Rubik 2x2x4 Tower

Made in Japan, purchased from Mefferts 2010.
(plastic, 1.7" x 1.7" x 3.4"
green opposite yellow, red opposite orange, white opposite blue)

Unlike Rubik 2x2x3, 90 degree turns on the long dimension can lead to jumbled shapes; here is a sequence of three 90 degree turns:

Solutions:
1. Return the puzzle to the correct shape.
   One approach is to think of this as a 2x2x2 cube formed by the center portion with stuff hanging off of it, and employ Rubik 2x2x2 transformations.
2. Use a solution for Rubik 3x3x4.
   (Steps to correct edge pieces can be omitted).