NAVIGATION TIPS

Maximizing your points depends on mastering the optimal navigation strategy. This sheet will provide you with some tips on how to achieve this. Imagine a circle between the smaller hexagon and larger hexagon. Your goal is to make the ship stay on this imaginary line and <u>slowly circle the fortress in a clockwise direction</u>. Remember you are in a frictionless environment and the rules below will describe how to achieve such an orbit in this environment.
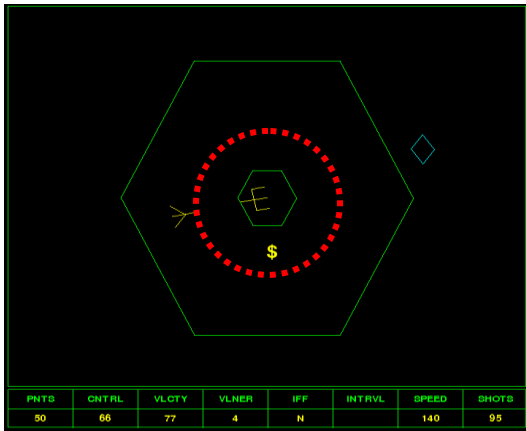

Turning. You want to keep your ship aimed at the fortress so that you shoot it. If you are going in a clockwise direction your ship's aim will drift past the fortress at which point you need to hit the "D" key to rotate clockwise so you maintain your aim. It is usually only necessary to tap the "D" key. You should only have to hit the "A" key if you overcorrect with the "D" key. You should not hold these keys down to long. Usually it is sufficient to just **tap** them.

Thrusting. To maintain a circular orbit you will also occasionally need to hit the thrust key. To decide when to hit the "W" key while in orbit you need to monitor the angle illustrated in the diagram below.
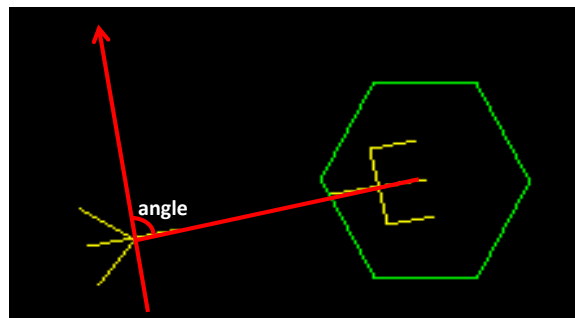

This angle is formed by two vectors. One is the vector that describes the direction your ship is aimed – that should be at the fortress as illustrated above. The other vector is the direction in which your ship is drifting. While you are trying to maintain a circular orbit your ship is drifting in a straight line and you constantly need to adjust that line to keep the ship circling. You can do this by apply thrust as soon as the angle illustrated above exceeds 90 degrees. You need not press the "W" key long just **tap** it.

The idea behind the above rules is illustrated in the diagram to the right. The ship is pointing at the fortress in the A direction, but it is actually moving along the B direction. Tapping W will produce a vector addition of the directions that will cause the ship change its trajectory to the C direction. By adjusting the ship trajectory using the above rules, you will be able to fly the ship in a clockwise direction around the fortress. Again you should only briefly hold the "W" down – basically just **tap**. Basically you want to keep your ship moving on a vector that is the tangent to the circle it is traveling.
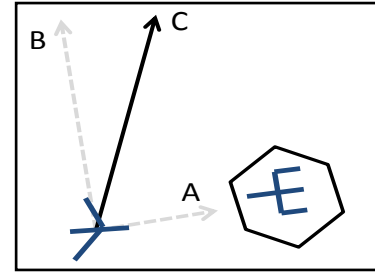
You want to be as close to the fortress as you can without facing the danger of hitting the inner hexagon. You can move your ship into a closer orbit to the fortress by tapping W. However, you do not want to get too close to the fortress or your attempts to maintain the obit will cause you to hit the smaller hexagon. If you are too close you will need to allow yourself to drift away before correct the angle to be 90 degrees..
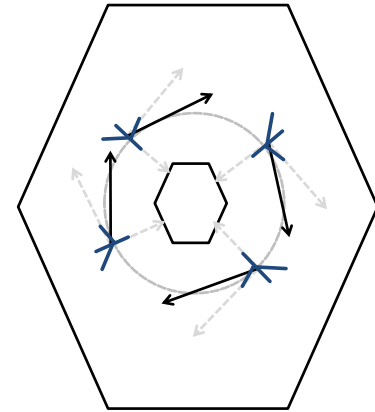
While the rules above describe the principles for maintaining the orbit you should eventually find yourself just **tapping a sequence of "W" and "D" keys** (and an occasional "A" key without thinking about these principles. The goal is to learn to steer your ship by a sequence of adjustments that come as instinctively as driving a car. You should be making **regular and slow key presses** (less than 2-3 key presses per 1 second will be enough). Again remember your the ship is very sensitive to input and you usually want to just **tap** keys and only when necessary.