



Brief User Guide

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Diamond 42

For program installation help please see <http://www.afmsolutions.com/installing.html>

For getting started help please see <http://www.afmsolutions.com/ipadiphone.html>

When starting the app for the first time you'll have to accept the license agreement in order to continue.

When the app is started, it always shows the Main Menu page as illustrated below. Here, you can tap the Weight & Balance button, Landing button or Takeoff button.



There are several options for the app's background color. Under different lighting conditions certain options may work better than others. The textured background works great in bright daylight, but a darker grey works better in low light situations.

Weight and Balance

Tap the “**Weight & Balance**” button on the main menu to jump to the Weight and Balance form. Then, you can either begin by typing the passengers’ weight values or you can use the quick fill method.

To begin entering numbers tap on a white input box of your choice, for example Seat 1 or Front Seat L:

Passenger and baggage weight values are in **kilograms**.

The user can select the **Fuel** Quantity units to be either in **kilograms** or in **US Gallons**.

In this example the main tank contains 30 US gallons of fuel on takeoff and it contains 15,9 gallons on landing.

A built-in keypad will appear so you can start typing. To move to the next box press the “**Next**” button:

The quick fill method:

1. Select the pre-determined passenger weight from 35 kg to 105 kg per row.
2. Tap the yellow “**Fill All Seats**” button. Then tap the “**CLR**” button next to any vacant seat.

W & B

Auto - Fill Clear All Clear All

Front Seat L 80 CLR

Front Seat R 80 CLR

Rear Seat L 80 CLR

Rear Seat R 0 CLR

Nose Baggage 5 CLR

Cabin Baggage 12 CLR

Baggage Ext. 5 CLR

De-Icing Fluid 10 CLR

Fill All Seats With: 80 kg

Fuel Units

kg

US Gal (3.1797 kg/gal)

Fuel Quantity Units: US Gal

Main Fuel (Takeoff) 30 CLR

Aux. Fuel (Takeoff) 22 CLR

Main Fuel (Landing) 15.9 CLR

Aux. Fuel (Landing) 15.9 CLR

Show Total Weight Go

Total Takeoff Weight 1687

Total Landing Weight 1623

Total Baggage Weight 32

Total Pax Weight 240

3. Press the “**Show Total Weight**” button at any time to the current Ramp Weight, Takeoff Weight, etc.
4. Press the “**View Configuration**” button to see the details of the current configuration or to change the configuration/

When finished typing, just press the green “**Go**” button to see the computed results.

Takeoff
Landing
W&B
Main

Back To Input
✓ Within Limits

TAKEOFF:

Weight.....1687.4
C.G.2.44
Forw. Limit.....2.38
Aft Limit2.49

LANDING:

Weight1623.2
C.G.2.43
Forw. Limit2.37
Aft Limit2.49

ZERO-FUEL:

Weight.....1522
C.G.2.4
Forw. Limit.....2.36
Aft Limit2.47

W & B Envelope

Max. Takeoff Weight

Max. Zero Fuel W.

B.O.W.

Takeoff Landing Zero-Fuel

All Weight units are in kg
All CG units are in m

➔ Email Options

➔ Print Screen

This form can be emailed or saved for later use

Diamond DA-42

Takeoff
Landing
Main Menu

The red square represents the Takeoff CG location, the blue square represents the Landing CG location and the yellow square represents the zero-fuel CG location.

The **Ramp Weight**, moment and CG values are also computed, but they are not shown in the diagram. However, if the ramp weight, cg or moment is out of limits a warning message will appear on the screen.

Takeoff

Enter the required airport and weather information. The values will default to zero if left blank.

The runway length and the altimeter setting fields cannot be zero.

The altimeter setting can be entered in several ways for your convenience. For example for standard conditions you can type "29.92" or "2992" (for US users) or you can use a metric value of "1013" (for European users)

The Runway Slope value is a number between -2% and +2%.

Main Menu
Landing
Takeoff
Copy Lnd. Data

Airport ID: () Runway:()

Climb Limited!

2

Max. TOW Allowed
1762 kg

Takeoff Ground Roll	444 m
T.O. Dist. (Over 50ft Obst)	762 m
1 Eng. Climb Gradient	0.8 %
1 Eng. Climb Rate	59 fpm
2 Eng. Climb Gradient	11.8 %
2 Eng. Climb Rate	906 fpm
Pressure Altitude	1500 ft
Deviation From ISA Temp.	25 °
HeadWind Component	20 Kts
VR	72 Kts
V2	79 Kts

Field Elevation (ft)
1500
CLR
Runway Heading..
0
CLR
Runway Length (m)
2100
CLR
Clearway Length (m)
0
CLR
Stopway Length (m)
0
CLR
Runway Slope....
0
CLR
Altimeter Setting..
1013
CLR
Temperature (°C)
37
CLR
Wind Direction.....
0
CLR
Wind Speed....(Kts)
20
CLR
Proposed Weight (kg)
1685
CLR
Use Proposed Weight
☐
Clear A
1
Go
View Details
3
0
CLR
0
CLR

Click on a Selection:

Required SID Gradient
None Used
Obstacle
None Used
None

Select Takeoff Mass Mod:

1700 kg
1785 kg

OAM 42-088

Landing
Main Menu

1. If the “**Use Proposed Weight**” box is checked, the program will use the weight found in the “Proposed Weight” box. If left unchecked, the program will find the maximum allowable takeoff weight for the given conditions.

2. If the resulting takeoff weight is limited then there will be a warning message at the top.

3. Press the “**View Details**” button to see the details of all the weight limitations encountered as it relates to EASA requirements.

The wind corrections include 50% factored headwind and 150% factored tailwind, as required.

Takeoff with an obstacle present:

Field Elevation (ft)

Runway Heading..

Runway Length (m)

Clearway Length (m)

Stopway Length (m)

Runway Slope....

Altimeter Setting..

Temperature (°C)

Wind Direction.....

Wind Speed....(Kts)

Proposed Weight (kg)

Use Proposed Weight ☐

Airport ID: () Runway:()

Obstacle Limited!

Max. TOW Allowed 1425 kg

Takeoff Ground Roll	244 m
T.O. Dist. (Over 50ft Obst)	377 m
1 Eng. Climb Gradient	4.3 %
1 Eng. Climb Rate	325 fpm
2 Eng. Climb Gradient	19.2 %
2 Eng. Climb Rate	1436 fpm
Pressure Altitude	1500 ft
Deviation From ISA Temp.	3 °
HeadWind Component	20 Kts
VR	70 Kts
V2	77 Kts

Click on a Selection:

Required SID Gradient

Obstacle

1 Obstacle Height (m)

Obstacle Distance (m)

1. If there are no obstacles to clear and no required SID gradient, press the “None” button.

2. If there is an obstacle, enter the obstacle height above the runway in **meters**. Then enter the obstacle’s distance from the end of the runway in **meters**.

The software makes sure that the net single-engine climb gradient clears the obstacle by at least 50 feet.

If the takeoff weight is limited by runway length due to EASA minimum requirements then there will be a warning message at the top of the form.

Pressing the “View Details” button will bring up the [Takeoff Data Details](#) box:
(See example below)

Main Menu
Landing

Takeoff

Copy Lnd. Data

Airport ID: () Runway:()

Field Length Limited!

Max. TOW Allowed 1719 kg

Takeoff Ground Roll 449 m
T.O. Dist. (Over 50ft Obst) 744 m
1 Eng. Climb Gradient 1.3 %
1 Eng. Climb Rate 104 fpm
2 Eng. Climb Gradient 12.2 %
2 Eng. Climb Rate 1004 fpm
Pressure Altitude 1500 ft
Deviation From ISA Temp. 18 °
HeadWind Component 10 Kts
VR 72 Kts
V2 79 Kts

Go

View Details

0 CLR

0 CLR

Field Elevation (ft) 1500 CLR
Runway Heading.. 0 CLR
Runway Length (m) 930 CLR
Clearway Length (m) 0 CLR
Stopway Length (m) 0 CLR
Runway Slope.... 0 CLR
Altimeter Setting.. 1013 CLR
Temperature (°C) 30 CLR
Wind Direction..... 0 CLR
Wind Speed....(Kts) 10 CLR
Proposed Weight (kg) 1750 CLR

Use Proposed Weight

Clear All

Click on a Selection:

Required SID Gradient

Obstacle

None

None Used
None Used

Select Takeoff Mass Mod:

1700 kg

1785 kg

OAM 42-088

Print Screen

Deviation From ISA Temp. 18 °
HeadWind Component 10 Kts
VR 72 Kts
V2 79 Kts

Takeoff Data Details

Clear / Runway Length = 1.25 x Takeoff Distance

No
No

Tap inside this box to close

The main values are then displayed in the details box.
To close this box, just tap anywhere inside the box.

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Landing

If the aircraft has to make an emergency landing immediately after takeoff, you can quickly transfer all the airport and weather information from the takeoff form into the landing form by pressing the “**Copy T.O. Data**” button near the top of the form.

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Main Takeoff Landing Copy T.O. Data

Airport ID: () Runway:()

Airport & Weather information

Field Elevation (ft) 3700 CLR

Runway Heading..... 0 CLR

Runway Length (m) 1200 CLR

Runway Slope..... 0 CLR

Altimeter Setting..... 1013 CLR

Temperature..... 33 CLR

Wind Direction..... 0 CLR

Wind Speed..... 0 CLR

Weight (kg) 1660 CLR

Clear All

Landing Weight 1660 kg

Landing Distance

Landing Ground Roll	377	m
Over 50-ft Obstacle	665	m
Pressure Altitude	3700	ft
Deviation From ISA Temp.	25.3	°
HeadWind Component	0	Kts
Approach Speed - Vapp	76	Kts
Balked Lnd. Climb Grd.	11.5	%
Balked Lnd. Climb Rate	951	ft/min
Single-Engine Climb Gradients at 0 ft and 1500 ft AGL		
Single-Engine Climb Grd.	1.09	%
S.E. Climb Grd. at 1500 ft	0.71	%

Go

If the “**Weight**” box is left blank, the program will use the structural maximum landing weight allowed. If any of the Landing Distance results are out of range there will be a warning message shown in red. In the example above, the landing distance of 665 m is less than the runway length of 1200 m, so consequently we see a green checkmark next to the landing weight. When the weight is not entered in the weight box, the program automatically uses the maximum landing weight allowed.

Other Landing Limitations

If the 70% factored landing distance is greater than the runway length of 1200 m then there will be a warning message.

If a climb gradient value is too low, there will be a message (see picture below)

Aircraft Configuration (Weight and Balance)

To view or modify the aircraft configuration, press the “**View Configuration**” button near the top of the weight and balance form. The W&B configuration form will show.

The screenshot shows the 'W&B Config.' form. At the top left is a 'Return' button. The form is divided into several sections. The top section contains 'B.O.W. (kg)' with a value of 1250 and a 'CLR' button, and 'B.O.W. Arm (m)' with a value of 2.35 and a 'CLR' button. To the right of these are two dropdown menus, both set to '4'. The first dropdown is labeled '- Total No. of Seat Stations' and the second is labeled '- Total No. of Bag. Stations'. A yellow arrow points to the first dropdown with a circled '1'. Below these are two columns of input fields. The left column is titled 'Enter Seat Station Names:' and contains five rows: 'Seat 1' with 'Front Seat L', 'Seat 2' with 'Front Seat R', 'Seat 3' with 'Rear Seat L', 'Seat 4' with 'Rear Seat R', and 'Seat 5' with 'Seat 5'. Each row has a 'CLR' button. A yellow arrow points to the 'Front Seat L' field with a circled '2'. Below this column is a 'Clear All' button. The right column is titled 'Enter Arms in Meters:' and contains five rows: 'Seat 1' with '2.3', 'Seat 2' with '2.3', 'Seat 3' with '3.25', 'Seat 4' with '3.25', and 'Seat 5' with '0'. Each row has a 'CLR' button. Below this column is a 'Clear All' button. At the bottom left is another 'Return' button. At the bottom center is the copyright notice '© 2009-2015 AFM Solutions'. At the bottom right is a red 'Save' button with a yellow arrow pointing to it.

W&B Config.

B.O.W. (kg) 1250 **CLR**

B.O.W. Arm (m) 2.35 **CLR**

4 - Total No. of Seat Stations

4 - Total No. of Bag. Stations

Enter Seat Station Names:

Seat 1 **Front Seat L** **CLR**

Seat 2 **Front Seat R** **CLR**

Seat 3 **Rear Seat L** **CLR**

Seat 4 **Rear Seat R** **CLR**

Seat 5 **Seat 5** **CLR**

Clear All

Enter Arms in Meters:

Seat 1 **2.3** **CLR**

Seat 2 **2.3** **CLR**

Seat 3 **3.25** **CLR**

Seat 4 **3.25** **CLR**

Seat 5 **0** **CLR**

Clear All

Enter Bag. Station Names:

Bag. 1 **Nose Baggage** **CLR**

Bag. 2 **Cabin Baggage** **CLR**

Bag. 3 **Baggage Ext.** **CLR**

Bag. 4 **De-Icing Fluid** **CLR**

Bag. 5 **Baggage 5** **CLR**

Clear All

Enter Arms in Meters:

Baggage Station 1 **0.6** **CLR**

Baggage Station 2 **3.89** **CLR**

Baggage Station 3 **4.54** **CLR**

Baggage Station 4 **1** **CLR**

Baggage Station 5 **0** **CLR**

Clear All

Return © 2009-2015 AFM Solutions **Save**

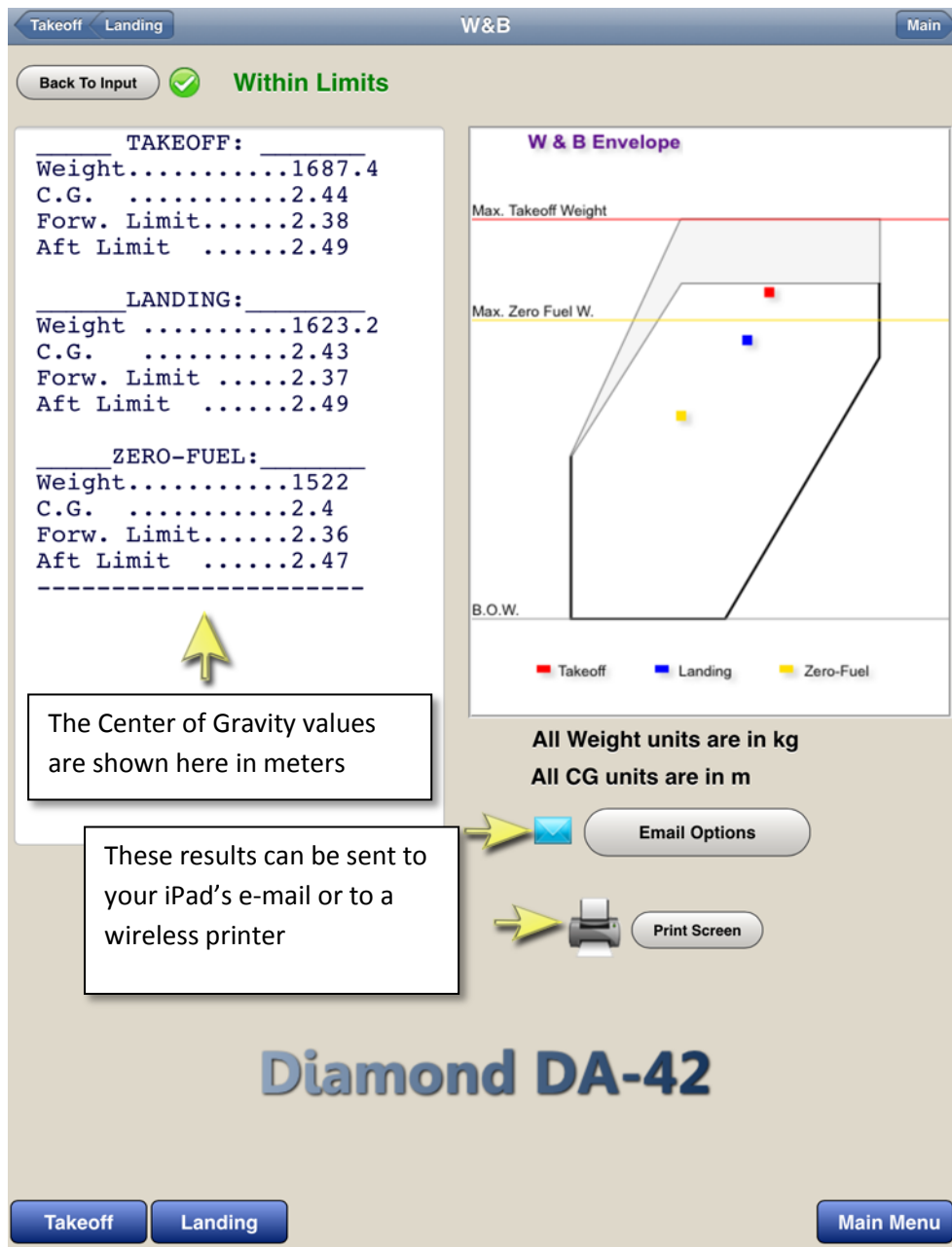
To return back to the weight & balance form, press the blue “**Return**” button. To save your changes press the blue “**Save**” button.

Here, you can change the number of seats present in your aircraft, the number of baggage areas present, B.O.W. weight etc.

1. This box lets you select how many passenger seats your aircraft uses.
2. You can rename the seats or baggage areas if needed.

For example if the first seat is the Pilot-In-Command seat, just tap the seat 1 box and change it to “Pilot PIC”. After you have made all the necessary changes, press the red “**Save**” button. Then return to the program.

The weight and balance output form shows the results. Detailed numerical results are on the left, and the graphical view with the CG envelope is on the right.



The user can add information to this form, such as flight number, route, Pilot in Command etc. Then press the "Update Form" button to add it to the form that will be e-mailed.

Go Back

Email Options

Send To Email

Date and Flight ID

Date & Flight ID

Clear

Route:

Enter Route

Clear

PIC:

Enter PIC Name

Clear

Compiled By:

Compiled By

Clear

Status:.....Within Limits

Dry Operating Mass (BOW):.....1250 kg

TAKEOFF:

Weight (kg)..... 1687.4

C.G. (m)..... 2.44

Forw. Limit (m)..... 2.38

Aft Limit (m)..... 2.49

LANDING:

Weight (kg)..... 1623.2

C.G. (m)..... 2.43

Forw. Limit (m)..... 2.37

Aft Limit (m)..... 2.49

ZERO-FUEL:

Weight (kg)..... 1522

C.G. (m)..... 2.4

Forw. Limit (m)..... 2.36

Aft Limit (m)..... 2.47

Aircraft Load Manifest Details:

Front Seat L 80 kg

Front Seat R 80 kg

Rear Seat L 80 kg

Rear Seat R 0 kg

Nose Baggage 5 kg

Cabin Baggage 12 kg

Baggage Ext. 5 kg

De-Icing Fluid 10 kg

Main Fuel Takeoff...30 US Gal

Aux. Fuel Takeoff... 22 US Gal

Main Fuel Landing.. 15.9 US Gal

Aux. Fuel Landing.. 15.9 US Gal

Update Form

Send

Go Back

Press this button to send this form to your iPad's e-mail program

Press this button to return to the Weight & Balance Form

When ready to e-mail this form press the "Send" button.
To return to Weight & Balance form, press the "Go Back" button.

EASA (EU-OPS) Requirements

This software always checks if the following requirements are satisfied:

Takeoff

Ops 1.530

An operator shall ensure that the take-off mass does not exceed the maximum take-off mass specified in the Aeroplane Flight Manual for the pressure altitude and the ambient temperature at the aerodrome at which the take-off is to be made.

The unfactored take-off distance does not exceed:

- (1) When multiplied by a factor of 1,25, the take-off run available; or
- (2) When stop way and/or clearway is available, the following:
 - (i) The take-off run available;
 - (ii) When multiplied by a factor of 1,15, the take-off distance available; and
 - (iii) When multiplied by a factor of 1,3, the accelerate-stop distance available.

OPS 1.535 Take-off Obstacle Clearance

- (a) take-off flight path, clears all obstacles by a vertical margin of at least 50 ft
- (1) The take-off flight path begins at a **height of 50 ft above the surface** at the end of the take-off distance required by OPS 1.530 (b) and ends at a height of 1 500 ft above the surface;
- (5) The gradient of the take-off flight path is equal to the one engine inoperative.

OPS 1.540 En-Route – Multi-engined aeroplanes

- (a) in the event of the failure of one engine, with the remaining engines operating within the maximum continuous power conditions specified, is capable of continuing flight at or above the relevant minimum altitudes for safe flight stated in the Operations Manual **to a point 1000 ft above an aerodrome.**
- (1) The aeroplane can achieve a **rate of climb of at least 300 ft per minute** with all engines operating within the maximum continuous power conditions specified;
The corresponding charts in the aircraft flight manual show that the above condition is always true for aerodrome altitudes between sea level and 15000 feet.

Landing OPS 1.550

The landing mass of the aeroplane determined in accordance with OPS 1.475 (a) does not exceed the maximum landing mass specified for the altitude and the ambient temperature expected for the estimated time of landing at the destination and alternate aerodrome.

OPS 1.550 Landing – Dry runway

- (a) The landing mass of the aeroplane determined in accordance with OPS 1.475 (a) for the estimated time of landing allows a **full stop landing from 50 ft above the threshold within 70 % of the landing distance available** at the destination aerodrome and at any alternate aerodrome.

Appendix 1 to OPS 1.525 (b) General – Take-off and Landing Climb

(a) Take-off Climb

(1) All Engines Operating

- (i) The steady **gradient of climb after take-off must be at least 4 %** with:

- (A) Take-off power on each engine;
- (B) The landing gear extended except that if the landing gear can be retracted in not more than 7 seconds, it may be assumed to be retracted;
- (C) The wing flaps in the take-off position(s); and
- (D) **A climb speed not less than the greater of 1,1 VMC and 1,2 VS1.**

(2) One Engine Inoperative

- (i) The steady **gradient of climb at an altitude of 400 ft above the take-off surface** must be measurably positive with:
 - (A) The critical engine inoperative and its propeller in the minimum drag position;
 - (B) The remaining engine at take-off power;
 - (C) The landing gear retracted;
 - (D) The wing flaps in the take-off position(s); and
 - (E) **A climb speed equal to that achieved at 50 ft.**
- (ii) The steady **gradient of climb must be not less than 0,75 % at an altitude of 1 500 ft above the take-off surface** with:
 - (E) **A climb speed not less than 1,2 VS1.**

(b) Landing Climb

(1) All Engines Operating

- (i) **The steady gradient of climb must be at least 2,5 %** with:
 - (A) Not more than the power or thrust that is available 8 seconds after initiation of movement of the power controls from the minimum flight idle position;
 - (B) The landing gear extended;
 - (C) The wing flaps in the landing position; and
 - (D) A climb speed equal to VREF.

(2) One engine Inoperative

- (i) The steady **gradient of climb must be not less than 0,75 % at an altitude of 1 500 ft above the landing surface** with:
 - (A) The critical engine inoperative and its propeller in the minimum drag position;
 - (B) The remaining engine at not more than maximum continuous power;
 - (C) The landing gear retracted;
 - (D) The wing flaps retracted; and
 - (E) **A climb speed not less than 1,2 VS1.**

The software calculates the optimum takeoff weight with respect to the runway length and obstacle and climb requirements.

If any of the other requirements listed above is not met, there will be a warning message alerting the user to that effect.

If a landing requirement is not met, there will be a warning message alerting the user to that effect.

Weight and Balance or Mass and Balance:

The software calculates the weight (mass), the center of gravity and moment of the aircraft for:

Zero Fuel, Ramp, Takeoff and Landing conditions

If any of the computed values are found to be outside of the allowed limits, the program will display a warning message to the user.



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