LOW REYNOLDS NUMBER SURFACE STATIC PRESSURE MEASUREMENTS OF LOW ASPECT RATIO FLAT PLATE WINGS FOR MICRO AERIAL VEHICLES. ***J. Jones,*** *Kozak*, Department of Mechanical Engineering, jej2874@rit.edu, jdkeme@rit.edu*

Micro aerial vehicles are by definition small aircraft that fly at relatively low speeds typically less than 30 mph. Many of the mathematical relationships used in conventional aircraft design do not apply to the flight of very small airplanes at very low speeds, thus requiring experimental data for flow description. Traditionally, wind tunnel data on MAV wings include only basic load cell force measurements, resulting in a lack of adequate knowledge of the pressure on the wing surface. Experimental pressure distribution results are useful in determining whether laminar separation bubbles occur, and the amount of drag that is due to the pressure gradient. Lift can be obtained by integration of surface pressures, providing a means of comparison to earlier work. As a baseline case, 64 static pressure measurements on each surface of a 0.160" thick rectangular flat plate wing of aspect ratio 1 were considered at Reynolds numbers of 100,000 and 140,000. The models have thickness-to-chord ratio of 2.00% and 5-to-1 elliptical leading and trailing edges. The static pressure tap array was acquired using 5 separate plates, requiring a fabrication process that ensures repeatability and accuracy. An application of the wind tunnel data and planned future work will be discussed.