Computer aided design is often a critical component of communication throughout the development process. With CAD packages capable of performing various complex analyses, this software has also become a boon to the invention process. Engineering Sketch Pad is one such software package, with capabilities to perform sensitivity analysis of various parameters, oriented primarily toward aircraft. A planned capability of ESP is the ability to use computational optimization methods to generate geometry based on a set of defined parameters specific to a particular aircraft. However, in order to evaluate the efficacy of these methods and have a point of comparison, some human-built baseline models are to be developed. The primary factors to be compared will be the time to build the model and the final goodness of the fit. It is implied, however, that the user generating these baseline geometries has some degree of experience doing so and some understanding of the overall process. This would reduce the time spent for learning and discovery, and ensure that most of the time is spent on tasks relevant to the interest of this research. In order to gain such familiarity with the aircraft modelling process and the methodology involved, a more accessible program, OpenVSP, is used as a precursor. This program is centered primarily on the design of aircraft models for visual purposes. The emphasis of the software is on ease of use, rather than on analysis. After creating these ‘practice’ geometries, they are to be recreated in ESP with its less constrained tools and extended functionality. Results reflected projected build times of relatively complex geometry to be approximately 7-8 hours, but further comparison awaits the development of computational methods.