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Close Combat 2 "A Bridge Too Far"

The Terrain-file

(Pc- & Mac-version of CC2)

What it is

"Close Combat - A Bridge Too Far" (abbreviated CC2, ABTF, CC2-ABTF) was the second game of the CloseCombat-series created by Atomic and presented by Microsoft to the Mac-community. It was also the last game of this series for the MacOS. The series was then continued by SSI and UbiSoft for PCs only (up to day CC3, CC4, CC5, CCM v3.1, RoadToBaghdad) and is now owned by Destineer and continued by MatrixGames (CCM v4, CCRAFRgt, CoI, CCMT, CC4/5-Rerelease). The game CC2 was released in 1997 on a hybrid-CD, running on PCs and under the MacOS 7.5 up to 9.2.2 (and on PPC-Macs under MacOS-X up to 10.4.11 in Classic environment) as well. Later localized versions (German, French) of CC2 were released for PCs only.

Many thanks to CPL FILTH

Many thanks to Cpl Filth (psaasta@otitsun.oulu.fi) for his great work. Without his program "SprTool.exe" the easy handling of sprite files of CC2 in the early days of CC2-modding was nearly impossible and the following work could never be done by myself. Please look at his homepage for further development on CC2-CC3-CC4-CC5-tools: <http://www.student.oulu.fi/%7Epsaastam/> Later on in 2004 I made a tool of my own ("CC2Spriter", <http://www.ftf.claranet.de/>) for MacOS and PCs. This tool handles sprite files in a more universal way. For further informations about sprite files throughout all CC-versions please also read my guide "CC2Guide-SpriteFiles-v7.pdf"

What do you need

First of all you need the original CD "Close Combat : A Bridge Too Far" (hybrid PC / Mac) and the last available update from the internet (version 2.0b: www.microsoft.com/games/closecombat/cc2/downloads.htm). For patching the sprites in the file "Terrain" you must first extract the sprites from the file "Terrain" using Cpl Filth's "SprTool.exe" or my tool "CC2Spriter.exe" / "CC2SpriterX" for MacOS-X. Both tools will extract the images as 16-bit TARGA-files. Due to an old myth that CC2 is storing the graphics in flipped direction (what in fact is only caused by using a wrong TARGA-header entry), the older tool "SprTool.exe" will deliver them in flipped graphics orientation. So I recommend to use the latest version of "CC2Spriter.exe" / "CC2SpriterX". The next difference between these tools is that "SprTool.exe" is counting them from #1, and "CC2Spriter" is counting them (like the internal CC2-logic) from #0. The resulting TARGA-files can be changed using any graphic program (there are reports that some graphic programs cannot save 16-bit TARGA-files correctly). The repacking of the TARGA-graphics to create a new "Terrain"-file will also be done by the same tool "SprTool.exe" / "CC2Spriter".



Picture: Strings from the stri-resource (Mac) or the file CC2rsrc.dll (PC) during battle from the PacificFront-Mod by TAKI (picture on the left). Sprites from the original file "Terrain" in action (VL-flag, European trees with shadow; picture on the right).

The CC2-file "Terrain"

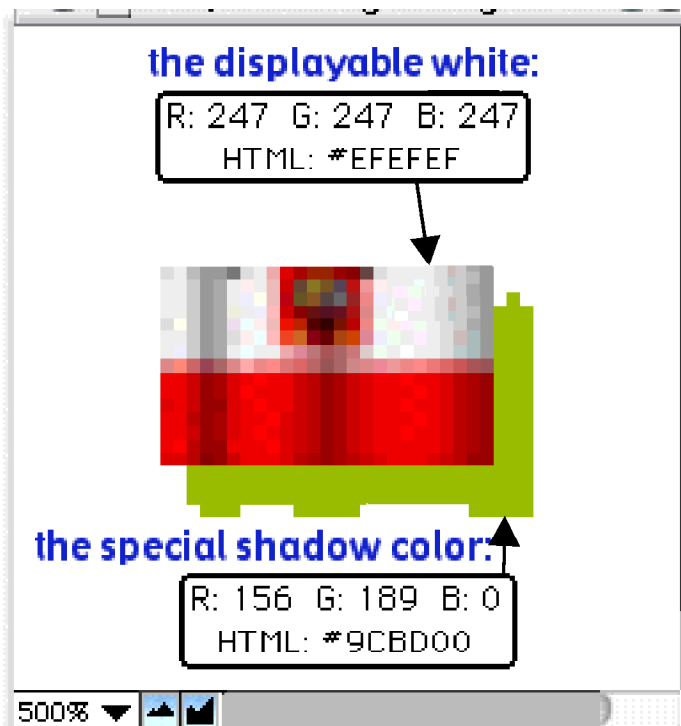
The file "Terrain" is part of the graphical environment of CC2. In the Mac-version of CC2, it resides on the original CD in the folder "Close Combat:Data:Graphics". In the PC-version it resides (after making a full install of CC2) in the folder "C:\A Bridge Too Far\Graphics". To replace original CC2-files in the Mac-version it is necessary to build up a volume-image of the original CD with read/write-access. In the PC-version it is simple: replace the file in the full installation on the harddisk.

The program "Close Combat 2 : A Bridge Too Far" stores some of its graphical data as sprites. All CC2-files containing sprites have a starting header. The first four bytes of this header are "SPRI". CC2-files containing sprites are "Explode", "Terrain", "VehB####"- and "VehSxxx"-vehicle-shadow-files, "Smoke", "Soldier" and "SoldierB". The vehicle-shadow-files contain each 74 shadows each for the representing vehicle. The sprite graphics are stored in the same orientation as you will see them on the screen during play (see last chapter on page 1).

As CPL FILTH stated in the ReadMe-file of "SprTool.exe", *the files resulting from extracting from a file will be named in sequence from image0001.x.y.tga to image9999.x.y.tga, where x and y are the hotspots of the sprites stored in the image-files. Dont change the names of the files, but feel free to try and change the image sizes or hotspots, that should work.* "CC2Spriter" uses to count them from #0 (starting with image0000.x.y.tga) with the same naming conventions. The file "Terrain" contains 257 different sprites. The flags for victory locations and grenade explosion smoke are arranged as an animation sequence similar to GIF-animations.

There are three special colors used by CC2, as CPL FILTH stated: *white (0xFFFF) is transparent, the olive greenish is a shadow (0xE04E, IIRC) and 0xE036 seems to be a special color too.* The developers of the CC-game series used a "shocking pink" color to indicate the shadow area within their own (not publicly published) tools. The suggestion of CPL FILTH for the indicating of the special colors (transparent, shadow and more) was also taken over by my tool "CC2Spriter".

Most of the sprites have also a wide transparent area around the sprite, so creation of new, even greater sprites seems to be possible without disturbing the program. Later CC-versions reduced this wide surrounding transparent area. Later CC-versions contain also animation sequences, but the developers decided to drop the animation effect during gameplay. The original CC2 is the only one game of the series with animated flags for victory locations (and you can also animate the trees (waving of the leaves)) during play. Animating other objects out of this file will fail like in all newer game versions.



Picture: the special color for shadows is RGB R: 156, G: 189, B: 0. White is transparent. To have "white" parts of sprites you can use a very light grey: RGB R: 247, G: 247, B: 247. A good example is the original Polish flag.

When using "SprTool.exe", you will see the images flipped (error in the TARGA-header). If you edit any of the images, save them as 16-bit TARGA.

Contents of CC2-"Terrain"

The file is a MacOS-born file. It is entirely encoded in BIG Endian! Like all other sprite files, the CC2-file "Terrain" consists of 5 sections (see my guide "CC2Guide-SpriteFiles-v7.pdf"):








- Header,
- Directory,
- Sprite image section,
- Static animation section,
- Direction-oriented animation section.









CC2-"Terrain" has an 8 byte header: "SPRI" followed by 00000001h encoded in BIG Endian. The Directory is also encoded in BIG Endian:

1000	// short	// 2 bytes	// ID indicating the start of the "Directory",
number	// short	// 2 bytes	// number of sprite graphics in the "Sprite section",
78	// short	// 2 bytes	// number of animation sequences in
			// the "Static animations section",
1	// short	// 2 bytes	// number of animation sequences in
			// the "Direction oriented animations section",
16	// short	// 2 bytes	// unknown purpose. Perhaps amount of directions.

The number of sprite graphics in the original CC2-"Terrain"-file is 257. This value can be modified (increased) without disturbing the file's functionality.



Contents of "Sprite image section" – Terrain (CC2)

Graphic's index-number (counted from #0)	Description of the sprites with graphical example	Hot-spot X	Hot-spot Y	Image-size in pixel	Modification by me for CC2-PacificFront-Mod
0 - 10	Grenade explosion in water, animation 	15	29	30x58	
11 -22	Damages on roofs or other buildings 	15	15	30x30	
23 - 38	Big arrow in various directions for BootCamp 	75	96	150x192	
39	US-Flag mounted on pole 	24	24	49x49	
40	X-marking for BootCamp 	18	18	37x37	
41 - 52	Open circle in green, red, yellow or orange (soldier's team function indicator) 	13	18	27x36	
53 - 60	Target-dots for Move / Fast move / Sneak / Fire / Smoke / Hide ... 	6	6	13x13	

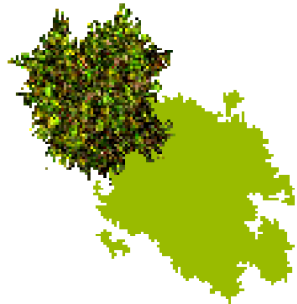



Graphic's index-number (counted from #0)	Description of the sprites with graphical example	Hot-spot X	Hot-spot Y	Image-size in pixel	Modification by me for CC2-PacificFront-Mod
61	Crosshairs 	14	14	29x29	
62	Crosshair circle 	14	14	29x29	
63	Yellow rectangle for team marking 	12	12	24x24	
64	Dark yellow inner rectangle as selected-soldier marking ¹ 	12	12	24x24	
65	Very small grenade impact 	5	5	10x10	
66	Small grenade impact 	7	7	15x15	
67	Medium grenade impact (not used) 	10	10	20x20	
68	Large grenade impact 	12	12	25x25	

¹ Picture: team marking during battle, selected soldier has double reactangle (CC2-Afrika-Mod):







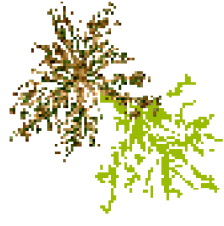


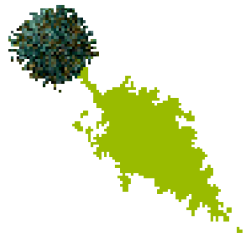
Graphic's index-number (counted from #0)	Description of the sprites with graphical example	Hot-spot X	Hot-spot Y	Image-size in pixel	Modification by me for CC2-PacificFront-Mod
69	Very large grenade impact 	15	15	30x30	
70 – 89	German flag for victory locations, not used² by regular German troops, animation 	25	25	50x50	 Japanese flag
90 - 109	British flag for victory locations, animation 	25	25	50x50	
110 - 129	US flag for victory locations, animation 	25	25	50x50	
130 - 149	Polish flag for victory locations, animation 	25	25	50x50	 Kuomintang flag
150 - 169	German/British combination flag for VL, animation 	25	25	50x50	
170 - 189	German/US combination flag for VL, animation 	25	25	50x50	
190 - 209	German/Polish combination flag for VL, animation 	25	25	50x50	
210	Damage on bricks 	11	13	30x30	
211	Damage on bricks 	12	12	30x30	
212	Damage on bricks 	16	12	30x30	
213	Damage on bricks 	14	13	30x30	

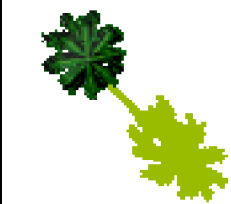
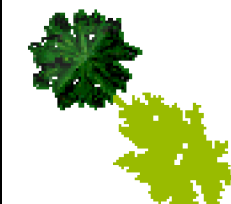
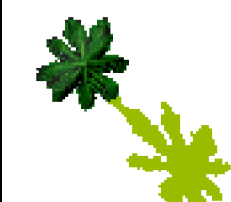


² the VL-flags used by the game for German troops see on page 11.

214	Zoomed tree ³	43	43	140x140	
215	Zoomed tree	43	43	140x140	
216	Zoomed tree	43	43	140x140	
217	Zoomed tree	43	43	140x140	


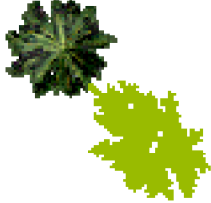









³ I suppose that all "Zoomed tree"-images are not used by the game, even when the user switches to "zoomed view".

218	Zoomed tree	43	43	140x140	
219	Zoomed tree	43	43	140x140	
220	Zoomed tree	43	43	140x140	
221	Zoomed tree	43	43	140x140	

222	Zoomed dead tree	43	43	140x140	
					
223	Zoomed dead tree	43	43	140x140	
					
224	Zoomed conifer tree	43	43	140x140	
					
225	Zoomed conifer tree	43	43	140x140	
					

226	Tree ⁴	27	27	90x90	
227	Tree	27	27	90x90	
228	Tree	27	27	90x90	
229	Tree	27	27	90x90	
230	Tree	27	27	90x90	

⁴ The CC2-Base-file "Elements" describes 5 different trees: "Small Tree", "Medium Tree", "Big Tree", "Orchard Tree" and "Dead Tree". Together with "Leaves" and "Leaves & Brush" they all belong to the "Tile Type"="Tree". In CC2 the sprite images with the index numbers 226 to 233 are assigned randomly during gameplay to the terrain elements "Small Tree", "Medium Tree", "Big Tree" and "Orchard Tree". The sprite images with the index numbers 234 and 235 are assigned randomly during gameplay to the terrain element "Dead Tree". So in CC2, you cannot foresee which terrain element will cause which sprite image to be displayed.

231	Tree		27	27	90x90	
232	Tree		27	27	90x90	
233	Small tree		27	27	90x90	
234	Dead tree		27	27	90x90	
235	Dead tree		27	27	90x90	
236	Medium grenade impact		10	10	20x20	
237 - 256	German flag for victory locations, this is the one used by regular German troops, animation		25	25	50x50	

Contents of "Static animation section" – Terrain (CC2)

Index	Number of entries	Indicator	Sprite numbers in sequence list	Purpose
0	11	1100h	#0 - #10	Grenade explosion in water
1	20	1200h	#90 - #109	British VL-flag
2	20	1200h	#237 - #256	German VL-flag
3	20	1200h	#150 - #169	German/British combination flag for VL
4	1	1200h	#65	Very very small grenade impact
5	1	1200h	#65	Very small grenade impact
6	1	1200h	#66	Small grenade impact
7	1	1200h	#236	Medium grenade impact
8	1	1200h	#68	Large grenade impact
9	1	1200h	#69	Very large grenade impact
10	1	1200h	#69	Very very large grenade impact
11	1	1200h	#11	Damages on roofs
12	1	1200h	#12	Damages on roofs
13	1	1200h	#13	Damages on roofs
14	1	1200h	#14	Damages on roofs
15	1	1200h	#15	Damages on roofs
16	1	1200h	#16	Damages on roofs
17	1	1200h	#17	Damages on roofs
18	1	1200h	#18	Damages on roofs
19	1	1200h	#19	Damages on roofs
20	1	1200h	#20	Damages on roofs
21	1	1200h	#21	Damages on roofs
22	1	1200h	#22	Damages on roofs
23	1	1200h	#53	Target-dot
24	1	1200h	#54	Target-dot
25	1	1200h	#55	Target-dot
26	1	1200h	#56	Target-dot
27	1	1200h	#57	Target-dot
28	1	1200h	#58	Target-dot
29	1	1200h	#59	Target-dot
30	1	1200h	#60	Target-dot
31	1	2200h	#0	Not used ? Splash in water
32	1	1200h	#39	US-Flag mounted on pole
33	1	1200h	#40	X-marking for BootCamp
34	1	1200h	#210	Damage on bricks
35	1	1200h	#211	Damage on bricks
36	1	1200h	#212	Damage on bricks
37	1	1200h	#213	Damage on bricks
38	20	1200h	#110 - #129	US VL-flag
39	20	1200h	#130 - #149	Polish VL-flag
40	20	1200h	#150 - #169	German/British combination flag for VL
41	20	1200h	#170 - #189	German/US combination

Index	Number of entries	Indicator	Sprite numbers in sequence list	Purpose
				flag for VL
42	20	1200h	#190 - #209	German/Polish combination flag for VL
43	0	1200h	none	not used
44	0	1200h	none	not used
45	0	1200h	none	not used
46	0	1200h	none	not used
47	0	1200h	none	not used
48	1	1200h	#214	Zoomed tree not used?
49	1	1200h	#215	Zoomed tree not used?
50	1	1200h	#216	Zoomed tree not used?
51	1	1200h	#217	Zoomed tree not used?
52	1	1200h	#218	Zoomed tree not used?
53	1	1200h	#219	Zoomed tree not used?
54	1	1200h	#220	Zoomed tree not used?
55	1	1200h	#221	Zoomed tree not used?
56	1	1200h	#222	Zoomed dead tree not used?
57	1	1200h	#223	Zoomed dead tree not used?
58	1	1200h	#224	Zoomed conifer tree not used?
59	1	1200h	#225	Zoomed conifer tree not used?
60	1	1200h	#226	Tree
61	1	1200h	#227	Tree
62	1	1200h	#228	Tree
63	1	1200h	#229	Tree
64	1	1200h	#230	Tree
65	1	1200h	#231	Tree
66	1	1200h	#232	Tree
67	1	1200h	#233	Tree
68	1	1200h	#234	Dead tree
69	1	1200h	#235	Dead tree
70	20	1200h	#110 - #129	US VL-flag
71	20	1200h	#130 - #149	Polish VL-flag
72	20	1200h	#170 - #189	German/US combination flag for VL
73	20	1200h	#190 - #209	German/Polish combination flag for VL
74	1	1100h	#210	Damage on bricks
75	1	1100h	#211	Damage on bricks
76	1	1100h	#212	Damage on bricks
77	1	1100h	#213	Damage on bricks

Some of the "Static animation sequences" seems to be doubled. And it looks like the file uses some graphics (grenade impacts, damages) more than once. It is likely that the game does not use all of the "Static animation sequences" defined in the file "Terrain". I'm sure that the game is not using the "Static animation sequences" defined for "Zoomed trees". When modifying the "Static animation sequences" using "CC2Spriter", you can change the number of entries and the sprite numbers in the sequence list, but I recommend not to change "Indicator" value.

Contents of "Direction-oriented animation section" – Terrain (CC2)

There is only one "Direction-oriented animation sequence" defined: it contains the reference to 16 sprite images. These are the sprite images with the big arrows for BootCamp. I recommend not to change this.

Making of a new flag for the PacificFront-Mod

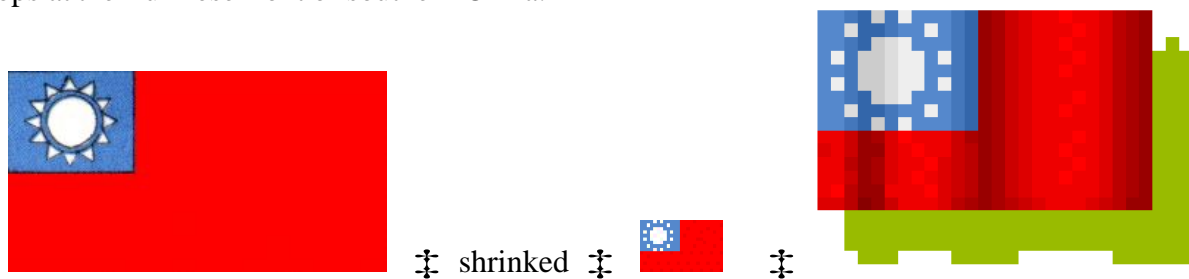
For TAKI's CC2-PacificFront-Mod (was: http://member.nifty.ne.jp/takixxx/cc2_eng.htm, now: <http://members.fortunecity.de/closecombat2/PacificFront.html>) (new Weapons- & Team-definitions, new Vehicle-graphics) the creation of the Japanese victory location flag was still missing in February 2001. After extracting all sprites from the original file "Terrain" of CC2, the German VL-flags must be substituted by the Japanese versions. First of all I created a normal Japanese flag with the size 25x15 pixels. Instead of the regular white I used a very light grey (RGB R: 247, G: 247, B: 247), because the color "white" (RGB R: 255, G: 255, B: 255) is the special-color used for transparency by CC2 (as CPL FILTH stated earlier, see page 2f). Because I used the old tool "SprTool.exe", the following images are flipped horizontally:



Afterwards the "waving flag"-imitation must be simulated by darkening some parts of the flag (corresponding to the original shadow-border). A good example on how to darken the flag is the original US-flag. The design of the combination-flags for victory locations has also be done:



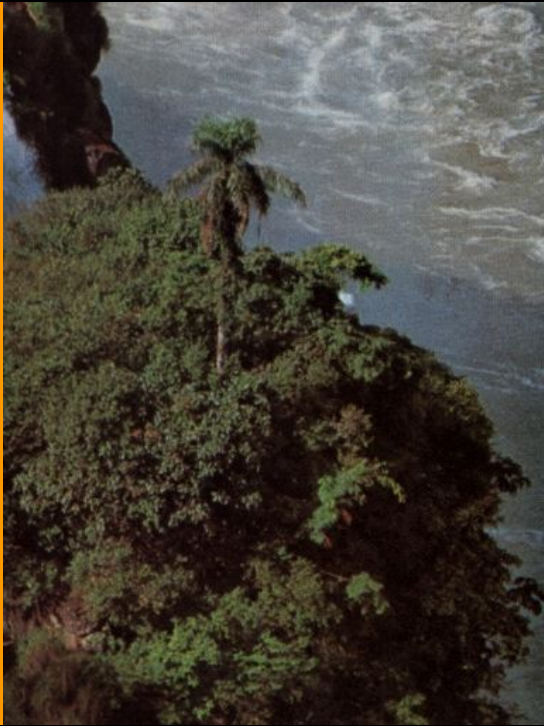


Later in April 2001 I added the Kuomintang flag for replacing the Polish one, suitable for Chinese troops at the Burmese front or southern China:


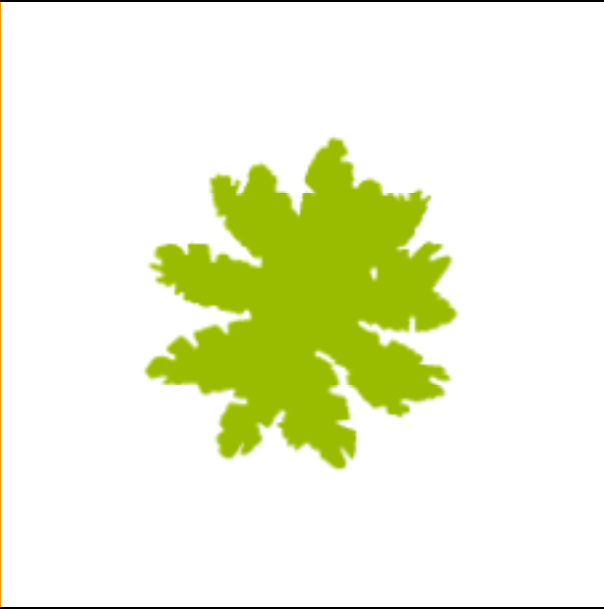






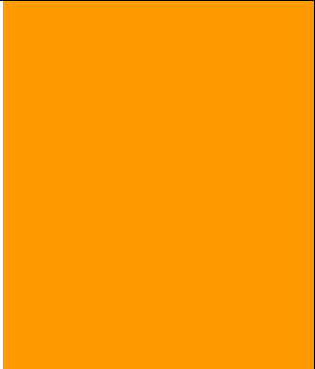


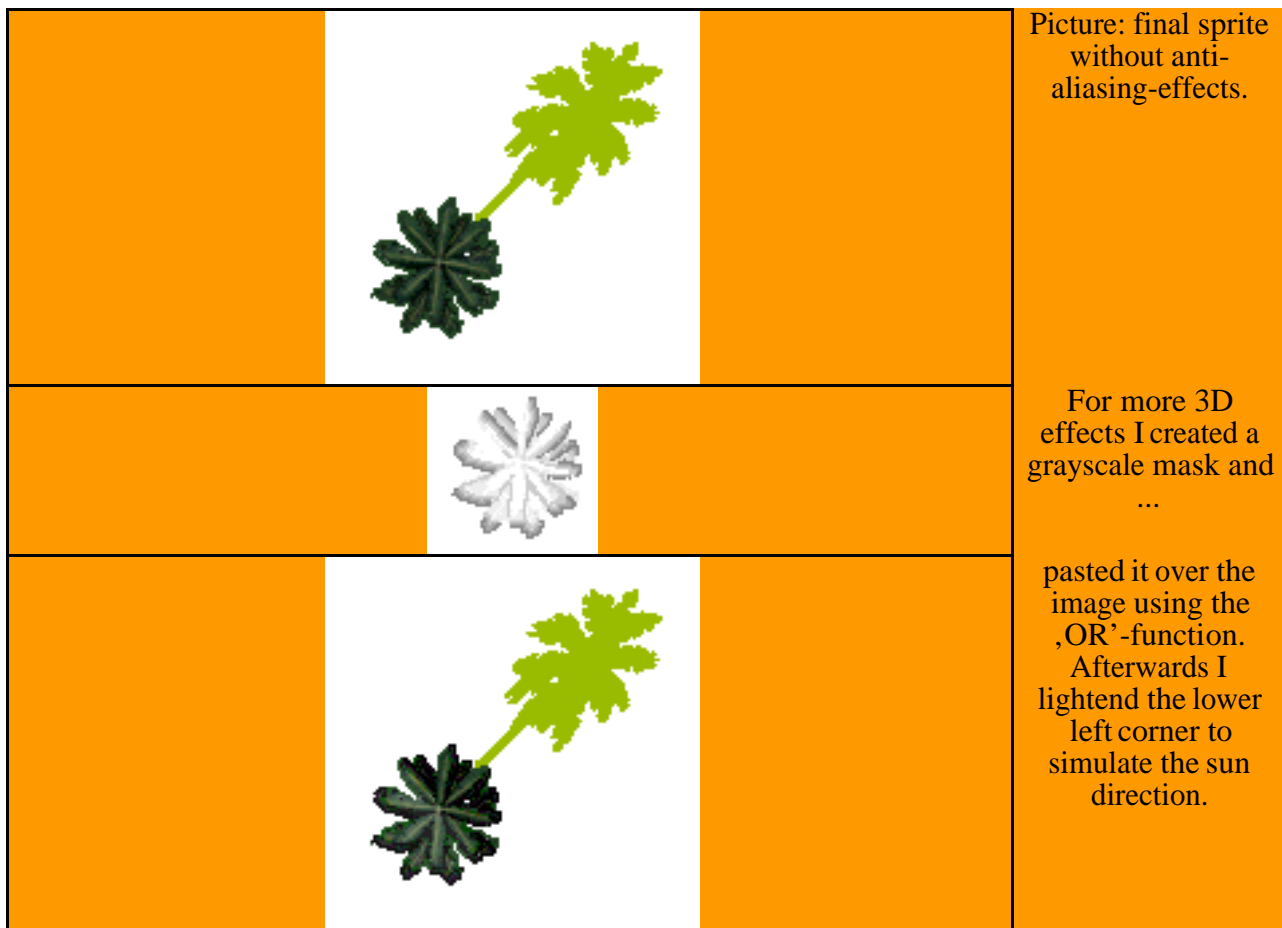
Picture: new Japanese VL-flags combined with European trees.

The making of palm-trees for the PacificFront-Mod

There are two sizes of trees in the file “Terrain”: normal (small) size and a large size (used if the battlefield is zoomed). Therefore each tree has to exist twice: a small (90x90 pixels) and a large one (140x140 pixels). See TOC above. I decided to substitute the European-style trees with palm trees for using by CC2 on the original maps. I took the suitable colors from a real live picture of a palm tree. To get the view of a palm tree directly from the sky I made a scan of a kiddy toy palm tree. Changing the colors and shrinking the size of the picture followed. It was necessary to remove anti-aliasing-effects from the image after shrinking the size. To create the shadow I masked the shape of the palm tree, filled it with the special shadow color, flipped or rotated the shape and distorted it to the same direction like the original trees are. To get variations of the first design I added/removed leaves and increased the greenish color part of the image.

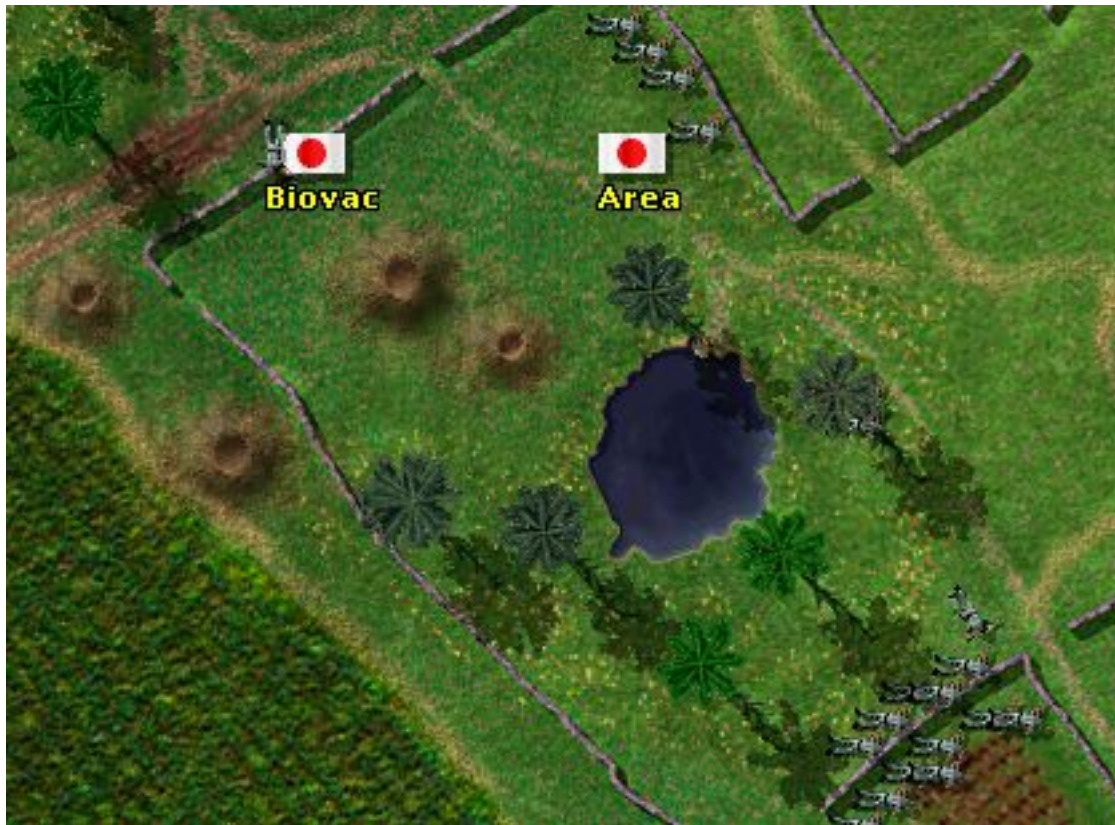
			Picture: a single palm tree in the jungle of Malaya.
			Picture: scan of a kiddy toy palm tree.
			Picture: adding colors to the first scan.

			<p>Picture: shadow of the palm tree with larger transparency area.</p>
			<p>Picture: flipped and distorted shadow.</p>
			<p>Picture: palm tree combined with shadow in the image size 140x140 pixels. Anti-aliasing-effects still there!</p>



The resulting effect

To build up a new file "Terrain" I saved all new files as TARGA-graphics with 16-bit color, using the same filenames like "SprTool.exe" generated. "SprTool.exe" (created by CPL FILTH) did the rest. Just renaming the resulting sprite-collection to "Terrain" and it was finished. The new file works on PC and Mac as well.



Picture: new VL-flags and palm trees (old version) on an original map of CC2 in action (February 2001).



Picture: new VL-flags and improved palm trees on an original map of CC2 in action (April 2001).

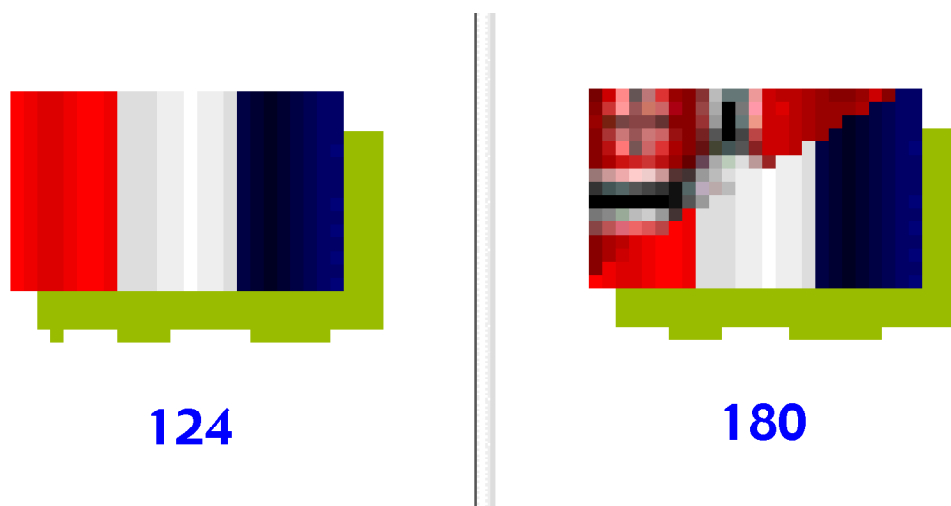
I hope it will be a good expansion to TAKI's mod. Enjoy!

The making of a new flag for the 1940-Mod



Picture: new flags of the "1940"-Mod in the "Debriefing-Detail"-screen of CC2.

FRANTZ "FRITZ" PERGOLINI made a CC2-Mod called "1940", which was posted at the site of the ANZAC-Clan site (<http://closecombat.thegamers.net/AnzacClan/index.htm>) and was also hosted on the former website of THE WIZARD / VONB (aka CSO_BEEBLEBROX = SEAN BEAN, one of the founders of CSO) (<http://www.btinternet.com/~thewizard/cc/Downloads/cc2/Files/1940/1940.zip>). He did not include a "Terrain"-file. To replace the US-flag by a French one, you have simply to build up a French flag and insert it in the slots 110 – 129 of the "Terrain"-file. Don't forget the flag combination German/French in the slots 170 – 189. It seems not suitable to change the Axis-flags, because FRANTZ used a combination-flag for the Axis in the "Debriefing"-screen of CC2, which might cause confusion when used as a VL-flag.



Picture: new French flags to fit the "1940"-Mod.

How does ABTF determine which flag to be used on a map?

For the Axis there is only one possible flag to use on a map ("Terrain"-file sequence number 237 – 256). But there are three possible Allied flags. **For a single battle**, ABTF examines the "AIOOB"-file (Allied Order Of Battle-file) in the folder Data/Battle/1###/, where ### stands for the used map-number. The Allied team with the highest rank (second column) used in this file determines which Allied flag will be used. In the file Data/Base/Teams each team is defined. The fourth column there

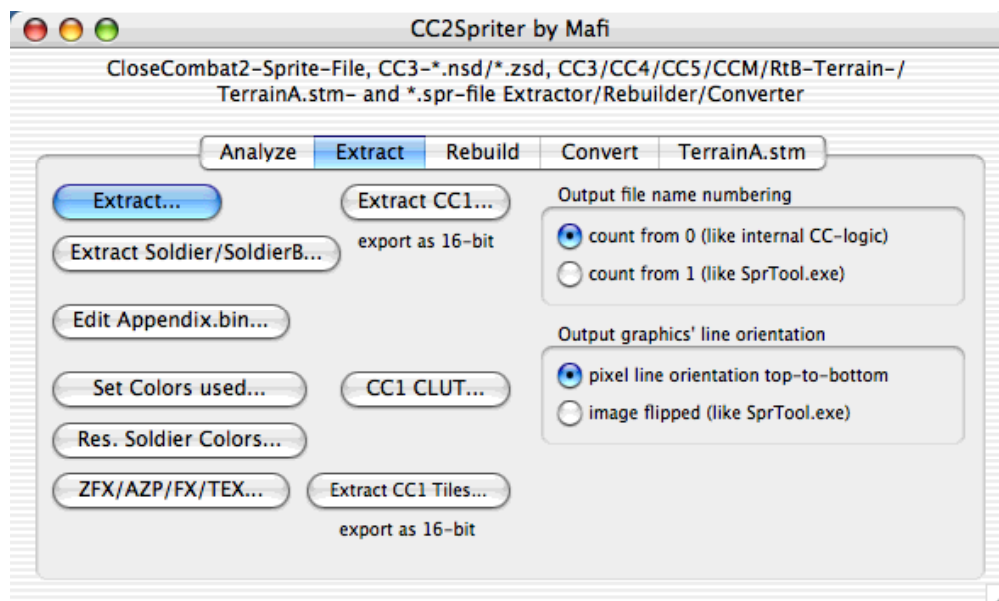
contains the "Nationality": if the team has the nationality "BR", the British flag is used, if it is "US", the US flag is used and if it is "PO", the Polish flag is used. You can mix the troops from different Allies, the one with the highest rank in the "AIOOB"-file determines the VL-flag (for example: if you want to have the Polish flag there instead of the US one, it is sufficient to add one single Polish rifle team to the "AIOOB"-file with a rank of 7).

Extending animation sequences (added 2008)

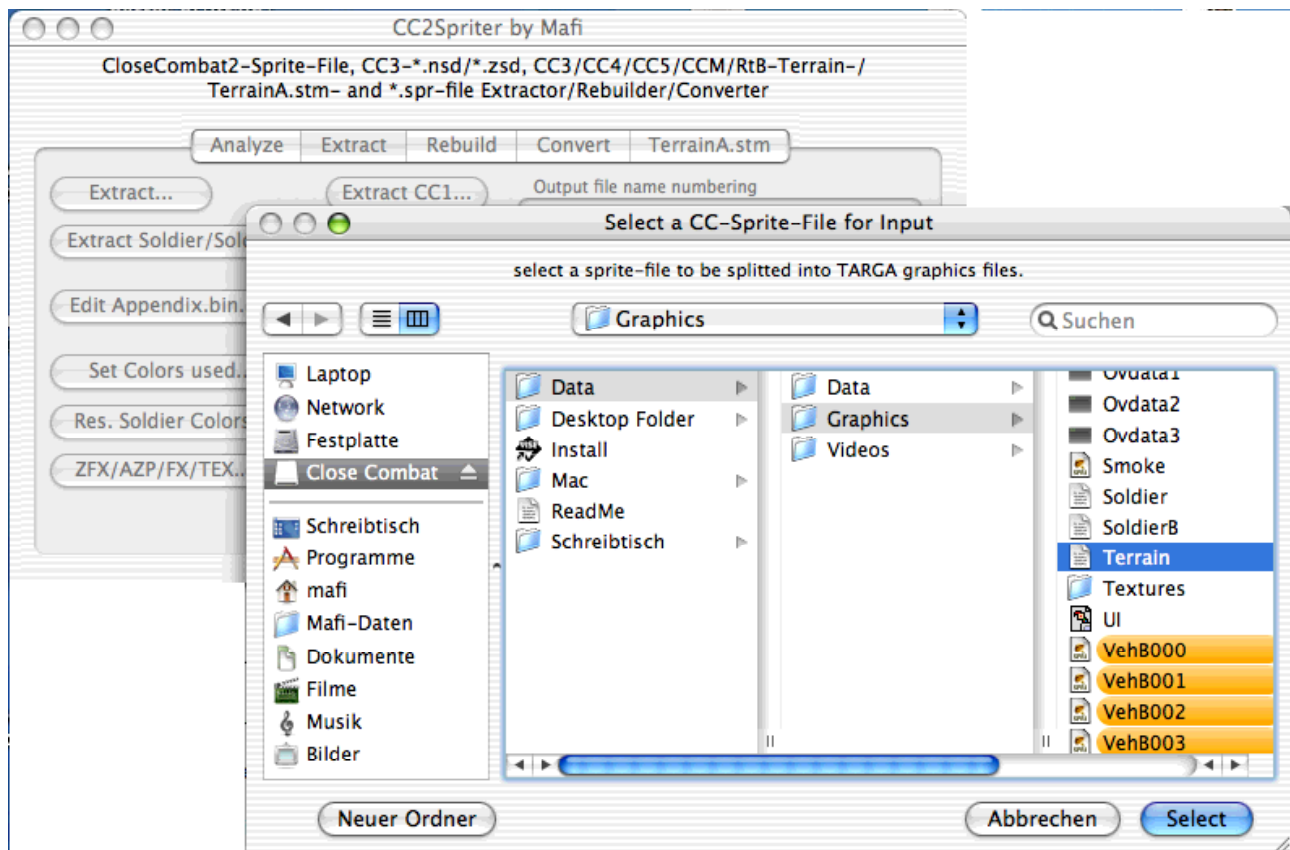
Using "CC2Spriters", it is possible to add further sprite images to the file "Terrain" without disturbing its functionality. Just add more TARGA-graphics to the folder containing the images to be repacked. During extraction of the sprite images, "CC2Spriters" will write the informations containing the animation sequencing to a file called "Appendix.bin" (see manual of "CC2Spriters"). When repacking the images, the tool will always try to generate the header in the correct format for the given "sprite file" and will adjust the number of sprite graphics according to the number of TARGA-files in the folder. You can expand the number of sprite graphics in the "Sprite section" via this way and you must not (but you can) overwrite existing sprites.

The tool will also set always the number of animation sequences ("Static animation sequences" and "Direction-oriented animation sequences") to the real numbers of sequences out of the file "Appendix.bin" (this is new since "CC2Spriters v2.9.1": the ignoring of the real numbers and automatical setting to the correct values of the given CC version is no longer implemented, but the tool will give you a warning if the number of sequences is different from the expected values). So you can extend also the "Static animation sequences" this way:

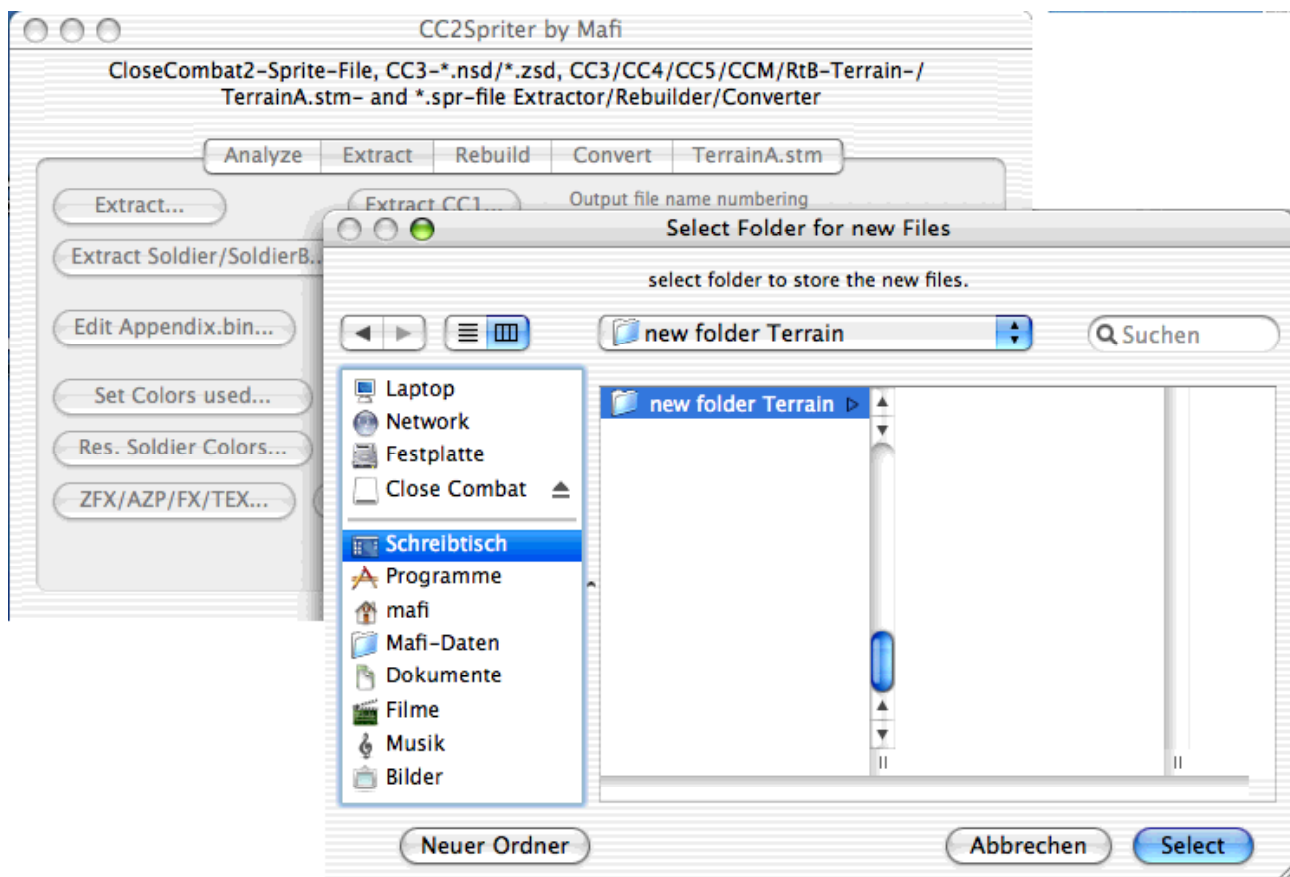
Start "CC2Spriters" and go to section "Extract", then press the button "Extract...":



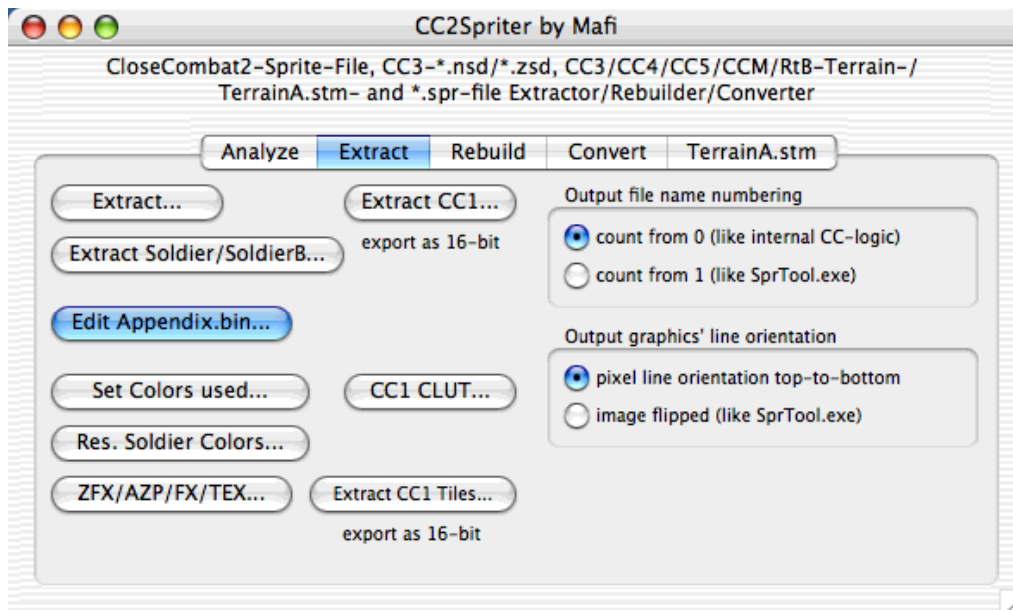
"CC2Spriters" will ask you for the input file. Select your desired "Terrain" file:



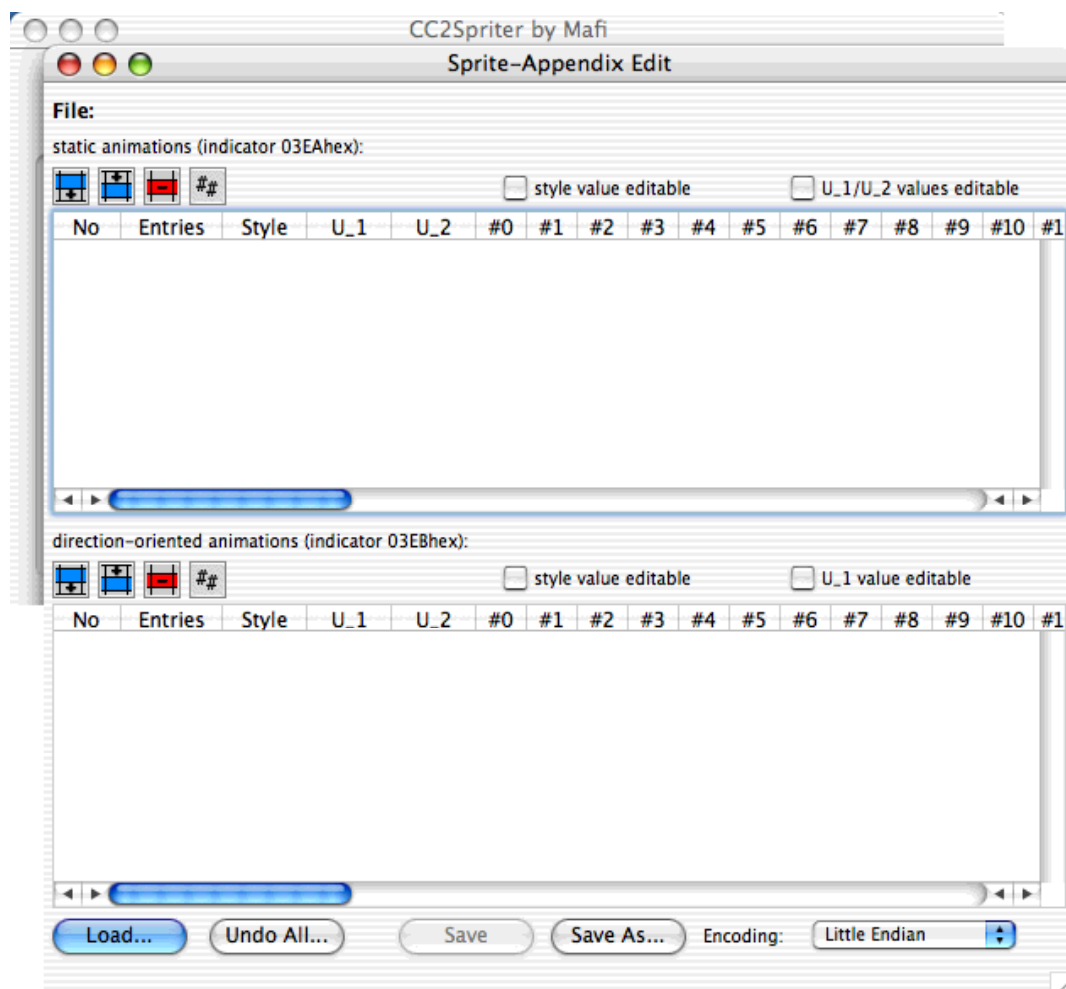
Then "CC2Spritier" will ask you for an output folder. I recommend to create a new one. This folder will store the extracted TARGA-graphic files, the file "Appendix.bin" and a MS-Excel table-file "AppendixReport.xls" (which can be used for documentation purposes).



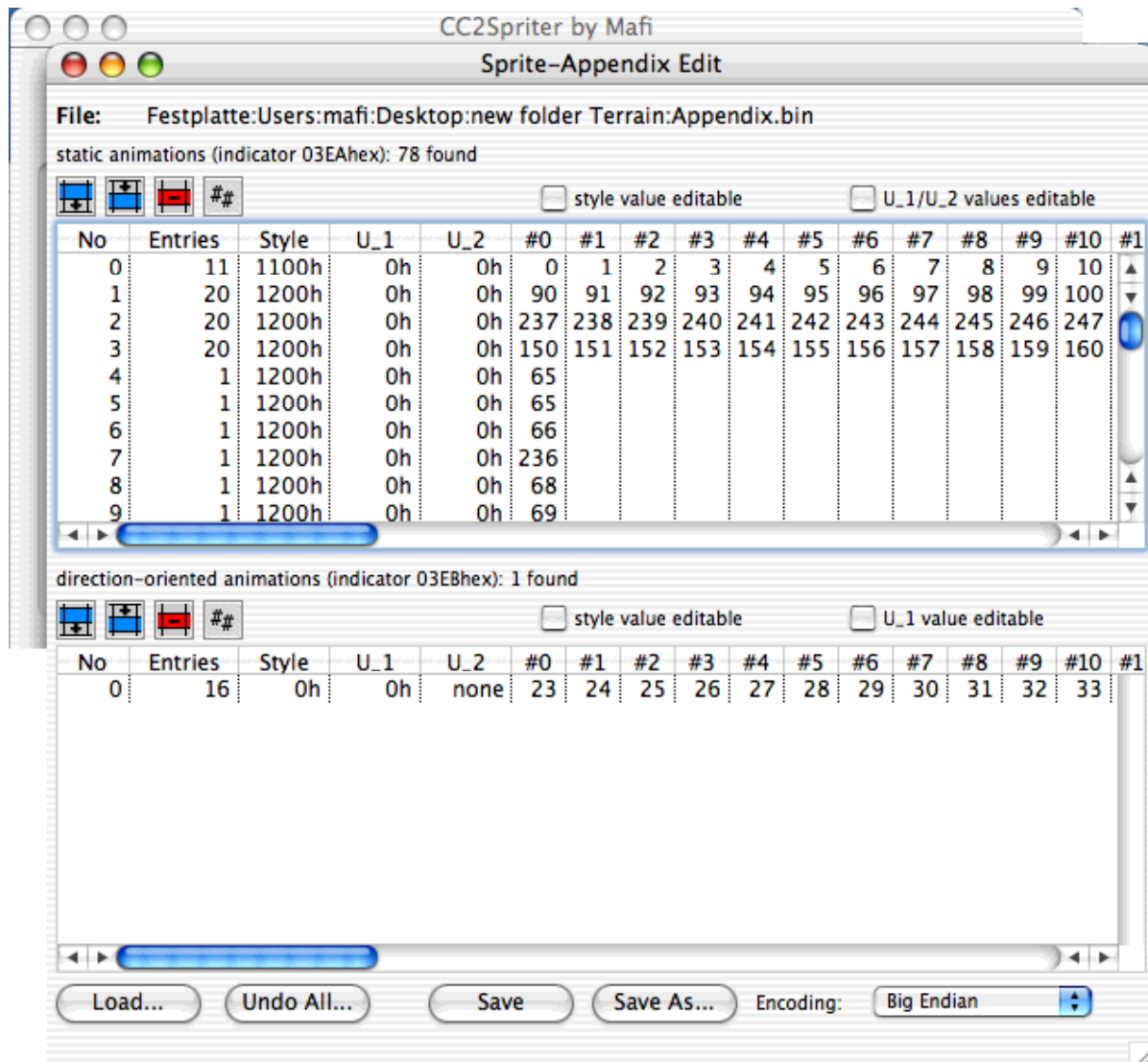
Then press the button "Edit Appendix.bin ...":



In the appearing window you can edit both, "Static animation sequences" and "Direction-oriented animation sequences":



Press the button "Load..." and select your newly extracted "Appendix.bin"-file. After loading this file, the window should show the correct encoding (in our case: BIG Endian) in the lower right corner of the window.



You can change the encoding to make a Terrain-file for newer CC-versions. To extend the animation sequence (for example to have a longer flag animation or to animate trees), just type into the columns additional sprite image index-numbers. **Don't forget to set the value "Entries" accordingly!** And don't forget to save your work! When all is done you can repack your file "Terrain" using the button "CC2-Terrain..." in the section "Rebuild" of "CC2Spriters". The program will respect the entries you have saved into the file "Appendix.bin" and will take all TARGA-graphic files out of the selected folder.

Adding additional animation sequences at the end of the list might confuse the game. Removing entire animation sequences will make the game crash. I recommend not to change the amount of animation sequences within the file "Terrain" as long as you do not change the game's source code.

Adding more than one sprite image to a "Static animation sequence" is only usefull for VL-flags and trees. Even if you add more sprite images to other "Static animation sequences", the game will not animate them (this is tested and proven).

Examples of "Terrain" files with animated trees are those of the CC2-Afrika-Mod (by Riccardo and me) and the CC2-OpJustCause-Mod by Nembo.

Known bugs inside the original file

There is one graphical bugs inside the original "Terrain" file: in the CC2 file the sprite image #60 has 6 pixels (= 8 bytes) too much (in one pixel line).

MAFI

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<http://www.geocities.com/cc2revival/>

<http://members.fortunecity.de/closecombat2/>

<http://www.closecombat2.claranet.de/>

<http://www.ftf.claranet.de/>