



DSSTop

Takeoff Performance Computer



- For PalmOS® 2.0 or later.
- Easy-to-use Performance Wizard guides your inputs!
- Estimates takeoff ground run, 50 foot obstacle distance, and rate of climb.
- For normally aspirated engines, and fixed or constant-speed propellers.
- Uses only 112 K of Palm memory.
- On-line Help for each screen!

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For Technical Support

How to reach us:

You can e-mail us on the Internet at **ddeloach@msn.com** for “same or next day” service (we check our mail every day).

For technical support by phone, call Darren evenings from 7:30 pm to 10:30 pm Central at **903-583-0982**.

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Overview

Welcome to DSSTop for PalmOS! TOP stands for TakeOff Performance, and DSSTop will let you quickly see the effects that various performance-robbing factors have on your takeoff and climb performance.

WARNING! DSSTop is neither a substitute nor a replacement for your aircraft's Pilot's Operations Handbook (POH). The POH for your aircraft has the final legal word on the performance characteristics of your aircraft for takeoff, climbout and landing! The computations in DSSTop use performance and engine behavior averages across a wide variety of aircraft and engines, and are not likely to exactly represent your specific aircraft and engine, especially at very high density altitudes. You should use DSSTop only as a guideline for how certain parameters such as weight and altitude generally affect an aircraft's performance. **USE DSSTOP AT YOUR OWN RISK!** You must ALWAYS check your POH for the exact performance numbers for your situation, and you should always compute the POH performance numbers before every takeoff. A good pilot should add a 25% to 50% safety margin for EVERY takeoff!

With DSSTop, you can save the performance characteristics of the aircraft you fly in a database for quick selection and reuse, or you can simply manually enter the base performance numbers to begin the performance calculations.

This manual will give you all the information you need to get started performing aviation computations. After you have installed the software on your Palm® device using HotSync®, you can get information specific to each dialog in the on-line Help.

Program Installation

Before Installing

Before you install DSSTop, make sure your computer meets the following minimum PC requirements:

System Requirements

- An IBM PC-compatible running the Palm® HotSync® software
- A PalmOS® version 2.0 or later handheld device; supports color or monochrome devices.
- 112K of free RAM in your handheld device

We welcome any comments you have on the installation and use of our software; future enhancements (and future pilots) depend on your feedback.

Setting Up DSSTop

1. From the Start Menu, start the Palm Desktop Install Tool.
2. Place the Installation Disk in the A: 3.5" floppy disk drive.
3. Click the Add button in the Install Tool and browse to your A: drive.
4. Select the following files to be added at the next HotSync operation: **DSSTOP.PRC** and **MATHLIB.PRC**.
5. Click Done to exit the Install Tool.
6. Place your handheld device in the cradle, and begin a HotSync operation by pressing the button on the cradle. The software will be copied to your Palm device.

DSSTop User Interface Basics

The DSSTop Main Dialog

When you first start DSSTop, you'll see the Main dialog. From here, you can create or modify aircraft in the database, or select an aircraft and begin a performance calculation:



There are only two **Menu** trees on the Main Screen:

- **Record** — Use the purge option to delete all of the aircraft in a particular category. It should be fairly unusual to need this operation!
- **Options** — Use the Preferences menu item to set the data entry units you normally use (US or metric). About DSSTop and About MathLib give copyright information.

From the Main dialog, you can:

- Select an aircraft from the dropdown list, then tap the <Next> button to begin a performance calculation,
- Tap the <New> button to add a new aircraft to the list,
- Tap the <Edit> button to edit the aircraft currently selected,
- Tap the <Manual Entry> button to enter the performance data for an aircraft not in your database manually, or
- Tap the <Clear> button to clear out all inputs from a previous calculation.

Adding and Editing Aircraft

Selecting New or Edit on the Main dialog displays the aircraft performance editor:

Enter unique name for each aircraft (such as a tail number or model). Use the four page buttons, TO1 (takeoff page 1), TO2 (takeoff page 2), Land (landing) and Note (notes) to display each performance page.

The screenshot shows the 'Aircraft' dialog box with the 'Unfiled' status. The 'Name' field contains '1978 Cessna 152'. Below the name are four buttons: 'TO 1' (selected), 'TO 2', 'Land', and 'Note'. The 'Sea Level, Std Temp, Max Weight:' section is visible. The 'Takeoff Distance' is set to '720' Feet. The '50 Foot Obstacle' is set to '1340'. The 'Liftoff Airspeed' is set to '50' KTAS. The 'Propellor' is set to 'Fixed Pitch'. At the bottom are 'OK', 'Cancel', and 'Delete' buttons.

You must enter at least the basic sea level takeoff distance, lift-off airspeed and propeller type on this dialog. The 50-foot obstacle and rate of climb values are optional, but I strongly suggest you enter the rate of climb as many accidents are caused by failing to note the reduced rate of climb at high density altitudes.

Be sure you select the appropriate units for takeoff distance and lift-off airspeed. These are the base numbers which are used throughout the calculations, so make SURE you get them correct on this dialog!

You might want to use the Notes page to put the configuration data which the performance numbers assume in your POH, for example flaps settings, RPM and MP, etc.

Here are samples of the other three data entry pages:

The screenshot shows the 'Aircraft' dialog box with the 'Unfiled' status. The 'Name' field contains '1978 Cessna 152'. Below the name are four buttons: 'TO 1', 'TO 2' (selected), 'Land', and 'Note'. The 'Sea Level, Std Temp, Max Weight:' section is visible. The 'Max Weight' is set to '1670'. The 'Rate of Climb' is set to '715'. The 'TO Calibration' is set to '1.0'. At the bottom are 'OK', 'Cancel', and 'Delete' buttons.

TO 2 (Takeoff 2): All values are optional, but I strongly suggest you enter the sea level rate of climb.

Use the Takeoff Calibration to calibrate the DSSTop computation to your particular aircraft. It defaults to 1.0, but you can compute a more realistic value by dividing the actual takeoff run you experience by the calculated takeoff run. For example, if DSSTop estimates a ground run of 1500

feet, but your aircraft using your technique actually took 1700, you would enter $(1700 / 1500) = 1.13$ as your Calibration value.

Aircraft ▼ Unfiled

Name: 1978 Cessna 152

TO 1 TO 2 Land Note

Sea Level, Std Temp, Max Weight:

Landing Distance: 475

50 Foot Obstacle: 1200

Lndng Calibration: 1.0

OK Cancel Delete

Land (Landing): The values are currently informational only. A future version of DSSTop may include landing performance, so you should begin entering the landing performance data for your aircraft now so that you'll be ready if the landing performance feature becomes available.

Note (Notes): Enter any free-form text notes you would like to track for the aircraft. One suggestion is to put POH performance settings for flaps, throttle, etc. which were used to generate the base performance data.

Aircraft ▼ Unfiled

Name: 1978 Cessna 152

TO 1 TO 2 Land Note

Takeoff flap 10 degress, full throttle.

OK Cancel Delete

Tap the Delete button to delete the aircraft. Please note the delete operation is permanent, so use this feature carefully.

The Performance Wizard

On the Main dialog, tap the Next button to begin the Performance Wizard. You are presented with a series of dialogs that request various pieces of information that are factors in your aircraft's performance, such as the weight you are loaded at, the pressure altitude, temperature, etc. Some screens are require an entry on your part, while others are optional or may be skipped if that item is not a factor in the takeoff you are examining.

Several screens in the Wizard allow more than one way to enter the performance factor. For example, look at the Gross Weight dialog:

Note that you can enter the loaded weight either as a percentage of the maximum gross weight of the aircraft, or by entering both the max gross and currently loaded absolute weight (in pounds or kilograms, etc.) You don't need to enter all three fields; either enter the top one, or the two bottom ones.

DSSTop - Gross Weight ⓘ

Percent Gross Weight: ▼ 100.0

- OR -

Max Gross Weight: 1670.0

Weight as Loaded: _____

(Max and Loaded weights must be in same units -lbs, kg, etc.)

Previous Next Clear

You should also note something interesting about the Percent Gross Weight field: it has BOTH a drop-down list triangle, AND an underlined text field. This is not the usual PalmOS field! These items act like drop-down combo boxes in desktop systems; you may either enter the data value directly using graffiti, or you can tap the drop-down button and select one of the items in the list.

Use the Help button <i> in the top right corner of each screen in the Wizard to get more information about the items on the screen.

Tap the <Next> button to move on to the next screen in the Wizard, <Previous> for the previous screen, or tap <Clear> to cancel the Wizard and return to the DSSTop Main dialog.

The Results Screens

When you have entered all of the Wizard screens, you'll see the Results screen.

IMPORTANT! These are estimates based on average aircraft and engines, plus several inputs which were judgement calls on your part. DO NOT takeoff in your aircraft without running the same calculations with the data in your Pilot's Operations

DSSTop - Results ⓘ

Basic Takeoff Distance: 882.0

Calibration Factor: 1.0

Safety Factor: 1.25

Estimated Takeoff Distance:
1102.5

Total to Clear 50 Foot Obstacle:
2207.8

Estimated Rate of Climb:
(59.0 %) 421.7

Previous Next Clear

Handbook (POH). The POH is the final legal word on your aircraft performance! These numbers are more like guidelines to point out to you the performance-robbing factors which may be at play in your particular situation.

- **Basic Takeoff Distance:** The computed takeoff distance given all input factors, not counting the calibration factor or safety factor.
- **Estimated Takeoff Distance:** Final estimated ground run including calibration and safety factors.
- **Total to Clear 50 Foot Obstacle:** Final estimated distance to clear a 50 foot obstacle, including calibration and safety factors.
- **Estimated Rate of Climb:** Final estimated rate of climb given all input factors. Remember, many accidents are caused by failing to note and heed poor rates of climb in low-performance conditions!

The screen following the Results screen displays the results of several important secondary calculations DSSTop performed. Note that some of these items may be blank in your calculation, depending on what you chose to input.

DSSTop - Other Factors	
Density Altitude:	5860.6
Headwind Component:	12.3
Crosswind Component:	-8.6
Slope Down Degrees:	0.25
Slope Down Percent:	0.4
Breakeven Headwind:	1.2

Previous Clear

- **Density Altitude** - The effective "performance" altitude seen by your aircraft and engine, Pressure Altitude adjusted for both temperature and humidity.
- **Headwind and Crosswind Components** - may be computed from your entries on the Wind dialog if you gave current wind and runway heading information.
- **Slope Down Degrees and Percent** - either or both may be computed from the data you gave on the runway slope dialog.

- Breakeven Headwind - The headwind component at which taking off uphill into a headwind or downhill into a tailwind will compute the same takeoff ground run. Please note that this is more of a theoretical value; in actual practice, terrain and other factors may have a stronger influence on your decision than wind components (including unique characteristics of your aircraft).

Summary

While DSSTop is not a substitute for your POH performance documentation, it may be of some assistance to help you ascertain general performance numbers in unusual circumstances not covered by your POH. However, the items you enter are often a matter of judgment and experience (such as runway composition effects), and DSSTop is NOT to be used to take the place of the Pilot In Command's legal obligation to determine the necessary runway needed to safely takeoff and climb out using the official documentation for the aircraft. The PIC must use all available information, keeping in mind his own skill and experience as well as the state of his aircraft, to make this judgement. Performance numbers in POHs were accurate for top test pilots flying with nearly perfect skill on perfect days, which you are unlikely to match. This is why you should ALWAYS add in safety margins, even 50% or 100%, before risking your own and your passengers' lives, or your aircraft, taking off in marginal performance situations.

DSSTop is more like the old "Koch chart" from the FAA: useful background material to put some perspective on the performance factors influencing your situation, but NOT a legal takeoff calculation!

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