Real-time data collection

A proposal for the 2012 CIMA Plenary from Richard Meredith-Hardy, CIMA President.

Introduction

For the first time in a Microlight or Paramotor competition, the Paramotor event at the June 2012 Asian Beach Games (ABG) in Haiyang had a complete integrated scoring system which enabled genuine 'instant scoring'. This was designed by Swiss Timing (ST), part of the Swatch Group, who were contracted to provide scoring systems for all 13 sports at ABG. In the case of the Paramotor competition, it was manifested in the display on a big screen of performance and position of every pilot within a few seconds of their completing a task. The system also produced live information for people operating the PA system, put results on the ABG website and produced all the printed scores. It was also capable of integrating with live a TV caption system and could be enhanced to produce spectator-interesting information like split times while a task is still being flown.

There is no question this dramatically enhanced the whole ambience of the competition; it meant spectators could be kept informed with what was happening at any moment, and everyone, including the pilot, were able to see what a performance was long before he landed.

The key to such a system is the data capture. Scores can be published anywhere, but if the performance data which goes towards calculating a score cannot be collected the moment it is generated then there will be a delay, and the whole point of 'instant scoring' is that it should be instant.

The Swiss Timing system

The data collection element of the ST system was implemented in the form of a bespoke software written in C#[1] and run in windows XP on small 'netbook' laptops which had a 'flip-over' touch-enabled screen.

Additionally, there was a simple 'button-box' with a standard USB connection to each laptop which, depending on the task, was configured to operate on-screen buttons with functions like start, stop, split and reset buttons like one might have on a stopwatch, and more reliable than a touch screen when the operator must be looking at the competitor and not the screen.

Laptop, local software and button box combined to make a stand-alone Data Collection Terminal (DCT), an electronic equivalent of paper, pencil and whatever else might be required to record a pilot's performance such as stopwatch.

Each DCT was in standard wifi communication with the central system which enabled the performance recorded on the DCT to be calculated in real time by the central system into a score, and distributed thereafter to big screen Etc. If a DCT went out of range of the central wifi system then an alert was displayed on the screen, and performance data was cached until such time as it came within range again.

[1] A demo of this software can be downloaded from the CIMA wiki and opened on any windows pc.

Before each task, the software in each DCT was configured from the central system so it could capture all the appropriate performance data from each pilot in that task and the appropriate penalties could be applied Etc. This was designed to be very simple to operate by the same marshals as would normally observe a task and record the same thing on paper[2]. It was also designed to make many common observer errors completely recoverable, such as a mistaken press on the stop button when a pilot narrowly misses the final (time-stop) stick in a paramotor slalom, and for those observers with a poor grasp of English, it was multi-lingual.

The proposal

All our competition activities in microlights and paramotors could benefit greatly from such a system. Unfortunately, for a variety of reasons the ST system is not suitable for adaption for our use[3] but it seems eminently possible something could be created which would work for us at a reasonable cost.

The proposal is therefore:

1. **That the CIMA Internet Working Group is tasked to arrive at a specification[4] for a simple, expansible, open-source software capable of capturing appropriate real-time data (excluding logger data) in any microlight or paramotor task on readily available or reasonably priced hardware, and transmitting such data to a central system in a form which is at least readily accessible by commonly used score calculation systems already in use such as a spreadsheet.**
2. **That if the working group decides it has arrived at a suitable specification, it is (subject to approval by the CIMA Bureau) granted a budget of up to 5000€ to develop the system in time for trials in the 2013 season.**

[2] Since this was essentially an experimental system, at ABG a 'traditional' manual record was also kept, but it only had to be referred to very rarely.

[3] There are quite a number of reasons why the existing ST system is not suitable for us:

- It is highly unlikely the organizer of any CIMA sanctioned event would ever be able to afford to have ST do their scoring.
- ST's DCT software is a copyright private software for which the source code is not available, so it only works with the exact ABG rules and in some tasks would benefit from more development.
- It is designed only to work on windows which is a very poor OS for touch screens, windows hardware with touch screens is expensive and rather rare, and certainly the hardware used at ABG performed very poorly in bright sunlight. There are far better alternatives in devices running Android or iOS which many people own already.
- It was designed from the bottom up to use some unusual communications protocols which integrate with ST's existing central systems which are also all bespoke copyright private softwares developed over many years for a virtually unlimited range of sports and scoring systems and consequently far more complex than we need.

[4] FAI now has a 'New Technology' expert group of which a member of the CIMA IWG is a member. It should be investigated if there are systems already developed by other commissions which might be adaptable to our use, or if not, whether any other FAI commissions are interested in such a system and thus may be in a position to contribute to the development cost.