm
16	1032	IMAGE	0	17	28	10	8	arm
17	100A	IMAGE	0	6	43	18	19	body
18	100B	IMAGE	0	28	43	19	19	body
19	100C	IMAGE	0	51	44	17	18	body

id=0x1001 type=0 image=0 x=1 y=1 w=12 h=11 desc="head"

☑ Info ☐ Transp ☐ All
☐ Grid ☑ NoClip ☐ Only Selected Image
☑ Origin ☑ Top ☑ Offset
☐ Guides ☐ Hide non image modules

Zoom 200%

Index	Width	Height	Palettes	Transp	File
0	176	188	1	00FF00FF	.\golfer.bmp
new...					

image=".\golfer.bmp" transp=0x00FF00FF

Index	Colors	File
0	256	.\golfer_gold.act
new...		

Sprite
Module Editor

- For each module you need to set:
  - Index:
    - auto-generated (expressed as int)
    - the modules are ordered according to this value
  - ID:
    - auto-generated (expressed as HEX)
    - from the frame editor you need to refer to this value always
  - Type:
    - indicates if it's an image or a RECT, a filled RECT, an ARC, a FILL_ARC, a MARKER, a TRIANGLE or a FILLED_TRIANGLE
  - Image:
    - If the type is an image indicate the index of it

Sprite

Module Editor

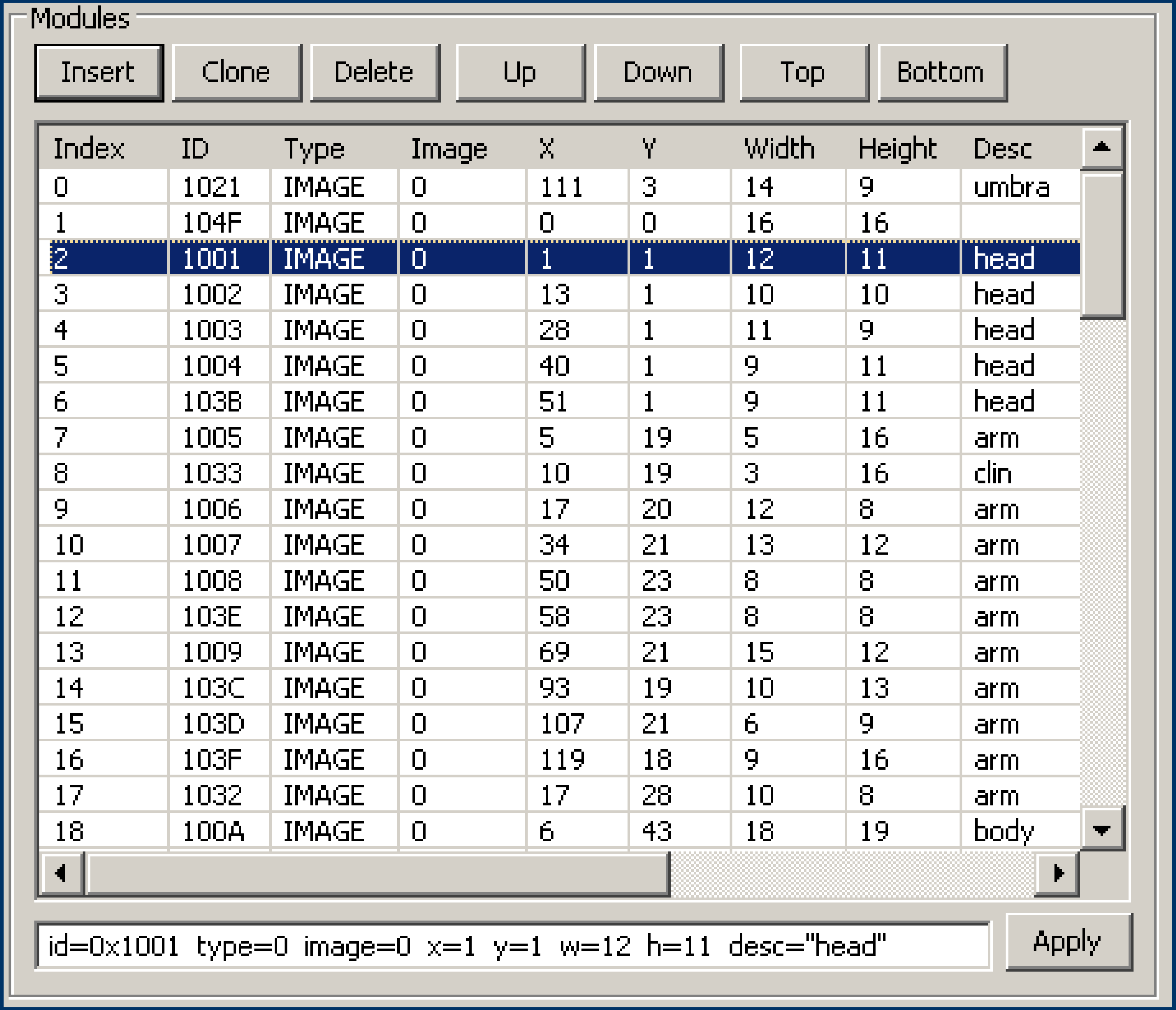
- Widht/Height
  - Portion taken from an image or size of any other object
- X/Y
  - Position of an image
  - For the other objects are 0 the default values and it cannot be changed
- Color:
  - For any filled objects (i.e. Fill_arc, Fill_rect)
- Desc:
  - Description of the module
  - Some font tools use this field for mapping characters

Sprite
Module Editor

- Triangle (specific)
  - p2X/p2Y/p3X/p3Y:
    - X and Y values for the 1st vertex are always zero
    - p2X and p2Y values for the 2nd vertex
    - p3X and p3Y values for the 3rd vertex
- Arc (specific)
  - StartAngle
    - From which angle the ellipse is going to start
  - ArcAngle
    - In which angle the ellipse ends
    - these are parameters from drawArc(..), fillArc(..) methods

Sprite

Module Editor



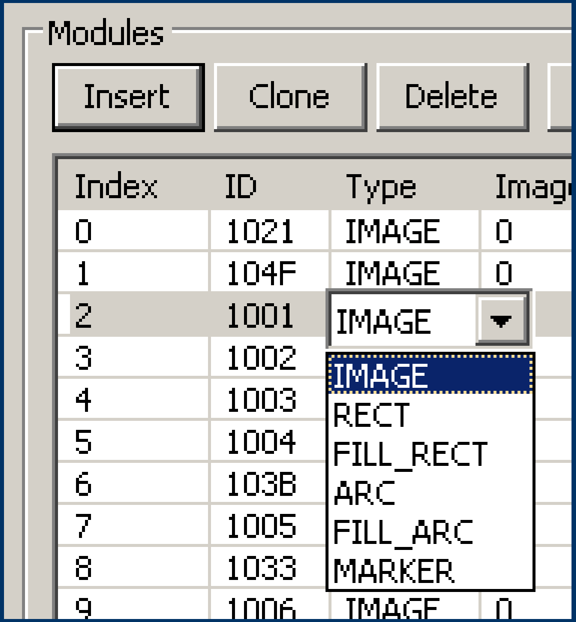
Modules

Insert | Clone | Delete | Up | Down | Top | Bottom

Index	ID	Type	Image	X	Y	Width	Height	Desc
0	1021	IMAGE	0	111	3	14	9	umbra
1	104F	IMAGE	0	0	0	16	16	
2	1001	IMAGE	0	1	1	12	11	head
3	1002	IMAGE	0	13	1	10	10	head
4	1003	IMAGE	0	28	1	11	9	head
5	1004	IMAGE	0	40	1	9	11	head
6	103B	IMAGE	0	51	1	9	11	head
7	1005	IMAGE	0	5	19	5	16	arm
8	1033	IMAGE	0	10	19	3	16	clin
9	1006	IMAGE	0	17	20	12	8	arm
10	1007	IMAGE	0	34	21	13	12	arm
11	1008	IMAGE	0	50	23	8	8	arm
12	103E	IMAGE	0	58	23	8	8	arm
13	1009	IMAGE	0	69	21	15	12	arm
14	103C	IMAGE	0	93	19	10	13	arm
15	103D	IMAGE	0	107	21	6	9	arm
16	103F	IMAGE	0	119	18	9	16	arm
17	1032	IMAGE	0	17	28	10	8	arm
18	100A	IMAGE	0	6	43	18	19	body

```
id=0x1001  type=0  image=0  x=1  y=1  w=12  h=11  desc="head"
```

Apply



Modules

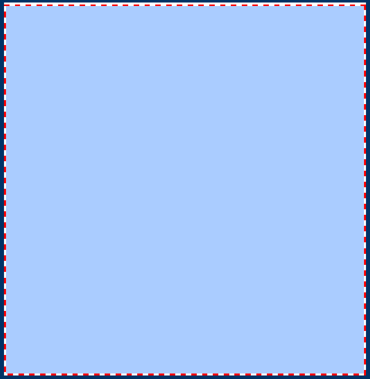
Insert | Clone | Delete

Index	ID	Type	Imag
0	1021	IMAGE	0
1	104F	IMAGE	0
2	1001	IMAGE	
3	1002		
4	1003		
5	1004		
6	103B		
7	1005		
8	1033		
9	1006	IMAGE	0

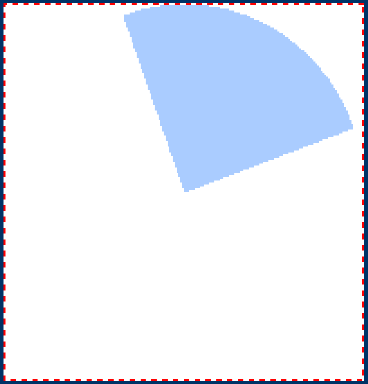
Sprite
Module Editor

- Examples of
  - FILL_RECT
  - FILL_ARC
  - FILL_TRIANGLE

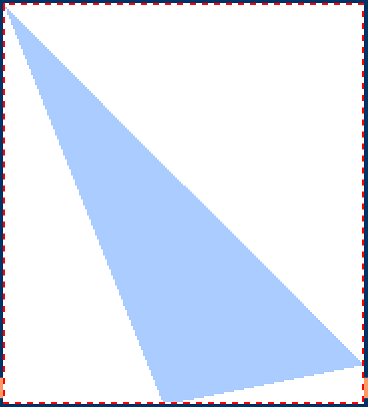
type=2 color=0x00AACCFF
w=50 h=50



type=4 color=0x00AACCFF
w=50 h=50 startAngle=20 arcAngle=9



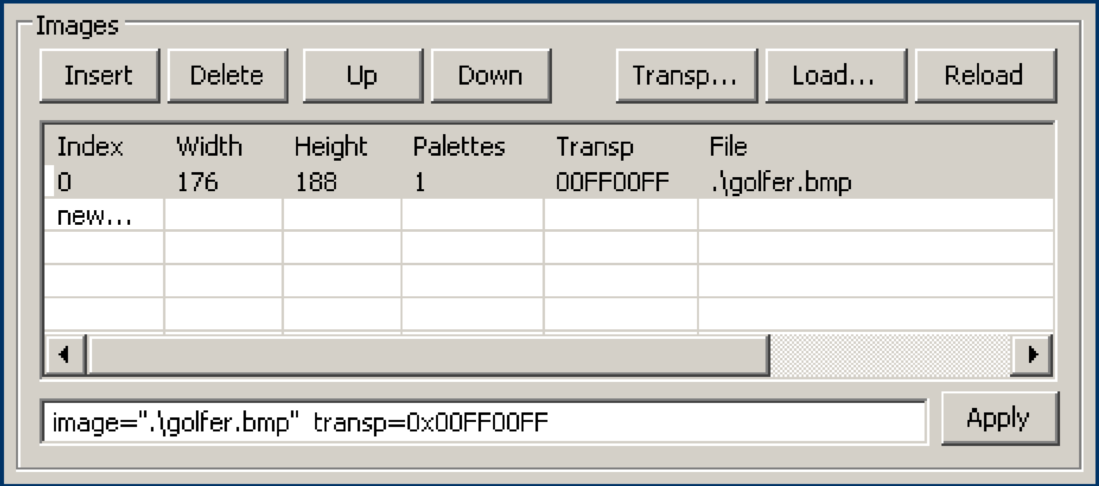
type=7 color=0x00AACCFF
p2X=20 p2Y=50 p3X=45 p3Y=45 desc=""



Sprite

Module Editor - Images

- IMAGES
  - Supports:
    - `*.bmp`
    - `*.png`
    - `*.jpg`
    - `*.gif`
    - `*.tga`



Index	Width	Height	Palettes	Transp	File
0	176	188	1	00FF00FF	.\golfer.bmp
new...					

```
image=".\golfer.bmp" transp=0x00FF00FF
```

Sprite
ASprite_PaintModule.hxx

- An important difference:
  - MIDP1 phones supports “at least” PNG version 1.0

    -
      ```
      static Image createImage(byte[] imageData,
              int imageOffset, int imageLength)
      ```
  - MIDP2 phones supports “at least” PNG version 1.0 and <u>image creation using an ARGB array</u>

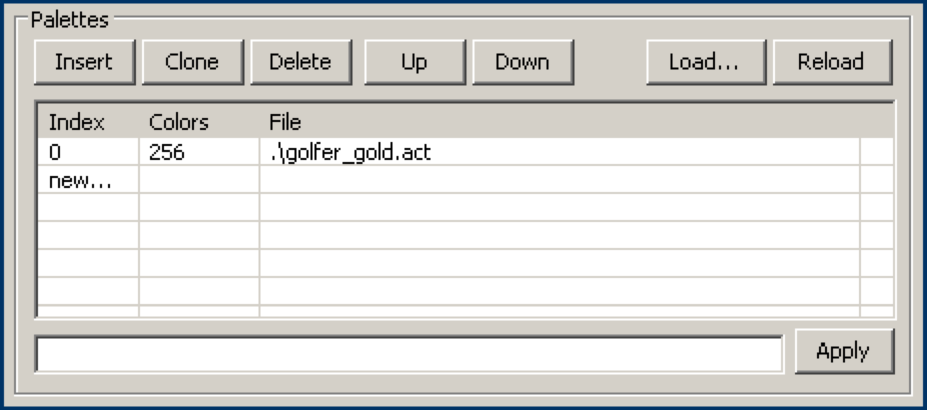
    -
      ```
      static Image createRGBImage(int[] rgb,
             int width, int height, boolean processAlpha)
      ```

Sprite
ASprite_PaintModule.hxx

- For painting modules:
  - Depends of one of the following flags (mutually exclusive):
    - `IMAGE_USAGE_DYNAMIC_PNG`
      - images are created using the Image.createImage(...) from PNG streams
    - `IMAGE_USAGE_RGB_ARRAYS`
      - images are created using the Image.createRGBImage(...) from RGB arrays
    - `IMAGE_USAGE_NOKIA_UI`
      - Nokia UI classes are used to handle images
    - `IMAGE_USAGE_DOJA`
      - DOJA classes are used to handle images

Sprite
Module Editor - Palettes

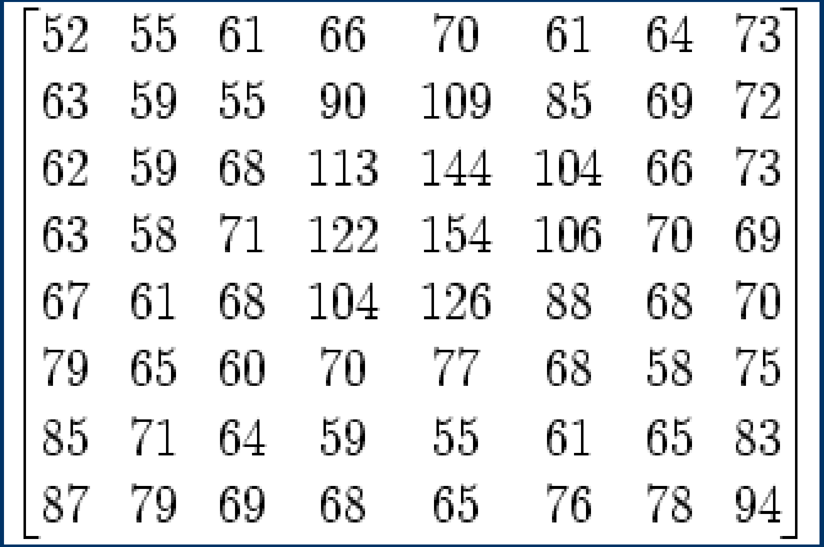
- Each image may have one or more palettes associated
  - the index field is use to indicate this
- You can set the palette/s through :
  - Image
  - ACT



Index	Colors	File
0	256	.\golfer_gold.act
new...		

Images
Review

- Images are stored in a 2D array:



$$\begin{bmatrix} 52 & 55 & 61 & 66 & 70 & 61 & 64 & 73 \\ 63 & 59 & 55 & 90 & 109 & 85 & 69 & 72 \\ 62 & 59 & 68 & 113 & 144 & 104 & 66 & 73 \\ 63 & 58 & 71 & 122 & 154 & 106 & 70 & 69 \\ 67 & 61 & 68 & 104 & 126 & 88 & 68 & 70 \\ 79 & 65 & 60 & 70 & 77 & 68 & 58 & 75 \\ 85 & 71 & 64 & 59 & 55 & 61 & 65 & 83 \\ 87 & 79 & 69 & 68 & 65 & 76 & 78 & 94 \end{bmatrix}$$

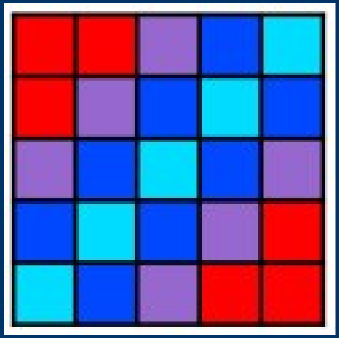
- This would require 8bits/pixel since values range is [0 - 255]
- This is a B&W image.
- In color images range is [0 - 16,777,216]
- This means 24bits/pixel

Images
Review

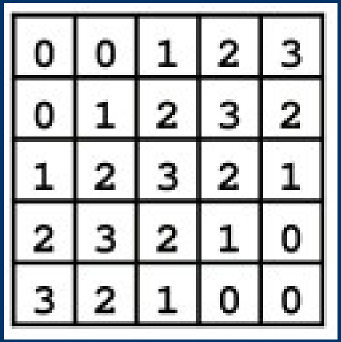
- Image size= bytes/pixel * number of pixels.
- Let´s say we have a 24 bit image -> 3bytes/pixel.
- For a 240x320 image, it would be:
  3 bytes * 240 * 320 = 240 kb !!!

Images
Review

- Original image:

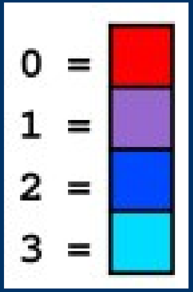


- Indexed image:



0	0	1	2	3
0	1	2	3	2
1	2	3	2	1
2	3	2	1	0
3	2	1	0	0

where..



0 =	🟥
1 =	🟪
2 =	🟦
3 =	🟦

- RAW Size:

24 bits/px * 25px=600bits

Every pixel needs 24 bits

- Indexed Size:

2 bits/px * 25px=50bits

Every pixel needs 2 bits

Images
Review

- Conclusion:
- Indexed images bit depth depends on the color table entries. (DATA_FORMAT)
- Every color table entry has a COLOR_FORMAT.

Images

Review

- Examples:

DATA_FORMAT: I4
COLOR_FORMAT: 0565

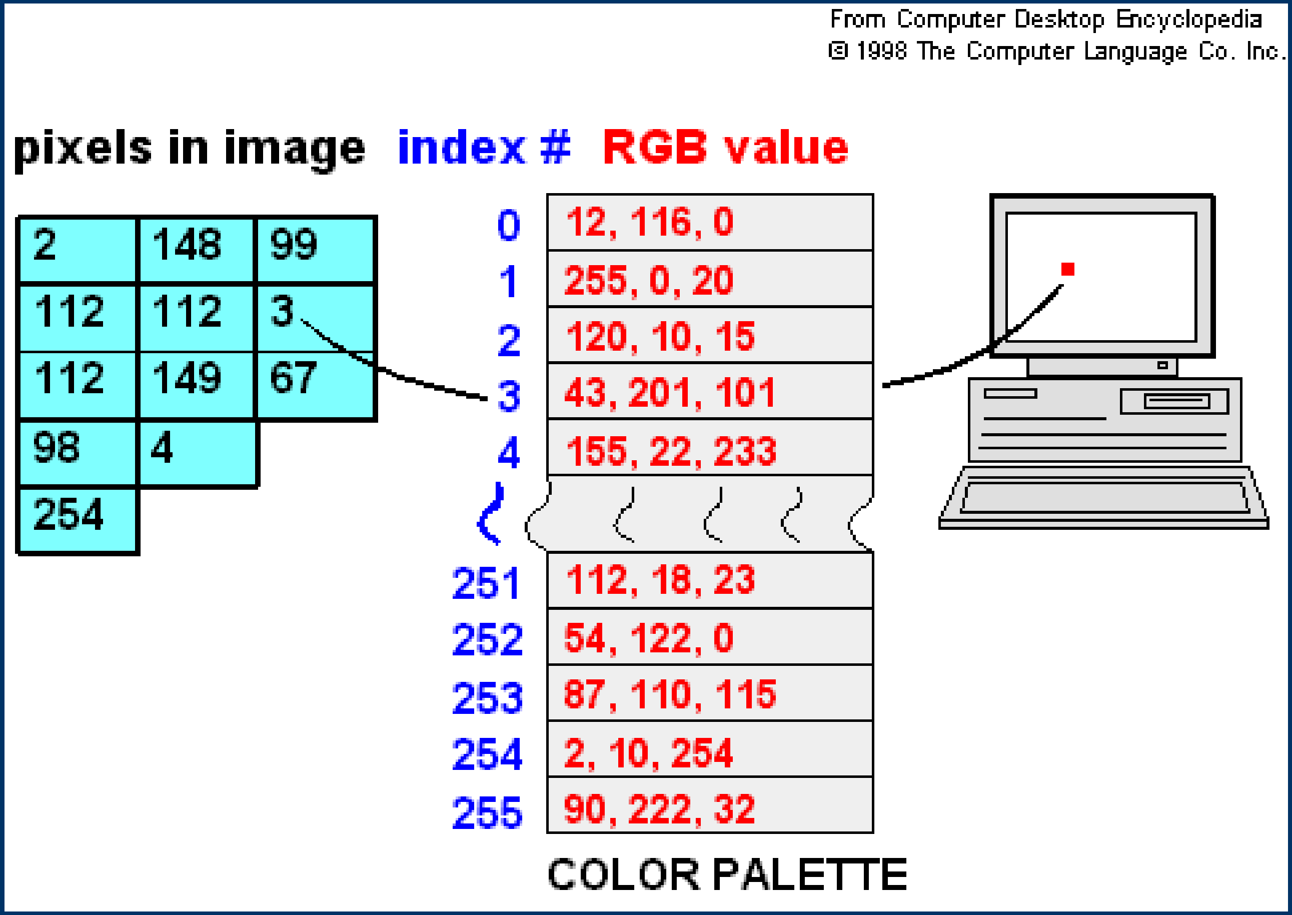
- Examples:

DATA_FORMAT: I16
COLOR_FORMAT: 1555

Sprite
Palettes

- PALETTES
  - Known as “index map”, “color table” or “color map”
  - *“is a designated subset of the total range of colors”* … *“each color in the palette is assigned an index, and for each pixel one of these indexes is stored to determine the color of the pixel.”*
  - **Save space**: instead of each pixel containing its own red, green and blue values (24 bits per pixel), each pixel holds an 8-bit value, which is an index number into the color palette

Sprite
Palettes

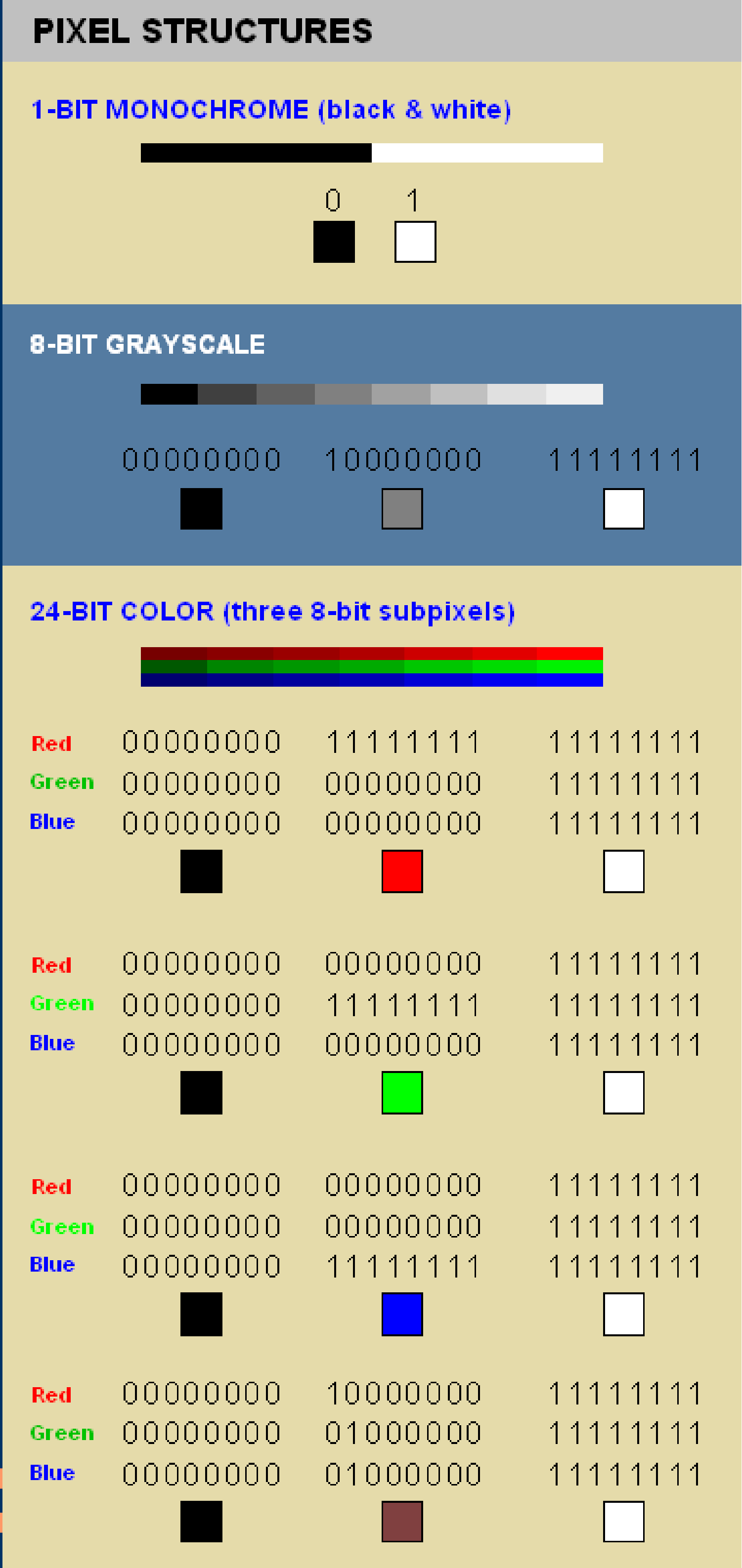


Sprite

Palettes

- Bit, Pixel or Color Depth:
  - The number of bits used to hold a pixel.

Bit depth	Number of colors
4-bits	16 (Standard VGA)
8-bits	256 (Super VGA, indexed color)
16-bits	65,536 (High Color)
24-bits	16,777,216 (True Color)
32-bits	16,777,216 + alpha channel
15-bits	32,768 (Custom option sometimes available on earlier display adapters)


PIXEL STRUCTURES
1-BIT MONOCHROME (black & white)
0 1
8-BIT GRAYSCALE
00000000 10000000 11111111
24-BIT COLOR (three 8-bit subpixels)
Red 00000000 11111111 11111111
Green 00000000 00000000 11111111
Blue 00000000 00000000 11111111
Red 00000000 00000000 11111111
Green 00000000 11111111 11111111
Blue 00000000 00000000 11111111
Red 00000000 00000000 11111111
Green 00000000 00000000 11111111
Blue 00000000 11111111 11111111
Red 00000000 10000000 11111111
Green 00000000 01000000 11111111
Blue 00000000 01000000 11111111

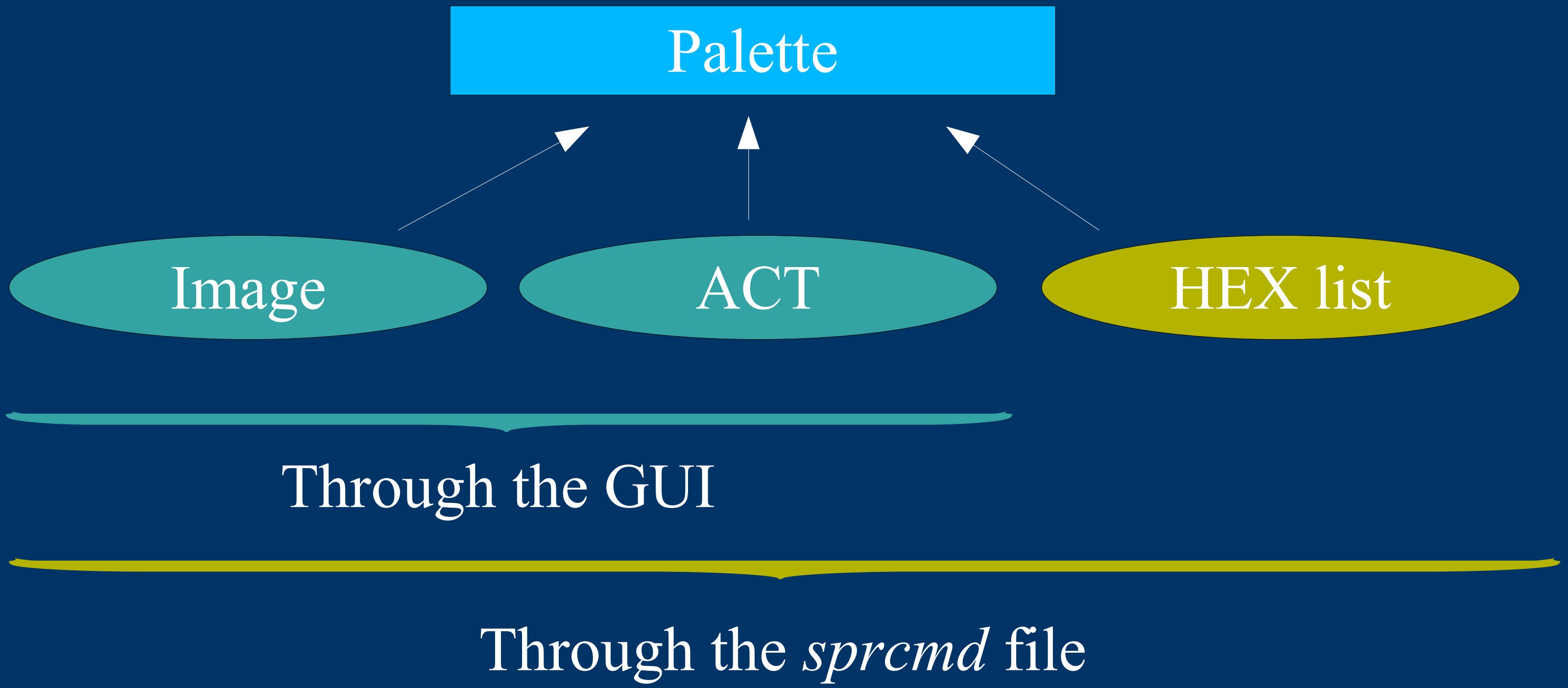
Sprite
Palettes

- The most common color depth / format color at AuroraGT are:

Name	Define	Bits per Color			
		Alpha	Red	Green	Blue
Ignore	USE_ORIGINAL_PAL_8888	8	8	8	8
8888	USE_PIXEL_FORMAT_8888	8	8	8	8
4444	USE_PIXEL_FORMAT_4444	4	4	4	4
1555	USE_PIXEL_FORMAT_1555	1	5	5	5
0565	USE_PIXEL_FORMAT_0565	0	5	6	5

Sprite
Palettes - Exporting

- How we set/generate a palette:

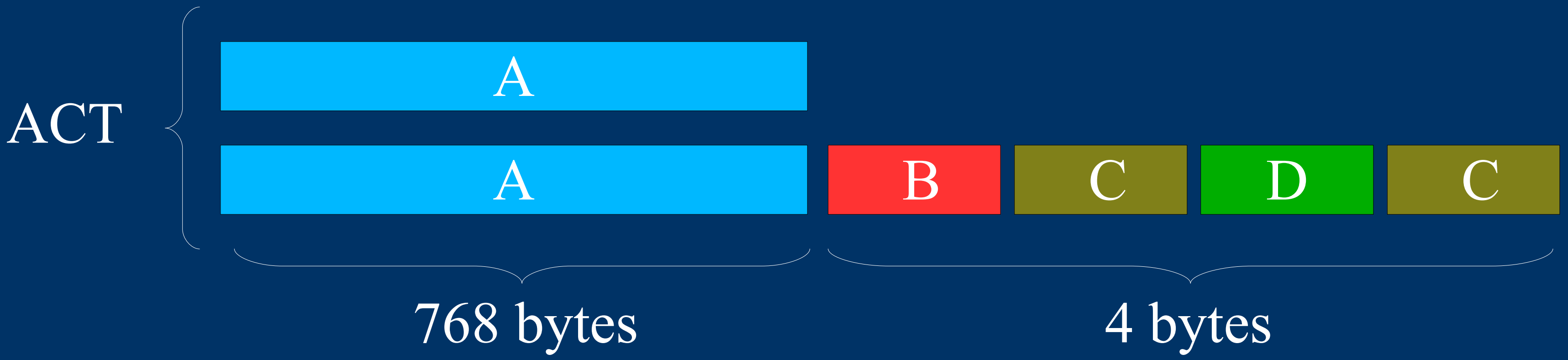


Sprite
Palettes - Exporting - ACT

- ACT means Adobe Color Table
  - Is the Photoshop format for defining a palette
  - Each triplet of bytes specifies a color
    - 1st Red
    - 2nd Green
    - 3rd Blue

Sprite

Palettes - Exporting - ACT



A (768 bytes) – specifies 256 colors
B (1 byte) – specifies how many colors are (often 256 but could be less)
C (1 byte) – always zero
D (1 byte) – indicates which byte contains the transparent color

Sprite
Palettes - Exporting - ACT

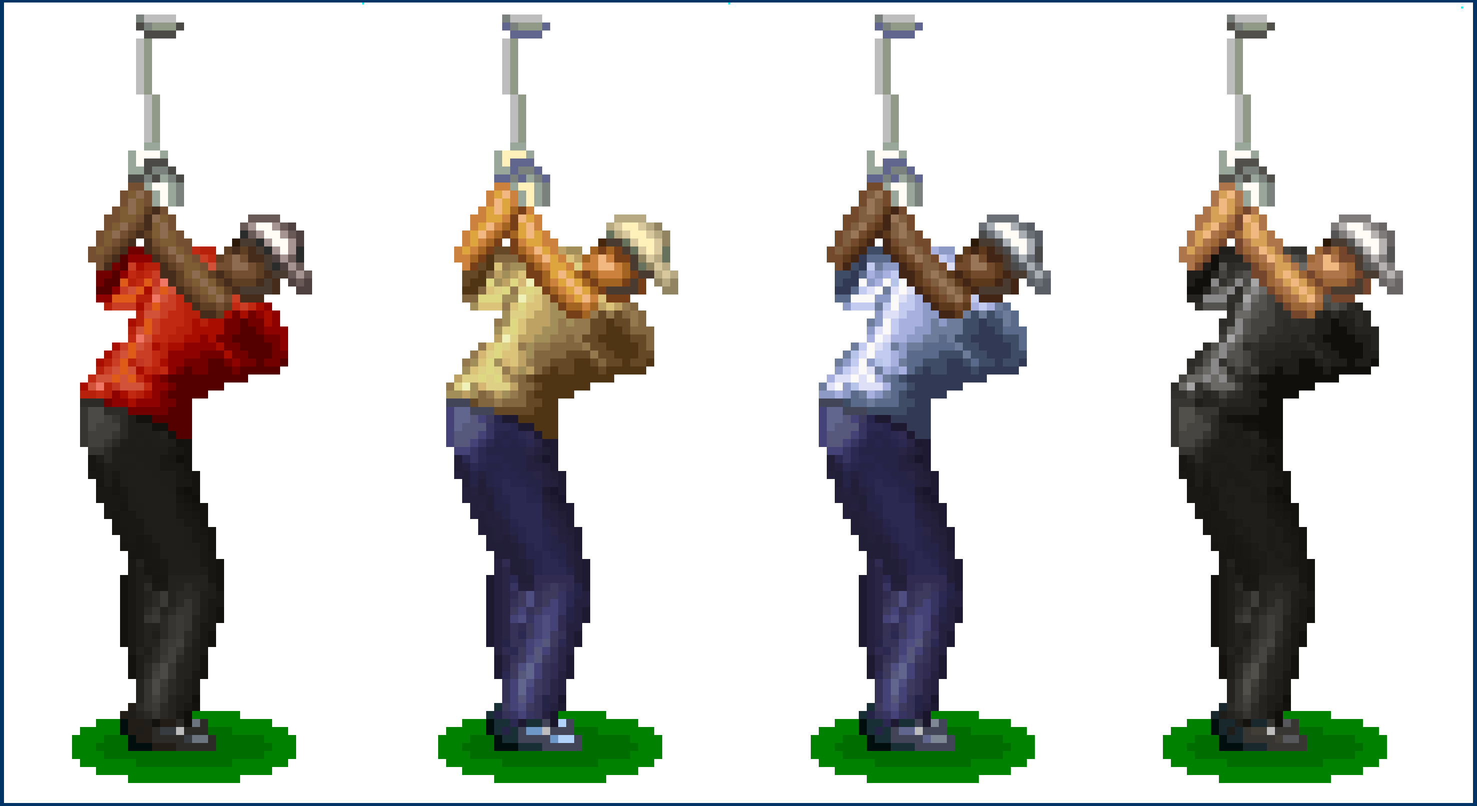
- You can convert from GPL (GIMP Palette) to ACT using the tool gpl2act[1] (designed by Boris Godin):

```
gpl2act.exe [-r] filename_input.gpl [filename_output.act]

    [-r] (revert) will convert from .ACT to .GPL
```

(1) https://wiki.gameloft.org/twiki/bin/view/Cordoba/Gpl2act

Sprite
Palettes - Exporting - ACT

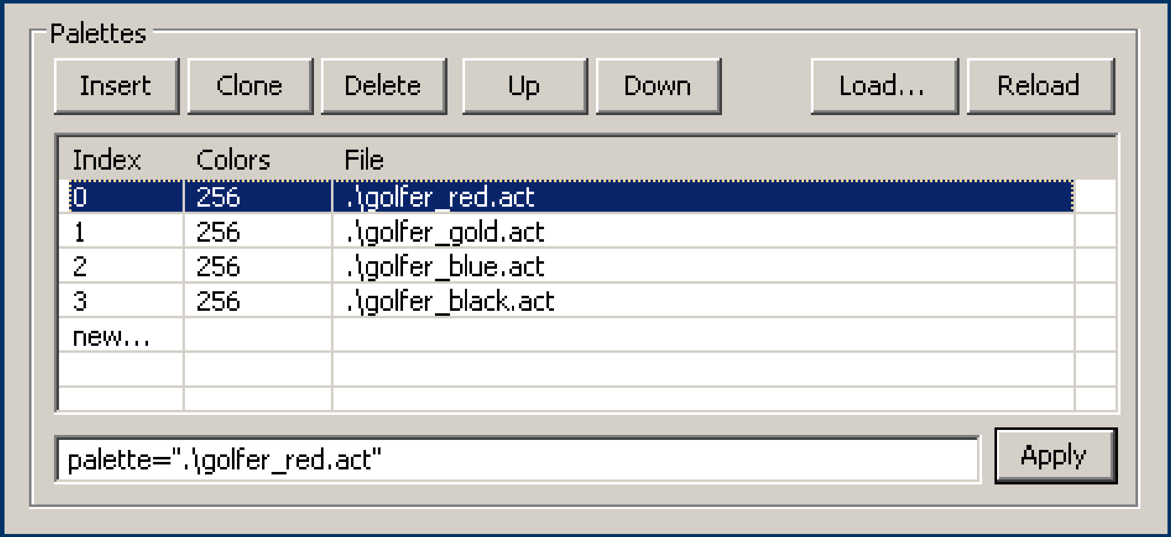


golfer_red.act golfer_gold.act golfer_blue.act golfer_black.act

Sprite

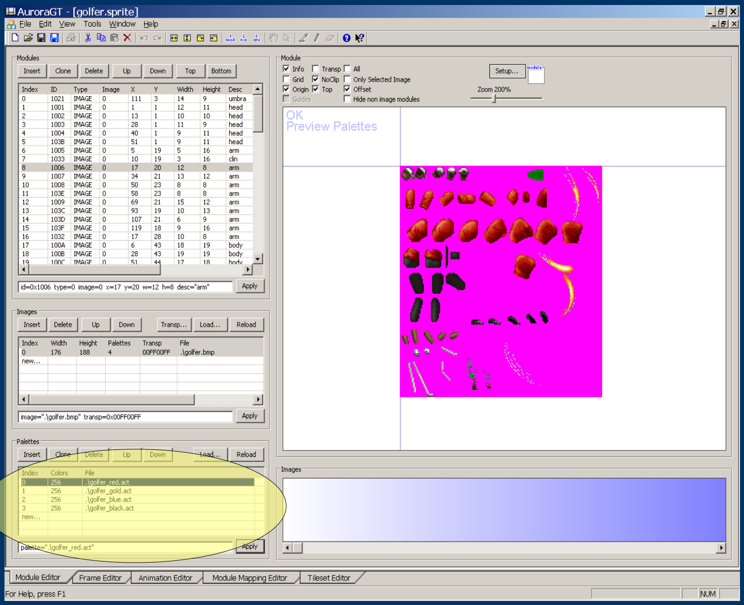
Palettes - Module Editor - Exporting - GUI tool

- You can specify them through the GUI:



Index	Colors	File
0	256	.\golfer_red.act
1	256	.\golfer_gold.act
2	256	.\golfer_blue.act
3	256	.\golfer_black.act
new...		

palette=".\golfer_red.act"



Sprite

Palettes - Exporting - sprcmd file

- Loading a palette from an ACT file or an image through the *sprcmd* file:

```
+ LoadPalette(image, palette, "file.act" or "IMAGE")
    -> loads a palette from a file
    * image
        -> image index
    * palette
        -> palette index -> multiple palettes
    * "file.act" or "IMAGE"
        -> a valid .act file
        -> or a "IMAGE" -> the palette will be copied
           from the image. Note: The sprite must use
           only .bmp files (8bpp, non compressed). Do
           not use .png, because the colors are scrambled.
```

NOTE: if you have any problem with 8bpp & the compression, the command convert (ImageMagick) may be helpful : i.e. “`convert -type truecolor [in] [out]`”

Sprite

Palettes - Exporting - sprcmd file

- Example:

```
Load("golfer.sprite")
   LoadPalette(0, 0, "golfer_gold.act")      // DEFAULT
   LoadPalette(0, 1, "golfer_red.act")       // T.WOOD
   LoadPalette(0, 2, "golfer_blue.act")      // VJ.SING
   LoadPalette(0, 3, "golfer_black.act")     // G.PLAYERS
   ExportBSpriteEx("golfer.bsprite", GLOBAL, I64RLE, _8888)
```

Sprite

Palettes - Exporting - sprcmd file

- Setting the palette through the *sprcmd* file:

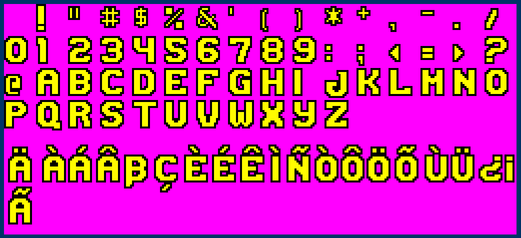
```
+ SetPalette(image, palette, { 0xAARRGGBB ... })
    -> modify a palette with hex codes of colors
    * image
        -> image index
    * palette
        -> palette index -> multiple palettes
    * { 0xAARRGGBB ... }
        -> hex codes for each color
        -> colors must be specified between "{" and "}"
        -> the order must match the bitmap
```

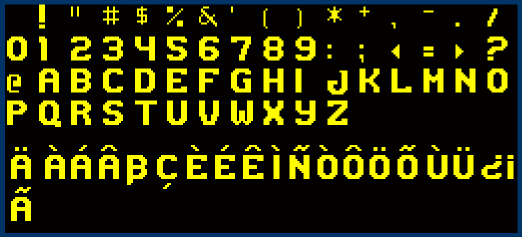
Sprite

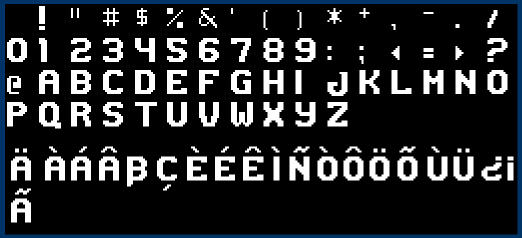
Palettes - Exporting - sprcmd file

- Example:

```
Load("fonts/fontL.sprite")
   //                  transp     color      outline
   SetPalette(0, 0, {0x00000000 0xFFfffc00 0xFF000000})
   SetPalette(0, 1, {0x00000000 0xFFFFFFFF 0xFF000000})
   ExportBSpriteEx("fontL.bsprite", GLOBAL, I4, _8888)
```


original image

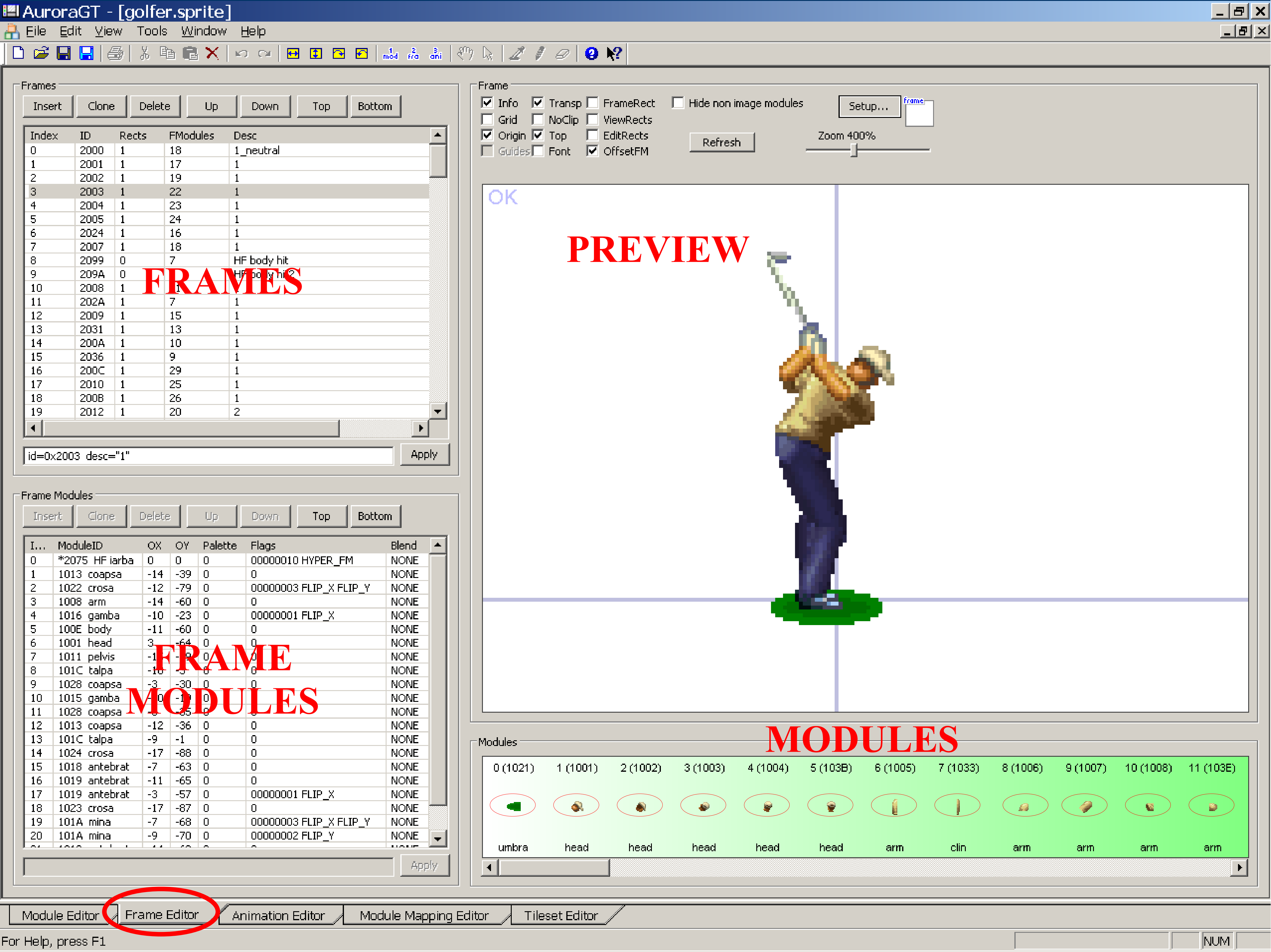

Yellow Font Black outline


White Font Black outline

Sprite
Palettes - ASprite_Palette.hxx

- Setting/getting a palette:

```
void SetCurrentPalette(int pal)  { _crt_pal = pal; }
int GetCurrentPalette() { return _crt_pal; }
```



Frames

Insert | Clone | Delete | Up | Down | Top | Bottom

Index	ID	Rects	FModules	Desc
0	2000	1	18	1_neutral
1	2001	1	17	1
2	2002	1	19	1
3	2003	1	22	1
4	2004	1	23	1
5	2005	1	24	1
6	2024	1	16	1
7	2007	1	18	1
8	2099	0	7	HF body hit
9	209A	0	[illegible]	HF body hit2
10	2008	1	[illegible]	1
11	202A	1	7	1
12	2009	1	15	1
13	2031	1	13	1
14	200A	1	10	1
15	2036	1	9	1
16	200C	1	29	1
17	2010	1	25	1
18	200B	1	26	1
19	2012	1	20	2

id=0x2003 desc="1" | Apply

Frame Modules

Insert | Clone | Delete | Up | Down | Top | Bottom

I...	ModuleID	OX	OY	Palette	Flags	Blend
0	*2075 HF iarba	0	0	0	00000010 HYPER_FM	NONE
1	1013 coapsa	-14	-39	0	0	NONE
2	1022 crosa	-12	-79	0	00000003 FLIP_X FLIP_Y	NONE
3	1008 arm	-14	-60	0	0	NONE
4	1016 gamba	-10	-23	0	00000001 FLIP_X	NONE
5	100E body	-11	-60	0	0	NONE
6	1001 head	3	-64	0	0	NONE
7	1011 pelvis	[illegible]	[illegible]	0	0	NONE
8	101C talpa	-10	-5	0	0	NONE
9	1028 coapsa	-3	-30	0	0	NONE
10	1015 gamba	[illegible]	[illegible]	0	[illegible]	NONE
11	1028 coapsa	[illegible]	-35	0	[illegible]	NONE
12	1013 coapsa	-12	-36	0	0	NONE
13	101C talpa	-9	-1	0	0	NONE
14	1024 crosa	-17	-88	0	0	NONE
15	1018 antebrat	-7	-63	0	0	NONE
16	1019 antebrat	-11	-65	0	0	NONE
17	1019 antebrat	-3	-57	0	00000001 FLIP_X	NONE
18	1023 crosa	-17	-87	0	0	NONE
19	101A mina	-7	-68	0	00000003 FLIP_X FLIP_Y	NONE
20	101A mina	-9	-70	0	00000002 FLIP_Y	NONE

Apply

Frame

[✓] Info [✓] Transp [ ] FrameRect [ ] Hide non image modules
[ ] Grid [ ] NoClip [ ] ViewRects
[✓] Origin [✓] Top [ ] EditRects
[ ] Guides [ ] Font [✓] OffsetFM

Setup... | Refresh | Zoom 400%

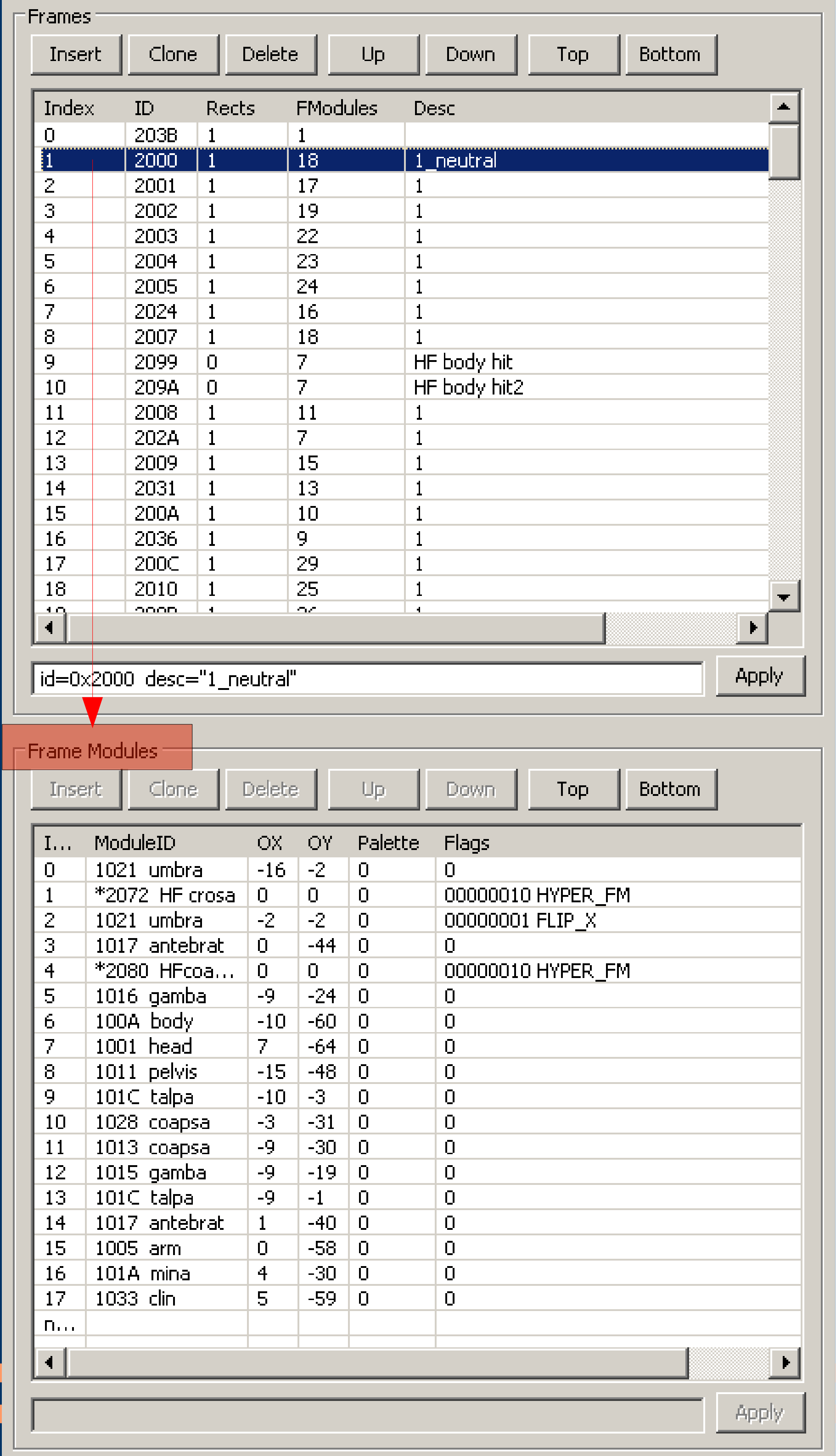
Modules

0 (1021)	1 (1001)	2 (1002)	3 (1003)	4 (1004)	5 (103B)	6 (1005)	7 (1033)	8 (1006)	9 (1007)	10 (1008)	11 (103E)
umbra	head	head	head	head	head	arm	clin	arm	arm	arm	arm

Sprite

Frame Editor

- Frame Modules
  - Means “all those modules that belongs to a frame”
  - For each one:
    - ModuleID: the reference of the module
    - Rects: rectangles on each FM
    - OX / OY: offset of the image since the origin (0 is the default value)
    - Palette: index of the palette (you set this on the module view)
    - Flags: rotations & flips



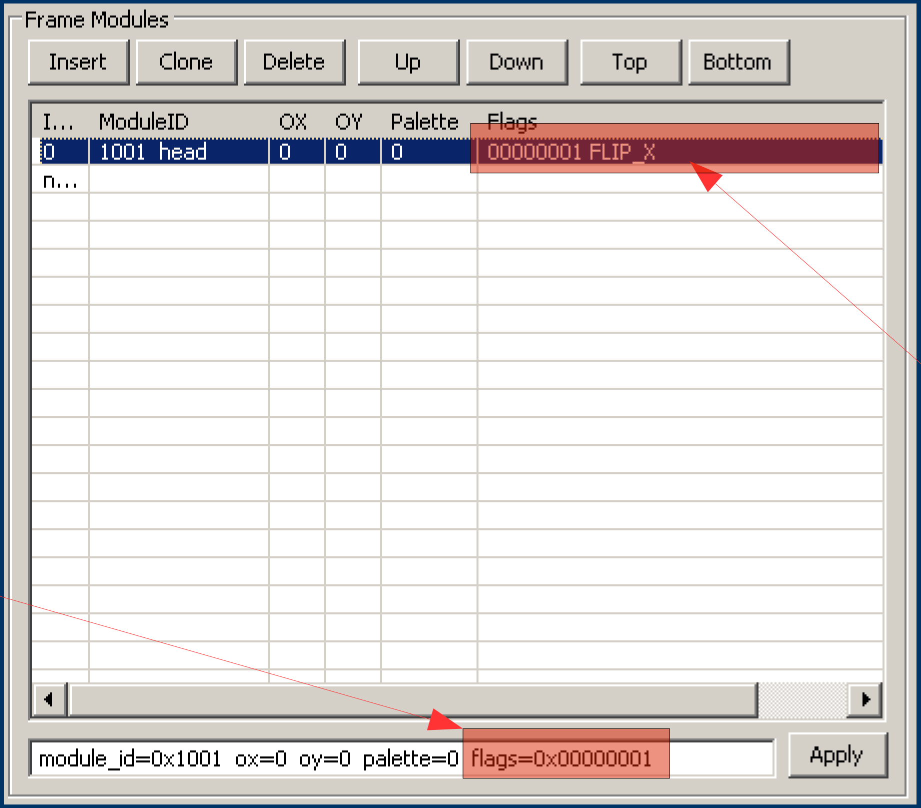
Index	ID	Rects	FModules	Desc
0	203B	1	1	
1	2000	1	18	1_neutral
2	2001	1	17	1
3	2002	1	19	1
4	2003	1	22	1
5	2004	1	23	1
6	2005	1	24	1
7	2024	1	16	1
8	2007	1	18	1
9	2099	0	7	HF body hit
10	209A	0	7	HF body hit2
11	2008	1	11	1
12	202A	1	7	1
13	2009	1	15	1
14	2031	1	13	1
15	200A	1	10	1
16	2036	1	9	1
17	200C	1	29	1
18	2010	1	25	1

id=0x2000 desc="1_neutral"

I...	ModuleID	OX	OY	Palette	Flags
0	1021 umbra	-16	-2	0	0
1	*2072 HF crosa	0	0	0	00000010 HYPER_FM
2	1021 umbra	-2	-2	0	00000001 FLIP_X
3	1017 antebrat	0	-44	0	0
4	*2080 HFcoa...	0	0	0	00000010 HYPER_FM
5	1016 gamba	-9	-24	0	0
6	100A body	-10	-60	0	0
7	1001 head	7	-64	0	0
8	1011 pelvis	-15	-48	0	0
9	101C talpa	-10	-3	0	0
10	1028 coapsa	-3	-31	0	0
11	1013 coapsa	-9	-30	0	0
12	1015 gamba	-9	-19	0	0
13	101C talpa	-9	-1	0	0
14	1017 antebrat	1	-40	0	0
15	1005 arm	0	-58	0	0
16	101A mina	4	-30	0	0
17	1033 clin	5	-59	0	0
n...					

Sprite
Frame Editor

- Flags



I...	ModuleID	OX	OY	Palette	Flags
0	1001 head	0	0	0	00000001 FLIP_X
n...					

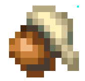
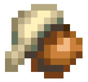
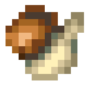
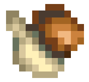
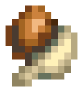
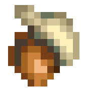
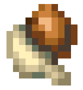
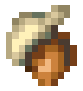
module_id=0x1001 ox=0 oy=0 palette=0 flags=0x00000001

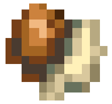
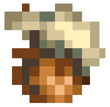
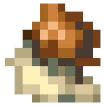
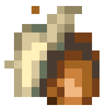
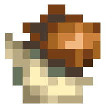
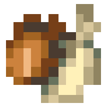
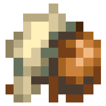
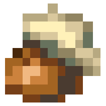
1) We change the value here

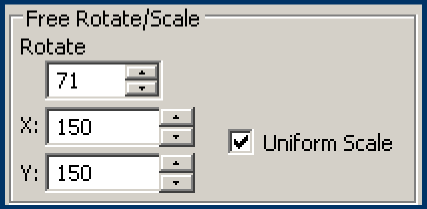
2) And it's reflected here

Sprite

Frame Editor - Flags

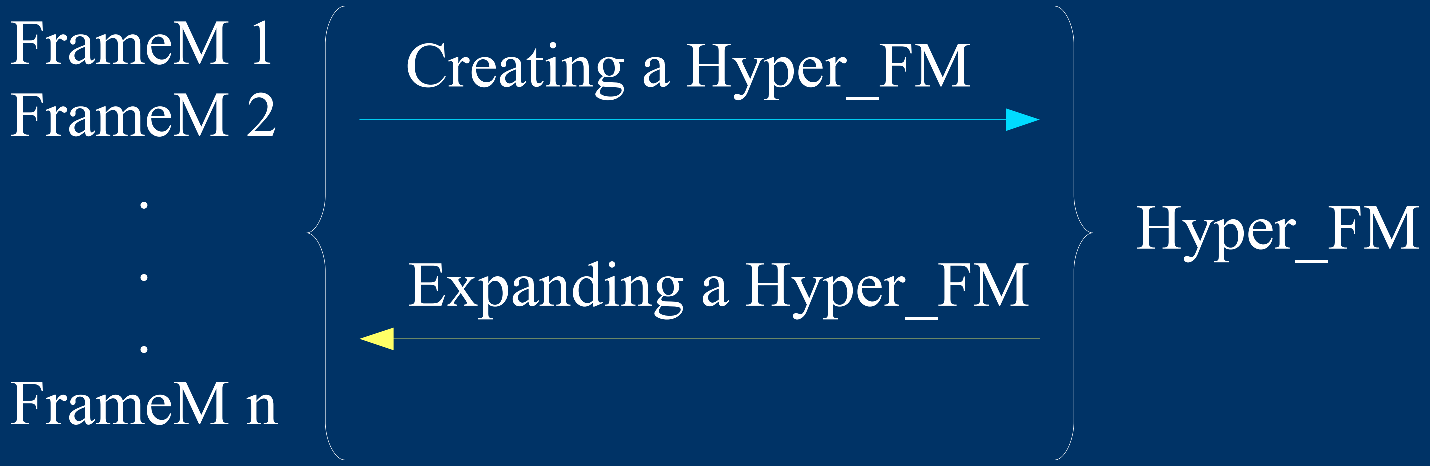
	0x00000000	0x00000001	0x00000002	0x00000003	0x00000004	0x00000005	0x00000006	0x00000007
FLIP_X		●		●		●		●
FLIP_Y			●	●			●	●
ROT_90					●	●	●	●
FREE_ROT_SCALE								
IMAGE								

	0x00000008	0x00000009	0x0000000A	0x0000000B	0x0000000C	0x0000000D	0x0000000E	0x0000000F
FLIP_X		●		●		●		●
FLIP_Y			●	●			●	●
ROT_90					●	●	●	●
FREE_ROT_SCALE	●	●	●	●	●	●	●	●
IMAGE								


Free Rotate/Scale
Rotate: 71
X: 150
Y: 150
[✓] Uniform Scale

Sprite
Frame Editor - Hyper_FM

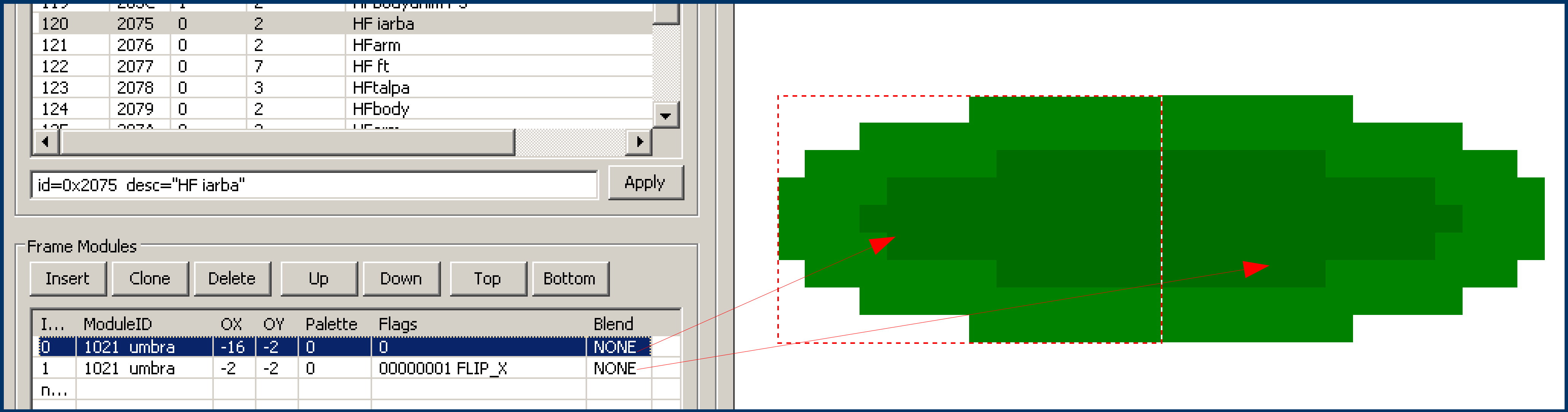
- Hyper Frame Modules:



Sprite

Frame Editor - Hyper_FM

- Let's say that we need to create a frame that draws the grass:



120	2075	0	2	HF iarba
121	2076	0	2	HFarm
122	2077	0	7	HF ft
123	2078	0	3	HFtalpa
124	2079	0	2	HFbody

id=0x2075 desc="HF iarba"

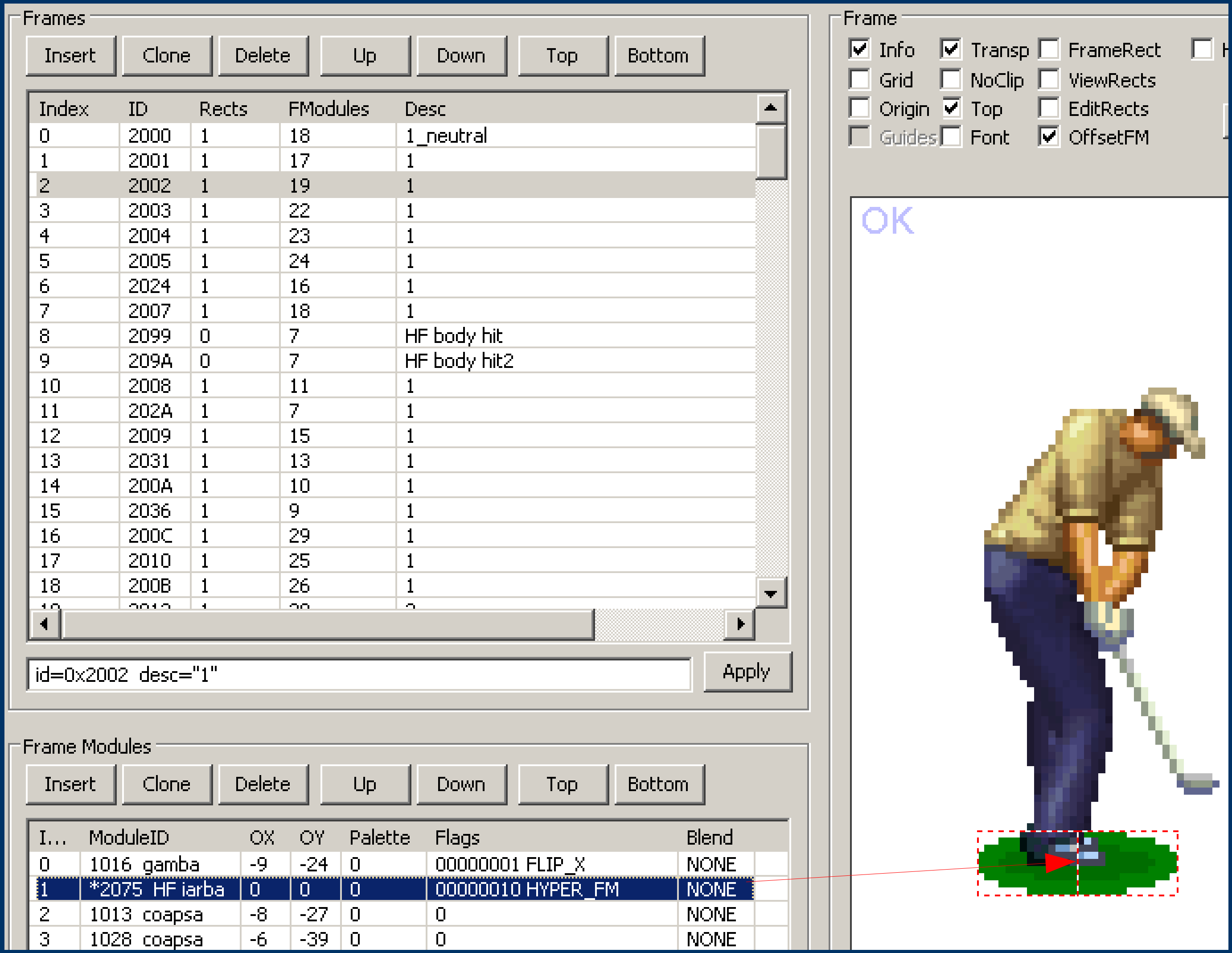
I...	ModuleID	OX	OY	Palette	Flags	Blend
0	1021 umbra	-16	-2	0	0	NONE
1	1021 umbra	-2	-2	0	00000001 FLIP_X	NONE
n...						

Sprite

Frame Editor - Hyper_FM

Hyper_FM

A FRAME REFERENCED BY ANOTHER FRAME



Frame: [✓ Info] [✓ Transp] FrameRect, Grid, NoClip, ViewRects, Origin, [✓ Top] EditRects, Guides, Font, [✓ OffsetFM]

Index	ID	Rects	FModules	Desc
0	2000	1	18	1_neutral
1	2001	1	17	1
2	2002	1	19	1
3	2003	1	22	1
4	2004	1	23	1
5	2005	1	24	1
6	2024	1	16	1
7	2007	1	18	1
8	2099	0	7	HF body hit
9	209A	0	7	HF body hit2
10	2008	1	11	1
11	202A	1	7	1
12	2009	1	15	1
13	2031	1	13	1
14	200A	1	10	1
15	2036	1	9	1
16	200C	1	29	1
17	2010	1	25	1
18	200B	1	26	1

id=0x2002 desc="1"

I...	ModuleID	OX	OY	Palette	Flags	Blend
0	1016 gamba	-9	-24	0	00000001 FLIP_X	NONE
1	*2075 HF iarba	0	0	0	00000010 HYPER_FM	NONE
2	1013 coapsa	-8	-27	0	0	NONE
3	1028 coapsa	-6	-39	0	0	NONE

Sprite

Frame Editor - Hyper_FM

- Creating a Hyper Frame Modules
  - Means: “convert a <u>Frame Module</u> into a <u>Hyper Frame Module</u>”
  - Steps:
    1) Insert a frame module
    2) Right click over the frame module
    3) Select the unchecked “Hyper FM (use other frame, not module)”
    4) Edit the field “frame_id” with the current ID of your reference frame (i.e. `frame_id=0x2075`)

Sprite

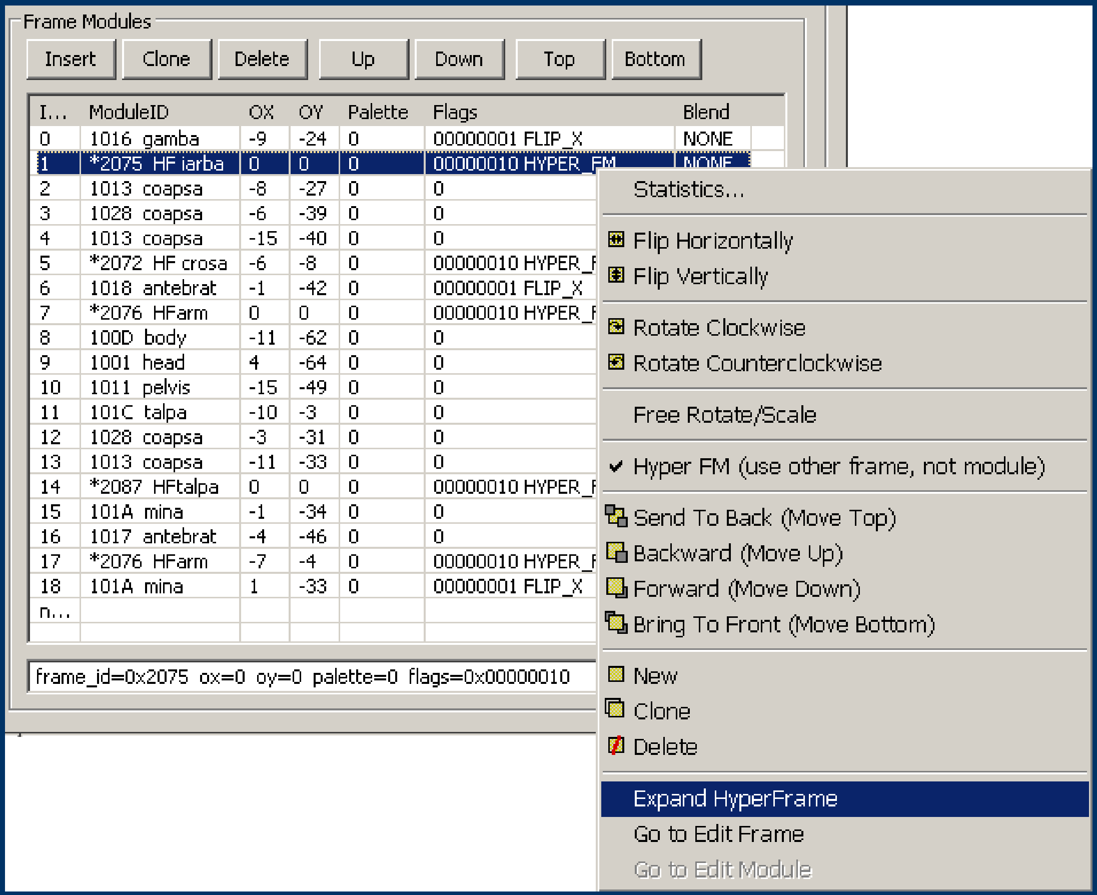
Frame Editor - Hyper_FM

- Expanding a HyperFrame
  - Means: “convert an <u>Hyper Frame Module</u> into 2 or more <u>Frame Modules</u>”
  - Steps:
    1) Right click over the Hyper_FM
    2) Select the checked “Expand HyperFrame”

Sprite

Frame Editor - Hyper_FM

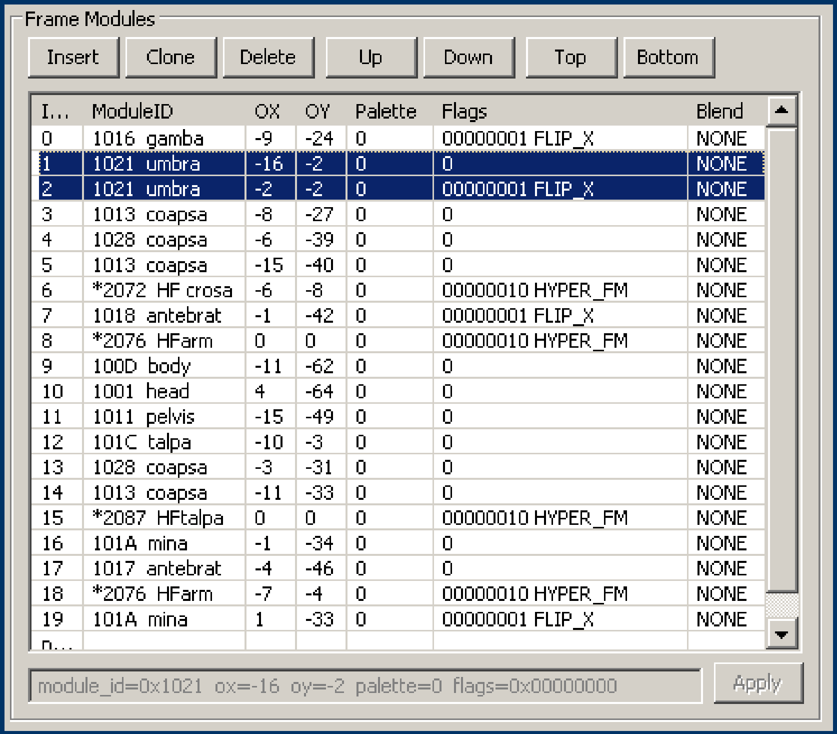
With Hyper_FM



I...	ModuleID	OX	OY	Palette	Flags	Blend
0	1016 gamba	-9	-24	0	00000001 FLIP_X	NONE
1	*2075 HF iarba	0	0	0	00000010 HYPER_FM	NONE
2	1013 coapsa	-8	-27	0	0	
3	1028 coapsa	-6	-39	0	0	
4	1013 coapsa	-15	-40	0	0	
5	*2072 HF crosa	-6	-8	0	00000010 HYPER_F	
6	1018 antebrat	-1	-42	0	00000001 FLIP_X	
7	*2076 HFarm	0	0	0	00000010 HYPER_F	
8	100D body	-11	-62	0	0	
9	1001 head	4	-64	0	0	
10	1011 pelvis	-15	-49	0	0	
11	101C talpa	-10	-3	0	0	
12	1028 coapsa	-3	-31	0	0	
13	1013 coapsa	-11	-33	0	0	
14	*2087 HFtalpa	0	0	0	00000010 HYPER_F	
15	101A mina	-1	-34	0	0	
16	1017 antebrat	-4	-46	0	0	
17	*2076 HFarm	-7	-4	0	00000010 HYPER_F	
18	101A mina	1	-33	0	00000001 FLIP_X	
n...						

frame_id=0x2075 ox=0 oy=0 palette=0 flags=0x00000010

Without Hyper_FM



I...	ModuleID	OX	OY	Palette	Flags	Blend
0	1016 gamba	-9	-24	0	00000001 FLIP_X	NONE
1	1021 umbra	-16	-2	0	0	NONE
2	1021 umbra	-2	-2	0	00000001 FLIP_X	NONE
3	1013 coapsa	-8	-27	0	0	NONE
4	1028 coapsa	-6	-39	0	0	NONE
5	1013 coapsa	-15	-40	0	0	NONE
6	*2072 HF crosa	-6	-8	0	00000010 HYPER_FM	NONE
7	1018 antebrat	-1	-42	0	00000001 FLIP_X	NONE
8	*2076 HFarm	0	0	0	00000010 HYPER_FM	NONE
9	100D body	-11	-62	0	0	NONE
10	1001 head	4	-64	0	0	NONE
11	1011 pelvis	-15	-49	0	0	NONE
12	101C talpa	-10	-3	0	0	NONE
13	1028 coapsa	-3	-31	0	0	NONE
14	1013 coapsa	-11	-33	0	0	NONE
15	*2087 HFtalpa	0	0	0	00000010 HYPER_FM	NONE
16	101A mina	-1	-34	0	0	NONE
17	1017 antebrat	-4	-46	0	0	NONE
18	*2076 HFarm	-7	-4	0	00000010 HYPER_FM	NONE
19	101A mina	1	-33	0	00000001 FLIP_X	NONE
n...						

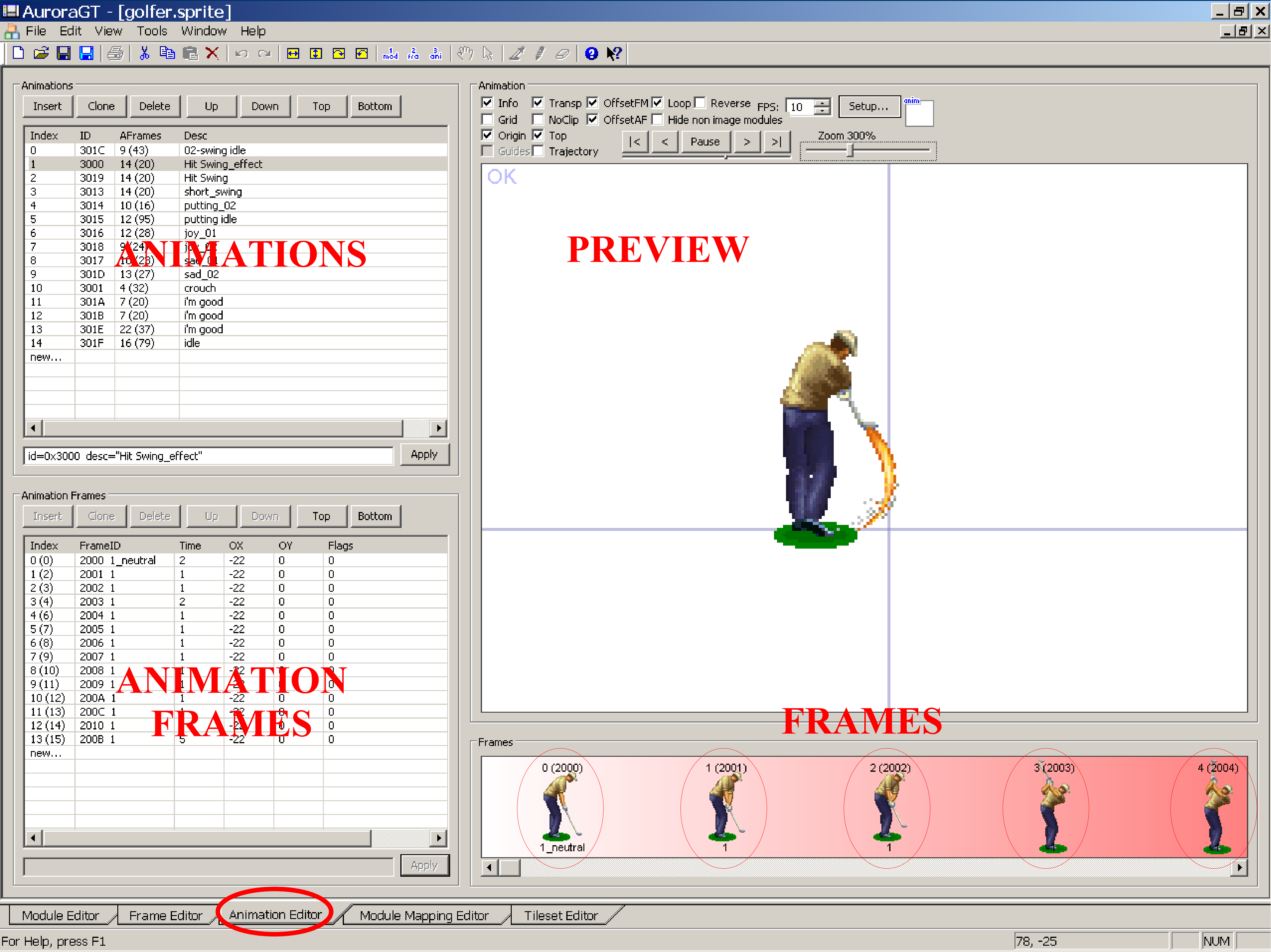
module_id=0x1021 ox=-16 oy=-2 palette=0 flags=0x00000000

Sprite

Frame Editor - Hyper_FM - ASprite_Paint.hxx

- Part of the code that handles Hyper_FM
  - (posX, posY and palette were modified before)

```
#ifdef USE_HYPER_FM
if ((fm_flags & FLAG_HYPER_FM) != 0)
{
   PaintFrame(index, posX, posY, flags ^ (fm_flags&0x0F));
}
else
#endif //USE_HYPER_FM
{
   PaintModule(index, posX, posY, flags ^ (fm_flags&0x0F));
}
```


AuroraGT - [golfer.sprite]
File Edit View Tools Window Help
Animations
Insert Clone Delete Up Down Top Bottom
ANIMATIONS
Apply
Animation Frames
Insert Clone Delete Up Down Top Bottom
ANIMATION FRAMES
Apply
Animation
Info Transp OffsetFM Loop Reverse FPS: 10 Setup...
Grid NoClip OffsetAF Hide non image modules
Origin Top Zoom 300%
Guides Trajectory
|< < Pause > >|
OK
PREVIEW
FRAMES
Frames
0 (2000) 1 (2001) 2 (2002) 3 (2003) 4 (2004)
1_neutral 1 1
Module Editor Frame Editor Animation Editor Module Mapping Editor Tileset Editor
For Help, press F1
78, -25
NUM

Index	ID	AFrames	Desc
0	301C	9 (43)	02-swing idle
1	3000	14 (20)	Hit Swing_effect
2	3019	14 (20)	Hit Swing
3	3013	14 (20)	short_swing
4	3014	10 (16)	putting_02
5	3015	12 (95)	putting idle
6	3016	12 (28)	joy_01
7	3018	9 (24)	joy_0[illegible]
8	3017	10 (23)	sad_01
9	301D	13 (27)	sad_02
10	3001	4 (32)	crouch
11	301A	7 (20)	i'm good
12	301B	7 (20)	i'm good
13	301E	22 (37)	i'm good
14	301F	16 (79)	idle
new...			

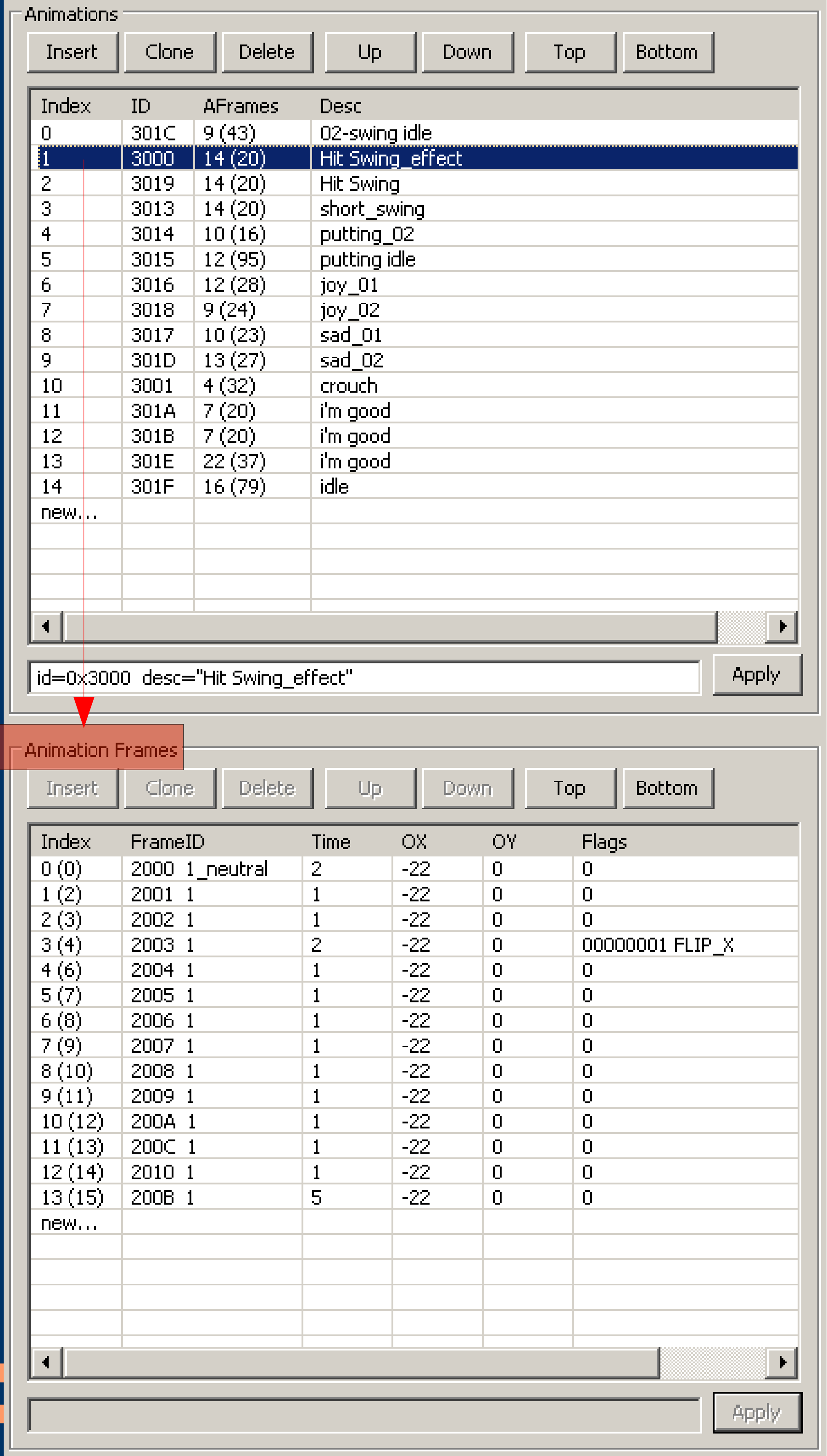
id=0x3000 desc="Hit Swing_effect"

Index	FrameID	Time	OX	OY	Flags
0 (0)	2000 1_neutral	2	-22	0	0
1 (2)	2001 1	1	-22	0	0
2 (3)	2002 1	1	-22	0	0
3 (4)	2003 1	2	-22	0	0
4 (6)	2004 1	1	-22	0	0
5 (7)	2005 1	1	-22	0	0
6 (8)	2006 1	1	-22	0	0
7 (9)	2007 1	1	-22	0	0
8 (10)	2008 1	1	-22	0	0
9 (11)	2009 1	1	[illegible]	0	0
10 (12)	200A 1	1	-22	0	0
11 (13)	200C 1	1	-22	0	0
12 (14)	2010 1	1	-22	0	0
13 (15)	200B 1	5	-22	0	0
new...					

Sprite

Animation Editor

- Animation Frames
  - Means “all those frames that belong to an animation”
  - The fields are analogous to the frame modules except for:
    - Time: indicates the number of times to reproduce the same frame (for delay purposes)



Index	ID	AFrames	Desc
0	301C	9 (43)	02-swing idle
1	3000	14 (20)	Hit Swing_effect
2	3019	14 (20)	Hit Swing
3	3013	14 (20)	short_swing
4	3014	10 (16)	putting_02
5	3015	12 (95)	putting idle
6	3016	12 (28)	joy_01
7	3018	9 (24)	joy_02
8	3017	10 (23)	sad_01
9	301D	13 (27)	sad_02
10	3001	4 (32)	crouch
11	301A	7 (20)	i'm good
12	301B	7 (20)	i'm good
13	301E	22 (37)	i'm good
14	301F	16 (79)	idle
new...			

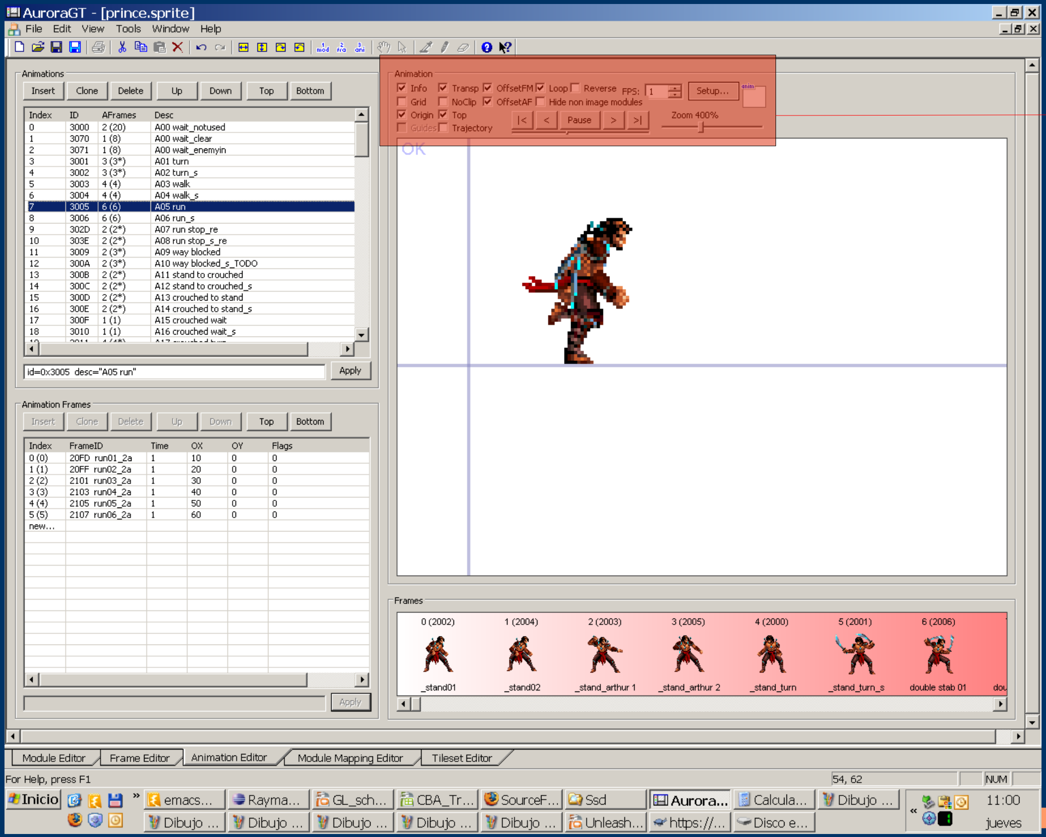
id=0x3000 desc="Hit Swing_effect"

Index	FrameID	Time	OX	OY	Flags
0 (0)	2000 1_neutral	2	-22	0	0
1 (2)	2001 1	1	-22	0	0
2 (3)	2002 1	1	-22	0	0
3 (4)	2003 1	2	-22	0	00000001 FLIP_X
4 (6)	2004 1	1	-22	0	0
5 (7)	2005 1	1	-22	0	0
6 (8)	2006 1	1	-22	0	0
7 (9)	2007 1	1	-22	0	0
8 (10)	2008 1	1	-22	0	0
9 (11)	2009 1	1	-22	0	0
10 (12)	200A 1	1	-22	0	0
11 (13)	200C 1	1	-22	0	0
12 (14)	2010 1	1	-22	0	0
13 (15)	200B 1	5	-22	0	0
new...					

Sprite

Animation Editor - Previewing an animation

- For each animation you can preview the sequence of an animation frame:

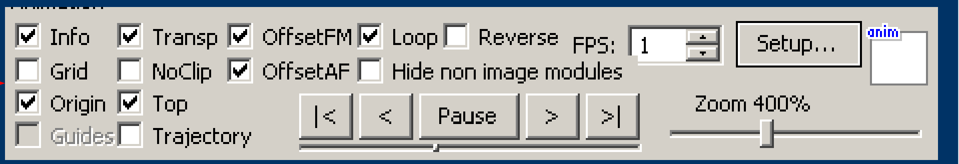


Index	ID	AFrames	Desc
0	3000	2 (20)	A00 wait_notused
1	3070	1 (8)	A00 wait_clear
2	3071	1 (8)	A00 wait_enemyin
3	3001	3 (3*)	A01 turn
4	3002	3 (3*)	A02 turn_s
5	3003	4 (4)	A03 walk
6	3004	4 (4)	A04 walk_s
7	3005	6 (6)	A05 run
8	3006	6 (6)	A06 run_s
9	302D	2 (2*)	A07 run stop_re
10	303E	2 (2*)	A08 run stop_s_re
11	3009	2 (3*)	A09 way blocked
12	300A	2 (3*)	A10 way blocked_s_TODO
13	300B	2 (2*)	A11 stand to crouched
14	300C	2 (2*)	A12 stand to crouched_s
15	300D	2 (2*)	A13 crouched to stand
16	300E	2 (2*)	A14 crouched to stand_s
17	300F	1 (1)	A15 crouched wait
18	3010	1 (1)	A16 crouched wait_s

id=0x3005 desc="A05 run"

Index	FrameID	Time	OX	OY	Flags
0 (0)	20FD run01_2a	1	10	0	0
1 (1)	20FF run02_2a	1	20	0	0
2 (2)	2101 run03_2a	1	30	0	0
3 (3)	2103 run04_2a	1	40	0	0
4 (4)	2105 run05_2a	1	50	0	0
5 (5)	2107 run06_2a	1	60	0	0
new...					

0 (2002) _stand01; 1 (2004) _stand02; 2 (2003) _stand_arthur 1; 3 (2005) _stand_arthur 2; 4 (2000) _stand_turn; 5 (2001) _stand_turn_s; 6 (2006) double stab 01

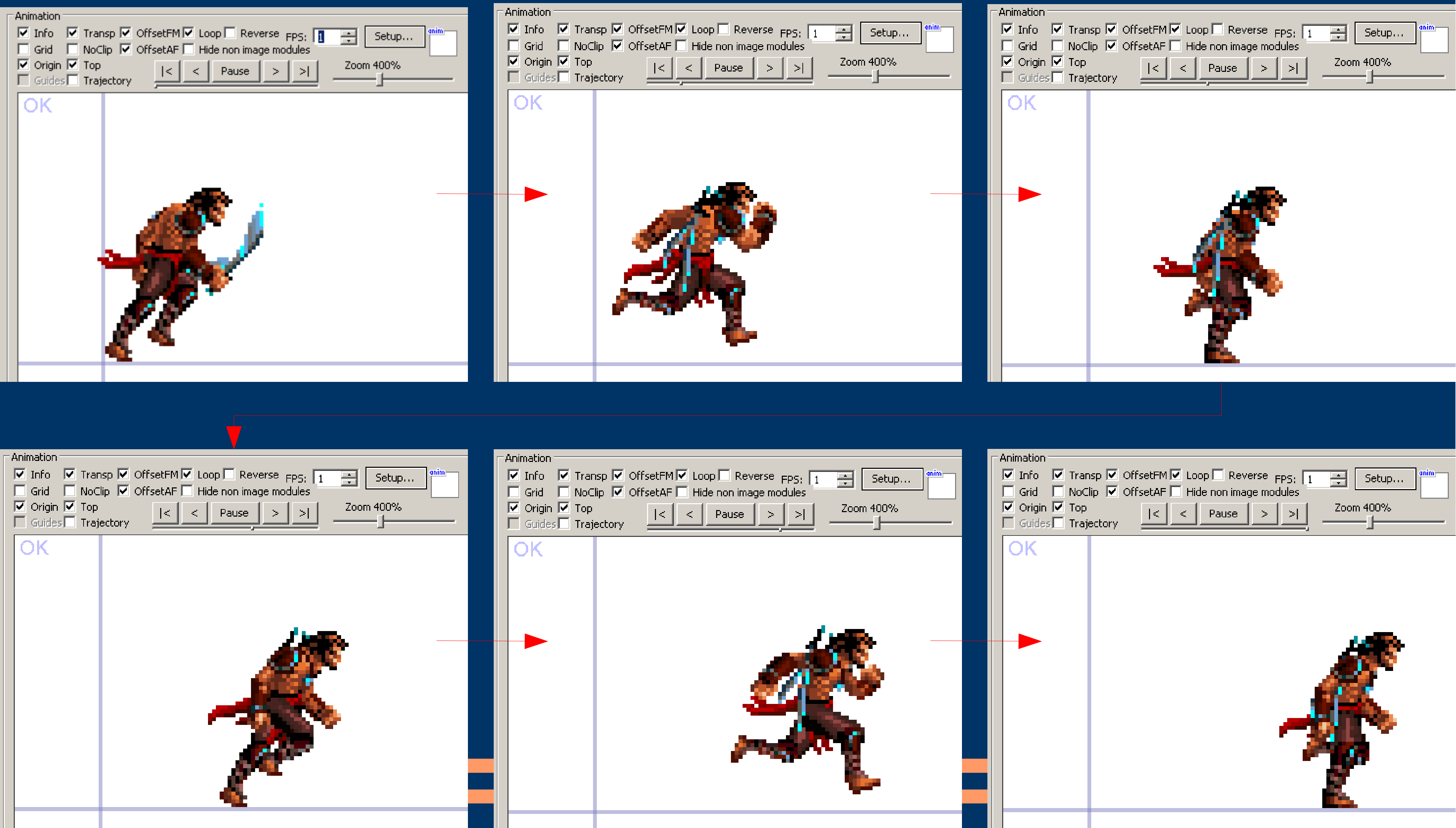


[✓] Info [✓] Transp [✓] OffsetFM [✓] Loop [ ] Reverse FPS: 1
[ ] Grid [ ] NoClip [✓] OffsetAF [ ] Hide non image modules
[✓] Origin [✓] Top Zoom 400%
[ ] Guides [ ] Trajectory

- You can set:
  - <u>FPS</u>: frames (animations frames) per second
  - <u>loop</u>: reproduce it every time

Sprite

Animation Editor - Previewing an animation



Animation

☑ Info ☑ Transp ☑ OffsetFM ☑ Loop ☐ Reverse FPS: 1 Setup...

☐ Grid ☐ NoClip ☑ OffsetAF ☐ Hide non image modules

☑ Origin ☑ Top

☐ Guides ☐ Trajectory

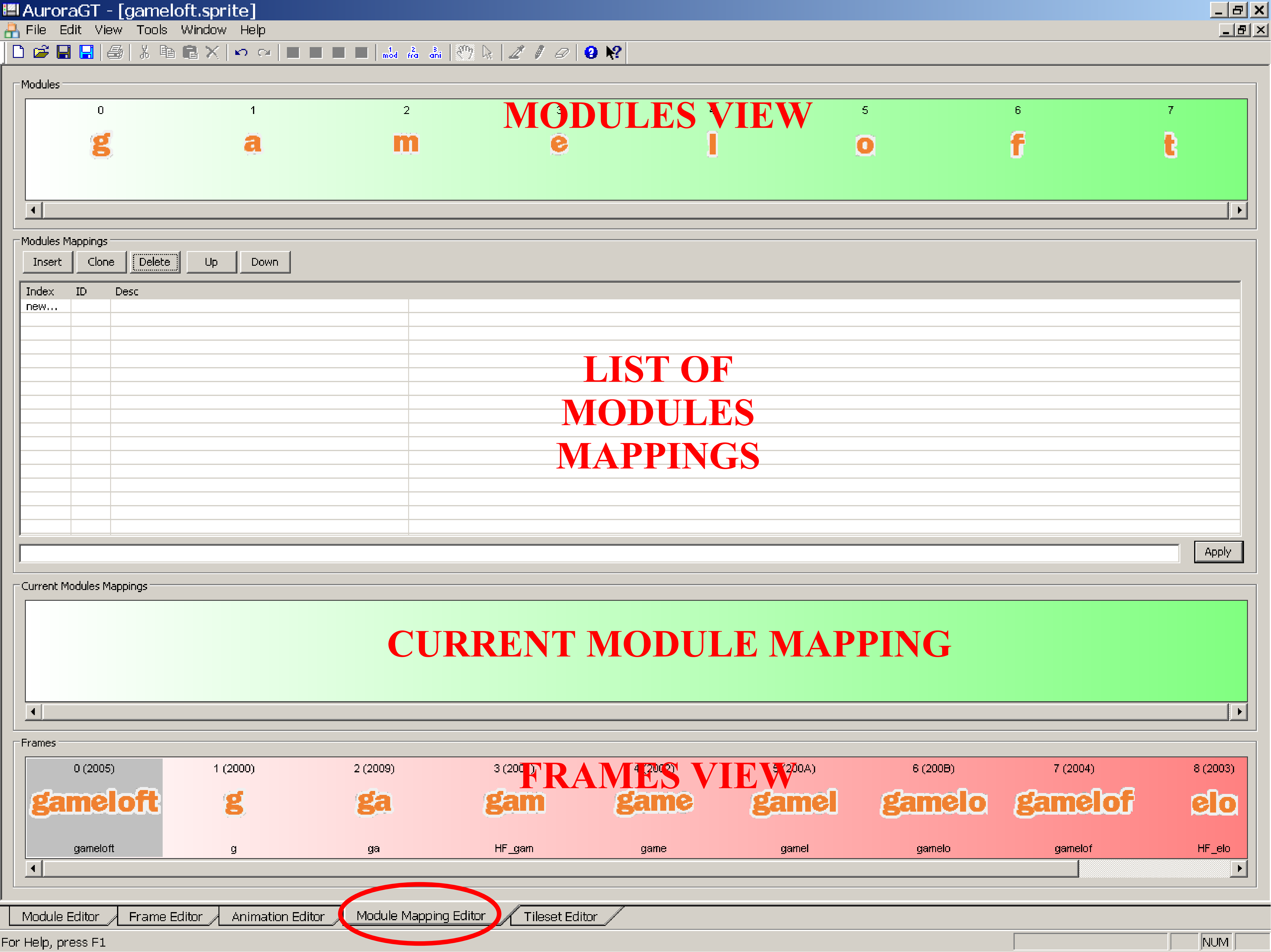
Sprite
ASprite_Paint.hxx

- For painting frames & animations:
  - `void PaintFrame(int frame, int posX, int posY, int flags)`

    ->Paints a frame
  - `void PaintFModule(int frame, int fmodule, int posX, int posY, int flags)`

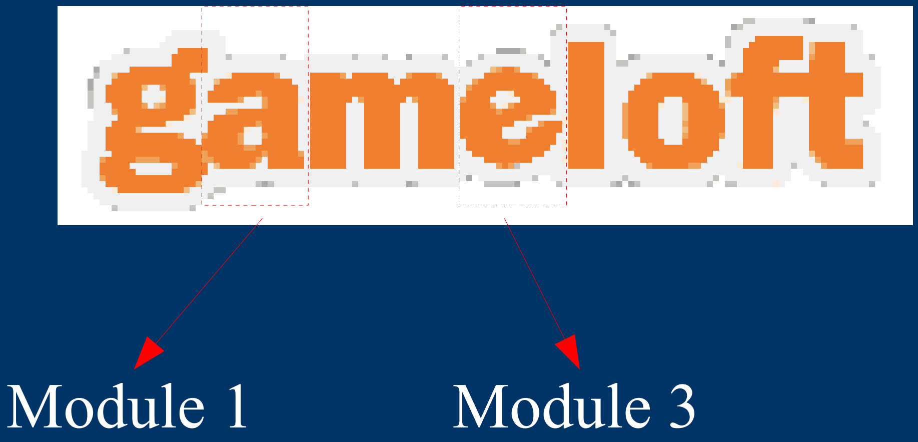
    ->Paints a frame module (a module that belongs to a frame)
  - `void PaintAFrame(int anim, int aframe, int posX, int posY, int flags)`

    ->Paints an animation frame (a frame that belongs to an animation)


AuroraGT - [gameloft.sprite]
File Edit View Tools Window Help
Modules
0 1 2 3 4 5 6 7
g a m e l o f t
MODULES VIEW
Modules Mappings
Insert Clone Delete Up Down
Index ID Desc
new...
LIST OF MODULES MAPPINGS
Apply
Current Modules Mappings
CURRENT MODULE MAPPING
Frames
FRAMES VIEW
0 (2005) gameloft
1 (2000) g
2 (2009) ga
3 (2001) HF_gam
4 (2002) game
5 (200A) gamel
6 (200B) gamelo
7 (2004) gamelof
8 (2003) HF_elo
Module Editor
Frame Editor
Animation Editor
Module Mapping Editor
Tileset Editor
For Help, press F1
NUM

Sprite
Module Mapping editor

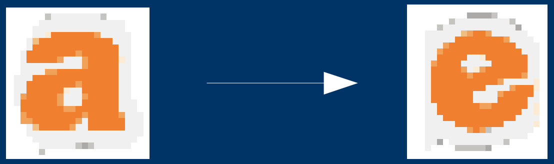
- This is a way to associate a module with another
  - So, changing this mapping implies the use of the mapped module
- For instance,



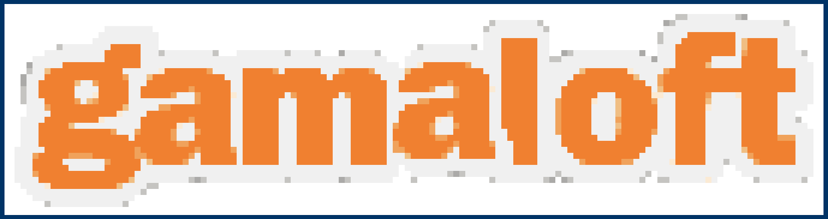
Sprite

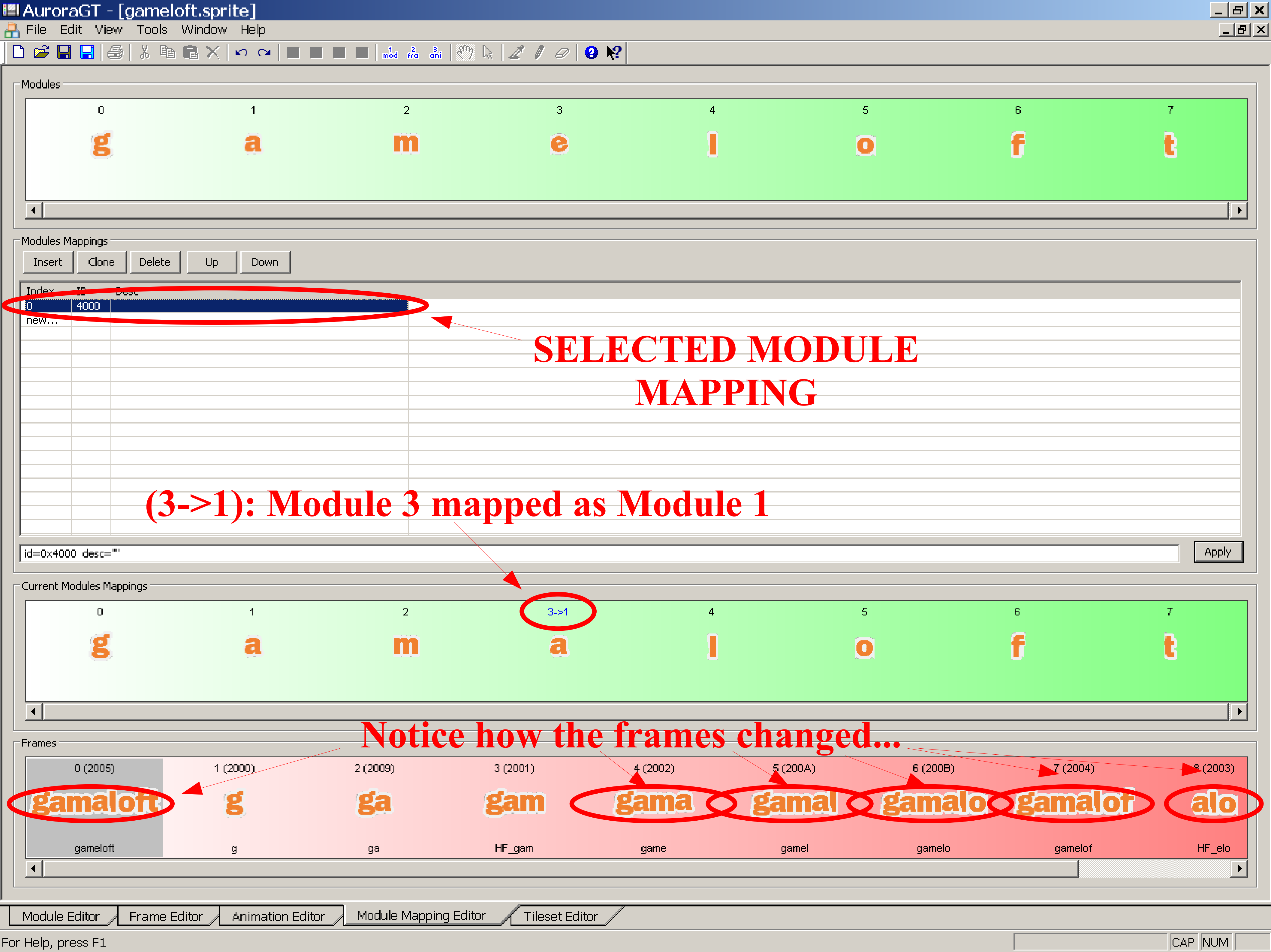
Module Mapping editor

- We map the “a” with “e”:



- So, if the module mapping is selected the frames and animations would show:





AuroraGT - [gameloft.sprite]

File Edit View Tools Window Help

Modules

0	1	2	3	4	5	6	7
g	a	m	e	l	o	f	t

Modules Mappings

Insert Clone Delete Up Down

Index	ID	Desc
0	4000	
new...		

SELECTED MODULE MAPPING

(3->1): Module 3 mapped as Module 1

id=0x4000 desc="" Apply

Current Modules Mappings

0	1	2	3->1	4	5	6	7
g	a	m	a	l	o	f	t

Notice how the frames changed...

Frames

0 (2005)	1 (2000)	2 (2009)	3 (2001)	4 (2002)	5 (200A)	6 (200B)	7 (2004)	8 (2003)
gamaloft	g	ga	gam	gama	gamal	gamalo	gamalof	alo
gameloft	g	ga	HF_gam	game	gamel	gamelo	gamelof	HF_elo

Module Editor | Frame Editor | Animation Editor | Module Mapping Editor | Tileset Editor

For Help, press F1 CAP NUM

Sprite
Module Mapping editor

- The modules mappings are stored with the MMP extension
  - To save them: `Export -> Module MMP`
  - `USE_MODULE_MAPPINGS` activates it and `Asprite_MMapping.h` mainly handles this feature

Conclusion

- Stuff we learned:
  - Create Modules / Frames / Animations / HyperFrames
  - Images & Palettes
  - Understand palettes and indexed images.
  - Pixel format types.
  - Useful for logos adaptation or resizing.

Bibliography

- **AuroraGT official repository**
  https://terminus.mdc.gameloft.org/vc/tools/AuroraGT
- **AuroraGT main wiki**
  https://wiki.gameloft.org/twiki/bin/view/Main/AuroraGT

Contact us

- Please, we look forward for any suggestions or bug found:
  - send us a mail to World-AuroraSuggestions@gameloft.com