Orienteering Australia - Technical News – October 2009

Technical News in Brief

Updates to Controller Syllabus
The course syllabus for all Controller levels have been or are currently being updated as follows
1. L1 – updated by Bob Mouatt in late 2008, this has been approved by the ASC. Documents are available on the OA web site on the Controllers page (this may be reorganised in the near future)
2. L2 – updated by Neville Bleakley and submitted to the ASC for approval, September 2009
3. L3 – update by Bob Mouatt in progress.

A Level 3 Workshop was held in Adelaide in August 2009. Some documents used at this workshop are available on the OA web site along with those from the previous workshop held in 2005 (see http://orienteering.asn.au/technical/controllers/l3workshop/).

The list of accredited controllers is available at http://www.orienteering.asn.au/technical/controllers/accredcont/ and will soon be updated. Any errors please contact Dave Meyer at oa_accreditation@netspeed.com.au.

IOF Print Tech Project Test Sheet
In January 2004, OA printed an off-set colour swatch sheet to be used as a reference when printing maps, especially for digital printing. In 2006 IOF produced a more comprehensive Print Test Sheet which is available as an OCAD file and as offset printed copies, both of which are available from Adrian Uppill, Chair of the OA Mapping Committee.

This sheet should be used as a reference and for test prints when planning the printing process (format, printer, paper) for Group A events, and preferably Group B, to ensure that printed maps meet the required map specifications.

Map Printing and Papers
Major events over the last 12 months have seen the use of waterproof "papers" including Teslin (Aus Champs 2008, Aus 3 Days 2009, WMOC) , Pretex (Aus Champs 2009), Pico Film (second day of Canberra 2 Day) and Never Tear (Christmas 5 Days 2009 and in SA). These "papers" show variation in
- whiteness (Teslin and Pretex are off white)
- behaviour when wet,
- folding behaviour(e,g Never Tear and Pico Film are "springy")
- how adjacent sheets clinging together,
- strength (how rip-able is the paper)
- durability and rubbing off of image

For more information or to provide comments, contact Adrian Uppill (Chair of Mapping Committee) at aruppill@chariot.net.au.

OA Results System
When uploading results, events can now be categorised as MTBO or Foot events, and an icon in the result list identifies each event's result type. Work has commenced on preparing statistical reports from the event results.

Control Description and Legend Sheet
This document was distributed to the states in hard copy format in 2004. These supplies have been exhausted, but a PDF version is available from the OA Executive Officer. States are encouraged to make these available from their web sites.

Windows Vista and Sport Software
Issues caused by the extra security with Windows Vista can be avoided when using Sport Software (OE etc) by installing in the Public folder rather the Program Files.
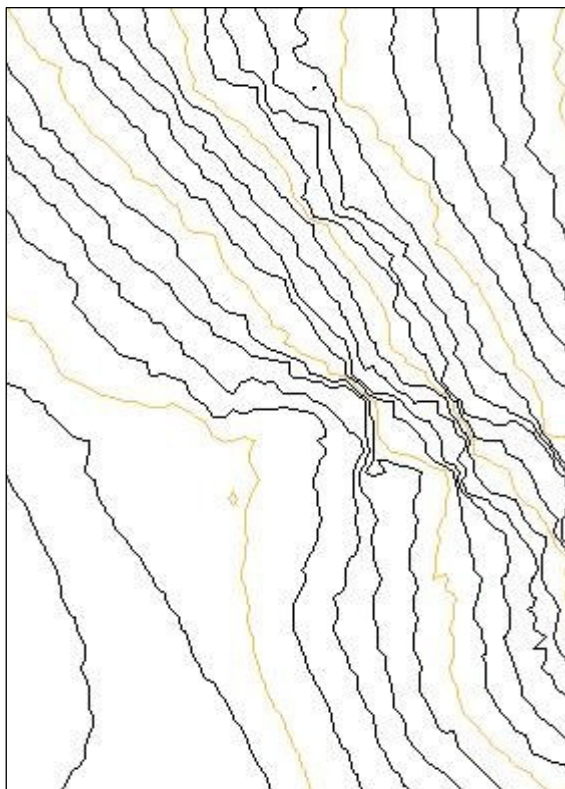
An experience with LiDAR
Peter Hoban
LiDAR shares many commonalities with RADAR - a more familiar technology. The principle difference is the use of lasers (Li-ght) instead of radio as the means of range finding. Working at the speed of light is

pretty quick, so LiDAR mounted in an aircraft is able to survey at flight speeds in stripes over 500m wide with astonishing resolution of surface detail.

LiDAR has advantages over conventional photography - it can be flown in most weather conditions, it does not depend on high sun (or any sun at all, and can even be flown at night). With accurate GPS and careful route planning the job might even be done almost pilotless. These differences amount to a dramatic reduction of the cost of LiDAR compared with aerial photography. Of course there are currently some start-up costs being recovered but it may be expected that in future costs will be greatly reduced.

The Tasmanian government spent some money last year having a LiDAR survey of the settled parts of the Tasmanian coast. The project covers more than 4000 sq km and was flown in 6 days (4-9 Mar 2008). Production of the data files was complete in 30 working days and the only manual editing required was for the identification of water bodies (presumably the laser frequencies used do not detect water surfaces). It is understood that the Tasmanian project cost an average of about $90 per square kilometre.

Figure 1

Notionally this was to cover areas lying below the 10m contour but of course the survey covers many parts at higher levels within that general area. The data is available as an XYZ digital terrain model (DTM) of the un-vegetated surface with a 1m grid to GDA and may be downloaded in 1km square 'tiles' without charge.

The survey information files suggest that the spot locations and heights are generally accurate to within a few centimetres of the un-vegetated surface (it appears that vegetation is semi-transparent at the laser frequencies used). It is also apparent that the data is somehow interpolated to estimate the levels under buildings but the info file does not explain how.

The DTM was loaded into OCAD 10 and a set of contours produced. The resulting 5m contours were surprisingly busy with details and tiny convolutions which frankly did not appear to reliably represent the surface – the plot looks poor and does not inspire confidence, but that may be only for lack of appropriate generalisation.

When the contours are produced at 1m intervals they are too close to discriminate in OCAD on steep slopes at a scale of 1:10000 - however if the contour symbol is reduced in width (to .01mm) the on-screen result is revealing, with outcrops and individual large rocks being easily recognisable and providing a very close representation of the surface.

This image of 1m contours shows an 80m x 56m sample of the data contoured at 1m intervals in OCAD (with reduced line width) covering a steep area becoming flat at the top to the west with several rock faces. The lighter coloured contours are the 5m lines.

A short search located QuikGrid (available only at http://www.perspectiveedge.com/), a GNU General Public License utility which reads the XYZ data and produces contours as a geo-referenced dxf file which imports directly to OCAD. This software offers a variable degree of generalisation (there is a variable grid spacing which determines the amount of generalisation) and the result is much less noisy than the contours produced by OCAD. Using a 10m grid they still include much small detail (but not individual rocks), and they look much better.
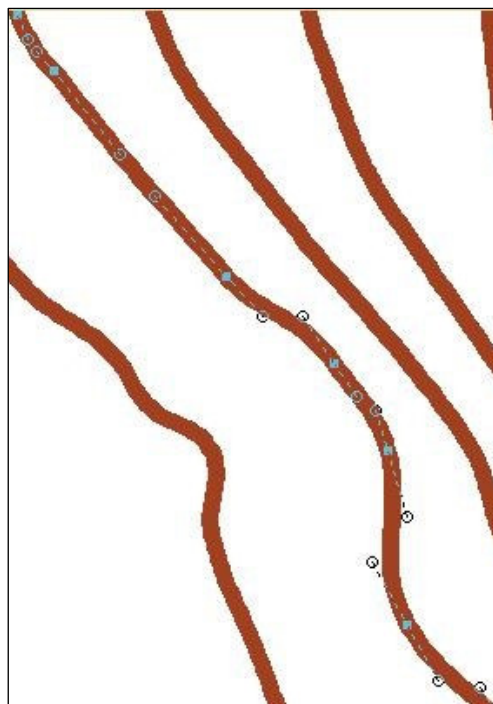
The QuikGrid contours also end appropriately at the boundary of the plot (unlike the OCAD result which generated spurious lines to the corner of the plot as though there were a vertical cliff at the edge of the data and which require some tidying).

The smoothed 5m contours shown in Fig2 cover the same area at the same scale with the QuikGrid output converted to curves in OCAD. As you can see the conversion has provided a very satisfactory density of points, making the line easy to adjust where that is necessary and having a reasonable file size (after it was optimised).

Figure 2

The accuracy of the LiDAR data is astonishing. The information files include comparison lists with about 1000 points of accurately known height. While the horizontal and vertical accuracy is claimed to be no worse than 25cm the comparison points show about 99% are within 2 cm (remembering that known datum points need to be at easily accessible and widely visible locations, often concrete slabs) and some of the few larger differences are clearly attributable to one of the measurements being on a structure and not on the ground.

Some differences will be expected as the reference points will usually fall somewhere between the LiDAR data points (which in this case lie in a 1m rectangular grid pattern) and not right on them so the LiDAR height must be interpolated for each comparison point. It is also noted that some (or all) of the comparison points may have been used for height datum reference and the closeness at those points would be spurious.

The significance of this is that very accurate surface modelling is becoming available and the technology to use it

is readily affordable, on any desktop or notebook computer. Having spent some time on the map I am very impressed.

The contours generated appear excellent.

While some would be tempted to modify the contours shown in the second figure, my own preference would be to use form lines and feature symbols to show the shape and leave the contours pretty much as they are confident that they represent the surface as accurately as is practical.

Constructive comment or questions invited.

Using Sport Software and a Check Station to Identify DNS Runners
Robert Mouatt and Norm Johnston

At some events, mainly those in which competitors have pre-entered, it is important that some method be used by the organisers to keep track of people that have started their course. This can be done manually be having someone check names off the start list. That requires someone to manually go through the list and set non-starters to DNS (in the Evaluate Chips window). This can be quite difficult especially if you have several starts (for different courses).

A simpler method is preferably to use the Check SI units to see who has started their course. This method will work for multiple Check stations. You can also use the Start units but you should not use both types at the same time. It is a good idea to have a person at the entrance to the start area with a Check station; all runners can insert their chip into the Check station as their name is checked off.
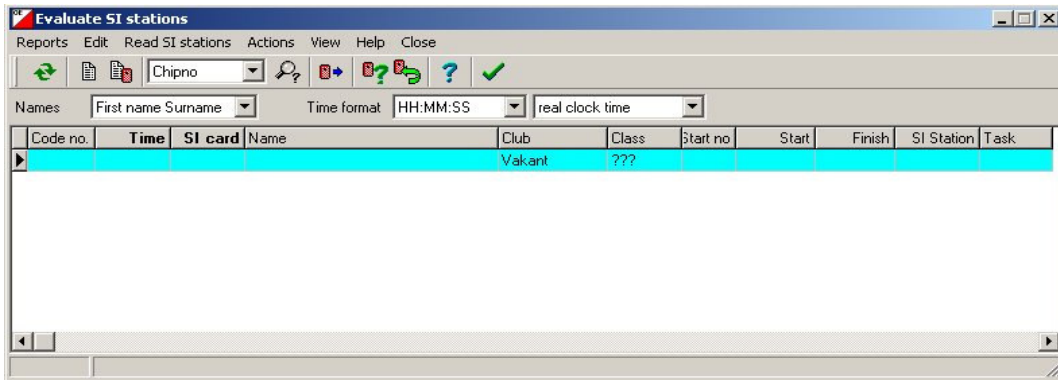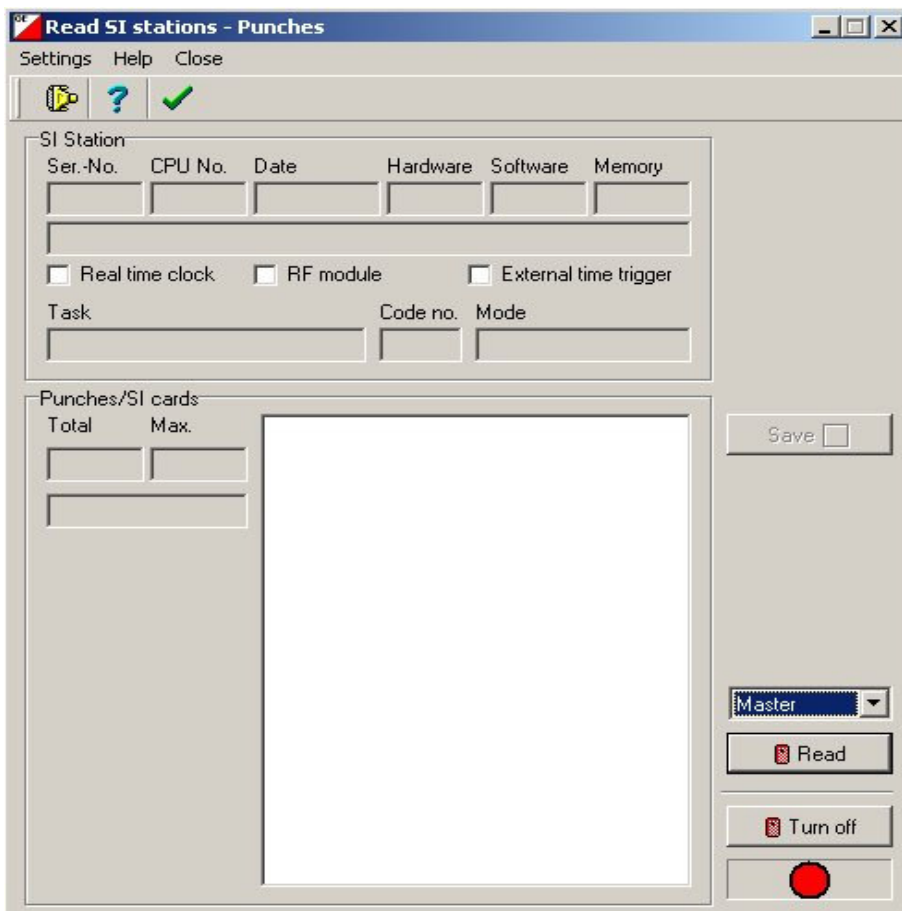
You should wait until all starts have sent off their last runners and you have all the Check stations at the computer. Get a Check station and connect it to the computer Master unit via the inductive coupling stick. If you are only using one computer and one Master unit then you will have to shut down the Read Chips window.

On the top level menu click on Competition day > Evaluate SI stations which will give the window:

If you have not accessed this window previously for this event then it should be empty.

Click **Read SI stations** (or click the relevant tool) which should show the following window:

If you are using two Master stations you may have to ensure that you are accessing the COM port not in use by the Read Chips system. Click **Settings**, or the tool under Settings. Place the Check SI station on the Master, and make sure **Master** is showing in the box above the Read button. Click **Read**. The red lamp should turn green and, if you are lucky, it will soon turn a Magenta colour which indicates it is reading the Check SI station. The time taken to read the station will depend on much data it contains.

As it is being read the chip data will show in the list box and when all data has been read the Save button will show red. When that occurs click the **Save** button. That will write the data to the Evaluate SI stations window (you should see that under the Read window). If you have other Check stations to read then do the above with them. When all Check units have been read click **Close**. That will take you back to the Evaluate SI stations window.

At this stage the window will show the data for all the SI chips that were read.

Click **Actions > Not started runners** which will cause a small window to pop up:

Ensure that the correct box is checked then press **OK**.

That will cause another window to open along with another pop-up window that will tell you how many chips were read. If you are happy to continue then press **Yes.** That will cause all runners who are in the entries and who have not checked their chips to be set to **DNS**. You can check that by going to the **Evaluate chips** window; you will have to click on the Refresh table button (top left).

IOF Rule Changes for Foot Orienteering

The IOF has recently made changes to the rules for Foot Orienteering as follows

Navigational aids

- New: 21.3 During the competition the only navigational aids that competitors **may use or carry** are the map and control descriptions provided by the organiser, and a compass.
- Old: 21.3 During the competition the only navigational aids that competitors may use are the map and control descriptions provided by the organiser, and a compass.

Telecom equipment (e.g. personal GPS-tracking over GPRS)

- New: 21.4 Competitors may not use or carry telecommunication equipment between entering the pre-start area and reaching the finish in a race, unless the equipment is approved by the organiser. The organiser may require competitors to wear a tracking device.
- Old: 21.4 Telecommunication equipment may only be used in the competition area with the permission of the organiser.

Controls 15 meters apart on 1:4000/1:5000

- New: 19.4 Controls shall not be sited within 30 metres of each other (**15 metres for map scales1:5000 or 1:4000**). (see also Appendix 2, #3.5.5).
- Old: 19.4 Controls shall not be sited within 30 m of each other (see also Appendix 2, #3.5.5).

The following clarification is from the IOF with respect to the rule changes relating to use of GPS.

Background
The IOF's motive for implementing the amended wording of rule 21.3 is to **preserve the basic values of the sport of orienteering,** namely to **navigate using map and compass only**. The development in the area of small, hand-held positioning and navigation devices is very rapid and the IOF believes it would be impossible to maintain the sport's basic values while allowing free use of such devices. It follows, as a consequence, that the carrying of such devices during a competition must be prohibited. Hence the IOF Council's decision to clarify rule 21.3 to take validity from June 1, 2009 at all IOF events, meaning The World Games, the World Championships, the World Cup, World Ranking Events, the Junior World Championships and the World Masters Orienteering Championships.

What is allowed?

The IOF is aware of the increasing popularity of GPS-based position recording devices over the last years as a tool for post-race analysis of performance and to share route-choice information etc. This is welcomed, and it is not the intention to prohibit such usage. The IOF, therefore, wants to make it clear that any position recording device that is **not capable of informing the athlete** about position or navigation during the race, is allowed. In practice this means that GPS data-logger devices without a display or sound communication may be used in all the above mentioned IOF events.

Would a GPS have helped reduce the number of minutes lost on some of these errors?

http://news.worldofo.com/2009/06/07/gps-tracks-noc-long-mistakes-collected/

Changes to the OA rules will be proposed at the OA conference to maintain consistency with the IOF rules, e.g. for Group A events, for the changes with respect to use of GPS. Note that any events run under IOF rules e.g. World Ranking events, must already follow IOF rules.

Good Friday Events

Current OA rules require an Elite Prologue (21 and 17-20 classes) and the Australian Family Relays are held on Good Friday. The following proposal was received from the organising committee of the Australian Three Days in 2010 with respect to the events held on Good Friday. The first option represents a variation from the rules for 2010.

Our opinion is that the Good Friday program should be simplified, and we are happy to trial a new system in 2010, provided it meets with the satisfaction of the Technical Committee and the OA Board. We can see two clear alternatives:

1. The **Elite Prologue** is followed by a **Public Prologue** (incorporating the **Family Teams Event**). The Family Teams Event would be run in much the same way as the current Family Relays: each Family Team would have to nominate 3 people, one on each of the short, middle and long courses. But each team member would run their race individually, as part of the Prologue (Public or Elite). Team results would be summed at the end of the day to provide an outright and handicap winner.

2. The **Elite Prologue** is followed by the **Easter Relay Extravaganza** (incorporating the **Family Relays**). Two relay courses would be offered as part of the Extravaganza. The short relay course is the traditional short – middle - long; the long relay course would be a middle-long-long combination. Entrants would have the option of specifying their team & course; or else would specify which leg they would like to run (short, middle or long) and the organisers would place them in a randomly allocated team. For a family team to be official, they would have to run the short relay.

This proposal was distributed to all states for consideration; the majority supported the first Option which will now be used in 2010. Extending this option to a permanent rule change will be considered at the OA 2009 December Conference.