Rubik's 2x3x3 Domino

Designed by Erno Rubik 1983; left purchased circa 1985; right purchased 2009.
(plastic, 1.5 inches high by 2.25 inches square)

Put the numbers in order on both sides.

**Notation:** R for a flip of the right side, U, D for clockwise rotations of the up and down faces (- for counterclockwise, and 2 to do it twice). We also use M to denote rotating the whole puzzle 90 degrees clockwise (with respect to looking down), as a convenience so that only right flips are needed (easier to hold and also useful for the solution to Rubik 3x3x4).

**Move pieces to their correct layers:**
1. Repeatedly position pairs of edges on the wrong layers on the right and do R.
2. Repeatedly position two corners on the wrong layers at the front right and do:
   
   *Exchange FRU and FRD: R U R U- R*

**Solve the two layers independently:**
3. Use this to permute corners; X = Step 2 transformation, Y = reverse of X:
   
   *Exchange URF and URB: X M- Y D-

4. Use this to permute edges:
   
   *Exchange UF and UR: (R U)² (R U2)² X*

*Jaap's Page* presents the transformations above (and others for faster solving), as well as the following transformation to change a side to its mirror image (F denotes a front flip):

   R F U- F U2 R (U F)² U2 R U- F R

**Further reading:**
*Jaap's Page*, from: http://www.jaapsch.net/puzzles/domino.htm

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