PLACEMENT OF CAMERA IN WORLD SPACE CAN BE TRICKY!

Consider that our camera in world space is looking at the Z axis and that 4 points in world space even have the Z coordinate so that our world space would look like so:

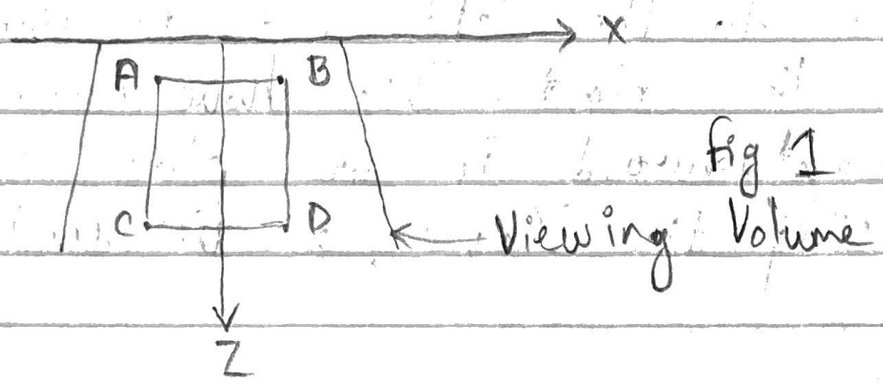

fig 1

When placing the world in camera space, we align it such that the camera is looking at -Z axis. This is achieved partially through a rotation transformation. So, the 4 points above in world space could be transformed into following in camera space.

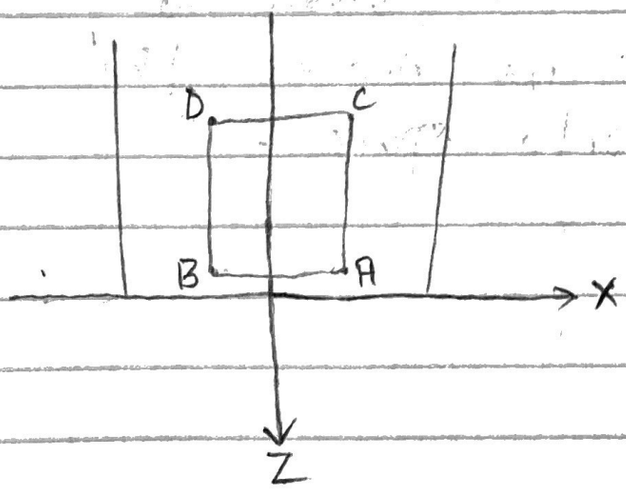

fig 2.

In fig ② B, A and D, C has "swapped" X coordinates in camera space relative to fig ① which was world space.

Movement of camera can be just as much tricky. Consider a top down view of the world where pressing left arrow on the keyboard, it is expected that the camera shifts to the left and the world shifts to the right. This however is not straightforward if we place the camera facing the Z axis, as we shall see:

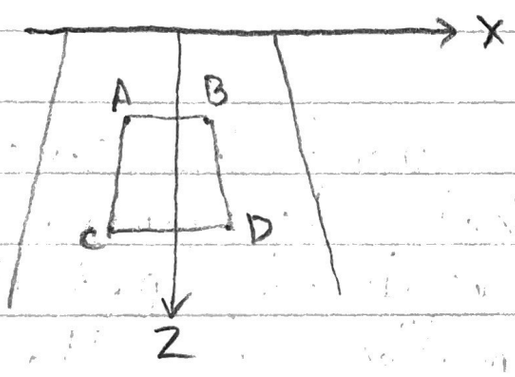

fig 3

Here we have the same arrangement as before and let us consider ABCD as flat object in top down view. When left arrow key is pressed, we move the camera left in world space:

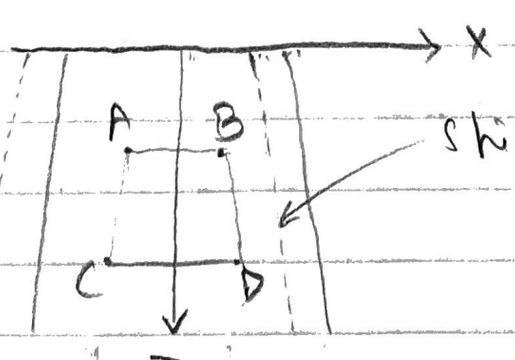

fig 4

But when we transform world into camera space it would look like:

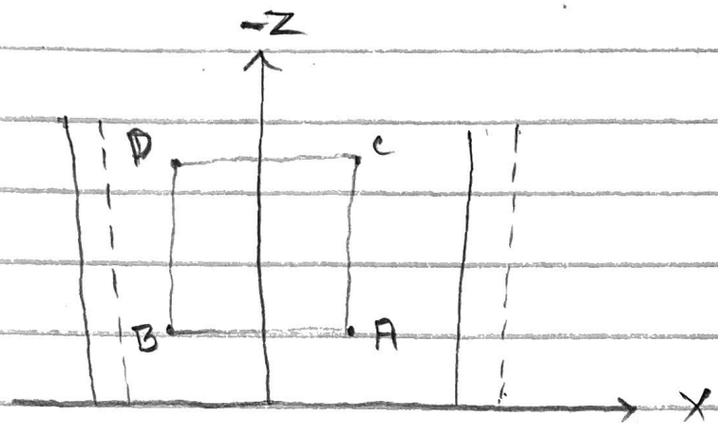

fig 5

It would appear as if the camera shifted to the right, and the world to left, which is the opposite of the desired result.

A fix for this would be to move the camera in right direction in world space upon left arrow key press, which would fix fig (5) like:

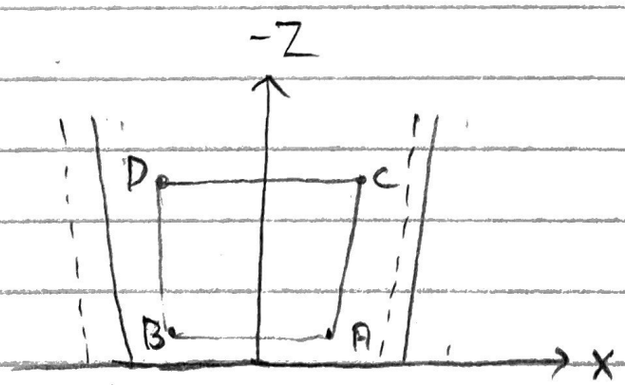

fig 6