ABAS
Arduino Based Auto-Pilot System
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Introduction

Flying in combat or surveillance missions is a very demanding and dangerous task. In order to help save lives, unmanned aerial vehicles have gained great interest. They can be used for combat missions, surveillance, and locating disaster victims simply by a controller on ground without having to put a life at risk.

Objective

Design an Arduino based autopilot Aircraft which will handle stabilization and navigation and provide live video while it’s flying, to be utilized for testing unknown territories, surveillance, or for news stations or weather stations live feed, without the need to put someone in danger.

System Overview

The servos are connected to rudder (yaw), elevator (elevation) and throttle (speed), they control the gears that are linked to the arms, when transmitter on ground sends a signal, the receiver picks up the signal and sends it to the corresponding servos which will control the arm’s action and push or pull the rod.

Roll
Throttle
Yaw

Implementing ABAS

MultiWiiPro (Autopilot Chip/microcontroller): includes gyroscope (senses yaw and pitch of plane), accelerometer, barometer, magnetometer

UBlox CN-06 GPS 10 Hz: provides global position of aircraft, includes a compass to show direction in which the aircraft faces.

3DR Radio Telemetry Kit: AT 915 Mhz, the telemetry allows data to be transferred between the Aircraft and the Controller using MAVLink protocol. Can be used to give aircraft additional instructions while in flight

Ardupilot Mega MinimOSD: A minimal Arduino-based on screen display board to display the data from sensors over the video.

12 Channel 900 MHz Tx/Rx video system with camera: Allows the Controller to receive live video during flight.

Mission Planner

Aircraft will have a programmed mission to complete, such as going to different points located in the map and after a certain time, finish the mission and land. In order to be able to select which points the Aircraft should go to, Google maps will be utilized so that the product is customer-friendly and easy to use. The person providing the directions to the Aircraft will be able to select points, as well as see the Aircraft completing the mission.