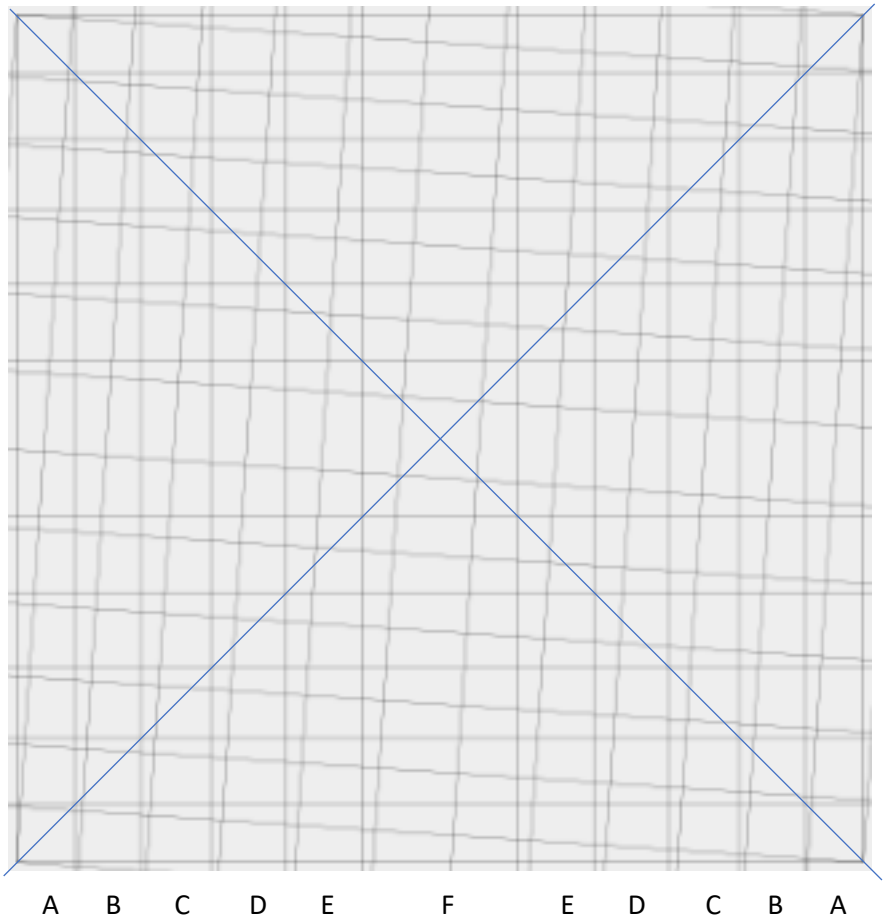
CQ. Counting Squares in the *Zig-Zag* VF

The top image is cropped to show the center of the VF of the Ultimate *Zig-Zag* Image which has inscribed square connecting vertices 6, 18, 30, 42. This square is horizontal. The blue diagonals are superimposed connecting those vertices.

The second largest square is the largest interior square, and this is based on jumps of 13. The top of this square is tilted 180/48 = 3.75°. The lines used here are 42-7 (for top), 6-19, 18-31, and 30-43. This is shown as the bottom image. Since *Word* only allows 1° increments in rotation, the top image was rotated 4° and then horizontal and vertical white rectangles were used to hide all but the "new" smaller square. You can note the difference between the two because the sides are not quite horizontal and vertical. As with the upper image, diagonals are superimposed to help with counting issues.



The question here is simple: *How many squares of various sizes are there in the image?*

Both larger squares are made up of smaller sided squares that use labels A-F and G-N and it should be noted that none of these lengths are the same as one another. If you think of each as measuring a length then there are two sets of inequalities:

A<B<C<D<E<F and G<H<K<L<M<N.

If you number the rectangles in the bottom row of the top image from 1 to 11, for example, only 1 and 11 are squares. The second, may look like a square but it is A high and B wide and A<B.

Note: The material in **ESA** is not typically used to do counting problems. You can read more about counting problems in Part II of **PwP**. File 6 provides a simple starting point, but File 8 is based on string art images using double jump models like in ESA Chapter 16.