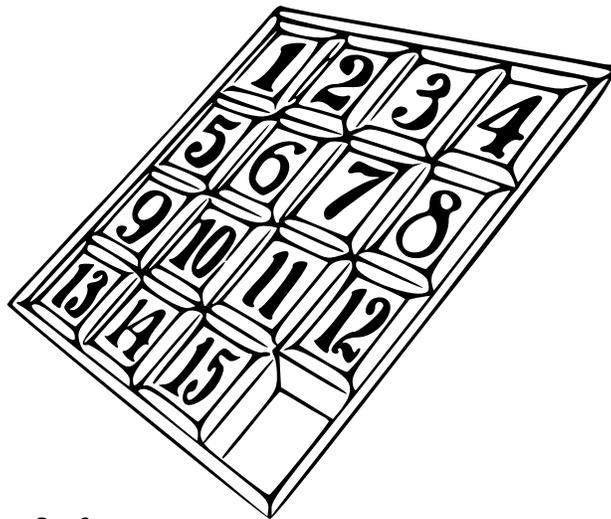


RCA *Studio II*



fifteen puzzle

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Photosensitive Epilepsy (PSE) Warning

This game generates bright, flickering graphics. DO NOT USE if you are susceptible to photosensitive epilepsy, a sensitivity to flashing lights or visual patterns that might trigger seizures and other symptoms.

Image Burn Warning

Displaying a stationary image for an extended period can cause image burn or image retention on any TV. Refer to the owner's manual of your TV for specific information and precautions.

Revision History

Initial version V1.00, produced December 12, 2017.

1 Author's Notes

This is a late release for the 40th anniversary (1977-2017) of the RCA Studio II video game system. For years I intended to write an anniversary game, but the idea was cast aside while I moved on to other projects.

Earlier this year I was asked to describe how I wrote programs for the Studio II by Cyril of Cote Gamers. I forgot many of the details, which made a review of old notebooks and source code necessary. I tried writing new programs to refamiliarize myself with how the tools worked. The results were surprising.

A prototype number game based on "Twister" from Radio Shack's PC-2 Games package (26-3702) started to materialize. Between 6/18/2017 and 8/1/2017 this evolved into what it is now. Title graphics are drawn by machine language, using letters based on fonts PixelFraktur by Extant and 4x4 by jambox_josh. The game is written in the incredibly versatile interpreted code.

This wasn't tested extensively, so this release is a beta. With luck no serious problems will be found. If you want to report a bug, please send the relevant information by email.

The artwork used on the cover of the booklet is from Sam Loyd's Cyclopedia of 5000 Puzzles, Tricks, and Conundrums, modified by the author using Paint Shop Pro Photo X2 and Inkscape. The PDF was made with ProTeXt 2013 and the OCR-A font by Matthew Skala.

Thanks to Cyril Denis for taking an interest in the older stuff, this game probably wouldn't exist otherwise. Additional thanks to Philip Marien for including my work in his multicart.

If you like Fifteen Puzzle, consider making a donation to show your support and encourage future projects. Donations are voluntary, a tip for the programmer. If you can't make online payments, or don't want to, that's OK. THANK YOU!

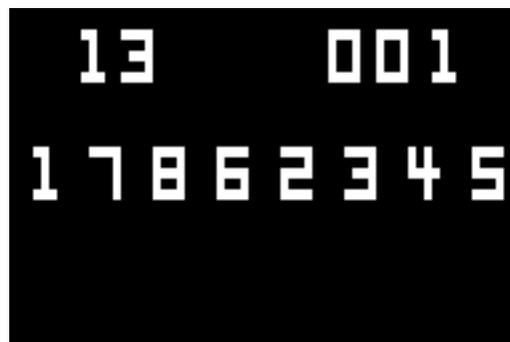


Figure 1: The Twister prototype

2 Running ST2 Files

The game program is distributed as an "ST2" file, which is a cartridge format defined by Paul Robson for use with Studio II emulators. It includes the binary game code plus a descriptive header. Fifteen Puzzle was written and tested with the Emma 02 emulator V1.23 written by Marcel van Tongeren.

Emma 02 is available here: <http://www.emma02.hobby-site.com>

After starting up Emma 02, click on the Studio II tab. Load the game by clicking the "CART" button. Navigate to the location of the "fifteen.st2" file, select it, and click "Open". Click the "Start/Reset" button at the bottom right of the window or press F12 to start the game (see figure 2). You might have to give the game window focus before it will respond to the keyboard.

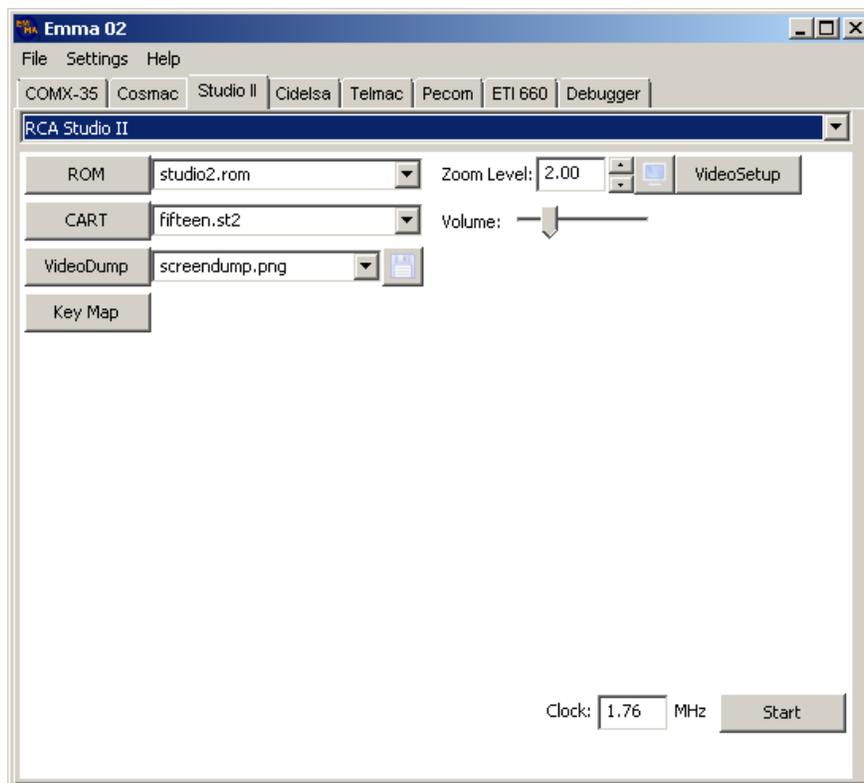


Figure 2: Emma 02 screenshot, Studio II tab

The game instructions refer to numbered keys as if you are using an actual Studio II console. Keyboard A is on the left side of the console, keyboard B on the right. When using Emma 02, the layout of Studio II keys is mapped to your PC keyboard with the defaults shown in figure 3. More information about keyboard mapping is available in the emulator's help file.



| Studio II | Emma 02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|------------|------------|---|---|---|---|---|---|---|--|---|--|---|---|---|---|---|---|---|---|---|---|--|---|--|---|---|---|---|---|---|---|---|---|---|--|---|--|
| Keyboard A/B | Keyboard A | Keyboard B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <tr><td>1</td><td>2</td><td>3</td></tr> <tr><td>4</td><td>5</td><td>6</td></tr> <tr><td>7</td><td>8</td><td>9</td></tr> <tr><td></td><td>0</td><td></td></tr> </table> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | 0 | | <table border="1"> <tr><td>1</td><td>2</td><td>3</td></tr> <tr><td>Q</td><td>W</td><td>E</td></tr> <tr><td>A</td><td>S</td><td>D</td></tr> <tr><td></td><td>X</td><td></td></tr> </table> | 1 | 2 | 3 | Q | W | E | A | S | D | | X | | <table border="1"> <tr><td>7</td><td>8</td><td>9</td></tr> <tr><td>4</td><td>5</td><td>6</td></tr> <tr><td>1</td><td>2</td><td>3</td></tr> <tr><td></td><td>0</td><td></td></tr> </table> <p>(NumPad)</p> | 7 | 8 | 9 | 4 | 5 | 6 | 1 | 2 | 3 | | 0 | |
| 1 | 2 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 5 | 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 8 | 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 1 | 2 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Q | W | E | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A | S | D | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Figure 3: Emma 02 PC keyboard map

3 Fifteen Puzzle

Fifteen Puzzle is a sliding puzzle on a 4x4 board with fifteen numbered pieces and one empty space. The pieces are scattered, and the object is to put them in numeric order with a series of moves through the vacant space. The idea dates back to around 1880, and is credited to Noyes Chapman. More information here:

https://en.wikipedia.org/wiki/15_puzzle

3.1 Getting Started

Following reset, the title screen is shown until you press any key on keyboard A to begin. The Studio II then generates a new puzzle, showing its status with a progress bar. Play can start after the board is displayed. Press reset for a new game.

3.2 Moving Pieces

This game uses keyboard A only. Direction keys 2, 4, 6, and 8 move the cursor, shown as a white square. Place it on top of the piece you want to move, and then press key 5 to slide the highlighted piece into the empty space. Only pieces that are horizontally or vertically adjacent to the empty space can be moved, diagonal moves are not allowed.

3.3 Winning

Although the traditional puzzle has multiple solutions, this version recognizes just one. You win if you can arrange the pieces in ascending order, left to right and top to bottom, the empty space at the bottom right (see figure 4). Note that hex digits A-F are used for numbers 10-15. If you can accomplish this a series of beeps will play and the game ends.



Figure 4: The won game