



Ed Link, Inventor



Flight Simulators (the ultimate video game)



Stef Petryszyn



F-4 Phantom

McDonnell Douglas



Air Force / Navy / Multiple Countries

All weather fighter/bomber

2 engine

Crew: 2

Top Speed Mach 2.23

R/C 41, 300 ft/min

S-3A Viking

Lockheed



Navy

Ant-Submarine

2 engine

Crew: 4

Top Speed Mach .79

R/C 5, 120 ft/min

F-111 Aardvark

General Dynamics



Air Force

Variable Sweep
fighter/bomber

2 engine

Crew: 2

Top Speed Mach 2.5

R/C 25, 890 ft/min

AH1 Huey Cobra/ AH64 Apache

Bell Helicopter Hughes



Army

Attack Helicopter

2 engines

Crew: 2

Cobra – Bell Helicopter

Apache - Hughes



JA 37 Viggen Saab



Swedish Air Force

Attack, fighter,
reconnaissance

1 Engine

Crew: 1

Top Speed Mach 2.1

R/C 12, 200 ft/min

SR71 Blackbird

Lockheed



Air Force / NASA

Reconnaissance

2 engine

Crew: 2

Top Speed Mach 3.2+

R/C 11, 810 ft/min

P3 Orion Lockheed



Navy / Multiple Countries

Maritime Patrol

4 engines

Crew: 11

F5 Tiger / Tigershark

Northrop



Air Force / Multiple Countries

Fighter / Attack

2 engines

Crew: 1

Top Speed Mach 1.6

R/C 34, 400 ft/min

F14 Tomcat Grumman



Navy

Interceptor / Multi-role
Fighter

2 engine

Crew: 2

Top Speed Mach 2.34

R/C 45, 000+ ft/min

C130 Hercules

Lockheed



Air Force / Marines /
Multiple Countries

Military Transport

Crew: 4 - 6

Range: 2.360 miles

F16 Falcon

General Dynamics / Lockheed Martin



Air Force / Multiple
Countries

Multi-role Fighter

1 Engine

Crew: 1

Top Speed Mach 2+

R/C 50,000 ft/min



F117 Nighthawk

Lockheed Martin



Air Force
Stealth Attack Aircraft
2 Engines
Crew: 1
Top Speed Mach .92

B2 Spirit

Northrop Grumman



Air Force
Stealth Bomber
Crew: 2
Top Speed Mach .95
Range: 6000 Miles

F18 Hornet

McDonnell Douglas



Navy / Marines / Multiple Countries

Multi-role fighter

2 engines

Crew: F18C – 1, F18D - 2

Top Speed Mach 1.8

Max R/C: 50, 000 ft/min

F22 Raptor

Lockheed Martin

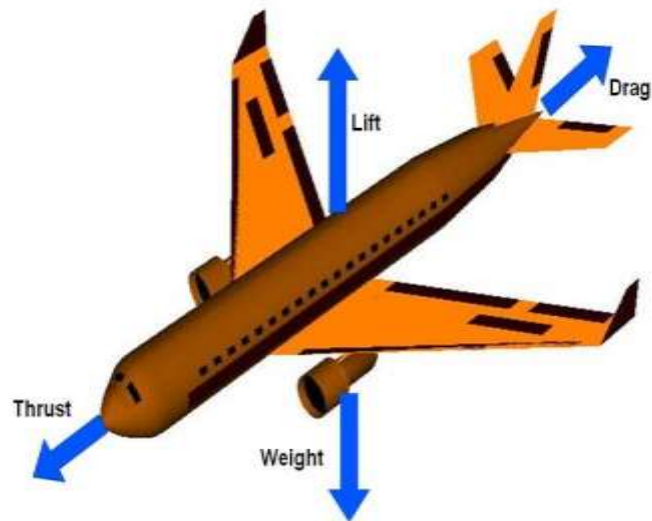


Air Force
Stealth Air superiority fighter
2 engines (pitch thrust vector)
Crew: 1
Top Speed Mach 2.25
Super cruise speed: Mach 1.8

Aircraft Forces

National Aeronautics and Space Administration

Four Forces on an Airplane

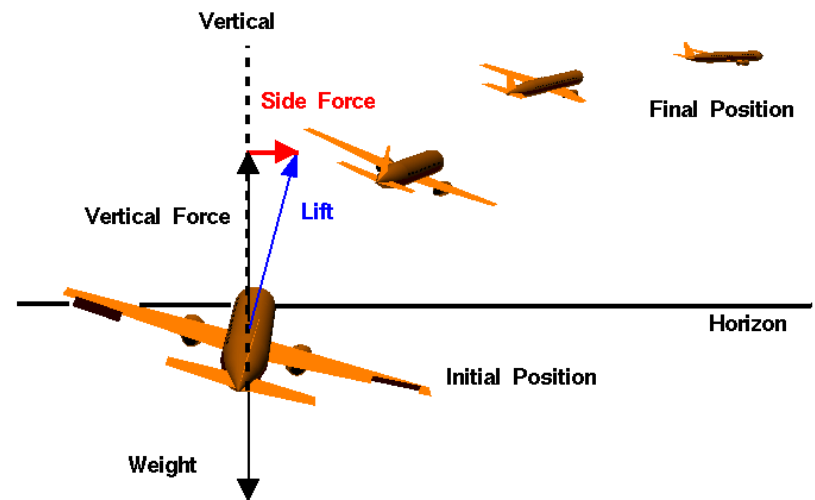


www.nasa.gov



Banking Turn

Glenn
Research
Center



Aircraft Forces

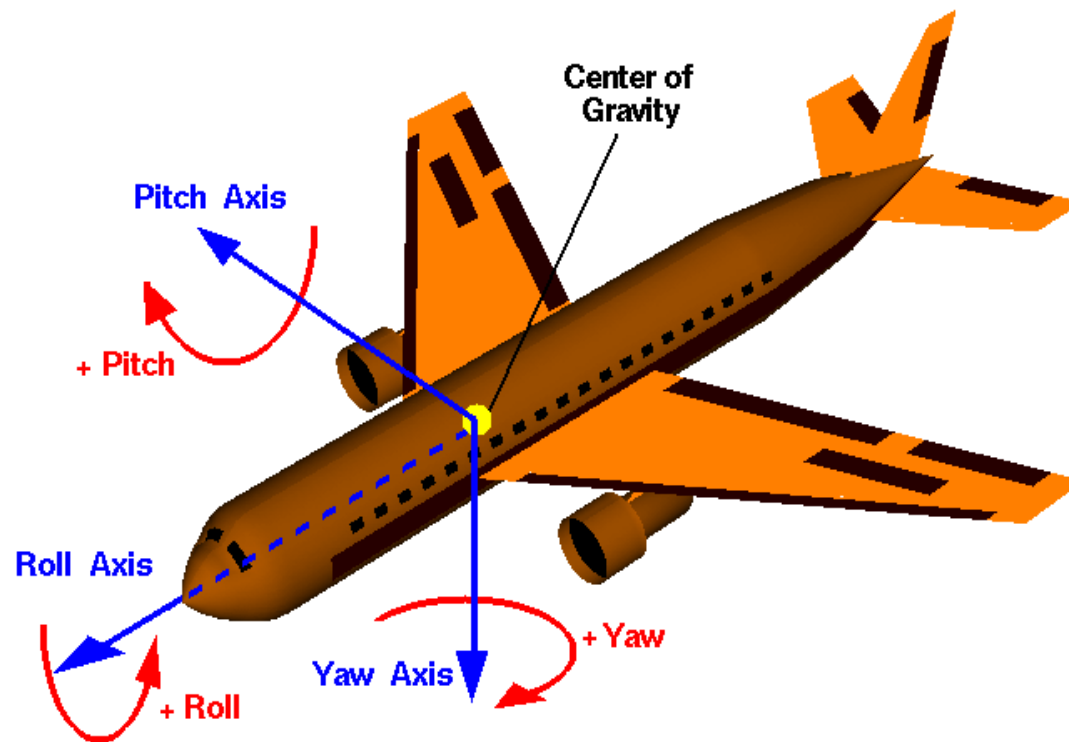
- Forces - pounds
 - Lift = $C_L * q * S$
 - Drag = $C_D * q * S$
 - Sideforce = $C_Y * q * S$
 - C_L = Lift Coefficient
 - C_D = Drag Coefficient
 - C_Y = Side Force Coefficient
 - Where q is dynamic pressure ($\frac{1}{2} \rho V^2$)
 - ρ = Air density
 - V = velocity in feet per sec
 - S = wing area in square feet

Aircraft Moments



Aircraft Rotations *Body Axes*

Glenn
Research
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Aircraft Moments

- Moments – ft pounds
 - Pitch = $C_m * q * S * c$
 - Roll = $C_l * q * S * c$
 - Yaw = $C_n * q * S * c$
 - Where q is dynamic pressure ($\frac{1}{2} \rho V^2$) in psf
 - ρ = Air density
 - c = wing cord in feet
 - S = wing area in square feet

What is the Unique Characteristic
of Each Aircraft?

Sep 27 – STEMosphere 2014

<http://www.eventbrite.com/e/share-fair-nations-stemosphere-denver-2014-tickets-12919457445>