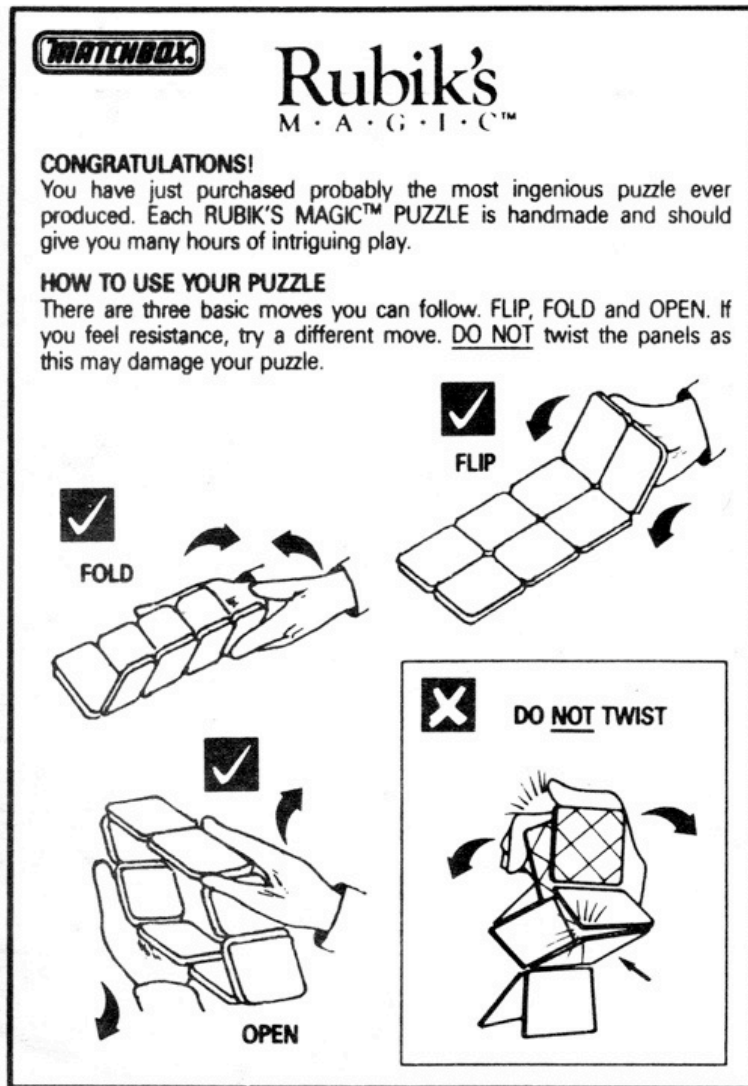# Rubik's Magic Panels

*Patented by E. Rubik 1987-U.S. & 1985-Hungary.*
(plastic, eight 2" panels, original black panels and newer red panels)

Eight panels, held by wire loops, can be folded and manipulated. Mix up and restore the 2x4 solution of 3 rings, or make the reverse side 3x3 (with a missing panel) solution of 3 linked rings. It is also fun to make different 3D shapes.

Basic Transformations From Red Panels Directions

The *star transform* of *Rubik's Magic Junior* can be generalized, and the Rubik's Magic directions show a generalized *loop* (called *roll*) and three new ones:
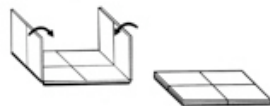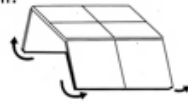
star transform:
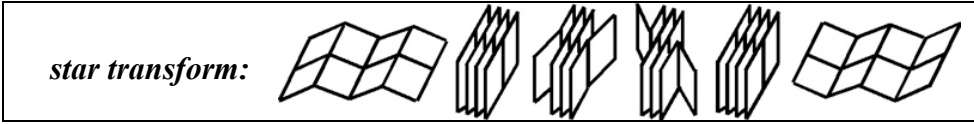
Roll
1. Fold RUBIK'S Magic in half.
2. Then open it, holding the centres of the top and bottom rows in different hands.
3. Pull your hands to the side in opposite directions while closing RUBIK'S Magic to complete the roll.
4. You can do a HALF ROLL, moving the top over by 1 panel, or a FULL ROLL, moving it over by 2 panels.
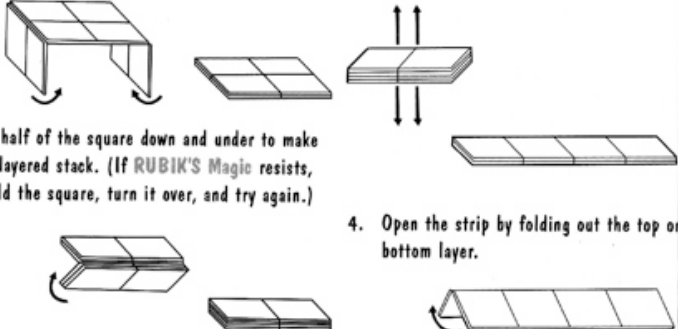
Reverse
1. Flip both ends up and in, making a 2-layered square.
2. Unfold the 2 bottom sections, perpendicular to your first flip. The original pattern has reversed itself.
3. Repeat steps 1 and 2 with the same side up to restore the pattern to its original design.
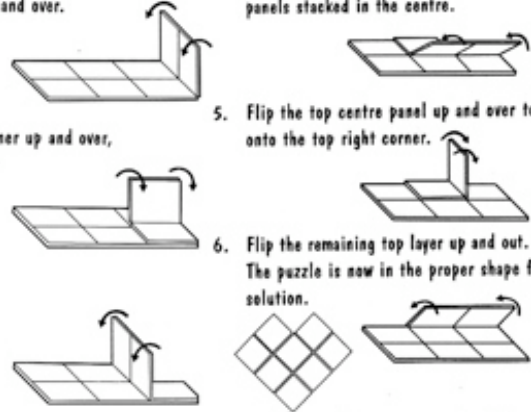
Wallet Stack
1. Flip both ends down and under, making a 2-layered square.
2. Flip half of the square down and under to make a 4-layered stack. (If RUBIK'S Magic resists, unfold the square, turn it over, and try again.)
3. Hold the top and bottom layers in the middle and pull RUBIK'S Magic open. The puzzle will expand and form a flat, 2-layered strip.
4. Open the strip by folding out the top or bottom layer.

Note: If in Step 3 of the wallet stack you pull it apart horizontally instead of vertically, you get the "row swap transform" (see *Jaap's Page*) that exchanges the top and bottom rows.

The Transformer
1. Start with RUBIK'S Magic as a 2x4 rectangle. Flip the right end up and over.
2. Flip the top right corner up and over, toward you.
3. Flip the top right end up and in.
4. Flip the top 2 panels closest to you up and over. The side away from you should now have three panels stacked in the centre.
5. Flip the top centre panel up and over to stack onto the top right corner.
6. Flip the remaining top layer up and out. Shazam! The puzzle is now in the proper shape for the solution.
7. Do the steps in reverse to return to the rectangle shape.

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What The Basic Transformations Do

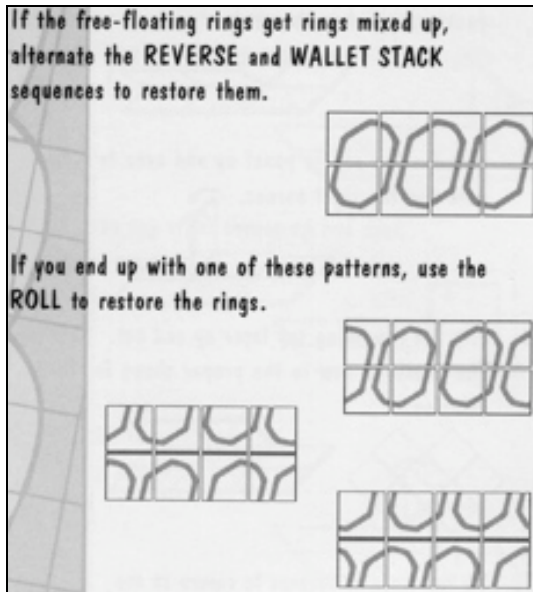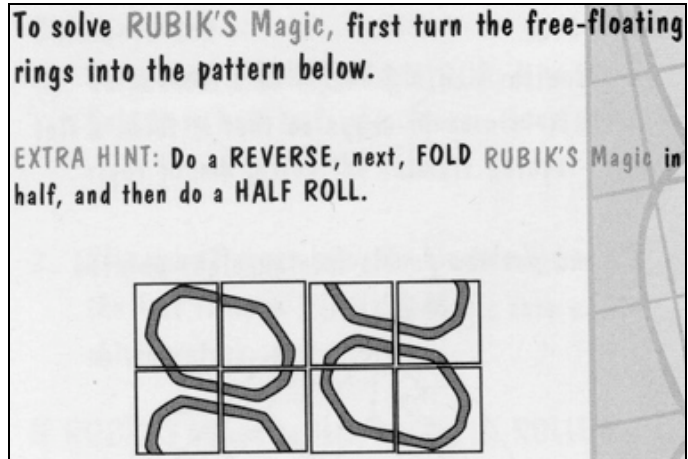After mixing up the puzzle, simply playing with the basic transformations typically gets you back to the starting pattern of three disconnected loops, and the more you do it, the more you get an intuition on how to do it faster. At some point, it is useful to really think about what each transformation does. Below, on the left is shown the starting position with panels labeled from 1 to 8 (or the back of the starting position with panels labeled A through H). The right shows where each panel goes; bars indicate where the top of that panel is now positioned.

front

1	2	3	4
5	6	7	8

star →

5	1	2	3
6	7	8	4

roll right 1
roll left 3 upside-down →

6	7	8	4
5	1	2	3

roll right 2
roll left 2 upside-down →

6	5	1	2
7	8	4	3

roll right 3
roll left 1 upside-down →

8	4	3	2
7	6	5	1

reverse →

I7	8I	4I	I3
I6	5I	1I	I2

wallet stack →

7	8	4	3
6	5	1	2

back

A	B	C	D
E	F	G	H

transformer,
step 2 flips down →

	C	D	
A	B	H	
E	F	G	

transformer,
step 2 flips up →

A	B	C
E	F	D
	G	H
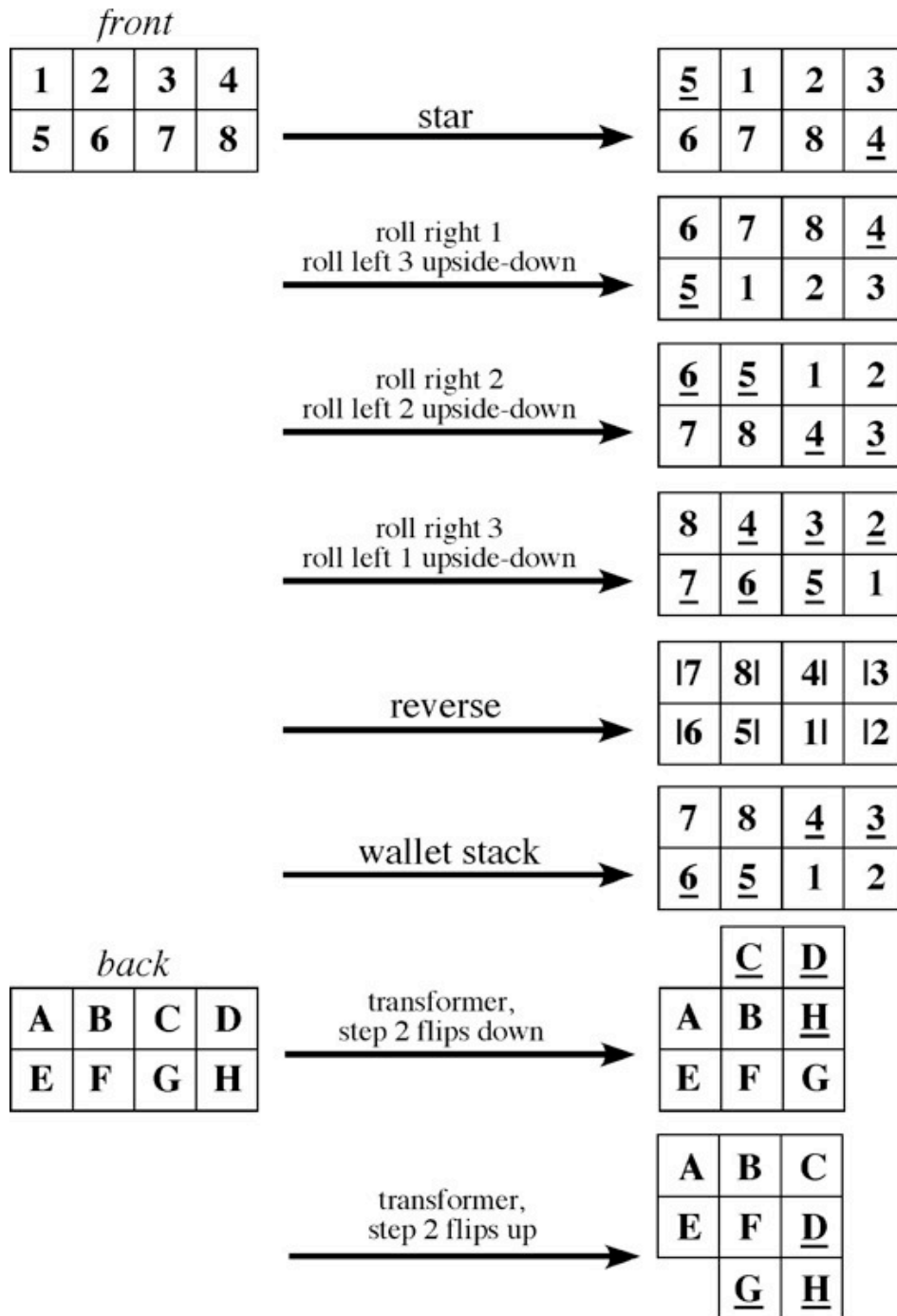
Rubik's Magic Panels Solution

If the free-floating rings get rings mixed up, alternate the REVERSE and WALLET STACK sequences to restore them.

If you end up with one of these patterns, use the ROLL to restore the rings.

Hint 1

To solve RUBIK'S Magic, first turn the free-floating rings into the pattern below.

EXTRA HINT: Do a REVERSE, next, FOLD RUBIK'S Magic in half, and then do a HALF ROLL.

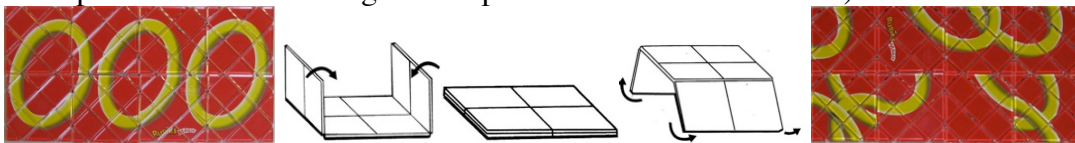**Hint 2**

The basic transformations together with the two hints of the red panels directions shown above lead to the following solution. Some other versions of the puzzle (e.g. *Simpson's* and *Harry Potter*) have the graphics placed so that this solution also works for them.

0. If necessary, as per *Hint 1*, play with transformations to restore the 2x4 solution; if using the new red version, reposition it with the copyright at the top (text upside-down).

1. As per *Hint 2*, do a *reverse*, and then position the puzzle horizontally (where the upper right three panels are the lower right three panels of the linked solution):

2. Continuing as per *Hint 2*, do a *half roll* towards the left that moves the upper right three panels to the lower left (when you are done, the underside has the pattern shown in Hint 2):
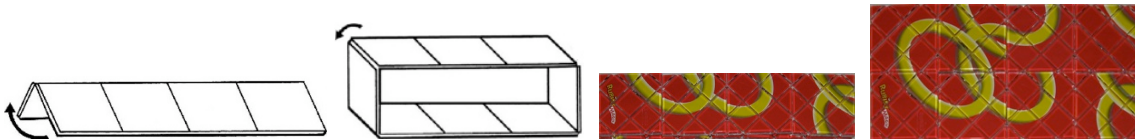
3. Do the *transformer*:

Copyright J. A. Storer
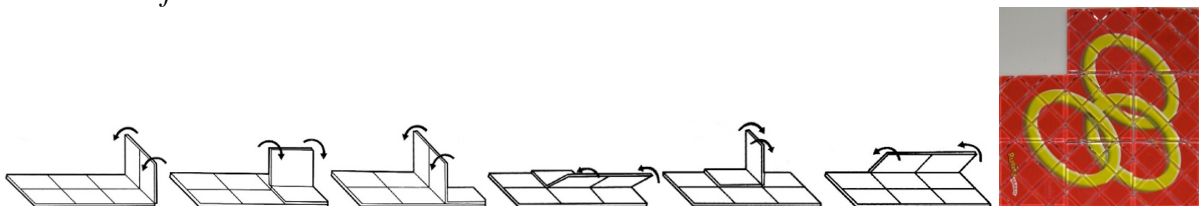
Ooms Solution that Uses Some Fun Moves

Jaap's Page credits the following method to *Alexander Ooms*.

0. If necessary, play with the transformations shown in the puzzle directions to restore the puzzle to the 2x4 solution.

1. Fold the right two panels up and then fold lengthwise:

2. Arrange into a 2x1 box where the right side is two panels thick, fold the extra two panels up through the box and back down (so they are now on the outside right), and then push the right side in to make a stack of 6 panels:

3. Push the stack of 6 down so that you have an open half box with a bottom that is 2 panels thick, flip the extra 2 panels under the bottom around 180 degrees to lie flat, and then rearrange into a Z shape:

4. Flip down the extra two panels on the back of the top of the Z (so the center of the bottom row is now three panels thick), flip the third center panel to the left so that all three sections of the bottom row are now two thick, then flip the extra row of three on the bottom down:
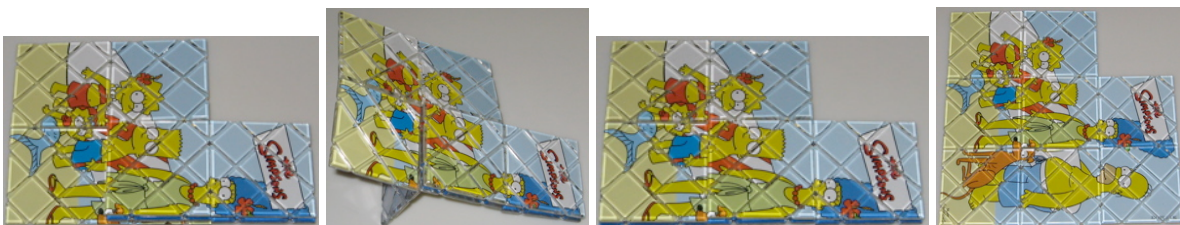
Fun Shapes From The Red Panels Directions

Mouse in the Hole

1. Start with RUBLK'S Magic as a rectangle. Fold it partway to make a long L-shape, with the bend away from you.

2. Push the bottom centre panels up and the back centre panels out, while pushing the ends together.

3. Pull your hands in to open up the hole. Wiggle your finger inside it to make the mouse.

Chimneystack

1. Start with RUBIK'S Magic as a rectangle. Fold it in half to form a square, keeping your right thumb inside the fold.

2. Slip your fingers into the hinged edge on the left to open RUBIK'S Magic into a chimneystack.

If RUBIK'S Magic resists, unfold it, ROLLLor REVERSE it, and try again.

8-Point Star

1. Start with RUBIK'S Magic as a rectangle. Push it into an M-shape so that it folds a flat four-layered stack.

2. Spread out the panels into an eight-pointed star.
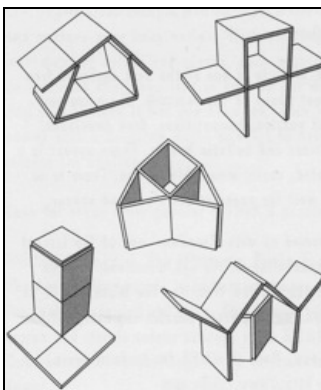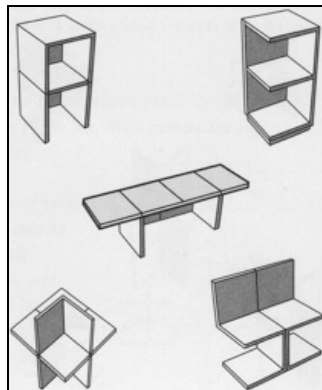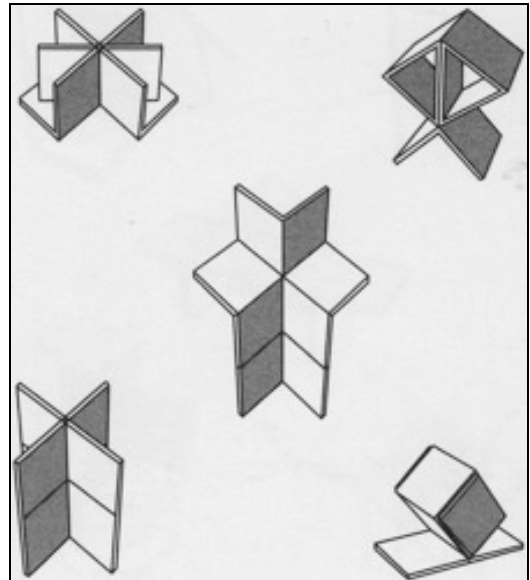
Other Versions of Rubik's Magic Panels

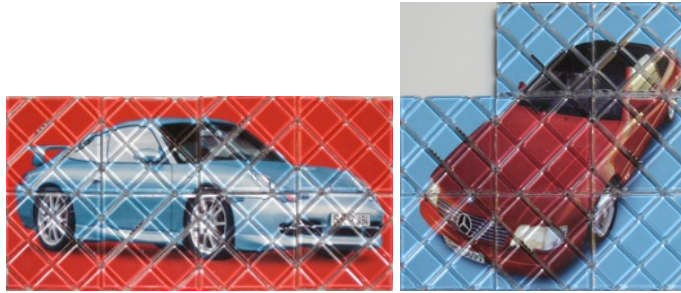*New orange version, 2" panels, same as new red one.*

Simpsons, 2" panels.

Harry Potter, 2" panels.

Versions of Rubik's Magic Panels With Small Panels

Porsche / Mercedes, 1.5" panels.

Mini Dinosaurs, 13/16" panels (really small but it works).

Further reading:

Jaap's Intro, from: http://www.geocities.com/jaapsch/puzzles/magic.htm
Jaap's Transforms, from: http://www.geocities.com/jaapsch/puzzles/magictrn.htm
Jaap's Solutions, from: http://www.geocities.com/jaapsch/puzzles/magicstd.htm

McFarren's Page, from: http://www.geocities.com/abcmcfarren/math/rm1/rm1int.htm

Koller's Page, from: http://www.mathematische-basteleien.de/magics.htm

Garron's Page, from: http://cube.garron.us/magic.htm

Rubiks.com booklet, from: http://www.rubiks.com/World/Rubiks%20downloads.aspx

Rubik Patent, from: www.uspto.gov - patent no. 4,685,680