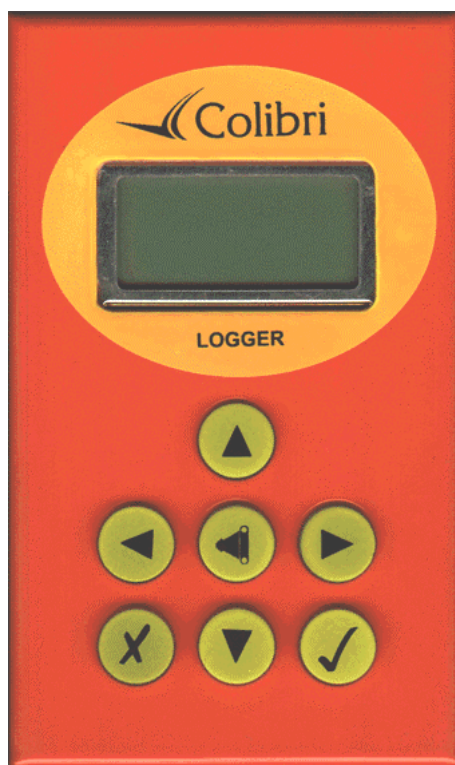


Colibri

FAI DATA LOGGER



Please read this manual before operating the unit

Version 1.0

May 1999

CONTENTS

1.	GENERAL DATA	3
2.	CONTROL KEYS	3
3.	GPS STATUS MENU	4
4.	NAVIGATION MENU	5
	4.1. ENTERING A NEW TURNPOINT	6
	4.2. EDITING TURNPOINT DATA	6
	4.3. DELETING A TURNPOINT	7
	4.4. EDITING A TASK	7
	4.5. THE EVENT BUTTON	8
5.	SETUP MENU	8
	5.1. LOGGER SETUP	8
	5.2. TIME ZONE	11
	5.3. UNITS SETUP	11
	5.4. NMEA OUTPUT	11
	5.5. COMMUNICATION SPEED	11
	5.6. PASSWORD	11
6.	VIEW LOGGER	11
7.	PRE-FLIGHT PROCEDURES	13
8.	PC CONNECTION	14
9.	WIRING DETAILS AND POWER CONNECTIONS	15
10.	ADDITIONAL INFORMATION	15
11.	IMPORTANT NOTES.....	16
12.	GLOSSARY	16
13.	APPENDIX	17

1. GENERAL INFORMATION:

Thankyou for purchasing the LX Colibri Data Logger. You will find the unit an accurate, reliable and a valuable aid to your gliding pursuits. The LX Colibri Logger is an FAI approved flight logger/recorder. The unit is extremely small and practical (55x100x32mm). The Colibri is operated via seven keys identified by symbols. All the data and flight information is displayed on a 2x8 character LCD matrix display. A BNC connector is used to connect the GPS antenna to the unit. The instrument is turned on by inserting the power lead (telephone type connector) into the appropriate socket on the Colibri.

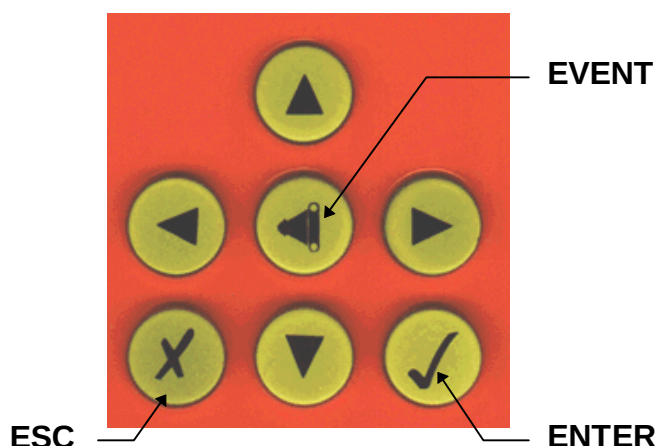
Technical data:

- Power Supply.....	10-24 V DC
- Current consumption.....	100 mA / 12 V
- 11 channel GPS receiver	
- NMEA output	
- Dimensions.....	55x100x32mm
- Weight.....	220 g
- Engine noise sensor is standard equipment	
- Zoom feature	
- Data Retention.....	Internal Lithium Battery

2. CONTROL KEYS

All necessary data input and manipulation can be done using the seven keys as shown below:

- DOWN arrow
- UP arrow
- RIGHT arrow
- LEFT arrow
- ENTER
- ESCAPE
- EVENT



The unit has four main menus. On power up the GPS STATUS page is displayed. Pressing consecutively the right arrow key displays the NAVIGATION page, then the SETUP menu and finally the VIEW LOGGER menu. Pressing the left arrow returns to the previous menu.

When power is applied the Colibri will display the program version followed by the serial number of the unit and the owner/pilots name for 20 seconds.

GPS STATUS menu - After the initial start up procedure the logger automatically switches to this menu and commences acquiring satellite fixes. If the aerial is not connected or the aerial is covered by obstacles, such as buildings, then GPS BAD, SAT = 0 will be displayed. Satellite acquisition time from a cold start is under 60 seconds. A warm start is typically 30-seconds.

NAVIGATION menu – From the GPS STATUS menu pressing the right arrow brings up the NAVIGATION menu screen. This shows bearing, track, distance and the first four letters of the selected turnpoint. Pressing ESCAPE will cause the glider's ground speed to be displayed **in place of** the turnpoint's name. Turnpoints, which are stored in the database can be selected and also edited as required from this screen. Pressing the right arrow again takes you to the;

SETUP menu- This page is not used during flight. It is normally used prior to the flight to define the logger and task parameters. All pilot and glider data are defined in this menu. From this menu pressing the LEFT arrow will return to the Navigation screen or the RIGHT arrow will lead to the VIEW LOGGER menu.

VIEW LOGGER menu – This is selected for flight analysis after landing. Flights made with the logger are stored in the unit (up to 100hrs depending on logging parameters) and the **information is retained even when the power is switched off**. Flights can be analysed via the Colibri's screen (after landing) without the need to transfer flight data to a PC. This menu will not be displayed if there are no flights stored in the logger.

All four main menus have **sub-menus** . To enter a sub menu use the **vertical arrows**. A detailed description of the sub-menus is contained further on in the manual. It is recommended you read this manual whilst referring to the menu structure diagram at the back of this manual.

The **ENTER** key always starts the edit procedure and confirms options selected or the data entered.

The **ESCAPE** key has two functions; go back a step in the menu and to accept the whole row in the editing procedure. Also the **ESCAPE** key cycles between the three navigation screens in the navigation menu. **During flight** this key starts the wind calculation procedure when pressed in the navigation page.

3. GPS STATUS menu

This menu is active after the instrument is switched on. There is **no edit** function, as this menu contains no user definable data. This means the data can only be read from the display. By using the UP and DOWN arrows the following pages of the GPS STATUS menu are displayed:

GPS OK
SAT=6

GPS status and number of satellites acquired

LAT N 45
00.12

LON E016
45.15

Coordinates of your current position

ALTITUDE
230m

Altitude referenced to the ISA 1013 Hpa pressure level

12:13:44
12.05.98

Current Time/Date

BAT=12.1
DOP =3.3

Battery voltage and DOP (Dilution of Position. Which is a measure of the accuracy of the GPS position. The lower the number the better)

LOG:STOP
Mem89.6h

Recording status; STOP or RUN is displayed and the Logger Recording Capacity in hours.
Do not switch off the logger at the end of a flight until LOG:STOP is displayed.

NOTE: The logger capacity figure displayed on the above screen doesn't indicate the remaining portion of unused_memory ! It displays the **total memory** available for flight recording, which depends upon the logging time interval and additional data options selected for recording. **As old data is automatically overwritten by new data** (ie. the current flight) you **don't** need to clear the memory prior to flight. Hence, after a flight you will find the logger memory number displayed has remained unchanged. However, changing the recording interval or selecting additional data recording options (see section 5.1.d of the manual) will change the amount of memory available and change the value displayed.

4.0 NAVIGATION MENU

This menu allows in-flight navigation to the selected turnpoint and also editing of the turnpoint data. A typical navigation screen looks like this.

123t CUND
126b235km

123° is track, **126°** bearing, **235km** is the distance to the TP and **CUND** is the first four letters of the turnpoint (designator). The Colibri counts down the distance to a TP in 1km increments, except when the glider enters the radius around the TP that is set in the Logger Setup menu (see 5.1). Then the Colibri displays the distance to the TP in 100 metre increments. This is very useful for competition as you approach the turnpoint and often lose sight of it under the nose of the aircraft.

Once you have rounded a turnpoint the next turnpoint can be selected by simply using the vertical arrows. After a short press of the UP or DOWN arrow a new turnpoint, which follows the old one alphabetically, will be displayed. For approximately 1 second the turnpoint designation is shown in 8-character form to confirm your selection. The internal database has a capacity for up to 600 turnpoints. To make your TP selection quicker there are special algorithms which allow you to jump over TP's. After the 'UP' or 'DOWN' arrow is pressed and held down, the Colibri jumps through the TP database in larger increments. Once the required TP is reached release the key and that TP will automatically be entered for navigation purposes and the display will update bearing, track, TP name and distance to go.

Pressing the **ESCAPE** key in this screen will cause the four-letter TP designator to be replaced by a display of the aircraft's ground speed. Press the **ESCAPE** button again and the wind calculation procedure is started. Wind speed and direction will be displayed as follows.

098°
25kph

The method of wind calculation is based on ground speed changes caused by wind effects during circling (thermalling). To calculate the wind reading the Colibri requires two circles of the aircraft (constant speed and no pilot induced change of position).

Pressing **ENTER** from any of the pages in the **NAVIGATION** menu will select the Turnpoint menu. Which allows editing of turnpoint data and also task editing. The following screen will appear:

TP
MENU

After using the 'DOWN' arrow, four sub menus will appear. Using the UP arrow reverses the order of menu display.

NEW
TPOINT

EDIT
TPOINT

DELETE
TPOINT

EDIT
TASK

4.1.a ENTERING A NEW TURNPOINT- from the airport data base. The APT Database is not available for Australia as yet.

NEW TPOINT	after ENTER	Copy APT data? N
-----------------------	-------------	-----------------------------

After the 'yes' option is selected, use the DOWN arrow until 'Y' is displayed, then press Enter. The copying procedure will follow. The Colibri has its own airport database and additional turnpoints can be copied from this database. Replace the four stars with ICAO airport code (up /down arrows and Enter).

APT ****

APT EDDM MUNICH

Confirm by pressing 'Enter' and a new turnpoint will be added to the TP database for further use. By unknown ICAO code press simple Escape select and select country.

APT **** GERMANY

Replace the four stars with the first four letters of the airport's name. You can enter less letters, say the first letter only, then press ESCAPE. Now the display will jump to the first airport whose name starts with that letter (use the UP or DOWN arrows to make your selection).

APT **** MUEN _

Confirmation all four stars with Escape will show you all airports of the selected country (or State.)

Data OK ? Y

After Y and Enter the airfield will be definitively copied

4.1.b ENTERING a NEW TURNPOINT - by input of the coordinates - select 'N' from the Copy APT menu .

NAME XXXXXXXX

Input a maximum of 8 Characters for the turnpoint's name. After input of all the characters, the following message appears.

Data OK? N

Select 'Y' using the UP or Down arrows if the data is correct. The same procedure is used to enter the coordinates of the turnpoint, that is the latitude and longitude of the turnpoint. After all necessary data has been entered the '**Data OK? N**' message will appear. After selecting 'Y' by pressing the UP or DOWN arrow, this turnpoint is added to the TP database. If you select 'N' the data can be corrected.

4.2 EDITING TURNPOINT

Select EDIT TPOINT and press ENTER

EDIT TPOINT

TP NAME:

Select the TP using the well known method of entering the first four letters of the TP name and change the data as required or you can cycle alphabetically using the UP or DOWN keys by entering just the first letter of the TP.

4.3 DELETING TURNPOINT

Select the TP and confirm the delete procedure with 'Y'.

4.4 EDITING A TASK

The Colibri logger has enough memory to store 100 Tasks. One of these Tasks could be selected and declared as an FAI Task (see SETUP LOGGER). This task has no relation or effect on the **NAVIGATION** screen. Navigation data is selected using the turning points from the **NAVIGATION** menu (screen). Selection of turnpoints during a flight is not automatic. The pilot must select the required TP for navigation purposes from the Navigation screen. Finally, it is much easier to edit an existing task than to create a new task when using the Colibri's keypad. Tasks can be easily programmed using a PC.

After pressing the Enter key two different screens could appear, depending upon whether there are any programmed tasks in the logger's library or not.

TSK93
NOT PROG

or for a pre-programmed task.

TSK01
4pt 155km

With programmed tasks, the display reads the task number, the number of turnpoints in the task, and the distance of the task. Pressing ENTER from the EDIT TASK menu will bring up a programmed task. The UP or DOWN arrows will cycle numerically through the task library. When you have reached the task required, press ENTER. This brings up the first TP, number 0. Use the UP or DOWN arrows to cycle through the task, when you have reached the TP you want to edit press ENTER, you will then be given three options;

INSERT TPOINT

DELETE TPOINT

SELECT TPOINT.

If you select the INSERT TPOINT or SELECT TPOINT option, the turnpoint database comes up and the required turnpoint can be selected from the Colibri's TP database as mentioned previously. DELETE TPOINT obviously removes that turnpoint from the task. To program a task that is not programmed in memory(ie. 'NOT PROG' is displayed), use the following procedure.

TSK 99
NOT PROG

ENTER

0:NOTPRG
-----km

ENTER

TP NAME:

select

TP NAME:
AACHEN-D

ENTER

0:AACHEN
---- -----km

The first turnpoint is called TPOINT 0, and it is actually the **start point**, this is selected. For the next TP press the DOWN arrow once and ENTER. This brings up the TP database. The next TP is selected by using the UP or DOWN keys, press ENTER to make your selection.

1:AJDOV
131 782km

The same procedure is used for all turnpoints and the finish point is the **last** TP. The whole 'task edit' procedure is completed by pressing the 'ESCAPE' key. Tasks can be prepared and edited on a PC and transferred to the Colibri via its PC link cable. This procedure is much easier and quicker than using the Colibri's keypad.

Tasks can be edited **in-flight** if required for competitions (eg POST tasks, etc). However, please familiarise yourself with task editing outside of the glider. It does take a little practice and when flying you must keep a good look outside the cockpit for other aircraft! Note, the Colibri **will not 'beep'** when rounding a turnpoint (ie when the glider enters the cylinder or photo sector) **if a task has not been declared**. Of course the turnpoint rounded must correspond to the declared task. You can fly a task without declaring it. Flight recording **will still occur** and subsequent flight analysis on a PC is available. However, the rounding of a turnpoint will have to be determined by the pilot (no audible confirmation will be given ie. 'beep').

4.5 EVENT BUTTON

This special key has two functions during the flight. A quick press will activate the event function which changes the sampling rate interval briefly as defined in the Logger Setup menu. After a longer press of the event button the following will appear on the display:

TP-QUICK
AP: 19:43

'AP' stands for actual position, and means your current position is stored as a turnpoint with the following name 'AP:19:43'. 19:43 is the time you marked the position, which allows you to distinguish several EVENT marked positions from one another in the TP database. The names of these 'AP' turnpoints can be changed using the edit function if required. This feature can be used to mark thermals, an outlanded glider (hopefully as you fly over it!) etc. As the marked position is stored in the turnpoint database, you can select one of the marked points in the NAVIGATION screen and fly to it later if required.

5.0 SETUP MENU

All the important logger parameters are defined in this menu.

SETUP
MENU

Using the vertical arrows the following sub menus can be selected.

LOGGER
SETUP

TIME
ZONE

UNITS
SETUP

NMEA
OUTPUT

COM
SPEED

PASSWORD

5.1 LOGGER SETUP

All important logger parameters are defined in this menu. After pressing ENTER the following settings can be altered.

NORMAL:
12s

After pressing 'ENTER' the cursor is activated, the recording (logging) interval is set . Shorter recording intervals reduce recording memory. This is shown in the GPS STATUS menu.

NEAR TP:
2s

This sets the recording (logging) interval which is used as the glider nears the **Turnpoint**.

NEAR RAD: 1.0km	Inside this radius around the TP, the logging interval (as set above) is used. Radius can be from 0.1 – 2 km. Also Colibri will beep when the aircraft flies inside this radius, hence TP confirmation dimensions can be set by the user.
PEV INT: 2s	This setting defines the logging interval which is used after the EVENT key is pressed.
PEV FIX: 30.	This determines the number of fixes stored after the EVENT key is pressed.

For example: If PEV INT 2s, PEV FIX 30 is set, then after the EVENT key is pressed 30 fixes, 2-seconds apart will be recorded.

K Record this setting is not active on this model.

5.1.a DECLARED TASK

This a very **important setting**. The task which will be flown must be declared before the flight. A flight without the proper declaration can not be evaluated as a badge or record flight. However full flight recording and analysis functions (via a PC) are still available after the flight even if a task is not declared. After ENTER is pressed from the DECLARED TASK menu, the following submenus are available.



Selecting the COPY TASK option allows you to select from one of the 100 pre-programmed tasks in the Colibri's database. DELETE TASK clears the previously declared task, and the EDIT TASK option is used to change a pre-programmed task (ie add or delete a TP) or to set up a completely new task.

An FAI task has the following structure:

TAKE OFF

START

TURNING POINTS

FINISH

LANDING

Example: The declaration of a completely new task using the EDIT TASK function.

After selecting the DECLARED TASK menu and ENTER, select **EDIT TASK** and press ENTER.



Selection of a turnpoint is done by replacing the stars with the letters or numbers corresponding to that TP. After the Take-Off point is selected continue the procedure using the INSERT option to define the Start Point. The same procedure is used for all the turnpoints of the task. Landing Point is automatically set to the Take-Off point and the **last turnpoint before landing is the Finish (F) Point**. To change the landing point to another turnpoint use the selection options. By using the UP and DOWN arrows the pilot is able to check his task before leaving the declaration process.

IMPORTANT - The declaration procedure is completed by pressing the **ESCAPE** key.

The **COPY TASK** procedure copies one of the tasks from the database (see 4.4). The required task is selected using the arrow keys. When using this method the take off and start positions are always the same points, as are the landing and finish points. After the task is copied a normal edit procedure can be used to modify it if required. All this data can be transferred to the Colibri before flight via a PC running the LXFAL program.

5.1.b TPOINT ZONE

This allows the pilot to select the appropriate turnpoint 'rounding' confirmation method required. Two options are available; FAI **photo-sector or cylinder**. With the cylinder confirmation option, the radius set in LOGGER SETUP-NEAR RAD(see section 5.1) defines the cylinder's dimensions. An acoustic signal (beep) will be activated when the aircraft enters this cylinder to alert the pilot. This is very useful for competition, which currently allows cylinder turnpoint confirmation. The pilot simply flies directly to the TP, when the alarm sounds (Colibri beeps), entry into the cylinder and hence rounding of the TP is confirmed. The pilot then makes track for the next TP on task. By selecting the photo-sector option, the acoustic signal will be activated when the aircraft enters the photo sector. **Competition pilots** must determine, from the organisers, what turnpoint confirmation method is to be used for the particular competition entered and ensure the Colibri is set up appropriately.

5.1.c TPOINT BEEP

To adjust the acoustic signal of the turnpoint confirmation BEEP, two parameters, the INTERVAL (time between beeps) and PERIOD (duration) can be adjusted by the pilot. After adjusting the parameters mentioned, selecting the BEEP TEST option will activate the alarm enabling you to check the settings.

5.1.d I-RECORD DATA

Additional data recording options are available with the Colibri if required. This menu extends logging data if the yes 'Y' option is selected. These settings are not essential for flight recording but if used they **will** reduce the memory capacity available for flight recording. The memory available for flight recording will be displayed on the GPS STATUS menu screen after selecting the options required. See section 3.

GSP	ground speed
TRM	magnetic track
TRT	true track
TEN	total energy
WDI	wind direction
WVE	wind velocity

5.1.e J-RECORD

The 'J-Record' has the same optional settings as the 'I-Record' and again are non-essential. It will reduce the memory capacity available if used.

5.1.f FLIGHT INFO

Information about the pilot, glider and observer are entered using this menu. This can be done on a PC.

PILOT: -	Pilot's name
GLIDER: -	aircraft type, eg Nimbus 3
REG.NUM: -	Registration number of the aircraft
CMP.NUM: -	Competition number
CMP.CLS: -	Competition class
OBSERVER: -	Name of official observer

5.2 TIME ZONE

The Universal Time (Greenwich Mean Time-GMT) to local time offset is entered in this menu. For Eastern Standard Time in Australia the offset is +10hrs (+11hrs during daylight saving).

5.3 UNITS SETUP

The preferred units of distance, height and speed are selected in this menu.

5.4 NMEA OUTPUT

The Colibri can transmit GPS data to a final glide/flight computer or palmtop computer via the NMEA 0183 protocol. Obviously the flight computer must have the facility to accept GPS input. The NMEA output data strings transmitted by the Colibri are selected in this menu. The sentences you select for transmission will depend upon the requirements of your flight computer, and you are referred to your flight computer's manual for guidance. The wiring details for NMEA output are contained at the end of this manual. Pay particular attention to the wiring details when making this connection yourself. You will have to connect the appropriate plug for the flight computer to the Colibri's power cable. Your dealer can help you with this. If you do not connect the Colibri to a flight computer then you can ignore this menu.

5.5 COMM SPEED

The baud rate or communication speed with which the Colibri sends and receives data is set in this menu. For reliable and fast transfer of data to and from your PC set this speed to 19200. Your final glide/flight computer may require a different communication speed to this. You will need to set the appropriate COMM SPEED prior to flight. For example the Cambridge LNAV requires a 4800 baud rate.

5.6 PASSWORD

A password security system can be set up on the Colibri if desired, although for general use it is not recommended. Setting the password to 99999 in this menu **clears all the flight recorded data** in the Colibri's memory.

6.0 VIEW LOGGER

All flights stored in the instrument can be evaluated using this menu. Downloading flight data to a PC will **not** delete the flight from memory. If the memory is full, the oldest flights will be lost, that means an automatic overwrite procedure is used. Hence you will **never** run out of memory for the flight in progress. Only entering 99999 in the Password menu will delete all flights stored in the Colibri's memory. To evaluate a particular flight in the memory, select the **VIEW LOGGER** menu: Note, this menu will not be accessible if there are no flights stored in the logger.

**VIEW
LOGGER**

Press ENTER. You are able to observe all flights stored in memory. Use 'DOWN' arrow to cycle through the flights

**Flt.: 2
30.07.98**

Eg. This is the second flight recorded and was flown on 30.07.98. Press ENTER and the statistics will be displayed

TAKE OFF
12:33:55

LANDING
15:45:11

DURATION
03:12:00

DATE
30.07.98

If the flight was not declared this ends the display flight statistics by the Colibri

TASK
STAT.

Pressing ENTER in this page will start the task statistics calculation (If task was declared)

WAIT
23%

Colibri calculates flight statistics for the declared task. Time to complete the job depends upon flight length

TSK.dist
530 .5 km

Task distance

FINISH !
v= 88.1 k/h

Task finished successfully, task average speed = 88.1km/h

Vario :
1.3m/s 22%

Vario average, percentage of time spent climbing

Track d.
580,6 km

Flown Distance

To start the leg statistics press the right arrow.

Leg 1 / 2
56.7 km

Using the down arrow more information is displayed

From:
CELJE AD

500m
12:33:55

To:
BRIDGE

500m
17:14.22

Duration:
2:44:45

Speed
78.5 kh

XC speed
79.8 kh

XC speed means the hypothetical maximum speed achievable between the turning points.

Vario:
4.5 m/s 18%

Average climb rate and percentage of time spent climbing

Track d.
79km

Flown distance

Using the right arrow will allow the next leg of the task to be evaluated. Note, comprehensive flight statistics will only be displayed by the **Colibri** if the task was declared before flight and actually flown as declared. If the flight was not declared then comprehensive flight statistics can only be viewed after downloading the flight data to a PC and entering the actual task flown using the PC's turnpoint database. For a non-declared flight only the take-off time, landing time, flight duration, and date of the flight will be displayed on the Colibri's screen.

7. PRE-FLIGHT PROCEDURES

The Colibri is ready to be used as a flight recorder as soon as the **GPS OK** message appears. For flight data logging only, it is not necessary to declare a task. With flights for badges and records it is essential to declare the task, and enter the pilot information etc. in the SETUP menu before take off.

The procedure is as follows:

1. Define cylinder or photo sector for turnpoint rounding confirmation.
2. Declare the task on the ground
3. Switch the Colibri ON approx. 5 minutes before take off (this will not reduce the memory).
4. After landing **DO NOT** switch off the instrument immediately. Wait until the message '**security check**' appears, or **LOG:STOP** appears in the **GPS STATUS** menu as shown below. Now you can switch off the unit.

LOG:STOP
Mem.89.7h

Flight recording (logging) automatically starts when the aircraft's ground speed exceeds 20kph and logging will automatically cease approximately 40 seconds after the glider has stopped moving (ie landed).

8. PC CONNECTION

The Colibri communicates with a PC via the RS232 port and the cable supplied. Data can then be transferred between the PC and the Colibri. The following functions are available when the unit is linked to a PC.

Read Logger-This allows downloading of flight details and flight (logging) data stored in the Colibri. The list of flights stored in the logger appears and a flight is selected for download using the PC's cursor keys.

Setup Logger- all logger parameters can be selected/entered via the PC's keyboard and uploaded to the Colibri.

Read Flight Info- Data regarding the Pilot etc is read from the Colibri.

Write Flight Info- Data regarding the Pilot, Official Observer, Glider etc is entered on the PC and written to the Colibri.

Read TP and TSK- The turnpoints and tasks stored in the Colibri are downloaded to the PC for editing if required.

Write TP and TSK – The turnpoint and task data stored or edited on the PC is transferred to the Colibri.

8.1 PROCEDURE FOR PC CONNECTION:

Install the LXFAL program onto your PC using the supplied floppy disk. Run the LXFAL program. Connect the PC and Colibri using the special cable supplied. Press 'T' on the PC's keyboard, the Colibri will 'beep' while it is communicating with the PC and display CONNECT. The PC's screen will display a number of options;

Read logger
Setup logger
Read flight info
Write flight info
Read TP and TSK
Write TP and TSK

COLIBRI

19200 bps
CONNECT

For instance after selecting **write flight info**, the data regarding the pilot and glider will be transferred from the PC into the Colibri. The 'Read' command will transfer data from the Colibri to the PC. If you are having trouble establishing connection with your PC, make sure that the Colibri's **COMM SPEED** is set to **19200** in the appropriate menu, see section 5.5 of the manual. This is particularly important if you have the Colibri connected to a final glide/flight computer during flight. For example, the Cambridge LNAV requires a 4800 baud rate from the data logger. This baud rate is selected on the Colibri (as per section 5.5) when installing the Colibri in the glider before flight. Note, you will need to change the COMM SPEED back to 19200 when connecting the unit to a PC after the flight.

If you do not connect the Colibri to a final glide/flight computer, then leave the COMM SPEED set on 19200.

9.0 WIRING DETAILS and POWER SUPPLY CONNECTION

The Colibri is immediately 'ON' when power is applied to the connector (there is no separate 'ON' switch as such). Each unit is supplied with two cables;

1. Power supply cable for installation in the aircraft.
2. PC cable with power supply and RS232 plug for connection to your personal computer.

The Power Supply Cable in addition to supplying power to the unit also has;

- a. Output for an LED to enable GPS monitoring if the Colibri is mounted out of view of the pilot.
- b. NMEA output for connection to final glide/flight computers, palmtop computers etc.

The user can make both connections, however some electronics experience is required, particularly soldering skills. It is recommended that you consult your dealer for advice if you do not feel competent to make these connections. The colour coding of the flat, black 6-wire cable used for connection to the Colibri is shown below. Note this applies to the thin wires inside the black telephone type cable. For convention, that is, so that red and black wires are used for connection to a battery or power supply, thick red and black wires are soldered onto the appropriate inner wires of the telephone type cable. Blue for the red(+) and yellow/white for the black (-) respectively. This is important if you wish to splice open the cable to effect NMEA output connection to a flight computer or use the LED output monitoring option. If not, just connect the thick red wire to the red positive '+' terminal of the battery and the black wire to the black negative '-' terminal of the battery. Insert the telephone type connector into the Colibri and the unit is now switched ON! It is recommended that a 1-amp slow blow fuse is connected between the battery and the power cable.

Component wires- of the cable connected to the Colibri via a telephone type plug.

-yellow /whiteGND (negative of battery)
-blackRx (Note, this is not to be connected to the negative terminal of the battery)
-red Tx (NMEA Output)
-green LED Anode
-white LED Cathode
-blue +12V with the supplied power cable a thick red wire is connected to this.

Note: the unit must be connected to a 10-24V DC power source

10.0 ADDITIONAL INFORMATION

10.1 A Low Battery warning is displayed when the battery voltage drops to 10.0V regardless of which screen you are using at the time. Press the ENTER button to resume control of the Colibri's functions. Logging does not stop during this time. The unit will continue to operate down the 9.0V. When the battery is exhausted the Colibri will BEEP continuously, and logging will cease. The battery voltage is continuously displayed on a page in the GPS STATUS menu if you wish to check the current state of your battery's voltage.

11. IMPORTANT NOTES

1. *It is recommended that you familiarise yourself with the Colibri's operation by connecting the unit to the PC cable and mains power pack. This will enable you to practice the operation of the unit. If you wish to obtain GPS fixes ensure the aerial is connected. Note; no harm will come to the unit if power is applied without the aerial connected. Re-read the manual with the Colibri in hand and its operation will become clear and simple.*
2. *The Colibri uses an internal lithium battery to retain the memory of stored data. After several years this battery will need to be replaced. Return the unit to the place of purchase to effect replacement. This is not covered under warranty.*
3. ***Do not disassemble the Colibri***, that is undo the case screws. This will destroy the unit's security seal and the logger will no longer function. There are **no** user serviceable components inside the Colibri. If you disassemble the unit it will have to be returned to the factory for reassembly. This will also void the warranty.
4. *It is recommended you seek assistance with the electrical connections for the Colibri if you are not experienced with electronic work. Alternatively contact your local agent to seek assistance with your installation.*
5. *If you intend to connect the Colibri to a flight computer the required NMEA output sentences (as per the flight computer's manual) are selected in the SETUP menu.*
6. *Turnpoints are best entered into a PC using the LXFAL program (decimal minute format). Once all the TP's are entered into your PC you can download them to the Colibri. Contact your dealer he may be able to supply the turnpoints you require on floppy disk for input into your PC or install them prior to shipping your order.*
7. *The Colibri's pressure transducer is calibrated with reference to the 1013Hpa International Standard Atmosphere (ISA) mean sea level (MSL) pressure datum.*

12. GLOSSARY

TP – Turnpoint or waypoint. (TPOINT)

PC – Personal Computer

DC – Direct Current

LED – Light emitting diode

GND - Ground

Rx – Receive

Tx – Transmit

TSK – Task

XC – Cross country

Vario – Variometer

INT – Interval

RAD - Radius

APT – Airport

LAT – Latitude

LON – Longitude

V - Volts

13 APPENDIX

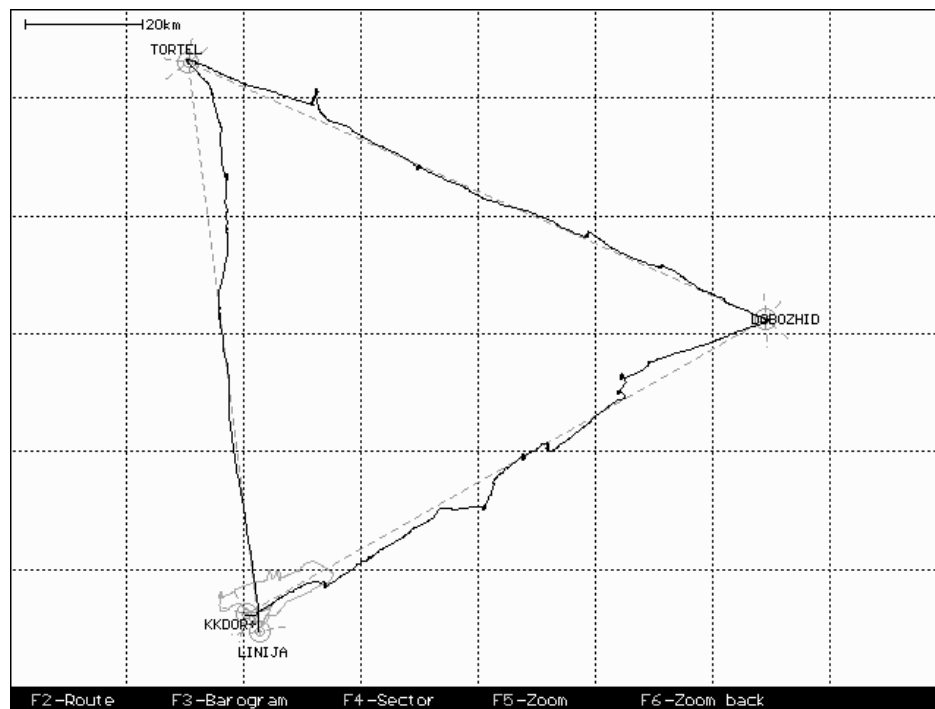
Some examples (actual screen prints) of flight evaluation using the LXFAL program.

Transfer			Edit	Logger	Setup	
FILE: 67df0ew1.igc			INTEGRITY: OK		FLIGHT DATE 13.07.96	
GPS Device: FDK/GSU-14						
Pilot: ERAZEM_POLUTNIK						
Glider: NIMBUS_3/25			Registration: S5-3068			
Competition number: CC			Class: OPEN			
Turning point		Latitude	Longitude	Dist.[km]	Course	
TAKE OFF	SZEGED	N46°15.470'	E020°05.480'	—	—	
START	KKDOR+	N46°16.500'	E020°03.800'	—	—	
POINT 00	DOBOZHID	N46°43.580'	E021°13.380'	102.0	60	
POINT 01	TORTEL	N47°07.120'	E019°56.030'	107.2	294	
FINISH	LINIJA	N46°14.890'	E020°05.610'	97.6	173	
LANDING	SZEGED	N46°15.470'	E020°05.480'	1.1	351	
F1 Help F2 Statistics F3 Print F4 Graphics F5 Convert F6 Task F7 Flu						

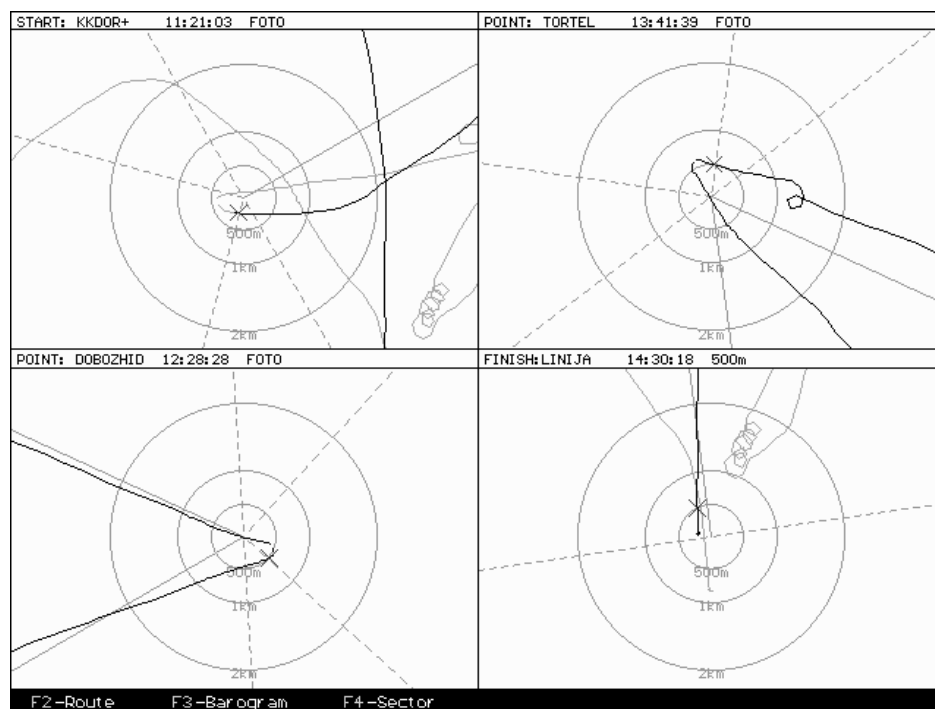
Task specification with integrity control

Transfer Edit Logger			Setup			
FILE: 67df0ew1.igc			FLIGHT DATE 13.07.96			
Pilot: ERAZEM_POLUTNIK		Glider: NIMBUS_3/25	Registration: S5-3068			
Flight statistics			Task statistics			
Start:	10:30:29		Task finished OK!			
Finish:	14:32:44		Total task distance: 306.7km			
Duration:	4:02:15		Task speed: 97.23km/h			
Tr.point	Lat./Lon.		Time	Dist.[km]	v[km/h]	Type
KKDOR+	N46°16.50'	E020°03.80'	11:21:03	—	—	FOTO
DOBOZHID	N46°43.58'	E021°13.38'	12:28:28	102.0	90.74	FOTO
TORTEL	N47°07.12'	E019°56.03'	13:41:39	107.2	87.87	FOTO
LINIJA	N46°14.89'	E020°05.61'	14:30:18	97.6	120.31	500m
F1 Help						

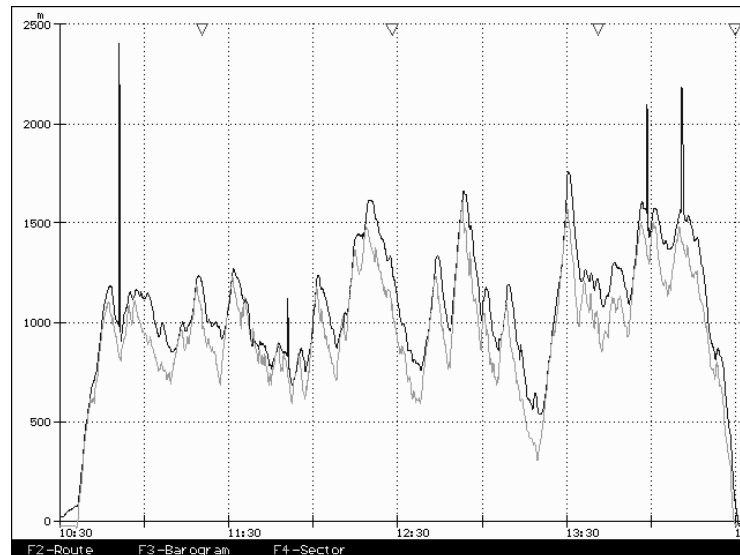
Statistics with turn point confirmation



Track Flown

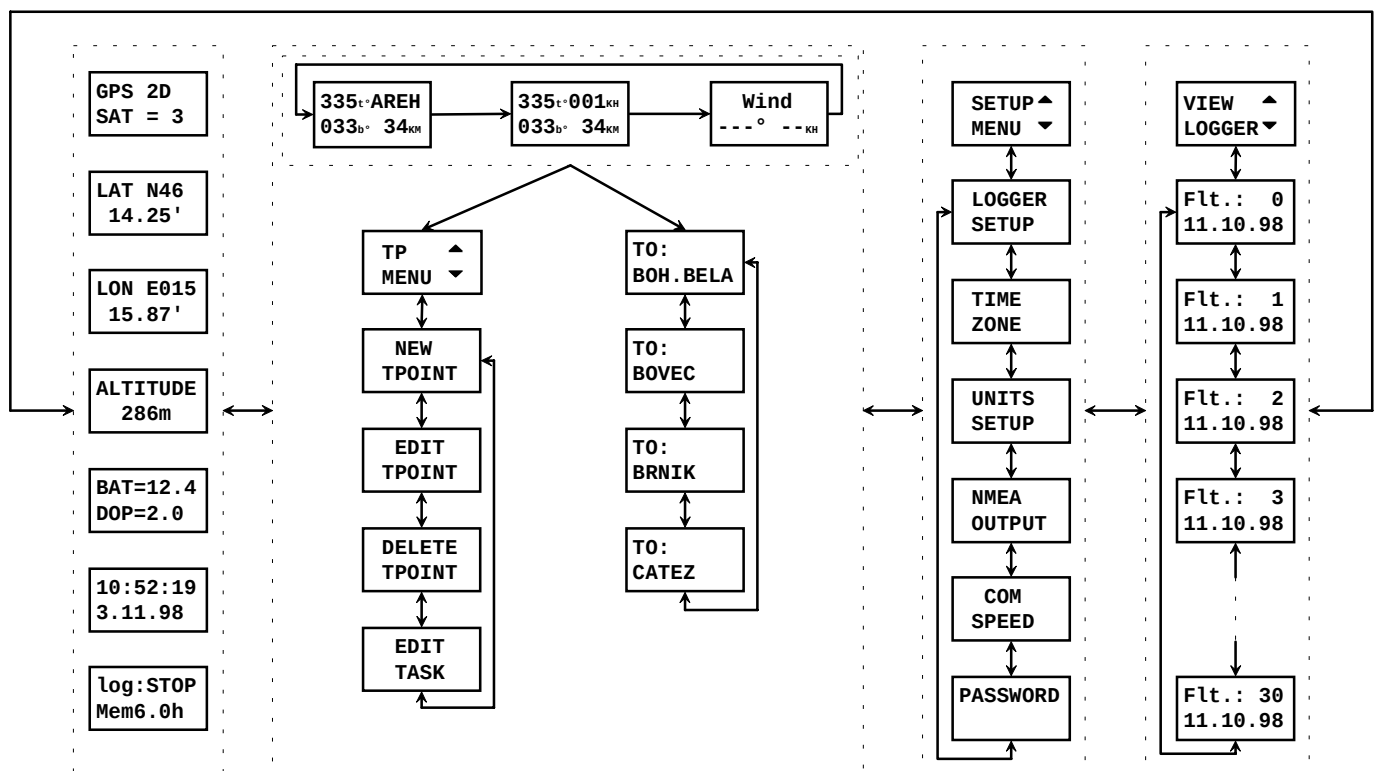


Graphic turnpoint confirmation



Barograph trace (pressure and GPS altitude)

COLIBRI - Menu Structure



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