Fifth Force Solutions
Maverick
—

User guide for the iPad app

20th February, 2020

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System Requirements

iPad^{TM}

iOS version 9.0 or higher

Registration

In order to register your account, please go to https://www.maverickapp.com/registration

Once the registration is complete, it is now time to add your first aircraft into your fleet. Please refer to

the Admin UI documentation page.

Admin UI
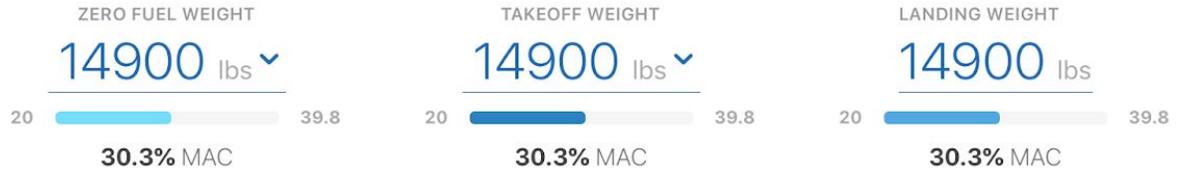
Please refer to the Admin UI documentation page.

Your Fleet

All the aircraft in the fleet are available inside of the app. Make sure to select the one you are flying, by verifying the call sign and the latest Basic Empty/Operating Weights.
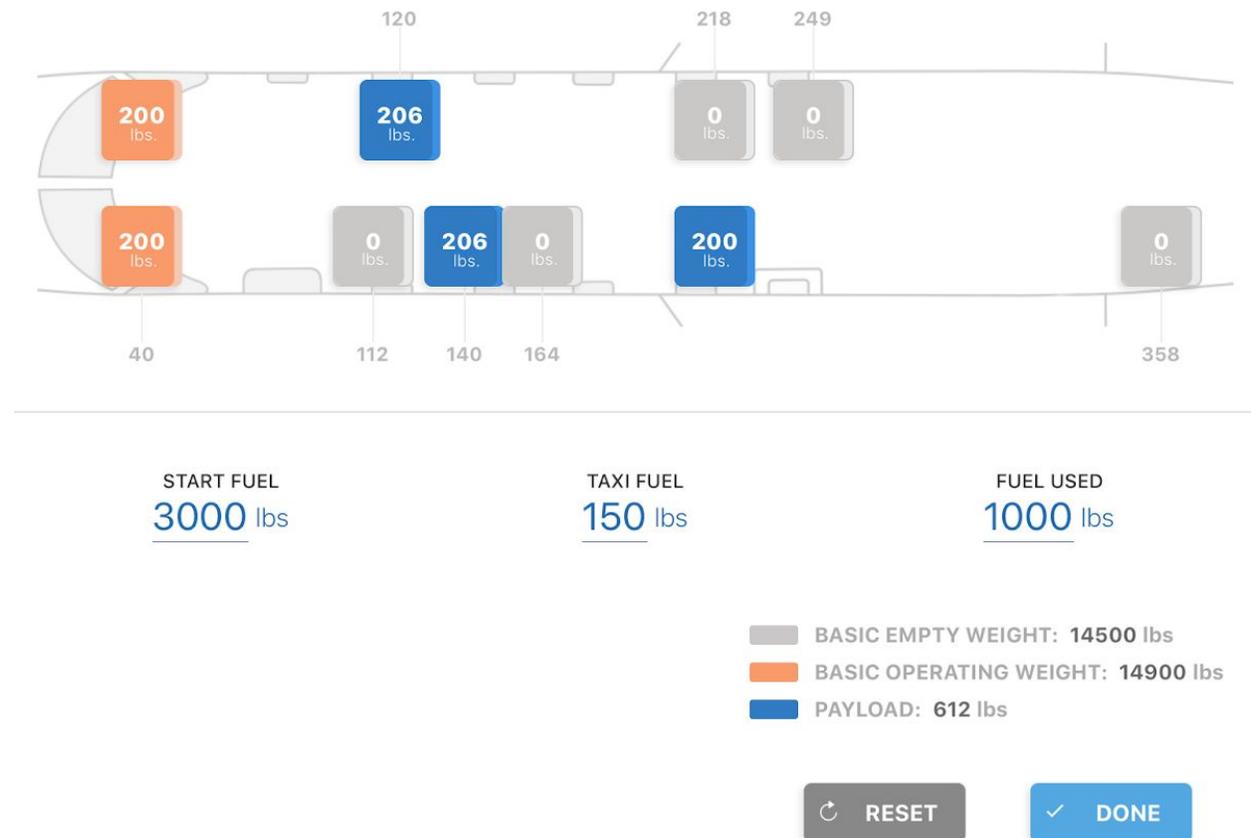
Weight and Balance

Maverick comes with an interface where fuel, passengers and cargo can be easily configured in a couple of taps. To access the Weight and Balance interface, simply tap on *ZERO FUEL WEIGHT* or *TAKEOFF WEIGHT* values.

ZERO FUEL WEIGHT	TAKEOFF WEIGHT	LANDING WEIGHT
14900 lbs ⌄	**14900** lbs ⌄	**14900** lbs
20 ▬▬▬ 39.8	20 ▬▬▬ 39.8	20 ▬▬▬ 39.8
30.3% MAC	**30.3%** MAC	**30.3%** MAC

Please note that tapping on the *LANDING WEIGHT* will allow you to directly enter the value as opposed to opening the Weight and Balance interface. This is done so that the numbers can be calculated a bit more quicker when getting ready for an approach. Entering the landing weight, will adjust the fuel burn value.

Once you have the Weight and Balance interface open, here is how it looks like:

START FUEL	TAXI FUEL	FUEL USED
3000 lbs	**150** lbs	**1000** lbs

■ BASIC EMPTY WEIGHT: **14500 lbs**
■ BASIC OPERATING WEIGHT: **14900 lbs**
■ PAYLOAD: **612 lbs**

[↻ RESET] [✓ DONE]

The top section represents the airplane, and actual arm distances for each station. Depending on the aircraft, this diagram will change to reflect the actual aircraft layout.

- Stations that comprise the aircraft's Basic Operating Weight (B.O.W.) will be colour coded. You can set the stations that make up the B.O.W. in the Admin UI.
- To load a station, simply tap on it once, and the program will populate the default value into the station. Default values are set in the Admin UI. Subsequent tap on that station, will bring up the keyboard, and offer some shortcuts as well.
- Depending on the preference or the type of operation, the user can first fill up the airplane with fuel and then see how much useful payload can be loaded onto the plane, OR, load the plane up with payload and see how much fuel can be carried with that payload. To achieve this, Maverick has several useful shortcuts, that allow the user to top up the airplane up to its maximum takeoff weight.

The next section consists of three elements: *START FUEL* (fuel on the ramp,) *TAXI FUEL* (fuel used during taxi,) and *FUEL USED* (estimated fuel burn during the flight.)

The bottom section is a summary of how the airplane is currently loaded. It will display Basic Empty Weight, Basic Operating Weight and the total Payload.

Speaking of shortcuts, there are some other useful ones that will help you save time:

Maximum landing weight - when entering the value for FUEL USED, this shortcut will calculate the amount of fuel that needs to be burned in order to get the airplane below the maximum landing weight.

Station weights - when entering the value for each station, there will be several shortcuts presented to help simplify the process. Some of the examples would be, Female (170 lbs), Male (206 lbs,) etc. There will also be a shortcut that will set the station to a default value, that was specified in the Admin UI.

Maximum takeoff fuel - when entering the value for START FUEL, this shortcut will calculate the maximum allowable fuel on board, loading the airplane up to its maximum takeoff weight.

Full fuel - when entering the value for START FUEL, this shortcut will set the value to maximum fuel

Clear / Reset - when entering any value, this shortcut will reset it to zero.

As the weights are entered, the app will calculate Weight and Balance for three stages of the flight:

ZERO FUEL WEIGHT: the weight of the empty aircraft + the weight of the passengers and baggage.

TAKEOFF WEIGHT: Zero fuel weight + the weight of the start fuel – fuel used for taxi.

**LANDING WEIGHT**: Takeoff weight – fuel used during the flight

Additionally, the system will calculate %MAC number based on the current configuration, and display it in a graphical representation, as well as the aft and forward limits for a given weight.

RESET button will reset the weight and balance entries only.

DONE button will close the Weight and Balance interface. This can also be done by tapping outside of the interface or by tapping any of the Zero Fuel, Takeoff or Landing weights again.

Airport and Runway database

Maverick is equipped with a worldwide database of airports and their respective runways. Currently the database consists of 26000+ airports around the planet. Maverick uses OurAirports, which is an awesome source of worldwide airport data. It is maintained by a community of air traffic controllers, pilots, scientists and other aviation professionals. It is constantly updated and refined.
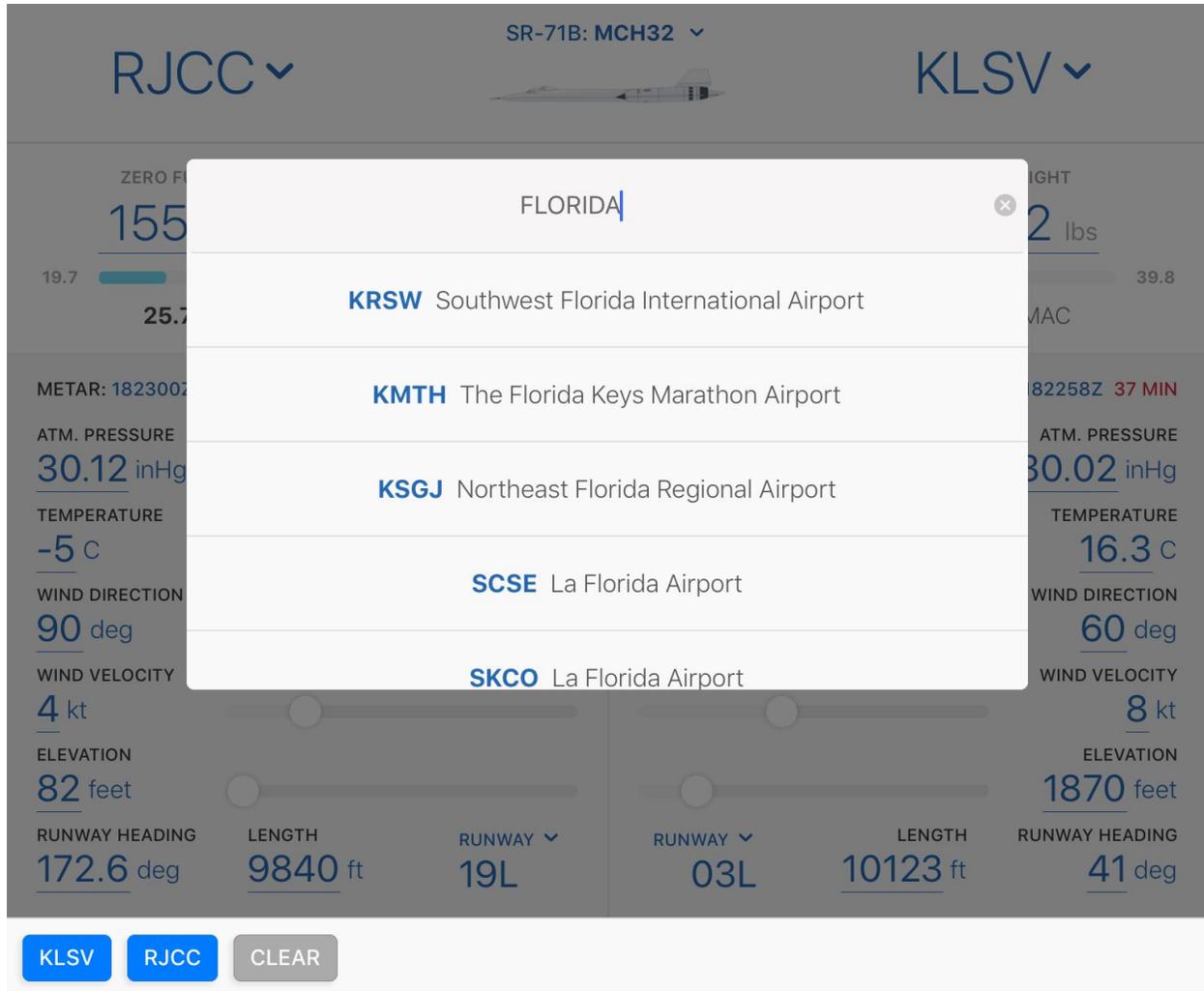
For the latest version of this database, please refer here.

The iPad app comes with this database baked into it, which means that it is available offline, no need for internet connection to access it.

To select a departure or an arrival airport, simply tap on the respective sections. You can search either by entering an ICAO code or the name of the airport.

Here is what happens when a particular airport is selected either as departure or arrival:

- ○ The elevation data is populated into the environment input for that parameter

- ○ If there is internet connection, the app will fetch the latest METAR for this airport.

- ○ The data from METAR will auto populate itself into each respective field.

- ○ Based on the prevailing winds, the most appropriate runway would be selected as default (this can be changed at any time)

- ○ Based on the threshold elevation data, the runway slope is also automatically calculated.

If all else fails, and the airport cannot be located via the search, there is always a way to manually enter the runway data.

Recently searched airports are available via shortcuts when the search is activated.

Once you select a departure or an arrival airport, if there is a METAR available for that airport Maverick will attempt to determine a runway that has the most amount of headwind based on the current conditions. However, to select a different runway, simply tap on the arrow beside the current runway name.

This will reveal a list of available runways. Once selected, the system will recalculate the performance numbers for that runway.

Weather

Weather data is automatically populated if the device is connected to the internet. The information comes from the NOAA digital METAR data.

When the app is offline, the app can be used by entering the weather data manually.

Atmospheric pressure could be entered both in inches of mercury or in hectopascal. One could enter the values like 29.73, 3002 or 1033.

Most of the environment inputs have shortcuts to make your life easier.

ISA - resets the value to International Standard Atmosphere

CALM - sets wind calm

SEA LEVEL - sets the elevation to sea level

A good use case for overriding values that have been populated from a METAR would be during the arrival, in which case you might have pulled a METAR before leaving for the flight, and the weather for the arrival has changed since. In this case, simply going into the application and adjusting the arrival weather values will produce the up to date results for the landing.

Configuration

Each aircraft type comes with configuration options for departure and arrival. To select these options, simply tap on the arrow beside "Configuration" or tap on the options themselves.

This will open an interface where you can change departure options and configuration. As the changes are made, the system will recalculate the departure and arrival data in real time.

Runway Surface Conditions

There are various runway surface conditions that are supported by the system. Simply selecting the condition will recalculate takeoff and landing numbers in real time.
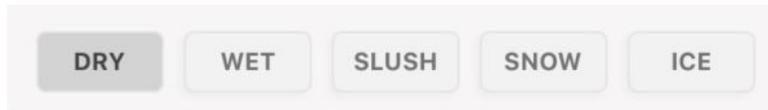
Output

Maverick calculates the following data based on the AFM charts and tables:

V_1 – Engine failure recognition speed

V_R – Rotation speed

V_2 – Takeoff safety speed

V_{FS} – Final segment one engine inoperative speed

N1 – Expected thrust in % N1

Takeoff distance – Runway required for takeoff

Climb Gradient – Second segment climb gradient (One engine inoperative)

V_{REF} – Landing reference speed

V_{AC} – Approach climb speed

A.C.G. - Approach climb gradient (One engine inoperative)

V_{LC} – Landing climb speed

L.C.G. - Landing climb gradient

Landing Distance – Unfactored landing distance

60% FACTORED – 60% factored landing distance

80% FACTORED – 80% factored landing distance

Crosswind - Crosswind component

PRESS. ALT. - Pressure altitude

PRESS ALT. **-118** ft
CROSSWIND **3** kt

V_{FS}
144

V_2
115
∡ **13.8 %**
2ND SEG GRAD

N_1 V_1 V_R
86.6   **101**   **103**

0.2 % SLOPE

DISTANCE REQUIRED **3206'**

V_{REF}
113

V_{AC}
116

∡ **15 %**
A.C. GRAD

V_{LC}
111

∡ **44 %**
L.C. GRAD

PRESS ALT. **1770** ft
CROSSWIND **3** kt

-0.36 % SLOPE

UNFACTORED DISTANCE **2487'** ⌄

Offline use

If there is internet connection the system will pull the latest METAR and populate the values automatically, given that the station selected has a METAR. However, if there is no connectivity, the system can be used in exactly the same way, by simply entering the values manually. The online icon will show green if there is internet connectivity.

Sending Takeoff Calculations

In order to send the takeoff calculation to the dispatcher, or person responsible, simply tap the upload button and hit **SEND REPORT**. This will forward takeoff weight, C.G. and fuel via email which can be configured in the Admin UI.

DEPARTURE AIRPORT	AIRCRAFT	ARRIVAl AIRPORT
KSLC		**RJCC**

PAYLOAD	TAKEOFF FUEL	TAKEOFF WEIGHT	TAKEOFF %MAC
800	**6000**	**21363**	**32.3**

⊗ DISREGARD   ☁ SEND REPORT