BEARHHAWK Weight and Balance

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The Bearhawk weight and balance program was designed for the Bearhawk aircraft. The program includes a simple performance section for determining fuel required for a specific trip. The program uses this data to determine the center of gravity (CG) of the aircraft for takeoff and landing using the aircraft owner's supplied information. This manual should explain the operation of the program.

SETUP:
When you first start up the program, the setup screen will display.

Enter the empty weight, arm and moment of your aircraft in the Empty Aircraft Weight frame. In this frame you should also enter the Max Gross Weight and Max Baggage Weight you will use for your aircraft. Some aircraft may have extended range tanks and contain more fuel than the factory aircraft. In the Max Fuel Load box, enter the maximum fuel your aircraft will carry.

The performance section of the program will use the following values.
In the Flight Parameters section, enter the fuel burn in gallons per hour, true airspeed in knots, and time in minutes (colons (:) are not required) for the various segments of flight. These values can be updated if your aircraft is different than what you initially entered.   The Climb and Descent should be entered in feet per minute.

Click the   Save Setup Data button to save the setup data.
Once you have entered the data required on the Setup tab, you can proceed with the use of the program.

If you have not weighed your aircraft, you can click the   Load Example button to place a generic Bearhawk data on the setup screen.

1

LOAD PROFILE:

To begin you should enter the loading of the aircraft. Select the Load Profile tab.
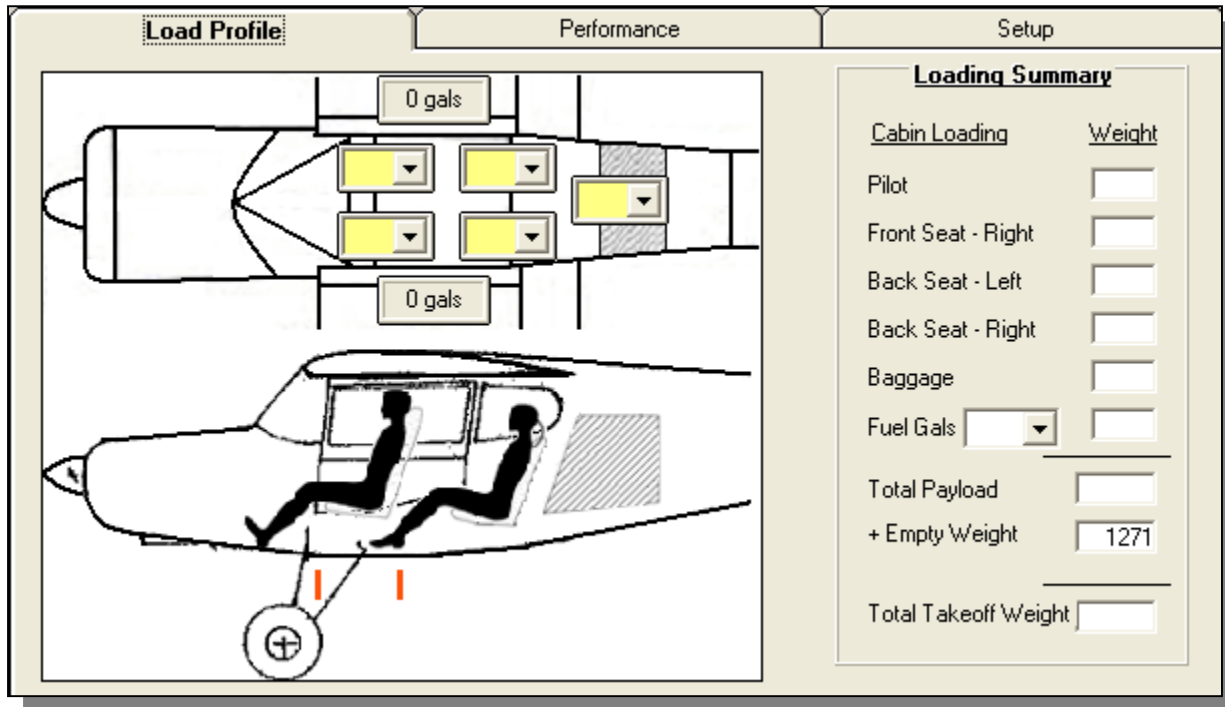
To enter weights on the aircraft, click on the appropriate arrow for the seat position and select the weight from the list. You can also type in a weight in the yellow box.
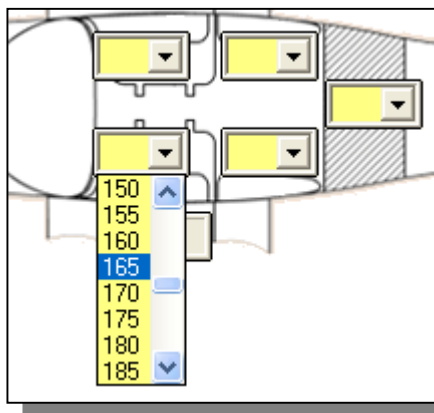
In this example we are selecting 165 pounds for the pilot seat. If you want to be accurate on the weight and the pilot weighed 167 pounds, you can type this value in the yellow box.

The baggage weights are entered the same way. The max baggage weight will be limited to the weight you specified on the setup screen.

Fuel loading, is entered by selecting the gallon amount on the Fuel Gals combo box in the Loading Summary frame. The fuel load will display on the Loading Diagram divided equally for each wing. During the use of the Performance tab, the fuel calculated for the trip can be copied to the Fuel Gallons combo box.
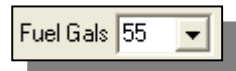
During the submission of data to the Load Profile tab, you will be prompted with various messages related to the current weights entered. These are advisory messages only.

Total weights selected will display on the Loading Summary frame. Takeoff weight will be calculated and the CG (green bar) on the loading diagram will move to show the center of gravity of the aircraft. By changing and rearranging weights in the aircraft, you can instantly see the new CG location. The CG value will be displayed in the lower right corner of the loading diagram.

Load Profile	Performance	Setup

Loading Summary

27.5

165   110

25

180   125

27.5

CG = 18.07

Cabin Loading	Weight
Pilot	180
Front Seat - Right	165
Back Seat - Left	125
Back Seat - Right	110
Baggage	25
Fuel Gals 55	330
Total Payload	935
+ Empty Weight	1271
Total Takeoff Weight	2206

PERFORMANCE:

The weight and balance program contains an added bonus to compute your CG during takeoff and your CG during landing. The Performance tab is divided into 2 tabs. [Flight Data] and [Weight/Balance for Flight].

Flight Data	Weight/Balance for Flight

Flight Conditions

Airport Elevations
Departure Airport (feet)	650
Destination Airport (feet)	300

Mileage
To Destination	350
Destination to Alternate	125
[X] Use IFR Reserve Fuel	

Cruise Conditions
Cruise Altitude	7000
Headwind(-) Tailwind(+)	+
Wind Speed (kts)	25

Flight Time and Fuel

Mode	Time	Fuel (gals)	Miles
Taxi	00:15	1	--------------
Climb	00:13	3	21
Cruise	02:02	20	314
Descent	00:07	1	15
Alternate	00:58	10	125
Reserve	00:45	8	--------------
Total for Flight *	02:22	43	350

Total flight time does not include taxi or reserve/alternate time.
Alternate time and fuel are based on cruise parameters.

Compute

The performance data displayed is only as accurate as the information you entered on the Setup tab. After you have flown your airplane, you can update the information on the Setup tab.

FLIGHT DATA:

Enter information about your flight.

Information required:

- **Departure Airport Elevation** – The altitude of the departure airport.
- **Destination Airport Elevation** – The altitude of the destination airport.
- **Mileage to Destination** – The nautical miles from the departure airport to the destination airport.
- **Mileage To Alternate** – The nautical miles from the destination airport to the alternate airport if you require an alternate.
- **Use IFR Reserve Fuel** - Check this box if you wish to use the IFR reserve fuel values -- (45 minutes). An unchecked box will use VFR reserve fuel of 30 minutes.
- **Cruise Altitude** – The altitude you want to cruise at.
- **Headwind** – If you know the winds at the cruise altitude, select a minus (–) for headwind or plus (+) for tailwind.
- **Wind Speed** – The wind speed in knots at the cruise altitude.

The example above has an airplane flying from Tulsa Riverside airport to Memphis Intl. Airport at an altitude of 7000 ft. Tulsa's elevation is 650 ft. The elevation for Memphis is 300 ft. The mileage Tulsa to Memphis is 350 NM. There is a tailwind of 25 kts at the cruise altitude. An alternate airport has been added with a distance of 125 NM from the Memphis airport.

If an IFR alternate distance is specified, the reserve time will automatically change to 45 minutes. Leaving the Alternate distance value at zero, the program will use the reserve value you entered on the Setup screen. VFR reserve fuel can be used by unchecking "Use IFR Reserve Fuel".

After entering the flight condition's data, click the [Compute] button to calculate the time, fuel needed and weight and balance for the trip.

The total flight time is the time during the flight portion of the trip. It does not include the Taxi, Reserve or Alternate times.

The total fuel does include all the fuel required for the trip including the Taxi, Reserve and Alternate fuel.

NOTE: If the fuel required is more than the fuel selected on the **Load Profile** page, you will be prompted of the fuel difference and given the choice to have the program increase the fuel load on the **Load Profile** page.

The mileage is the distance from takeoff to touchdown.

Anytime parameters are changed on the Flight Condition section or Load Profile section, you will need to re-calculate the Flight Time and Fuel.
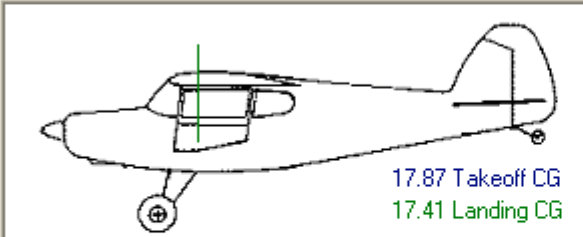
WEIGHT/BALANCE FOR FLIGHT:

The final section of the program is the Performance's Weight and Balance for the flight. This page will show the Aircraft Flight Loading Summary for the flight. The CG for the flight will be displayed for the takeoff condition and the landing condition.

If the CG of the aircraft is not within the designed CG range, the Takeoff and/or Landing CG will be colored red to alert you of this condition.

Miscellaneous Controls

Clear Data

To clear all data entered, except for the setup screen, click the [**Clear Data**] button.

Print

Selecting this button will display a complete summary of the Weight and Balance/Performance data. Select the Print button on this display to send the information to the printer.

Note: The performance screen should be filled out and the weight and balance should be computed before selecting [Print].

Calculator

Displays a calculator that can compute decimal and time values.

* DECIMAL FORMAT *

Select Mode   Display Time Value

0.00

7	8	9	C	CE	MR
4	5	6	+	−	M+
1	2	3	X	/	M−
0		.		=	
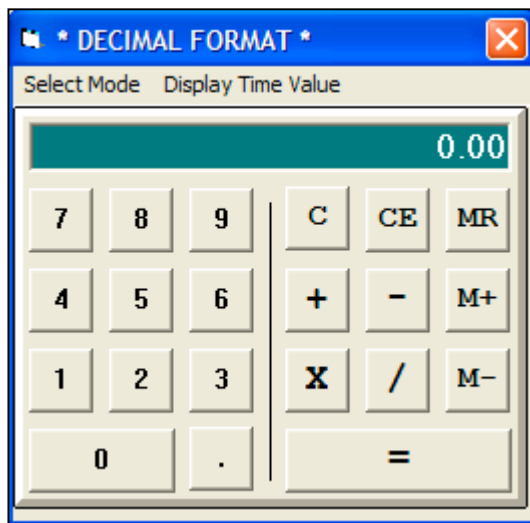
The calculator initially displays in the "Decimal" format. To use the "Time" format, click on the "Select Mode" menu to display the choices.

Select Mode   Display Time Value
Use Calculator in Time Mode
Use Calculator in Decimal Mode
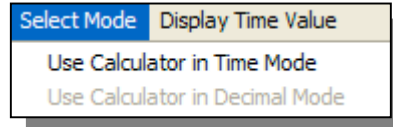
Click the "X" in the top right corner to close the calculator.

The information supplied in this document and the weight and balance program is experimental. The author of this program does not make any claim of the accuracy of the data displayed. The user should verify the information is correct.

Problems with the operation of the program can be sent to me at ghale5224@aol.com.