

INPUT DATA GENERATION FOR MARCHING CALCULATION OF SUPERSONIC FLOW PAST VARIOUS ROCKET LAYOUTS

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This paper gives a general overview of components and layouts used in supersonic rockets of different purposes. The rocket layout is specified as a structure and a set of components (a wing, a rudder, a stabilizer, a destabilizer, and a superstructure) arranged along the rocket structure. The goal of this work is to develop a unified approach to specifying the shape parameters of rocket layouts regardless of the rocket type. For complex-shape rocket layouts, the paper proposes an approach in which the shapes of the rocket structure and the additional components installed thereon are specified independently. The additional components of the rocket layout are bound to the rocket structure using operation parameters. The use of the operation parameters binds each additional component of the rocket layout to the rocket structure, thus offering a unified method for specifying the geometrical parameters of variously shaped rocket layouts. This approach is developed towards more complex shapes of rocket layout elements arbitrarily placed on rocket structures. The outside shape of each rocket component is specified in a Cartesian system of coordinates rigidly bound thereto.

A unified approach to specifying the outside shape of various rocket components is presented. According to the general scheme of specifying the geometrical parameters of rocket layout components, they are specified by three methods: analytically, by plan shape, and by plan shape with board and end chord profiles. To describe the outside shape of a component, the specification method and the number and the values of its key parameters are specified.

To specify rocket layout input data, one has to fix the number of additional components to be installed on the rocket structure. For each layout component, the parameters that define its shape, location on the rocket structure, and deflection angle are specified. To each layout component there corresponds an input data set of its own. The set consists of parameters that define the shape of the component and parameters of its operation as a part of the layout. A standard input data file for specifying rocket layout shapes is configured.

Keywords: *rocket, structure, wing, control, stabilizer, destabilizer, superstructure, input data, supersonic flow.*

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