**Purpose of this document is to draft up material before putting it into LaTex. Easier to read**

**Intro to fixed wing UAVs**

Unmanned Aerial Vehicles (UAVs) operate without an on-board pilot making them ideal for high endurance and dangerous missions. Remotely piloted aircraft can trade-off pilots when they become fatigued allowing the aircraft to remain in service for longer periods of time. UAVs do not have cockpits or life support systems which free up space for additional equipment and reduces costs. The lack of an on-board pilot and low system costs also allows a UAV to be expendable.

UAVs can be found in rotorcraft and fixed wing varieties. Fixed wing UAVs range widely in form factor and size, but typically fall under either hand-launched or large systems. Hand launched varieties can be carried on the back of a soldier and launched without the use of a runway and are typically battery powered. Large FWUAVs are typically gas powered and require a runway to take-off and land.

FIGURES

Hand-launched UAVs are primarily tasked with surveilling the immediate area for soldiers on the ground. Cameras on-board relay video to the ground allowing soldiers to identify threats prior to engagement. Large UAVs are tasked with surveillance and can be used for armed reconnaissance [ citation].

Missions can be described in terms of a path that a UAV is required to fly on. The paths are typically constructed from simple primitives such as straight lines connecting waypoints and circular loiter paths. Obstacle free and flyable paths are generated at a ground station prior to flight and sent to the UAV. The UAVs autopilot uses the path as a reference and attempts to keep the UAV as close to the path as possible. The relationship between a ground station and a UAV is discussed in more detail in the following section.

**Autopilot and Ground Station**