

- **DblSoma 2,5.exe** with Twist function
- **SomaPlus 2,3.exe** with Twist function
- **FindUnique 2,1.exe**
- **SomaComp 2,3.exe**

Soma Programs for Windows

This collection of four Windows-based programs is used for generating and solving Soma figures. The first two programs, **Double SOMA Solver** and **SOMAPlus Solver**, are very similar except for the particular puzzle pieces used.

Double SOMA allows 2 complete SOMA sets, with 14 pieces.

SOMAPlus allow the 11 pieces that are 7 SOMA pieces + 4 Plus pieces.

The **SOMA Compare** program compares all figures in a file to all other figures contained in files in the same directory. It identifies which figures are new and which are duplicates of existing figures, including any possible rotation or reflection.

The **Find Unique Solutions** program processes files produced by either the Solver programs when the user selects to generate all solutions to a figure. These files include rotated and reflected solutions to symmetrical figures, so this program processes the files and outputs only the unique solutions to the figure.

Installation:

There is no need to run an installer for these programs. Simply unzip the files for each program to any directory. All of the programs can be in the same directory if desired. The programs were all developed using Microsoft Visual Basic 6. This is an old 32-bit programming language, but the programs run fine in any version of Windows from XP to Windows 10.

The **Find Unique Solutions** program has been seen to “freeze” and be labeled as non-responsive on some Windows 10 computers when processing large files while the user changes focus to another program. If this happens the display does not update - but the program continues to run and will return to normal status when processing is complete.

There is an easy fix to prevent this display problem. Create a desktop shortcut for the program by right-clicking on the FindUnique.exe file in Windows Explorer and select Create Shortcut. Drag and drop the shortcut to the Desktop and then click on the text to rename it “Find Unique”. Now right-click on the shortcut icon and select Properties. Select the Compatibility tab and check the box to run the program in compatibility mode. The default mode of Windows 8 works fine.

Double SOMA and SOMA+ Solver Programs:

The features in these programs are identical except for the puzzle pieces that are available for use. Figures are entered by loading a figure file with an HTM extension, using the File/Open menu selection or using manual entry.

On the left side of the program there is a 9x16x7 model space to manually enter figures. Using the option buttons select any level 1-7 and then click on a square in the grid to enter a cube or remove an existing cube. To aid in keeping the figure lined up, cubes on lower levels are displayed in shades of gray based on how far they are below the selected level. Any figure can be saved to a file before or after solving. Select **File/Append to ...** from the menu and select an existing figure file or enter a new file name and it will be created.

Each figure requires a figure name, and an optional header information.

Be sure to give each figure in any file a unique name. If duplicate names exist only the first figure with that name can be loaded.

If you experience that problem, then open the HTM file with 'Notepad', find the figure name and change one of them.

In addition to saving figures to HTM files it's possible to copy the figure text to the Windows Clipboard at any time. There is a **Copy Text** menu selection under the **Figure** menu, but a simpler method is to type Ctrl-C.

The programs have a frame titled "**Pieces to Use**" that allows selection of any combination of pieces up to a double set of SOMA pieces, or a single set of SOMA+ pieces. In addition to option buttons for each piece the Double Solver has command buttons to easily select one or two complete sets of pieces. It also has a button to invert the selection, which is useful for analyzing problems like the **Trade Game** [[Newsletter 2020.12.20](#)] where a single set of pieces are modified by removing one piece and using two copies of another piece.

When only using a few pieces, selecting a double set and then inverting the selection clears all pieces. Then you can select the few to be used.

The SOMA+ program has buttons to select a single set of SOMA pieces or a set of SOMA+ pieces. Again, individual pieces can be switched on or off.

Solving.

When solving figures there are several options available. Clicking the **Solve button** cycles the available pieces through their possible placements until a solution is found. If none is found it states that the figure is impossible. A common mistake is to have less cubes available than the total to be filled, which is obviously an impossible setup.

There is a checkbox option to **find all solutions** to a figure. Solving with this option cycles through all possible piece placements and outputs all solutions to a file named Solutions.htm in the same directory as the program.

That file is overwritten each time this option is used, so it's necessary to rename the file if you want to save it.

There is also a **Batch Solve** button that cycles through all figures in the list, starting with the currently selected figure. The solutions are saved to a file with the same name as the figure file but with a .SOL extension. After a batch solve it's necessary to rename this file and use a .HTM extension so it can be reloaded in the future.

In addition to the .SOL file, another file with the same name and a .TXT extension is created. This file contains one line for each figure and lists the figure name, the solution time in seconds, and an asterisk for any figure that is impossible.

Main display.

The main display has several options available when viewing figures and during solving. The X, Y and Z axes have arrows to rotate the display 90 degrees in any direction. A command button is available to reset the axes to the default position.

There is a '**Display after...**' selection that determines which pieces are displayed during solving. Setting this to zero disables the display and results in the fastest solution time. A checkbox is provided to **view solutions** loaded from a file to the Figure List. There is also a command button to cycle through the individual pieces when viewing a solved figure or a figure loaded from a file.

Twisting a figure.

By June 2021 the two solving programs **Double SOMA 2,5** and **SomaPlus 2,3** has been expanded with a "Twisting" function.

Twisting is a process in which a SOMA figure may be rotated by 45°.

This of course seem strange in a field of 90° cubes, where cubes rotate in steps of 90° due to symmetry, and rotations of 30°, 25° or other angles do not really make any sense.

However in Feb 2000 Bob Allen discovered the "Twisting" by in which a SOMA figure may be rotated by 45°. (the half of the right angular 90°)

Details of twisting are described in [[Newsletter 2000.02.09.](#)]

Bob Allen found that this process had some interesting properties.

In Twisting, individual cubes are "rotated" (shifting in **concentric** squares) around a central axis.

The solver programs now have a **Mode** menu allowing you to select either **Normal** or **Twisting** mode.

In twisting mode the figure is relocated to the center of the entry area.

Two controls appear, to allow 45° Twisting, and the **Figure** menu expand to allow us to move the figure thereby reposition it relative to the rotation axis.

Obs: Twisting is only possible with figures that fit within a 9x9 entry area.

Quick keys are.	Ctrl-C	Copy the current figure as text, to be pasted in Notepad
	Alt-G-C	Recenter your figure in the 9x9 grid
	Alt-G-U	Move the figure 1 step UP
	Alt-G-D	Move the figure 1 step DOWN
	Alt-G-L	Move the figure 1 step LEFT
	Alt-G-R	Move the figure 1 step RIGHT
	Alt-G-P	Twist the figure POSITIVE by a + 45° turn
	Alt-G-N	Twist the figure NEGATIVE by a - 45° turn

Moving your figure to have a different center will produce totally different Twists.

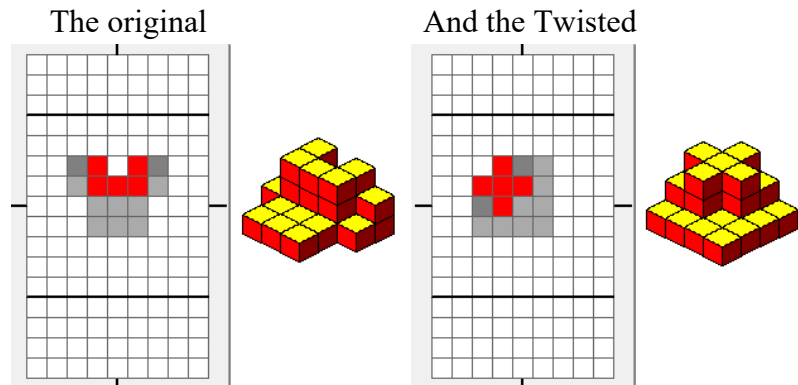
Try them yourself.

Here is a small sample figure. Copied with Ctrl-C and placed here.

```

/.*.*/**.**/**.**
/.***./***./*****
/...../...../***.
/...../...../***.

```



SOMA Compare Program:

After creating new figures and saving them to a file, this program is used to check if the figures already exist in other files. All existing figure files on Thorleif's SOMA website are available in a ZIP file. Extracting these files to any directory allows checking of new figures by placing the new file in the same directory. Use the Browse button to select the file with the figures to be checked. Then click the Search button and the program will compare each figure to the figures in all files in the same directory. It will find duplicates if any of the 48 possible rotations and reflections of each figure matches. The results list each figure that matches a figure in another file, including the symmetry number to make the figures identical. The transform associated with each symmetry can be seen using the **Help/Symmetries** menu selection.

The results can be printed using the **File/Print** menu selection. They can be copied to the Clipboard using standard selection and Copy methods. There is also an **Edit/Copy Results** menu selection to copy the results including a header line with the directory and file name.

Find Unique Solutions Program:

The Solver programs can create files containing all solutions to a figure. For symmetrical figures these files include the associated rotated or reflected solutions. This program processes the files and outputs a file containing only unique solutions. The output file has the same name as the input file with "Unique" added as a prefix to the file name.

When using a single set of SOMA pieces to solve figures containing 27 cubes or a set of SOMA+ pieces to solve figures with 40, the number of unique solutions is simply the total number of solutions divided by the number of symmetries. This is typically not true for partial figures or solutions using other combinations of pieces. The program compares each solution to all others in order to find the unique solutions.

Any particular rotation or reflection of a symmetric solution may be output as the unique solution. There is nothing special about this particular orientation. It is simply the first one found.