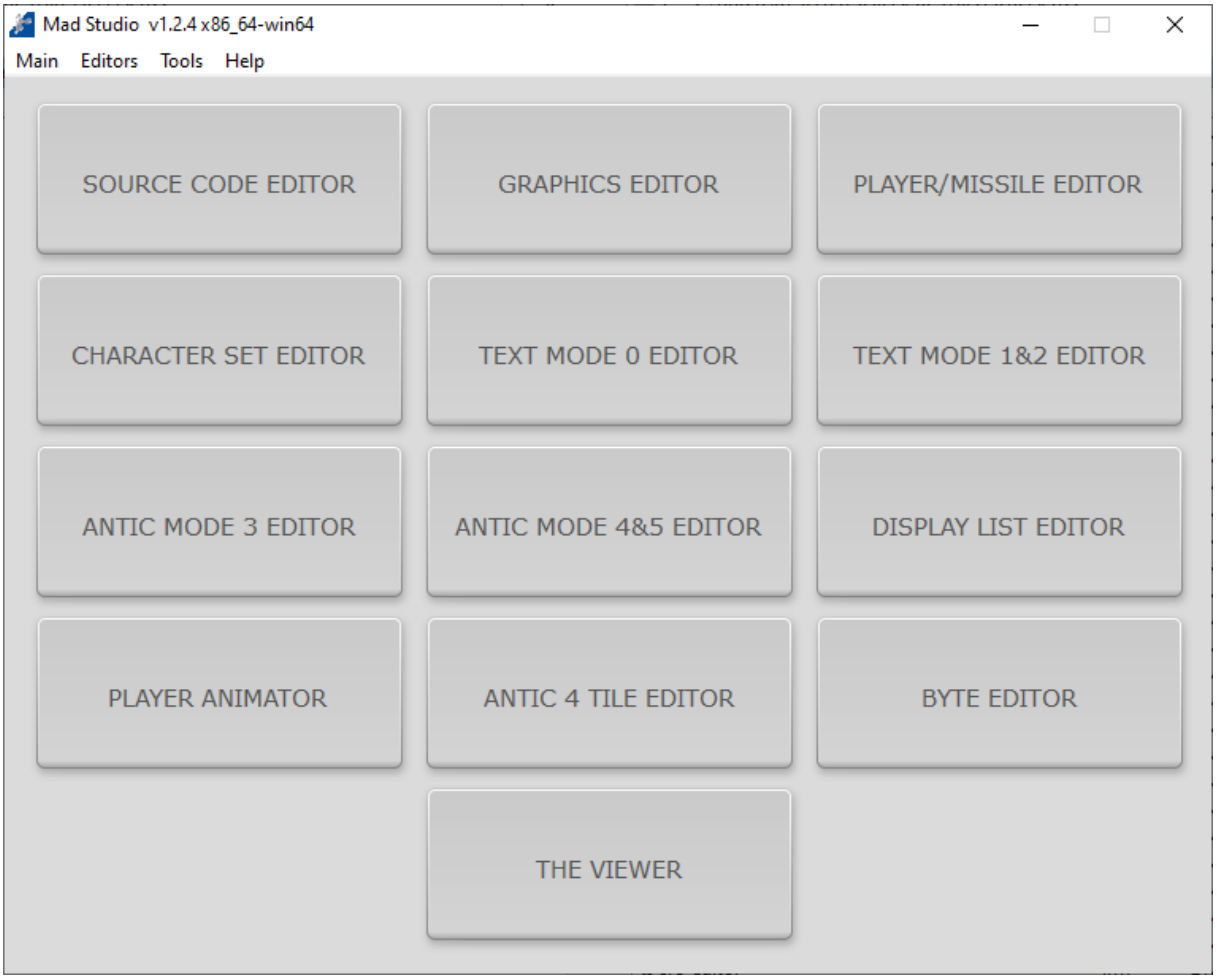
MAD STUDIO

By Boštjan Gorišek

Mad Studio is set of utilities to simplify your development work with Atari 8-bit home computers ranging from 400/800 to XL/XE series. It features editors for drawing in text and graphics modes, creating character sets, player and missiles, player animation and even enables you to automatically generate source code listings in various programming languages.

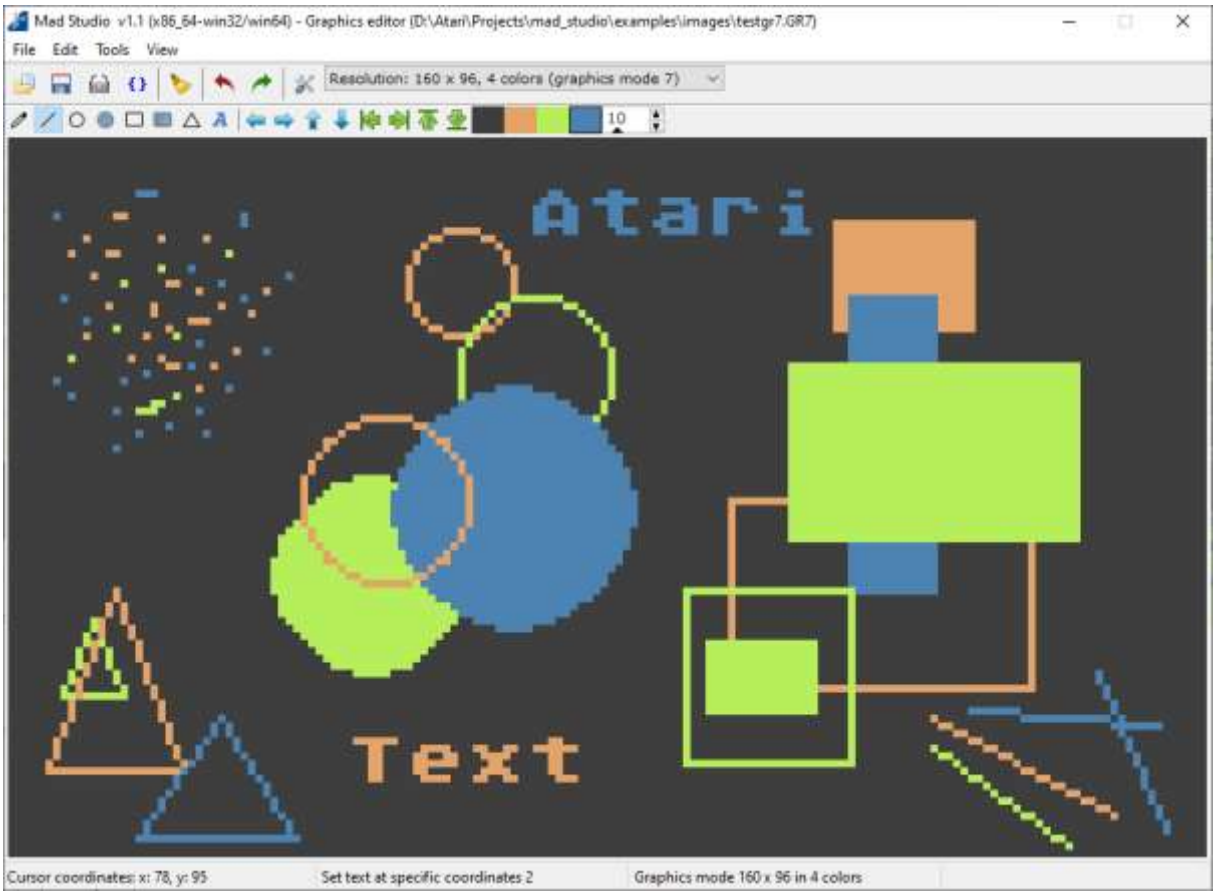


The main screen offers you all the editors/modules in one place. These can be opened freely independently of each other by clicking on selected button. You can come back to the main window by pressing F12 key from any editor.

The documentation will focus on currently available features, not the missing and forthcoming features and other changes. So the documentation may change accordingly depending on new releases.

Graphics editor

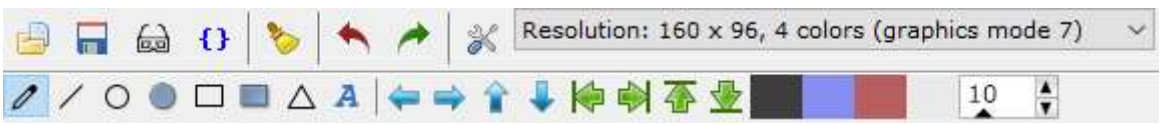
This is simple graphics drawing tool with very basic features to help you make new drawings or load existing ones and saving them back.



The supported graphics modes are:

- Resolution: 40 x 24, 4 colors (graphics mode 3)
- Resolution: 80 x 48, 2 colors (graphics mode 4)
- Resolution: 80 x 48, 4 colors (graphics mode 5)
- Resolution: 160 x 96, 2 colors (graphics mode 6)
- Resolution: 160 x 96, 4 colors (graphics mode 7)
- Resolution: 160 x 192, 2 colors (graphics mode 14)
- Resolution: 160 x 192, 4 colors (graphics mode 15)
- Resolution: 320 x 192, 2 colors (graphics mode 8)

User interface consists of the menu, the two toolbars and editor.



The menu includes the features from the first toolbar and some other features, like loading custom and default color palette.

Here is a list of functions from top toolbar:

 Load image

 Save image

 Graphics viewer

 Source code generator

 Clear image

 Undo previous operation

 Redo operation

 Settings

The image is edited and saved in graphics mode selected from combo box list.

Let's describe the operations available in second toolbar.

 A pencil tool

Draw pixel on screen by pressing left mouse buton. When mouse down, you can draw pixels as you move your mouse around the screen, in selected color pen shown in second toolbar. With pressing right mouse button you draw in bavkground color, so in effect, you erase a pixel beneath mouse cursor.

 A line tool

Draw a line on screen. First mark starting position with left mouse button then while mouse button is in down state, you move mouse cursor to ending position anywhere on the screen. When you release mouse button, a line is drawn from starting point to the point beneath mouse cursor.

 A circle tool

Draw a circle on screen. First mark starting position by pressing left mouse button and while holding down a button and moving around, you select ending point where you wish ending point of a circle will be drawn. When you release mouse button, a circle is draw from staring point to the beneath mouse cursor.

 A filled circle tool

Draw filled circle on screen. First mark starting position by pressing left mouse button and while holding down a button and moving around, you select ending point where you wish ending point of a circle will be drawn. When you release mouse button, a circle is draw from staring point to the beneath mouse cursor.

 A rectangle tool

Draw a rectangle on screen. First mark starting position by pressing left mouse button and while holding down a button and moving around, you select ending point where you wish ending point of a rectangle will be drawn. When you release mouse button, a rectangle is draw from staring point to the beneath mouse cursor.

 A filled rectangle tool

Draw filled rectangle on screen. First mark starting position by pressing left mouse button and while holding down a button and moving around, you select ending point where you wish ending point of a rectangle will be drawn. When you release mouse button, a rectangle is draw from staring point to the beneath mouse cursor.

 A triangle tool

Draw triangle on screen. First mark starting position by pressing left mouse button and while holding down a button and moving around, you select ending point where you wish ending point of a triangle will be drawn. When you release mouse button, a triangle is draw from staring point to the beneath mouse cursor.

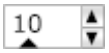
 A text tool

Draw a text on graphics screen. When you select this tool, edit control will show on the right side of color pen boxes, in which you can input text to be draw on screen.

When you are satisfied with the text, just move around the screen with the mouse and mark the spot on the screen where you want this text to show up by pressing left mouse button. It is drawn from the point beneath the mouse cursor and aligns to the right. There are no boundary checks so no worries, the text be cut on the edges with no errors. You draw your text in the color you selected from color pen box.

 Shift screen tool

This tool allows you to shift whole screen in all directions except diagonal. A pixel offset by which screen is shifted can be set by entering value in text box with up/down arrows on the right side.



 Move screen tool

This tool allows you to shift whole screen in all directions except diagonal. A pixel offset by which screen is shifted can be set by entering value in text box with up/down arrows on the right side as described above.

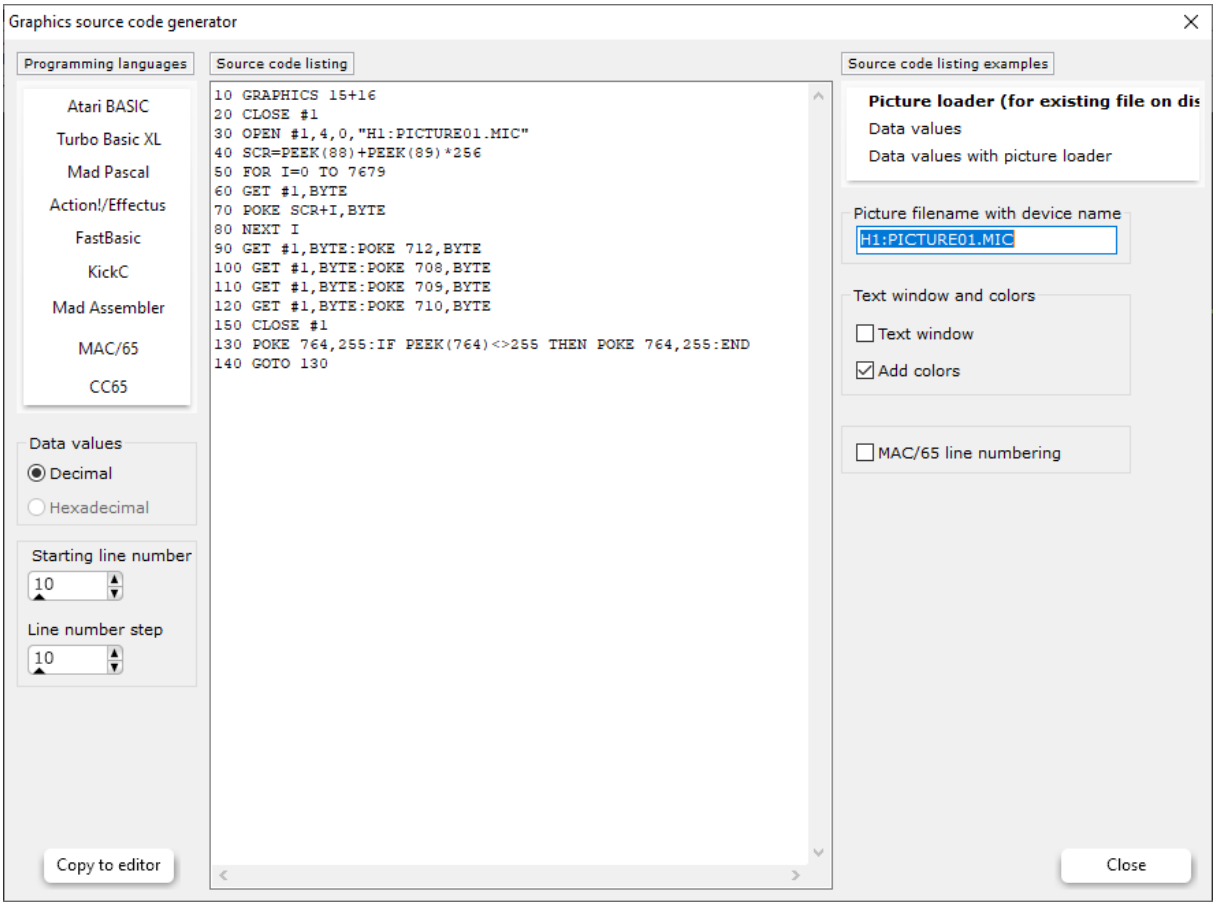
 Color pen box

Color pen box shows available colors for selected graphics mode. The four-color graphics modes show 4 pens and the two-color graphics modes show only 2 color pens available. By default the program uses near-default color palette as used on real hardware machine. You can choose another palette by choosing Load color palette in Tools menu. To use default values, just use Load default color palette from Tools menu.

Source code generator

Processed screen can be saved to disk as array of bytes in the form of source code listing for different programming languages. This can be achieved with source code generator, accessible through top toolbar or Tools menu.

Note!
The usage and layout of source code generator is very similar through all editors/modules.



This tool enables you to quickly and automatically assemble parts or whole source code automatically just by clicking on one of choices from Source code listing examples panel on the right side of the screen.

The left side offers you a list of programming languages to choose from to automatically generate source code listing in preferred language. You can even select a way the values are shown in the listing: decimal, hexadecimal and binary in some modules.

Atari BASIC and Turbo Basic XL require line numbers preceeded before anything else, so this utility features customization of starting line number and step between line numbers. These fields are hidden when other programming language is selected.

The right side offers you the list of source code listing examples and options to additionally customize resulting code.

You copy generated code to editor by pressing Copy to editor button. Pressing Close button just returns you back to the editor with no changes.

Player/missile editor

This module supports player/missile graphics. User interface is organized in three editors, separated with tabs. There is standard menu and toolbar with most used functions.

Here is a list of functions from toolbar:

 Load player

 Load Atari player frames (set of players grouped as animation)

 Save player

 Save all players

 Player viewer

 Source code generator

 Byte editor and loader

 Clear player data

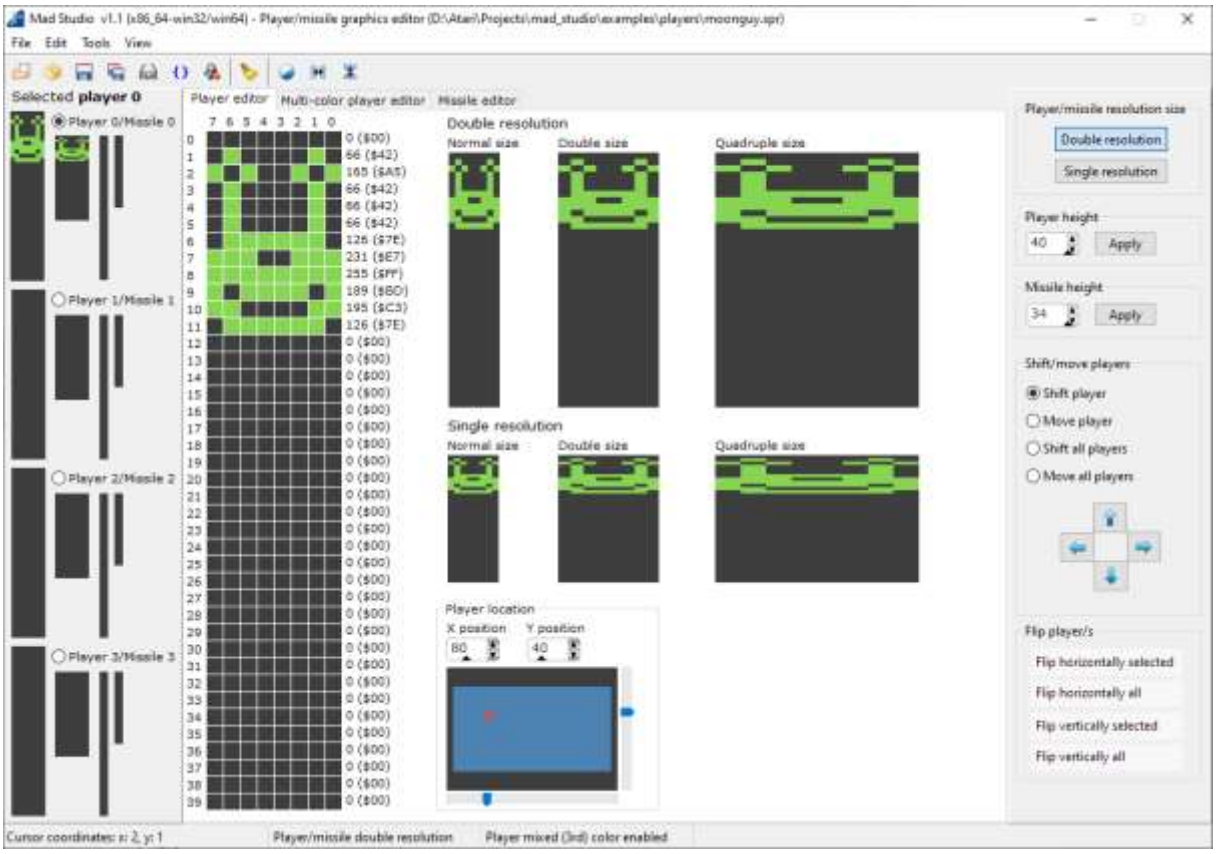
 Invert bits of player

 Flip player horizontally

 Flip player vertically

The editors include Player editor, Multi-color player editor and Missile editor. The left panel displays all players and missiles in minimized form. The right panel offers you additional options to manipulate player and missile data: selecting single or double resolution, player and missile height, shifting and moving data, flip data horizontally and vertically.

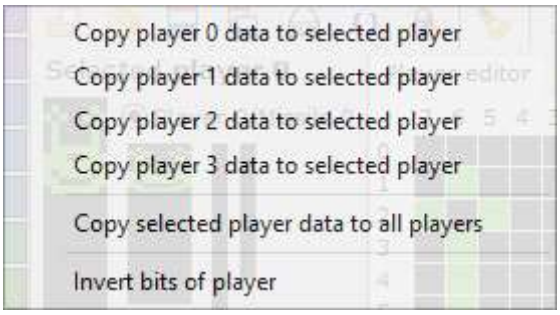
Player editor



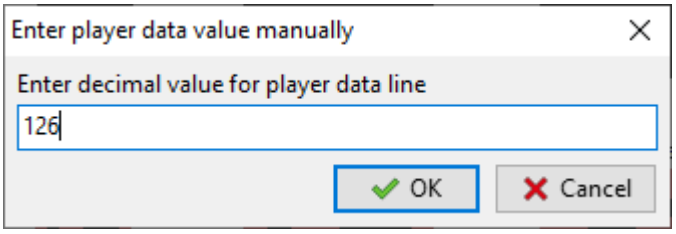
You edit a player by drawing with mouse, left button for drawing and right button for erasing pixel underneath mouse cursor. You switch between players by selecting a player in the left panel. All work

is stored in memory, so no worries when switching between players. You can monitor current drawing progress here, with player and missile display in double, single resolution and current color.

Some operations are accessible in pop up menu by pressing right mouse button outside editor area. All these operations are available also in Edit menu.

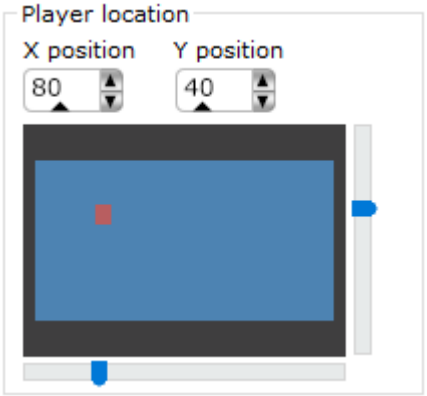


Player data values for each line are displayed on the right side of the editor. Values change depending on new data (drawn by mouse or updated with new player). This value can be changed directly by clicking on it. The dialog window appears, where you can enter new value for selected line.



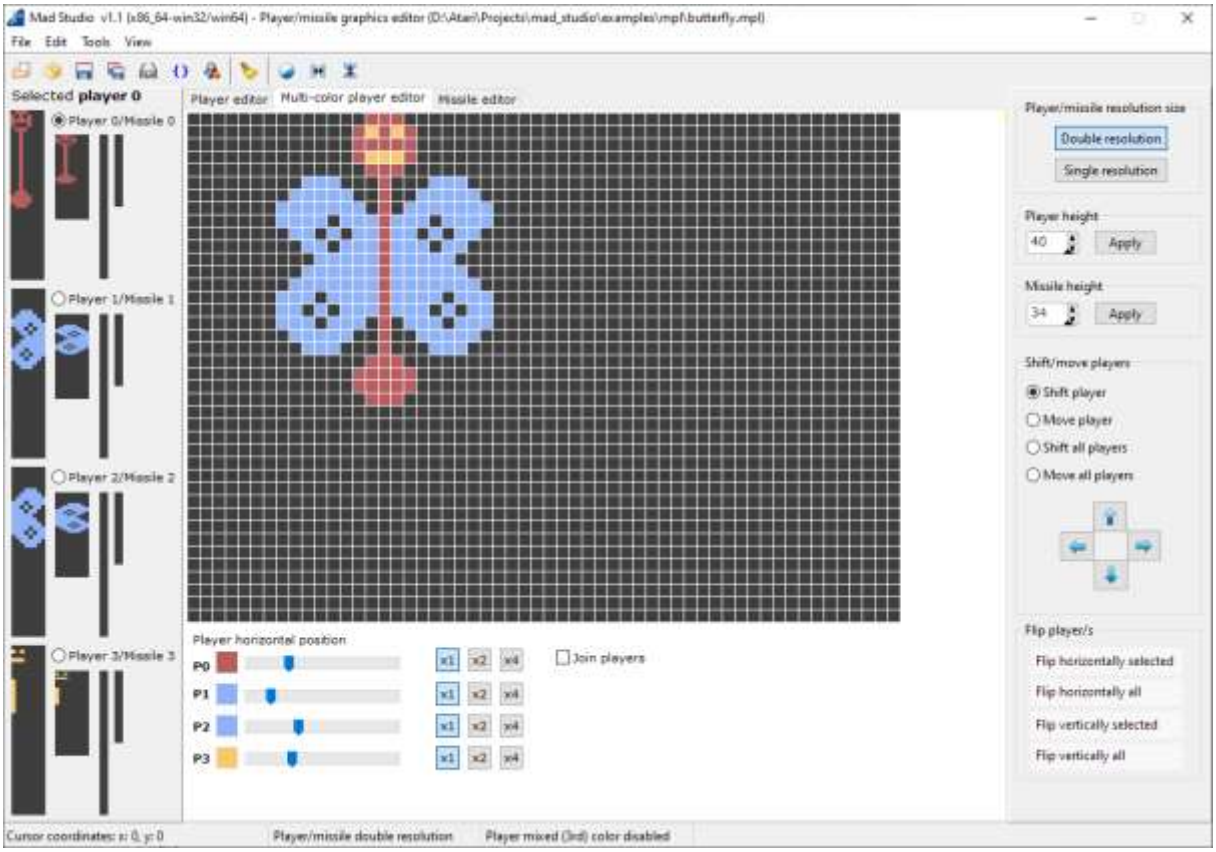
After applying by pressing Ok button new value is processed and player pattern changes accordingly. By pressing Cancel button nothing changes.

Minimized Atari screen at the bottom helps you locate your player's coordinates on the screen. Move little square player by moving horizontal and vertical sliders with the mouse. Player's X and Y coordinates are updated with every move in up/down editboxes, which can be edited, too.



Right panel offers additional options to process your players. You can set double or single resolution, change player height, shift, move and flip player data.

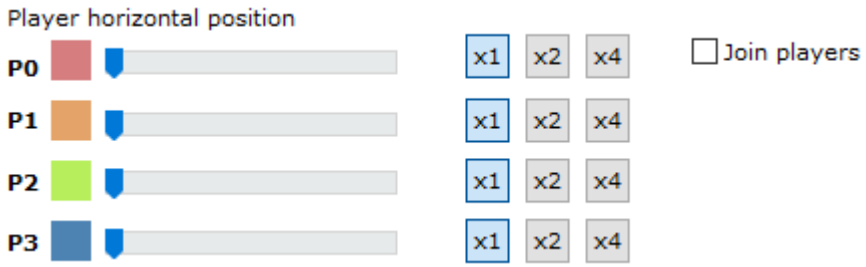
Multi-color player editor



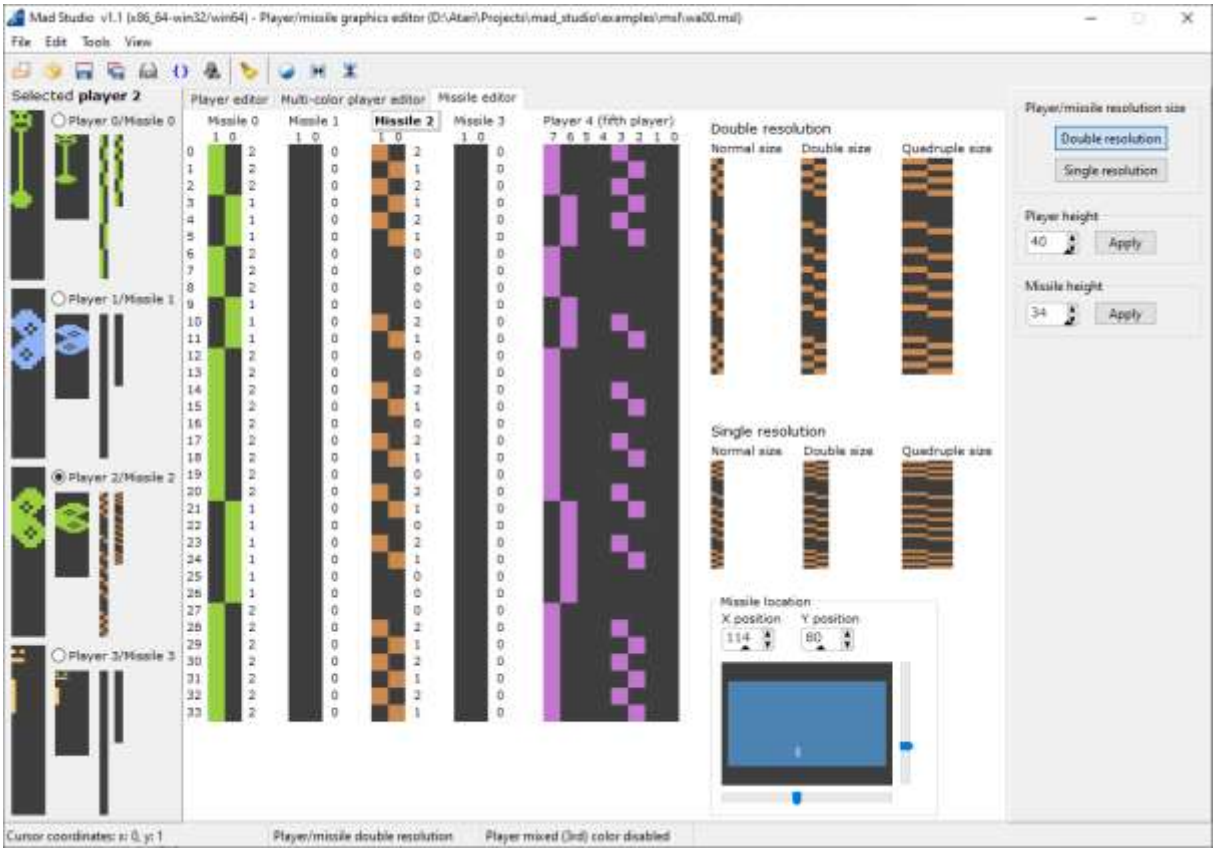
This editor is an extension of existing player editor, in which you can edit all four players together in the same editor. Drawing is limited only by the rules of player/missile graphics.

You control the flow of players by moving them in horizontal direction by using sliders below. Each slider has player label and color box indicating each of the available players. To the right are toogle buttons to set player sizes independently of each other.

To join all players together you can click on check box button on the right. By checking this option all players move along together when used with sliders. Unchecking this option players become independent of each other again.



Missile editor



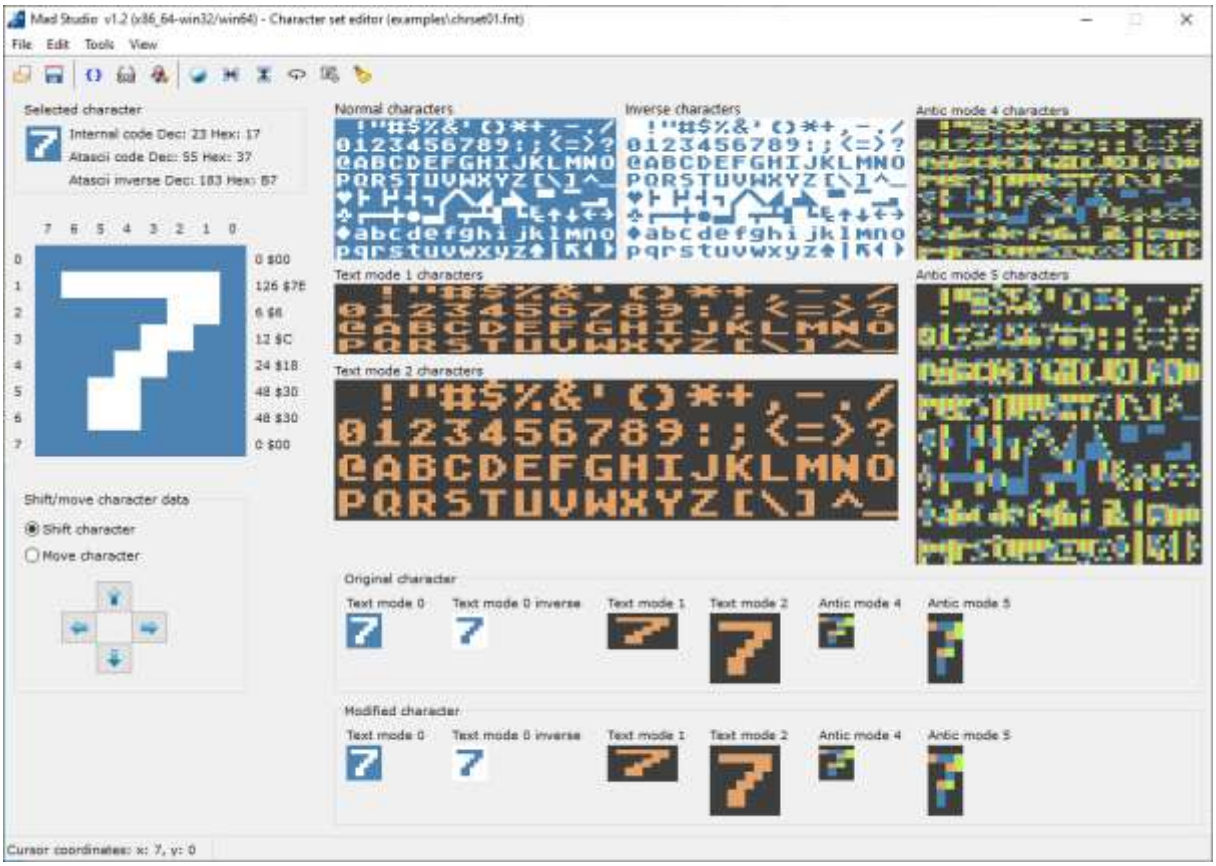
The missiles have their own editor. All four missiles can be edited simultaneously. On the right is a display, which shows combined all 4 missiles together as so called 5th player.

This editor also includes a missile locator window with the same functionality like in Player editor, but for locating coordinates for missile.

Note!
Player/missile resolution size applies immediatelly for all editors in this module, for all players and missiles included. The same with player and missile height...

Character set editor

Character sets (fonts) can be edited and viewed with this module. User interface is organized in character editor and panels with full character set display in different text modes.



There is standard menu and toolbar with most used functions.

Here is a list of functions from toolbar:

 Load character set

 Save character set

 Source code generator

 Character set viewer

 Byte editor and loader

 Invert bits of character

 Flip character horizontally

 Flip character vertically

 Rotate character

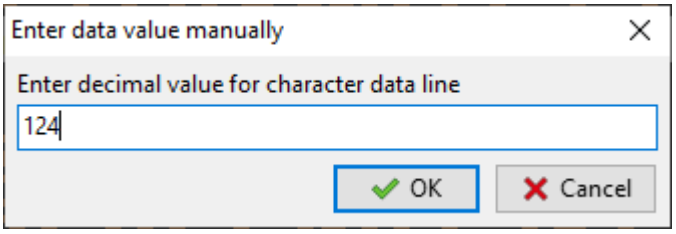
 Copy edited data to selected character set cell

 Clear character data

To edit a character you click on selected character from any of displayed character sets. Selected character is drawn in character editor in bigger format for further editing. You draw a pixel by pressing left mouse button and erase it by pressing right mouse button.

Information panel above editor displays internal and ATASCII code value for selected character in decimal and hexadecimal format.

Character data values for each line are displayed on the right side of the editor. Values change depending on new data (drawn by mouse or updated with new character). This value can be changed directly by clicking on it. The dialog window appears, where you can enter new value for selected line.



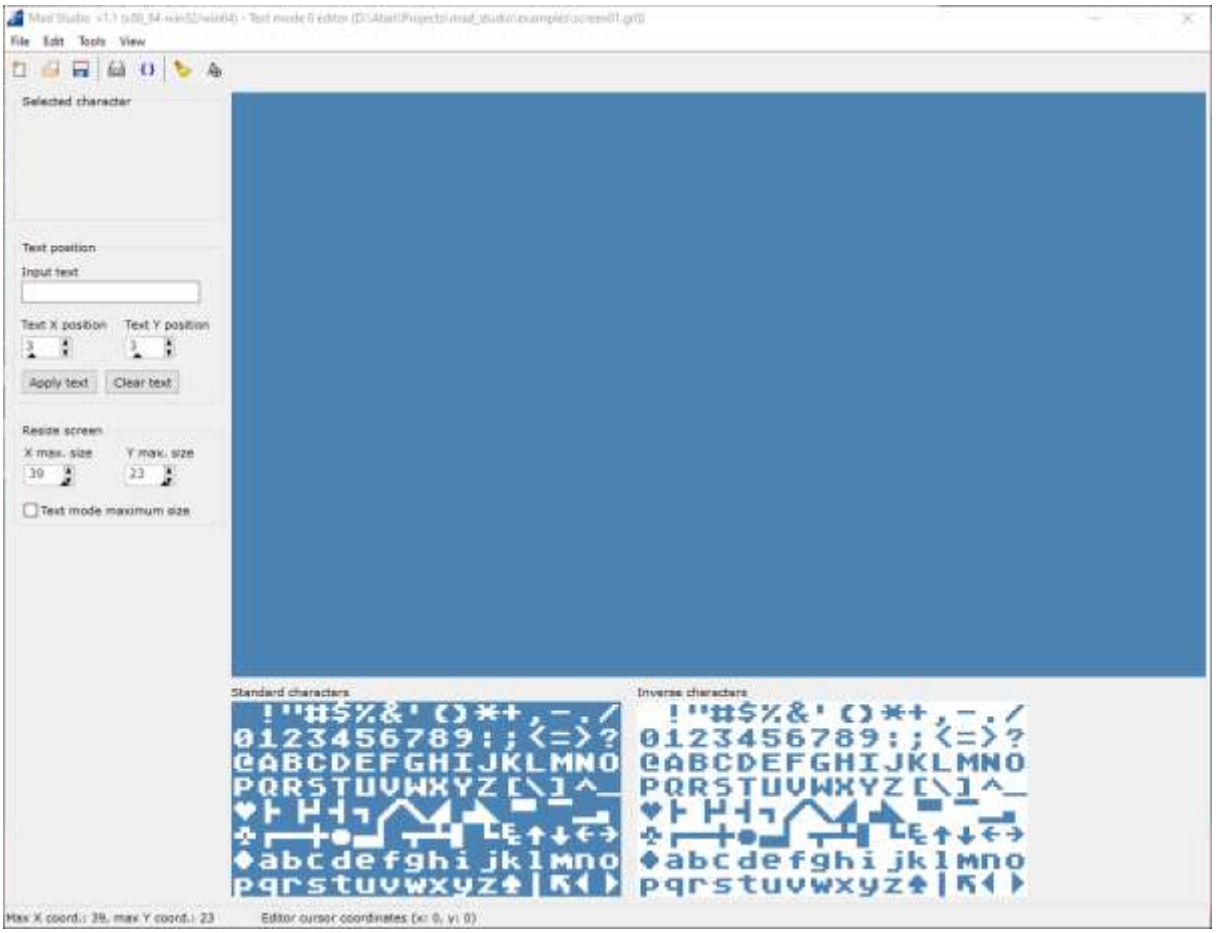
After applying by pressing Ok button new value is processed and character pattern changes accordingly. By pressing Cancel button nothing changes.

You can shift or move character data by using arrow keys in Shift/move character data panel.

All changes to character being edited are immediatelly displayed in all character sets, so you can check the actual result in different text modes.

Text mode 0 editor

Standard text mode 0 screens can be edited with this module. User interface is organized in screen editor, left panel with selected character, input text directly by the given coordinates and screen resize utility (up to 40 columns and 24 rows). At the bottom are standard and inverse character set displays, from which you select characters to draw in editor.



There is standard menu and toolbar.

Here is a list of functions from toolbar:

 New screen

 Load screen

 Save screen

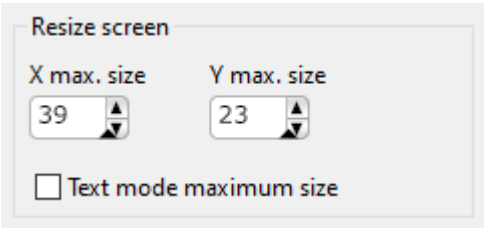
 Screen viewer module

 Source code generator

 Clear screen data

 Fill screen with selected character

Resize screen panel allows you to change screen dimension. You can freely change X and Y dimensions, 0 to 39 for X size and 0 to 23 for Y size. To set default values (39 x 23), check the option Text mode maximum size.



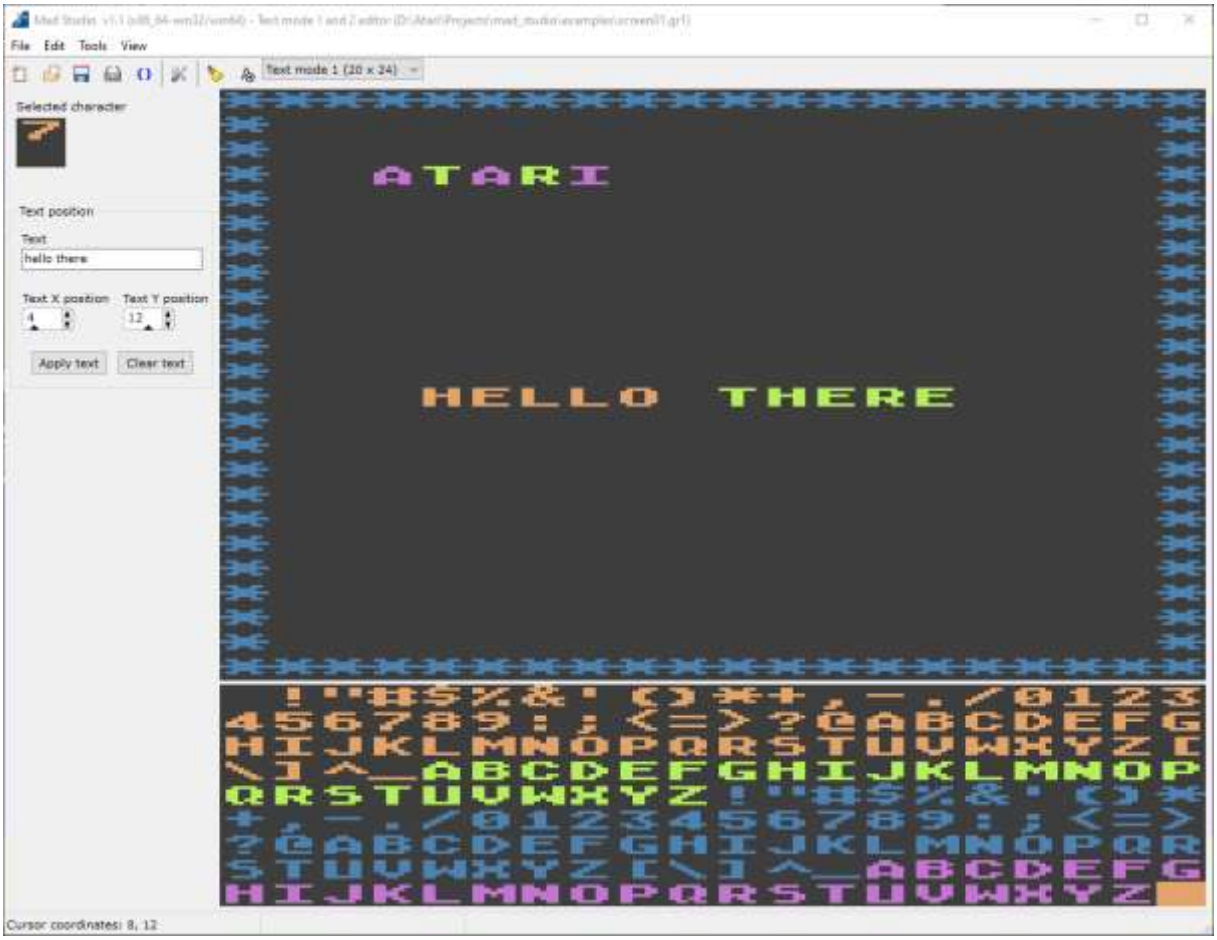
Note!
You must take into account that the dimension value is actually value starting from 0, not 1, so you must decrement value by one. For example, X max. size is 40, but actually 39 is the value which must be entered in that field. Same goes for Y value.

Warning!
Currently there is a glitch which can mess up your work if you are drawing characters in editor and simultaneously changing sizes to other values. It is adviced to set dimension size first, then draw a screen and finally save the screen. The screen will be loaded back correctly this way, with proper size and correct layout of drawn screen data.

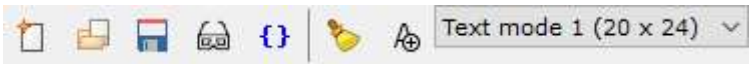
Text mode 1 and 2 editor

5-color text modes 1 and 2 can be edited using this module. User interface is organized in screen editor, left panel with selected character and possibility to enter text directly by given coordinates.

At the bottom is a character set display, from which you select characters to draw in editor.



There is standard menu and toolbar.



Here is a list of functions from toolbar:

 New screen

 Load screen

 Save screen

 Screen viewer module

 Source code generator

 Clear screen data

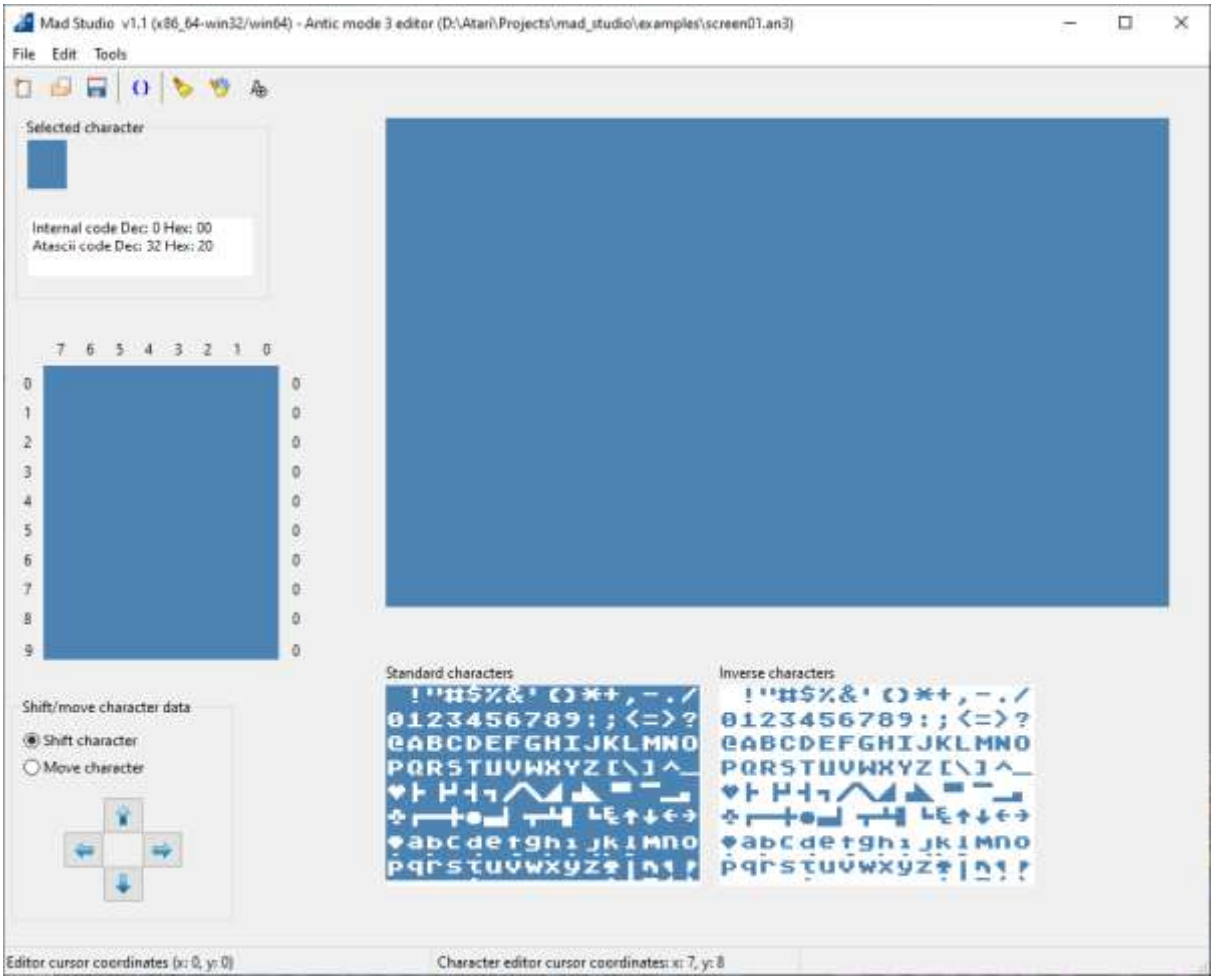
 Fill screen with selected character

You can select text mode from dropdown list. Default is text mode 1 (20 x 24). When you change text mode, you get a message to warn you that previous data will be lost. Canceling this popup message returns you back to currently selected text mode with no changes to the screen. If you confirm, the data is lost and new text mode is set. It is advised to save your work before doing so.

Antic mode 3 editor

There is a special mode supported by Atari computers, which is used very rarely, a derivate of text mode 0, called Antic mode 3. This mode modifies lowercase and some special characters so first two lines of characters are moved to the bottom. The screen has lesser number of rows than text mode 0. This module provides some basic understanding what this mode looks like.

User interface is organized in screen editor, left panel with character editor and shift/move operations. Below is a regular and inverse character set display for selecting characters when drawing into editor.



There is standard menu and toolbar.

Here is a list of functions from toolbar:

 New screen

 Load screen

 Save screen

 Source code generator

 Clear screen data

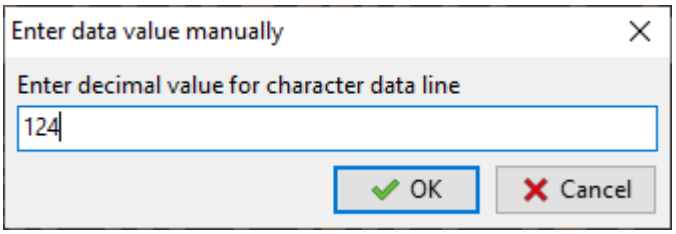
 Clear selected character

 Fill screen with selected character

To edit a character you click on selected character from any of displayed character sets. Selected character is drawn in character editor in bigger format for further editing. You draw a pixel by pressing left mouse button and erase it by pressing right mouse button.

Information panel above editor displays internal and ATASCII code value for selected character in decimal and hexadecimal format.

Character data values for each line are displayed on the right side of the character editor. Values change depending on new data (drawn by mouse or updated with new character). This value can be changed directly by clicking on it. The dialog window appears, where you can enter new value for selected line.



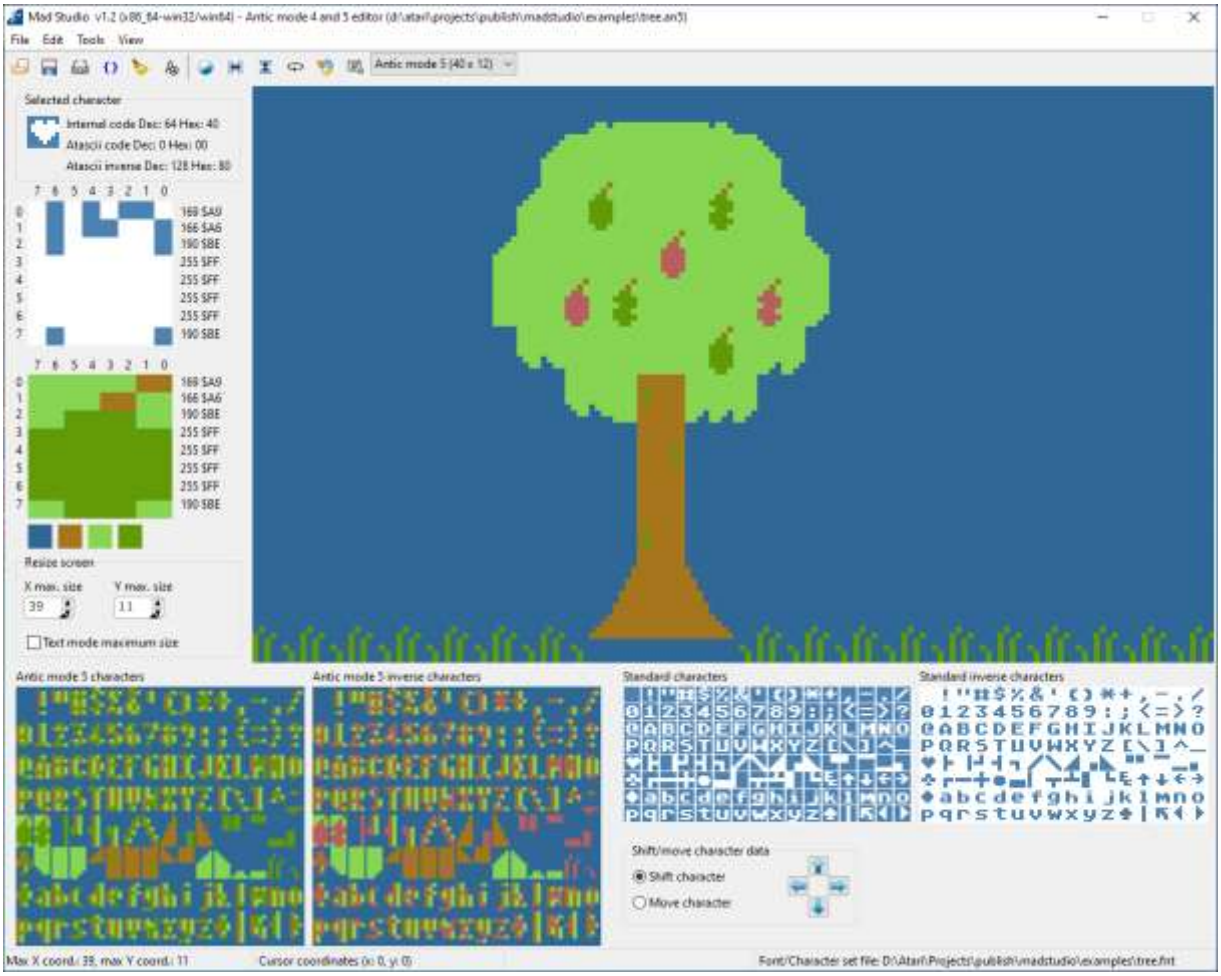
After applying by pressing Ok button new value is processed and character pattern changes accordingly. By pressing Cancel button nothing changes.

You can shift or move character data by using arrow keys in Shift/move character data panel.

Antic mode 4 and 5 editor

You can create multi-color screens in 5 colors using Antic modes 4 and 5 modes. This module enables you to access these text modes and create your own multi-color images. User interface is organized in screen editor, left panel with selected character, character editors in Antic mode 2 and 4, screen resize utility (up to 40 columns and 24 rows).

At the bottom are Antic mode 4 or Antic mode 5 character sets in normal and inverse mode. To the right are default character sets in Antic mode 2 to distinquish between multi-color mode characters. Below is also utility for shifting and moving character data.



There is standard menu and toolbar.

Here is a list of functions:

 Load screen

 Save screen

 Screen viewer

 Source code generator

 Clear screen

 Fill screen with selected character

 Invert bits of character

 Flip character horizontally

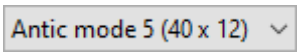
 Flip character vertically

 Rotate character

 Clear character data

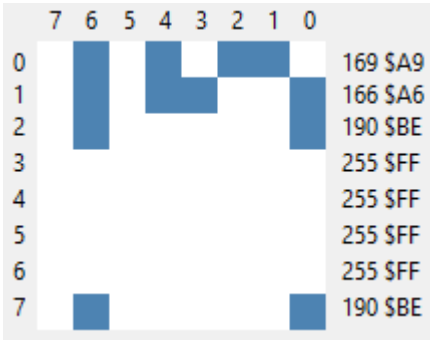
 Copy edited data to selected character set cell

You can select text mode from dropdown list. Default is Antic mode 4 (40 x 24). When you change text mode, you get a warning message that previous data will be lost. Canceling this popup message returns you back to currently selected text mode. When confirming, the data is lost and selected text mode is set. It is advised to save your work before doing so.

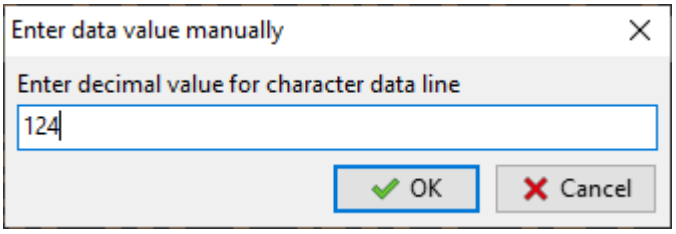


After selecting Antic mode of your choice, character set panels below change according to the selection except Antic mode 2 character set panels on the right.

The upper character editor on the left allows you to edit selected character and watching changes in screen editor for that character. It edits character in Antic mode 2.

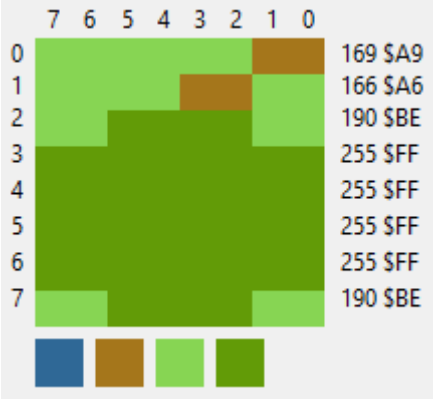


Character editor displays data values of currently selected character on the right side. Values change depending on new data (drawn by mouse or updated with new character). This value can be changed by directly clicking on it. The dialog window appears where you can enter new value for selected line.

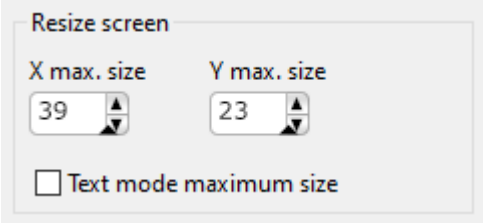


After applying by pressing Ok button new value is processed and character pattern changes accordingly. By pressing Cancel button nothing changes.

Second character editor enables you to draw data for selected character directly in Antic mode 4. Colors for drawing can be selected below the multi-color character editor.



Resize screen panel allows you to change screen dimension. You can freely change X and Y dimensions, 0 to 39 for X size and 0 to 23 for Y size. To set default values (39 x 23), check the option Text mode maximum size.

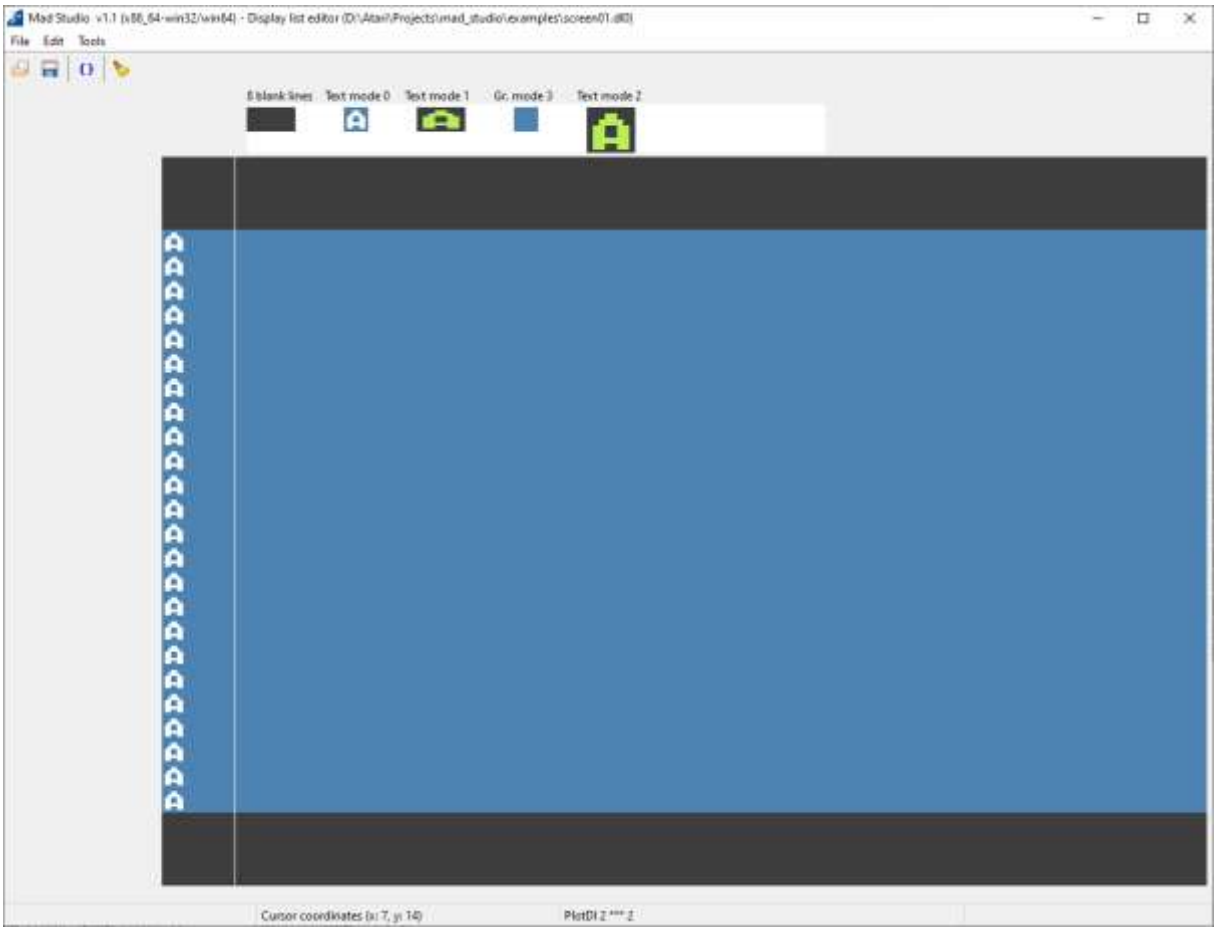


Note!
You must take into account that the dimension value is actually value starting from 0, not 1, so you must decrement value by one. For example, X max. size is 40, but actually 39 is the value which must be entered in that field. Same goes for Y value.

Warning!
Currently there is a glitch which can mess up your work if you are drawing characters in editor and simultaneously changing sizes to other values. It is adviced to set dimension size first, then draw a screen and finally save the screen. The screen will be loaded back correctly this way, with proper size and correct layout of drawn screen data.

Display list editor

Display list is a special list of commands to produce screen on Atari. Very basic display lists can be created with this module.



There is standard menu and toolbar.

Here is a list of functions:

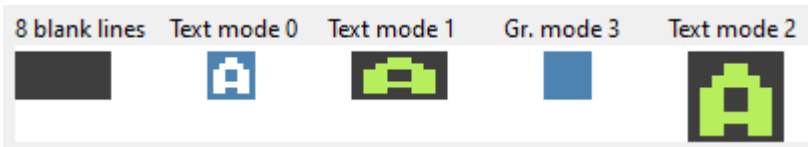
 Load custom display list

 Save custom display list

 Source code generator

 Set default display list

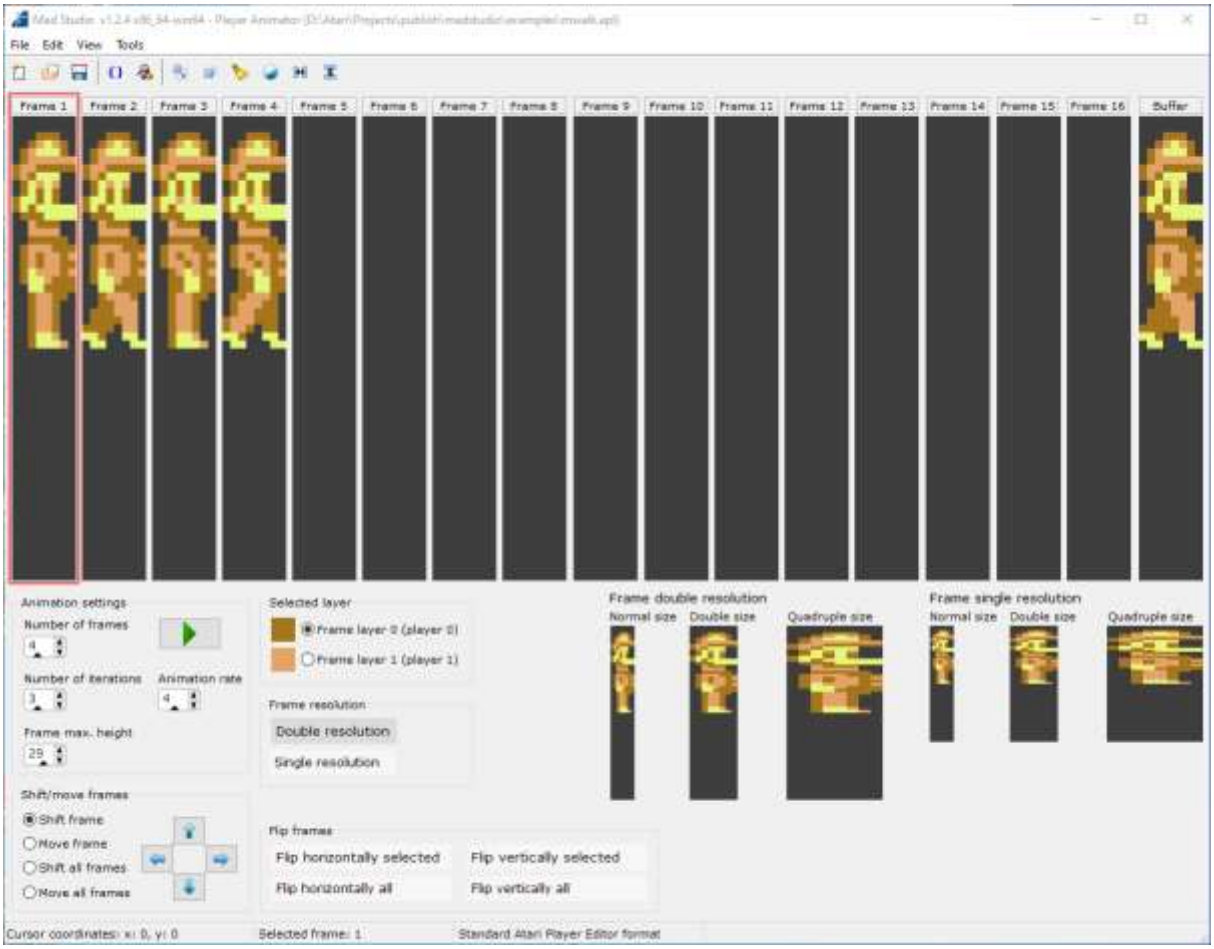
The screen editor is organized in lines composed of particular Antic modes, defaulted to Antic mode 2 as on real hardware. This editor offers very basic selection of Antic modes to choose from. These are accessible on top of editor and can be chosen for any line in the editor.



To input selected Antic mode into editor, select it from selection menu and drop it by clicking left mouse button. When you are satisfied with the result, you can save new display list to disk. To retrieve it, use load function. To help you make your own display lists in code, use Generated source code module to make things easier.

Player Animator editor

Making things »alive« and moving objects around is a dream of many programmers. This editor enables you to animate players. The inspiration for this module came from the tool from web, called Atari Player Editor by PlaySoft (reference: http://playsoft.co.uk/aplayed_instructions.html). You can create 2-layer players, animated in maximum 16 frames, each in 3 colors, as 2-players are mixed to produce 3rd color.



There is standard menu and toolbar.

Here is a list of functions:

 New animation

 Load animation

 Save animation

 Source code generator

 Byte editor and loader

 Copy frame to buffer

 Copy frame from buffer

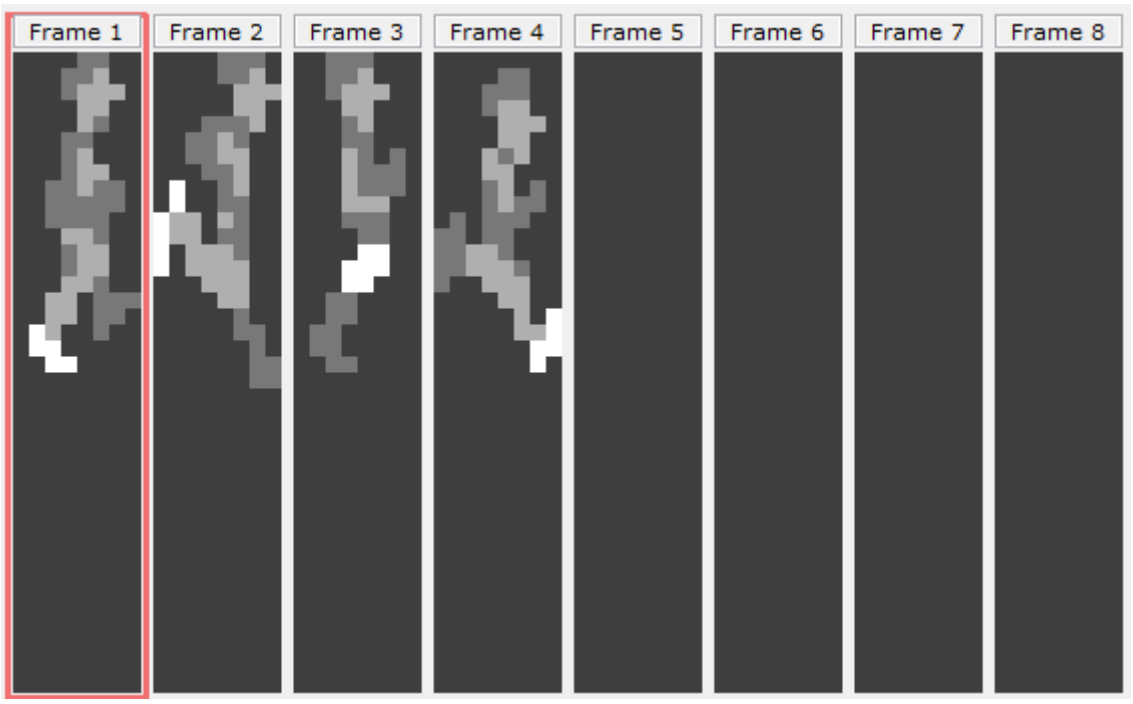
 Clear animation data

 Invert bits of frame

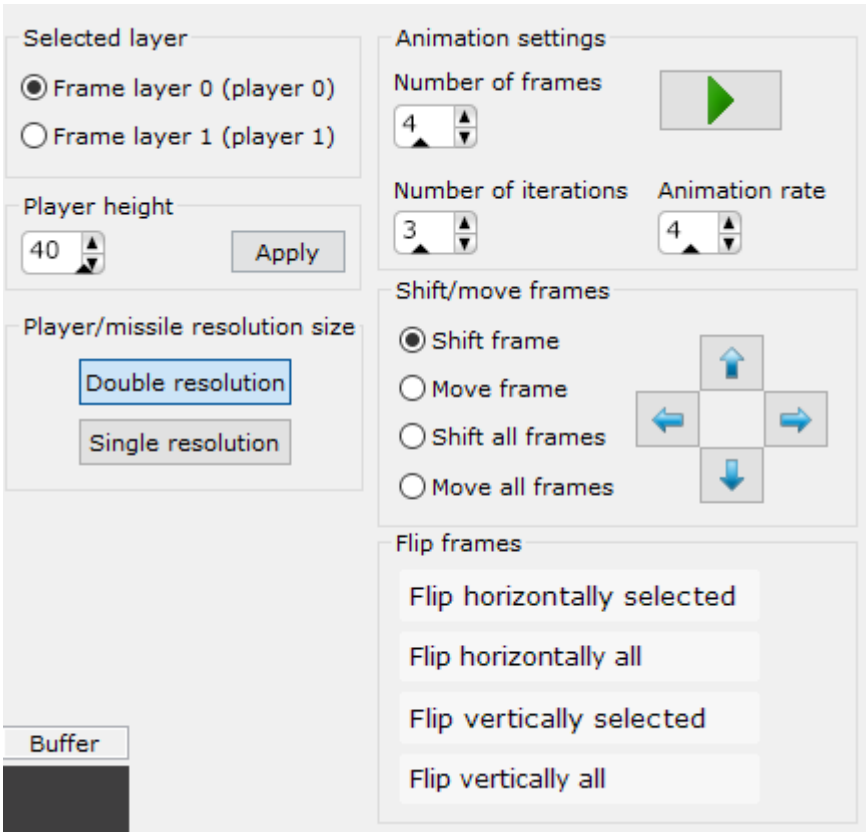
 Flip animation horizontally

 Flip animation vertically

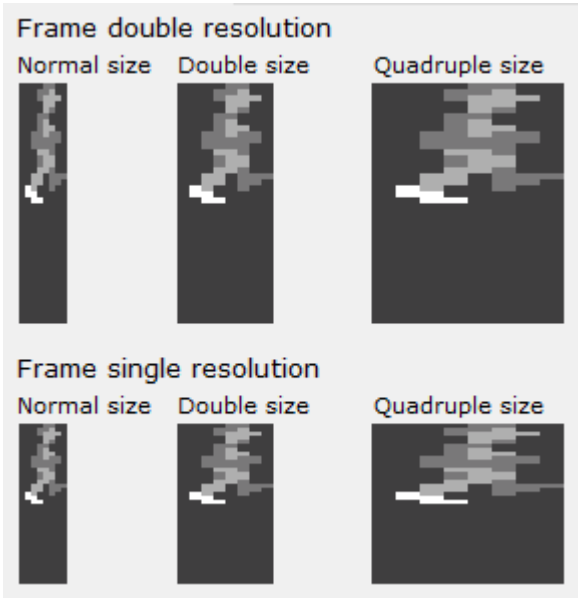
Animation frames can be edited in editor slots, one for each of the frames plus buffer. A buffer is used as temporary data storage for any frame. You can draw in two colors, selected from the right panel's Selected layer. To start creating a frame, click on frame slot numbered from 1 to 16 or buffer. You draw by pressing left mouse button and move around until mouse is released. Current pixel is erased by pressing right mouse button.



The panel below editor cells offers you options to set and process your animation and frames. These are: changing color, playing the animation with the ability to set number of frames, animation iteration and speed rate. Also there is frame height (player's single or double resolution), shifting/moving frames, flipping horizontally or vertically...

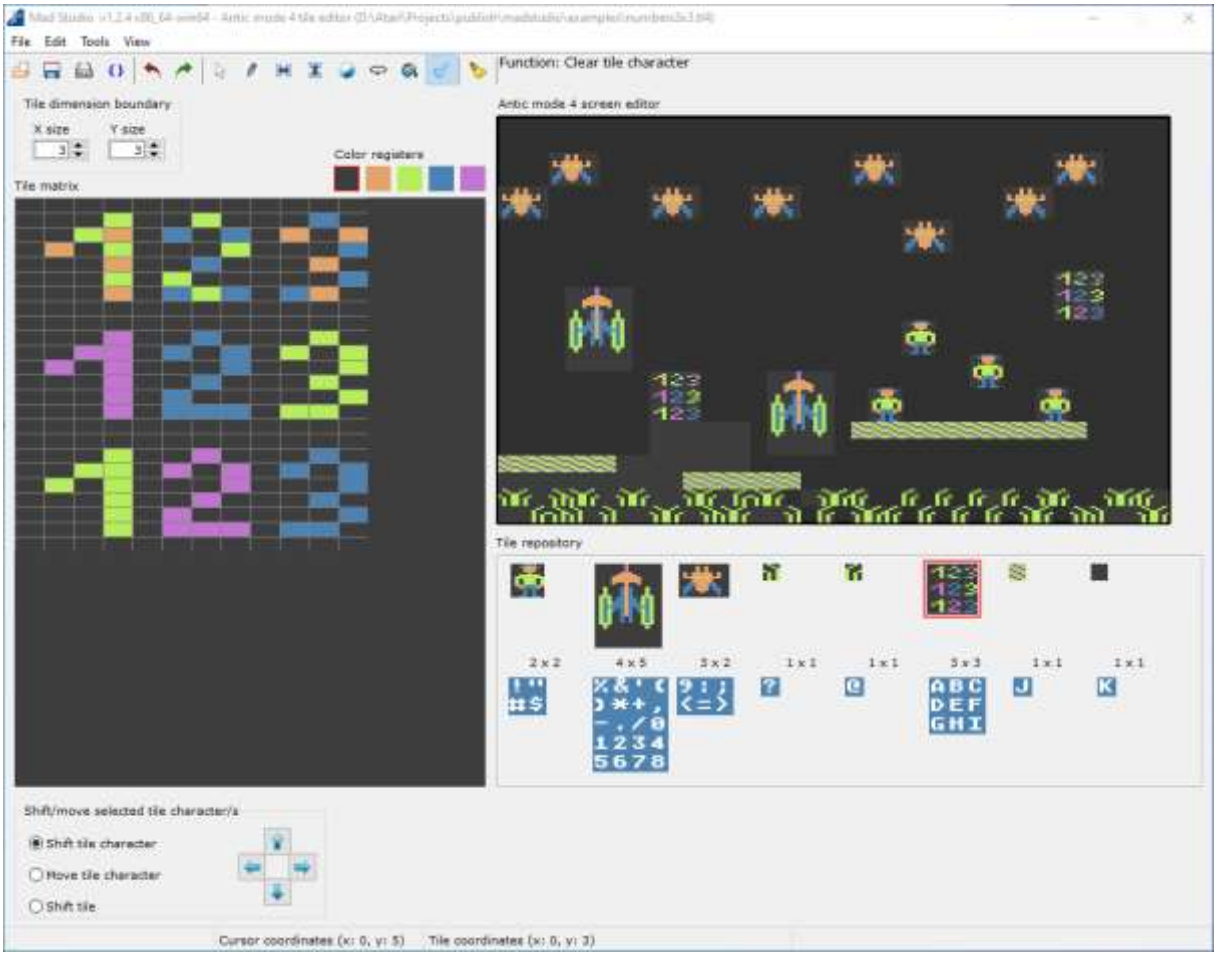


Selected frame is displayed as a frame in single/double resolution and in all three sizes. This can be previewed at the bottom right of the screen.



Antic 4 Tile Editor

This module lets you design your own tiles for Antic mode 4 (text mode 12). You can create, edit, load and save customized tiles, which can be expaned from 1 x 1 character in size and up to 4 x 5 characters in size.



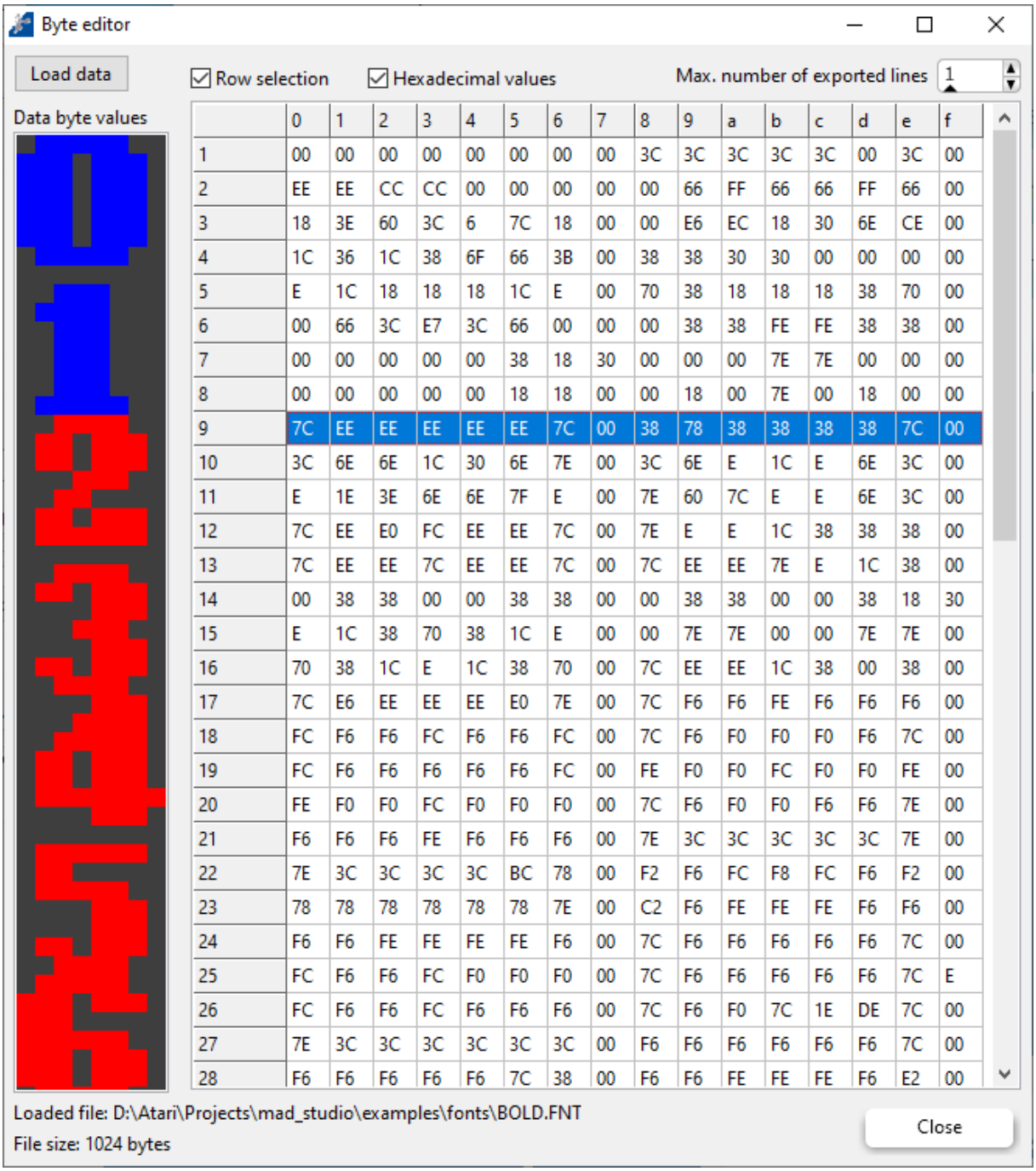
It contains standard menu and toolbar options to choose from. The editor on the left (labeled Tile matrix) is used to edit tile, which can be set to customized size, which can be from 1 x 1 to 4 x 5 in character size. Antic mode 4 screen editor, which is displayed on the right side, can be used to put tiles into. The panel below it is used to operate on tiles, which can be selected in cells (1 to 8 tiles). The numbers below show current tile character sizes and the character set beneath it shows used characters for the tiles.

Drawn screen can be additionally edited in source code editor, which automatically generated code for designed tiles.

The shift and move operations are available in bottom panel. To use this feature, you have to select specific area (tile character area) in tile matrix editor and use arrow keys to operate on selected tile character.

Byte editor

This module allows you to view/monitor data from any file source and import data to some of the editors.



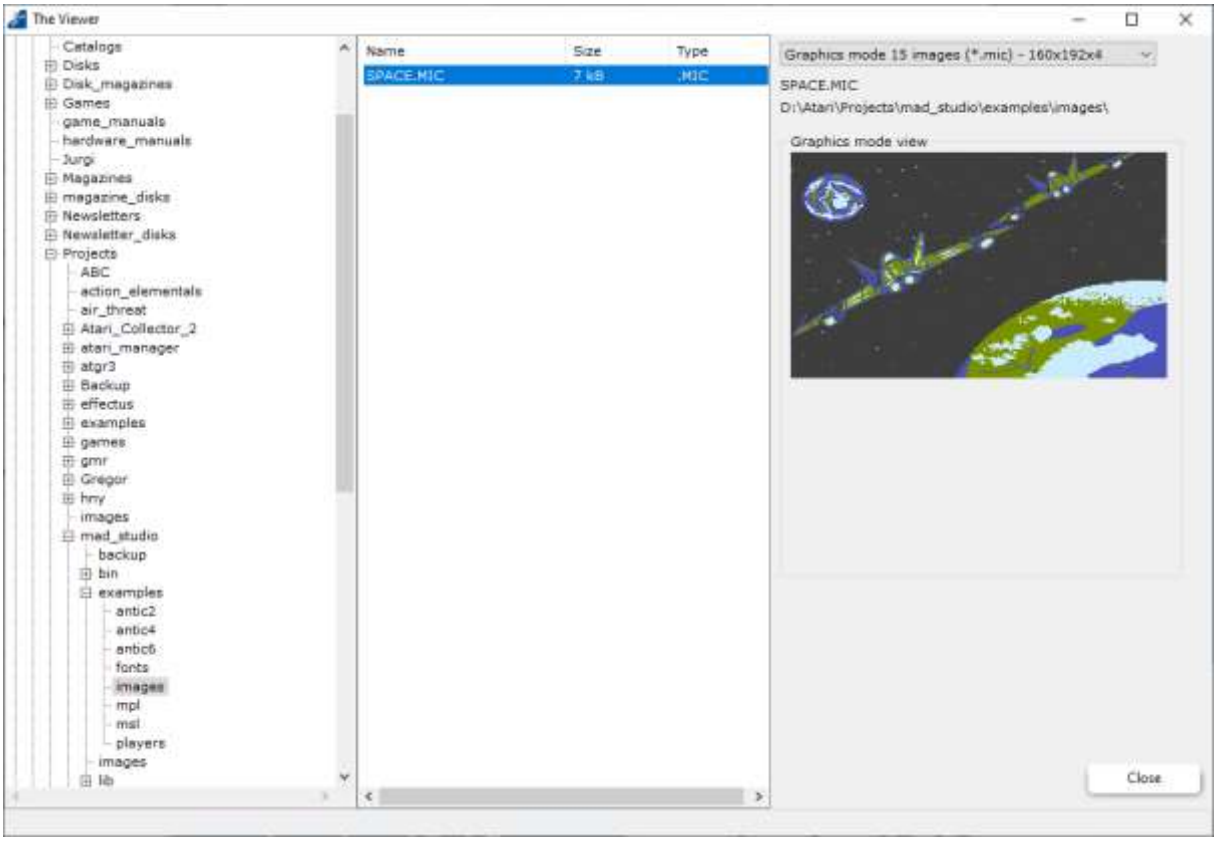
	0	1	2	3	4	5	6	7	8	9	a	b	c	d	e	f
1	00	00	00	00	00	00	00	00	3C	3C	3C	3C	3C	00	3C	00
2	EE	EE	CC	CC	00	00	00	00	00	66	FF	66	66	FF	66	00
3	18	3E	60	3C	6	7C	18	00	00	E6	EC	18	30	6E	CE	00
4	1C	36	1C	38	6F	66	3B	00	38	38	30	30	00	00	00	00
5	E	1C	18	18	18	1C	E	00	70	38	18	18	18	38	70	00
6	00	66	3C	E7	3C	66	00	00	00	38	38	FE	FE	38	38	00
7	00	00	00	00	00	38	18	30	00	00	00	7E	7E	00	00	00
8	00	00	00	00	00	18	18	00	00	18	00	7E	00	18	00	00
9	7C	EE	EE	EE	EE	EE	7C	00	38	78	38	38	38	38	7C	00
10	3C	6E	6E	1C	30	6E	7E	00	3C	6E	E	1C	E	6E	3C	00
11	E	1E	3E	6E	6E	7F	E	00	7E	60	7C	E	E	6E	3C	00
12	7C	EE	E0	FC	EE	EE	7C	00	7E	E	E	1C	38	38	38	00
13	7C	EE	EE	7C	EE	EE	7C	00	7C	EE	EE	7E	E	1C	38	00
14	00	38	38	00	00	38	38	00	00	38	38	00	00	38	18	30
15	E	1C	38	70	38	1C	E	00	00	7E	7E	00	00	7E	7E	00
16	70	38	1C	E	1C	38	70	00	7C	EE	EE	1C	38	00	38	00
17	7C	E6	EE	EE	EE	E0	7E	00	7C	F6	F6	FE	F6	F6	F6	00
18	FC	F6	F6	FC	F6	F6	FC	00	7C	F6	F0	F0	F0	F6	7C	00
19	FC	F6	F6	F6	F6	F6	FC	00	FE	F0	F0	FC	F0	F0	FE	00
20	FE	F0	F0	FC	F0	F0	F0	00	7C	F6	F0	F0	F6	F6	7E	00
21	F6	F6	F6	FE	F6	F6	F6	00	7E	3C	3C	3C	3C	3C	7E	00
22	7E	3C	3C	3C	3C	BC	78	00	F2	F6	FC	F8	FC	F6	F2	00
23	78	78	78	78	78	78	7E	00	C2	F6	FE	FE	FE	F6	F6	00
24	F6	F6	FE	FE	FE	FE	F6	00	7C	F6	F6	F6	F6	F6	7C	00
25	FC	F6	F6	FC	F0	F0	F0	00	7C	F6	F6	F6	F6	F6	7C	E
26	FC	F6	F6	FC	F6	F6	F6	00	7C	F6	F0	7C	1E	DE	7C	00
27	7E	3C	3C	3C	3C	3C	3C	00	F6	F6	F6	F6	F6	F6	7C	00
28	F6	F6	F6	F6	F6	7C	38	00	F6	F6	FE	FE	FE	F6	E2	00

Left panel displays data as image representation of selected array of bytes from the right panel. You move along the data with your mouse and watch data underneath. Data values are displayed in hexadecimal format by default, but can be changed to decimal values by unchecking the option above the table.

Some of the editors can use this feature to import data from any file. These editors include Export data button which can do this operation.

The Viewer

This module enables you to explore some of the supported formats of files in Mad Studio. Supported formats are graphics modes from Graphics editor, text modes 0, 1, 2 and Antic modes 4 and 5. Also supported are players (Player/missile editor) and character sets (fonts).



This module, run from main application window, automatically detects supported file format. But you can change to specific format by selecting it from combo box list. Module closes by pressing Close button.

This module is also included in some of the editors. The Viewer, started from such editor, offers you Open button which allows you to open selected file in editor for further editing.

Enjoy using Mad Studio!

Boštjan Gorišek