VI. CONCLUSION

The present investigation has produced data which supports the following conclusions:

1. The leading edge of flat plates used for boundary layer investigation should be blunt. The leading edge shape specifications as set forth by Davis are adequate to prevent leading edge seperation. In this study the leading edge shape consisted of an 11/64 inch radius nose blended into the 1 1/4 inch thick test plate with circular arcs.

2. Measurement of pressure coefficients along plates for boundary layer test should be referenced to the leading edge station static pressure.

3. False walls intended to produce a zero pressure gradient along a wind tunnel test section need not extend across an entire side of the test section. However, the false walls should be installed on opposite walls to prevent asymmetry.

4. It is possible to install an injection nozzle upstream of a flat test plate without appreciably distorting the flow over the plate. In this study a 3/8 inch diameter nozzle was installed three feet ten and one-half inches upstream of the test plate.

5. Interpretation of hot-wire anemometer readings can vary greatly with the function used to fit calibration data. The best static calibration function found related voltage squared to a third order polynomial in the square root of velocity.

6. The plate system in the final configuration was free from leading edge separation, with a boundary layer conforming to the Blasius boundary layer model until transition.

7. The boundary layer over the test plate, with and without roughness at the leading edge, was an equilibrium turbulent boundary layer obeying the law of the wall and of similar properties across the test plate.

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