DIGEST

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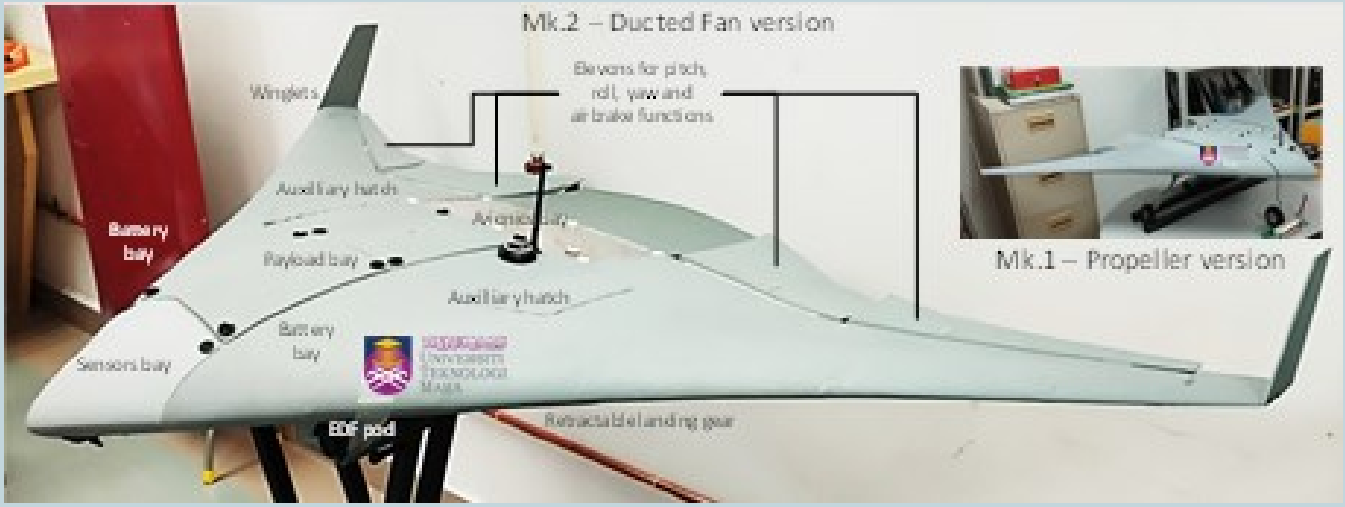
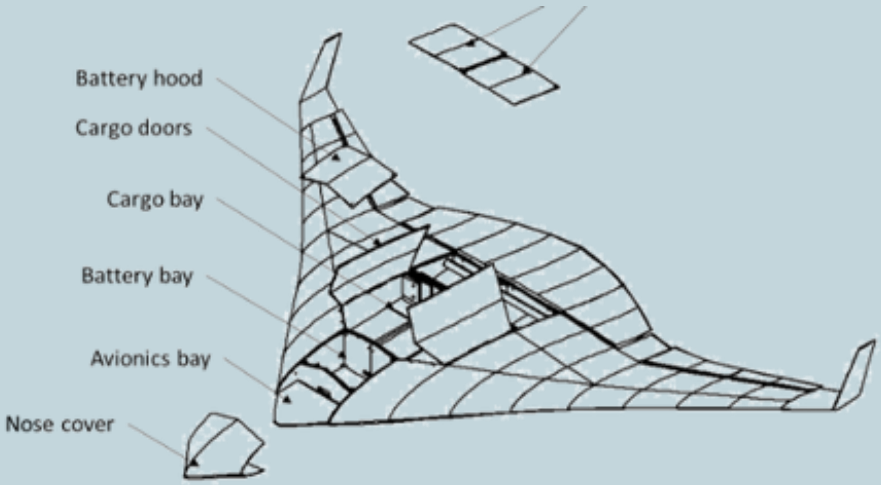
Blended Wing-Body Unmanned Aerial Transport Aircraft

by Associate Professor Dr. Rizal Effendy M. Nasir





Most parcel delivery companies aspire to replace road-going riders and drivers with unmanned drones for last-mile delivery purposes. These multirotor drones are limited to a range of only 10 kilometres. 60 to 100-kilometre inter-city parcel transport still uses land transport such as postal vans or lorries and is susceptible to traffic conditions. There is a need for fast or urgent inter-city parcel transport service that is quicker than regular land transport without waiting for bulk postages. BWB-X is a mini unmanned aerial vehicle with a fixed-wing configuration designed to transport parcels/items up to 2 kilograms. The unmanned aircraft system (UAS) is designed based on the team's research in blended wing-body technology – an advanced aerodynamics that enhances performance and efficiency. The UAS, which measures only 2.0 m in wingspan, 1.5 m in length, and less than 0.5 m high, is a hybrid between conventional and flying-wing aircraft that allows all-lifting wing-body with huge volumes to carry payloads.

It is powered by electric propulsion, either a propeller or a ducted fan, in which power comes from its twin lithium batteries. With a 100 km/h cruising speed, 100 km range and 100 minutes of flight endurance, the UAS consists of two central units – the aircraft and the ground control units. The former consists of a flight computer-IMU combo with auto stabilization and autopilot function with inertial and satellite navigation systems. Communication with the ground control unit is via radio for command, video transmission and telemetry, and 4g/5g internet protocol for beyond-line-of-sight command, control and telemetry. The ground control unit consists of a radio transmitter controller, laptop with mission management software, flight control joystick for BVLOS flight, transceiver, video screen, etc. The UAS can also be used by the military as a surveillance/intelligence and light aerial delivery (bombing) mission platform.

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