VARIABLES USED:

|  |  |
| --- | --- |
|  | Moment about nose |
|  | Weight of individual component |
|  | Moment arm |
|  | Center of gravity without wings/fuel |
|  | Mean chord length |
|  | Wing planform area |
|  | Wingspan |
|  | Mean aerodynamic center |
|  | Wing center of gravity |
|  | Center of gravity with wings and fuel added |
|  | Moment including wings/fuel |
|  | Weight of wings plus fuel |
|  | Moment arm from center of gravity to aerodynamic center of gravity of horizontal tail |
|  | Aerodynamic center of gravity of horizontal tail |
|  | Moment arm from center of gravity to aerodynamic center of gravity of vertical tail |
|  | Aerodynamic center of gravity of vertical tail |
|  | Planform area of horizontal tail |
|  | Horizontal tail volume |
|  | Sideview area of vertical tail |
|  | Vertical tail volume |
|  | Neutral point |
|  | Static margin |
|  | Longitudinal position of the wing aerodynamic center |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

MAIN EQUATIONS USED:

Eq.1 – Moment about nose

Eq.2 – Center of gravity without wings/fuel

Eq.3 – Mean chord length

Eq.4 – Mean aerodynamic center of wing

Eq.5 – Wing center of gravity

Eq.6 – Center of gravity adjusted for wing and fuel

Eq.7 – Moment arm from center of gravity to aerodynamic center of gravity of horizontal tail

Eq.8 – Moment arm from center of gravity to aerodynamic center of gravity of vertical tail

Eq.9 – Planform area of horizontal tail

Eq.10 – Sideview area of vertical tail

Eq.11 – Neutral point location

Eq.12 – Longitudinal position of wing aerodynamic center

Resource:

Anderson, John D. “Chapter 8.” Aircraft Performance and Design, McGraw Hill Education, 1999.