

Introdução

Navier-Stokes Equations

Continuity equation

Nonconservation form

$$\frac{D\rho}{Dt} + \rho \nabla \cdot \mathbf{V} = 0$$

Conservation form

$$\frac{\partial \rho}{\partial t} + \nabla \cdot (\rho \mathbf{V}) = 0$$

Momentum equations

Nonconservation form

$$\text{x component : } \rho \frac{Du}{Dt} = -\frac{\partial p}{\partial x} + \rho f_x \quad (2.83a)$$

$$\text{y component : } \rho \frac{Dv}{Dt} = -\frac{\partial p}{\partial y} + \rho f_y \quad (2.83b)$$

$$\text{z component : } \rho \frac{Dw}{Dt} = -\frac{\partial p}{\partial z} + \rho f_z \quad (2.83c)$$

Conservation form

$$\text{x component : } \frac{\partial(\rho u)}{\partial t} + \nabla \cdot (\rho u \mathbf{V}) = -\frac{\partial p}{\partial x} + \rho f_x \quad (2.84a)$$

$$\text{y component : } \frac{\partial(\rho v)}{\partial t} + \nabla \cdot (\rho v \mathbf{V}) = -\frac{\partial p}{\partial y} + \rho f_y \quad (2.84b)$$

$$\text{z component : } \frac{\partial(\rho w)}{\partial t} + \nabla \cdot (\rho w \mathbf{V}) = -\frac{\partial p}{\partial z} + \rho f_z \quad (2.84c)$$

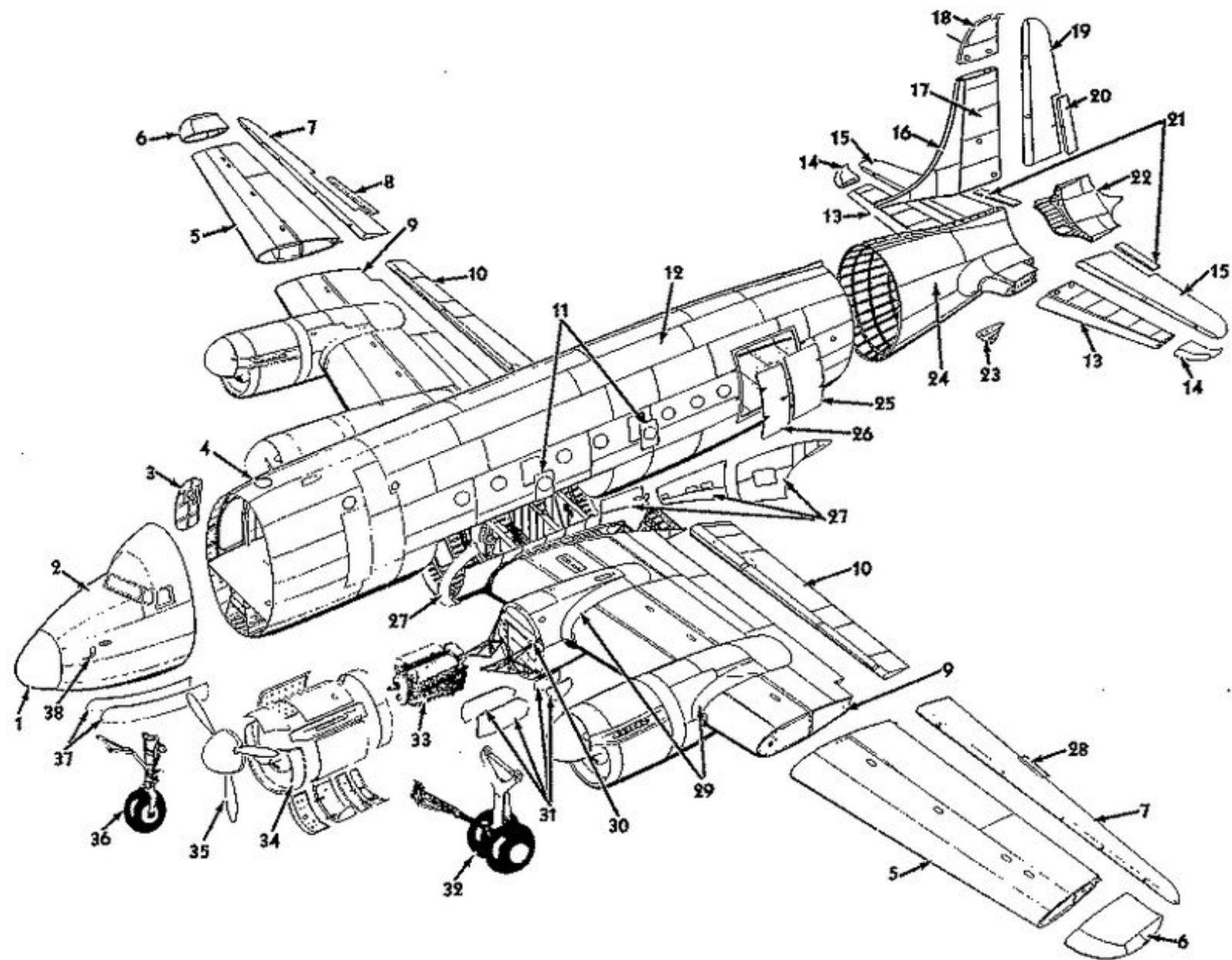
Energy equation

Nonconservation form

$$\rho \frac{D}{Dt} \left(e + \frac{V^2}{2} \right) = \rho \dot{q} - \frac{\partial(\rho u p)}{\partial x} - \frac{\partial(\rho v p)}{\partial y} - \frac{\partial(\rho w p)}{\partial z} + \rho \mathbf{f} \cdot \mathbf{V} \quad (2.85)$$

Conservation form

$$\frac{\partial}{\partial t} \left[\rho \left(e + \frac{V^2}{2} \right) \right] + \nabla \cdot \left[\rho \left(e + \frac{V^2}{2} \right) \mathbf{V} \right] = \rho \dot{q} - \frac{\partial(\rho u p)}{\partial x} - \frac{\partial(\rho v p)}{\partial y} - \frac{\partial(\rho w p)}{\partial z} + \rho \mathbf{f} \cdot \mathbf{V} \quad (2.86)$$



WHO

AM i?

Demoiselle - 1907



SPAD XIII – Francês - 1917



Travel Air Type R - 1931



P51 Mustang - 1940

don't me



Messerschmitt ME 262 – 1944 – 1º Jato em operação



Boeing B-29 (1943) e Bell X-1 (XS1) (1946) – 1º aeronave a quebrar a barreira do som



Boeing 747 – 1º Transatlântico com motor à reação



QAC Quickie Q200



Boomerang - 1996



Solar Impulse - Primeira circum-navegação (asa fixa) feita somente com energia solar



X29 – 1984 – Mach 1.8



14 BIS - 1906

Fairchild PT-19 – Utilizado pela FAB para treinamento de pilotos militares entre 1942 e 1960





AEROBACS INCLUDING SPINS PROHIBITED

Intentional Spinning With Flaps Extended Prohibited

FLAP WARNING
DO NOT LOWER FLAPS
ABOVE 95 M.P.H.

CLIMB
DOWN
UP

Night Solo Flight From Front seat only

STARTER
PUSH

MIXTURE LEAN
RICH

NOSE UP - NOSE DOWN

DOWN
CORNER

ONLY

ON
OFF
MASTER
SWITCH

FLAPS
DOWN

FA

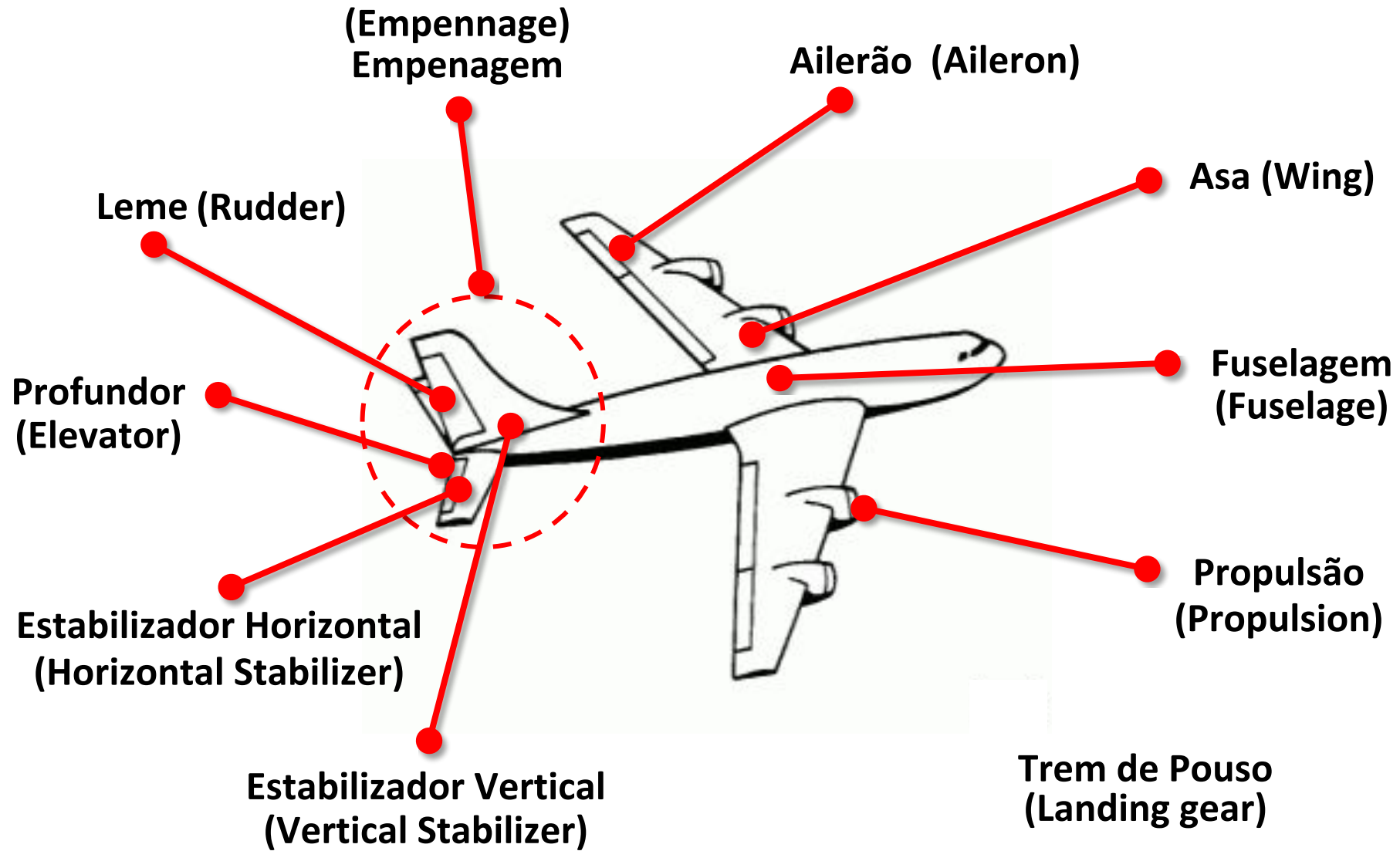
Gulfstream G650 – Aeronave executiva de maior alcance do mundo (~ 13000 km)

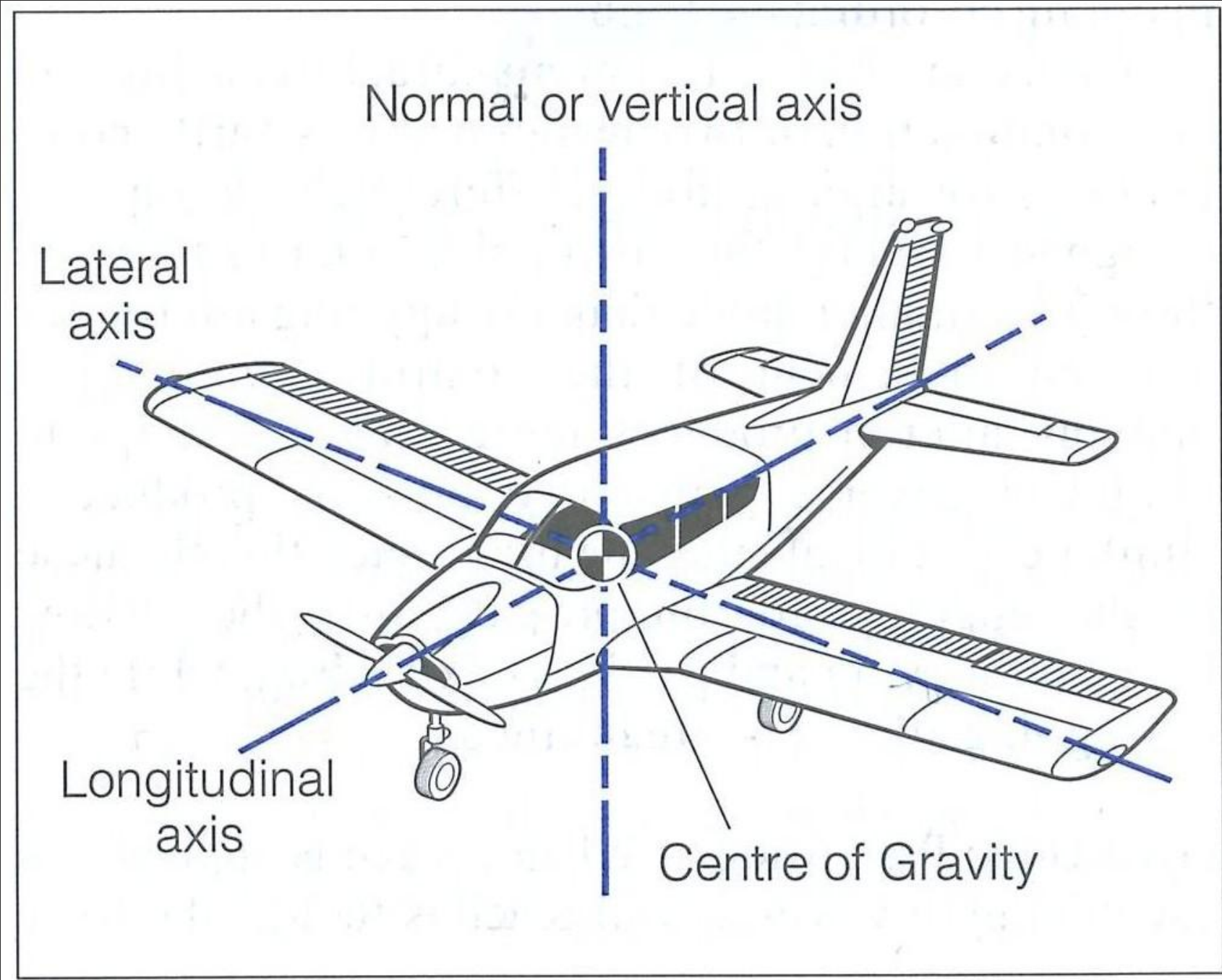


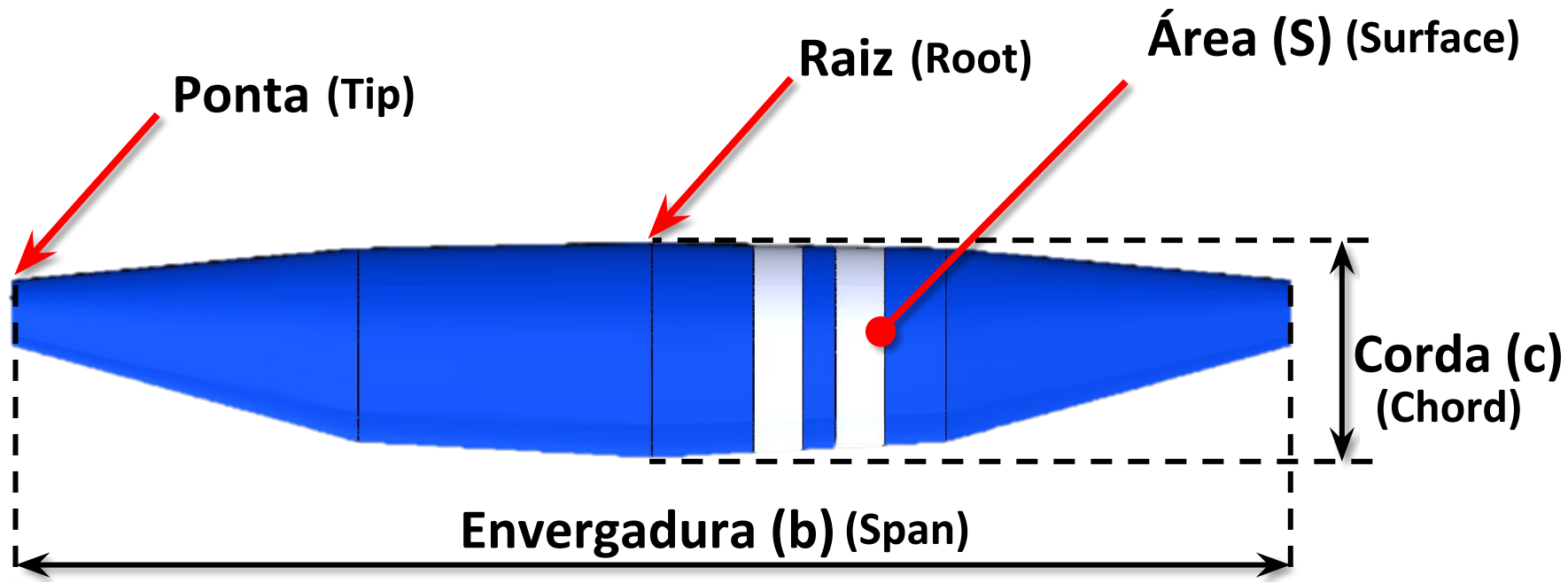




https://www.youtube.com/watch?time_continue=3&v=boB6qu5dcCw







$$\text{Alongamento (AR)} = \frac{b^2}{S} = \frac{b}{c} \quad (\text{p/ asas retangulares})$$

$$\text{Afilamento } (\lambda) = \frac{c_t}{c_r}$$

Why are you here?

Azul S.A.

Demonstrações do resultado

Exercícios findos em 31 de dezembro de 2014, 2013 e 2012

(Em milhares de reais, exceto lucro/prejuízo por ação)

	Controladora			Consolidado		
	31 de dezembro de			31 de dezembro de		
	2014	2013	2012	2014	2013	2012
Receita líquida (Nota 27)						
Transporte de passageiros	-	-	-	5.129.613	4.667.542	2.454.651
Outras receitas	-	-	-	673.440	566.613	262.704
Receita líquida	-	-	-	5.803.053	5.234.155	2.717.355
Custos dos serviços prestados (Nota 28)	-	-	-	(4.743.650)	(4.160.819)	(2.317.904)
Lucro bruto	-	-	-	1.059.403	1.073.336	399.451
Despesas operacionais						
Comerciais (Nota 28)	-	-	-	(254.418)	(223.211)	(141.800)
Administrativas (Nota 28)	(1.369)	(7.112)	(8.139)	(404.059)	(381.883)	(249.010)
	(1.369)	(7.112)	(8.139)	(658.477)	(605.094)	(390.810)
Resultado de equivalência patrimonial (Nota 15)	(39.139)	20.286	(162.668)	-	-	-
Lucro (prejuízo) operacional	(40.508)	13.174	(170.807)	400.926	468.242	8.641



