DEVELOPMENT OF A MICRO AIR VEHICLE (MAV) AIRFRAME.

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The design and testing of a Micro Air Vehicle (MAV) airframe was recently completed at the Rochester Institute of Technology. MAVs are defined as having a maximum dimension of 6 inches and weighing no more than 90 grams. Past research has typically adopted a trail and error method as the primary mode in the design of the low aspect ratio wings used as MAV airframes. This presentation discusses the systematic design approach used in the design of the MAV airframe. This innovative design method bridges the gap between known aerodynamic theory and experimental techniques. The discussed MAV airframe is of a flying wing design incorporating an inverse Zimmerman plan form with a dragging tail. The MAV was designed with roll stability in mind therefore a small amount of polyhedral was incorporated into the final prototype. Different modes of manufacturing were evaluated during the construction of the final prototype including the use of composites and vacuum molding techniques. The constructed model was tested for lift, drag, and pitching moment using the RIT wind tunnel. Finally, a comparison between theoretical design parameters and data achieved through wind tunnel testing are presented.