Sliding Three

The start is a large piece containing two U-pieces, each covering half a disc, with along the bottom two curved pieces at the left and right and a square in the middle. The discs and bottom three pieces are all 2 units high and wide, the U-pieces are 2 units high by 4 units wide, the big piece is 4 units high by 10 units wide, and the tray interior is 6 units high by 12 units wide.

Part 1 is to exchange the discs. The following page shows a 34 rectilinear moves (43 straight-line moves) solution that works with strictly rectilinear motion that is not benefited from or restricted by the interior or exterior curved corners. Moves 18 and 32 move X and two other pieces together and can both be performed by pushing one of the pieces with a finger.

Part 2 is to exchange the two U-pieces. It does not appear solvable with strictly rectilinear movement (due to the interior curves of the big piece), but can be easily solved by employing a combination of rotating and sliding. Slide the discs down, slide the big piece to the right, slide all the other pieces except the two U-pieces to the left and up, and now manipulate the two U-pieces and the right most bottom piece; here are three key positions: