

Free Variables	Units	Description
AR_{vt}	[-]	Vertical tail aspect ratio
$C_{D_{pvt}}$	[-]	Viscous drag coefficient
$C_{L_{vt,EO}}$	[-]	Vertical tail lift coefficient during engine out
$C_{L_{vt,landing}}$	[-]	Vertical tail lift coefficient during landing
$C_{L_{vt}}$	[-]	Vertical tail lift coefficient
D_{vt}	[N]	Vertical tail viscous drag, cruise
D_{wm}	[N]	Engine out windmill drag
I_z	[kgm ²]	Total aircraft moment of inertia
$L_{vt,EO}$	[N]	Vertical tail lift in engine out
$L_{vt,max}$	[N]	Maximum load for structural sizing
M	[-]	Cruise Mach number
Re_{vt}	[-]	Vertical tail reynolds number
S_{vt}	[m ²]	Vertical tail reference area (half)
V_∞	[$\frac{m}{s}$]	Freestream velocity
W_{struct}	[lbf]	Full span weight
W_{vt}	[lbf]	Vertical tail weight
$\Delta x_{lead_{vt}}$	[m]	Distance from CG to VT leading edge
$\Delta x_{trail_{vt}}$	[m]	Distance from CG to VT trailing edge
\bar{c}_{vt}	[m]	Vertical tail mean aero chord
λ_{vt}	[-]	Vertical tail taper ratio
μ	[$\frac{N \cdot s}{m^2}$]	Dynamic viscosity
ρ_∞	[$\frac{kg}{m^3}$]	Freestream density
τ_{vt}	[-]	Vertical tail thickness/chord ratio
b_{vt}	[m]	Vertical tail half span
$c_{root_{vt}}$	[m]	Vertical tail root chord
$c_{tip_{vt}}$	[m]	Vertical tail tip chord
l_{fuse}	[m]	Length of fuselage
l_{vt}	[m]	Vertical tail moment arm
$x_{CG_{vt}}$	[m]	Location of vertical tail CG
x_{CG}	[m]	Location of aircraft CG
$z_{\bar{c}_{vt}}$	[m]	Vertical location of mean aerodynamic chord