

Aero

Software

Flight Computer  
E6B

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## Introduction

This software will run on any operating system from Windows 95 onwards (including 64 bit versions), It will also run on Linux, Mac and many others. It has been written in Java, Java is free to download from [www.java.com](http://www.java.com). If you have any problems running this program please check that you are using the latest version of Java.

## Getting Started

If you are running Windows click Start -> Programs -> Aero Software -> E6B  
For all other operating systems double click E6B.jar

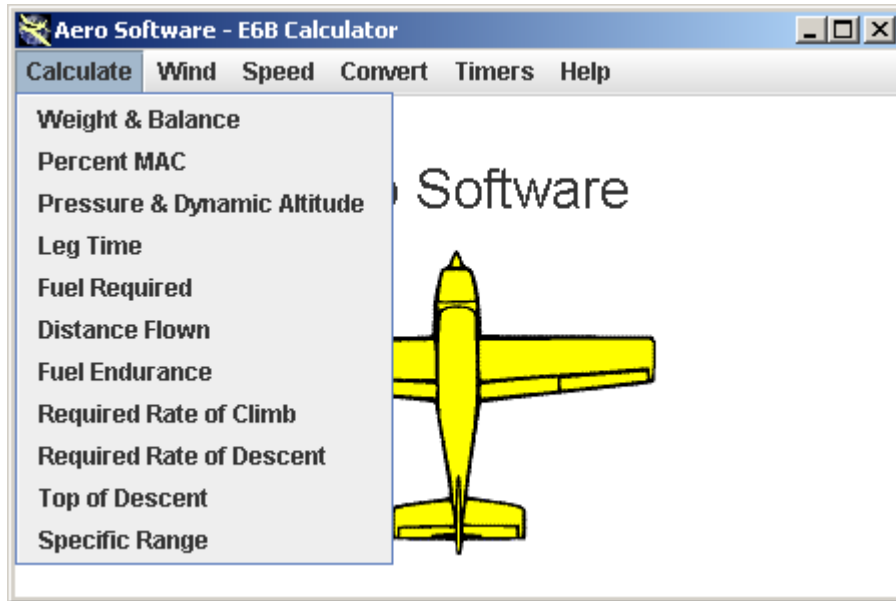
You will see the opening screen



"Calculate" "Wind" "Speed" "Convert" "Timers" and "Help"  
Are all dropdown menus containing functions which will run when you click on your chosen function.

# Calculations

Click on "Calculate" and you will see the following list.



## *Weight and Balance*

The screenshot shows a window titled "Aero Software - Weight and Balance". The window has a "File" menu. The main area contains the following input fields:

- Maximum Take Off Weight Authorised
- Minimum Lever Arm
- Maximum Lever Arm
- Aircraft Empty Weight
- Fuel
- Pilot
- Front Passenger
- Rear Passenger(s)
- Rear Passenger(s)
- Baggage
- Baggage
- First Datum Point
- Second Datum Point
- Third Datum Point
- Utility Category Datum Point

There are two columns of input fields labeled "Weight" and "Lever Arm". A "Calculate" button is located at the bottom of the window.

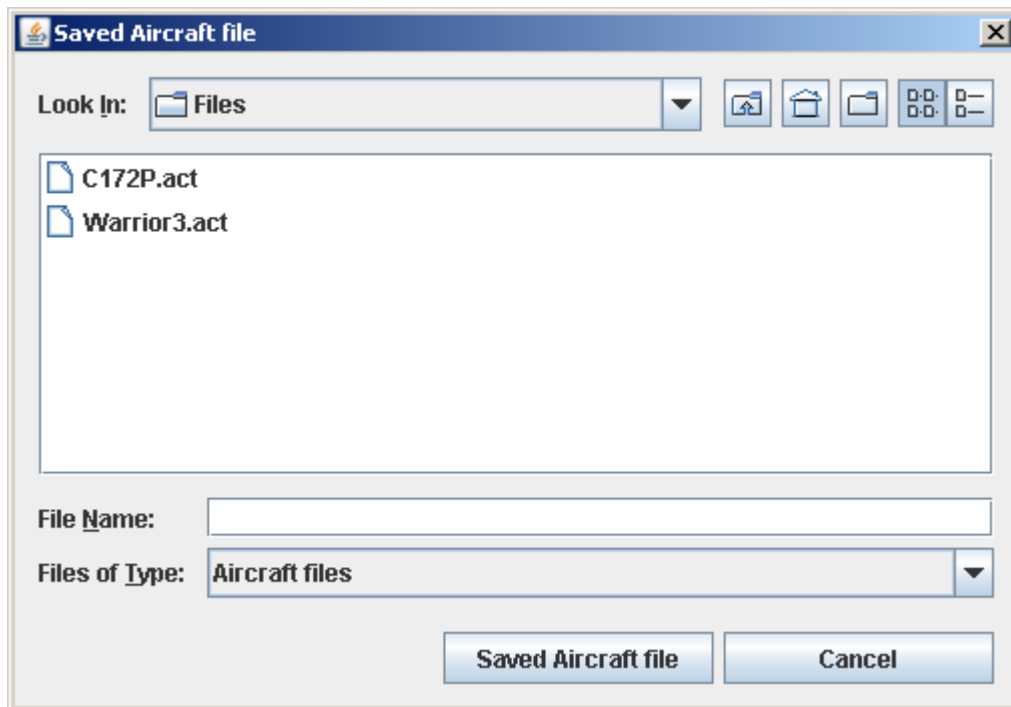
## Loading aircraft types

Two aircraft are provided to accompany this software C172P and Warrior 3.

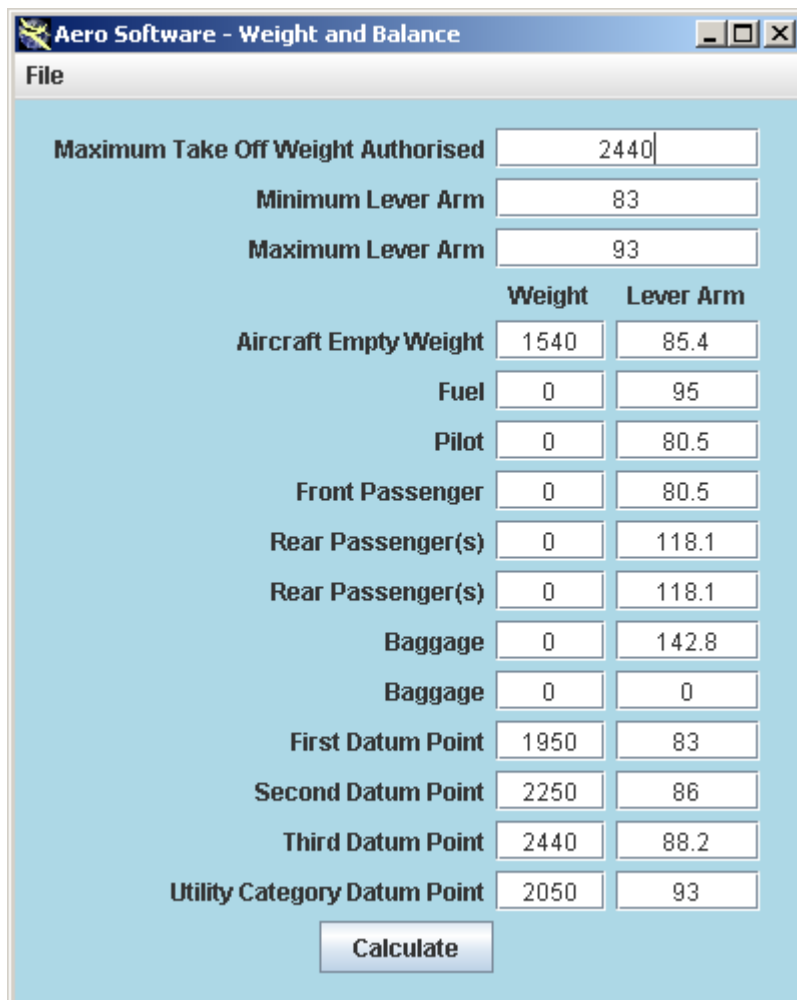
To load these aircraft (or any others you have created choose File -> Open

	Weight	Lever Arm
Maximum Take Off Weight Authorised	<input type="text"/>	<input type="text"/>
Minimum Lever Arm	<input type="text"/>	<input type="text"/>
Maximum Lever Arm	<input type="text"/>	<input type="text"/>
Aircraft Empty Weight	<input type="text"/>	<input type="text"/>
Fuel	<input type="text"/>	<input type="text"/>
Pilot	<input type="text"/>	<input type="text"/>
Front Passenger	<input type="text"/>	<input type="text"/>
Rear Passenger(s)	<input type="text"/>	<input type="text"/>
Rear Passenger(s)	<input type="text"/>	<input type="text"/>
Baggage	<input type="text"/>	<input type="text"/>
Baggage	<input type="text"/>	<input type="text"/>
First Datum Point	<input type="text"/>	<input type="text"/>
Second Datum Point	<input type="text"/>	<input type="text"/>
Third Datum Point	<input type="text"/>	<input type="text"/>
Utility Category Datum Point	<input type="text"/>	<input type="text"/>

You will see the file chooser window



Click on your chosen aircraft type and then click “Saved Aircraft File” or double click on the aircraft type you require. The values for an empty aircraft of this type will be shown

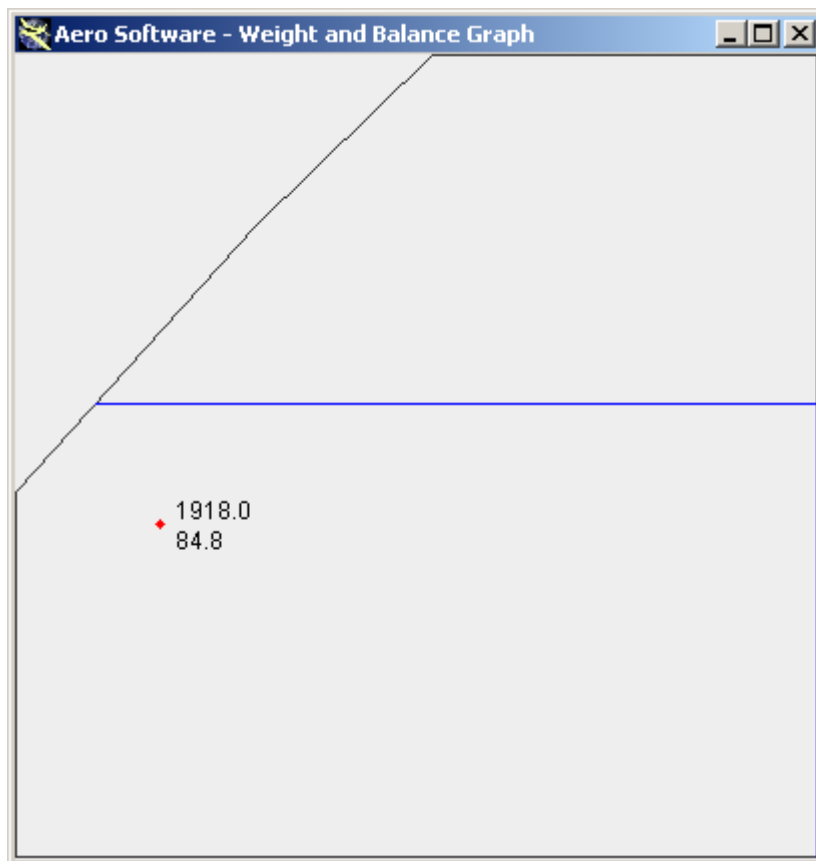


Enter the amount of fuel in US Gallons, weight of pilot, and all other variables required in pounds. Then click "Calculate"

You will see a graph for your aircraft type with a red dot indicating the relative position of your weight and balance within the parameters for your aircraft type. Alongside the dot the top number is the aircraft weight in pounds, the second number is the aircraft lever.

The blue line(s) represent the limit of the "Utility Category" weight and balance if applicable to your aircraft type.

**If you cannot see the red dot, or it is outside the black lines in the top left hand corner of the graph the aircraft **MUST NOT BE FLOWN** in this configuration.**

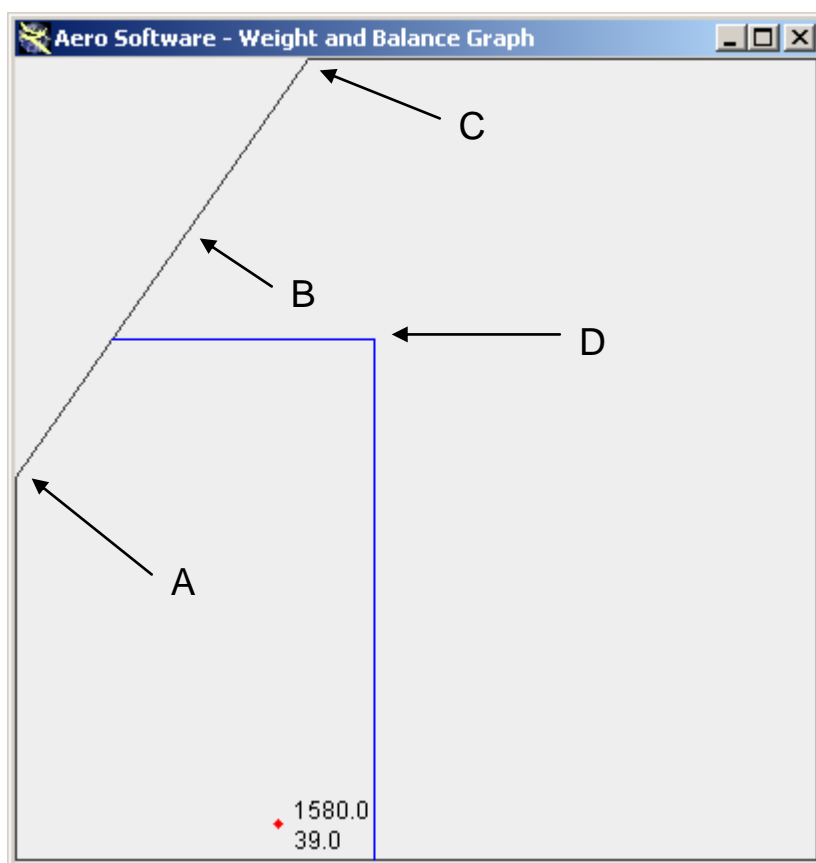


## Creating your own aircraft types

Firstly you need to know how the software uses the data on the first screen to produce the graph:

1. The aircrafts empty weight is used to produce the bottom line of the graph.
2. The aircrafts maximum permissible weight is used to produce the top line of the graph.
3. The aircrafts minimum lever arm produces the left hand line and
4. The aircrafts maximum lever arm the right hand line.

There are generally four other points which will be required for your aircraft type as marked on the following diagram:



- A) Is the weight at which the line deviates from the minimum lever arm and is entered as the “first datum point.
- B) Is the point at which the first angled line ends and the second begins it is entered as the second datum point.
- C) Is the point at which the second line meets the maximum take off weight authorised line at the top this is entered as the third datum point.
- D) This is the point which forms the maximum weight permitted operation in the “Utility Category” and the maximum lever arm permitted for the same. This is entered as the Utility Category datum point.



	Weight	Lever Arm
Maximum Take Off Weight Authorised	2400	
Minimum Lever Arm	35	
Maximum Lever Arm	47.25	
Aircraft Empty Weight	1538	38.71
Fuel	42	48
Pilot	0	37
Front Passenger	0	37
Rear Passenger(s)	0	73
Rear Passenger(s)	0	73
Baggage	0	95
Baggage	0	123
First Datum Point	1950	35
Second Datum Point	2200	37.5
Third Datum Point	2400	39.5
Utility Category Datum Point	2100	40.5

Enter the Maximum Take Off Weight Authorised top box,  
the Minimum Lever Arm permissible in the second,  
the Maximum Lever Arm in the third,  
The Aircrafts Empty Weight and Lever Arm in the fourth row,  
Enter 0 (zero) and the Fuel Lever Arm in the fifth row,

Enter 0 (zero) and the Pilots Seat Lever Arm in the fifth row,  
*Note this could be used for the front row of seats and the weight of the pilot  
and co-pilot (or pilot and front seat passenger combined) in the weight  
column.*

Enter 0 (zero) and the Front Passengers Lever Arm in the fifth row,  
*Note: if you wish this could be the second row of seats and the weight of all  
passengers in this row combined and placed in the weight box. This is true for  
the remaining rows which can be as stated or additional rows of seats.*

Enter 0 (zero) and the Lever and for the baggage area (if any)  
Enter 0 (zero) and the lever arm for any second baggage area.

Please make sure that any unused weight and lever arms if not applicable to  
your aircraft type are set to 0 (zero).

Now you should have all the parameters in place to represent your aircraft  
empty.

**Please double check all your figures.**

## Saving Aircraft Types

To save this data for later use click

	Weight	Lever Arm
Maximum Take Off Weight Authorised	2400	
Minimum Lever Arm	35	
Maximum Lever Arm	47.25	
Aircraft Empty Weight	1538	38.71
Fuel	42	48
Pilot	0	37
Front Passenger	0	37
Rear Passenger(s)	0	73
Rear Passenger(s)	0	73
Baggage	0	95
Baggage	0	123
First Datum Point	1950	35
Second Datum Point	2200	37.5
Third Datum Point	2400	39.5
Utility Category Datum Point	2100	40.5

You will see the save dialogue window

Look In: Files

- C172P.act
- Warrior3.act

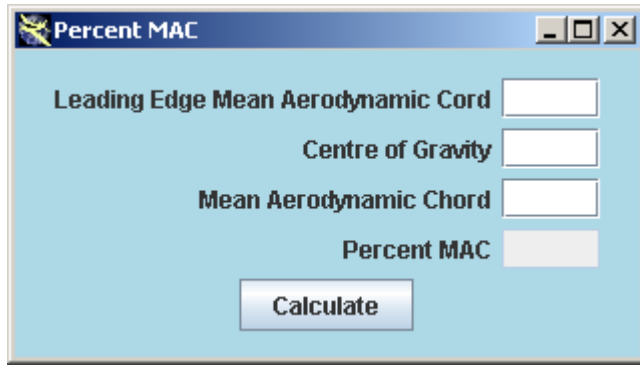
File Name: MyAircraft

Files of Type: Aircraft files

Save file Cancel

Type the name of the aircraft type you have created and click “Save File”

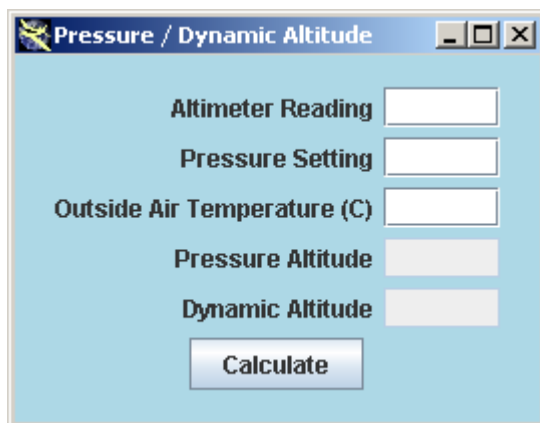
## **Percentage MAC**



The screenshot shows a window titled "Percent MAC" with a light blue background. It contains four input fields arranged vertically, each with a label to its left: "Leading Edge Mean Aerodynamic Cord", "Centre of Gravity", "Mean Aerodynamic Chord", and "Percent MAC". Below these fields is a "Calculate" button. The "Percent MAC" field is currently empty and has a light grey background, while the others are white.

Enter the Leading Edge Mean Aerodynamic Cord,  
Enter the centre of gravity,  
Enter the Mean Aerodynamic Chord,  
Click "Calculate" – the centre of gravity will be displayed as a percentage of the Mean Aerodynamic Chord.

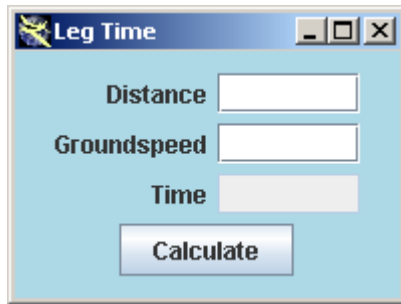
## **Pressure and Dynamic Altitude**



The screenshot shows a window titled "Pressure / Dynamic Altitude" with a light blue background. It contains five input fields arranged vertically, each with a label to its left: "Altimeter Reading", "Pressure Setting", "Outside Air Temperature (C)", "Pressure Altitude", and "Dynamic Altitude". Below these fields is a "Calculate" button. The first three fields are white, while "Pressure Altitude" and "Dynamic Altitude" have light grey backgrounds.

Enter the Altimeter Reading,  
Enter the Pressure Setting in either mb or Inches of Mercury (accepts both),  
Enter the Outside Air Temperature (in degrees Centigrade),  
Click "Calculate" – the Pressure Altitude and Dynamic Altitude will be displayed.

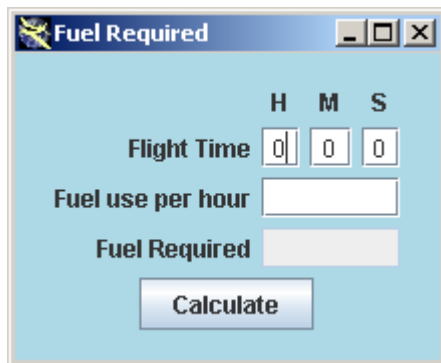
## Leg Time



The screenshot shows a window titled "Leg Time" with a light blue background. It contains three input fields: "Distance", "Groundspeed", and "Time". Below these fields is a "Calculate" button. The "Time" field is currently empty and has a grey background, indicating it is the result of the calculation.

Enter the Distance,  
Enter your Groundspeed,  
Click "Calculate" – the Leg Time will be displayed.

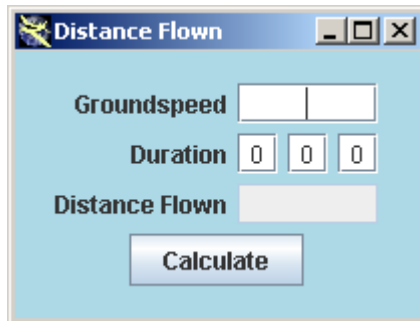
## Fuel Required



The screenshot shows a window titled "Fuel Required" with a light blue background. It features a "Flight Time" section with three columns labeled "H", "M", and "S", each containing a text input field with the number "0". Below this is a "Fuel use per hour" input field and a "Fuel Required" output field with a grey background. A "Calculate" button is located at the bottom.

Enter the Flight Time in Hours, Minutes and Seconds,  
*Note: You can enter fractions i.e. 1.2 or any figure in the hours, minutes and seconds columns.*  
Enter the Fuel user per hour,  
*Note: this can be in any measurement you prefer.*  
Click "Calculate" – the Fuel Required will show you're the fuel you require in the specific measurement you used.

## ***Distance Flown***



The screenshot shows a window titled "Distance Flown" with a light blue background. It contains three input fields: "Groundspeed" (a single text box), "Duration" (three separate boxes for hours, minutes, and seconds, each containing the number 0), and "Distance Flown" (a single text box). Below these fields is a "Calculate" button.

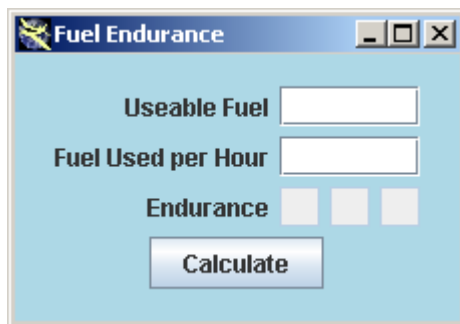
Enter your groundspeed,

Enter your flight duration,

*Note: You can enter fractions i.e. 1.2 or any figure in the hours, minutes and seconds columns.*

Click "Calculate" – The distance you have flown will be calculated.

## ***Fuel Endurance***



The screenshot shows a window titled "Fuel Endurance" with a light blue background. It contains three input fields: "Useable Fuel" (a single text box), "Fuel Used per Hour" (a single text box), and "Endurance" (three separate boxes for hours, minutes, and seconds, each containing the number 0). Below these fields is a "Calculate" button.

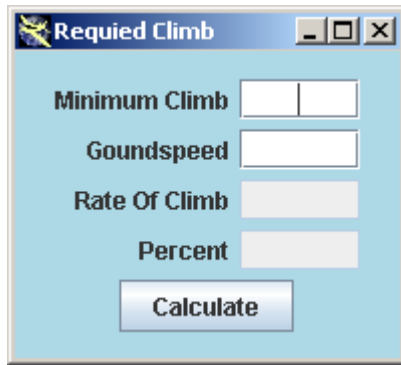
Enter your useable fuel,

Enter the fuel used per hour,

*Note: Both measurements must be the same i.e. both gallons, or litres etc.*

Click "Calculate" – the maximum remaining flying time on the fuel available will be displayed in hours, minutes and seconds.

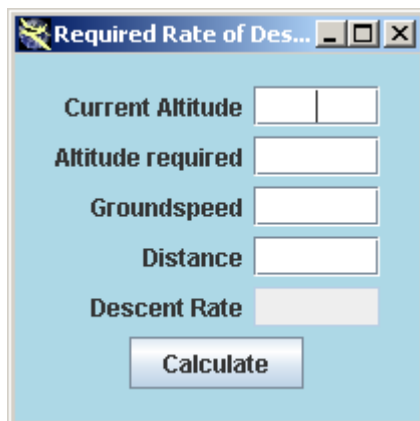
## ***Required Climb***

A screenshot of a software window titled "Required Climb". The window has a light blue background and a title bar with standard Windows window controls. It contains four input fields: "Minimum Climb" (a two-part text box), "Groundspeed" (a single text box), "Rate Of Climb" (a single text box), and "Percent" (a single text box). Below these fields is a "Calculate" button.

Enter your required rate of climb in feet per mile,  
Enter your groundspeed,  
Click "Calculate".

Your required rate of climb in feet per minute and climb gradient will be calculated.

## ***Required Rate of Descent***

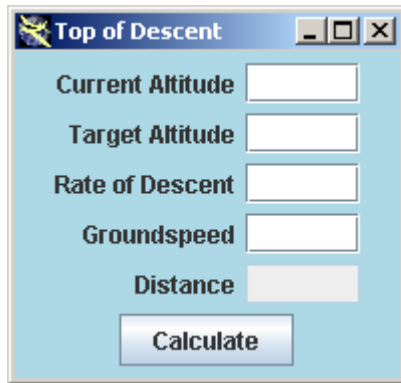
A screenshot of a software window titled "Required Rate of Des...". The window has a light blue background and a title bar with standard Windows window controls. It contains five input fields: "Current Altitude" (a two-part text box), "Altitude required" (a single text box), "Groundspeed" (a single text box), "Distance" (a single text box), and "Descent Rate" (a single text box). Below these fields is a "Calculate" button.

This function calculates your required rate of descent (or climb).

Enter your Current Altitude,  
Enter the Altitude you require,  
Enter your groundspeed,

Enter the distance (in miles) at which you require to be at the new level.  
Click "Calculate" your rate of descent (or climb) will be calculated.

## ***Top of Descent***



The screenshot shows a window titled "Top of Descent" with a light blue background. It contains five input fields: "Current Altitude", "Target Altitude", "Rate of Descent", "Groundspeed", and "Distance". The "Distance" field is currently empty and has a light gray background. Below the fields is a "Calculate" button.

Given your current altitude, the altitude you require, your groundspeed and your chosen rate of descent, this will calculate at what distance from the target you need to start your descent.

Enter your current altitude,

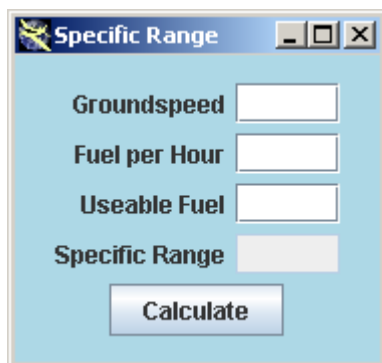
Enter your target altitude,

Enter your groundspeed,

Enter your chosen rate of descent.

Click "Calculate" – the distance at which you need to start your descent will be calculated.

## ***Specific Range***



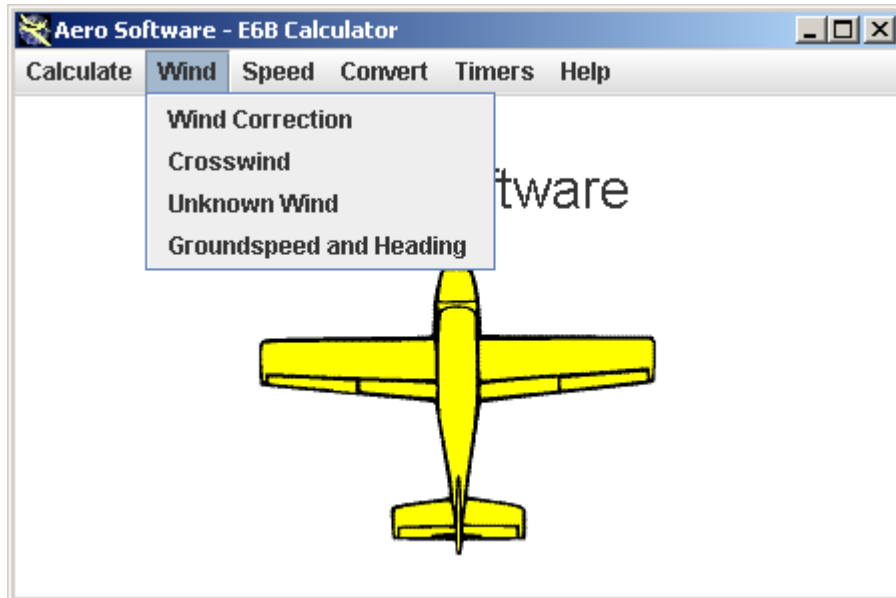
The screenshot shows a window titled "Specific Range" with a light blue background. It contains four input fields: "Groundspeed", "Fuel per Hour", "Useable Fuel", and "Specific Range". The "Specific Range" field is currently empty and has a light gray background. Below the fields is a "Calculate" button.

Enter your groundspeed,

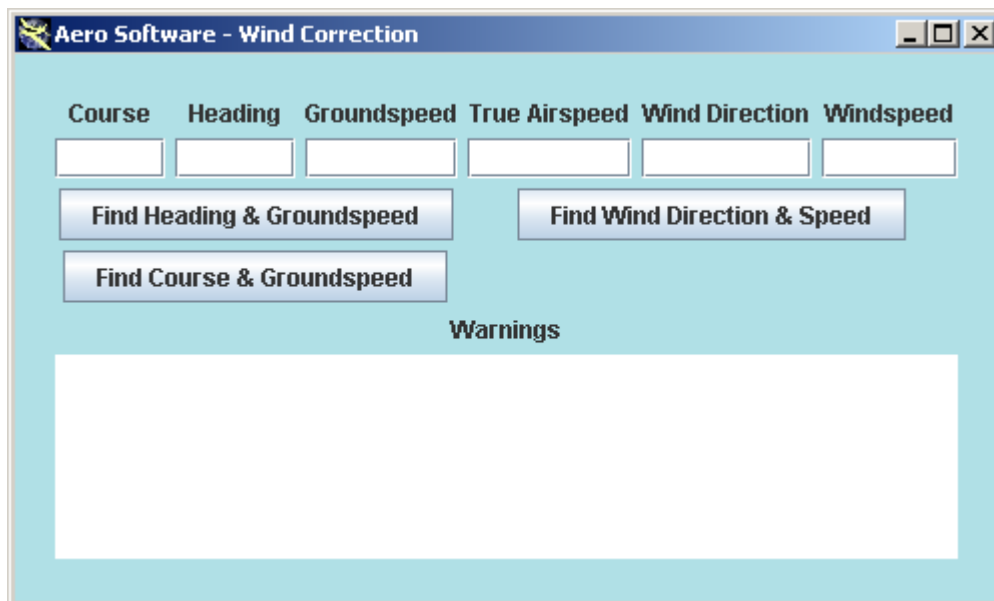
Enter your fuel use per hour,

Enter the remaining useable fuel,

Click "Calculate" – Your range will be calculated.



### ***Heading and Groundspeed***



Enter the wind direction,  
Enter the winds speed,  
Enter your course,  
Enter your true airspeed  
Click "Find Heading and Groundspeed",  
The heading and groundspeed boxes will display the result.

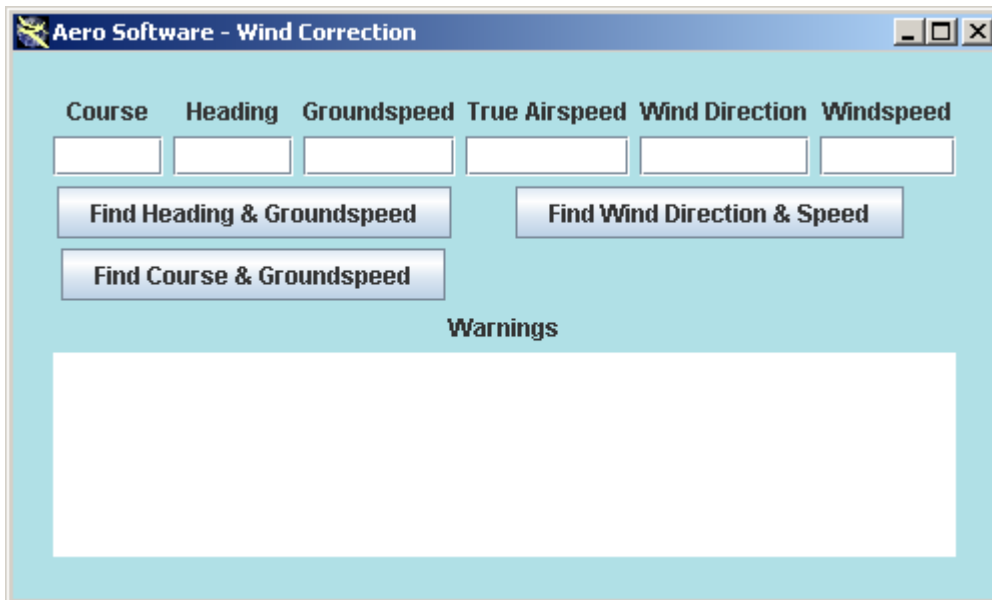


## ***Crosswind***



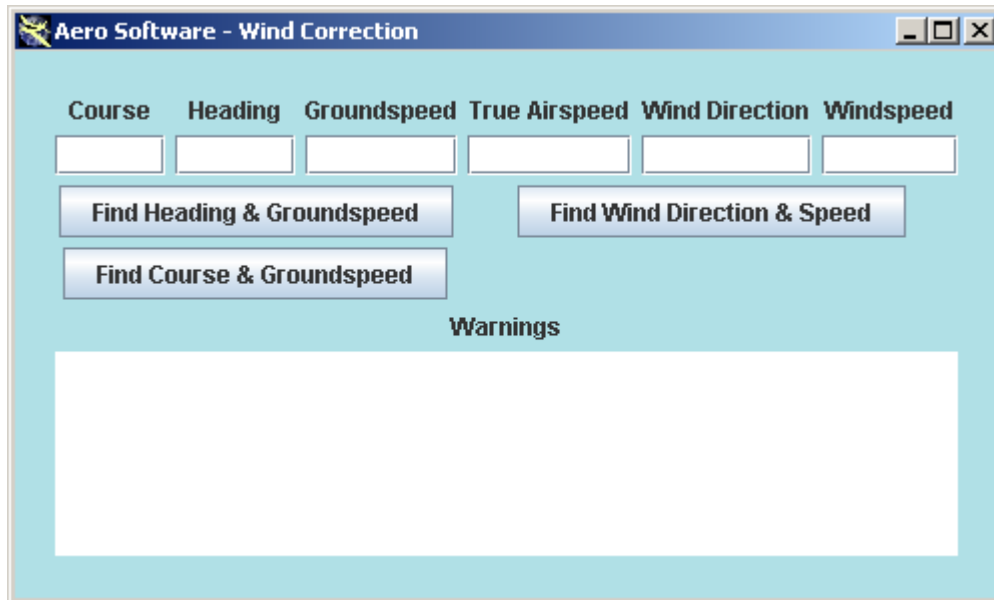
Enter the runway number,  
Enter the Wind direction,  
Enter the wind speed,  
Click “Calculate” – the crosswind component and headwind will be displayed.

## ***Wind Direction and Speed***



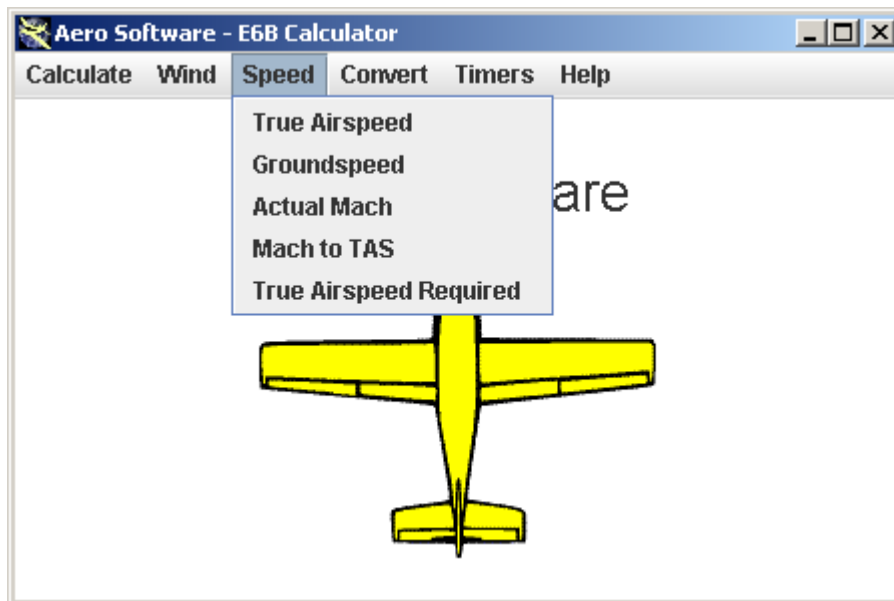
Enter your course,  
Enter your true airspeed,  
Enter your groundspeed,  
Enter your heading,  
Click “Find Wind Direction & Speed” – The wind direction and wind speed will be displayed.

## Course and Groundspeed

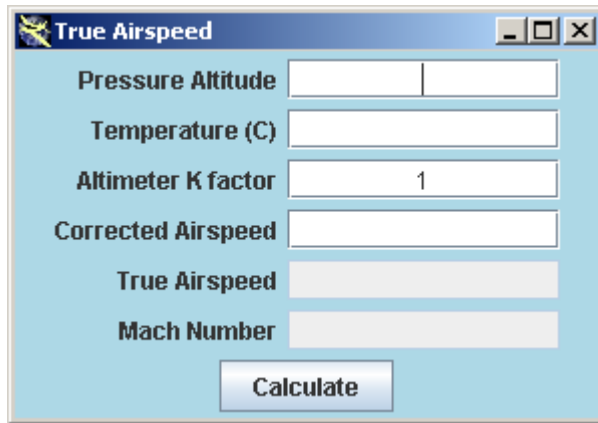


The screenshot shows a software window titled "Aero Software - Wind Correction". It features six input fields at the top labeled "Course", "Heading", "Groundspeed", "True Airspeed", "Wind Direction", and "Windspeed". Below these fields are three buttons: "Find Heading & Groundspeed", "Find Wind Direction & Speed", and "Find Course & Groundspeed". At the bottom of the window, there is a section labeled "Warnings" with a large empty white box below it.

Enter the wind speed,  
Enter your true airspeed,  
Enter your heading,  
Enter the wind direction,  
Click "Find Course and Groundspeed" – the results will be displayed for you.



## ***True Airspeed***

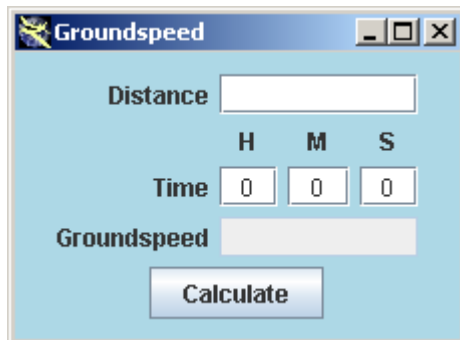


The screenshot shows a window titled "True Airspeed" with a light blue background. It contains the following fields and controls:

- Pressure Altitude**: A text input field with a vertical line separator.
- Temperature (C)**: A text input field.
- Altimeter K factor**: A text input field containing the number "1".
- Corrected Airspeed**: A text input field.
- True Airspeed**: A read-only text field.
- Mach Number**: A read-only text field.
- Calculate**: A button at the bottom center.

Enter your pressure altitude (altimeter reading with 1013 / 29.92 set on the subscale),  
Enter the outside air temperature,  
Enter your altimeters K factor (if known),  
Enter your corrected airspeed,  
Click "Calculate" – your true airspeed and Mach number will be displayed.

## ***Groundspeed***

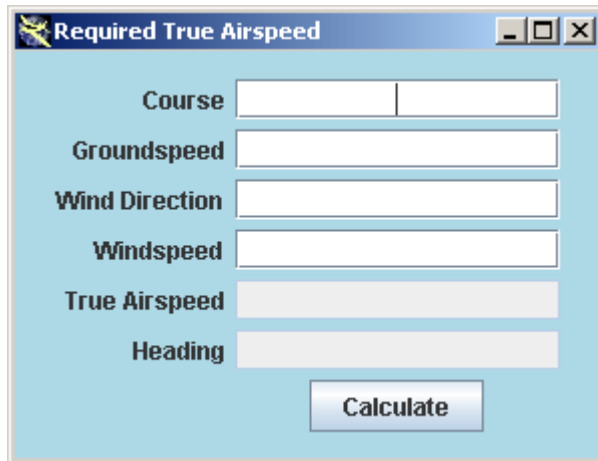


The screenshot shows a window titled "Groundspeed" with a light blue background. It contains the following fields and controls:

- Distance**: A text input field.
- Time**: Three separate text input fields labeled "H", "M", and "S", each containing the number "0".
- Groundspeed**: A read-only text field.
- Calculate**: A button at the bottom center.

Enter the distance you have flown,  
Enter the time in hours minutes and seconds.  
*Alternatively you can put numbers with decimal places in any of the boxes, for example 1.25 in the hours box.*  
Click "Calculate" – your groundspeed will be displayed.

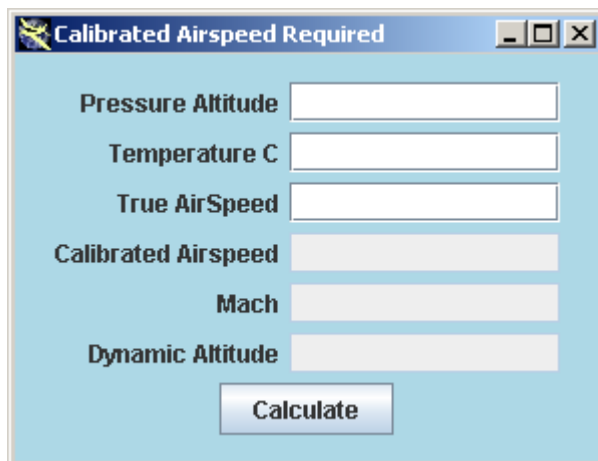
## ***True Airspeed Required***



The screenshot shows a software window titled "Required True Airspeed". It contains six input fields: "Course" (a two-part field), "Groundspeed", "Wind Direction", "Windspeed", "True Airspeed", and "Heading". The "True Airspeed" and "Heading" fields are currently empty and have a light gray background. A "Calculate" button is located at the bottom center of the window.

Enter your course,  
Enter your groundspeed,  
Enter the wind direction,  
Enter the wind speed,  
Click "Calculate" The true airspeed and heading required to make good your groundspeed and course will be displayed.

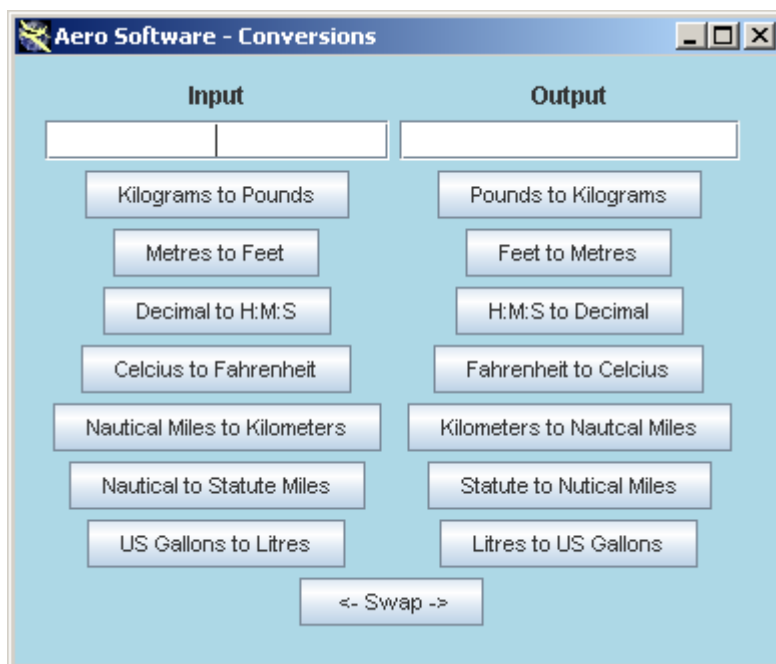
## ***Calibrated Airspeed Required***



The screenshot shows a software window titled "Calibrated Airspeed Required". It contains five input fields: "Pressure Altitude", "Temperature C", "True AirSpeed", "Calibrated Airspeed", and "Mach". The "Calibrated Airspeed", "Mach", and "Dynamic Altitude" fields are currently empty and have a light gray background. A "Calculate" button is located at the bottom center of the window.

Enter your pressure altitude,  
Enter the outside air temperature,  
Enter your true airspeed,  
Click "Calculate" – your calibrated airspeed, Mach number and your dynamic altitude will be displayed.

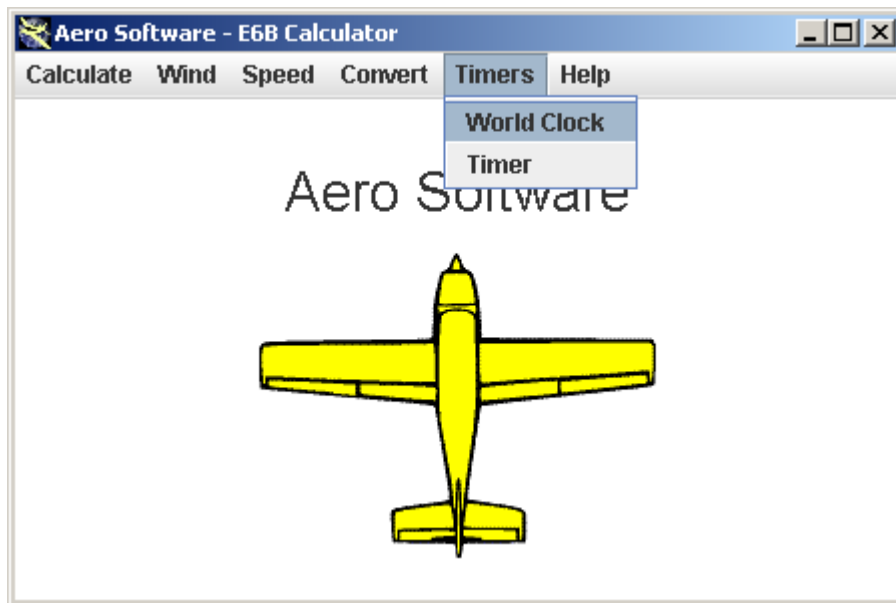
## Common Conversions



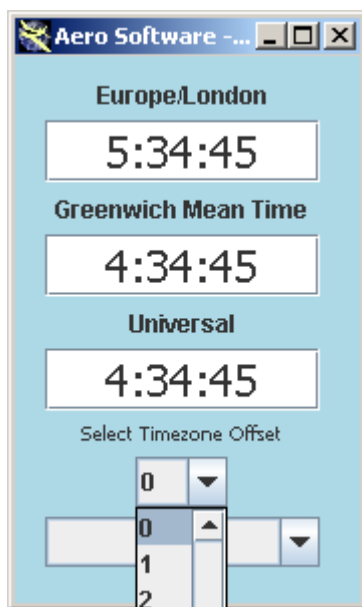
Enter the value you want converted and click the required conversion.

The output and input values can be swapped by clicking "Swap" if further conversions are necessary.

## Timers



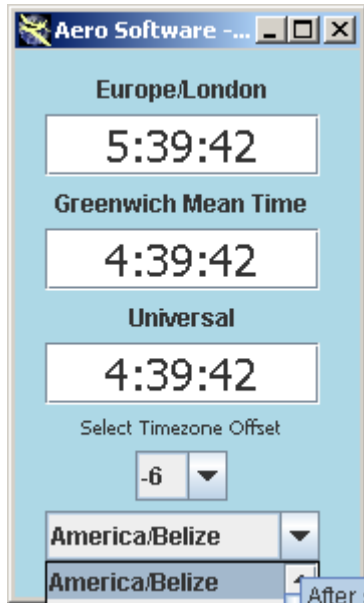
### *World Clock*



Run the world clock,  
The program will automatically detect your time zone and display this in the top window.

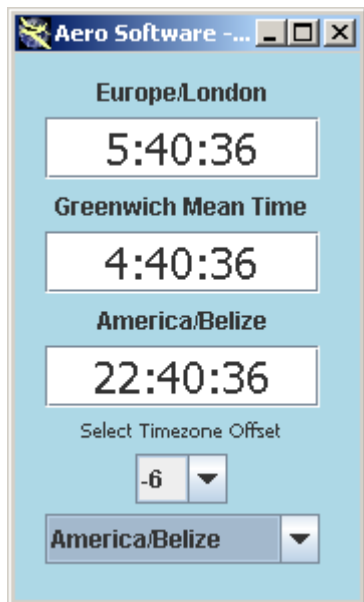
GMT (UTC) will be displayed in the second window (as shown)  
The third time zone can be selected.

To set the third time zone click on the down arrow to the right on the window directly below "Select Time zone Offset" you will see a list from -12 to +12 centred on the current setting.

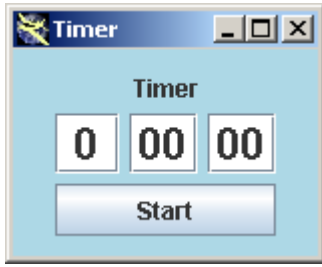


Click on the required offset the lower dropdown list will contain a list of countries and zones in your chosen time zone.

Once selected the third time zone will update to reflect the change.



## ***Timer***



The timer operates in to modes:

1. Count-up
2. Count-down

Click start and the time will start counting up.

or

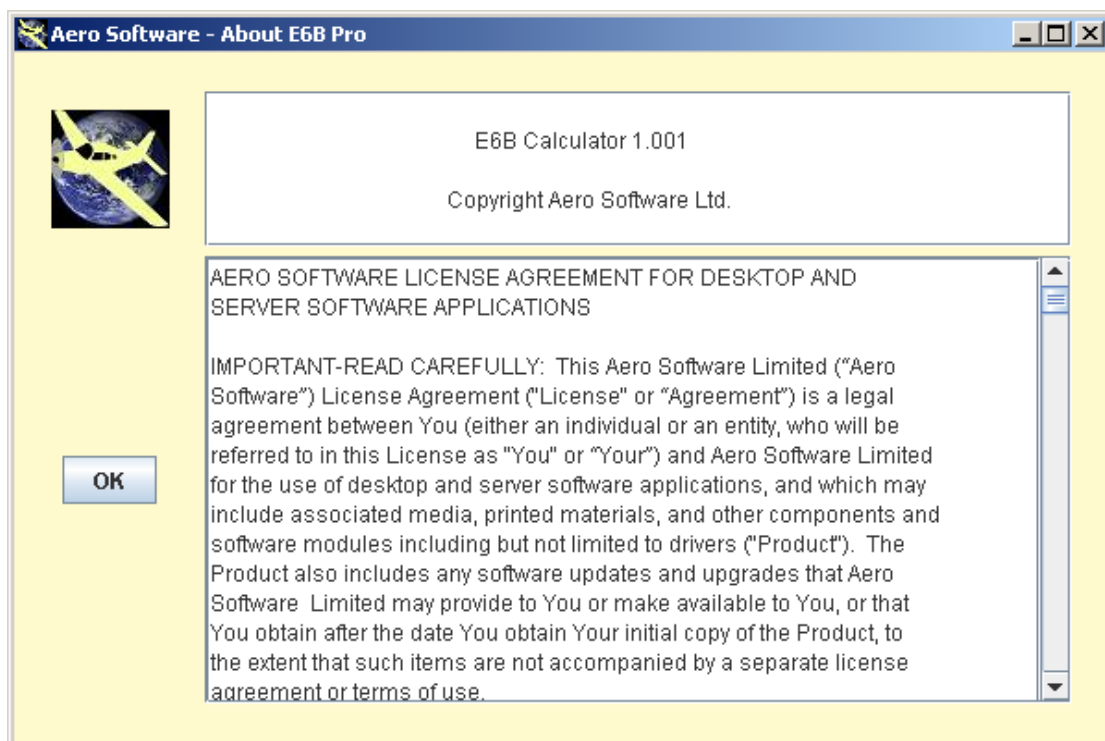
Enter a time to count down from then click start. In this mode a beep tone will sound when zero has been reached and the counter will stop counting.



# Help



## About



This window displays the software version number and licensing information.