

An Object-Oriented Method for the Definition of Mission Profiles for Aircraft Design

ABSTRACT: A mission profile is a detailed description of an aircraft's flight path and its in-flight activities. It is a vital aspect of the conceptual design of an aircraft. Although the analysis of the trajectory or mission of an aircraft is treated in great depth by a number of conceptual design software systems, a general methodology for defining the mission profile does not exist. This paper presents a new method for organizing the data and methods related to the definition of the mission profile for an aircraft. An object-oriented method is used to define the overall mission profile as a set of classes. The user interface methods which will provide the aircraft designer with tools to interactively define the mission profile are encapsulated within these classes. An object-oriented design provides this method with a high degree of extensibility. The encapsulation and inheritance features allow new types of phases and other mission data and methods to be simply "plugged" into an existing system. New classes can be defined with specific methods built into them to tailor the system to the needs of any existing conceptual aircraft design system. An implementation of this new method is also presented in this paper. The implementation provides the user with a Motif-like interface which is based on the ISO standard for 3D graphics, PHIGS. This implementation has been integrated with the aircraft design software, ACSYNT (Aircraft SYNThesis). This integration and use of these methods with ACSYNT are also discussed.