Aircraft Characteristics/
Aircraft Recognition
Aircraft Characteristics and Recognition
Lesson Objectives

1. Identify aircraft using common recognition features
   A. Categories.
   B. Weight classes.
   C. Designators.
   D. Performance characteristics.
   E. Identification features.

2. Recognize selected aircraft
Aircraft Categories

Category I (CAT I)

Category II (CAT II)

Category III (CAT III)
CAT I Aircraft

- Weight: 12,500 lbs. or less
- **Single-engine**
- Propeller-driven

All helicopters
CAT II Aircraft

- Weight: 12,500 lbs. or less
- **Twin-engine**
- Propeller-driven
CAT III Aircraft

Any other aircraft **not** described in either CAT I or CAT II
CAT I General Performance Characteristics

Speed: 100-160 knots
Altitude: 10,000 feet and below
Climb Rate: 1,000 feet per minute or less
Weight Class: Small (S)
CAT II General Performance Characteristics

Speed: 160-250 knots
Altitude: FL240 and below
Climb Rate: 1,000-2,000 feet per minute
Weight Class: Small (S)
CAT III General Performance Characteristics

Speed: 300-550 knots
Altitude: FL450 and below
Climb Rate: 2,000-4,000 feet per minute
Helicopter’s General Performance Characteristics

Speed: 90-160 knots

Altitude: FL200 and below

Climb Rate: 500-2,150 feet per minute
Weight Class Definitions

Small: Aircraft of 41,000 pounds or less maximum certified takeoff weight.

Large: Aircraft of more than 41,000 pounds, maximum certified takeoff weight, up to 300,000 pounds.

Heavy: Aircraft capable of takeoff weights of more than 300,000 pounds whether or not they are operating at this weight during a particular phase of flight.
### Examples of Civil Designators

<table>
<thead>
<tr>
<th>Model Name</th>
<th>Designator</th>
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<tbody>
<tr>
<td>COMMANDER</td>
<td>AC68</td>
</tr>
<tr>
<td>SUPER KING AIR</td>
<td>BE20</td>
</tr>
<tr>
<td>BARON 58</td>
<td>BE58</td>
</tr>
<tr>
<td>SKYHAWK</td>
<td>C172</td>
</tr>
<tr>
<td>CITATION</td>
<td>C550</td>
</tr>
<tr>
<td>(CHEROKEE) ARCHER</td>
<td>P28A</td>
</tr>
<tr>
<td>GULFSTREAM</td>
<td>GLF3</td>
</tr>
<tr>
<td>BOEING 737-300</td>
<td>B733</td>
</tr>
<tr>
<td>MD11</td>
<td>MD11</td>
</tr>
<tr>
<td>BELL 222</td>
<td>B222</td>
</tr>
</tbody>
</table>
Examples of Military Designators

A - Attack      A10
B - Bomber      B1
C - Cargo Transport      C5
E - Electronic (ECM)      E8
F - Fighter      F15
H - Helicopter      H60
P - Patrol      P3
T - Trainer      T37
Aircraft Identification Features

1. Size
2. Engine location and number
3. Engine type
4. Wing placement
5. Wing configuration
6. Tail configuration
7. Windows
8. Fuselage shape
9. Landing gear
Size

Boeing B767

Boeing B737
Engine Locations and Numbers

- GLF2 on fuselage (2)
- B737 under wing (2)
- DC10 under wing and through tail (3)
- B747 under wing (4)
Three Basic Aircraft Engine Types

- Reciprocating
  - C421 Golden Eagle

- Turboprop
  - BE20 Super King Air

- Turbojet
  - C550 Citation II
Wing Placement

High-Wing

Cessna Skyhawk C172

Mid-Wing

Fighting Falcon F-16

Low-Wing

Cherokee Arrow P28R
Straight-Wing Configuration
Piper Saratoga PA32
Swept-Wing Configuration
DC-10
Delta-Wing Configuration
Fighting Falcon F16
Conventional Tail
Piper Saratoga-PA32
“T” Tail
Beech Super King Air 200-BE20
Question

• What is the general speed range for CAT II aircraft?

A. 100 to 160
B. 160 to 250
C. 250 to 500
Question

• What category do helicopters fall under?

  – ANSWER: CAT I
Question

• What category do turbojet engine aircraft fall under?

  – ANSWER: CAT III
Question

• A twin-engine, turboprop aircraft weighing 12,500 pounds or less will fall under which category?

  – **ANSWER:** CAT II
Question

• An aircraft capable of 300,000 pounds of takeoff weight, but which currently only has a takeoff weight of 225,000 pounds, would fall into what weight class?

  – ANSWER: Heavy
Question

• An aircraft in the small weight class has a maximum certified takeoff weight of _________ pounds or less.

  – ANSWER: 41,000
Question

• If an aircraft has a 250,000 pound maximum certified takeoff weight, what would its weight class be?

  – ANSWER: Large
“V” Tail
Stealth Fighter-F117
Horizontal Stabilizer Above Fuselage (Mid-Tail)
Dassault-Breguet Mystere/Falcon 20-FA20
Twin Boom Tail
Cessna Super Skymaster 337-C337
Forward Slant Vertical Stabilizer
Mooney Mark 21-M20P
Bubble Canopy
Round
Oval
Teardrop
Square
Question

Are these two aircraft the same model?
Windows

The side window on this aircraft has a teardrop shape.
Windows

The side window on this aircraft has a square shape. In addition, the rear window is a solid single wrap-around type.
Answer

BE77 BEECH “SKIPPER”

PA38 PIPER “TOMAHAWK”
Tricycle Landing Gear
Cessna 150
Conventional Landing Gear
Cessna 170
Tandem Landing Gear
B52 “Stratofortress”
Fixed Gear

CESSNA 150

CESSNA 152
Retractable Gear

CESSNA 210

BE35
P28A
C210
PA38
B222
PA34
C421
LJ35
BE40
C550
CL60
CRJ1, CRJ2, CRJ7, CRJ9
MD81, MD82, MD83, MD87, MD88
B731 through B739
A306
B752, B753
B772, B773
B721, B722, B72Q
B741 through B744
C130
F16
F18
F22
KC10
The End Of THE LECTURE –

NOW TO THE TEST!!
Question

• What are two types of engines having propellers?

  – ANSWER: Reciprocating and turboprop
Question

- Turbojet engines are limited to what weight class of aircraft?

  - **ANSWER:** Turbojet engines can be found on ALL weight classes of aircraft.
Question

• What are the nine generally-accepted identification features of aircraft?

  – ANSWER:
    1. Size
    2. Engine location and number
    3. Engine type
    4. Wing placement
    5. Wing configuration
    6. Tail configuration
    7. Windows
    8. Fuselage shape
    9. Landing gear
Question

• What are the three basic wing placement positions?
  – ANSWER: High-wing, Mid-wing, Low-wing
Question

• What are the three basic wing shapes or configurations?

  – **ANSWER:** Straight-wing, Swept-wing, Delta-wing
Question

• How many basic tail configurations are there? Name them.

  – ANSWER: Six
    1. Conventional Tail
    2. Forward Slant Vertical Stabilizer
    3. Horizontal Stabilizer above the fuselage
    4. “T” Tail (swept or straight)
    5. “V” Tail
    6. Twin Boom Tail
Question

• What are the five basic aircraft window shapes?
  
  – **ANSWER:** Teardrop, oval, round, square, and bubble canopy
Question

• What are the three basic types of landing gear?

  – **ANSWER:** Tricycle, Conventional (aka ‘tail dragger’), Tandem
Identify the Aircraft

Determine Aircraft Designator

AND

List at least 3 features you would use to recognize each aircraft
C172
PA38
PA34
C421
BE40
BE40
C750
GLF3
CL60
CRJ1, CRJ2, CRJ7, CRJ9
B741 through B744
MD81, MD82, MD83, MD87, MD88
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C17
F16
F15
F22
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PA38
B222
BE58
PA34
C310
BE20
FA20
BE40
C550
C750
CRJ1, CRJ2, CRJ7, CRJ9
MD81, MD82, MD83, MD87, MD88
B731 through B739
A320
A306
B752, B753
B772, B773
B721, B722, B72Q
MD11
B741 through B744
C17
F16
F15
F18
F22