Relatively Simple Vectorish Movement
An Optional Rule for Quasi-Real Rockets/Knight Hawks

The default movement system in Knight Hawks is simple and easy to understand but is closer to aircraft movement than realistic space craft movement. Vector movement is more realistic but generally very hard to keep track of. This rule is an approximation of vector movement that is designed to be easy to understand and keep track of.

The basics of the rule are as follows:

1. A ship may have zero, one, or two speeds. Each speed is tied to a specific direction on the map and thus a specific hex face.
   Example: The ship in figure one is currently moving in the direction labeled A. It later rotates to face direction C. It will continue to move in direction A at the same speed.
2. If a ship has two speeds, they must point at adjacent hex faces. If the two speeds are not adjacent, resolve them as in steps 8 and 9 below.
3. A ship can only accelerate in the direction it is facing.
4. Each turn, a ship may change facing by a number of hex faces equal to its MR. It may also increase its speed in the direction it is facing by its ADF.
5. Unless using the speed chart below, a ship may accelerate by up to its ADF or rotate up to its MR at any point in its move so long as it does not exceed either value over the course of its turn.
6. A ship moves in each direction it has a speed in. This should be done in a proportional manner (a ship with a speed of 8 in direction A and 4 in direction B should move 2 hexes in A for every hex it moves in direction B)
7. When a ship accelerates in a direction it does not currently have a speed in, it gains one.
   Example: The ship in figure one is currently moving in direction F at 2 hexes per turn. It is facing direction A and accelerates by 3ADF. It now has two speeds, direction F at 2 hexes, direction A at 3 hexes.
8. If a ship acquires more than two speeds, the newest speed must be reduced to eliminate the speed farthest from the hex face the ship is facing. If two of the speeds are on opposite faces, subtract the smaller from the larger. The result is the ship's new speed in the direction it had a larger speed in.
   Example: The ship is currently moving in direction A at 3 hexes per turn. The captain wishes to reverse direction. The ship rotates to face direction D and accelerates at 5 ADF. Since this is greater than its speed, it is able to stop and will then move two hexes in direction D.
9. If none of the speeds are opposite one another, use the following procedure.
   - Take the speed of the direction the ship is facing. Reduce both it and the farther speed by one.
   - Reduce the speed of the direction the ship is facing by one and **increase** the adjacent speed by one.
   - Continue doing this until there are two or fewer speeds.
   Example: The ship is moving at 3 hexes per turn in direction A, 4 hexes per turn in direction F, and is facing direction E. It accelerates by 5 in direction E. One is subtracted from both directions A and E (reducing the acceleration to 4) then another is subtracted from E and added to F. This is repeated. The final point of acceleration reduces A to zero. The ship is left moving 6 hexes per turn in direction F. Despite accelerating in direction E, it does not move in that direction this turn.

Ships with an ADF of 1 may take multiple turns to complete a maneuver. If so, alternate which direction is adjusted first. This prevents them from braking in a direction they are not facing:

Example: The Lucky Star is a freighter with an ADF and MR of 1. It is currently moving at 10 hexes per turn in direction A. Navigation warns that the Star is on a collision course with a planet 4 hexes wide and 50 hexes away. The Lucky Star has no chance of stopping before it impacts the planet so the captain orders the ship to turn and attempt to gain enough speed to sidestep the planet. The Star turns to direction B and accelerates, giving it a speed of 10 in direction A and 1 in direction B. The following turn they rotate to direction C and accelerate. By the above procedure, its speed in direction A is reduced to 9 while B is unchanged. They then accelerate the following turn in direction C. This time they use the second step and increase speed B to 2. This gives the Lucky Star enough lateral speed to miss the planet so they do not accelerate but instead rotate to direction D on turn 4.

With the ship out of danger the captain wants to resume the previous course. Turn 5 he rotates to direction E and the Star accelerates by one in that direction. Since that is directly opposite the speed in B, it will take two turns to eliminate all speed in direction B. Two more turns to face back to direction A and accelerate back to speed 10. All told, it took the Lucky Star eight turns to complete its evasion of the planet and return to its previous speed and heading. Since buying better sensors is cheaper than buying bigger engines, the captain puts a bigger radar unit on his shopping list.

At the end of this article is a hex diagram. Use it to record the directions your ship is moving in as well as to determine which speeds need to be resolved.

Speed Chart (Optional)

Allowing a ship to expend all of its ADF and MR at any point in its movement is unrealistic but simplifies the rules greatly. Those desiring more evenness in movement can use the speed chart. Each turn is divided into ten segments, each equal to one Alpha Dawn turn in the case of QRR, or one minute in standard Knight Hawks. Instead of one side completing its move before the other, both sides alternate each segment and movement is considered simultaneous. If using the speed chart, the designation MPO loses its meaning, as both players move before either player fires.

Using the speed chart requires the alteration of the sequence of play:

Sequence of Play

- Start of the Turn
    - Each segment is called out and played one at a time
        - Side A Moves
            - Activate Defenses
            - Activate/Move Seekers
            - Move ships if called for by speed chart
            - Rotation and Acceleration
        - Side B Moves
            - Activate Defenses
            - Activate/Move Seekers
            - Move ships if called for by speed chart
            - Rotation and Acceleration
        - Combat Phase
            - Fire Damage
            - Side A shoots
            - Side B shoots
    - Call Next Phase and Repeat
- End of Turn
- Repair Turn (after every 3 turns)

Each segment any legal action can be taken however all per turn restrictions apply. A laser battery fired on segment 3 can not be fired again on segment 7 as it may fire only once per turn.

Rotation

A ship may turn 60 degrees (one hex face) a number of times per turn equal to its MR. After turning, a ship may not turn again for 10/MR segments, even if that means it cannot rotate again this turn. Seeking weapons use their own rules for turning.

Example: A frigate with an MR of 3 turns on segment 6. It cannot turn again for 10/3 or 3 segments. On segment 9 it turns again. Even though its MR allows 3 changes of heading each turn, the frigate will be unable to turn until segment 2 of the next turn.

Acceleration

A ship may accelerate by 1 after each time it moves, up to its ADF. If the ship's ADF is greater than its current speed, it may accelerate by the remainder at the end of the turn. Ships with an ADF greater than 5, including all seeking weapons, may accelerate by 2 rather than 1.

Example: An assault scout with an ADF of 5 is moving at a speed of 1. On segment 5, it moves and increases its speed to 2. Speed 2 moves again on segment 8 so it increases its speed to 3. Speed 3 does not move again so at the end of the turn the rest of the ADF is applied and the assault scout will have a speed of 6 next turn.

	Speed									
Segment	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1				*			*	*	*	*
2					*	*		*	*	*
3		*	*	*			*		*	*
4					*	*		*	*	*
5	*		*			*	*	*		*
6				*	*	*	*	*	*	*
7							*	*	*	*
8		*	*		*	*			*	*
9				*			*	*	*	*
10					*	*	*	*	*	*

To use the speed chart, look your speed up on the top row. If there is an asterisk in the column for a segment, the ship moves one hex that segment. Ships moving faster than speed 10 will move multiple times on some segments. For example, a ship moving at a speed of 12 would move 1 hex each time speed 10 moves and one hex each time speed 2 moves. A ship with a speed of 25 moves 2 hexes each segment, 3 hexes when speed 5 moves.

A ship with more than one speed will move when each of its speeds dictate. For example, a ship moving at 25 in direction C and 7 in direction D will move 2 hexes in direction C when speed 10 moves, 1 hex in direction C when speed 5 moves, and 1 hex in direction D when speed 7 moves.

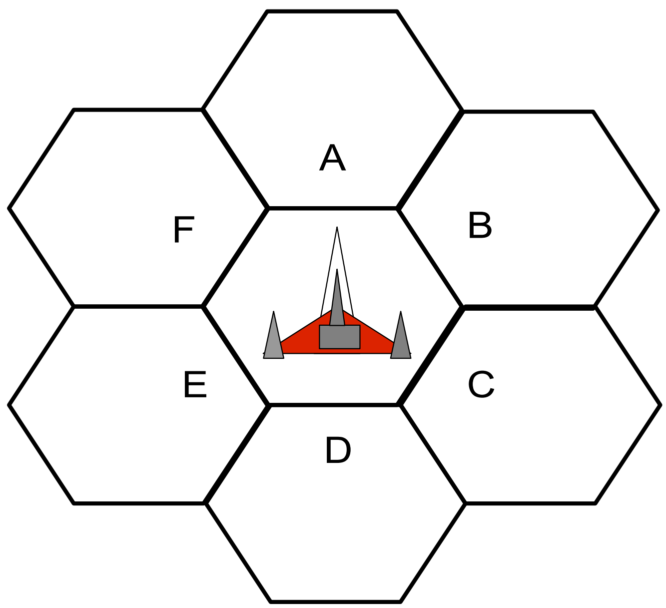

Figure 1: Hex Facing Diagram