Abstract – Team Ganges

There is considerable research being done into the feasibility of short range Unmanned Aerial Vehicles (UAVs), for delivery of goods from online retailers such as Itchen. In order to transport the cargo effectively the UAV must have a high maximum cargo weight to UAV weight ratio, enough battery life to transport the cargo then return to the base-station and produce a stable flight-path.

The Pilot operates two sets of X-Y joystick potentiometers, values of which are translated into desired Thrust, Pitch, Yaw and Roll values. Ground control communicates with the UAV via two sets of RFM12B-S2 transceivers. There are separate on-board communications and control microprocessors allowing the control system to operate as quickly as possible. The UAV consists of 4 brushless DC motors controlled by a bank of ESCs, which take input from a microcontroller which takes measurements from a gyroscope-accelerometer module, to form the PID controller for the UAV. This controller system devolves much of the responsibility for stability from the pilot. Cargo is collected by a hooking mechanism actuated by a micro-servo such that the torque on the loaded servo is zero. The UAV has an IR proximity sensor.