

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 0

JOF PAGE:

JOF CHAPT NAME:

Aerospace Education

branch of general education concerned with communicating knowledge, skills and attitudes about aerospace activities and the total impact of air and space vehicles upon society

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 1

JOF PAGE:

JOF CHAPT NAME:

aviator

a person who operates an aircraft during flight

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 1

JOF PAGE: 186

JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

supersonic

faster than the speed of sound

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 1

JOF PAGE:

JOF CHAPT NAME:

aviation

the art, science and technology of flight within the atmosphere

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 1

JOF PAGE: 218

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

AGL

above ground level

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 1

JOF PAGE:

JOF CHAPT NAME:

aerospace

a combination of aeronautics and space.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 1

JOF PAGE: 264

JOF CHAPT NAME: Chapter 10 – The Airport

airport

a place on either land or water where aircraft can land and take off for flight

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 1

JOF PAGE:

JOF CHAPT NAME:

aero

pertaining to air

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 1

JOF PAGE: 173

JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

aeronautics

the science of flight within the atmosphere

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 1

JOF PAGE: 381

JOF CHAPT NAME: Chapter 18 – The Atmosphere

air

a mixture of gases that contain approximately 79% nitrogen, 19% oxygen and 2% other gases

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 1

JOF PAGE: 190

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

aircraft

any machine that is capable of flying through the air; ex. Ultra lights, airplanes, gliders, balloons and helicopters

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 1

JOF PAGE: 191

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

airplane

an aircraft that is kept aloft by the aerodynamic forces upon its wings and is thrust forward by a propeller, or other means of propulsion, such as a jet or rocket

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 1

JOF PAGE: 177

JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

airfoil

a component, such as a wing, that is specifically designed to produce lift, thrust or directional stability, four main components are leading edge, trailing edge, chord, and camber

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 1

JOF PAGE:

JOF CHAPT NAME:

static

standing still, or without motion

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 1

JOF PAGE: 186

JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

subsonic

slower than the speed of sound

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 1

JOF PAGE: 173

JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

aerodynamics

relating to the forces of air in motion

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 2

JOF PAGE: 5

JOF CHAPT NAME: Chapter 1 – Introduction to Air Power

Icarus

in mythology, flew too close to the sun, melting the wax on his wings thus plunging him to his death.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 2

JOF PAGE: 5

JOF CHAPT NAME: Chapter 1 – Introduction to Air Power

Daedalus

mythological story where he warned his son Icarus against flying too close to the Sun

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 2

JOF PAGE: 5

JOF CHAPT NAME: Chapter 1 – Introduction to Air Power

Daedalus and Icarus

in ancient mythology, father and son, the son did not heed the instructions of his father, flew too close to the Sun melting the wax on his wings thus falling to his death

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 3

JOF PAGE: 7

JOF CHAPT NAME: Chapter 1 – Introduction to Air Power

Mongolfier

the name of the two French brothers who created the first successful manned hot air balloon in 1783

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 4

JOF PAGE: 180

JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

induced lift

Bernoullian lift, the pressure difference between the upper and lower areas of a bird's wings.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 4

JOF PAGE: 182

JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

dynamic

forces in motion

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 4

JOF PAGE: 182

JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

dynamic lift

Newton's lift, takes effect when a bird changes its body angle slightly upward to its flight path

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 5

JOF PAGE: 179

JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

Bernoulli's Principle

fluid, like air in motion, has a constant pressure, however, when fluid is accelerated, the pressure drops; wings are designed to make air flow faster on the top, causing the pressure to drop and the wing moves upward against gravity. With low pressure on top and high pressure underneath, the wing goes up.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT
CHAPTER NAME: Chapter 1 – Flight
AD PAGE: 5 JOF PAGE: 179
JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

Daniel Bernoulli

discovered the relationship between pressure and fluids in motion; this became the cornerstone of the theory of airfoil lift.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT
CHAPTER NAME: Chapter 1 – Flight
AD PAGE: 6 JOF PAGE: 450
JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

Newton's 3rd Law of Motion

for every action, there is an equal and opposite reaction.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT
CHAPTER NAME: Chapter 1 – Flight
AD PAGE: 6 JOF PAGE: 449
JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

Newton's 2nd Law of Motion

a force acting upon a body causes it to accelerate in the direction of the force; acceleration is directly proportional to the force and inversely proportional to the mass of the body being accelerated

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT
CHAPTER NAME: Chapter 1 – Flight
AD PAGE: 6 JOF PAGE: 449
JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

Newton's 1st Law of Motion

An object at rest will remain at rest unless acted upon by some outside force.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT
CHAPTER NAME: Chapter 1 – Flight
AD PAGE: 7 JOF PAGE: 178
JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

trailing edge

the back part of an airfoil

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT
CHAPTER NAME: Chapter 1 – Flight
AD PAGE: 7 JOF PAGE:
JOF CHAPT NAME:

coefficient of lift formula

mathematical formula that has 5 components: air density, velocity, wing area, airfoil design, and angle of attack.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT
CHAPTER NAME: Chapter 1 – Flight
AD PAGE: 7 JOF PAGE: 177
JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics
4 main components of an airfoil

leading edge, trailing edge, chord, and camber

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT
CHAPTER NAME: Chapter 1 – Flight
AD PAGE: 7 JOF PAGE: 177
JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics
camber

the curved part of an airfoil that goes from the leading to the trailing edge

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT
CHAPTER NAME: Chapter 1 – Flight
AD PAGE: 7 JOF PAGE: 175
JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics
relative wind

the flow of air which moves opposite the flight path of an airplane

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT
CHAPTER NAME: Chapter 1 – Flight
AD PAGE: 7 JOF PAGE: 177
JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics
leading edge

the front part of an airfoil

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT
CHAPTER NAME: Chapter 1 – Flight
AD PAGE: 8 JOF PAGE: 196
JOF CHAPT NAME: Chapter 8 – Aircraft in Motion
thrust

the force which moves an aircraft forward in flight, in CAP aircraft is provided by a propeller; drag opposes

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT
CHAPTER NAME: Chapter 1 – Flight
AD PAGE: 8 JOF PAGE: 179
JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics
2 artificial forces of flight

thrust and lift.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 8

JOF PAGE: 447

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

gravity

the natural force which pulls everything toward the center of the Earth; gives an orbit its shape; lift opposes

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 8

JOF PAGE: 179

JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

4 forces of flight

drag, gravity, thrust, and lift.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 8

JOF PAGE: 183

JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

drag

a force which retards the forward movement of an aircraft in flight.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 8

JOF PAGE: 180

JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

lift

the upward force, which opposes gravity, that supports the weight of an aircraft.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 8

JOF PAGE: 179

JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

2 natural forces of flight

drag and gravity

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 8

JOF PAGE: 177

JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

chord

an imaginary line drawn through an airfoil from its leading to its trailing edge

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 9

JOF PAGE: 184

JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

critical angle of attack

the point at which a wing will stall.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 9

JOF PAGE: 184

JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

stall

airflow breakaway from the surface of the wing creates a loss of lift, occurs with an angle of attack of around 17 degrees.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 9

JOF PAGE: 178

JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

angle of attack

the angle between the chord line and the relative wind.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 10

JOF PAGE: 178

JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

changes the angle of attack and increases lift

pulling on the control stick during take off

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 11

JOF PAGE: 191

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

roll

rotation around the longitudinal axis.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 11

JOF PAGE: 192

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

pitch

rotate around the lateral axis.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 11

JOF PAGE: 191

JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

3 axes of an airplane

longitudinal axes, lateral axes, vertical axes

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 11

JOF PAGE: 191

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

center of gravity

where the 3 (vertical, lateral, and longitudinal) axes of and airplane converge at a point

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 11

JOF PAGE: 192

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

yaw

rotation around the vertical axis.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 12

JOF PAGE: 192

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

elevator

itches the nose up or down in a rotation around the lateral axis.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 12

JOF PAGE: 191

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

ailerons

surfaces on the ends of wings, when one moves up the other moves down, rotates the airplane around the longitudinal axis, roll.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 12

JOF PAGE: 193

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

rudder

causes a plane to go left or right around the vertical axis, yaw.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 13

JOF PAGE: 202

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

flaps

increases lift, allow airplane to fly slower, creates a steeper landing angle, creates drag.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 1 – Flight

AD PAGE: 14

JOF PAGE: 196

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

lift

the shape of a propeller is used to create this

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 2 – To Fly By the Lifting Power of Rising Air

AD PAGE: 1

JOF PAGE:

JOF CHAPT NAME:

altitude

the height or distance above a reference plane; the most common planes of reference used in aviation are heights above sea level and ground level. If it is above average sea level, it is referred to as "MSL", or Mean Sea Level, and if it is Above Ground Level, it is referred to as "AGL".

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 2 – To Fly By the Lifting Power of Rising Air

AD PAGE: 23

JOF PAGE:

JOF CHAPT NAME:

lift to drag ratio

this ratio is used to measure the gliding efficiency of an aircraft; the angle of attack that results in the least drag will give the maximum lift to drag ratio, the best glide angle and the maximum glide distance.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 2 – To Fly By the Lifting Power of Rising Air

AD PAGE: 23

JOF PAGE: 417

JOF CHAPT NAME: Chapter 19 – Weather Elements

wave

as air moves across mountain ranges, it sometimes starts a waving action with strong up and down motions.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 2 – To Fly By the Lifting Power of Rising Air

AD PAGE: 23

JOF PAGE: 292

JOF CHAPT NAME: Chapter 12 – General Aviation

soaring

the art of staying aloft by exploiting the energy of the atmosphere

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 2 – To Fly By the Lifting Power of Rising Air

AD PAGE: 23

JOF PAGE: 386

JOF CHAPT NAME: Chapter 18 – The Atmosphere

density

mass in a given volume

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 2 – To Fly By the Lifting Power of Rising Air

AD PAGE: 23

JOF PAGE: 392

JOF CHAPT NAME: Chapter 18 – The Atmosphere

convection

fluid motion between regions of unequal heating, any heat transfer by vertical motion

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 2 – To Fly By the Lifting Power of Rising Air

AD PAGE: 23

JOF PAGE:

JOF CHAPT NAME:

tow plane

usually a single-engine airplane that will pull a glider from the ground to an altitude where it can be released

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 2 – To Fly By the Lifting Power of Rising Air

AD PAGE: 23

JOF PAGE:

JOF CHAPT NAME:

aspect ratio

the ratio between the span of the wing and the chord length

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 2 – To Fly By the Lifting Power of Rising Air

AD PAGE: 23

JOF PAGE:

JOF CHAPT NAME:

glide ratio

a mathematical relationship between the distance an aircraft will glide forward to the altitude loss; if an aircraft has a glide ratio of 20 to one, and it is one mile above the Earth, it should glide 20 miles before landing.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 2 – To Fly By the Lifting Power of Rising Air

AD PAGE: 23

JOF PAGE:

JOF CHAPT NAME:

span

the distance from wingtip to wingtip

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 2 – To Fly By the Lifting Power of Rising Air

AD PAGE: 23

JOF PAGE:

JOF CHAPT NAME:

thermal

a column of air that moves upward

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 2 – To Fly By the Lifting Power of Rising Air

AD PAGE: 24

JOF PAGE: 382

JOF CHAPT NAME: Chapter 18 – The Atmosphere

temperature lapse rate

the average rate at which temperature decreases with an increase in altitude; the average lapse rate is 3.5 degrees F per 1000 feet increase in altitude.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 2 – To Fly By the Lifting Power of Rising Air

AD PAGE: 24

JOF PAGE:

JOF CHAPT NAME:

stability

the atmosphere's resistance to vertical motion

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 2 – To Fly By the Lifting Power of Rising Air

AD PAGE: 24

JOF PAGE: 292

JOF CHAPT NAME: Chapter 12 – General Aviation

sailplane

an aircraft that soars on the energy of the environment, using every possible method to find lift and then to ride it to a greater height.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 2 – To Fly By the Lifting Power of Rising Air

AD PAGE: 24

JOF PAGE: 292

JOF CHAPT NAME: Chapter 12 – General Aviation

glider

an aircraft that is towed to a certain altitude and then glides back to Earth due to the pull of gravity.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 2 – To Fly By the Lifting Power of Rising Air

AD PAGE: 26

JOF PAGE: 203

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

spoilers

devices located on the wings that disrupt the airflow (laminar airflow) over the wing; this disruption causes a loss of lift; they can also serve as air, or dive, brakes

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 3 – Balloons, They Create Their Own Thermals

AD PAGE: 24

JOF PAGE: 291

JOF CHAPT NAME: Chapter 12 – General Aviation

propane burner

the heat source for filling the envelope with hot air

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 3 – Balloons, They Create Their Own Thermals

AD PAGE: 33

JOF PAGE: 291

JOF CHAPT NAME: Chapter 12 – General Aviation

wicker

a form of wooden construction used in the baskets (gondolas)

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 3 – Balloons, They Create Their Own Thermals

AD PAGE: 34

JOF PAGE: 291

JOF CHAPT NAME: Chapter 12 – General Aviation

envelope

the main body of the balloon usually made of nylon

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 3 – Balloons, They Create Their Own Thermals

AD PAGE: 34

JOF PAGE: 291

JOF CHAPT NAME: Chapter 12 – General Aviation

buoyancy

to rise or float on the surface of water or within the atmosphere

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 3 – Balloons, They Create Their Own Thermals

AD PAGE: 34

JOF PAGE: 291

JOF CHAPT NAME: Chapter 12 – General Aviation

crown

the top of the hot air balloon's envelope

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 3 – Balloons, They Create Their Own Thermals

AD PAGE: 34

JOF PAGE: 7

JOF CHAPT NAME: Chapter 1 – Introduction to Air Power

1st powered manned flight

two Frenchmen, Pilatre d'Rozier and Marquis Francois d'Arlandes, Paris, November 21, 1783.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 3 – Balloons, They Create Their Own Thermals

AD PAGE: 34

JOF PAGE: 291

JOF CHAPT NAME: Chapter 12 – General Aviation

balloon

an aircraft that uses lighter-than-air gas for its lift; this craft has no built-in means of horizontal control.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 3 – Balloons, They Create Their Own Thermals

AD PAGE: 35

JOF PAGE: 291

JOF CHAPT NAME: Chapter 12 – General Aviation

gore

one of several vertical panels that make up the envelope of a balloon.

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 3 – Balloons, They Create Their Own Thermals

AD PAGE: 35

JOF PAGE: 291

JOF CHAPT NAME: Chapter 12 – General Aviation

parachute panel

located in the top of the balloon's envelope that allows it to be deflated; when a larger area of deflation is needed some balloons are equipped with a rip panel

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 3 – Balloons, They Create Their Own Thermals

AD PAGE: 36

JOF PAGE: 292

JOF CHAPT NAME: Chapter 12 – General Aviation

hot air balloon instruments

altimeter, vertical velocity indicator, thermistor

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 3 – Balloons, They Create Their Own Thermals

AD PAGE: 36

JOF PAGE: 291

JOF CHAPT NAME: Chapter 12 – General Aviation

propane

a lightweight, low carbon fuel used to power hot air balloon burners

AD MODULE NAME: 1 – INTRODUCTION TO FLIGHT

CHAPTER NAME: Chapter 3 – Balloons, They Create Their Own Thermals

AD PAGE: 36

JOF PAGE: 292

JOF CHAPT NAME: Chapter 12 – General Aviation

thermistor

an instrument which measures the temperature within the envelope of a hot air balloon.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 0

JOF PAGE: 220

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

attitude indicator

uses a gyroscope to give the pilot an artificial horizon

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 2

JOF PAGE:

JOF CHAPT NAME:

cylinder

forms a part of the chamber in which the fuel is compressed and burned

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 2

JOF PAGE: 194

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

powerplant

a term which applies to the airplane's engine and its accessories, such as when the airplane's energy is used as an electrical system

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 2

JOF PAGE: 195

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

cycle

a recurring series of events; the airplane engine has four cycles, intake, compression, power and exhaust.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 3

JOF PAGE: 195

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

intake valve

is needed to let the fuel/air into the cylinder.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 3

JOF PAGE: 196

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

exhaust valve

is needed to let the exhaust gases out

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 3

JOF PAGE:

JOF CHAPT NAME:

nacelle

streamlined enclosure covering a wing-mounted engine.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 4

JOF PAGE: 195

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

compression

the act of making a given volume of gas smaller

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 4

JOF PAGE:

JOF CHAPT NAME:

four-stroke operating cycle

intake, compression, ignition/power, exhaust

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 4

JOF PAGE:

JOF CHAPT NAME:

intake

in a reciprocating engine, in this stroke is the mixture of air and fuel drawn into the engine

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 4

JOF PAGE: 445

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

rocket engine

aircraft engine that does not require air.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 4

JOF PAGE: 194

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

reciprocating

a type of engine that processes air and fuel by a back and forth movement of its internal parts

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 4

JOF PAGE: 195

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

stroke

in the example of an airplane engine, it is the movement of the piston, within the combustion chamber to its limits

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 5

JOF PAGE:

JOF CHAPT NAME:

lean mixture

a mixture of gasoline and air in which there is less fuel and more air.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 5

JOF PAGE:

JOF CHAPT NAME:

mixture

occurs when two chemical compounds come together, yet are not chemically combined.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 5

JOF PAGE:

JOF CHAPT NAME:

fuel

a chemical substance that is used as a source of energy; aircraft fuels include gasoline, kerosene and propane.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 5

JOF PAGE: 461

JOF CHAPT NAME: Chapter 23 – Orbits and Trajectories

combustion chamber

an enclosed container in which fuel and air are burned for the production of energy

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 5

JOF PAGE: 461

JOF CHAPT NAME: Chapter 22 – Chemical Propulsion

combustion

the chemical process of burning

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 5

JOF PAGE:

JOF CHAPT NAME:

stoichiometric

a ratio of fuel to air in which, upon combustion, all of the fuel is burned. In energy terms, it is 15 parts air to 1 part gasoline.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 5

JOF PAGE:

JOF CHAPT NAME:

rich mixture

a mixture of gasoline and air in which there is more gasoline and less air than needed for normal combustion

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 6

JOF PAGE:

JOF CHAPT NAME:

carburetor

the volume of fuel and air is controlled by the throttle

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 6

JOF PAGE: 540

JOF CHAPT NAME: Chapter 25 – Our Solar System

meter/metering

In terms of fuel for an engine, this is the process of allowing a precise amount of fuel to pass. An example would be a passageway that allows only so many molecules of gasoline to pass in a given amount of time.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 6

JOF PAGE:

JOF CHAPT NAME:

venturi

a restriction in the carburetor which causes air from the outside to accelerate as it passes through the restriction.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 7

JOF PAGE: 428

JOF CHAPT NAME: Chapter 20 – Aviation Weather

carburetor heat

used to melt ice that might form in the venturi tube.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 8

JOF PAGE:

JOF CHAPT NAME:

magneto

provides electrical power to an aircrafts sparkplugs.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 8

JOF PAGE:

JOF CHAPT NAME:

throttle and mixture

in most CAP training airplanes there are only two engine controls

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 9

JOF PAGE:

JOF CHAPT NAME:

ammeter

monitors the electrical current.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 9

JOF PAGE:

JOF CHAPT NAME:

alternator

produces alternating current which is then converted to direct current

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 11

JOF PAGE: 217

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

tachometer

monitors engine speed.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 13

JOF PAGE:

JOF CHAPT NAME:

vertical speed/velocity indicator

displays a rate of change in altitude, tells the pilot the rate of climb or descent

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 13

JOF PAGE: 218

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

airspeed indicator

records the difference between still air and air that is being rammed into the system

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 13

JOF PAGE:

JOF CHAPT NAME:

pitot

small, hollow tube, usually located on the wing, used to measure air being rammed into the system

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 13

JOF PAGE: 218

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

altimeter

measures altitude by measuring air pressure

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 14

JOF PAGE:

JOF CHAPT NAME:

gyroscope

has a small rotating wheel, called a rotor, that is mounted to an axle; the rotor will maintain its position in space while spinning at a very high speed.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 1 – Airplane Systems

AD PAGE: 15

JOF PAGE:

JOF CHAPT NAME:

inclinometer

a curved, liquid-filled glass tube with a ball inside, used to determine the quality of a turn, shows it whether the airplane is slipping or skidding in a turn.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 19

JOF PAGE: 239

JOF CHAPT NAME: Chapter 9 – Flight Navigation

course

the intended path of flight; this is measured in angular degrees from true or magnetic north.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 19

JOF PAGE:

JOF CHAPT NAME:

noise abatement

a policy set forth by a governing body that controls the noise impact upon a community surrounding an airport

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 19

JOF PAGE: 266

JOF CHAPT NAME: Chapter 10 – The Airport

control tower

a structure that houses air traffic controllers; controls the runway by giving permission to aircraft for takeoff or landing

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 19

JOF PAGE: 349

JOF CHAPT NAME: Chapter 16 – Aerospace Organizations

ATC

Air Traffic Control

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 19

JOF PAGE: 347

JOF CHAPT NAME: Chapter 16 – Aerospace Organizations

FAA

Federal Aviation Administration

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 19

JOF PAGE: 264

JOF CHAPT NAME: Chapter 10 – The Airport

taxiway

a passageway between the parking area and the runways of an airport, roads that aircraft use to get to the runway

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 19

JOF PAGE: 265

JOF CHAPT NAME: Chapter 10 – The Airport

ramp

the airport's "parking lot"

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 19

JOF PAGE: 239

JOF CHAPT NAME: Chapter 9 – Flight Navigation

heading

the direction that an airplane points with respect to true, or magnetic north, the direction that an airplane points with respect to true, or magnetic north, axis.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 19

JOF PAGE:

JOF CHAPT NAME:

traffic pattern

a rectangular path around an airport that facilitates the flow of aircraft

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 20

JOF PAGE: 238

JOF CHAPT NAME: Chapter 9 – Flight Navigation

controlled airport

an airport with an operating control tower

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 20

JOF PAGE: 266

JOF CHAPT NAME: Chapter 10 – The Airport

uncontrolled airport

an airport without an operating tower

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 20

JOF PAGE:

JOF CHAPT NAME:

typical flight profile

preflight, taxi, takeoff, climb, cruise, descent, approach-to-landing, landing, taxi, stop.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 21

JOF PAGE: 264

JOF CHAPT NAME: Chapter 10 – The Airport

taxi

ground movement of an airplane

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 22

JOF PAGE: 264

JOF CHAPT NAME: Chapter 10 – The Airport

runway heading

a magnetic number that corresponds with the runway

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 22

JOF PAGE: 264

JOF CHAPT NAME: Chapter 10 – The Airport

runway

a dedicated pathway for taking off and landing airplanes

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 22

JOF PAGE: 264

JOF CHAPT NAME: Chapter 10 – The Airport

shortened magnetic headings.

the numbers at the end of runways; the first two digits of a compass direction

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 23

JOF PAGE:

JOF CHAPT NAME:

location signs

black with yellow inscription and a yellow border, no arrows; identify a taxiway or runway location, boundary of the runway or identify an instrument landing system critical area.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 23

JOF PAGE:

JOF CHAPT NAME:

direction signs

yellow sign that gives the pilot directions.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 23

JOF PAGE:

JOF CHAPT NAME:

information signs

yellow sign with black lettering that gives information on such things as areas that cannot be seen by the tower, noise abatement procedures, and applicable radio frequencies.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 23

JOF PAGE:

JOF CHAPT NAME:

destination signs

yellow sign with black lettering and a distinctive black arrow; gives direction to special locations like military, international, FBOs, etc.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 23

JOF PAGE:

JOF CHAPT NAME:

mandatory signs

red background with white numbers/letters; denote an entrance to a runway, critical area or prohibited area

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 24

JOF PAGE: 267

JOF CHAPT NAME: Chapter 10 – The Airport

FSS-Flight Service Station

An FAA facility that provides pilots with weather briefings, flight planning, and coordination of search and rescue

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 24

JOF PAGE:

JOF CHAPT NAME:

Runway Distance Remaining signs

large black sign with a white number tells pilots the distance remaining during takeoff or landing.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 25

JOF PAGE:

JOF CHAPT NAME:

VASI

Visual Approach Slope Indicator; most common visual glide path system and gives pilots a visual indication of the proper approach angle during the landing.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 25

JOF PAGE: 267

JOF CHAPT NAME: Chapter 10 – The Airport

beacon

a tower-mounted, large rotating light located at an airport. If a civilian airport will flash alternating colors of white and green. If water airport will flash alternating white and yellow. Helicopter airports have a 3 color display of green, yellow, and white. Military airports have a white-white-green display.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 25

JOF PAGE:

JOF CHAPT NAME:

REIL

high intensity white strobe lights places on each side of the runway to mark the threshold.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 25

JOF PAGE:

JOF CHAPT NAME:

ALS

Approach Lighting System.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 25

JOF PAGE:

JOF CHAPT NAME:

runway edge lights

lights used to outline the edges of runways at night or during low visibility conditions.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 25

JOF PAGE: 264

JOF CHAPT NAME: Chapter 10 – The Airport

end of runway lighting

set of red lights marking the end of the runway.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 27

JOF PAGE:

JOF CHAPT NAME:

tetrahedron and wind tee

point into the wind

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 27

JOF PAGE:

JOF CHAPT NAME:

wind sock

indicates where the wind is coming from

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 27

JOF PAGE:

JOF CHAPT NAME:

segmented circle

a set of indicators, usually surrounding an airport's wind sock, that provide traffic pattern information to pilot in the air.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 27

JOF PAGE:

JOF CHAPT NAME:

wind direction indicators

several devices that give a pilot an indication of wind direction. Include wind sock, a wind tee, and a tetrahedron.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 27

JOF PAGE:

JOF CHAPT NAME:

taxiway lights

blue lights are the norm

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 27

JOF PAGE:

JOF CHAPT NAME:

tetrahedron

a device that gives an indication of the landing directions at an airport

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 39

JOF PAGE:

JOF CHAPT NAME:

blue symbol

on a common VFR-type aviation chart an airport with an operating control tower is shown with a:

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS

CHAPTER NAME: Chapter 2 – Airports

AD PAGE: 39

JOF PAGE:

JOF CHAPT NAME:

rotating beacon

on a common VFR-type aviation chart an airport with a star on its symbol indicates:

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS
CHAPTER NAME: Chapter 3 – Airport to Airport – Aeronautical Charts
AD PAGE: 33 JOF PAGE:
JOF CHAPT NAME:

fix

the intersection of two lines of position

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS
CHAPTER NAME: Chapter 3 – Airport to Airport – Aeronautical Charts
AD PAGE: 33 JOF PAGE:
JOF CHAPT NAME:

cartography

the art and science of creating charts and maps

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS
CHAPTER NAME: Chapter 3 – Airport to Airport – Aeronautical Charts
AD PAGE: 33 JOF PAGE:
JOF CHAPT NAME:

scale

the size of an item, or area, on a chart, compared to it in actuality

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS
CHAPTER NAME: Chapter 3 – Airport to Airport – Aeronautical Charts
AD PAGE: 33 JOF PAGE: 233
JOF CHAPT NAME: Chapter 9 – Flight Navigation

projection

a method of transferring a portion of the Earth's surface onto a flat chart; the most widely used in aeronautical charts is the Lambert Conformal Conic

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS
CHAPTER NAME: Chapter 3 – Airport to Airport – Aeronautical Charts
AD PAGE: 33 JOF PAGE:
JOF CHAPT NAME:

statute mile

a unit of length that is 5,280 feet

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS
CHAPTER NAME: Chapter 3 – Airport to Airport – Aeronautical Charts
AD PAGE: 33 JOF PAGE:
JOF CHAPT NAME:

WAC

this is the World Aeronautical Chart; it covers a much larger area than the sectional chart; the scale is 1:1,000,000 or approximately 16 statute miles per one inch.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS
CHAPTER NAME: Chapter 3 – Airport to Airport – Aeronautical Charts
AD PAGE: 33 JOF PAGE: 234
JOF CHAPT NAME: Chapter 9 – Flight Navigation

relief

a term used to describe elevations; a relief is depicted by color tints, contour lines and shading

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS
CHAPTER NAME: Chapter 3 – Airport to Airport – Aeronautical Charts
AD PAGE: 33 JOF PAGE: 231
JOF CHAPT NAME: Chapter 9 – Flight Navigation

map

a representation of the surface of the Earth (or the sky/space above)

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS
CHAPTER NAME: Chapter 3 – Airport to Airport – Aeronautical Charts
AD PAGE: 33 JOF PAGE:
JOF CHAPT NAME:

line of position (LOP)

the concept that an airplane is located somewhere along a given line

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS
CHAPTER NAME: Chapter 3 – Airport to Airport – Aeronautical Charts
AD PAGE: 33 JOF PAGE: 234
JOF CHAPT NAME: Chapter 9 – Flight Navigation

legend

an illustration showing the symbols that are used on charts

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS
CHAPTER NAME: Chapter 3 – Airport to Airport – Aeronautical Charts
AD PAGE: 33 JOF PAGE:
JOF CHAPT NAME:

nautical mile

a unit of length that is approximately 6076 feet

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS
CHAPTER NAME: Chapter 3 – Airport to Airport – Aeronautical Charts
AD PAGE: 33 JOF PAGE:
JOF CHAPT NAME:

tick

a small, or abbreviated mark on a line

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS
CHAPTER NAME: Chapter 3 – Airport to Airport – Aeronautical Charts
AD PAGE: 34 JOF PAGE: 234
JOF CHAPT NAME: Chapter 9 – Flight Navigation

chart

a projection, usually on paper, showing a body of land and other features such as water; the chart gives information, usually in the form of symbols, graphs or illustrations.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS
CHAPTER NAME: Chapter 3 – Airport to Airport – Aeronautical Charts
AD PAGE: 34 JOF PAGE: 234
JOF CHAPT NAME: Chapter 9 – Flight Navigation

Sectional Aeronautical Chart

specifically designed chart for aviation use and visual flight rules; the scale is 1:500,000 or approximately 8 statute miles to one inch.

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS
CHAPTER NAME: Chapter 3 – Airport to Airport – Aeronautical Charts
AD PAGE: 34 JOF PAGE: 231
JOF CHAPT NAME: Chapter 9 – Flight Navigation

longitude

a system of lines, known as meridians, between the north and south poles

AD MODULE NAME: 2 – AIRCRAFT SYSTEMS & AIRPORTS
CHAPTER NAME: Chapter 3 – Airport to Airport – Aeronautical Charts
AD PAGE: 34 JOF PAGE: 232
JOF CHAPT NAME: Chapter 9 – Flight Navigation

latitude

a system of lines that run parallel to the equator, also known as parallels

AD MODULE NAME: 3 – AIR ENVIRONMENT
CHAPTER NAME: Chapter 1 – Air Circulation
AD PAGE: 1 JOF PAGE: 392
JOF CHAPT NAME: Chapter 18 – The Atmosphere

radiation

the method by which the Sun heats the Earth

AD MODULE NAME: 3 – AIR ENVIRONMENT
CHAPTER NAME: Chapter 1 – Air Circulation
AD PAGE: 2 JOF PAGE:
JOF CHAPT NAME:

rotation

the Earth rotates on its axis at an angle of 23.5°, in a counter clockwise direction, while it revolves around the sun

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 1 – Air Circulation

AD PAGE: 2

JOF PAGE:

JOF CHAPT NAME:

rotation and revolution

in relation to the Sun, the two motions of Earth that effect the amount of heat received from the Sun

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 1 – Air Circulation

AD PAGE: 2

JOF PAGE:

JOF CHAPT NAME:

rotational tilt

causes the length of the days to vary and with the revolution causes seasonal changes

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 1 – Air Circulation

AD PAGE: 2

JOF PAGE:

JOF CHAPT NAME:

autumnal (fall) equinox

on September 22, the sun's direct rays strike the equator resulting in day and night of equal length

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 1 – Air Circulation

AD PAGE: 2

JOF PAGE: 395

JOF CHAPT NAME: Chapter 18 – The Atmosphere

Coriolis Force

deflects a freely moving object to the right in the Northern Hemisphere

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 1 – Air Circulation

AD PAGE: 2

JOF PAGE:

JOF CHAPT NAME:

revolution

the movement of the Earth revolving around the sun; it takes 365 days, 5 hours and 48 minutes

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 1 – Air Circulation

AD PAGE: 2

JOF PAGE:

JOF CHAPT NAME:

summer solstice

when the Sun is at its northernmost point from the equator in the Northern Hemisphere, the day is the longest, usually on June 21st or 22nd, the Northern Hemisphere is tilted TOWARD the Sun

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 1 – Air Circulation

AD PAGE: 2

JOF PAGE:

JOF CHAPT NAME:

vernal (spring) equinox

on March 21, the sun's direct rays strike the equator resulting in day and night of equal length

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 1 – Air Circulation

AD PAGE: 2

JOF PAGE:

JOF CHAPT NAME:

winter solstice

when the Sun is the farthest south of the equator and the Northern Hemisphere, the day is the shortest, usually on December 21st or 22nd, the Northern Hemisphere is tilted AWAY from the Sun

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 1 – Air Circulation

AD PAGE: 3

JOF PAGE: 393

JOF CHAPT NAME: Chapter 18 – The Atmosphere

equator

area of Earth receiving most of the sun's heat

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 1 – Air Circulation

AD PAGE: 3

JOF PAGE: 397

JOF CHAPT NAME: Chapter 18 – The Atmosphere

unequal heating

causes air movement in the atmosphere

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 1 – Air Circulation

AD PAGE: 3

JOF PAGE: 395

JOF CHAPT NAME: Chapter 18 – The Atmosphere

polar easterlies

formed when the atmosphere over the poles cools, the cold air sinks and spreads out over the surface

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 1 – Air Circulation

AD PAGE: 3

JOF PAGE: 396

JOF CHAPT NAME: Chapter 18 – The Atmosphere

prevailing westerlies

winds between 30 degrees and 60 degrees latitude, in the Northern Hemisphere are responsible for many of the weather movements across the US and Canada

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 1 – Air Circulation

AD PAGE: 3

JOF PAGE: 395

JOF CHAPT NAME: Chapter 18 – The Atmosphere

trade winds

warm, steady breezes that blow almost continuously, caused by air sinking at about 30 degrees north and south latitude and returning toward the equator

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 1 – Air Circulation

AD PAGE: 3

JOF PAGE: 395

JOF CHAPT NAME: Chapter 18 – The Atmosphere

doldrums

area of calm at the equator where the trade winds meet and produce general upward winds as they are heated, therefore, there are not steady surface winds

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 1 – Air Circulation

AD PAGE: 3

JOF PAGE: 391

JOF CHAPT NAME: Chapter 18 – The Atmosphere

circulation of the atmosphere

air movement caused by unequal heating

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 1 – Air Circulation

AD PAGE: 4

JOF PAGE: 382

JOF CHAPT NAME: Chapter 18 – The Atmosphere

jet stream

a strong wind that develops at 30,000-35,000 feet and moves as a winding road across the US, generally from the west to the east

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 2 – Weather Elements

AD PAGE: 0

JOF PAGE:

JOF CHAPT NAME:

sleet

frozen or partly frozen rain

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 2 – Weather Elements

AD PAGE: 0

JOF PAGE:

JOF CHAPT NAME:

humidity

the amount of water vapor in the air.

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 2 – Weather Elements

AD PAGE: 0

JOF PAGE:

JOF CHAPT NAME:

hail

form of precipitation which consists of balls or irregular lumps of ice

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 2 – Weather Elements

AD PAGE: 0

JOF PAGE:

JOF CHAPT NAME:

ice

frozen water

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 2 – Weather Elements

AD PAGE: 9

JOF PAGE: 394

JOF CHAPT NAME: Chapter 18 – The Atmosphere

wind direction

defined as the direction from which the wind is blowing

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 2 – Weather Elements

AD PAGE: 9

JOF PAGE: 394

JOF CHAPT NAME: Chapter 18 – The Atmosphere

wind

a body of air in motion, described as having direction and speed

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 2 – Weather Elements

AD PAGE: 10

JOF PAGE:

JOF CHAPT NAME:

Beaufort Scale

a scale for estimating wind speed, on land or sea

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 2 – Weather Elements

AD PAGE: 10

JOF PAGE:

JOF CHAPT NAME:

wind chill

temperature and wind speed are used to explain how cold it feels

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 2 – Weather Elements

AD PAGE: 11

JOF PAGE: 418

JOF CHAPT NAME: Chapter 19 – Weather Elements

microburst

a downdraft or downburst of wind, associated with a thunderstorm

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 2 – Weather Elements

AD PAGE: 12

JOF PAGE: 391

JOF CHAPT NAME: Chapter 18 – The Atmosphere

temperature

a measure of molecular motion expressed on a man-made scale

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 2 – Weather Elements

AD PAGE: 12

JOF PAGE: 391

JOF CHAPT NAME: Chapter 18 – The Atmosphere

pressure differences affecting takeoffs and landings

unequal heating gives us temperature differences which in turn causes the atmosphere to circulate

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 2 – Weather Elements

AD PAGE: 12

JOF PAGE: 391

JOF CHAPT NAME: Chapter 18 – The Atmosphere

heat

the total energy of all molecules within a substance

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 2 – Weather Elements

AD PAGE: 13

JOF PAGE: 386

JOF CHAPT NAME: Chapter 18 – The Atmosphere

atmospheric pressure

the weight of all of the atmosphere's gases and molecules on the Earth's surface

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 2 – Weather Elements

AD PAGE: 13

JOF PAGE:

JOF CHAPT NAME:

barometer

measures atmospheric pressure

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 3 – Moisture and Clouds

AD PAGE: 19

JOF PAGE: 390

JOF CHAPT NAME: Chapter 18 – The Atmosphere

dew point

the temperature at which the air becomes saturated

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 3 – Moisture and Clouds

AD PAGE: 19

JOF PAGE: 415

JOF CHAPT NAME: Chapter 19 – Weather Elements

clouds and fog

are products of condensation

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 3 – Moisture and Clouds

AD PAGE: 19

JOF PAGE: 387

JOF CHAPT NAME: Chapter 18 – The Atmosphere

water vapor

as a gas, moisture is called

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 3 – Moisture and Clouds

AD PAGE: 19

JOF PAGE: 387

JOF CHAPT NAME: Chapter 18 – The Atmosphere

weather

without moisture in the atmosphere, this could not exist

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 3 – Moisture and Clouds

AD PAGE: 19

JOF PAGE: 387

JOF CHAPT NAME: Chapter 18 – The Atmosphere

saturation

a parcel of air is holding as much water vapor as it can

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 3 – Moisture and Clouds

AD PAGE: 19

JOF PAGE: 387

JOF CHAPT NAME: Chapter 18 – The Atmosphere

moisture

the main component for clouds, rain, snow, and fog; exists in 3 states: solid, liquid, and gas

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 3 – Moisture and Clouds

AD PAGE: 19

JOF PAGE: 390

JOF CHAPT NAME: Chapter 18 – The Atmosphere

condensation

the process of converting water vapor to liquid

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 3 – Moisture and Clouds

AD PAGE: 19

JOF PAGE: 415

JOF CHAPT NAME: Chapter 19 – Weather Elements

fog

tiny droplets of liquid water in contact with the ground

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 3 – Moisture and Clouds

AD PAGE: 19

JOF PAGE: 389

JOF CHAPT NAME: Chapter 18 – The Atmosphere

relative humidity

amount of water vapor in the air compared to its water vapor capacity at a given temperature

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 3 – Moisture and Clouds

AD PAGE: 20

JOF PAGE: 409

JOF CHAPT NAME: Chapter 19 – Weather Elements

cumulus and stratus

clouds found low in the sky and close to the ground

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 3 – Moisture and Clouds

AD PAGE: 20

JOF PAGE: 413

JOF CHAPT NAME: Chapter 19 – Weather Elements

stratus

cloud with a very uniform appearance, thin with very little vertical development, sheet-like appearance, gray instead of white

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 3 – Moisture and Clouds

AD PAGE: 20

JOF PAGE: 409

JOF CHAPT NAME: Chapter 19 – Weather Elements

cumulus, stratus, and cirrus

3 basic cloud forms

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 3 – Moisture and Clouds

AD PAGE: 20

JOF PAGE: 413

JOF CHAPT NAME: Chapter 19 – Weather Elements

cirrus

clouds very high in the sky; white, thin, wispy clouds, usually in patches, filaments, hooks or bands, mainly composed of ice crystals

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 3 – Moisture and Clouds

AD PAGE: 20

JOF PAGE: 409

JOF CHAPT NAME: Chapter 19 – Weather Elements

nimbostratus

cloud type that can produce rain that can last for hours

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 3 – Moisture and Clouds

AD PAGE: 20

JOF PAGE: 412

JOF CHAPT NAME: Chapter 19 – Weather Elements

cumulomimbus

cloud that produces storms with thunder and lightning

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 3 – Moisture and Clouds

AD PAGE: 20

JOF PAGE: 409

JOF CHAPT NAME: Chapter 19 – Weather Elements

cumulus

normally white, billowy, puffy clouds, fair weather clouds

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 3 – Moisture and Clouds

AD PAGE: 20

JOF PAGE: 409

JOF CHAPT NAME: Chapter 19 – Weather Elements

clouds

made up of minute droplets of water or tiny ice crystals, or both; classified by their appearance and height

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 3 – Moisture and Clouds

AD PAGE: 21

JOF PAGE: 390

JOF CHAPT NAME: Chapter 18 – The Atmosphere

precipitation

general term given to various types of condensed water vapor that fall to the Earth's surface such as rain, snow, or ice.

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 3 – Moisture and Clouds

AD PAGE: 21

JOF PAGE: 427

JOF CHAPT NAME: Chapter 20 – Aviation Weather

turbulence

instability of the air, the motion of the air that affects the smoothness; an unrest or disturbance of air

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 3 – Moisture and Clouds

AD PAGE: 21

JOF PAGE: 390

JOF CHAPT NAME: Chapter 18 – The Atmosphere

rain

precipitation that falls to the ground as a liquid and stays a liquid

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 3 – Moisture and Clouds

AD PAGE: 21

JOF PAGE:

JOF CHAPT NAME:

freezing rain

precipitation that falls to the ground, but freezes upon contact with various surfaces

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 27

JOF PAGE: 405

JOF CHAPT NAME: Chapter 19 – Weather Elements

cT

continental tropical

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 27

JOF PAGE: 405

JOF CHAPT NAME: Chapter 19 – Weather Elements

cA

continental arctic

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 27

JOF PAGE: 405

JOF CHAPT NAME: Chapter 19 – Weather Elements

source region

an air mass's place of origin

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 27

JOF PAGE: 405

JOF CHAPT NAME: Chapter 19 – Weather Elements

mT

maritime tropical

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 27

JOF PAGE: 404

JOF CHAPT NAME: Chapter 19 – Weather Elements

air mass

huge body of air, usually 1000 miles or more across, with the same temperature and moisture characteristics

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 27

JOF PAGE: 405

JOF CHAPT NAME: Chapter 19 – Weather Elements

mE

maritime equatorial

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 27

JOF PAGE: 405

JOF CHAPT NAME: Chapter 19 – Weather Elements

mP

maritime polar

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 27

JOF PAGE: 405

JOF CHAPT NAME: Chapter 19 – Weather Elements

T

air mass capital letter indicates a tropical temperature

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 27

JOF PAGE: 405

JOF CHAPT NAME: Chapter 19 – Weather Elements

E

air mass capital letter indicates an equatorial temperature

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 27

JOF PAGE: 405

JOF CHAPT NAME: Chapter 19 – Weather Elements

P

air mass capital letter indicates a polar temperature

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 27

JOF PAGE: 405

JOF CHAPT NAME: Chapter 19 – Weather Elements

air masses

are classified by their source region and the nature of the surface in their source region; identified by a two-letter code consisting of a lowercase letter and a capital letter

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 27

JOF PAGE: 405

JOF CHAPT NAME: Chapter 19 – Weather Elements

m

air mass lowercase letter indicating a maritime (wet) source region

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 27

JOF PAGE: 405

JOF CHAPT NAME: Chapter 19 – Weather Elements

C

air mass lowercase letter indicating a continental (dry) source region

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 27

JOF PAGE: 405

JOF CHAPT NAME: Chapter 19 – Weather Elements

cP

continental polar

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 27

JOF PAGE: 405

JOF CHAPT NAME: Chapter 19 – Weather Elements

maritime

stands for water (high moisture and wet), air mass originates over water

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 27

JOF PAGE: 405

JOF CHAPT NAME: Chapter 19 – Weather Elements

A

air mass capital letter indicates an arctic temperature

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 27

JOF PAGE: 405

JOF CHAPT NAME: Chapter 19 – Weather Elements

capital letter

in an air mass classification, refers to temperature (latitude)

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 27

JOF PAGE: 405

JOF CHAPT NAME: Chapter 19 – Weather Elements

continental

stands for land (low moisture and dry), air mass originates over land

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 28

JOF PAGE:

JOF CHAPT NAME:

alternating red semicircles and blue triangles on same side of line

weather maps color and shape of occluded front symbols

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 28

JOF PAGE: 409

JOF CHAPT NAME: Chapter 19 – Weather Elements

occluded front

involves 3 differing air masses

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 28

JOF PAGE: 405

JOF CHAPT NAME: Chapter 19 – Weather Elements

cold front

occurs when the air moving into the area is colder than the already present warmer air; the heavier, colder air pushes the warmer air up and out of the way

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 28

JOF PAGE: 407

JOF CHAPT NAME: Chapter 19 – Weather Elements

warm front

occurs when warm air moves into an area of colder air and they collide; the warm air overrides the cold because it is lighter, the colder air sinks

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 28

JOF PAGE: 405

JOF CHAPT NAME: Chapter 19 – Weather Elements

front

a boundary between two air masses, classified as warm, cold, stationary and occluded

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 28

JOF PAGE:

JOF CHAPT NAME:

blue triangles

on weather maps color and shape of cold front symbols

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 28

JOF PAGE: 409

JOF CHAPT NAME: Chapter 19 – Weather Elements

cold occluded front

cold air moves in and collides with warmer air pushing the warm air aloft; then the leading edge of the cold front comes in contact with the trailing edge of the cooler surface air that was below the warm air

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 28

JOF PAGE:

JOF CHAPT NAME:

alternating red semicircles on one side of line, blue triangle on other side of line

on weather maps color and shape of stationary front symbols

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 28

JOF PAGE:

JOF CHAPT NAME:

red semicircles

on weather maps color and shape of warm front symbols

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 28

JOF PAGE: 408

JOF CHAPT NAME: Chapter 19 – Weather Elements

stationary front

when two air masses collide and neither is strong enough to force the other out of the way

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 29

JOF PAGE: 430

JOF CHAPT NAME: Chapter 20 – Aviation Weather

3 stages of a thunderstorm

building, mature, and dissipating

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 29

JOF PAGE: 430

JOF CHAPT NAME: Chapter 20 – Aviation Weather

lightning

the most spectacular and dangerous part of a thunderstorm

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 29

JOF PAGE: 430

JOF CHAPT NAME: Chapter 20 – Aviation Weather

thunderstorm

cumulonimbus cloud possessing thunder and lightning; usually strong winds, rain and sometimes hail

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 30

JOF PAGE: 431

JOF CHAPT NAME: Chapter 20 – Aviation Weather

tornado

whirling funnel of air of very low pressure and very strong winds; can suck up anything in its path and must touch the ground to be called a tornado

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 31

JOF PAGE: 434

JOF CHAPT NAME: Chapter 20 – Aviation Weather

Saffir-Simpson Hurricane Damage Potential Scale

scale presenting the categories of a hurricane

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 31

JOF PAGE: 433

JOF CHAPT NAME: Chapter 20 – Aviation Weather

tropical storm

highest category of a tropical cyclone BEFORE becoming a hurricane, winds between 39 and 74 mph.

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 31

JOF PAGE: 433

JOF CHAPT NAME: Chapter 20 – Aviation Weather

tropical depression

second lowest category of a tropical cyclone

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 31

JOF PAGE: 434

JOF CHAPT NAME: Chapter 20 – Aviation Weather

category 2 hurricane

hurricane category with winds between 96-110 mph

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 31

JOF PAGE: 525

JOF CHAPT NAME: Chapter 25 – Our Solar System

5 categories

number of categories of hurricanes in the Saffir-Simpson Hurricane Damage Potential Scale

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 31

JOF PAGE: 434

JOF CHAPT NAME: Chapter 20 – Aviation Weather

category 1 hurricane

hurricane category with winds between 75-95 mph

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 31

JOF PAGE: 432

JOF CHAPT NAME: Chapter 20 – Aviation Weather

Fujita Wind Damage Scale

explains the categories of wind speed and expected damage

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 31

JOF PAGE: 434

JOF CHAPT NAME: Chapter 20 – Aviation Weather

category 3 hurricane

hurricane category with winds between 111-130 mph

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 31

JOF PAGE: 434

JOF CHAPT NAME: Chapter 20 – Aviation Weather

category 4 hurricane

hurricane category with winds between 131-155 mph

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 31

JOF PAGE: 433

JOF CHAPT NAME: Chapter 20 – Aviation Weather

tropical disturbance

lowest category of a tropical cyclone

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 31

JOF PAGE: 434

JOF CHAPT NAME: Chapter 20 – Aviation Weather

category 5 hurricane

hurricane category with winds between 155+ mph

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 31

JOF PAGE: 433

JOF CHAPT NAME: Chapter 20 – Aviation Weather

hurricane

a tropical cyclone of low pressure and very strong winds;
usually heavy rain with possible thunderstorms and tornadoes

AD MODULE NAME: 3 – AIR ENVIRONMENT

CHAPTER NAME: Chapter 4 – Weather Systems and Changes

AD PAGE: 32

JOF PAGE: 433

JOF CHAPT NAME: Chapter 20 – Aviation Weather

eye

the calm center of a hurricane

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 1 – History of Rockets

AD PAGE: JOF PAGE: 491

JOF CHAPT NAME: Chapter 23 – Orbits and Trajectories

space shuttle

the only reusable launch vehicle we currently have

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 1 – History of Rockets

AD PAGE: 0 JOF PAGE:

JOF CHAPT NAME:

China

was probably the first country to use rockets as weapons of war.

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 1 – History of Rockets

AD PAGE: 1 JOF PAGE:

JOF CHAPT NAME:

Hero

developed first rocket engine

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 1 – History of Rockets

AD PAGE: 2 JOF PAGE:

JOF CHAPT NAME:

Roger Bacon

increased the range of rockets

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 1 – History of Rockets

AD PAGE: 2 JOF PAGE: 445

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

William Congreve

designed rockets for military use, added flight stabilizing guide sticks to rockets; built the first viable launching pad; standardized the composition of gunpowder explosives

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 1 – History of Rockets

AD PAGE: 2 JOF PAGE: 448

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

Isaac Newton

laid scientific foundation for modern rocketry with his laws of motion

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 1 – History of Rockets

AD PAGE: 2

JOF PAGE: 445

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

William Hale

developed spin stabilization for rockets

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 1 – History of Rockets

AD PAGE: 2

JOF PAGE:

JOF CHAPT NAME:

Jean Froissart

improved the accuracy of rockets by launching them through tubes

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 1 – History of Rockets

AD PAGE: 3

JOF PAGE: 446

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

Robert Goddard

experimented with solid and liquid propellant rockets; known as the "Father of Modern Rocketry"

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 1 – History of Rockets

AD PAGE: 3

JOF PAGE: 446

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

Konstantin Tsiolkovsky

in 1903, proposed the use of rockets for space exploration

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 1 – History of Rockets

AD PAGE: 4

JOF PAGE: 446

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

Hermann Oberth

space pioneer; wrote a book about rocket travel into outer space

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 1 – History of Rockets

AD PAGE: 4

JOF PAGE:

JOF CHAPT NAME:

Sergei Korolev

the leading Soviet rocket scientist

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 1 – History of Rockets

AD PAGE: 4

JOF PAGE: 554

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

Explorer I

launched by US on Jan 31, 1958, the first US satellite, ,
discovered the Van Allen radiation belts

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 1 – History of Rockets

AD PAGE: 4

JOF PAGE: 553

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

Wernher von Braun

director of the V-2 rocket project

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 1 – History of Rockets

AD PAGE: 5

JOF PAGE: 594

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Russian; the first man in space

Yuri Gagarin

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 1 – History of Rockets

AD PAGE: 5

JOF PAGE: 584

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

first American to orbit the Earth, Project Mercury

John Glenn

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 1 – History of Rockets

AD PAGE: 5

JOF PAGE: 584

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

first American in space, Project Mercury

Alan Shepard

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 1 – History of Rockets

AD PAGE: 6

JOF PAGE: 596

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Skylab

first US space station, launched in May 1973

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 1 – History of Rockets

AD PAGE: 7

JOF PAGE: 588

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Space Shuttle

a United States space transportation system for traveling to space and back to Earth

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 2 – Rocket Principles

AD PAGE: 14

JOF PAGE: 449

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

Newton's First Law of Motion

a body at rest remains at rest and a body in motion tends to stay in motion at a constant velocity unless acted on by an outside force

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 2 – Rocket Principles

AD PAGE: 14

JOF PAGE: 449

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

Newton's Third Law of Motion

to every action, there is an equal and opposite reaction

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 2 – Rocket Principles

AD PAGE: 14

JOF PAGE: 449

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

inertia

the tendency of an object at rest to stay at rest and an object in motion to stay in motion

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 2 – Rocket Principles

AD PAGE: 14

JOF PAGE: 449

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

acceleration

the rate of change in velocity with respect to time

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 2 – Rocket Principles

AD PAGE: 14

JOF PAGE: 449

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

Newton's Second Law of Motion

the rate of change in the momentum of a body is proportional to the force acting upon the body and is in the direction of the force

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 3 – Rocket Systems and Controls

AD PAGE: 14

JOF PAGE: 183

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

rocket thrust

the amount of push used to get the rocket traveling upwards

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 3 – Rocket Systems and Controls

AD PAGE: 23

JOF PAGE: 454

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

guidance system

gets the rocket to its destination; the brain of the rocket

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 3 – Rocket Systems and Controls

AD PAGE: 23

JOF PAGE: 451

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

payload

what the rocket is carrying

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 3 – Rocket Systems and Controls

AD PAGE: 23

JOF PAGE: 452

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

airframe

the shape of the rocket

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 3 – Rocket Systems and Controls

AD PAGE: 23

JOF PAGE: 451

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

four major systems or rockets

airframe, guidance, control, and propulsion

AD MODULE NAME: 4 – ROCKETS

CHAPTER NAME: Chapter 3 – Rocket Systems and Controls

AD PAGE: 23

JOF PAGE: 455

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

control system

steers the rocket and keeps it stable

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 1 – Space

AD PAGE:

JOF PAGE:

JOF CHAPT NAME:

-250F to 250F

temperature extremes on the Moon

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 1 – Space

AD PAGE:

JOF PAGE:

JOF CHAPT NAME:

prominence

a mass of gas resembling a cloud that arises from the chromosphere of the sun

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 1 – Space

AD PAGE:

JOF PAGE:

JOF CHAPT NAME:

chromosphere

(literally, "color sphere") is a thin layer of the Sun's atmosphere just above the photosphere, roughly 10,000 kilometers deep

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 1 – Space

AD PAGE:

JOF PAGE:

JOF CHAPT NAME:

spicule

a spikelike short-lived prominence appearing close to the chromosphere of the solar atmosphere

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 1 – Space

AD PAGE:

JOF PAGE: 543

JOF CHAPT NAME: Chapter 25 – Our Solar System

quasar

extremely luminous bodies, more prevalent in the early universe, emits up to 10,000 times the energy of the entire Milky Way galaxy

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 1 – Space

AD PAGE:

JOF PAGE: 542

JOF CHAPT NAME: Chapter 25 – Our Solar System

supernova

occurs when a star gives up great mass in one giant explosion of light and energy

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 1 – Space

AD PAGE: JOF PAGE: 542

JOF CHAPT NAME: Chapter 25 – Our Solar System

nova

stars that are not stable; they flare, subside, and flare again

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 1 – Space

AD PAGE: JOF PAGE:

JOF CHAPT NAME:

novae

is a cataclysmic nuclear explosion caused by the accretion of hydrogen onto the surface of a white dwarf star.

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 1 – Space

AD PAGE: 2 JOF PAGE: 499

JOF CHAPT NAME: Chapter 24 – Space Environment

space

region beyond the Earth's atmosphere where there is very little molecular activity

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 1 – Space

AD PAGE: 2 JOF PAGE:

JOF CHAPT NAME:

microgravity

small gravity levels or low gravity

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 1 – Space

AD PAGE: 2 JOF PAGE:

JOF CHAPT NAME:

universe

everything is part of the universe; stars, planets, galaxies, animals, plants and humans

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 1 – Space

AD PAGE: 3 JOF PAGE: 504

JOF CHAPT NAME: Chapter 24 – Space Environment

interplanetary space

measured from the center of the Sun to the orbit of its outermost planet

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 1 – Space

AD PAGE: 3

JOF PAGE: 499

JOF CHAPT NAME: Chapter 24 – Space Environment

cislunar space

the space between the Earth and the Moon

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 1 – Space

AD PAGE: 3

JOF PAGE: 501

JOF CHAPT NAME: Chapter 24 – Space Environment

interstellar space

the distance from one solar system to another

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 1 – Space

AD PAGE: 4

JOF PAGE: 541

JOF CHAPT NAME: Chapter 25 – Our Solar System

galaxy

an enormous collection of stars arranged in a particular shape

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 1 – Space

AD PAGE: 4

JOF PAGE: 545

JOF CHAPT NAME: Chapter 25 – Our Solar System

nebulae

giant cloud of dust and gas

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 1 – Space

AD PAGE: 5

JOF PAGE: 501

JOF CHAPT NAME: Chapter 24 – Space Environment

star

a body of hot gases

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 1 – Space

AD PAGE: 5

JOF PAGE: 546

JOF CHAPT NAME: Chapter 25 – Our Solar System

black hole

a region in space where no radiation is emitted

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 1 – Space

AD PAGE: 5

JOF PAGE:

JOF CHAPT NAME:

constellation

a grouping of stars, named after mythical figures and animals

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 1 – Space

AD PAGE: 5

JOF PAGE: 544

JOF CHAPT NAME: Chapter 25 – Our Solar System

pulsar

pulsating star that flashes electromagnetic emissions in a set pattern

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 1 – Space

AD PAGE: 6

JOF PAGE: 509

JOF CHAPT NAME: Chapter 24 – Space Environment

Van Allen belts

radiation belts filled with charged particles

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 14

JOF PAGE: 501

JOF CHAPT NAME: Chapter 24 – Space Environment

Sun

the most important element in our solar system, internal temperatures reach 15,000,000 degrees C

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 14

JOF PAGE: 522

JOF CHAPT NAME: Chapter 25 – Our Solar System

solar system

the sun and the bodies that orbit around it

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 14

JOF PAGE: 525

JOF CHAPT NAME: Chapter 25 – Our Solar System

93 million miles

distance from Sun to Earth

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 15

JOF PAGE: 503

JOF CHAPT NAME: Chapter 24 – Space Environment

photosphere

The very thin shell of the Sun's outer layer, the part that gives off light.

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 15

JOF PAGE: 503

JOF CHAPT NAME: Chapter 24 – Space Environment

solar flares

short-lived high energy discharges that can harm satellites, ground systems, spacecraft and astronauts

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 15

JOF PAGE: 502

JOF CHAPT NAME: Chapter 24 – Space Environment

solar prominences

larger energy discharges that can be thousands of miles high and last for months

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 15

JOF PAGE: 525

JOF CHAPT NAME: Chapter 25 – Our Solar System

Moon

situated in an elliptical orbit around the earth, about 1/4 the size of Earth, consists mainly of solid rock covered by dust

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 16

JOF PAGE:

JOF CHAPT NAME:

full moon

when the Moon is on the opposite side of the Earth from the Sun

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 16

JOF PAGE: 525

JOF CHAPT NAME: Chapter 25 – Our Solar System

new Moon

when the Moon is on the side of the Earth nearer the Sun

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 17

JOF PAGE: 523

JOF CHAPT NAME: Chapter 25 – Our Solar System

9 planets

number of known planets in our solar system

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 17

JOF PAGE: 523

JOF CHAPT NAME: Chapter 25 – Our Solar System

Mercury

the closest planet to the Sun, but the most difficult to see, second smallest of the 9 planets, revolves around the Sun in 88 days, with a rotation of 59 Earth days

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 17

JOF PAGE: 526

JOF CHAPT NAME: Chapter 25 – Our Solar System

1 Moon day

27 Earth days

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 18

JOF PAGE: 525

JOF CHAPT NAME: Chapter 25 – Our Solar System

Earth

only planet we know for sure sustains life

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 18

JOF PAGE: 394

JOF CHAPT NAME: Chapter 18 – The Atmosphere

our atmosphere

acts like a protective blanket absorbing some of the Sun's radiation

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 18

JOF PAGE: 524

JOF CHAPT NAME: Chapter 25 – Our Solar System

Mariner 2, Mariner 5, and Mariner 10

Mariner spacecraft which visited Venus

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 18

JOF PAGE: 523

JOF CHAPT NAME: Chapter 24 – Space Environment

Mariner 10

made a flyby of Mercury in 1974

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 18

JOF PAGE: 524

JOF CHAPT NAME: Chapter 25 – Our Solar System

Venus

second planet from the Sun, closest planet to Earth in both size and distance, revolves around the Sun in 225 Earth days, hottest planet in the solar system, covered with clouds made of water vapor and sulfuric acid, only know planet to rotate in a clockwise manner, referred to as the Evening Star

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 18

JOF PAGE: 524

JOF CHAPT NAME: Chapter 25 – Our Solar System

Pioneer 1 and Pioneer 2

Pioneer spacecraft which visited Venus

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 18

JOF PAGE: 524

JOF CHAPT NAME: Chapter 25 – Our Solar System

Venera 9 and Venera 10

USSR spacecraft which visited Venus

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 19

JOF PAGE: 528

JOF CHAPT NAME: Chapter 25 – Our Solar System

Mars

4th planet from the Sun, reddish in color because of a high iron content, atmosphere mainly composed of carbon dioxide, about half the gravity of Earth, revolves around the sun in about 687 Earth days. Red Planet

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 19

JOF PAGE: 525

JOF CHAPT NAME: Chapter 25 – Our Solar System

365 Earth days

one Earth revolution around the Sun

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 19

JOF PAGE: 523

JOF CHAPT NAME: Chapter 24 – Space Environment

Mariner

made flybys of Mars in the late 60s; flew by Venus and Mercury giving us pictures of Venus' clouds and Mercury's cratered surface

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 19

JOF PAGE: 529

JOF CHAPT NAME: Chapter 25 – Our Solar System

Viking 1 and Viking 2

spacecraft that touched down on Mars in the mid 70s

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 19

JOF PAGE: 529

JOF CHAPT NAME: Chapter 25 – Our Solar System

Sojourner Truth

the rover to the Mars Pathfinder, explored the surface of Mars

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 19

JOF PAGE: 529

JOF CHAPT NAME: Chapter 25 – Our Solar System

Mars Pathfinder

landed on Mars in July 1997

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 20

JOF PAGE: 530

JOF CHAPT NAME: Chapter 25 – Our Solar System

has 16 moons

known number of Jupiter moons

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 20

JOF PAGE: 532

JOF CHAPT NAME: Chapter 25 – Our Solar System

Saturn

has easily seen rings made of icy chunks of rock, rotates very 10 Earth hours, takes 29 Earth years to revolve around the Sun, about 900 million miles from the Sun

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 20

JOF PAGE: 531

JOF CHAPT NAME: Chapter 25 – Our Solar System

Io

moon of Jupiter that has volcanic activity

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 20

JOF PAGE: 531

JOF CHAPT NAME: Chapter 25 – Our Solar System

Giant Red Spot

a giant hurricane storm on Jupiter that is 30,000 miles long and 10,000 miles wide that has existed for over 359 years

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 20

JOF PAGE: 530

JOF CHAPT NAME: Chapter 25 – Our Solar System

Jupiter

largest planet in the solar system, 3 times the mass of all other planets put together, rotates every 10 hours which creates high winds and giant storms, a gas giant, revolves around the Sun every 11 Earth years

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 21

JOF PAGE: 534

JOF CHAPT NAME: Chapter 25 – Our Solar System

Uranus

3rd largest planet in the solar system, a gas giant, has a bluish green color, about 1.7 billion miles from the Sun, takes 84 Earth years to revolve around the Sun, rotates every 18 Earth hours, has a 60 degree tilt on its axis, has 11 very narrow black rings

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 21

JOF PAGE:

JOF CHAPT NAME:

Titan

moon of Saturn that has an atmosphere of nitrogen and methane, only moon in our solar system with its own atmosphere

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 21

JOF PAGE: 534

JOF CHAPT NAME: Chapter 25 – Our Solar System

has 15 moons

number of Uranus moons

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 21

JOF PAGE: 532

JOF CHAPT NAME: Chapter 25 – Our Solar System

has 18 moon

number of known moons of Saturn

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 22

JOF PAGE: 535

JOF CHAPT NAME: Chapter 25 – Our Solar System

has 8 moons

number of known moons of Neptune

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 22

JOF PAGE: 535

JOF CHAPT NAME: Chapter 25 – Our Solar System

Neptune

outermost of the gas giants, 4th largest planet in the solar system, about 3 billion miles from the Sun, revolves around the Sun every 165 Earth years, rotates every 19 Earth hours, has a bluish color, the most windy planet in the solar system, has a storm called the Great Dark Spot about the size of Earth, has a very narrow faint ring system, windiest planet in the solar system

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 22

JOF PAGE: 536

JOF CHAPT NAME: Chapter 25 – Our Solar System

Pluto

the least known planet, rotates about 6.5 Earth days, about 4 billion miles from the Sun, has a very elongated orbit and sometimes is closer to the Sun than Neptune

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 22

JOF PAGE: 536

JOF CHAPT NAME: Chapter 25 – Our Solar System

Charon

moon of Pluto

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 22

JOF PAGE:

JOF CHAPT NAME:

Triton

moon of Neptune which Voyager 2 showed had active geyser-like eruptions spewing out invisible nitrogen gas and dark dust particles.

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 23

JOF PAGE: 538

JOF CHAPT NAME: Chapter 25 – Our Solar System

comet

a small icy body orbiting the sun, growing in size and brightness as they approach the Sun, creating a tail that can extend for millions of miles

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 23

JOF PAGE: 537

JOF CHAPT NAME: Chapter 25 – Our Solar System

Gaspra

in October 1991 was visited by the Galileo spacecraft and became the first asteroid to have high-resolution images taken of it

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 23

JOF PAGE: 537

JOF CHAPT NAME: Chapter 25 – Our Solar System

asteroid belt

orbit between Mars and Jupiter where most asteroids are found

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 23

JOF PAGE: 537

JOF CHAPT NAME: Chapter 25 – Our Solar System

NEAR Near Earth Asteroid Rendezvous

made a high-speed, close encounter with the asteroid Mathilde in 1997, then went on to encounter the asteroid Eros

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 23

JOF PAGE: 537

JOF CHAPT NAME: Chapter 25 – Our Solar System

asteroid

a small rocky body orbiting the sun; usually found in the asteroid belt, range in size from dust particles to some that are a few hundred miles across

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 23

JOF PAGE: 539

JOF CHAPT NAME: Chapter 25 – Our Solar System

Halley's Comet

comet that appears every 76 years, last appearance was in 1996

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 23

JOF PAGE: 537

JOF CHAPT NAME: Chapter 25 – Our Solar System

Kleopatra

a metallic, dog bone-shaped asteroid the size of New Jersey

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 24

JOF PAGE: 540

JOF CHAPT NAME: Chapter 25 – Our Solar System

meteor

a small streak of light; when a meteoroid enters the Earth's atmosphere it becomes a meteor

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 24

JOF PAGE: 540

JOF CHAPT NAME: Chapter 25 – Our Solar System

meteorite

a meteor large enough to penetrate our atmosphere and actually hit the surface of the Earth

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 24

JOF PAGE: 540

JOF CHAPT NAME: Chapter 25 – Our Solar System

meteoroid

clump of dust or rock orbiting the sun

AD MODULE NAME: 5 – SPACE ENVIRONMENT

CHAPTER NAME: Chapter 2 – Solar System

AD PAGE: 115

JOF PAGE: 503

JOF CHAPT NAME: Chapter 24 – Space Environment

sunspots

darker, cooler areas of the sun, from which solar flares and prominences occur

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE:

JOF PAGE: 164

JOF CHAPT NAME: Chapter 6 – Advances in Aeronautics

X-33

was a technology demonstrator for NASA's "next-generation" of space launch vehicles, Advanced Technology Demonstrator is an unmanned vehicle, launched vertically like a rocket and lands horizontally like an airplane

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: JOF PAGE:

JOF CHAPT NAME:

Shannon Lucid

is an American astronaut who holds the record for the longest duration stay in space by a woman. She has flown in space five times including a prolonged mission aboard the Mir space station.

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: JOF PAGE: 563

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

Score satellite

communication satellite in the 1950, this one only lasted 13 days but excited the people of this nation

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: JOF PAGE:

JOF CHAPT NAME:

Kathryn Sullivan

became the first American woman to walk in space when she performed an EVA during Space Shuttle Challenger mission STS-41-G on 1984 October 11. She flew on three space shuttle missions and logged 532 hours in space.

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 1 JOF PAGE:

JOF CHAPT NAME:

satellite

natural or artificial object in space that orbits the Earth

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 1 JOF PAGE: 554

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

Sputnik

first artificial satellite, launched in 1957 by Soviet Union

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 1 JOF PAGE: 563

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

Telstar I

in 1962 became the first commercial satellite

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 1

JOF PAGE:

JOF CHAPT NAME:

COMSAT

communications satellites

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 2

JOF PAGE: 563

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

INTELSAT

International Telecommunications Satellite Organization

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 2

JOF PAGE: 565

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

DSN Deep Space Network

consists of 3 deep space communications complexes, providing continuous communications for planetary spacecraft probing into deep space

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 2

JOF PAGE: 564

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

TDRSS Tracking and Data Relay Satellite System

a COMSAT satellite, relays data and communications between the satellites and Earth

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 3

JOF PAGE:

JOF CHAPT NAME:

NAVSTAR

navigation satellites

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 3

JOF PAGE:

JOF CHAPT NAME:

GOES

Geostationary Operational Environmental Satellites

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 3

JOF PAGE: 565

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

TRANSIT

the first navigational satellite was developed to provide Polaris missile submarines with the ability to fix accurate positions

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 3

JOF PAGE: 567

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

Tiros I

first weather satellite, launched in 1960

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 3

JOF PAGE: 568

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

LANDSAT

satellites that locate natural resources and monitor conditions on the Earth's surface

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 3

JOF PAGE: 252

JOF CHAPT NAME: Chapter 9 – Flight Navigation

GPS Global Positioning Position

a civilian and military navigational satellite system that offers a precise positioning service

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 4

JOF PAGE: 551

JOF CHAPT NAME:

Explorer 6

in 1959 gave us our first photograph of Earth from space

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 4

JOF PAGE: 571

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

OSO Orbiting Solar Observatory

provided continuous solar observations for most of the 1960s and 1970s, furthered our studies of x-rays, gamma rays and ultraviolet rays

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 4

JOF PAGE:

JOF CHAPT NAME:

space probes

satellites or spacecraft that either fly by, orbit or land on a celestial body, other than Earth

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 4

JOF PAGE: 554

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

Explorer

first and oldest US satellite series

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 4

JOF PAGE: 575

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

Pioneer

in the 1970s, these probes gave us close-up pictures of Jupiter and Saturn

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 4

JOF PAGE: 529

JOF CHAPT NAME: Chapter 25 – Our Solar System

Viking

in 1975, this series explored the environment of Mars, analyzing and photographing Mars' surface with the primary emphasis on the search for life

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 4

JOF PAGE: 576

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

Voyager 1 and 2

in the late 1970s encountered Jupiter and Saturn, providing greatly improved pictures and data

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 4

JOF PAGE:

JOF CHAPT NAME:

satellites as a system

refers to a satellite's related parts in a set or a system

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 4

JOF PAGE:

JOF CHAPT NAME:

people

in a satellite as a system this part involves the design, manufacture, launch, operation of any satellite and the customers.

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 4

JOF PAGE: 574

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

Ranger

first probes to take pictures of the Moon in preparation for the Apollo landings

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 5

JOF PAGE: 516

JOF CHAPT NAME: Chapter 24 – Space Environment

over a billion

estimated number of tiny pieces of space junk is orbiting Earth, posing a potential hazard to other satellites and astronauts

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 6

JOF PAGE: 453

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

propulsion

the sub-system that boosts the satellite into orbit

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 6

JOF PAGE:

JOF CHAPT NAME:

payload of a satellite

refers to the sensors and instruments used to perform the mission

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 6

JOF PAGE:

JOF CHAPT NAME:

mission of a satellite

defines the satellite's purpose, what services will be provided, why the satellite is being built, and how it should be designed

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 6

JOF PAGE:

JOF CHAPT NAME:

structure of a satellite

has a frame and windows, insulated to control temperature, must be sturdy enough to survive the launch but light enough to get into orbit, supplies the support for other sub-systems

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 6

JOF PAGE:

JOF CHAPT NAME:

attitude control system

used to make minor corrections in direction, steers and controls where the satellite is pointed

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 6

JOF PAGE:

JOF CHAPT NAME:

electrical power

essential power ingredient of a satellite

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 6

JOF PAGE:

JOF CHAPT NAME:

solar power from solar cells

main source of electricity while the satellite is in orbit

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 6

JOF PAGE:

JOF CHAPT NAME:

insulation and heaters

most common way to control temperature on a satellite

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 6

JOF PAGE:

JOF CHAPT NAME:

sub-systems

refer to the support that is given to the spacecraft in space, including the structure, propulsion system, attitude control, power system, thermal control, and a command and control system

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 7

JOF PAGE:

JOF CHAPT NAME:

Ptolemy

gave us the first theory of the motion of celestial bodies

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 7

JOF PAGE: 477

JOF CHAPT NAME: Chapter 23 – Orbits and Trajectories

orbit

the movement or path a satellite takes around a celestial body

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 7

JOF PAGE:

JOF CHAPT NAME:

geocentric

theory which places the Earth at the center of the universe

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 7

JOF PAGE:

JOF CHAPT NAME:

telemetry

the information that tells the controller how the satellite is functioning

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 7

JOF PAGE:

JOF CHAPT NAME:

communications system

the command and control function of a satellite

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 7

JOF PAGE:

JOF CHAPT NAME:

launch

the part of the system which gets the satellite into orbit

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 7

JOF PAGE:

JOF CHAPT NAME:

celestial bodies

planets, stars, comets, and any other large objects in space

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 7

JOF PAGE:

JOF CHAPT NAME:

mission requirements

determine the orbit needed to accomplish the mission

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 8

JOF PAGE: 479

JOF CHAPT NAME: Chapter 23 – Orbits and Trajectories

perigee

the lowest point of an orbit

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 8

JOF PAGE: 448

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

Newton's Law of Universal Gravitation

law which explains the gravitational attraction or pull between bodies in the universe

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 8

JOF PAGE:

JOF CHAPT NAME:

Kepler's first law

the orbit of each planet is and ellipse, with the Sun at the focus

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 8

JOF PAGE:

JOF CHAPT NAME:

Kepler

studied the motion and measured the movement of planets, in 1600s created rules of motion

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 8

JOF PAGE:

JOF CHAPT NAME:

heliocentric

theory which places the Sun as the center of the universe

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 8

JOF PAGE:

JOF CHAPT NAME:

Copernicus

in 1400s developed the heliocentric theory, placing the Sun at the center of the universe

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 1 – Unmanned Spacecraft

AD PAGE: 8

JOF PAGE: 479

JOF CHAPT NAME: Chapter 23 – Orbits and Trajectories

apogee

the highest point of an orbit

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 13

JOF PAGE: 583

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Project Mercury

US' first manned spaceflight project, its mission was to find out if a human could survive space travel, and what, if any, effects would space travel have on the human body, lasted 2 years and consisted of 6 manned flights

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 13

JOF PAGE: 584

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Alan Shepard

on May 5, 1961 became the first American in space

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 14

JOF PAGE: 585

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Project Gemini

first two-man capsule, first American walk in space, first rendezvous and docking of a manned spacecraft with another satellite, gathered additional information about the effect of spacecraft on the human body

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 14

JOF PAGE: 584

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

John Glenn

became the first American to orbit the Earth, Project Mercury

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 14

JOF PAGE: 586

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Ed White

made the first American space walk

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 14

JOF PAGE: 584

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Gordon Cooper

flew the last Mercury flight which lasted 34 hours and 20 minutes, orbiting Earth 22 times

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 15

JOF PAGE: 586

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Edwin "Buzz" Aldrin

second man to step foot on the Moon, 20 July 1969

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 15

JOF PAGE: 586

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Apollo 13

Apollo mission that had to be aborted due to an explosion in the spacecraft, but made a successful emergency landing

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 15

JOF PAGE: 586

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Project Apollo

mission was to put a man on the Moon

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 15

JOF PAGE: 586

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Neil Armstrong

first man to step foot on the Moon, 20 July 1969

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 15

JOF PAGE: 586

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Apollo 11

first Apollo flight to land a man on the Moon, 20 July 1969, used a Saturn V launch vehicle

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 16

JOF PAGE: 587

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Project Skylab

US' manned spaceflight project that put a laboratory into space, launched in May 1973, the main lesson learned was that people could live and work in space for at least 3 months with no ill effects

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 16

JOF PAGE: 588

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Apollo-Soyuz

manned spaceflight project linking American and Soviet spacecraft in space, July 1975

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 17

JOF PAGE: 588

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

3 main parts of the Space Shuttle

orbiter, solid rocket booster, external tanks

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 17

JOF PAGE: 588

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

STS Space Transportation System

the Space Shuttle

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 17

JOF PAGE: 592

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

orbiter

part of the Space Shuttle that carries the crew and the payload

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 17

JOF PAGE: 589

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Enterprise

first Space Shuttle, only used for flight tests, never went into space

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 18

JOF PAGE: 590

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Hubble Space Telescope

launched in April 1990, provided images of space clear of atmospheric disturbances

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 18

JOF PAGE: 589

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Challenger

on Jan 28, 1986, exploded less than 2 minutes after takeoff.

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 18

JOF PAGE: 590

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Sally Ride

first American woman in space

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 19

JOF PAGE:

JOF CHAPT NAME:

Aleksei Leonov

in March 1965, first man to walk in space, spending 20 minutes outside his spacecraft

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 19

JOF PAGE: 595

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Salyut 1

first space station launched by Soviet Union in April 1971

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 19

JOF PAGE: 594

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Yuri Gagarin

first man in space, launched by the Soviet Union in April 1961

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 2 – Manned Spacecraft

AD PAGE: 19

JOF PAGE:

JOF CHAPT NAME:

Valentina Tereshkova

first woman in space, launched by Soviet Union in June 1963

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 3 – Living and Working in Space

AD PAGE: 27

JOF PAGE: 595

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Salyut

Russia's first space station, first launched in April 1971

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 3 – Living and Working in Space

AD PAGE: 27

JOF PAGE: 595

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Salyut 7

Soviet astronauts stayed aboard this space station for 234 days

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 3 – Living and Working in Space

AD PAGE: 27

JOF PAGE: 596

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Mir

Russia's space station of the 1980s and 1990s, launched in February 1986, housed Soviet and American astronauts

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 3 – Living and Working in Space

AD PAGE: 28

JOF PAGE: 597

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Spacelab

European Space Agency's first space station

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 3 – Living and Working in Space

AD PAGE: 29

JOF PAGE: 592

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

EVA Extravehicular Activities

general term used for going outside the spacecraft

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 3 – Living and Working in Space

AD PAGE: 30

JOF PAGE:

JOF CHAPT NAME:

1930s

space suit design began with high-altitude flyers

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 3 – Living and Working in Space

AD PAGE: 31

JOF PAGE: 593

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

MMU Manned Maneuvering Unit

first used in 1984, fit on astronaut's back and allowed him or her to move around without being tied to the spacecraft

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 3 – Living and Working in Space

AD PAGE: 31

JOF PAGE: 585

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Gemini 7

first spacecraft in which space suits were taken off

AD MODULE NAME: 6 – SPACECRAFT

CHAPTER NAME: Chapter 3 – Living and Working in Space

AD PAGE: 32

JOF PAGE: 602

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Space Station Alpha

future space station, a joint venture with US, Europe, Canada, Japan and Russia

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 7

JOF CHAPT NAME: Chapter 1 – Introduction to Air Power

Joseph and Etienne Montgolfier

papermakers in Annonay, France; developed a hot air balloon in June 1783

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 19

JOF CHAPT NAME: Chapter 1 – Introduction to Air Power

Orville Wright

made the first manned, powered, CONTROLLED airplane on December 17, 1903

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 7

JOF CHAPT NAME: Chapter 1 – Introduction to Air Power

Joseph Black

Professor of Chemistry at Glasgow University recognized that if hydrogen were enclosed in a thin bladder, it would weight less than the surrounding air and would rise

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 6

JOF CHAPT NAME: Chapter 1 – Introduction to Air Power

Francesco de Lana

In 1670, wrote about an "aerial ship" that would be carried aloft by four large spheres from which all air had been removed to make them lighter than the surrounding air, first scientific writings about a "vacuum balloon"

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 8

JOF CHAPT NAME: Chapter 1 – Introduction to Air Power

Jean Pierre Blanchard

with John Jeffries, made the first balloon flight from one nation to another, flying across the English Channel on Jan 7th, 1785

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 8

JOF CHAPT NAME: Chapter 1 – Introduction to Air Power

John Jeffries

with Jean Pierre Blanchard, made the first balloon flight from one nation to another, flying across the English Channel on Jan 7th, 1785

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 216

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

control instruments

tell the current state of some aircraft devices so that we are aware of its condition

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 19

JOF CHAPT NAME: Chapter 1 – Introduction to Air Power

Wright Brothers

developed the first manned, powered, controlled aircraft, developed the idea of twisting the wings called wing-warping

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 239

JOF CHAPT NAME: Chapter 9 – Flight Navigation

true course

what the navigator indicates as the course the airplane will follow

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 180

JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics

vector

a graphic mathematical illustration showing both direction and magnitude

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 25

JOF CHAPT NAME: Chapter 2 – The Adolescence of Air Power: 1904-1919

Theodore Roosevelt

in 1910, as a former president, became the first president to fly in and airplane

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 12

JOF CHAPT NAME: Chapter 1 – Introduction to Air Power

George Cayley

In 1809 published a scientific paper which laid the foundation for modern aeronautics with one sentence "The whole problem in confined within these limits, namely, to make a surface support a given weight by the application of power to the resistance of air." Identified the forces of lift, drag, and thrust; developed the cambered upper surface of a wing to increase lift; worked on propellers, developed the concept of biwinged and triwinged aircraft; in 1850 built the first successful full-sized, manned glider

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 177
JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics
upper and lower camber

this curvature determines the airfoil's thickness

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 182
JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics
maximum gross weight

airplane's total weight limitation

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 427
JOF CHAPT NAME: Chapter 20 – Aviation Weather
wingtip vortex

high pressure air spills over wing tips into low pressure space above wings creating drag behind the wing tips

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 7
JOF CHAPT NAME: Chapter 1 – Introduction to Air Power
Henry Cavendish

an English chemist, discovered the "flammable air" later named hydrogen, however, he did not recognize its lighter than air importance to flight

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 182
JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics
useful load

subtract the empty weight from the maximum allowable weight to find out how many pounds may be loaded into the airplane

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 174
JOF CHAPT NAME: Chapter 7 – Basic Aeronautics and Aerodynamics
viscosity

a fluid's resistance to flow

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 380

JOF CHAPT NAME: Chapter 18 – The Atmosphere

atmosphere

ocean of air

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 82

JOF CHAPT NAME: Chapter 4 – Air Power Goes to War

Battle of Britain

Luftwaffe was not designed to be a long range bombing force there for Germany was at a disadvantage

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 195

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

energy from fossil fuel

in a conventional, reciprocating light training engine, energy is converted as

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 206

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

semimonocoque

a fuselage structure that uses internal braces to help the skin carry the forces generated

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 207

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

3 basic types of aircraft landing gear

conventional, tricycle, and tandem

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 210

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

gravity-feed fuel system

simplest fuel system, most likely to be found in a high-wing airplane or as a backup system, uses gravity to cause the fuel to flow from the tanks downward to the engine

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 210

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

force-feed fuel system

fuel pump us usually run from the electrical power system of the aircraft, small motor that helps to keep a positive flow of fuel from the tanks to the engine so that it does not stall

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 27

JOF CHAPT NAME: Chapter 2 – The Adolescence of Air Power: 1904-1919

Harriet Quimby

In 1911 became America's first licensed female pilot, first woman to fly across the English Channel

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 487

JOF CHAPT NAME: Chapter 23 – Orbits and Trajectories

Hohmann Transfer

a practical method of space maneuver, the vehicle is first placed in a low-elliptical parking orbit, when the vehicle swings around to perigee, sufficient thrust is applied to push the vehicle to apogee at the desired altitude, when the vehicle reaches the high point of this transfer ellipse, thrust is applied again, and the vehicle moves out on a circle that is tangent to the transfer ellipse

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 33

JOF CHAPT NAME: Chapter 2 – The Adolescence of Air Power: 1904-1919

70 - 80 mph average speed

average speed of a WW1 airplane in 1914

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 19

JOF CHAPT NAME: Chapter 1 – Introduction to Air Power

Wright Flyer

the first manned, powered, CONTROLLED airplane, flew for 12 seconds, traveled 120 feet and landed safely

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 392

JOF CHAPT NAME: Chapter 18 – The Atmosphere

conduction

when one molecule (energized to a higher level of molecular motion through the heating process), contacts another molecule, the second molecule absorbs some of this heat

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 15

JOF CHAPT NAME: Chapter 1 – Introduction to Air Power

Samuel Pierpont Langley

In 1896, successfully built a steam-powered unmanned model that flew 3/4 of a mile before running out of fuel; his manned Aerodrome did not fly but fell into the Potomac, causing the government to withdraw its funding

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 139

JOF CHAPT NAME: Chapter 5 – Aviation: From the Cold War to Desert Storm

Tet offensive

In January 1968, during a holiday cease-fire, the North Vietnamese communists abandoned small guerrilla warfare attacks and launched a large-scale surprise conventional attack on US and South Vietnamese forces. While the attack failed because of superior US air power it changed public opinion in the US about the war.

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 33

JOF CHAPT NAME: Chapter 2 – The Adolescence of Air Power: 1904-1919

10,000 flight ceiling

average flight ceiling of a WW1 airplane in 1914

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 26

JOF CHAPT NAME: Chapter 2 – The Adolescence of Air Power: 1904-1919

Vin Fiz Flyer

aircraft in which Calbraith Perry Rodgers made the first US coast to coast flight

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 24

JOF CHAPT NAME: Chapter 2 – The Adolescence of Air Power: 1904-1919

Glenn Curtis

with Alexander Graham Bell founded an organization called the Aerial Experiment Association that designed and built several aircraft, including the first American aircraft to be equipped with aileron

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 40

JOF CHAPT NAME: Chapter 2 – The Adolescence of Air Power: 1904-1919

Billy Mitchell

in 1918, commanded the first mass use of aircraft for bombing attacks on enemy supply routes and for supporting the ground troops

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 23

JOF CHAPT NAME: Chapter 2 – The Adolescence of Air Power: 1904-1919

Wilber Wright

went to France to demonstrate their plane to the European governments, resulting in signing a \$100,000 contract to for a French airplane building company

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 216

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

instrument classification

aircraft instruments are classified either in terms of their use or in terms of the principle underlying their operation or construction

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 114

JOF CHAPT NAME: Chapter 5 – Aviation: From the Cold War to Desert Storm

National Security Act

the US Army Air Force became the United State Air Force

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 264

JOF CHAPT NAME: Chapter 10 – The Airport

white runway lights

color of lights that border the edges along the length of a runway

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 266

JOF CHAPT NAME: Chapter 10 – The Airport

FBO Fixed Base Operation

service station for airplanes

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 267

JOF CHAPT NAME: Chapter 10 – The Airport

passenger terminal

place in an airport where people, baggage and cargo are processed

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 264

JOF CHAPT NAME: Chapter 10 – The Airport

parallel

most common airport taxiway

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 382

JOF CHAPT NAME: Chapter 18 – The Atmosphere

troposphere

that region in which people live, work, play, and fly, extending from the Earth's surface to about 10 miles above the Earth at the equator; the atmosphere within the region is constantly turning and changing as it produces what is known as weather; temperatures generally decrease with increase in altitude

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 57

JOF CHAPT NAME: Chapter 3 – The Golden Age: 1919-19

Washington, DC and NYC

first airmail route in the US

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 381

JOF CHAPT NAME: Chapter 18 – The Atmosphere

78% nitrogen 21% oxygen

composition of Earth's atmosphere

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 232

JOF CHAPT NAME: Chapter 9 – Flight Navigation

prime meridian

the great circle line that passes from the North Pole to the South Pole through Greenwich, England

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 64

JOF CHAPT NAME: Chapter 3 – The Golden Age: 1919-19

McNary-Waters Act

passed in 1930 as an amendment to the Air Mail Act of 1925, authorized the postmaster general to extend or combine air mail routes

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 79

JOF CHAPT NAME: Chapter 4 – Air Power Goes to War

Blitzkrieg

"lightning war", known as combined arms operations because the army and air forces are used in combination with each other

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 65

JOF CHAPT NAME: Chapter 3 – The Golden Age: 1919-19

Pan American Clipper

seaplane, made the first airline crossing of both the Pacific and Atlantic Oceans

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 64

JOF CHAPT NAME: Chapter 3 – The Golden Age: 1919-19

Boeing 247

Feb 1933, a twin-engine, all-metal, low-wing monoplane, constructed with stressed skin and retractable landing gear, could carry 10 passengers and 400 lbs of mail, with a cruising speed of 189 mph make possible the first "same-day service" between New York and San Francisco

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 64

JOF CHAPT NAME: Chapter 3 – The Golden Age: 1919-19

DC-2

May 1934, Douglas Commercial Two, cruising speed of 192 mph, carried 14 passengers and several thousand pounds of mail

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 59

JOF CHAPT NAME: Chapter 3 – The Golden Age: 1919-19

Spirit of St. Louis

in May 1927, first airplane to fly nonstop across the Atlantic Ocean, piloted by Charles Lindbergh

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 66

JOF CHAPT NAME: Chapter 3 – The Golden Age: 1919-19

Hindenburg

launched in 1936, exploded during it's landing at Lakehurst, NJ in 1937

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 66

JOF CHAPT NAME: Chapter 3 – The Golden Age: 1919-19

Graf Zeppelin

dirigible launched in 1928; made a successful round the world flight in 1930; in 10 years of service made 590 flights, including 144 ocean crossings, flew more than 1,000,000 miles and carried 13,110 passengers, retired in 1939

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 577

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

Giotto spacecraft

launched in 1985 by the European Space Agency; explored Halley's Comet as close as 450 km, flying through the tail

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 238

JOF CHAPT NAME: Chapter 9 – Flight Navigation

airway

a 3 dimensional highway in the sky

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 397

JOF CHAPT NAME: Chapter 18 – The Atmosphere

isobars

lines drawn on maps to join points having the same barometric pressure, when the lines are far apart, the wind is weak; when the lines are close together, the wind is strong

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 382

JOF CHAPT NAME: Chapter 18 – The Atmosphere

mesosphere

a region of the atmosphere starting at 30 miles up to about 50 miles altitude

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 382

JOF CHAPT NAME: Chapter 18 – The Atmosphere

stratosphere

a region where temperature goes up with increase in altitude, beginning at 10 miles above the Earth and going to about 30 miles up

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 382

JOF CHAPT NAME: Chapter 18 – The Atmosphere

thermosphere

a region of the atmosphere that begins at 50 miles up and extends outward to about 300 miles, temperature increases

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 385

JOF CHAPT NAME: Chapter 18 – The Atmosphere

homosphere

extends from Earth's surface up to an altitude of about 60 miles, that region in which the gaseous composition and mixing are relatively constant

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 385

JOF CHAPT NAME: Chapter 18 – The Atmosphere

heterosphere

begins at about 55 to 60 miles in altitude where the molecules and atoms of the gases are spaced much further apart

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 505

JOF CHAPT NAME: Chapter 24 – Space Environment

ionosphere

an outer region of the atmosphere that consists of layers of ionized air particles; reflects certain radio waves, which allows them to be received at stations far away from the broadcasting station

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 384

JOF CHAPT NAME: Chapter 18 – The Atmosphere

ozonosphere

a special region of the atmosphere that performs the very important function of shielding us from ultraviolet and infrared radiation that could be fatal

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 255

JOF CHAPT NAME: Chapter 9 – Flight Navigation

ILS Instrument Landing System

is used only with a short distance from the airport and only when the purpose is to land the airplane

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 393

JOF CHAPT NAME: Chapter 18 – The Atmosphere

insolation

the rate at which the Earth's surface is heated by solar radiation

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 235

JOF CHAPT NAME: Chapter 9 – Flight Navigation

black dot on a sectional chart

highest point on a hill on a sectional chart

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 397

JOF CHAPT NAME: Chapter 18 – The Atmosphere

air friction

tends to slow air movement from Earth's surface up to about 6000 feet

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 417

JOF CHAPT NAME: Chapter 19 – Weather Elements

wind shear

an atmospheric condition in which changes in speed and direction of the wind occur

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 411

JOF CHAPT NAME: Chapter 19 – Weather Elements

altostratus

usually thin, produces a gray or bluish veil through which the sun may be dimly seen

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 411

JOF CHAPT NAME: Chapter 19 – Weather Elements

cirrostratus

appears at high altitudes and is very, very thin; composed entirely of ice crystals

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 5

JOF CHAPT NAME: Chapter 1 – Introduction to Air Power

Leonardo da Vinci

made the first scientific experiments in the field of aviation; left 160 pages of descriptions and sketches of flying machines including the first known design of the parachute and the helicopter; understood the importance of the center of gravity, center of pressure, and streamlining; described, sketched, and built models of ornithopters; his manuscripts were lost for 300 years

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 387

JOF CHAPT NAME: Chapter 18 – The Atmosphere

evaporation

the process by which liquid water molecules change to a gas or vapor state and enter the Earth's atmosphere

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 62

JOF CHAPT NAME: Chapter 3 – The Golden Age: 1919-19

National Advisory Committee for Aeronautics

in 1915, formed by President Wilson to "supervise and direct the scientific study of the problems of flight"

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 415

JOF CHAPT NAME: Chapter 19 – Weather Elements

advection

lateral heat transfer that is important in the global circulation of air

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE:

JOF CHAPT NAME: Chapter 18 – The Atmosphere

sublimation

happens when water molecules leave the frozen (solid) state and directly enter the atmosphere without first changing into a liquid

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 553

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

Atlas rocket

originally designed as a missile in the 1950s, adapted for use in the Project Mercury program

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 119

JOF CHAPT NAME: Chapter 5 – Aviation: From the Cold War to Desert Storm
stopping the advance of the North Korean Army

US forces first priority in the Korean War

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 88

JOF CHAPT NAME: Chapter 4 – Air Power Goes to War
gave priority to defeating Germany

US WWII overall strategy because Germany was perceived as a more immediate threat than Japan because of Germany's industrial power.

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 101

JOF CHAPT NAME: Chapter 4 – Air Power Goes to War
Battle of the Coral Sea

one of the battles that stopped the Japanese advance across the Pacific in the spring of 1942, fought entirely by aircraft

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 101

JOF CHAPT NAME: Chapter 4 – Air Power Goes to War
Battle of Midway

one of the battles that stopped the Japanese advance across the Pacific in the summer of 1942, fought entirely by aircraft

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 445

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals
Christopher Geissler

in 1668, experimented with rockets over 100 pounds

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 531

JOF CHAPT NAME: Chapter 25 – Our Solar System
Galileo

In the 1500 and 1600s discovered the period (the time in which a pendulum swings back and forth) does not depend on the arc of the swing (the isochronism); asserted that all objects, regardless of their density, fall at the same rate in a vacuum; he created a telescope later that could magnify objects twenty times; with this telescope, he was able to look at the moon, discover the four satellites of Jupiter, observe a supernova, verify the phases of Venus, and discover sunspots. His discoveries proved the Copernican system which states that the earth and other planets revolve around the sun.

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 449

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

momentum

product of mass and velocity

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 120

JOF CHAPT NAME: Chapter 5 – Aviation: From the Cold War to Desert Storm

Operation Rolling Thunder

In the Vietnam War, President Johnson's objective was to raise the morale of the nearly defeated South Vietnamese Army, and to demonstrate to North Vietnam that if they did not start negotiations for peace, the bombings of North Viet Nam would continue

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 491

JOF CHAPT NAME: Chapter 23 – Orbits and Trajectories

expendable launch vehicle

rockets that are only used once

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 231

JOF CHAPT NAME: Chapter 9 – Flight Navigation

global coordinate system

a system of map coordinate uses number or letters to designate location

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 130

JOF CHAPT NAME: Chapter 5 – Aviation: From the Cold War to Desert Storm

Mel Apt

test pilot

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 491

JOF CHAPT NAME: Chapter 23 – Orbits and Trajectories

Titan rocket

rocket used in Project Gemini

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 479

JOF CHAPT NAME: Chapter 23 – Orbits and Trajectories

circular orbit

an orbit that maintains a virtually constant altitude above the Earth's surface

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 479

JOF CHAPT NAME: Chapter 23 – Orbits and Trajectories

equatorial orbit

the orbit a satellite travels from west to east over the Earth's equator

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 479

JOF CHAPT NAME: Chapter 23 – Orbits and Trajectories

elliptical orbit

any closed orbit that is not circular

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 480

JOF CHAPT NAME: Chapter 23 – Orbits and Trajectories

velocity requirement

the velocity required in order to travel a certain path

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 486

JOF CHAPT NAME: Chapter 23 – Orbits and Trajectories

circular velocity

_____ minus apogee velocity give the amount of kick needed to circularize an orbit at a give altitude

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 455

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

specific impulse

the number of pounds of thrust delivered by consuming one pound of propellant in one second

<p>AD MODULE NAME: 0 - JOURNEY OF FLIGHT</p> <p>CHAPTER NAME: JOURNEY OF FLIGHT</p> <p>AD PAGE: JOF PAGE: 147</p> <p>JOF CHAPT NAME: Chapter 5 – Aviation: From the Cold War to Desert Storm</p> <p>Operation Desert Shield</p>	<p>August 1990, military deployment to defend Saudi Arabia from Iraq</p>
<p>AD MODULE NAME: 0 - JOURNEY OF FLIGHT</p> <p>CHAPTER NAME: JOURNEY OF FLIGHT</p> <p>AD PAGE: JOF PAGE: 51</p> <p>JOF CHAPT NAME: Chapter 3 – The Golden Age: 1919-19</p> <p>Ostfriesland</p>	<p>captured German battleship sunk in a test by Mitchell to show that airplanes could be effective tools in sinking enemy ships, lesson lost on Army generals but Navy learned lesson well and had its first aircraft carrier within 8 months</p>
<p>AD MODULE NAME: 0 - JOURNEY OF FLIGHT</p> <p>CHAPTER NAME: JOURNEY OF FLIGHT</p> <p>AD PAGE: JOF PAGE: 240</p> <p>JOF CHAPT NAME: Chapter 9 – Flight Navigation</p> <p>true north</p>	<p>the location of Earth's north geographic pole</p>
<p>AD MODULE NAME: 0 - JOURNEY OF FLIGHT</p> <p>CHAPTER NAME: JOURNEY OF FLIGHT</p> <p>AD PAGE: JOF PAGE: 504</p> <p>JOF CHAPT NAME: Chapter 24 – Space Environment</p> <p>corona</p>	<p>a division of the Sun's atmosphere known as the crown. And enormous area of faint white light that visibly extends outward from the Sun's surface</p>
<p>AD MODULE NAME: 0 - JOURNEY OF FLIGHT</p> <p>CHAPTER NAME: JOURNEY OF FLIGHT</p> <p>AD PAGE: JOF PAGE: 159</p> <p>JOF CHAPT NAME: Chapter 6 – Advances in Aeronautics</p> <p>Scott Crossfield</p>	<p>first test pilot of the X-15</p>
<p>AD MODULE NAME: 0 - JOURNEY OF FLIGHT</p> <p>CHAPTER NAME: JOURNEY OF FLIGHT</p> <p>AD PAGE: JOF PAGE: 491</p> <p>JOF CHAPT NAME: Chapter 23 – Orbits and Trajectories</p> <p>missile</p>	<p>a rocket-propelled vehicle with a weapon or warhead as a payload</p>

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 481

JOF CHAPT NAME: Chapter 23 – Orbits and Trajectories

burnout velocity

the velocity that is required to place a spacecraft on its intended trajectory must be attained at the moment a rocket engine ceases to produce thrust

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 113

JOF CHAPT NAME: Chapter 5 – Aviation: From the Cold War to Desert Storm

cold war

post WWII years, battle of influence over the world between the Soviet Union and the US.

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 553

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

Redstone rocket

first flew in August 1953, had a 200 mile range and reached speeds of 3,300 mph, America's first orbiting satellite, Explorer 1, was launched Jan. 31, 1958, using a Jupiter C rocket powered by a this engine; in May 1961, astronaut Alan Shepard became the first American in space when he was launched on a suborbital flight by this rocket engine

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 489

JOF CHAPT NAME: Chapter 23 – Orbits and Trajectories

geostationary

an orbit stationed above one point on Earth's surface

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 591

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Judy Resnik

mission specialist, a member of the Challenger mission that exploded

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 489

JOF CHAPT NAME: Chapter 23 – Orbits and Trajectories

Non-Coplaner Transfer

no launch from Cape Canaveral could put a vehicle directly into an orbit around the Equator, to do so requires this kind of transfer

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 506

JOF CHAPT NAME: Chapter 24 – Space Environment

ion

an atom that carries a positive or a negative electrical charge as a result of losing or gaining one or more electrons

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 507

JOF CHAPT NAME: Chapter 24 – Space Environment

magnetosphere

the region of the Earth's atmosphere where ionized gas plays a big part in the dynamics of the atmosphere and where the geomagnetic field plays an important role

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 507

JOF CHAPT NAME: Chapter 24 – Space Environment

exosphere

the top of the atmosphere above the heterosphere

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 508

JOF CHAPT NAME: Chapter 24 – Space Environment

solar winds

steady electromagnetic emissions that are an extension of the Sun's corona into interplanetary space

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 515

JOF CHAPT NAME: Chapter 24 – Space Environment

differential charging

occurs when one part of the spacecraft gets charged and has a different charge than another part of the craft

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 527

JOF CHAPT NAME: Chapter 25 – Our Solar System

anorthosite

the most common rock on the Moon composed of almost entirely one mineral, feldspar

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 114
JOF CHAPT NAME: Chapter 5 – Aviation: From the Cold War to Desert Storm
July 26, 1947

date the US Army Air Force became the United State Air Force

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 78
JOF CHAPT NAME: Chapter 4 – Air Power Goes to War
bombers

between WWI and WWII England build up its fleet of this type of aircraft

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 600
JOF CHAPT NAME: Chapter 27 – Manned Spacecraft
Robert Smith

systems director at The Aerospace Corporation's Houston office, has received NASA's prestigious Silver Snoopy Award in recognition of his support to the International Space Station (ISS) program.

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 130
JOF CHAPT NAME: Chapter 5 – Aviation: From the Cold War to Desert Storm
Chuck Yeager

1st person to break the sound barrier

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 162
JOF CHAPT NAME: Chapter 6 – Advances in Aeronautics
oblique wing

this aircraft wing changes form during flight for optimum lift under different circumstances and can be rotated to different positions for the best aerodynamic characteristics

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 165
JOF CHAPT NAME: Chapter 6 – Advances in Aeronautics
F-117A

stealth fighter

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 133
JOF CHAPT NAME: Chapter 5 – Aviation: From the Cold War to Desert Storm
B-52

flew for the first time in April 1952; had an unrefueled range of 10,000 miles

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 322
JOF CHAPT NAME: Chapter 14 – Military Aircraft
C-5A

The USAF's largest aircraft, was built primarily to provide massive strategic airlift for combat supplies; first flew in 1968

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 165
JOF CHAPT NAME: Chapter 6 – Advances in Aeronautics
Boeing 707

revolutionized the commercial aviation industry because it outclassed every airliner in use at that time in all aspects: size, speed, range, and capacity

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 486
JOF CHAPT NAME: Chapter 23 – Orbits and Trajectories
apogee velocity

orbital velocity at apogee, the high point of orbit

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 166
JOF CHAPT NAME: Chapter 6 – Advances in Aeronautics
Boeing 727

unveiled in Feb 1963, it was a short- and medium-haul trijet; the most successful jet ever built

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 19
JOF CHAPT NAME: Chapter 1 – Introduction to Air Power
wing-warping

twisting the wing, developed by the Wright brothers.

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 168

JOF CHAPT NAME: Chapter 6 – Advances in Aeronautics

Concorde

supersonic commercial transport developed by the British and French; could fly from London or Paris to Washington, DC in 4 hours

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 170

JOF CHAPT NAME: Chapter 6 – Advances in Aeronautics

Learjet

American business jet developed in the 1960s

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 166

JOF CHAPT NAME: Chapter 6 – Advances in Aeronautics

Caravelle 1

the first short-haul jet which first flew in 1955 and went into service with Air France in 1959

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 167

JOF CHAPT NAME: Chapter 6 – Advances in Aeronautics

Airbus

competition to US passenger jet manufacturers, designed for short and medium ranges powered by twin turbofans; first subsonic commercial aircraft to have control by fly-by-wire throughout normal flight

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 553

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

Vanguard I

launched March 1, 1958, consisted of a tiny 3.25-pound (1.47-kilogram) sphere equipped with two radio transmitters. It was the second artificial satellite placed in orbit around the Earth by the United States, the first being Explorer 1 (Jan 31, 1958).

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 555

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

NASA

created on July 29, 1958 to lead America's civilian space program; launches nonmilitary spacecraft for the US

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 556
JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

opinio juris

the consensus opinion of the experts in the field, may be based on previous court cases, or when there is no previous related case, it is simply the consensus opinion of the experts in the field

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 564
JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

Galaxy 1

dedicated to distributing cable television programming

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 591
JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Christa McAuliffe

teacher, a member of the Challenger mission that exploded

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 166
JOF CHAPT NAME: Chapter 6 – Advances in Aeronautics

Douglas DC-8

short-haul jet in the 1960s

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 517
JOF CHAPT NAME: Chapter 24 – Space Environment

Vomet Comet

an airplane that flies as high as it can and then dives straight down putting its passengers in free fall for almost a minute

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 563
JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

Courier 1satellite

communication satellite in 1960, first of the repeater types, received signals from ground stations, amplified them, then rebroadcast the signals to receiving stations on Earth

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 563
JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

Relay satellite

launched in the 1960s, was launched for the RCA Corporation of America, added Italy and Brazil to the growing list of countries receiving broadcasts from satellites in outer space

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 565
JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

TIMATION satellite

two-dimensional navigation system, used high stability oscillators and time transfer capabilities to determine longitude and latitude

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 567
JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

Nimbus 1

weather satellite first launched in 1964, improved upon Tiros 1, measured radiation in the Earth's atmosphere

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 577
JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

Galileo spacecraft

launched by the US in 1989, arrived at Jupiter in 1995; mission was to take direct measurements of within Jupiter's atmosphere

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 167
JOF CHAPT NAME: Chapter 6 – Advances in Aeronautics

Lockheed L-1011

trijet airliner first flew in November 1970, carries about 350 passengers up to 4,000 miles

AD MODULE NAME: 0 - JOURNEY OF FLIGHT
CHAPTER NAME: JOURNEY OF FLIGHT
AD PAGE: JOF PAGE: 562
JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

communication, navigation, observation, scientific

categories of satellites

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE:

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Eileen Collins

On STS-93, was the first woman Shuttle Commander

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 557

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

1967 Outer Space Treaty

established the principle of freedom of use and called space the "province of all mankind", also stated that the exploration of space should benefit all countries

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 595

JOF CHAPT NAME: Chapter 27 – Manned Spacecraft

Vladimir Komarov

cosmonaut that died when Soyuz 1 crashed in April 1967; the first human to die during a space mission

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 396

JOF CHAPT NAME: Chapter 18 – The Atmosphere

pressure gradient

the rate of pressure increase or decrease on any atmospheric plane, usually a horizontal plane, for any given distance

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 6

JOF CHAPT NAME: Chapter 1 – Introduction to Air Power

ornithopter

flying machines that are kept aloft and propelled by flapping wings

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 216

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

classification by principle of operation

mechanical, pressure, and electrical aircraft instruments

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 216

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

classification by use

performance and control aircraft instruments

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 216

JOF CHAPT NAME: Chapter 8 – Aircraft in Motion

performance instruments

us how the aircraft has responded to our commands

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 452

JOF CHAPT NAME: Chapter 21 – Rocket Fundamentals

Saturn rocket

used by the Apollo program to go to the Moon, specifically the Saturn V rocket

AD MODULE NAME: 0 - JOURNEY OF FLIGHT

CHAPTER NAME: JOURNEY OF FLIGHT

AD PAGE: JOF PAGE: 578

JOF CHAPT NAME: Chapter 26 – Unmanned Space Exploration

Cassini spacecraft

launched in 1997, headed for Saturn