1 hp

$C_{l\beta}$

1 J

$C_{n\beta}$

1 W

1 N

1 slug

1 lbf

1 BTU

Air Density at
Sea-Level in
Standard Atmosphere (SI)

Rolling Moment Coefficient due to Sideslip (1/deg, 1/rad)

$550\ \frac{ft\text{-}lbf}{sec}$

Yawing Moment Coefficient due to Sideslip (1/deg, 1/rad)

1 N-m

1 kg-m/s^2

1 J/s

1 slug-ft/s^2

32.2 lbm

1.23 kg/m^3

778ft-lbf

Reynolds Number

1 Pa

C_y

Definition, units & positive direction

1 ksi

C_{mq}

Definition, units & sign

1 Hz

1 nmi

0 C = ?°F

F_{ty} or σ_{ty}

G (materials)

$$Pa = \frac{N}{m^2}$$

$$Rn = \frac{\rho V x}{\mu} = \frac{V x}{\nu}$$

1000 lbf/in^2

Side force coefficient, positive right, unitless

$$C_Y = \frac{F_Y}{\bar{q} S}$$

1 cycle/s

Pitching moment coefficient variation with pitch rate (< 0)

32°F

6076ft

Shear Modulus
Msi or GPa

Tension Yield Stress
ksi or MPa

Air Density at Sea-Level in Standard Atmosphere (English Units)

Dynamic Pressure

Definition in words and typical value for $c_{l\alpha}$

1 Radian

Definition in words and typical value for $C_{L\alpha}$

Static Margin

TSFC relates to what kind of engine?

TSFC

Definition & units

BSFC relates to what kind of engine?

BSFC

Definition & units

$$\bar{q} = \frac{1}{2}\rho V^2$$

0.002378 slugs/ft^3

57.3 deg

Airfoil 2-d section
lift curve slope
~ 2π/rad ~ 0.10/deg

$$SM = \bar{X}_{ac} - \bar{X}_{cg}$$

Lifting Surface or Aircraft
3-d lift curve slope
< 2π/rad ~ 0.10/deg

Thrust Specific
Fuel Consumption

$$TSFC = \frac{\dot{W}_f}{T}\left(\frac{lbf}{lbf - hr}\right)$$

Jet

Brake Specific
Fuel Consumption

$$BSFC = \frac{\dot{W}_f}{P}\left(\frac{lbf}{hp - hr}\right)$$

Piston

σ

atmospheric

I_{sp}

Definition & units

Speed of sound in a standard atmosphere (SI)

Speed of sound in a standard atmosphere (English Units)

β

flight dynamics

γ

flight dynamics

β

aerodynamics

γ

thermodynamics

c_p

thermodynamics

ϕ

flight dynamics

Specific Impulse (sec.)	Atmospheric density ratio
1116 ft/s	340 m/s
Flight path angle	Sideslip Angle
Ratio of Specific Heats	Prandtl-Glaurt Compressibility Factor or Wave Angle
Roll angle (deg)	Specific heat at constant pressure

α

materials, w/units

Part of an I-beam
which primarily carries vertical shear load

I_{zz}

Definition & units
For stability & control

Part of an I-beam
which primarily
carries the moment

$C_{m\alpha}$

Definition & typical sign

C_{lp}

Definition & typical sign

Γ

aerodynamics

STP

Ideal Gas Law

Newton's law of Gravitation

web	Coefficient of thermal expansion, CTE μstrain/degC
flange	Mass moment of inertia about the z-axis slug-ft^2
Change in rolling moment coefficient with roll rate (< 0)	Change in pitching moment coefficient with angle of attack (< 0)
Standard Temperature and Pressure	Circulation
$F_1 = F_2 = G\frac{m_1 \times m_2}{r^2}$	$p = \rho RT$

C_A vs C_D

C_L vs C_N

C_p
(aerodynamics)

Kutta
Condition

C_{Du}

C_{lp}

$C_{l\delta a}$

C_{lr}

$C_{m\delta e}$

C_{mq}

Lift Coefficient

Axial Force Coefficient

Normal Force Coefficient

Drag Coefficient

$\gamma(TE) = 0$

Pressure Coefficient

Rolling Moment Coefficient due to Roll Rate

Drag Coefficient due to forward flight speed perturbation

Rolling Moment Coefficient due to Yaw Rate

Rolling Moment Coefficient due to Aileron Deflection

Pitching Moment Coefficient due to Pitch Rate

Pitching Moment Coefficient due to Elevator Deflection

$C_{n\beta}$

$C_{n\delta r}$

C_{NP}

h_x

C_y

$C_{y\beta}$

$C_{h\alpha}$

T_{2s}

C_{mu}

$\psi\ \theta\ \phi$

Yawing Moment Coefficient due to Rudder Deflection

Yawing Moment Coefficient due to Sideslip

Angular Momentum about the X-Axis

Propeller Normal Force Coefficient

Side Force Coefficient due to Sideslip

Side Force Coefficient

Time to Double Amplitude in Spiral

Hinge Moment Coefficient due to Angle of Attack

Euler Angles

Pitching Moment Coefficient due to Perturbation in Forward Flight Speed

$\frac{EA}{L}$

$\frac{GJ}{L}$

ν

(materials)

E

(materials)

ε

(materials/structures)

τ

(materials/structures)

γ

(materials/structures)

Ohm's Law

V_r

Tropopause

Torsional Stiffness

Axial Stiffness

Young’s Modulus

Poisson’s Ratio

Shear Stress

Strain

V = IR

Shear Strain

Boundary between Earth’s Troposphere and Stratosphere

Rotation Speed

Unit Conversion between
ft and nmi

Unit Conversion between
ft. and st. mi

Unit Conversion between
Slug, lbf, s, ft

Unit Conversion between
W, J, s, N, m

Unit Conversion between
s, hp, ft, lbf

Unit Conversion between
W, hp

Unit Conversion between
lbf, lbm, s, ft

Unit Conversion between
lbm, slug

Unit Conversion between
m, in

Unit Conversion between
s, hr

$$1 = 5280 \frac{ft}{nmi}$$

$$1 = 6076 \frac{ft}{nmi}$$

$$1 = 1 \frac{W - s}{J} = 1 \frac{W - s}{N - m}$$

$$1 = 1 \frac{slug - ft}{lbf - s^2}$$

$$1 = 745.7 \frac{W}{hp}$$

$$1 = 550 \frac{ft - lbf}{s - hp}$$

$$1 = 32.174 \frac{lbm}{slug}$$

$$1 = 32.174 \frac{lbm - ft}{lbf - s^2}$$

$$1 = 3{,}600 \frac{s}{hr}$$

$$1 = 39.37 \frac{in}{m}$$

Speed of Sound as a function of temperature

Taper Ratio

Wing Dihedral Angle

Advance Ratio

Mach number

Wing Sweep Angle

Stress at point in beam away from neutral axis
Exposed to bending moment

Definition & Units of J (structures)

Dutch Roll Damping

Dutch Roll Frequency

λ (deg)
(wing geometry)

$a = \sqrt{\gamma RT}$
(ft/s, m/s)

$J = \frac{V}{nD}$ (~)
(propellers)

Γ
(wing geometry)

Λ (deg)
(wing geometry)

$M = \frac{V}{a}$ (~)

Polar Moment of Inertia
$J = \int r^2 \, dA$ (in^4, m^4)

$\sigma = \frac{MY}{I} (psi, ksi, Pa)$

$\omega_D (\frac{rad}{s})$

$\zeta_D (\sim)$