



HELIPORT VERSION 0.17 MANUAL

(last beta release before version 1.00)

GENERAL HELP:

HeliPort is a free and portable, digital toolkit for R/C helis:

- Available for Windows and Windows Mobile 6.x (touchscreen).
- No installation needed, even runs from a USB stick.

- Use the menus Tools and Data to view all functions.
- Read the specific help menu in each tool and data module.
- Any saved file can be used by both versions. This includes the sound recordings made with the tachometer.
- User settings are stored in a file called settings.hp, do not remove or change it. E.g. the delay and alert settings in the tachometer.

MENU "TOOLS":

1.HEADSPEED CALCULATOR:

How to use:

1. Click a pinion and a pack, Lipo or LiFe (A123) are available.
2. Type the number of teeth of the maingear and the motor kV value manually in the appropriate fields. Or use the gray fields, selecting a predefined main gear and motor, and the right values will be filled in automatically.
3. If the efficiency field turns green after selecting a motor, it means that this is a known value for the chosen motor. It can always be changed manually between 75 and 95 %.
4. Use the slider to roughly simulate reduced throttle. This is a linear reduction, keep in mind that most speed controllers are not linear.

2.BATTERY CALCULATOR:

How to use:

1. Enter the nominal capacity of the battery in the 'Capacity?' field.
2. Enter the used capacity (see your charger) of the battery in the 'Used?' field.
3. Optionally enter the flight time in minutes and seconds. If these values are not given, some of the results in the table will remain at zero.
4. Click the equal sign button, and the table will show the results. You can transfer the results to other programs (use Shift-arrow to select, Ctrl-c to copy and Ctrl-v to paste).

Notes:

- A. HeliPort estimates 80 % discharge a safe value. Results below or equal to 80% will make the results turn green. Any value above that will make the results turn orange, as a warning.
- B. Maximum possible input for flight times is 30 minutes and 59 seconds. Mail me if you need higher values, I'd like to see your heli :-)

3.FLIGHT LOGGER:

How to use:

1. Make a new flight log or open a saved flight log using the menu 'Flight log' - 'New...' or 'Open...'.
2. A new log file can be created for every heli you wish to log. Use a meaningful file name for each log file, like for example 'Helil_BrandX'. HeliPort will now automatically create a first row, with the fields 'Date' and 'Time' filled in, change them as you like.
3. Fill in the flight time in the fields 'Min.' and 'Sec.', by first clicking the target cell, adding or changing a value in the white input field and clicking 'Change cell' to confirm.
4. Do the same for the field 'Comment' if you like. This could be a location or the weather condition.
5. Add end rows as needed and fill these in, one row for every flight.
6. Select any cell on any row and click 'Delete row' to delete that entire row, HeliPort will ask for confirmation first.
7. Save the created log using the menu 'Flight log' - 'Save'. If you forget to save and the data have been changed, HeliPort will ask you to do so before quitting or opening another log or making a new log.
8. Use the button 'Stats' to show some statistics about the heli, based on the logged data.
9. The complete path and filename of the opened flight log is always shown at the bottom of the screen.

Notes:

- A. HeliPort uses CSV files to hold the logged data, these can be created, opened and saved at any chosen folder.
- B. The CSV files are interchangeable by both versions of HeliPort, and also usable with any spreadsheet program or word processor.

4.BATTERY LOGGER:

How to use:

1. Make a new battery log or open a saved battery log using the menu 'Battery log' - 'New...' or 'Open...'.
2. A new log file can be created for every battery you wish to log. Use a meaningful file name for each log file, like for example 'Lipol_BrandX_6S_2600mAh'. HeliPort will now automatically create a first row, with the fields 'Date' and 'Time' filled in, change them as you like.
3. Fill in the flight time in the fields 'Min.' and 'Sec.', by first clicking the target cell, adding or changing a value in the white input field and clicking 'Change cell' to confirm.
4. Do the same for the field 'mAh used', this can (also) be done later.
5. Add end rows as needed and fill these in, one row for every discharge cycle.
6. Select any cell on any row and click 'Delete row' to delete that entire row, HeliPort will ask for confirmation first.
7. Save the created log using the menu 'Battery log' - 'Save'. If you forget to save and the data have been changed, HeliPort will ask you to do so before quitting or opening another log or making a new log.
8. Use the button 'Stats' to show some statistics about the battery, based on the logged data.
9. The complete path and filename of the opened battery log is always shown at the bottom of the screen.

Notes:

- A. HeliPort uses CSV files to hold the logged data, these can be created, opened and saved at any chosen folder.
- B. The CSV files are interchangeable by both versions of HeliPort, and also usable with any spreadsheet program or word processor.

5.GPS LOGGER:

How to use:

The GPS logger records GPS data on a PDA in a heli during flight, at 1 GPS sample per second.

1. Start the GPS logger, move a few meters and quit/restart at least once, right before use! Accuracy will suffer terribly otherwise. Expect precision to be about 5-10 meters. Make sure the first column 'fix' shows '3D'.
2. The menus 'Save' and 'Help' and the scrollbars are not available while logging, stop logging first. Clicking 'Start' again will clear all unsaved data (!)
3. The columns can be adjusted in width, by dragging the border between two column headers.
4. Logs can be saved as CSV files, and opened with wordprocessors or spreadsheet programs (= best to import as comma delimited CSV file).
5. Make sure to attach the PDA firmly to the heli, and lock the touchscreen while flying.

Legend:

'fix' = can be unknown, 2D or 3D (= best)
'maxs' = maximum horiz. speed in km/h
'maxd' = maximum horiz. distance in m
'maxa' = maximum altitude in m
'speed' = actual horiz. speed in km/h
'dist' = actual horiz. distance in m
'alt' = actual altitude in m
'dir' = direction 0=N 90=E 180=S 270=W
'time' = precise universal time
'sa' = number of used satellites
'pr' = precision scale 1-50, 1 is better
'sen' = state of GPS sensor, must be ON
'dri' = state of GPS driver, must be ON

With this in mind, the saved data will hold all the information to reconstruct the flight.

6.TACHOMETER:

How to use:

1. Optionally, use the delay box to preset a delay before recording will start, between 0 and 180 seconds.
2. Also optionally, use the Alert menu to set a sound (or not) to be played when the recording will be finished.
3. Click the record button when ready to measure headspeed. The buttons will temporarily disappear, indicating HeliPort is busy. The buttons will become visible again, once the delay time is over and the recording finished.
4. Optionally click the play button to check the recorded sound.
5. Click the RPM button and the RPM value appears.
6. After that, the spectrum button will become visible. Clicking it will show:
 - a list of the 5 main frequencies, these can be copied and pasted into other programs.
 - an autoscaling graph. In case of an unlikely result, consider the RPM value of the next largest peak! Use the headspeed calculator for a rough estimate. HeliPort does not ask for an estimated guess by the user, so in some cases this spectrum analyzer can be needed.

Important notes:

- A. For now this tachometer is intended only for use with 2-bladed, electric helis.
- B. HeliPort will always consider the loudest sound, but only between 1000 and 5000 RPM. Meaning that a very noisy electric helimotor won't matter, as it runs at higher RPMs. But also that extremely low headspeeds are not a good subject to measure.
- C. Holding the microphone very close AND pointed directly towards the main blades can produce erratic results, caused by turbulence.
- D. During the recording, HeliPort will make a 2 second long recording of the sound, and save and/or overwrite a small file named tacho.wav in the HeliPort folder.

E. The format of this uncompressed sound is WAVE, PCM, 8 bit and 11025 samples/second.

F. Any other self-made wave file can be used, as long as the above conditions are met. The duration of that file can be much longer, HeliPort will only look at the first two seconds, so this part of the file needs to be representative. Mono or stereo format does not matter. Simply copy any suitable file to the HeliPort folder, rename it to tacho.wav and click the RPM button. Attention: clicking the record button will overwrite that file!

G. Avoid using software equalizers or acoustic filters of any kind whilst recording.

H. RPM accuracy is within 10 RPM.

I. Only for the desktop version: Windows caches files, meaning a new recording might not be available on disk immediately to execute the calculations. This can cause strange behavior of the tachometer tool. Simply wait a few seconds after recording before clicking the RPM button in that case. Restarting HeliPort will also solve this.

MENU "DATA":

A.ELECTROMOTORS:

How to use:

1. The columns can be adjusted in width, by dragging the border between two column headers.
2. Scroll down the list by clicking the arrows at the right.
3. Or use the search field by typing the first letter(s) of a specific brand.

Notes:

A. This is the list of motors that is also used in the headspeed calculator.

B. Ef = maximum efficiency (if known).

B.TAILBELTS:

How to use:

1. Choose a type of tailbelt. Possible choices are MXL, XL or HTD-3.
2. The 'show' button shows a picture of the chosen type of tailbelt.
3. Use the up/down arrows next to the fields teeth and/or length to calculate any belt, from 200 up to 500 teeth. Or type a number in one of the fields. Both fields always react immediately in relation to each other.

Note:

The table shows a number of common helis with the stock tailbelt, as a reference.

C.ELECTRICAL WIRES:

How to use:

1. The wire calculator asks for the maximum number of amperes used by the helimotor, and will reply with a (conservative) estimation of the optimal type of wire that should be used on the ESC and battery pack. Meaning that in most cases using a type of wire one size thinner wouldn't hurt much.
2. It will also calculate the voltage drop for that specific current and recommended type of wire, per meter and per feet.
3. The user is free to choose a different type of wire anyway at the same current, and HeliPort will reply with a Not optimal response in orange, but nevertheless calculate the voltage drop per meter and per feet of cable.
4. The reference list holds some specifications of the most common type of metric and AWG copper wires, not only power wires but also some very thin diameters.

Notes:

- A. AWG means American Wire Gauge.
- B. The values in the table refer to solid wire, note that most wires used in helis will be various types of stranded wires, having slightly different specifications. But the results are precise enough to be perfectly usable.
- C. The calculated voltage drops are valid for a two-way circuit like used in a heli, but note that the resistance values in the reference list are given for a single wire!

D.CONNECTORS:

How to use:

Simply click a connector in the list, and a picture of that connector will appear.

Note:

The first number of any ampere rating is the maximum allowed continuous current, the second number is the current allowed for short periods.

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