ABSTRACT

This study is part of a final project conducted during an internship at the Research and Application Center for Avionics Technology and Aviation Platform (RA-ATAP). The developed system is a portable Air Data Test Set (ADTS) prototype based on an ESP32 microcontroller, designed to simulate air pressure in testing airspeed indicators (ASI). The prototype integrates mechanical and electrical components, including the MS5803-14BA digital pressure sensor, pressure pump, solenoid valves, and a user interface with an LCD and keypad, all packaged in a portable unit. The system is programmed to receive airspeed input (knots), convert it into target pressure, and control the actuators to automatically generate pressure until the set value is reached. Testing focused on positive pressure mode, with results showing alignment between digital sensor readings, analog pressure gauge measurements, and airspeed indicator outputs, with average differences ranging from 0.20 mbar to 0.40 mbar. Although the system supports vacuum mode features, altimeter and vertical speed indicator testing were not included at this stage. The findings are expected to serve as an educational tool for understanding pitot-static system principles at laboratory and vocational education levels.

Keywords: ADTS, pitot-static, ESP32, airspeed indicator, air pressure, educational prototype