Brief User Guide

Challenger 850 Program

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

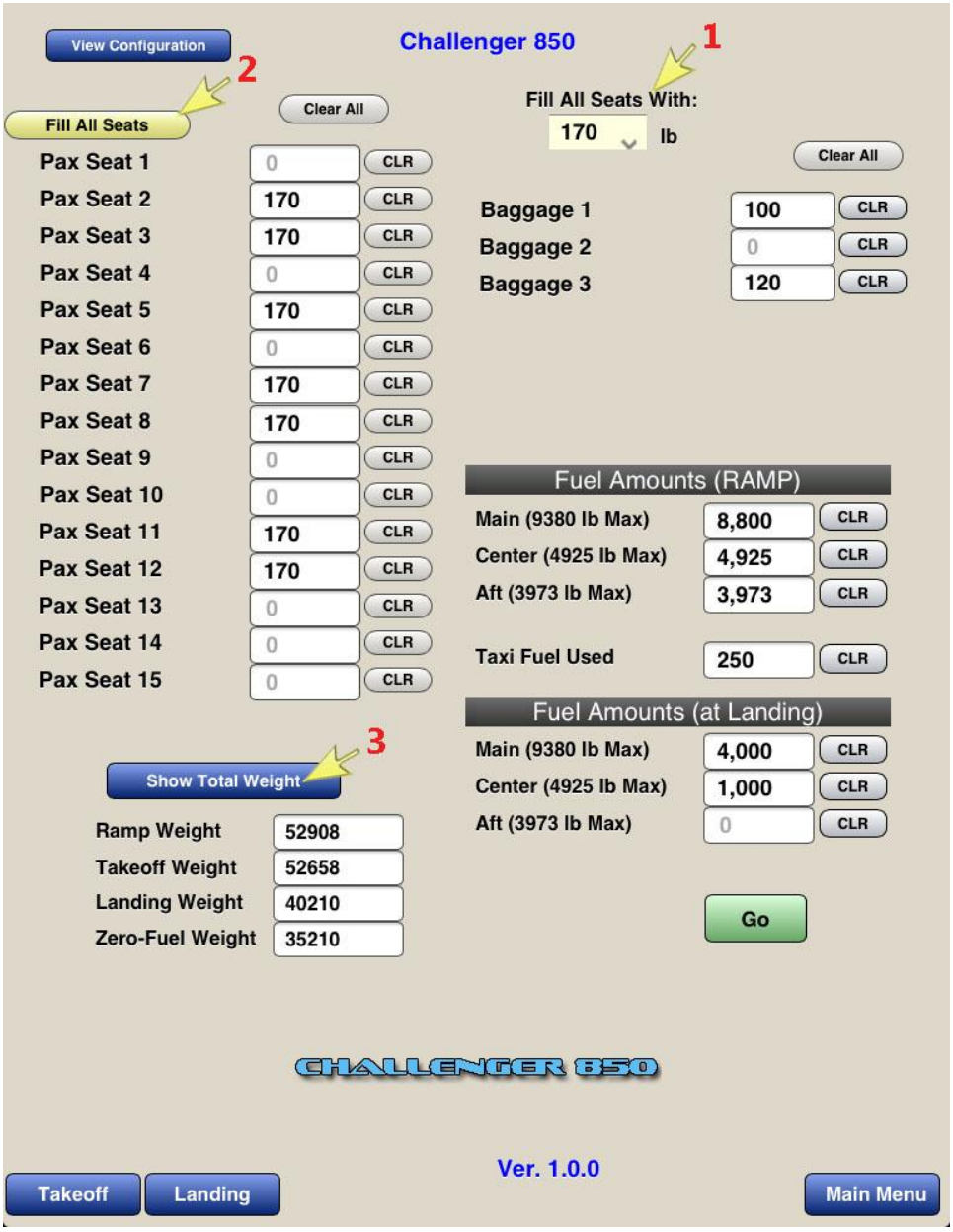
Tap the "**Weight & Balance**" button on the main menu to jump to the Weight and Balance form.
Then, you can either begin by typing the passengers' weight values or you can use the quick fill method.

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

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

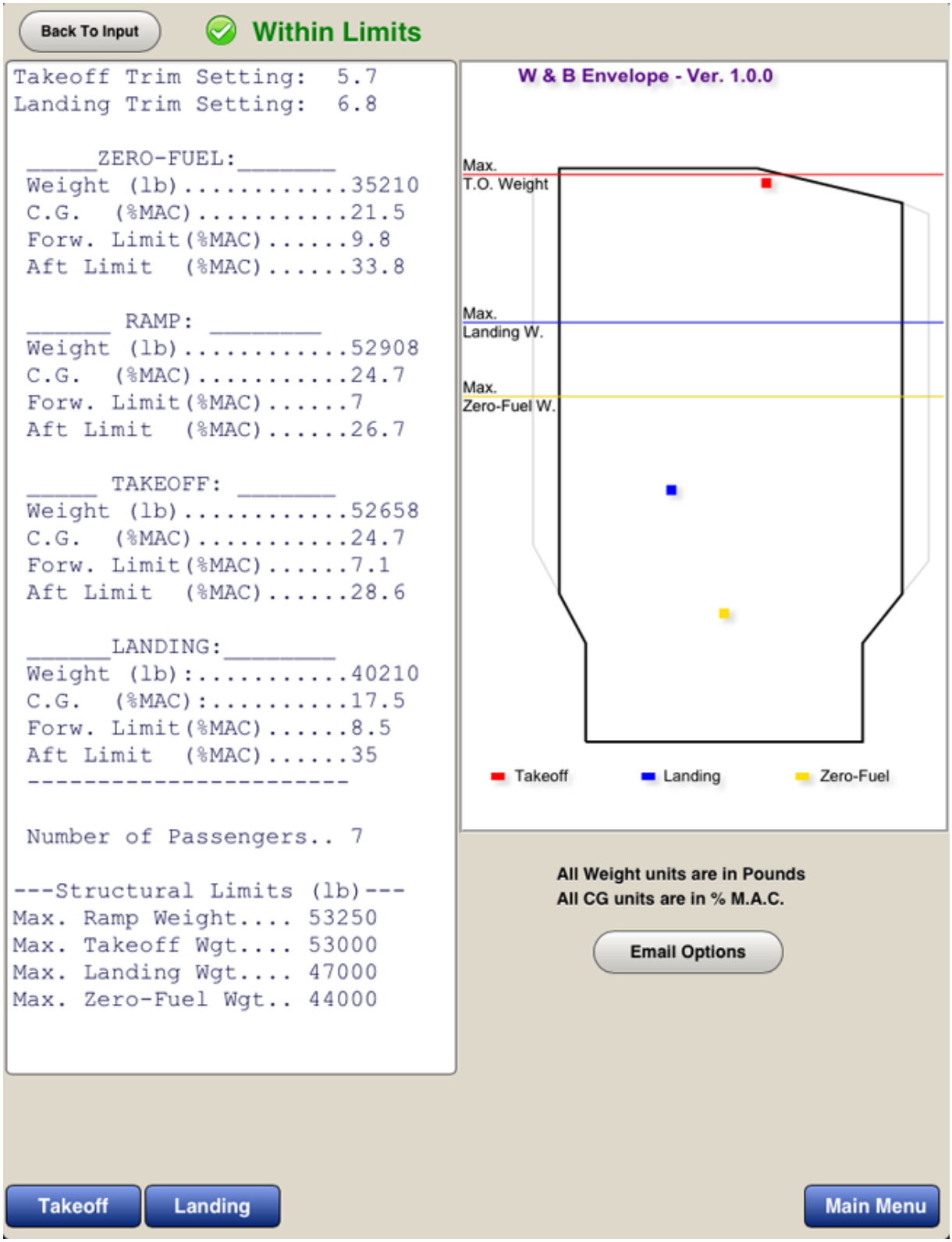
The quick fill method:

1. Select the pre-determined passenger weight from 125 lb to 200 lb.
2. Tap the yellow " **Fill All Seats**" button. Then tap the "**CLR**" button next to any vacant seat.



3. Press the "**Show Total Weight**" button at any time to the current Ramp Weight, Takeoff Weight, etc.

When finished typing just press the green "Go" button to see the computed results.



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.

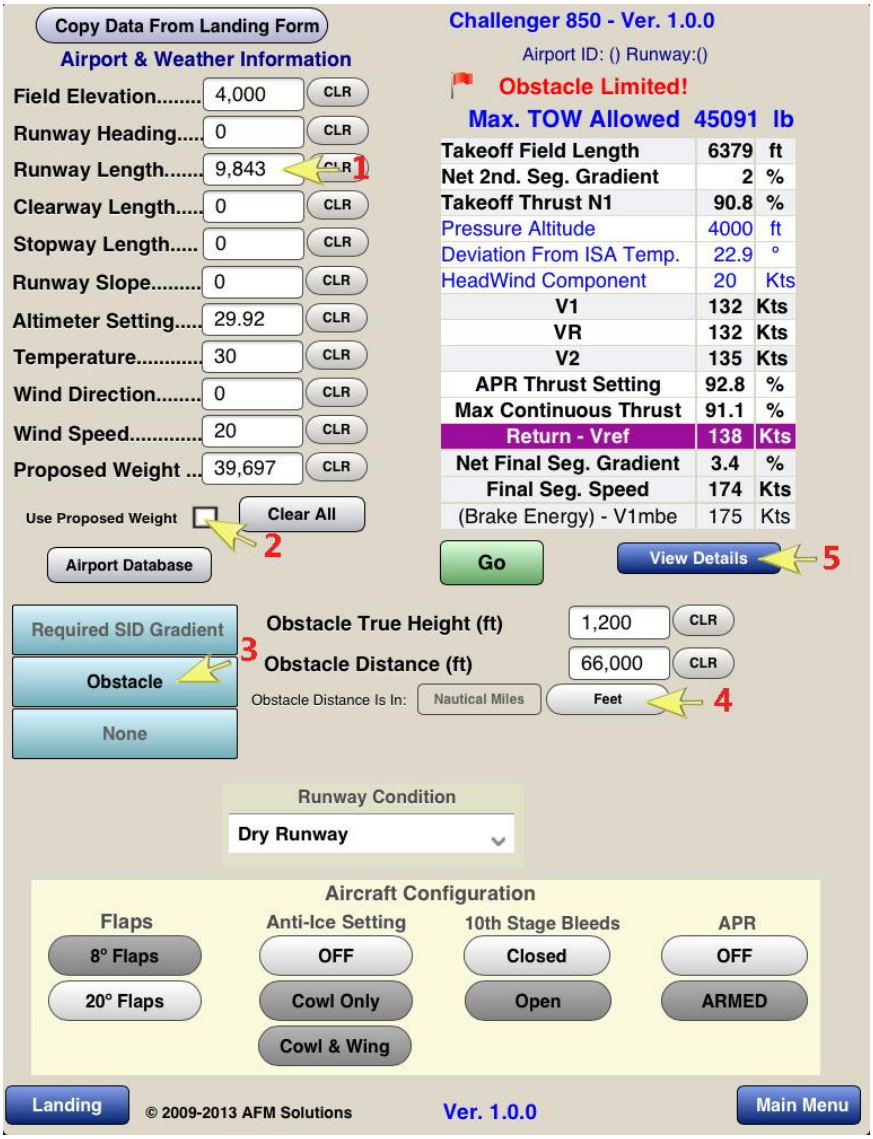
The **Ramp Weight**, moment and CG values are also computed, but they are not shown in the diagram. However, if the ramp weight , cg or moment is out of limits a warning message will appear on the screen.

Takeoff

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

1. 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” or you can use a metric value of “1013”



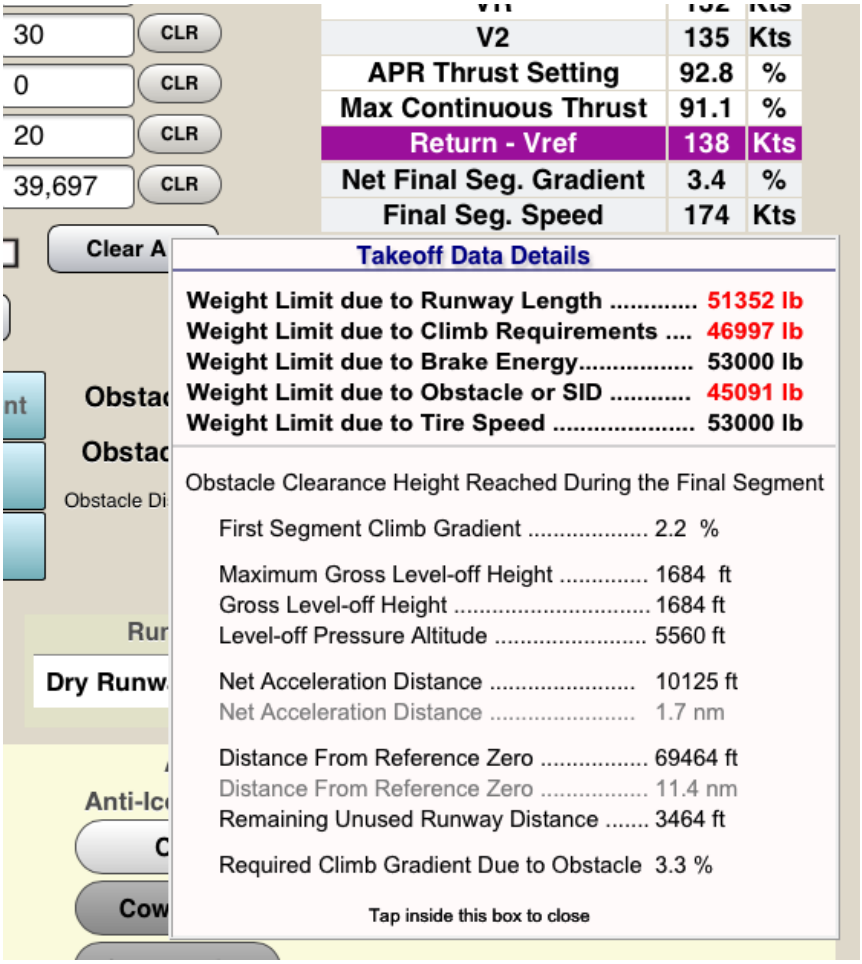
2. If the “Use Proposed Weight” box is checked, the program will use the weight found in the “Proposed Weight” box. If left unchecked, the program will find the maximum allowable takeoff weight for the given conditions.

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

If there is an obstacle, enter the obstacle true height above the runway surface in feet. Then enter the obstacle's distance from the end of the runway (DER).

4. You have the option to enter the distance in feet or in nautical miles.

5. Press the "**View Details**" button to see the details of all the weight limitations encountered and the flight path details



If a computed weight limit value is less than the MTOW then it is shown in red.

Note that the maximum continuous thrust is always computed at the pressure altitude and temperature of the level-off height. The calculated value of the level-off pressure altitude is always adjusted for any deviation from ISA temperature.

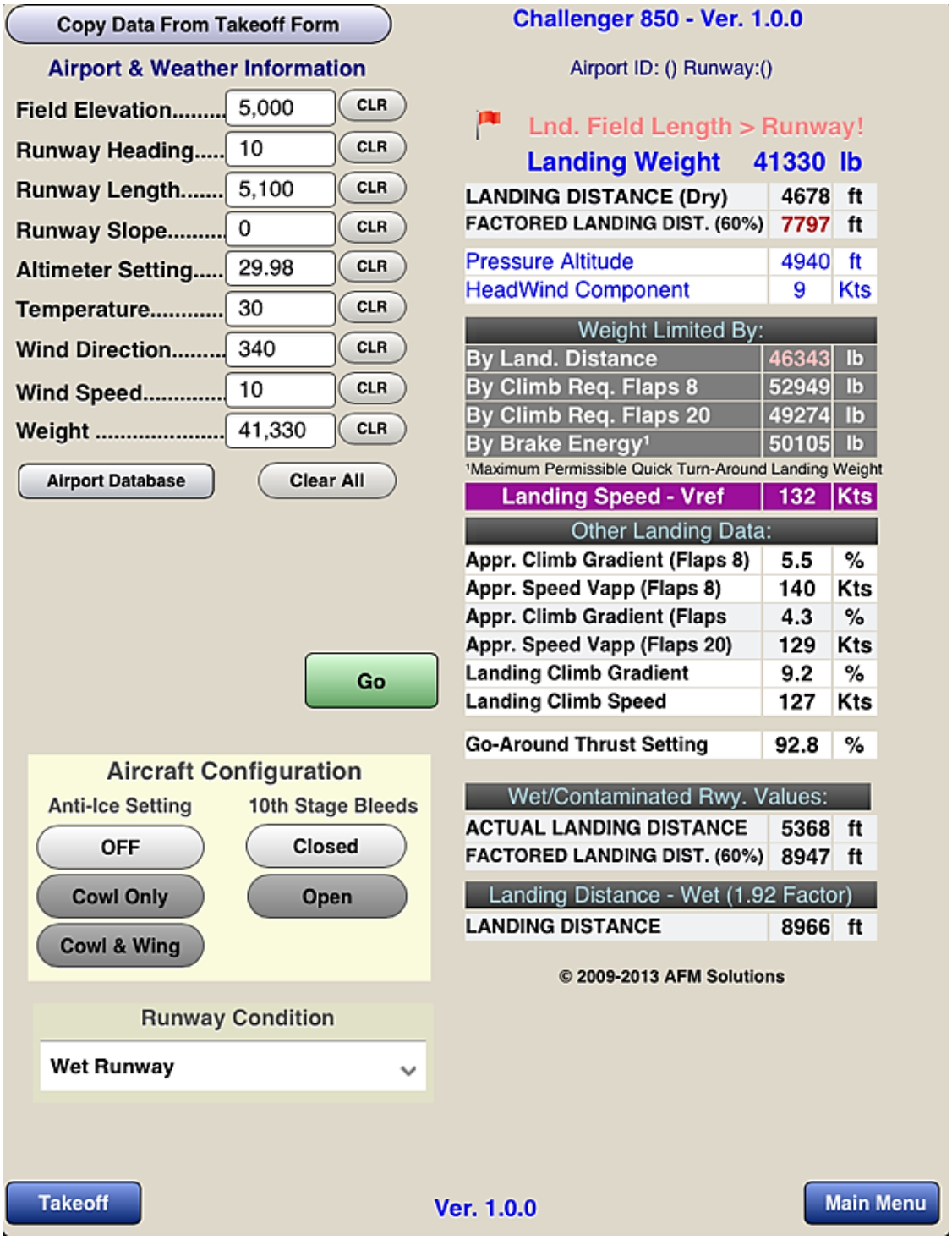
When it is required to clear an obstacle, the program will always find the highest possible weight that will allow the **net flight path** to clear the obstacle by a **minimum of 35 feet**.

The first and second segment climb gradients are always computed. The **net level-off height** is normally equal to obstacle height + 35 ft. If the corresponding **gross level-off height** is higher than the maximum allowed gross level-off height, then the program finds an optimum lower height. In that case a full flight path is computed. The program calculates the height reached in the 1st. segment, 2nd. Segment and final segment. It also calculates the horizontal distance travelled during each segment as well as the horizontal acceleration distance required during the transition segment.
The main values are then displayed in the details box. To close this box, just tap anywhere inside the box.

The minimum required climb gradient is optimized by adding any extra runway distance to the original obstacle distance.

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 Data From Takeoff Form**" button near the top of the form.



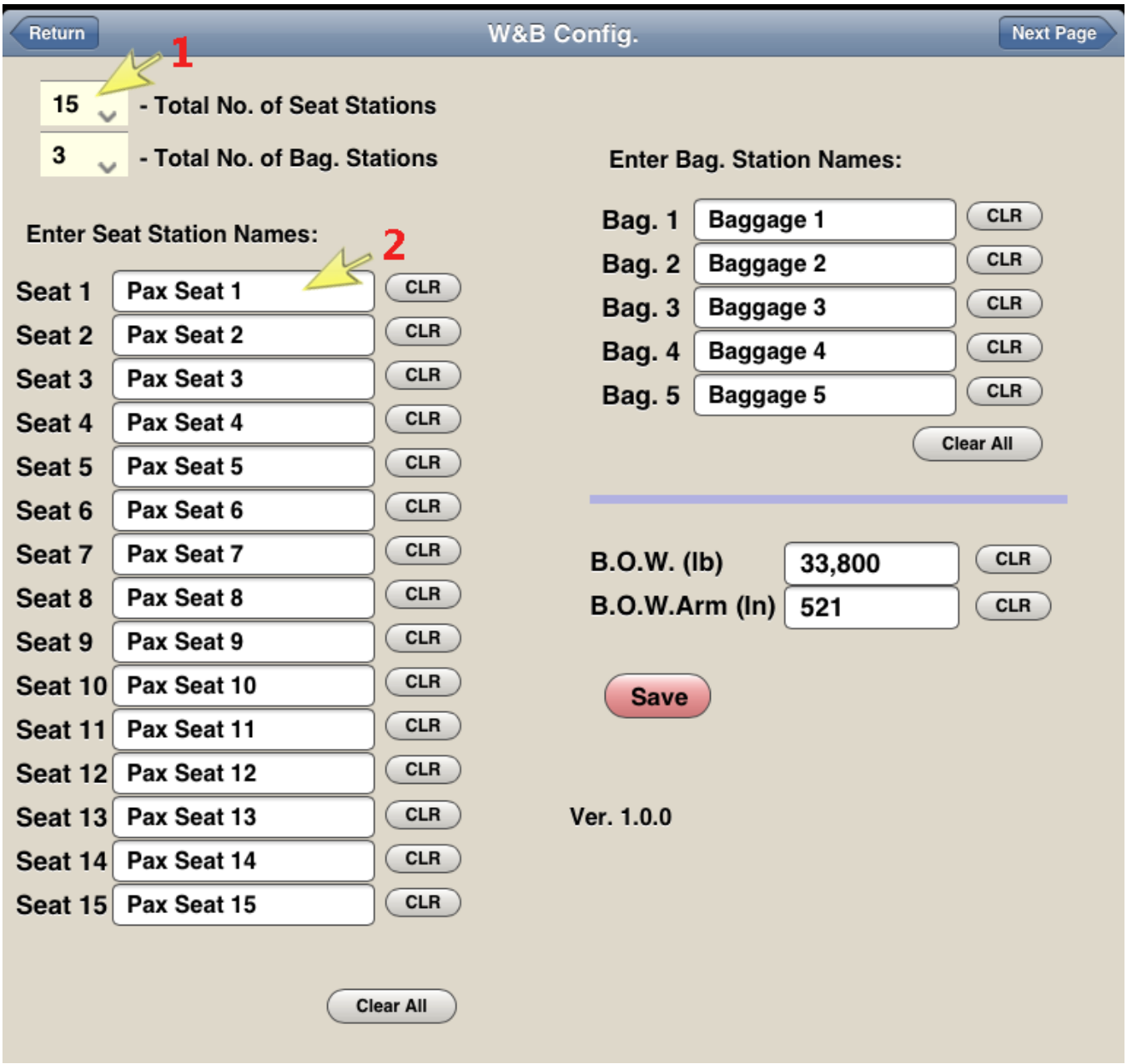
If the "Weight" box is left blank, the program will use the structural maximum landing weight allowed.

If any of the Dry-Runway results are out of range they will be shown in red. In the example above, the factored landing distance of 7797 feet is greater than the runway length.

When wet or contaminated runway is selected, the program will always display the **dry-runway** values first.
It will also show the **wet/contaminated** runway landing distance near the bottom of the form.
The last line shows the "Wet Distance – 1.92 Factor". That is the dry-runway landing distance divided by 0.6 and then multiplied by 1.15.

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.



To return back to the weight & balance form press the blue "**Return**" button. To move to the second page press the blue "**Next Page**" button.

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

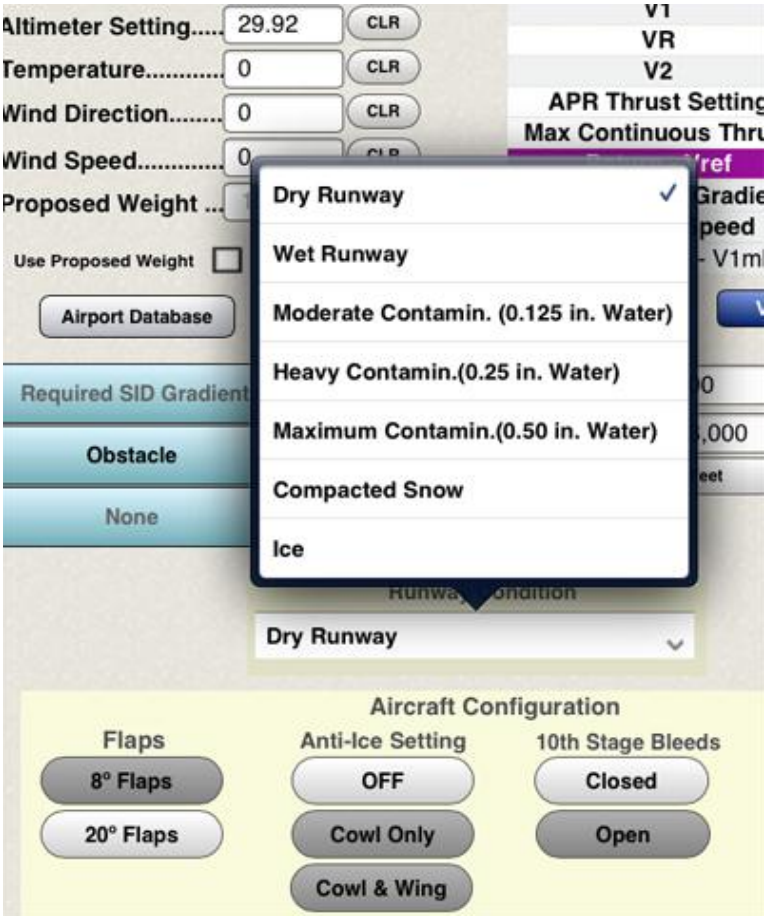
1. This box lets you select how many passenger seats your aircraft uses.
2. You can rename the seats or baggage areas if needed.

For example if the first seat is a flight attendant seat, just tap the "Pax Seat 1" box and change it to "Jump Seat" or "Flight Attendant". After you have made all the necessary changes, press the red "Save" button. Then return to the program.

If your aircraft has more than 15 seats please contact AFM Solutions so adjustments can be made to the program.

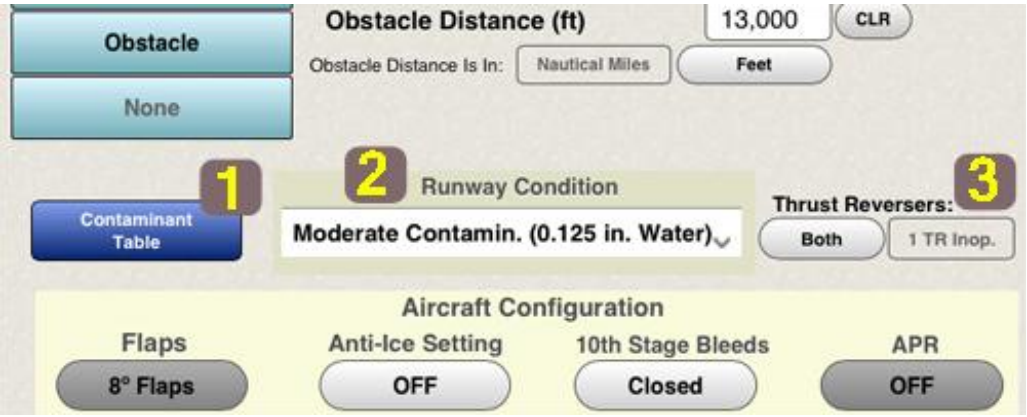
Using the Contaminated-Runways Data

Tap on the "**Runway Condition**" box in the Takeoff form to see the different types of contaminants available



If you selected Wet or Contaminated Runway options, you will also be able to select the number of operating thrust reversers (item 3 below). Your choices will be “Both ReversersOperating” or “One Reverser Inoperative” .

To the left of the runway condition box (item 2 below) there will be a blue button labeled “Contaminant Table” (item 1 below)

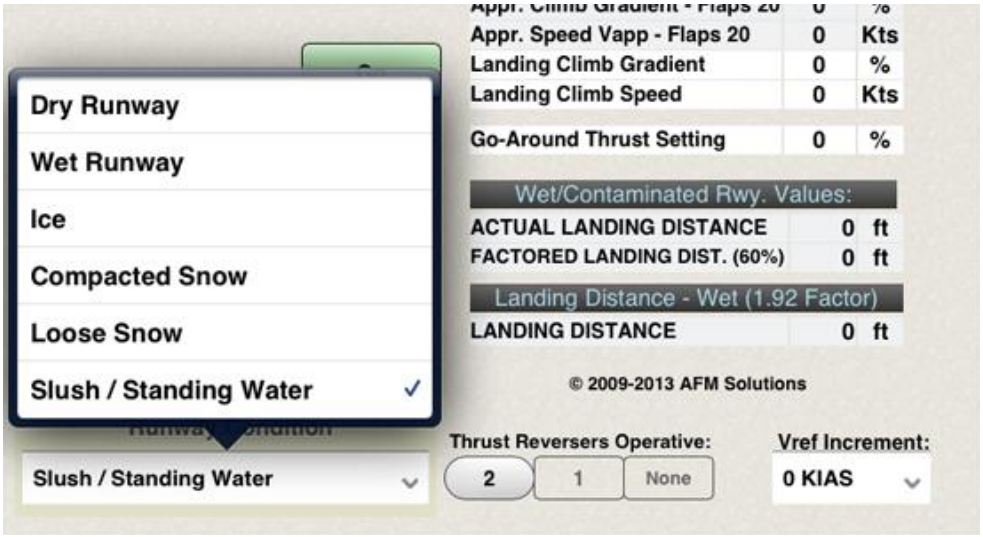


Tap this button to see a table displaying the different types of contaminants:

Any time a contaminated runway option is selected, the program will calculate the weight limit due to field length for dry runway first. Then this value will be used to compute the corrections required for contaminated runway. If there is a clearway present, the program automatically takes it into account. The clearway correction is not used when the charts are used in reverse for computing the takeoff distance, as directed by the AFM.

If for the purpose of obtaining more conservative results one does not wish to use the available clearway, simply enter the value of zero feet for clearway in the input section.

Tap on the "**Runway Condition**" box in the Landing form to see the different types of contaminants available



If you selected Wet or Contaminated Runway options, you will also be able to select the number of operative thrust reversers . Your choices will be 2 Reversers Operative, 1 Reverser Operative, or None Operative" .

You can also select the Vref increment used so that the program can apply the proper correction for Landing Distance.