



## FAI Microlight Commission (CIMA) Flight Recorder approval document

### 1 IDENTIFICATION

1.1 **Approval document ref.:** MLR001

1.2 **CIMA approval date:** 1 September 2005

1.3 **Flight recorder name:** MLR SP24XC

1.4 **Manufacturer:** MLR Electronique, 44330 Vallet, France

Tel unknown Fax unknown

Email: unknown Website: unknown

1.5 **Applicable serial numbers:** all

1.6 **Hardware version:** SP24XC

Check this by looking at the physical serial number, it should start SP24XC

1.7 **Firmware version:**

SP24XC FFVL: 2.70A 21/01/02 (Records only)

SP24XC TRACK\_2 : 2.82A 15/05/03 (Championships or records)

SP24XC TRACK\_5 : 2.85A 15/05/03 (Championships or records)

Check this by switching the device on and with the cursor select VERS at the bottom of the display and press Enter. Displays the firmware version.

1.8 **Transfer software name:** CIMA Flight Log Downloader.

Check this in the title bar of the Transfer software window.

1.9 **Transfer software version:** 0.2.0.4 or better.

Check this by locating the file PMLrDownload.exe and right click: *properties* --> *version*.

### 2 DESCRIPTION

#### 2.1 Hardware.

A blue plastic hand-held 'traditionally shaped' GPS unit approx 160mm x 60mm x 45mm. Marked with the label "SP24XC Free Flying". On the face, a LCD display and five buttons; yellow : on/off, red: 'mark', central left-right-up-down cursor, blue 'Page' blue : 'Enter'. On the rear a proprietary shaped 5 pin serial port, and on the end, a door to the battery compartment (4 x AA in a carrier).

#### 2.2 Firmware.

This GPS unit can be loaded with three different firmware configurations via a serial cable from a PC. It comes as standard with the FFVL Hang-Gliding software which makes it a useful 'every-day' GPS or a FR for records, but it is NOT approved for championships.

It can be converted between the FFVL version and the championships approved TRACK\_2 two sec recording interval FR version or the TRACK\_5 five sec recording interval FR version with the software *MLR Load 1.0 VL FF* (MLR\_LOAD\_VL-FF.exe)

This software and instructions for its use are freely available at <http://www.flymicro.com/fr/index.cfm?page=Software%2FMLR%20firmware>

Warning: DO NOT disconnect or otherwise stop the alteration process before it finishes or the device becomes useless!

In 2 or 5 second FR mode the GPS Date of the FR must always be set to the current year. On the main window, select *VERS* --> *Enter* --> *Next* to display the current setting. Cursor up or down to change it, press *Enter* to save the change. Press *Page* to return to the main window.

A user guide for the 2 and 5 second FR versions is attached to this approval as Annex 1

### 2.3 **Transfer software.**

Switch logger on, connect with serial cable to PC. The COM port may be selected from a choice of options.

A user guide for *CIMA Flight Log Downloader* is attached to this approval as Annex 2

The *CIMA Flight Log Downloader* software is freely available from the microFLAP Yahoo group <http://www.groups.yahoo.com/group/MicroFLAP/>

### 2.4 **Not tested in this approval.**

No items untested.

### 2.5 **Items known to NOT conform to the CIMA FR specification.**

When the 'Mark' button is pressed, this is saved as a waypoint in the FR. The time associated with this waypoint is recorded in GPS time, not UTC. UTC is slowly diverging from GPS time because GPS time does not account for leap-seconds.

From 1 Jan 1999: GPS-UTC = +13s (i.e., GPS will be ahead by thirteen seconds)

From 1 Jan 2006: GPS-UTC = +14s (i.e., GPS will be ahead by fourteen seconds)

CIMA Flight Log Downloader correctly loads PEV's into the data file, but the flight analysis operator must be aware that some seconds must be subtracted from their associated times to obtain the correct UTC time.

## 3 APPROVAL STATEMENT

3.1 This flight recorder is approved to FAI/CIMA Type 1 standard in the hardware / firmware / transfer software configuration above when it is used for the validation of championship or record flights under the FAI Sporting Code Section 10 in accordance with the conditions below.

3.2 This document must not be interpreted as implying any other form of approval.

3.3 FAI reserves the right to alter the terms of this approval at any time.

## 4 CONDITIONS FOR USE IN MICROLIGHT CHAMPIONSHIPS

4.1 The FR, together with a copy of this document must be presented to the organization before the start of the championship for compliance inspection and recording of the serial number.

4.2 The pilot must make a data transfer cable and a copy of the transfer software available to the organization if required.

4.3 Before the championship starts the physical serial number, electronic serial number, hardware and firmware versions must be checked by the organization.

4.4 The FR must be clearly labelled with pilot's name, nation and competition number.

4.5 No cable or plug capable of connecting to the serial socket of the FR or any other device capable of flight data communication with the FR may be carried in the aircraft during a championship flight. Infringement could mean zero task score or even disqualification under the 'Electronic apparatus' rules.

4.6 Only the TRACK\_2 or TRACK\_5 firmware versions are permitted.

4.7 The FR's *Date* setting must always be set to the current year.

4.8 Flight analysis operators must be aware of the UTC-GPS time offset discrepancy associated with the PEV function.

4.9 When data is exported to CIMA format all optional fields should be filled with the pilot's correct details.

## 5 CONDITIONS FOR USE IN MICROLIGHT RECORD CLAIMS

Evidence from this FR may be used to corroborate certain record claims but the OO (Official Observer) and the claimant must be aware that being a CIMA Type 1 FR (see S10 Annex 6, 2.1) it is not capable of recording atmospheric altitude or MOP (means of propulsion) or of secure data generation. Care must therefore be taken by both parties to ensure that in addition to the FR evidence there is sufficient alternative evidence to support the claim (OO observations, turn point photos, landing witness statements Etc.). So long as all the conditions below are complied with then evidence from this FR may be used as the sole proof of no intermediate landing, the accurate determination of takeoff and/or landing times and/or gate crossing times and/or leg distances and/or that turnpoints were rounded correctly.

5.1 Evidence from this FR may be used to corroborate claims for any of the following records:

- Distance in a straight line without landing
- Distance in a straight line with limited fuel
- Distance in a closed circuit without landing
- Distance in a closed circuit with limited fuel
- Speed over a straight course
- Speed over a closed circuit

5.3 Before takeoff, the OO shall observe:

- The physical serial number, electronic serial number, hardware and firmware versions of the FR.
- The firmware's logging interval is set at a value of max 30 sec.
- The serial port of the FR is sealed with an OO countersigned sticky label (or similar).
- The FR's *Date* setting is set to the current year.
- That the FR's memory has been cleared.
- That the aircraft has the FR on board at takeoff.

5.4 Immediately after landing, or as soon as reasonably possible thereafter, the OO shall observe:

- The FR's serial number is the same as was observed before takeoff.
- The serial port is still correctly sealed.
- The entire data transfer process from FR to computer, and subsequent file export to CIMA format .IGC file. The *ID* and *Task* fields should be set to ZERO. All other fields should be filled with the pilot's correct details.
- A printout of the CIMA format .IGC file, countersigned by the OO verifying that it is a perfect representation of all the data obtained from the FR after the flight.

5.5 The record claim must include:

- The reference number of this approval document.
- Which firmware version was used.
- Verification by the OO that that the FR completely matches the identification in this approval document and all the conditions above were complied with.
- The signed printout of the .IGC file and a copy of the .IGC file on floppy disk or CD.

## Annex 1: MLR SP24XC Flight Recorder instructions

*Instructions for use of the MLR SP24XC when it is in 2 sec or 5 sec flight recorder mode.*

To switch on, press the yellow button.

### 1 Main screen

- 1.1 At first the display will show -- ? this means it is acquiring satellite coverage<sup>1</sup>. After a while it will display a number (the number of satellites it can see) and a little picture of a satellite.<sup>2</sup>
- 1.2 If you do not see -- ? or the picture of the satellite, Press *Page* to return to the main screen.
- 1.3 VERY IMPORTANT: DO NOT TAKE OFF BEFORE YOU HAVE THE PICTURE OF THE SATELLITE. It may not acquire when you are moving.
- 1.4 At the bottom of the main screen:

WPTS: 0000 This increments whenever you press the *Mark* button. Pilots will be briefed on the use of this feature in a championship.

TR.: 0000 This is your track recording and, depending on the firmware version, increments every 2 or 5 seconds whenever the MLR is switched on. Memory capacity is 8000 points. MAKE SURE IT IS NEAR TO ZERO BEFORE YOU TAKE OFF.

VERS: Select with cursor and press *Enter*. Displays the software version. Press *Next* to display the GPS Date which MUST ALWAYS be the current year. Press *Enter* to change this. Press *Page* to return to the main screen.

LT: Select with cursor and press *Enter*. Track recordings are always recorded in UTC but you can set the difference between UTC and local time for the display on the main screen. As an example, the difference for UK summer time is +01h 00 min and for France summertime +02h 00min. Press *Page* to return to the main screen. Check that the time shown is correct.

RESET: This wipes the memory and re-boots the MLR. Press *Page* to return to the main screen.

Battery remaining indicator: Battery life is approx. 15 hours with alkaline batteries, 4-5 hours with ordinary ones.

The little telephone symbol: This indicates that the data port is operational.

### 2 Other functions

- 2.1 Press the *yellow* button briefly and you get a screen Backlight On.... Contrast. Etc. The default setting is ON 1 minute. There is no need to alter this because it will revert to this when you RESET. Press *Page* to return to the main screen.

### 3 Batteries

- 3.1 4 x AA Alkaline. When replacing the battery holder, make sure the indent in the battery holder matches the foam inside the battery door. IT IS THE PILOT'S RESPONSIBILITY TO MAKE SURE THE BATTERIES ARE GOOD.

### 4 Switch off

- 4.1 To switch off, press the *yellow* button for more than 3 seconds, confirm by pressing *Enter*. The track is NOT LOST when you switch off.

### 5 Replacement value

- 5.1 If you lose or damage your MLR flight recorder then is your responsibility to reimburse the owner. Guide value: MLR: £150. Pouch: £20.

### 6 Position on the aircraft

- 6.1 The unit must always be positioned with the antenna upwards in a location on the aircraft which has a continuous view of as much sky as possible. The MLR is highly reliable, but if it has a restricted view of the GPS system satellites then the quality of fixes it records will degrade and often it will not record fix points at all. This will almost certainly be critical to your eventual task score.

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<sup>1</sup> If the display shows only WRONG CHECKSUM WAIT PROGRAM then the ROM is corrupted. It is possible to achieve this by disconnecting data cable when altering the internal software. The only solution to this is to contact a CIMA FRAC member (see the FAI website) who may be able to advise a method of fixing it.

<sup>2</sup> Normally it will acquire in a few seconds, however, if you have moved a long way since it was last used then it will need to collect a new almanac from the GPS satellite system which can take quite a long time, up to 12 minutes. If it still doesn't acquire then there is a 'helper' function permitting you to enter the part of the world you are in, after you have set this correctly it usually 'finds itself' in two or three minutes.

## Annex 2: CIMA Flight Log Downloader instructions

*Instructions for use of the CIMA Flight Log Downloader version 0.2.0.4.*

The CIMA Flight log downloader is a stand-alone executable file and needs no special installation onto a PC installed with Windows 2000 or better.

- 1 On opening, the user is asked to select a directory (folder) to store downloaded tracks. In a championship, all tracks should always be saved to the same directory.

Select the appropriate COM port, usually COM 1. The status message at the top of the main window should say *Serial port open*. If the PC is 'legacy free' as in the case of many modern laptops and it does not have a serial port it will still work with some types of USB-Serial adapters, often on COM 5.

Connect a MLR to the data cable, switch it on, and the FR will automatically start to be downloaded. The status message at the top of the main window should say what is happening and will say when the downloaded PEV events and flight track is ready to be saved into an .igc file.

Each recording is divided into 'segments' by the download software, these are displayed as separate rows on the main window. Each segment is identified by the CIMA Flight log downloader when there is a gap of 30 seconds or more in the track recording. Ideally there should be only one segment to each track. A track with many segments is usually either an indication that the FR has been used in a location with a poor view of the GPS satellites or there is more than one track in the FR. Pilots should be advised of such problems when their FR's are returned.

### 2 Normal championship use

- 2.1 **Identification setting.** The first time a FR is downloaded in a championship the cross-reference between each FR's serial number and the pilot's comp no & name should be saved, this will make subsequent downloads much faster and more reliable.

When a FR has been downloaded, if the *ID* and *Name* fields report ?????? then the FR is unidentified. Copy the *Serial #* (ctrl-c) and click the *Edit* button. This reveals a grid; paste the serial no. (ctrl-v) into the first available row, and enter the competition number and pilot name into the appropriate fields in the same row. It is strongly recommended a certain discipline is maintained with the pilot name; it should be exactly as in the entry list & scoring system preferably in *GivenName FAMILYNAME* format.

If the FR is the pilot's secondary FR, append *secondary* to the pilot name.

Click *OK* and in the main window click *Force download* to download the FR again. This time the Comp No and Pilot name should be automatically entered in the *Id* & *Name* fields.

Subsequent downloads are much faster if the FR can be automatically identified.

Championship rules of course forbid the 'swapping' of FR's between pilots in a championship but because the FR serial number is saved, it should be impressed on pilots that as far as the download office is concerned their Primary FR as presented for the first download will remain their primary one for the remainder of the championship, it is no good them just switching the identification label.

- 2.2 **Task Window setting.** This acts as an automatic track filter based on the time a recording was made. If a window for a task is set correctly, then only the track segments which were recorded in that time window will be saved to file and other segments (eg test recordings, other tasks Etc) won't.

To set a task window, click the *Edit* button. Enter the task number in the first available row and the broad date and time period in which the task occurred, for example if the task occurred between 15:00 and 17:00, it is suggested you enter 13:00 to 19:00, generally it is unwise to let separate task windows overlap. Click the *OK* button to save it and return to the main window.

Once a task window is set, and, for example you are interested in downloading tracks for task 2, then set this in the *Task* dropdown. The segments to be saved will only be those recorded between the times you set for that task, in other words if the user left his recording from Task 1 on the FR, this track won't be saved. The number of track fix points and PEV events to be saved are displayed in the *Points* and *Events* boxes.

- 2.3 **Downloading.** Once the *Identification* and *Task window* is set correctly then it is a very rapid business to download many FR's and save their tracks to the correct file names without error.

Switch the FR on, plug it in, the FR should be identified and start to download automatically. When complete, press the *Save* button. The status message at the top of the main window will show the file name it has been saved to.

If, for some reason the FR doesn't automatically download, check the FR is switched on and press the *Force download* button. If it still doesn't download, some checks include ensuring the FR is plugged in

to the correct serial port and there is no other software running on the computer using that port. As a last resort, try shutting down the CIMA Flight log downloader and re-starting it, or even try rebooting the whole computer.

If there are no track fix points on the FR in the task window to be saved, then the *Save* button is disabled.

Repeat saves will always write a new version of the file as the CIMA specification requires, track files are never overwritten.

In a championship with many FR's, a certain discipline is required to ensure they are all downloaded, it is usually catastrophic to the task if even one track is not recovered from a FR. Be methodical and place the FR's which have been downloaded in a separate pile to the ones which are yet to be done.

It is recommended all tracks are viewed in a flight analysis program before the FR's are returned to their users just in case one was missed or the track wasn't downloaded properly.

The FR memories should NEVER be reset or emptied by download staff. This is a responsibility of each pilot once the FR has been returned.

In a big championships, once all tracks have been downloaded often the FR download office will waste an inordinate amount of time searching for missing tracks belonging to pilots who actually did not return their FR's at all, perhaps they didn't fly or otherwise did not score in the task. It is therefore wise to either ask Pilots to ALWAYS return their FR's to the scoring office at the end of a task, or otherwise implement some means of knowing which FR's are missing.

### 3 Occasional use

If you have just one track to download or it is necessary to save a track in a more manual fashion and the FR is unidentified, once the track is ready to be saved you may manually enter the *Id* and *Name* manually in place of the ???????

Select the *Manual selection* tab and enter the task number.

With the mouse in the main window, select the segments of the recorded track you want saved together in the track file. According to what is selected, the number of track fix points and PEV events to be saved are displayed in the *Points* and *Events* boxes.

Press the *Save* button to save the track, the status message at the top of the main window will show the file name it has been saved to.

### 4 Emergencies

Should a track not be saved properly or the task window was set wrong or some other error occurred and the required track is no longer available on the FR for a repeat download, all is not lost, there is an emergency solution so long as the FR was actually connected and allowed to download at least once.

As soon as the status message at the top of the main window says *Download complete*. You may save track. a special file containing ALL the data which was in the FR is always saved automatically by the CIMA Flight log downloader to the tracks directory. The name of this special file is in the format *FrSerialNo-yyyymmdd-hhmmss.igc*

The 'missing' track can (with great care) be reproduced from the contents of this special file by manually copying it to the appropriate CIMA specification file name and, optionally cropping the data if necessary. See S10 Annex 6 for a detailed description of the CIMA file naming protocol and .igc file data.

### 5 Shortcuts

It may be useful in a championship to set up a shortcut on the desktop so the same tracks directory is always opened when the CIMA Flight log downloader is opened.

To do this, and after you have manually selected a directory once, open the tracks directory in windows explorer and double-click on *loggers.tsv* which is the file the FR identification settings are saved in or *tasks.tsv* which is the file task window settings are saved in.

By default, windows will not know what to do with a .tsv file, so a window will open asking you to associate the program you want to open a .tsv file with. As the CIMA Flight log downloader won't be listed in the installed programs list, click *Other* and navigate to the location of the CIMA Flight log downloader .exe file and select it. Make sure *Always use this program to open these files* is checked and click *OK*.

You may then create a shortcut to *loggers.tsv* or *tasks.tsv* and place it on the desktop. Any time you double click it, the CIMA Flight log downloader will open and the directory it is in will be automatically selected as the one where tracks will be saved.