

LK8000 version 4.0

What's new and what has changed since v3.0

THIS IS NOT A MANUAL! THESE ARE ONLY THE CHANGES IN LK 4.0.
THEY ARE IN FACT ONLY A SMALL PART OF WHAT LK CAN DO IN FLIGHT

Multimaps

See things from different perspectives. You got several views, and all of them only a single touch away. Choose what you want to see, and disable what you feel is not needed.

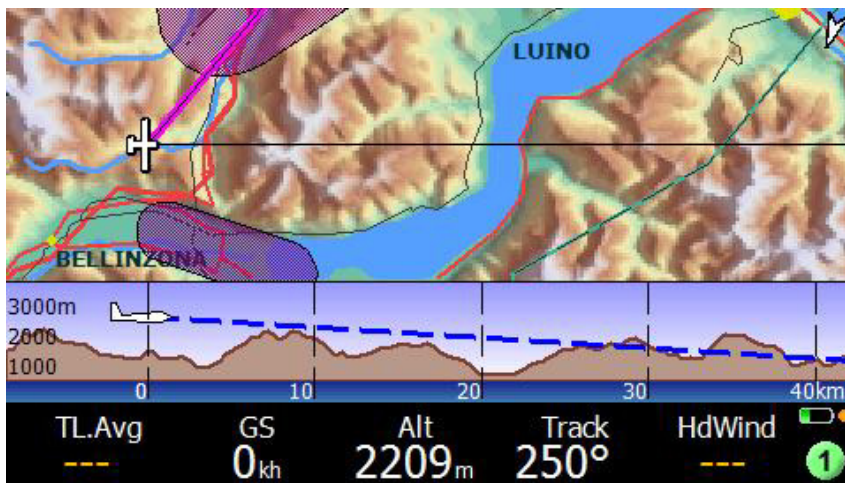
Zoom in and out, as usual, and adjust top and sideview even separately.

See terrain ahead, look at 3D airspaces, examine the current glide path.

Rescale side-topviews in each multimap, set display options for each multimap, and all is saved automatically to profile for the next time. Easy and powerful.

You still have the good old main map, of course, plus M1, M2, M3 ...

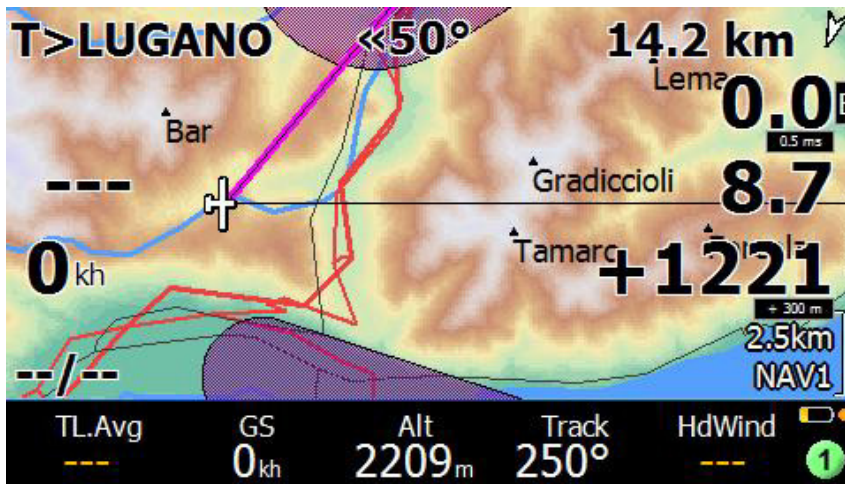
M1 Alternate topview plus sideview



choose orientation, resize topview and sideview, decide what to show on the topwindow..



or simply use it to see "further ahead" in landscape mode.. with no sideview.

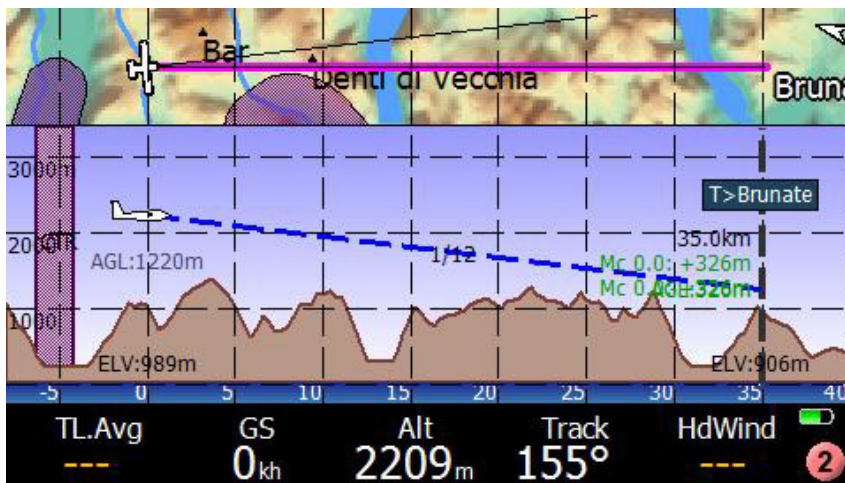


M2 Target view

Care about final glides? This multimap page is for you.

No matter how you set up other map pages, you can customise this one to the best of the best.

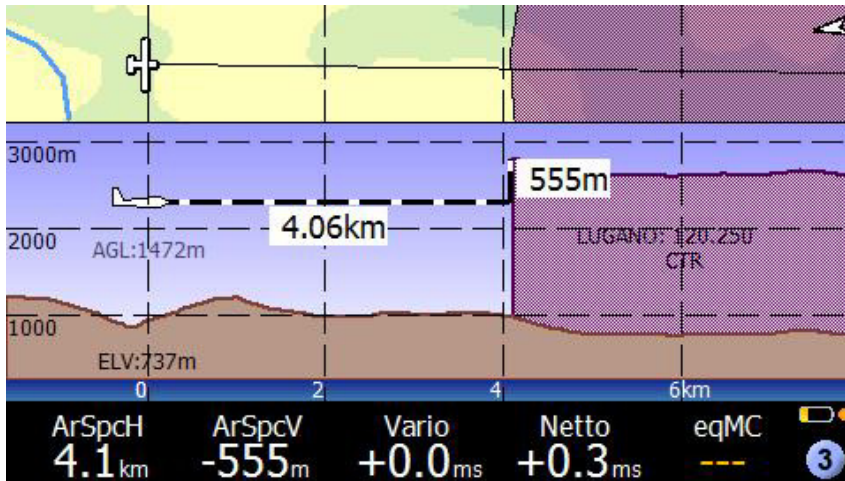
This map is auto-zoomed to the best to let you see the destination, and you do get all obstacles in between! Airspaces? Of course, they are shown both in top and sideview, if you like.



M3 Problems with airspaces?

You came to the right place! Multimap M3 was made for you.

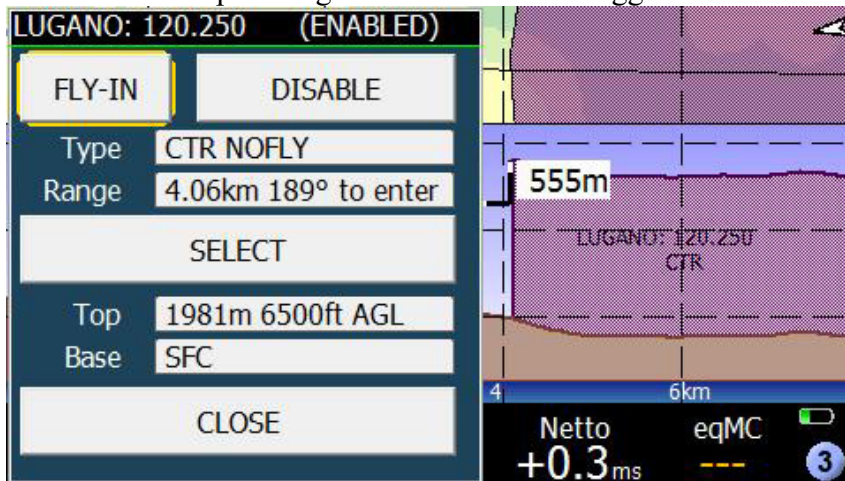
Truly, all multimaps can show you in both top and sideview the surrounding airspaces, but M3 is special. Because M3 is automatically selecting the closest airspace nearby, it rescales the distance to it in order to let you see at the best possible view what's coming up.



When you are in doubt, M3 will help you with no need to select anything.

But there's more than that! We have a **SONAR** sound, if you want, which is always working in the background even when you are not in the M3 page. If you are approaching an airspace, the SONAR will always alert you, and M3 is here for you. No panic!

Click on the airspace to get more info and to trigger some action..

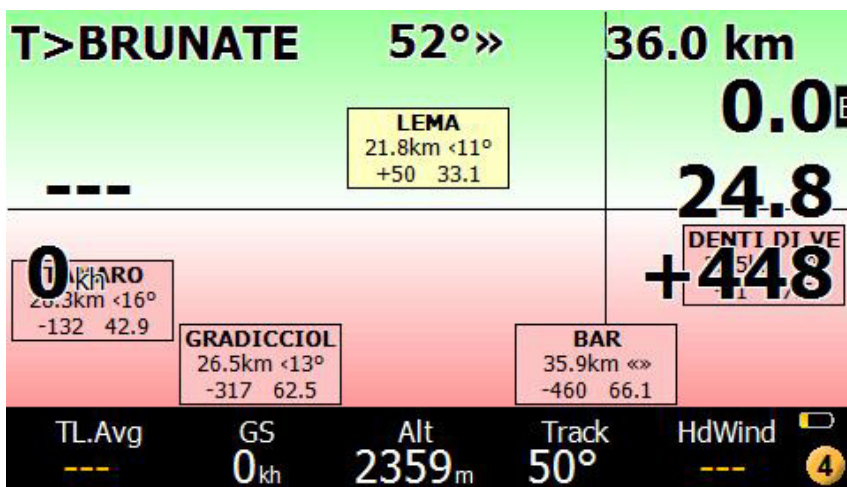


M4 VISUAL GLIDE

You dream about knowing automatically what's ahead of you, which ridges are reachable with your current altitude, how far you can go, still making it over the next mountain? This is the VisualGlide.

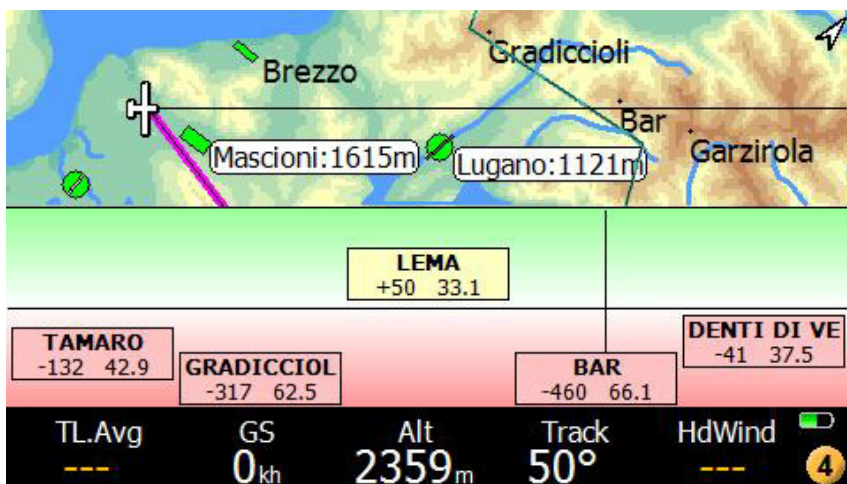
No need to do anything, because everything is done automatically:

- 1) Selection of best points to show you, giving priority to mountain passes, if around.
- 2) Obstacle calculations
- 3) ordered by direction



Look at it as in a FRONT view. Objects above the horizontal line are reachable, those below the line, in the red area, are unreachable. Yellow boxed means caution. Red boxed in green area means obstacles. The vertical line is your current track. Quite innovative concept, but easy to get along with, in only a few lines of explanations.

Of course, you can also resize the windows.



The VisualGlide will not give you useless information's, such as "you can make it over the ridge 2 miles ahead, with 4000feet margin". This would not be an information, it would be a waste of time to read it, because you can actually see it by yourself, the ridge is well visible and you are so high!

Instead, more cleverly, the good VG will try to spot for you something you cannot see or judge with your eyes, for example telling you "hey, climb 200feet more, and you can skip the next thermal on that ridge you are pointing to, and go directly to the next".

M5 FLARM RADAR

First of all, this page is not about safety. When you have traffic around, look outside, don't look at your computer. This is just obvious. For this reason LK will not give you a single traffic warning alert for possible collisions. We don't want you to look at the screen of the PNA when an alarm is triggered. Look outside!

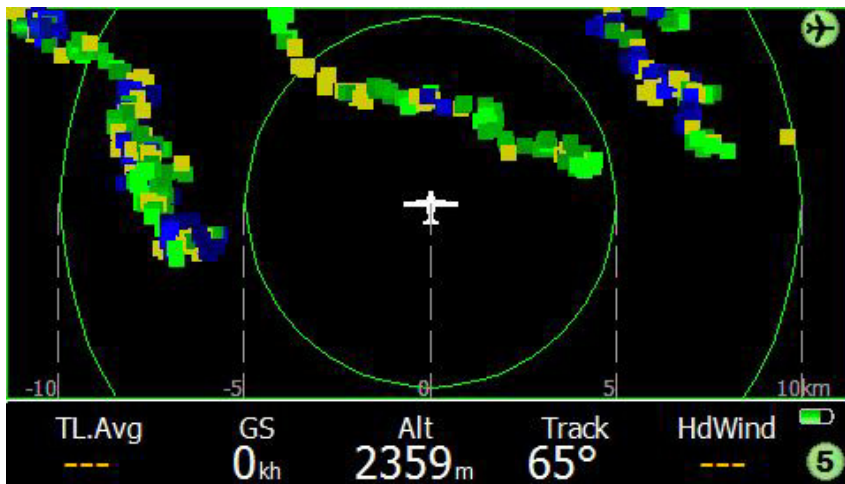
This said, you have some interesting traffic a few miles away. How is the lift under that cumulus?



The FLARM TRAFFIC multimap offer both side and top view of traffic. And you can resize the windows as you like. Zoom in and out to enlarge or reduce the range.



Enable or disable the traces left by the traffic. This is important.. because when you reach the cumulus, or the ridge, you still want to see where was the other glider flying, and how good was the airmass up there. And we do tell you!



Light green, good lift, darker green not so good, blue spots are sinks. Easy.
Traces survive for enough time, even if the traffic has long gone.
Of course, all the good old pages for traffic are still there, for more detailed info.

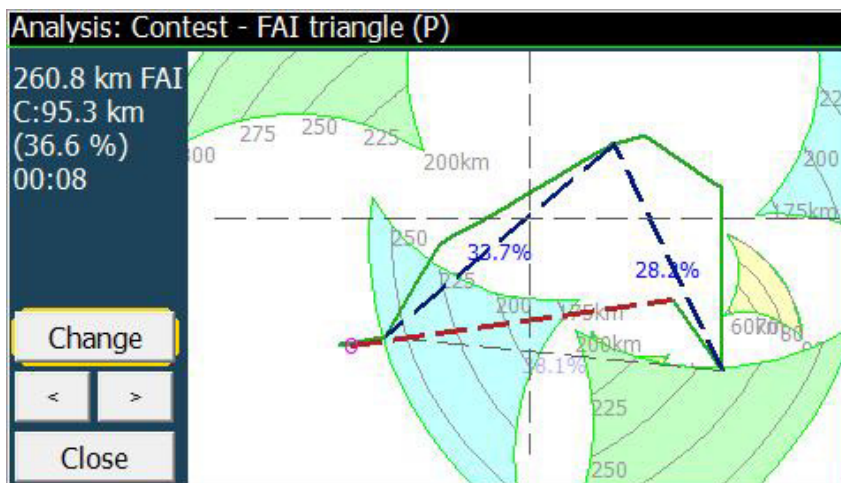
The manual does explain multimaps in details.
If you dont like some pages, simply disable them.

FAI triangle optimization during flight

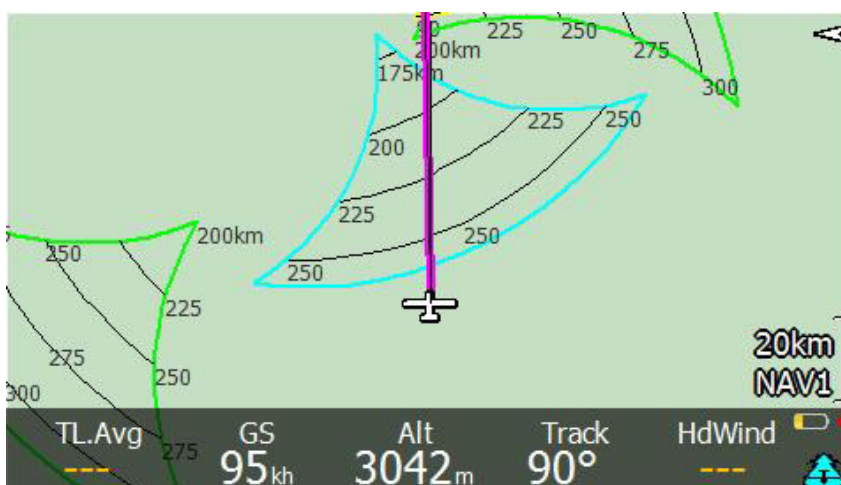
The FAI Optimizer is designed to give a navigation aid to fulfill a FAI triangle. After flying for a while the Optimizer tries to find the longest straight flow distance and shows two Sectors. In order to achieve a FAI triangle we need to navigate into one of these sectors. Once reached the sector, the optimizer draws the FAI triangle which can be achieved by flying back back to the closing point which track is shown by the red dashed line. Note that the closing point is not necessarily the takeoff point.

Once the FAI triangle is determined there is also a sector drawn around the FAI closing point. This is to show into which direction we can extend the flight in order to increase the total triangle distance.

You get visual aid to FAI triangle in both analysis page



and main map, as overlay in place of task sectors, anytime.



A special "virtual" waypoint is now available in 3.1 list, named FAI CLOSE. This is the point you want to go to in order to close the chosen triangle.

3.1 COMN 1/1	Distance	Direction	ReqEff	AltArr
VALBREMBO	95.7	«31°	39.2	-308
BORGOTICI	20.1	« 6°	8.3	+1845
DENTI DI	57.8	«64°	39.0	-138
BRUNATE	58.2	«39°	28.2	+435
FAI CLOSE	38.7	«57°	63.0	-470

TL.Avg	GS	Alt	Track	HdWind
---	95 _{kh}	2971 _m	125°	---

Select it, and see details.

Waypoint Info: FAI CLOSE	
Next >	Lat/Lon N45°55'22" E008°49'48"
	Elevation 2358m
	Sunset 16:45
	Distance 38.6km
	Bearing 68°
	Alt diff Mc 0 -472 m
Close	Alt diff Mc current -474 m
	260.8 km FAI closing point

So let's take it and try to close this 260km triangle now.

Two new infoboxes are available for additional realtime informations:

The distance left to close the triangle

The same distance in percentage

19 InfoBox Auxiliary	
Copy Paste Next > < Prev Close	1 OLC FAI triangle Distance to close
	2 OLC FAI triangle Distance close %
	3 Vario
	4 Netto Vario
	5 MacCready Equivalent
	6 Speed To Fly
	7 MacCready Setting
	8 Track

In the next picture, we still need to fly for 18.7km (7% of the total) to close the triangle.



And when we get there.. is it true that we did really close it?

1.5 Contest	
OLC dis	FAI dis
318 km	261 km
OLC*dis	FAI*dis
318 km	261 km
OLC spd	FAI spd

Oh yes. See confirmation in the independent OLC analyzer. 261km FAI accomplished. Trust the FAI optimizer and you won't be disappointed.

Screen rotation

Automatic rotation after detecting screen orientation change, or manually with menu buttons. Rotation can happen also at runtime, during the flight. 90 or 180 deg rotation support.

LiveTracker support

Realtime tracking using cellular phones/smartphones

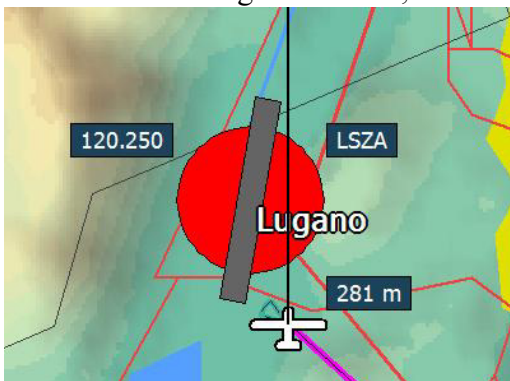
UTM coordinate system support

You can now choose to use the UTM system everywhere, in place of degrees. This was requested by paragliders and hanggliders users.

Vector waypoint icons

with radio frequency, ground altitude, ICAO code, runway direction.

Beautiful rendering of airfields, with real runway orientation.



New PROFILES

allow to use the same SD memory on different devices, including PC.

Separated configuration for DEVICE, SYSTEM, AIRCRAFT and PILOT, available at startup.



Flight Data Recorder and range alarm for flight engineers

This is a real FDR, fully configurable. You can choose what to log and the time interval.

It will generate a text document ready to be used with all of your flight activity, including sensors, temperature, battery, accelerations in 3 axis, everything. It is a perfect companion for flight engineers, giving them a real blackbox for free.

```

* flight recorded on: 24:04:2012 starting at 23:25:48 UTC
*
*****
*
Recording interval:1s

    External Batt. 1 recording enabled
      PDA Batt. % recording enabled
    Outside Air Temperature recording enabled
      Longitude recording enabled
      Latitude recording enabled
      Altitude recording enabled

```

You also can setup an alarm if a specific flight parameter is out of a user-defined range.
 e.g. OAT $\leq 0^{\circ}$ to remind you about the water ballast.
 External Battery level to low
 IAS $\leq V_{min}$ stall warning
 G-load too high
 Gear warning below 200m AGL

Takeoff safety altitude bell

Concentrate on commands instead of looking at the altimeter during the early takeoff phase.
 LK will tell you with a soft "cabin chime" sound and a quiet voice that you have reached the safety altitude.

15 Alarms	
Max Altitude 1	3500 m
Max Altitude 2	6000 m
Max Altitude 3	0 m
Takeoff safety	50 m

Enhanced CAR mode and TREKKING mode support

Setting CAR/TREKKING mode will make LK work pretty much a trekking unit, tuned for slow speed in 2D. Some dedicated infoboxes are appearing in the bottombar, to show: moving times, steady times, total times, averages, distances, like in a ordinary trip computer.

STAS				
Moving	Steady	Total	AvgSpd	AvgDist
01:09	00:11	01:20	45.0 _{kh}	0.33 _{km}

A Trip Reset button is available. Snail trail, logging, etc. are internally working differently, tuned for this special mode. The trekking modality has been extensively tested while doing real trekking in the alps.

The variometer bar is also showing CAR - BIKE acceleration and deceleration, autocalibrated.

Paragliders

Add Sector Turnpoint in PGTaskMgr, for new optimization for type of turnpoint, use always center point !

Remove AAT Iso Line Drawing for PG Task

Add IN/OUT type in Task Waypoint dialog for PGTask

Disable AAT Time notification for PG optimized Task

Quick gestures

Only for paragliders and hanggliders mode: enable/disable quick gestures.

By default, quick gestures are enabled. Quick gestures allow the pilot to click on right or left nearest/info pages to switch to next/previous like with gestures.

Using gloves during the flight will require this option be disabled.

New LKRUN.exe execution shell

LKRUN.EXE is an executable inside LK8000 folder, in the same place of LK8000-PNA.EXE.

Running LKRUN.EXE will make LK8000-PNA.EXE run as well.

Upon exit, LK will restart automatically.

If you Exit from the startup screen, you exit LKRUN and the loop is over.

This shell is particularly suggested for the case you need to restart LK during the flight, for any reason.

New virtual waypoint: FREEFLY and FAIOPTIM

They indicate start of freeflight and the current optimized triangle turnpoints.

They appear automatically inside COMMONs page, and in the waypoint list of course.

New declutter engine for landings, at low zoom levels

We always pay great attention to details also at low zoom levels, when too many useless informations were given to the pilot in earlier versions. Deciding what to show and what to hide is never a trivial operation, but it is nevertheless an important option when you load thousands of waypoints and navigate in areas populated by many airfields. Decluttering means simplifying life to the pilot in such cases.

Before 4.0:



In 4.0:

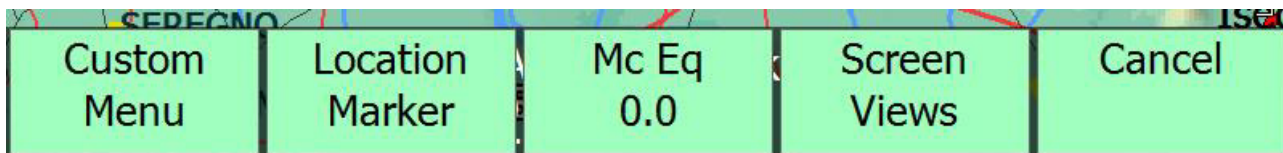


Fewer information make better information sometimes. But it's up to you, through configuration, in any case.

Custom menu buttons

New custom menu buttons in main menu.

This menu is configurable in system setup page 10.

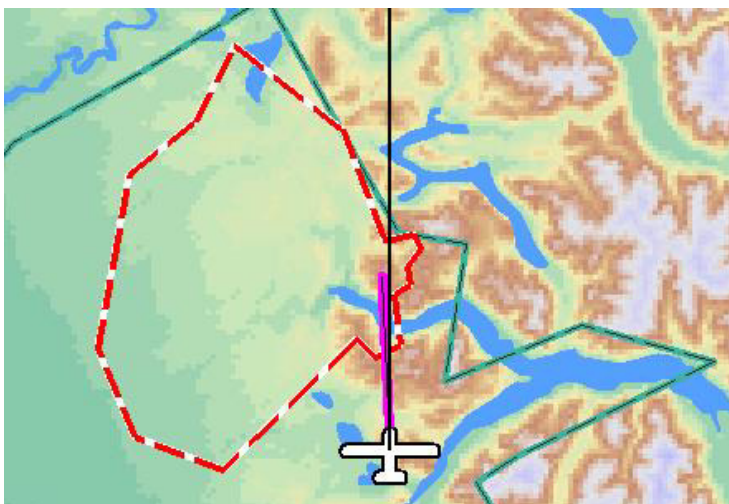


You can assign up to 10 buttons choosing actions from customkeys.



Dual glide footprint

You can now see the glide footprint relative to the current destination waypoint. This means: what will be the glide range once you get there, at the estimated altitude.



The red and white area is what you can expect to reach once you get to the current turnpoint.

Airspaces

Grouped airspace acknowledging

Acknowledging one airspace will then extend this confirmation to all of the airspaces having the same name and the same class.

This is particularly useful if flying in populated airspace areas where a single zone is splitted into several airspaces all logically connected.

- Airspace warnings have no more Analysis button (useless since we have multimaps) and the alert sound is shorter and with no voice.
- Use thin airspace outlines if content is not filled or selected.

Tasks

Import task from SeeYou CUP files

From load task it is possible to select also CUP files containing a task.

The CUP must be located inside the Task folder (not in waypoints!).

Only the first task in the file will be loaded. If the CUP file has more than a task, the other task lines after the first will be ignored.

- Arm TPs support added
- Save and Load Time Gate config in Task file
- New task action buttons in waypoint details, for more clear actions: Insert and replace will tell which waypoint are affecting .
- New Append before and after finish.
- Allow saving a task that is using virtual waypoints. This is needed because it is now possible to insert a virtual waypoint during the flight in pan mode
- TASK lines made thicker and better visible
- New task edit button "delete" for deleting task files. This button is available only when TimeGates are disabled, because they share the same screen location

External instruments

Westerboer

Disable STF switch use

Volkslogger

Barometric altitude support for the B50

LX

V7 full support, also with RMB option

MiniMap support as custom device

ASI FlyNet Vario

Full support

COMPASS C-PROBE full support

GPS-NAV task declaration support

EYE support

Choose the wind source, anytime

Configuration for using wind precalculated by external instrument

In config menu 5 (Glide Computer) Auto Wind can also be "External"

In basic wind setup, the same.

Using external wind from instruments like CAI, LX etc requires setting.

More than a barometric altitude source? No problems.

New engine for multiple sources of barometric altitude, with **automatic fallback**.

If one source is out of order during the flight, we switch to the other good one.

Without manual input required. Like we do for GPS position, since ever.

New Polars

- H-206 Hornet
- Apis2 15m
- LP-49
- ASK-13

New Infoboxes

For CAR and TREKKING mode, calculated average speed and distance achieved in the last average period of time. These values are reset by Trip Reset.

FAI Closing Point distance C: and relative C: %

Custom keys

More customkeys available for you, and now you can also assign them to 10 classic menu buttons in the new Custom submenu.

ARM Toggle Advance
Task calculator
Task target
Custom menu
Message Repeat
Waypoint lookup
Pan mode

Toggle Wind Rose

will change wind direction overlay and infopage from degrees to textaul and back.

Example 245/5 becomes WSE/5

This customkey is assigned by default also to a custom menu button. The status of this flag is saved to profile automatically.

Flarm Radar
Reset Odometer
SONAR TOGGLE , will toggle the sonar sounds on and off
Reset Trip Computer .

Force landing

This will force landed status, so that logbook is updated, and eventually logger is stopped.

This customkey requires to be below the takeoff speed, otherwise it will simply say "Stop moving".

PC keyboard shortcuts

On PC, in SIM mode only, it is possible to trigger changes of altitude, direction and speed very quickly by using the keyboard.

While replaying an IGC file, it is also possible to change the replay speed with a key press, and to advance 5 minutes forward in time.

User interface changes

Display menu buttons choices are now saved to profile, differently for each map page they are used into.

Draw thermal bar also in cruise mode (can be configured in config 13 page: disabled, in thermal, in thermal and cruise)

More accurate battery indicator, flashing when below 6%, and full blue when 100% under power.

CPU load infobox in bottombar SYS page

BestAlternate messages lasting only 2 seconds, instead of 5 to 10 seconds

New bearing diff indicator

Change in ActiveMap function: after selecting an object, or changing page, it is automatically disabled. Flashing text is alerting pilot that active map is enabled for direct screen selection.

New configuration for Bottom Bar TRM0 AUTO mode: selection can be made automatic upon entering thermal mode. By default it is enabled, as it has been so far.

Fast exit from thermal mode. Previously up to 15 seconds, now 10 seconds

While circling keep showing Bearing Diff, instead of adopting bearing on overlays and in infopage

Overtarget rotation:

Skip MATE overtarget if no target mate is set. To access MATE own code the direct multitarget menu is available.

Skip F> overtarget if there is no Target set while Flarm is detected.

Show required Task Req. Efficiency also before valid start

New Ungesture feature

clicking on the already selected sort button in nearest pages will advance to next page.

Example: you select 2.1 page (APTS), there are seven pages and you read APTS 1/7 .

The page is sorted by Distance. You click on Direction, the page is sorted by Direction now.

You click again on Direction, the page is showing APTS 2/7 : you have advanced to next page like with a gesture down.

This ungesture works also in Common and Recent pages, although they cannot be sorted by anything. Any sort place will nevertheless advance to next page, as expected.

PAN mode

smoother coordinates printed in overlay

Orientation: always NORTH UP.



New location marking

A new button is available in pan mode: **location marker**.

It is the same "location marker" available to create a marker while flying, but in this case it will create the marker in the cross center pan position.



Location marker altitude in pan mode is the terrain altitude, if available. Otherwise it is zero.

The marker is then available for selection as a waypoint, can be inserted in a task as an intermediate waypoint, can be used as an alternate destination, etc.

New "Position" button in SIM mode PAN mode.

To reposition the aircraft in sim pan mode, simply change position by dragging the moving map, and when the center cross is where you want to position the aircraft, click on the "Position" new button on left top screen.

Allow Find NearestWaypoint button to select also markers.

So it is possible to pan, create a virtual waypoint, and select it for a goto.

Add Button INFO 1/2 for SONAR TOGGLE

The SONAR for airspaces is always available now, not only in ASP pages.

Better white text outlinining, smoother and much nicer

Faster panning and zooming

Many times faster drawing airspaces "border only"

Add BEEP to startup timeout on welcome page, so we know the LK has got the GPS fix.

Clock is shown (if enabled) also in portrait mode.

Some resolutions will display the clock lower after right overlays.

Most resolutions will display it on top right, as usual

DrawTRI Turn Rate indicator showing acceleration point

New NAV 3/3 button Clear Alternates

This button is replacing the old Clear Alternates button in waypoint details pages

Other changes

Airspace Sonar is now working globally, and can be disabled/enabled with a button

Load FlarmNET database during startup, not before LK launch.

This will dramatically speed up startup of LK and gain to the splash screen, while using FlarmNet.

Reset profile will now load DEMO.tsk as well

Reset COMM ports automatically on no activity after 3 minutes, not after 30 seconds

Improve battery warning messaging: after 1 hour with no errors, accept back warnings even if they were disabled because too many, previously

Terrain with no topology will nevertheless print water areas

Enhancement for dual feed com ports: if no valid fix on any port, we use the first port with at least some data going through!

This will keep probably at least the time updated since the gps may still be receiving a valid time.

Improve direction sorting for Nearest pages 2.x

Now sorting is done by both direction and distance, and using only waypoints actually ahead of us in a +-90 degrees, not those at our back. This is an important change, because the nearest pages are now selecting more waypoints sorted by direction, that previously wouldnt have been listed at all.

Add startup check for SD card locked or full, not writable.

New G Record Key for LK8000 Logger, valid for OLC.

We have our own 3 letters code now, which is XLK.

New support for external validators of IGC logs.

This is for online contests or even real contests currently rejecting LK logs because the signature key is in public. An external program called LKRECORD_PNA.LK8 should be copied inside _Logger folder to activate the special signature.

Rename virtual waypoints if they are part of a task, when saved.
Virtual, like TAKEOFF or FREEFLY are renamed with a leading TSK_ .
These virtual waypoints can be saved to task, and made real waypoints.

Fixes

Many glitches fixed, expecially about resizing menus and buttons everywhere

Fix speed for determining flaps in turn, should be corrected for bank angle. It behaves the same like for example minimum speed rising.

Fix bug in comm port not managing correctly lonesome barometric altitudes

Fix accuracy of average speed, and more accurate Equivalent MC.

Show required Task Req. Efficiency also before valid start

Fix 3,0 bug after loading a waypoint file without a valid header line , LK was correctly discovering the real waypoint format and it was correctly loading waypoints, but the filename of wp file was disappearing in config. So at the next run, wp file was no more configured.

Fix old bug hardware keys no more working after defocusing LK windows, on PC or PDAs.

Fix old bug not correctly saving some CUP waypoint files (file name disappearing in configuration)

Fix loading CompeGPS waypoints

Fix waypoint selection list not showing invalid virtual waypoints (like LKMARKERs for example!)

Fix 3.0 bug not managing correctly FLYTEC FLYSEN time, not advancing.
We also fix the UTC time incorrectly managed as local time.

Fix very old bug not considering day advanced through a new month.
Only a single day was considered, and this was creating problems to people not switching off the gps for many days.

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