



**Federal Aviation  
Administration**

# **Initial En Route Qualification Training**

## **Lesson 20 Aircraft Characteristics**

**Course 50148001**

## LESSON PLAN DATA SHEET

|                                         |                                                                                                       |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------|
| <b>COURSE NAME:</b>                     | INITIAL EN ROUTE QUALIFICATION TRAINING                                                               |
| <b>COURSE NUMBER:</b>                   | 50148001                                                                                              |
| <b>LESSON TITLE:</b>                    | AIRCRAFT CHARACTERISTICS                                                                              |
| <b>DURATION:</b>                        | 2+30 HOURS                                                                                            |
| <b>DATE REVISED:</b>                    | 2022-02                                                                                               |
| <b>VERSION:</b>                         | V.2022-02                                                                                             |
| <b>REFERENCE(S):</b>                    | FAA ORDER JO 7110.65, AIR TRAFFIC CONTROL; ATG-2, TRI-<br>OPTION CONTROLLER REFERENCE AIRCRAFT MANUAL |
| <b>HANDOUT(S):</b>                      | NONE                                                                                                  |
| <b>EXERCISE(S)/<br/>ACTIVITY(S):</b>    | AIRCRAFT CHARACTERISTICS ELEARNING                                                                    |
| <b>END-OF-LESSON TEST:</b>              | NONE                                                                                                  |
| <b>PERFORMANCE TEST:</b>                | NONE                                                                                                  |
| <b>MATERIALS:</b>                       | NONE                                                                                                  |
| <b>OTHER PERTINENT<br/>INFORMATION:</b> | AN AIRCRAFT CHARACTERISTICS STUDY CHART IS<br>INCLUDED AS AN APPENDIX                                 |

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# INTRODUCTION

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## Initial En Route Qualification Training

### Lesson 20 Aircraft Characteristics

V.2022-02  
Presented by  
FAA Academy  
Air Traffic Division  
Training Branch



Federal Aviation  
Administration



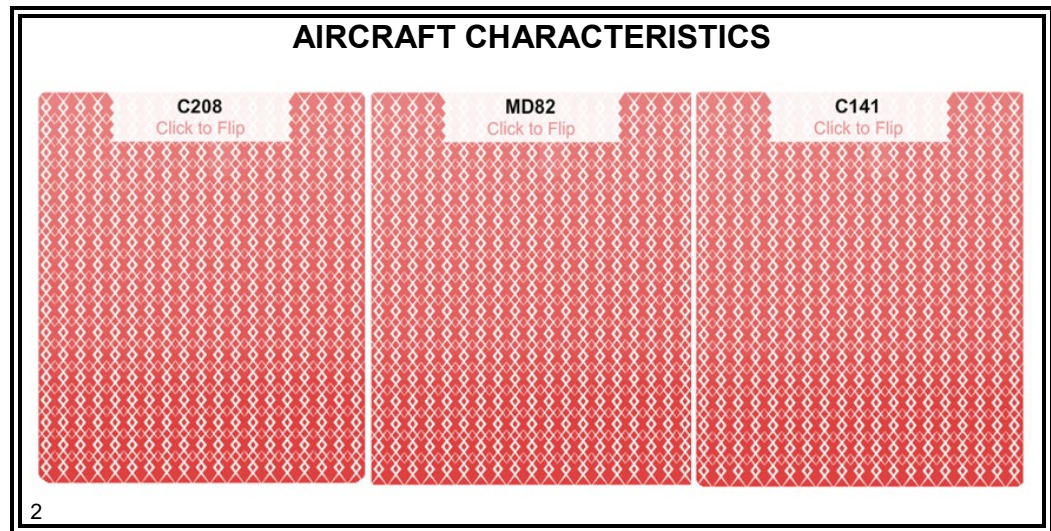
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In order for you to properly apply the specific skills taught in the previous lessons, it is critical you understand the key characteristics of the aircraft you will be responsible for as an En Route controller.

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# INTRODUCTION *(Continued)*

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Critical to your job as an air traffic controller is the capability to recognize key aircraft performance characteristics quickly. Being proficient in identifying aircraft capabilities and limitations enables you to recognize potential problems and make appropriate decisions. By learning this foundational knowledge, you will expand your ability to interpret information presented to you.

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## **Purpose**

The purpose of this lesson is to enhance your ability to differentiate and recognize aircraft characteristics.

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# INTRODUCTION *(Continued)*

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## Lesson Objectives

### LESSON OBJECTIVES

- At the end of this lesson, you will be:
  - Familiar with the aircraft designators for each aircraft and their key characteristics, including:
    - Aircraft type
    - Weight class
    - Number and type of engine
    - Climb rate
    - Cruise speed
  - Able to order selected aircraft by climb rate and cruise speed and categorize aircraft by type engine

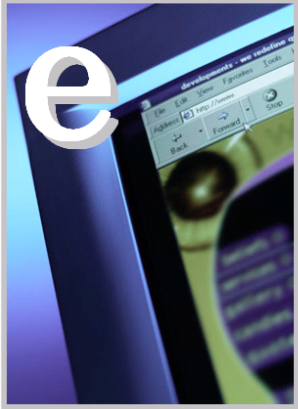
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# ACTIVITY: AIRCRAFT CHARACTERISTICS

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## Activity

**AIRCRAFT CHARACTERISTICS ACTIVITY**



**Purpose:** to become familiar with common aircraft and their characteristics

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## Description

The learning activity begins with an overview of key aircraft characteristics. The second part of the activity is comprised of a variety of interactive modules to help you learn these characteristics.

**NOTE:** For review purposes a study chart is included as Appendix A. Your ability to recall common characteristics such as designators, weight classes, engine types, climb rates, and cruise rates enhances your ability to keep aircraft moving safely and expediently within your sector.

## Directions

Access the IET eLearning menu. Select **Lesson 20 – Aircraft Characteristics** and click on each title to launch the activities.

## Time Allotted

2+30 Hours

# IN CONCLUSION

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## Lesson Review

### LESSON REVIEW

**This lesson covered common aircraft and their characteristics including:**

- Aircraft type
- Weight class
- Number and type of engine
- Climb rate
- Cruise speed



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## APPENDIX A: AIRCRAFT CHARACTERISTICS STUDY CHART

| Aircraft          |                       | Data                |                                     |                         |                            |                                                         | Image                                                                                 |
|-------------------|-----------------------|---------------------|-------------------------------------|-------------------------|----------------------------|---------------------------------------------------------|---------------------------------------------------------------------------------------|
| <i>Designator</i> | <i>Aircraft Model</i> | <i>Weight Class</i> | <i>Number &amp; Type of Engines</i> | <i>Climb Rate (FPM)</i> | <i>Cruise Speed (KTAS)</i> | <i>Comment</i>                                          |                                                                                       |
| BE36              | Beech Bonanza         | S                   | 1/Prop                              | 1000-1200               | 160-190                    | B36T = Turboprop                                        |    |
| C172              | Cessna Skyhawk        | S                   | 1/Prop                              | 600-800                 | 120-150                    |                                                         |    |
| C182              | Cessna Skylane        | S                   | 1/Prop                              | 800-1000                | 120-150                    |                                                         |   |
| C210              | Cessna Centurion      | S                   | 1/Prop                              | 800-1000                | 160-190                    | P210 = Pressurized;<br>C10T = Pressurized and Turboprop |  |

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## APPENDIX A: AIRCRAFT CHARACTERISTICS STUDY CHART *(Continued)*

| Aircraft   |                | Data         |                          |                  |                     |                  | Image                                                                                 |
|------------|----------------|--------------|--------------------------|------------------|---------------------|------------------|---------------------------------------------------------------------------------------|
| Designator | Aircraft Model | Weight Class | Number & Type of Engines | Climb Rate (FPM) | Cruise Speed (KTAS) | Comment          |                                                                                       |
| PA24       | Piper Comanche | S            | 1/Prop                   | 1000-1200        | 120-150             |                  |    |
| PA32       | Piper Cherokee | S            | 1/Prop                   | 800-1000         | 160-190             |                  |    |
| PA46       | Piper Malibu   | S            | 1/Prop                   | 1100-1400        | 160-200             | P46T = Turboprop |   |
| SR22       | Cirrus SR-22   | S            | 1/Prop                   | 1000-1200        | 160-190             |                  |  |

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## APPENDIX A: AIRCRAFT CHARACTERISTICS STUDY CHART *(Continued)*

| Aircraft   |                     | Data         |                          |                  |                     |                  | Image                                                                                 |
|------------|---------------------|--------------|--------------------------|------------------|---------------------|------------------|---------------------------------------------------------------------------------------|
| Designator | Aircraft Model      | Weight Class | Number & Type of Engines | Climb Rate (FPM) | Cruise Speed (KTAS) | Comment          |                                                                                       |
| BE58       | Beech Baron         | S            | 2/Prop                   | 1400-1700        | 160-200             |                  |    |
| C421       | Cessna Golden Eagle | S            | 2/Prop                   | 1400-1700        | 200-240             | C21T = Turboprop |    |
| PA31       | Piper Navajo        | S            | 2/Prop                   | 1400-1700        | 160-200             |                  |   |
| PA34       | Piper Seneca        | S            | 2/Prop                   | 1100-1400        | 160-200             |                  |  |

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## APPENDIX A: AIRCRAFT CHARACTERISTICS STUDY CHART *(Continued)*

| Aircraft   |                | Data         |                          |                  |                     |                                                                                                      | Image |                                                                                       |
|------------|----------------|--------------|--------------------------|------------------|---------------------|------------------------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------|
| Designator | Aircraft Model | Weight Class | Number & Type of Engines | Climb Rate (FPM) | Cruise Speed (KTAS) | Comment                                                                                              |       |                                                                                       |
| C208       | Cessna Caravan | S            | 1/Turboprop              | 1100-1400        | 160-200             | Commonly used in skydiving operations                                                                |       |    |
| PC12       | Pilatus Eagle  | S            | 1/Turboprop              | 1500-2000        | 200-240             | Generally outperforms other single engine turboprops                                                 |       |    |
| BE9T       | Beech King Air | S            | 2/Turboprop              | 1800-2400        | 200-240             | The BE10 and BE20 are also King Airs that perform from 20-30% better in climb rate and cruise speed. |       |   |
| B190       | Beech 1900     | S            | 2/Turboprop              | 1800-2400        | 240-270             |                                                                                                      |       |  |

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## APPENDIX A: AIRCRAFT CHARACTERISTICS STUDY CHART *(Continued)*

| Aircraft             |                      | Data         |                          |                  |                     |                                                                                                                                                                                | Image                                                                                |
|----------------------|----------------------|--------------|--------------------------|------------------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Designator           | Aircraft Model       | Weight Class | Number & Type of Engines | Climb Rate (FPM) | Cruise Speed (KTAS) | Comment                                                                                                                                                                        |                                                                                      |
| B350                 | Beech Super King Air | S            | 2/Turboprop              | 2700-3000        | 270-300             |                                                                                                                                                                                |   |
| C441                 | Cessna Conquest      | S            | 2/Turboprop              | 2700-4200        | 240-270             | Cessna 400 series aircraft consist of both twin props and turboprops.                                                                                                          |   |
| DH8A<br>DH8B<br>DH8C | Dehavilland-8        | L            | 2/Turboprop              | 1400-1700        | 240-270             | DH8s normally climb or descend at lower rates than most other twin turboprops; however, the DH8D performs much better than the other DH8s and climbs at almost twice the rate. |  |

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## APPENDIX A: AIRCRAFT CHARACTERISTICS STUDY CHART *(Continued)*

| Aircraft   |                         | Data         |                          |                  |                     | Image                                                                                                                                                                                                                                                                     |
|------------|-------------------------|--------------|--------------------------|------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Designator | Aircraft Model          | Weight Class | Number & Type of Engines | Climb Rate (FPM) | Cruise Speed (KTAS) |                                                                                                                                                                                                                                                                           |
| DH8D       | Dehavilland Dash 8      | L            | 2/Turboprop              | 2400-2600        | 270-300             | <p>DH8s normally climb or descend at lower rates than most other twin turboprops; however, the DH8D performs much better than the other DH8s and climbs at almost twice the rate.</p>  |
| SF34       | Saab 340                | L            | 2/Turboprop              | 1800-2400        | 240-270             |                                                                                                                                                                                        |
| SW4        | Fairchild Metro         | S            | 2/Turboprop              | 1800-2400        | 240-270             |                                                                                                                                                                                       |
| C130       | Lockheed Hercules C-130 | L            | 4/Turboprop              | 1400-1700        | 300-340             | <p>Military Cargo; "C" stands for cargo; IT IS NOT A CESSNA</p>                                                                                                                      |

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## APPENDIX A: AIRCRAFT CHARACTERISTICS STUDY CHART *(Continued)*

| Aircraft   |                                  | Data         |                          |                  |                     |                                                                                                                                   | Image                                                                                 |
|------------|----------------------------------|--------------|--------------------------|------------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Designator | Aircraft Model                   | Weight Class | Number & Type of Engines | Climb Rate (FPM) | Cruise Speed (KTAS) | Comment                                                                                                                           |                                                                                       |
| F16        | General Dynamics Fighting Falcon | L            | 1/Jet                    | 8000-10000       | 460+                | Similar aircraft: F15, F18, and F117; Military Fighter; capable of high rates of climb/descent; notice that an F16 has one engine |    |
| A320       | Airbus 320                       | L            | 2/Jets                   | 3000-3500        | 430-450             | Similar aircraft: A319, and A321                                                                                                  |    |
| BE40       | Beech Beechjet                   | S            | 2/Jets                   | 3000-3500        | 430-450             |                                                                                                                                   |   |
| B712       | Boeing 717 200 Series            | L            | 2/Jets                   | 2000-3000        | 430-450             |                                                                                                                                   |  |

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## APPENDIX A: AIRCRAFT CHARACTERISTICS STUDY CHART *(Continued)*

| Aircraft   |                | Data         |                          |                  |                     |                                                                                                                                   | Image                                                                                 |
|------------|----------------|--------------|--------------------------|------------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Designator | Aircraft Model | Weight Class | Number & Type of Engines | Climb Rate (FPM) | Cruise Speed (KTAS) | Comment                                                                                                                           |                                                                                       |
| B738       | Boeing 737-800 | L            | 2/Jets                   | 3000-3500        | 430-450             | Similar aircraft: B731 through B739; the most common are B737 and B738; B731 and B732 perform significantly worse than the others |    |
| B753       | Boeing 757-300 | L            | 2/Jets                   | 2000-3000        | 460+                | Special wake turbulence procedures apply.                                                                                         |    |
| B772       | Boeing 777     | H            | 2/Jets                   | 2000-3000        | 460+                | Similar aircraft: B773                                                                                                            |   |
| B763       | Boeing 767-300 | H            | 2/Jets                   | 3000-3500        | 460+                | Similar aircraft: B762, and B764                                                                                                  |  |

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## APPENDIX A: AIRCRAFT CHARACTERISTICS STUDY CHART *(Continued)*

| Aircraft   |                         | Data         |                          |                  |                     |                                                                                                                                                   | Image                                                                                |
|------------|-------------------------|--------------|--------------------------|------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Designator | Aircraft Model          | Weight Class | Number & Type of Engines | Climb Rate (FPM) | Cruise Speed (KTAS) | Comment                                                                                                                                           |                                                                                      |
| CRJ2       | Canadair Jet - CRJ200   | L            | 2/Jets                   | 2000-2500        | 400-420             | Similar aircraft: CRJ1                                                                                                                            |   |
| CRJ9       | Canadair Jet – CRJ-900  | L            | 2/Jets                   | 2000-3000        | 430-450             | Similar aircraft: CRJ7; the CRJ7 and CRJ9 cruise about 20 knots faster than the CRJ1 and CRJ2                                                     |   |
| C510       | Cessna Citation Mustang | S            | 2/Jets                   | 2000-3000        | 320-360             | One of several aircraft termed "Very Light Jets"(VLJ); although these are jets, they significantly underperform airliners and most corporate jets |  |

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## APPENDIX A: AIRCRAFT CHARACTERISTICS STUDY CHART *(Continued)*

| Aircraft   |                        | Data         |                          |                  |                     |                                                                                                                                                                                                                                          | Image                                                                                 |
|------------|------------------------|--------------|--------------------------|------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Designator | Aircraft Model         | Weight Class | Number & Type of Engines | Climb Rate (FPM) | Cruise Speed (KTAS) | Comment                                                                                                                                                                                                                                  |                                                                                       |
| C750       | Cessna 750 Citation 10 | S            | 2/Jets                   | 3500-4000        | 460+                | There are many models of Citation jets starting with the 500 series up to the 750; the C500 is a low performing jet that may perform similar to a twin turboprop; the C560, 600 series, and the C750 are high performance corporate jets |    |
| EA50       | Eclipse 500            | S            | 2/Jets                   | 2000-3000        | 320-390             | One of several aircraft termed "Very Light Jets"(VLJ); although these are jets, they significantly underperform airliners and most corporate jets                                                                                        |    |
| E145       | Embraer EMB-145        | L            | 2/Jets                   | 2000-3000        | 430-450             | Similar aircraft: E135 and E140                                                                                                                                                                                                          |   |
| E190       | Embraer EMB-190        | L            | 2/Jets                   | 2000-2500        | 430-450             | Similar aircraft: E170                                                                                                                                                                                                                   |  |

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## APPENDIX A: AIRCRAFT CHARACTERISTICS STUDY CHART *(Continued)*

| Aircraft   |                         | Data         |                          |                  |                     |                                                                                                | Image                                                                                 |
|------------|-------------------------|--------------|--------------------------|------------------|---------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Designator | Aircraft Model          | Weight Class | Number & Type of Engines | Climb Rate (FPM) | Cruise Speed (KTAS) | Comment                                                                                        |                                                                                       |
| E3TF       | Boeing E-3A Sentry      | H            | 4/Jets                   | 3000-3500        | 430-450             | Military airborne reconnaissance aircraft based on a Boeing 707 platform                       |    |
| GLF4       | Gulfstream              | L            | 2/Jets                   | 4000-5000        | 460+                | Similar aircraft: GLF5; they are high performance corporate jets                               |    |
| LJ55       | Gates Lear Jet 55       | S            | 2/Jets                   | 4000-5000        | 430-450             | Similar aircraft: LJ23, LJ24, LJ35, LJ60, and others; they are high performance corporate jets |   |
| MD82       | McDonnell-Douglas MD-82 | L            | 2/Jets                   | 3000-3500        | 430-450             | Similar aircraft: MD83, and MD88                                                               |  |

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## APPENDIX A: AIRCRAFT CHARACTERISTICS STUDY CHART *(Continued)*

| Aircraft   |                      | Data         |                          |                  |                     |                                                                                                                                                      | Image                                                                                 |
|------------|----------------------|--------------|--------------------------|------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Designator | Aircraft Model       | Weight Class | Number & Type of Engines | Climb Rate (FPM) | Cruise Speed (KTAS) | Comment                                                                                                                                              |                                                                                       |
| T37        | Cessna T-37          | S            | 2/Jets                   | 3000-3500        | 320-390             | Military Trainer; performs similar to a Citation C500                                                                                                |    |
| T38        | Northrop Talon AT-38 | S            | 2/Jets                   | 8000-10000       | 460+                | Military Trainer                                                                                                                                     |    |
| A343       | Airbus 340           | H            | 4/Jets                   | 3000-3500        | 460+                | Similar aircraft: A342, A345, and A346                                                                                                               |   |
| A388       | Airbus 380           | H            | 4/Jets                   | 3000-3500        | 460+                | Use the term "SUPER" when coordinating with a terminal facility, and when issuing traffic advisories. Note: ICAO does not have a super weight class. |  |

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## APPENDIX A: AIRCRAFT CHARACTERISTICS STUDY CHART *(Continued)*

| Aircraft   |                             | Data         |                          |                  |                     |                                                                | Image |                                                                                      |  |
|------------|-----------------------------|--------------|--------------------------|------------------|---------------------|----------------------------------------------------------------|-------|--------------------------------------------------------------------------------------|--|
| Designator | Aircraft Model              | Weight Class | Number & Type of Engines | Climb Rate (FPM) | Cruise Speed (KTAS) | Comment                                                        |       |                                                                                      |  |
| B1         | Rockwell INTL B1- Lancer    | H            | 4/Jets                   | 3000-3500        | 460+                | Military Bomber                                                |       |   |  |
| B2         | Northrop Grumman B2- Spirit | H            | 4/Jets                   | 3000-3500        | 460+                | Military Bomber                                                |       |   |  |
| B742       | Boeing 747                  | H            | 4/Jets                   | 3000-3500        | 460+                | Similar aircraft: B741, B743, B74D, B744, B74R, B74S, and B748 |       |   |  |
| C5         | Lockheed C-5 Galaxy         | H            | 4/Jets                   | 2000-3000        | 460+                | Military Cargo                                                 |       |  |  |

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## APPENDIX A: AIRCRAFT CHARACTERISTICS STUDY CHART *(Continued)*

| Aircraft          |                            | Data                |                                     |                         |                            |                                                     | Image                                                                                |
|-------------------|----------------------------|---------------------|-------------------------------------|-------------------------|----------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------------|
| <i>Designator</i> | <i>Aircraft Model</i>      | <i>Weight Class</i> | <i>Number &amp; Type of Engines</i> | <i>Climb Rate (FPM)</i> | <i>Cruise Speed (KTAS)</i> | <i>Comment</i>                                      |                                                                                      |
| C17               | Boeing C-17 Globemaster    | H                   | 4/Jets                              | 2000-3000               | 430-450                    | Military Cargo                                      |   |
| K35R              | Boeing KC-135 Stratotanker | H                   | 4/Jets                              | 4000-5000               | 430-450                    | Similar aircraft: K35E, Military Refueling Aircraft |   |
| B52               | Boeing B-52 Stratofortress | H                   | 8/Jets                              | 3000-3500               | 460+                       | Military Bomber                                     |  |