LXNAV LX80x0 and LX90x0 Tips

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The LXNAV LX8000, LX8080, LX9000, LX9050, and LX9070 are the most powerful and popular soaring flight computer systems available. Once you're familiar with the user-interface basics, it is easy to use it to get the most out of your cross-country soaring speed flights, free-distance flights, wave flights, etc.

I fly with an LX9000 and V8 vario in our DG-1000S. I love it.

This document includes some tips to help you get the most out of your LXNAV LX80x0 or LX90x0. I have tried to make it as complete as possible. Please consider it to be in addition to the LXNAV LX80x0 and LX90x0 User Manual (link below).

I suppose that, at first glance, all the tips found here can be a bit intimidating. Please keep in mind that this will all become clear over time – as you gain more experience with your LX80x0 or LX90x0.

Documents and Help Resources
This and related documents are available here: http://www.cumulus-soaring.com/lxnav.htm.

LX80x0 and LX90x0 Resources:

- **LXNAV LX80x0 and LX90x0 User Manual and Installation Manual**
  LXNAV manuals are available on the LXNAV web site (www.lxnav.com). Use the "Downloads" menu and select "Manuals". Or use the following direct link:
  https://gliding.lxnav.com/lxdownloads/manuals/

- **LX9000 Overview and Training Videos**
  My LX9000 overview and training videos are part of the Soaring Product Training video series. You can rent a single video for 30 days for $3, or buy a single video forever for $10. Or rent the entire Soaring Product Training video series for $60 for a year. If you find the videos useful, please consider renting the entire series for a year to help support my efforts. http://cumulus-soaring.com/training.htm
  - LX9000 Soaring Flight Computer Overview
  - Bridge for Becker AR6201 Radios
  - Checklists for LX80x0 & LX90x0
  - Spring Updates for LX80x0 & LX90x0
  - Task Setup for U.S. Soaring Contests for LXNAV LX80x0 & LX90x0
  - Wi-Fi Module for LX80x0 & LX90x0

  Access to the Soaring Product Training video series is also included in all Mutual Support

Memberships: http://cumulus-soaring.com/membership.htm.

- **Other LX80x0 and LX90x0 Videos**
  Glider Pilot Shop in the Netherlands has made some very nice, short product feature videos:
  - LX80x0 and LX90x0 New AAT Functions: https://youtu.be/3dUITbW8tMo
  - LXNAV Flap Sensor: https://youtu.be/x0oiOs-wli0
  - LXNAV Stick-Mounted Remote and .cupx support: https://youtu.be/psoaPiAEXrI
  - LXNAV AAT in Two Minutes: https://youtu.be/picpQYCEViU
  - LX80x0 and LX90x0 WiFi Functions: https://youtu.be/wQZVeQOqHOg
  - LXNAV Radio and Transponder Control: https://youtu.be/S1UNYIm2_4g
  - More: https://www.youtube.com/user/GliderPilotShop/videos?view=0&shelf_id=0&sort=dd

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How To Power-up

To turn-on the flight computer color display and variometer, press the button that has a raised ON/OFF icon. It is the only button with the unique raised marking.

How to Correctly Power-Down – IMPORTANT!

It is important to power-off the flight computer system properly. If you simply remove power, recent parameter changes may be lost and it is possible to mess-up the unit's operating system. Think of the unit like a PC. It is important to shut it down using software – not by suddenly removing power. There are several good ways to power-down the system.

- **Method 1**:
  Press the button with the ON/OFF icon for about 4 seconds. Be sure to release the button when the shut-down message appears.
- **Method 2:**
  Press any button and use the "MORE>>" button to find the "OFF" button. It may take several presses of the "MORE>>" buttons to find the OFF label. Press the button next to the "OFF" label. It will then display, "Do you really want to shutdown?" Press the "YES" button to shut down.
- **Method 3:**
  In the rare event that the unit is stuck or locked-up, you can force a shutdown by pressing and holding the OFF button for more than 8 seconds.

User-Interface – Quick Overview

- **Control Knobs**
  Note: When you purchase an LX9000, LX9050, or LX9070 system from Cumulus Soaring, Inc., I apply control knob labels to the face of the unit – making it easier to remember how to use the unit after periods of non-use.

VOLUME selector

MODE selector

Ambient light sensor

POWER button

LX9000

Filesystem
Loading ....

For VFR use only as an aid to prudent navigation. All information is presented for reference only. Terrain, airports and airspace data are provided only as an aid to situational awareness.
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SD Card reader

ZOOM selector

PAGE selector

- o **Top Left Knob: Volume**
  Subtle Tip: When you rotate the volume knob – note that a "VOLUMES" label appears over the bottom-right push-button. Press the button below or next-to the label and you will see sliders for Vario, Speech, Beep, Speed to Fly, and Radio. Rotate the bottom-right knob to highlight the desired slider. Then use the top-left knob to change the volume. It is easy to not notice the "VOLUMES" button. It is easy to use when you know it is available. It is very nice that you can set the vario and speed-to-fly (climb and cruise) volumes differently.
- o **Top Right Knob: Mode**
  Use the mode knob to move through the Near, Apt, Wpt, Tsk, Logbook/Statistics, Setup, and Info modes. I love that you can be navigating to 3 different points at the same time using the Apt, Wpt, and Task modes. I often have one going to the next task turnpoint, one going back to the previous turnpoint, and one going to the nearest landing point when low.
- o **Lower Right Knob: Page/Edit**
  Use this knob to move up and down through the screens in a particular mode, or up and down through the Setup menu, or through parameters in a settings screen. It is also used to change a parameter setting in small increments (one unit at a time).
- o **Lower Left Knob: Zoom/Backspace**
  This knob is mainly used to zoom in and out when viewing a map in the Apt, Wpt, or Tsk modes. It can also be used to change a parameter in large increments (10 or 100 units at a time). Another function it can do is move the cursor back when editing a text field – such as an airport name.

- **Buttons**
  - o LX8000, LX8080 and LX9050 units have 3 buttons above and below the screen when the screen is mounted in portrait (vertical) orientation. The buttons are on the sides when the LX9050 is mounted in landscape (horizontal) orientation. LX9000 and LX9070 units have 4 buttons above and below or to the sides of the display. Despite the different number of buttons, the units are all operated identically. To see what a particular button does, lightly touch the button and the

function label will appear above or below or next-to the button. The "MORE>>" button is used to access additional functions. You will use the "MORE>>" button more on units with groups of 3 buttons than you will need to on units with room for groups of 4 buttons, but that is not a problem. On older units, you need to press the button to get the button labels to appear. On newer units, you need to only gently touch the button to get the labels to appear.

Operating Modes
Rotate the top-right "Mode" knob to move through the operating modes. You can move in either direction and "wrap" around the ends.

Rotate the bottom-right "Page/Edit" knob to move up and down through the screens (pages) in a given mode. You can edit and add and delete screens using the "Layout" features on the unit, or using the LXStyler program on a PC.
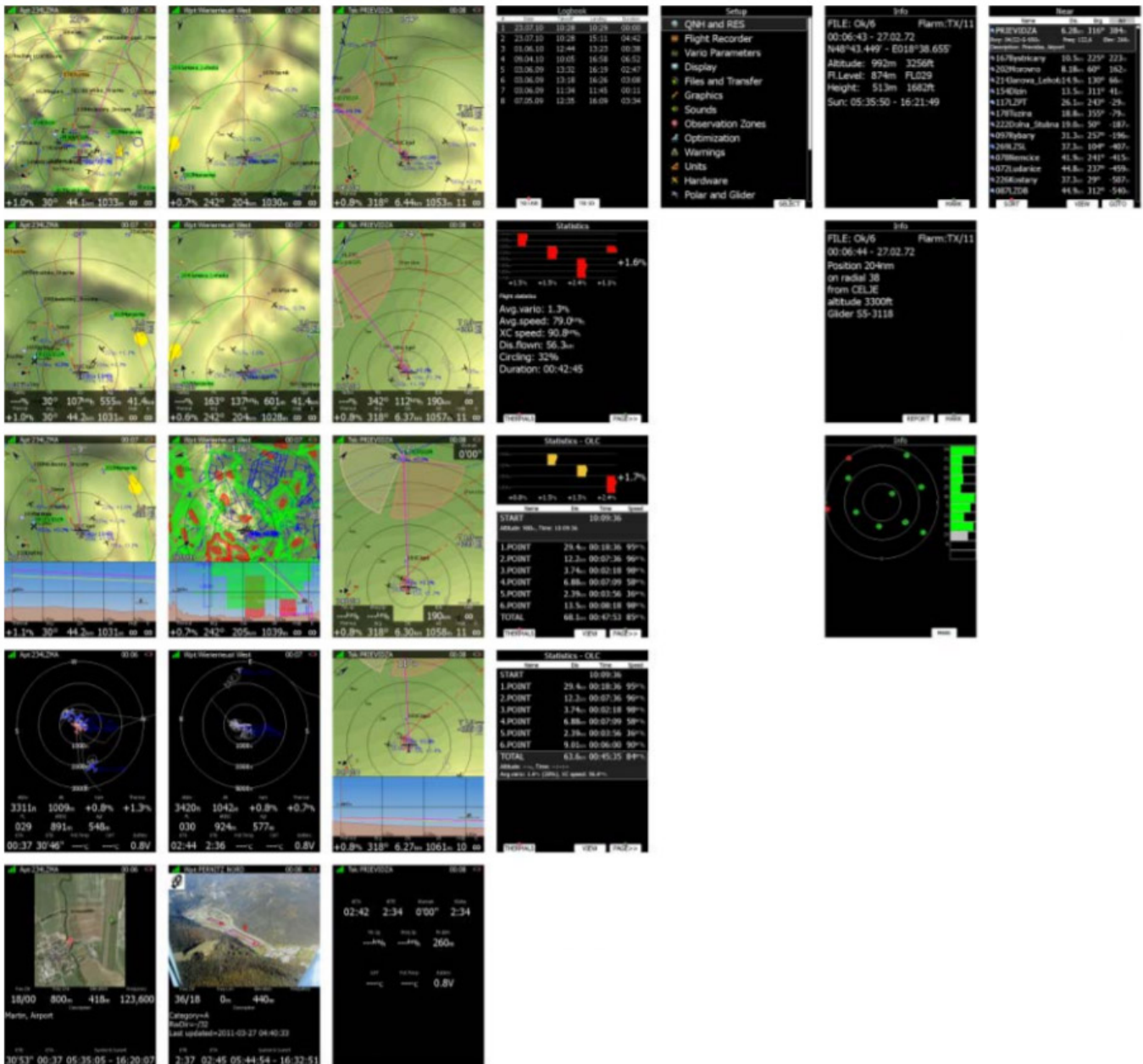
Mode Overview

- **Apt**

  The Airport mode is used to navigate either to airports from the built-in Airport database, or to navigate to any waypoint or airport selected using the Near mode – which is one click of the Mode knob to the left of the airport mode. I usually don't use the LXNAV supplied airport database. I use waypoint files that include all my task points as well as all airports in the region. So I use the Near mode to select an airport to navigate to on the Apt screen. I often use the Near and Apt modes when looking for a landing site when low. When using only a waypoint database (no Airport database selected), you can use the Apt mode exactly like the Wpt mode.

- **Wpt**

  The waypoint mode is used to navigate to waypoints in the turnpoint database. I often have my home airport selected in this mode. I use the Tsk mode to navigation through the points in the task and the Near and Apt modes to find landing sites when low. I love that it is easy to be navigating to 3 destinations (one each in Apt, Wpt, and Tsk modes) at the same time. You can switch between them very quickly using the top-right Mode knob.

- **Tsk**

  The task mode is used to navigate through the points in a task.

  Note: The final glide bars and arrival altitude displayed at the right side of the map show final glide all the way around the task to the finish point.
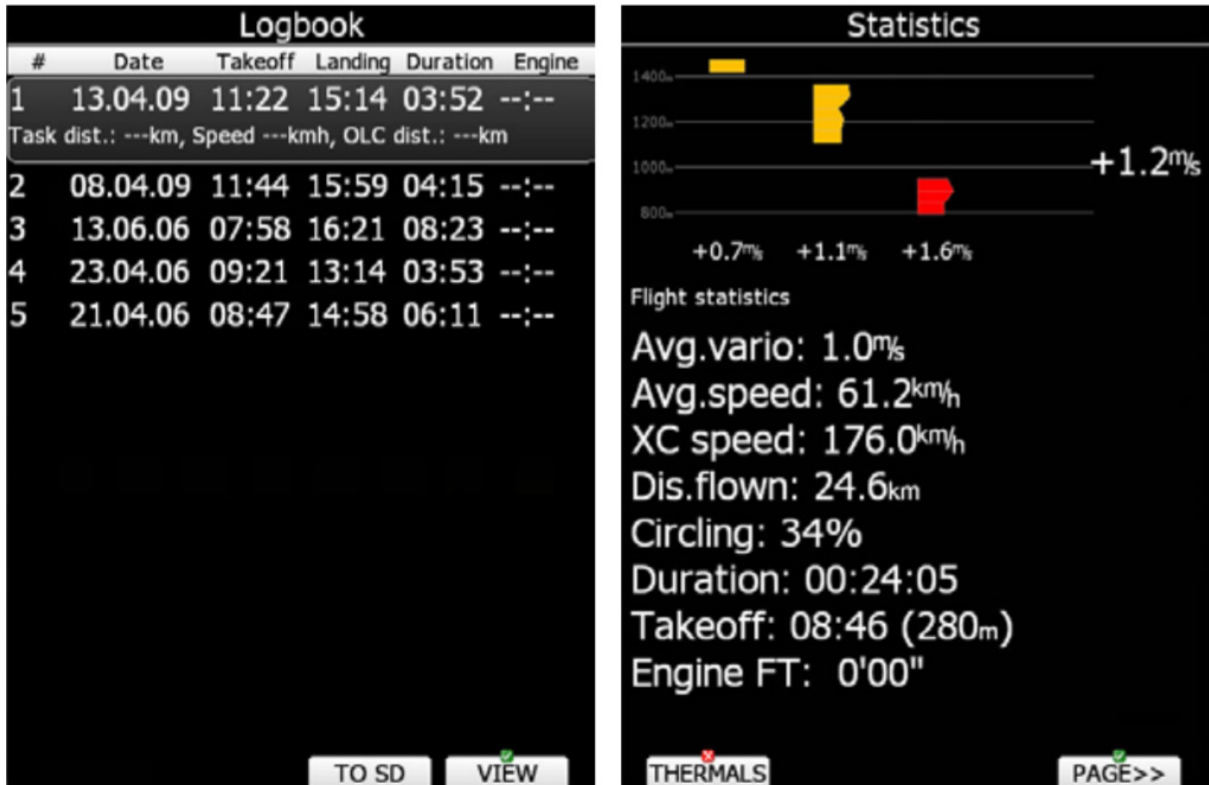
- **Logbook/Statistics**

  Logbook
  When on the ground, the mode to the right of the Tsk mode is the Logbook mode. It is used to view a list of past flights. The "SAVE" button is used to copy a particular flight log from the flight computer's internal memory to a SD or microSD card or USB flash drive. When using an optional WiFi module, you can email the flight log to yourself, or to the contest scorer, or upload it to the OLC or SeeYou Cloud. You can also use the VIEW button to view a map and barogram trace of the selected flight. It's great for reviewing your flight immediately after landing.

  Statistics – Thermal History Bar Graph
  When flying, the mode to the right of the Tsk mode is the Statistics screen. The tops of the screen features the thermal history bar graphs. The overall thermal average is shown at the right and the most recent thermal climbs are shown with thermal average climb rates. The graph shows clearly at what altitude each thermal was entered (bottom of bar) and exited (top of bar). The width of the bar indicates the climb rate. A bar that is wide at the top would indicate a fast climb near cloudbase. The bars are colored relative to the MacCready setting.

  Statistics – Flight Data
  The bottom portion of the Statistics mode shows numeric statistics. It is important to note that the PAGE button can be used to select from data from the entire flight, or the last 60 minutes, or the task so far, etc. I suspect that some pilots never notice that the PAGE button can be used to select from different data sets.

Logbook

#	Date	Takeoff	Landing	Duration	Engine
1	13.04.09	11:22	15:14	03:52	--:--
	Task dist.: ---km, Speed ---kmh, OLC dist.: ---km				
2	08.04.09	11:44	15:59	04:15	--:--
3	13.06.06	07:58	16:21	08:23	--:--
4	23.04.06	09:21	13:14	03:53	--:--
5	21.04.06	08:47	14:58	06:11	--:--

TO SD   VIEW

Statistics

+1.2m/s

+0.7m/s   +1.1m/s   +1.6m/s

Flight statistics

Avg.vario: 1.0m/s
Avg.speed: 61.2km/h
XC speed: 176.0km/h
Dis.flown: 24.6km
Circling: 34%
Duration: 00:24:05
Takeoff: 08:46 (280m)
Engine FT: 0'00"

THERMALS   PAGE>>

- **Setup**
  The Setup mode contains the menus for accessing the settings of the flight computer. Use the lower-right knob to move through the setup menu list. Use the SELECT button to go into the desired settings screen. On newer instruments, you can press/click the lower-right knob in to select something.

- **Info**
  The Info mode displays numeric data such as the GPS coordinates (great for land-outs), date, time, altitude, flight level, sunrise and sunset times, etc. It also includes a stopwatch that can be started, stopped, and reset using a button on the screen.

- **Near**
  Select a nearby airport or landing site or turnpoint. Rotate the bottom-right knob to move up and down through the list. Use the "SORT" button to sort the points by Name, Distance, Bearing, or Arrival Altitude (my favorite). The "VIEW" button is used to select the amount of information to display for the selected point. When you press "GOTO", the display jumps to the Apt mode and starts navigating to the selected point. The Near mode is extremely handy when low and looking for a nearby landing site.

Map Overview
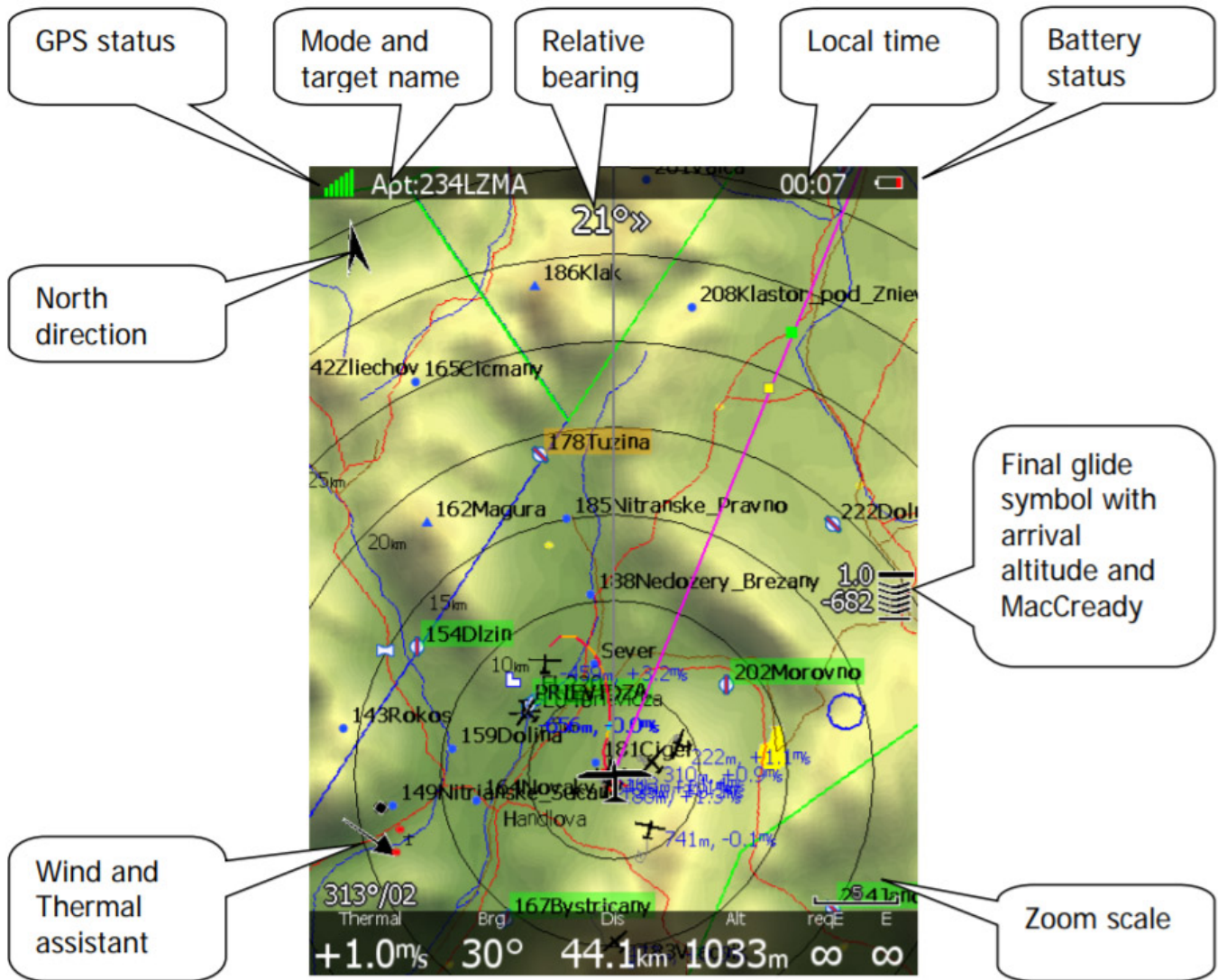
Selecting a Destination in the Apt or Wpt Modes

To select an airport to navigate to in the Apt mode, you can use the Near mode (the mode immediately to the left of the Apt mode).

Alternatively, in either the Apt or Wpt modes, press the "Select" button. Then you can use the "SORT" button to sort the airport list by name, distance, bearing, or arrival altitude (my favorite).

Or you can use the "METHOD" button to select "FILTER" and start using the lower-right knob to select the first characters of the desired target's name. The "CHAR" button is used to move to the next character. The lower-left knob can be used to back-up. You usually don't need to enter many characters before the list of targets is "filtered"-down to a very short list. Hit the "GOTO" button when you are close enough, and then use the lower-right knob to move to the desired target in the list. Then hit "GOTO" again.

I tend to use the "LIST" method most often – sorted by arrival altitude. I use the "FILTER" method when I want to select a target that is farther away.

Setting MacCready, Bugs and Ballast

Final Glide Symbol

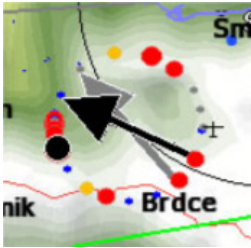**Creating a Turn Area Task and Editing the Task Time**

Creating a Task in the Task Mode

Copying a Flight Log to a Memory Card After the Flight

Selecting a Waypoint File (loading from a memory card to internal memory first)

Selecting a Predefined task from a .cup Turnpoint and Task File

Thermal Assistant Overview

The Thermal Assistant appears as a small icon on the lower-left corner of the moving map screen. It can also be displayed on the variometer. I made it larger on my LX9000 by going to "LAYOUT" (use the MORE button to get to that option on any screen). I describe the on-unit editing of screens in layout mode below. Note that the black arrow is the wind indicator. It is **not** pointing the best side of the thermal. The black dot is the spot with the best lift. The glider is a very small icon on either the left (turning right) or right (turning left) side of the Thermal Assistant icon. Think of it as if the glider is standing still and the thermal is rotating around to meet the glider. When the black dot is coming around in front of the glider, you may want to level the wings for a second or 2 – or do whatever is necessary to move the glider to better use the lift of that side of the circle. I use a mental picture of which side of the circle has the best lift and move the glider to it. The colored dots are larger in stronger lift and colored to indicate whether the lift is more or less than your current MacCready setting. Large red dots indicate the best lift.

From the manual:

> The thermal assistant continuously analyses the thermal whilst circling. The sizes of the dots indicate the strength of the thermal. Big dots mean stronger lift at that point. On the left or right side of the circle a small airplane symbol is shown. This airplane indicates your position. A black dot indicates the thermal maximum. The pilot should extend the circle when the black dot is about 60° away from glider. This value varies and depends on the turn rate of the glider and type of thermal. All other dots are coloured based on the MacCready setting. Red colour means values above MacCready, blue values below MacCready and yellow dots represents lift about the same strength as the MacCready setting.
> This colour scheme gives us hints about a thermal at glance. If most of dots are red we should consider increasing the MacCready value; if most of dots are blue we should consider decreasing the MacCready setting.

Updating the Airspace

Loading a FlarmNet File

Loading and Displaying U.S. Sectional Charts

Updating System Software

Setting-Up the Display of Arrival Altitudes next to Landable Points on the Map

Editing Airspace Display Settings if not visible at some zoom levels

Entering Pilot Name and Glider Information In the Flight Recorder screen

Enabling a Glide Range Area (Glide Range Amoeba)

Using OLC Turn Areas

Creating and Using Checklists

Working with Profiles
Profiles are files that are used to store user settings such as units, polars, waypoint files, arrival altitude, etc. You select the profile at start-up.

- **Single User**
  If you are the only person using the system, I recommend using only a single profile. You could use different profiles for different wing spans, different gliderports, etc. However, I find it easier to use a single profile and change only the active waypoint file or glider polar. I am continually tweaking the settings, if I were to use multiple profiles, I'd need to adjust the settings in every profile file – which would be difficult to do. I sometime receive calls from frustrated customers who were certain they made changes, but the changes were lost. I suspect that they were using multiple profiles and the changes were saved in a different profile.

- **Multiple Users (syndicate)**
  I fly a 2-seat glider that has 3 owners. We each use our own profile files. At power-up, I select my profile and have asked the other owners not to use my profile. I don't want them to make changes to my profile. They have respected that. It works well for us. I don't think that would work well in a soaring club with dozens of members using the same LX80x0 or LX90x0. I'd be worried that someone would accidentally change all the settings in my profile – which would be frustrating when I go flying.

- **Locking a Profile**
  It is possible to "Lock" a given profile – so that changes will not be saved. For example, if you change the distance units from mi to nm, the change would be lost when the unit was powered-down. At power-up the unit would go back to the previous settings. I don't find that very useful because it would be easy to forget that you have the profile locked and be confused and frustrated when changes were lost after power-down.

- **Admin Mode**
  Another option for protecting the settings in every profile, is Admin Mode. To enable admin mode, go to Setup, Admin Mode. You enter a password (twice) and then you can select which parameters will be editable. This might be useful in a club setting – but it

doesn't allow each profile to be protected – every profile is secured. I don't think I would find that useful in a club setting.

- **Recommendation for Club Use**
  If I were going to setup an LX80x0 or LX90x0 for use in a soaring club environment, I would create a "default" profile for everyone else to use. I'd then create a copy of that profile and name it "Paul Remde". When done getting it just right, I'd save it to my memory card. Then my settings would always be protected and ready for me to use whenever I fly that glider. I would bring the SD or microSD card with me and plug it into the LX80x0 or LX90x0 and go to the Setup, Profiles and Pilots screen. I'd then see a list of profiles. The ones at the top of the screen are in the unit's internal memory. The ones below the "Files on SD" line are saved in the memory card. I'd select the profile in the memory card. I'd probably copy my profile to internal memory using the "LOAD" button. That way others could create new profiles using mine as the starting point.

Editing Screens On the Unit

Editing Screens using the LXNAV Styler PC Program

Understanding the AAT Assistant

USA Airport Data
There are 3 very nice **free** sources for U.S. airport data. Both can provide .cup waypoint files for SeeYou.

- **Worldwide Soaring Turnpoint Exchange**
  The Worldwide Soaring Turnpoint Exchange is an amazing **free** resource by John Leibacher. It includes a great airport file which includes all the public and private airports in the USA. The data comes from files provided by the F.A.A. and the data is very accurate and current. You can access the data file here:
  http://soaringweb.org/TP/FAA/
  To open the airport data file follow the steps below.
    o Right-click on the left most icon for the SeeYou data and select "Save Target As..." from the pop-up menu.
    o Save the file on your computer. I save all my waypoint files in the "My Documents/Waypoints" directory.

- **Cumulus Soaring, Inc.**
  http://cumulus-soaring.com/seeyou.htm#Downloads
  I have taken the FAA data from John Leibacher's site and separated it into 3 files for the Western, Central and Eastern USA – with a fair amount of overlap. The files work great in the LX80x0 and LX90x0 soaring flight computers and in SeeYou and SeeYou Mobile and in LXNAV Nano3 and Nano4 GPS flight recorders.

- **SoaringData.info**
  http://www.soaringdata.info/

Click on the "this link" link in the Airport Information area.
Soaringdata.info is a great **free** source for current U.S. airspace and airport data created by Lynn Alley. The site can be used to generate and download airport files for the entire U.S. or for specified regions. I normally generate a file for the entire USA by specifying that I want the 15000 nearest airports. To force the web site to put airport identifiers into the "Code" field in the SeeYou .cup waypoint file, select "Code" for the "Short Name Length".

To use the .cup waypoint files from any source in SeeYou for PC:

- Open the file in SeeYou using the File menu and selecting Open.

Settings I do Before Shipping a New System – or before first flight
- **Setup, Units**
- **Setup, Units, UTC Time Offset**

Creating a polar for your glider

The LX80x0 and LX90x0 have dozens of glider polars pre-installed. However, polars are not available for every glider type. To create a polar for your glider:

- In SeeYou on the PC, go to the Tools > Polars screen and enter 3 airspeeds and sink rates for your glider. Note: You can enter the units with each number you enter. SeeYou will display 3 coefficients that represent the polar for your glider.
- Enter the 3 coefficients into the LX80x0 or LX90x0 soaring flight computer in the Setup > Polar and Glider screen.

Paul Remde's Polars Web Page

Another great tool for creating and tweaking sailplane polars is the Paul Remde's Polar Data web site. It includes polar data for many sailplane types along with the Remde_Polar_Analysis.xlsx Excel spreadsheet. Excel users will find it extremely useful.
http://cumulus-soaring.com/polars.htm

Polar data only applies to a given wing loading and therefore weight of a glider. Changes to the weight will change the airspeed numbers as well. Your glide computer would not work properly if you simply adjust the weight amount to that of your glider. The Remde_Polar_Analysis.xlsx spreadsheet can be used to adjust the polar speed numbers due to differences in weight in your glider compared to the glider used to measure the polar. The dry all up weight in the polars table on that web page should be the weight at which the polar data was measured. It should not be the weight of your particular glider. The spreadsheets can be used to calculate the airspeed numbers for your glider at its current weight including pilot(s) and parachute(s).

Please let me know if you have any other tips or setup procedure items that I should add to this document.

Good Soaring,

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