## General

This section contains the required FAA performance information applicable to this aircraft. Additional information is provided for flight planning purposes.

Performance information associated with those optional systems and equipment that require handbook supplements is provided by Section 9 Supplements.

## Introduction – Performance and Flight Planning

The performance information presented in this section is based on measured Flight Test Data corrected to I.C.A.O. standard day conditions and analytically expanded for the various parameters of weight, altitude, temperature, etc.

The performance charts are un-factored and do not make any allowance for varying degrees of pilot proficiency or mechanical deterioration of the aircraft. Following the stated procedures in a properly maintained airplane, however, can duplicate this performance.

Effects of conditions not considered on the charts must be evaluated by the pilot, such as the effect of soft or grass runway surface on takeoff and landing performance, or the effect of winds aloft on cruise and range performance. Endurance can be grossly affected by improper leaning procedures, and in-flight fuel flow and quantity checks are recommended.

**REMEMBER! To get chart performance, follow the chart procedures.**

1. Aircraft Loading. The first step a planning the flight is to calculate the airplane weight and center of gravity by utilizing the information provided by Section 6 (Weight and Balance) of this handbook.

   The basic empty weight for the airplane as licensed at the factory has been entered. If any alterations to the airplane have been made effecting weight and balance, reference to the aircraft logbook and Weight and Balance Record should be made to determine the current basic empty weight of the airplane.

   Make use of Load Manager to determine the total weight of the airplane and the center of gravity position.

## Flight Planning Example

### A. AIRCRAFT LOADING

The first step a planning the flight is to calculate the airplane weight and center of gravity by utilizing the information provided by Section 6 (Weight and Balance) of this handbook.

The basic empty weight for the airplane as licensed at the factory has been entered In Figure 6-5. If any alterations to the airplane have been made effecting weight and balance, reference to the aircraft logbook and Weight and Balance Record (Figure 6-7) should be made to determine the current basic empty weight of the airplane.

Make use of Load Manager to determine the total weight of the airplane and the center of gravity position.

The landing weight cannot be determined until the weight of the fuel to be used has been established (refer to item G 1).

| | | |
|---|---|---|
| 1. | Basic Empty Weight | 3122 lbs. |
| 2. | Occupants (2 x 170 lbs..) | 3401bs. |
| 3. | Baggage and Cargo | 27 lbs. |
| 4. | Fuel (6 lb./gal. x 80) | 480 lbs. |
| 5. | Takeoff Weight | 3969 lbs. |
| 6. | Landing Weight (A 5) less (G 1). (3969 lbs. - 355 lbs.) | 3614 lbs. |

The takeoff and landing weights are below the maximums and the weight and balance calculations have determined that the CG position is within the approved limits.

**B. TAKEOFF AND LANDING**

The landing distance calculations are performed in the same manner using the existing conditions ii the destination airport and, when established, the landing weight.

The conditions and calculations for the example flight me listed below. The takeoff and landing distances required for the example flight have fallen well below the available runway lengths.

| Condition | Departure Airport | Destination Airport |
|---|---|---|
| 7. Pressure Altitude | 2000 ft. | 3000 ft. |
| 8. Temperature | 21° C | 22° C |
| 9. Wind Component | 9 KTS (Headwind) | 10 KTS (Headwind) |
| 10. Runway Length Available | 7400 ft. | 9000 ft. |
| 11. Runway Required (Normal Procedure- Std. Brakes)<br>Takeoff<br>Accelerate and Stop<br>Landing | <br><br>1620 ft.*<br>3032 ** | <br><br><br>2240 ft. *** |

**NOTE!** The remainder of the performance charts used in this flight plan example assumes a no wind condition. The pilot when computing climb, cruise and descent performance must consider the effect of winds aloft.

**C. CLIMB**

The following values were determined from the above instructions in the flight-planning example.

| | |
|---|---|
| Cruise Pressure Altitude | 16,500 ft. |
| Cruise OAT | -13°C |
| Time to Climb (12.5 min. - 1.5 min.) | 11 min. |
| Distance to Climb (22 nm - 2 nm) | 20 nm * |
| Fuel to Climb (12 gal. - 1 gal.) | 11 gal. * |

**D. CRUISE**

Using the total distance to be traveled during the flight, subtract the previously calculated distance to climb and distance to descend to establish the total cruise distance

The cruise calculations established for the cruise segment of the flight planning example are as follows:

| | |
|---|---|
| **1. Total Distance** | 394 nm |
| **2. Cruise Distance (1) minus (C 4) minus (D 2).** | |

| | |
|---|---|
| **(394 nm - 20 nm - 37 nm)** | 337 nm |
| **3. Cruise Power** | Normal Cruise |
| **4. Cruise Speed** | 187 kts * |
| **5. Cruise Fuel Consumption** | Approx. 24 GPH ** |
| **6. Cruise Time**<br>**(2) Divided by (4), (337 nm / 187)** | 1.8 hr. |
| **7. Cruise Fuel**<br>**(5) x (6), (24 GPH x 1.8 hr.)** | 43.2 gal. |

**F. TOTAL FLIGHT TIME**

Adding the time to climb, the time to descend and the cruise time determine the total flight time. Remember, the time values taken from the climb and descent graphs are in minuses and must be converted to hours before adding them to the cruise time.

The following flight lime is required for the flight-planning example:

1. Total flight lime
   (C 3) plus (D 1) plus (E 6),
   (0.18 + 0.22 + 1.8) 2.2 hrs.

**G. TOTAL FUEL REQUIRED**

Determine the total fuel required by adding the fuel to climb, the fuel to descend and the cruise fuel. When the total fuel (In gallons) is determined, multiply this value by 6 lb. per gallon to determine the total fuel weight used for the flight.

The total fuel calculations for the example flight plan are shown below.

| | |
|---|---|
| 1. Total Fuel Required<br>(C 5) plus (D 3) plus (E 7),<br>(11 + 5 + 43.2)<br>(59.2 gal. X 6 lb/gal.) | <br><br>59.2 gal.<br>355.2 lb. |