



V = VMS, where displacement = Vector Change
D = DV, where displacement = 1/2 of Vector Change
1 Hex = 10 km. (VMS, based on B5W, has no specified game scale), one turn is 64 seconds.

Black Circles With Numbers Indicate position at end of displacement + drift, assuming continuous burn. Number indicates turn.

White circle indicates position at end of turn N+1 if engines are cut off at the beginning of the indicated turn.

Velocity = a*t
Displacement = 0.5 * a * t^2

The green bounding box is VMS, the standard we're comparing to.

The first purple bounding box is DV movement on the same scale, assuming that the VMS thrust is only change of velocity, and keeping velocities identical.

The second purple bounding box is DV movement on the same scale as the VMS example, assuming that the displacement in VMS is correct, but that the velocity is being compensated for by counter thrusting. Note that, logically, VMS should be able to replicate the results of the magenta box by disabling the counterthrusters as a command action, and a ship capable of using counterthrusters sufficient to replicate VMS should be able to decelerate without reversing course by 180 degrees.

Note that this graphic understates the discrepancy, because it's measuring it from a fixed point. Spaceships aren't fixed points when calculating movement and firing ranges. Assuming that the green box is closer to the error discrepancy in VMS, two units in approaching each other at thrust 2 via VMS would be 8 hexes closer to one another than where they would be with correct movement after turn 4.

The error increases linearly with thrust rate. Going to thrust 4 results in double the error above; two units thrusting towards each other at thrust 4 in VMS would have a combined positional error of 16 hexes, which is significant in most games that can be played on a hex map -- and a thrust rate of 4 is fairly modest for most VMS systems. This positional error also expands at the rate of n^2 where n is the number of units in a combat.

The blue bounding box shows what happens when facing changes are allowed in the middle of a burn; assuming the turn took place at the exact midpoint of the burn, there would be no displacement on the hex grid in correct Newtonian movement. Assuming vector change always equals displacement as VMS does, you get a significant positional error.