

# ORIENTEERING WORLD



IOF

**Orienteering  
racing towards  
a new millennium**

No. 2

INTERNATIONAL ORIENTEERING FEDERATION

1999

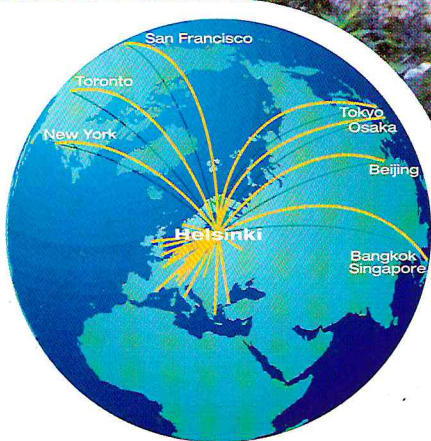
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## PUBLICATION NOTES

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**Front cover:** Orienteering stands on the threshold of a new exciting era. Technology development will enable spectators and TV viewers to participate in the story of the competition and to see the athletes, here represented by the Czech elite runner Rudolf Ropek, racing through the forest. Photo: Pirjo Valjanen.





**M**ost sports, including orienteering, have a lot of common characteristics.

Yet all sports enthusiasts

claim their own particular sport to be special. And so does orienteering. What distinguishes orienteering from other sports and makes it special? Well, for example the sports stadium.

Athletics, volleyball, Formula 1 motor racing, ski-jumping, and swimming, to mention only a few; all of them need a stadium or a sports hall. Orienteering does not require any permanent buildings. Natural terrain is the sports stadium.

Orienteering can be adjusted to fit the local conditions. The orienteering stadium can vary from heath, moorland and city parks to deep forest, from plains to hills and mountains. The events can be organised in urban areas as well as in remote places.

However, because of the particular nature of the sport, orienteering also has to cope with particular challenges. How can TV viewers and spectators follow the progress of the competition when there are no 'ringside seats' for them in the terrain but only at the finish area?

And when, on the other hand, would allowing spectators in the terrain affect the fairness of the competition?

Now, on the doorstep of the new millennium, orienteering is revealing the secrets of the sport to the public, offering spectators and TV viewers ringside seats. Without giving up the essence of the sport. How?

By using advanced technology. Welcome to the wonderful world of orienteering!

*Barbro Rönnerberg*

## Richest prize in sight

SUE HARVEY,  
IOF PRESIDENT

**T**echnology development has affected most sports at some stage. In athletics we hear that a particular track is "fast" or "slow". We have false starts recorded electronically instead of manually, and tracking cameras to provide close views of every stage of the action.

All sports enjoy better equipment and all athletes now have all kinds of technology to assist training.

In orienteering technology has revolutionised several aspects already: for the organiser electronic punching has removed the chore of checking control cards and calculating results, while the athlete and trainer take advantage of knowing the split times.

Despite these advances, perhaps for orienteering the biggest technological revolution is yet to come, and it will be in portrayal of the competition on television. I say "competition" on purpose.

It is the development of the competition – how the competitors progress against one another, and their emotions as this unfolds – that is of interest to viewers and enthusiasts, not merely who won.

Tennis was a relatively boring game to watch on TV until the use of a combination of several camera angles, plus close-ups of the competitors' faces, enabled us to follow exactly what was happening and how the players felt as the game progressed.

Now two months ago, for the first time in my life, I had the experience of getting excited as I watched orienteering on TV. The occasion? A promotional video prepared by the WOC 2001 organisers.

The video followed the progress of



three runners, starting with them punching at one control and then alternating clips of each in the forest with shots of the map showing how each was progressing along his chosen route.

Significantly, it was transposed out of real time so that it was as if all three were running simultaneously, so that as each reached the end of the leg his elapsed times flashed up as he punched.

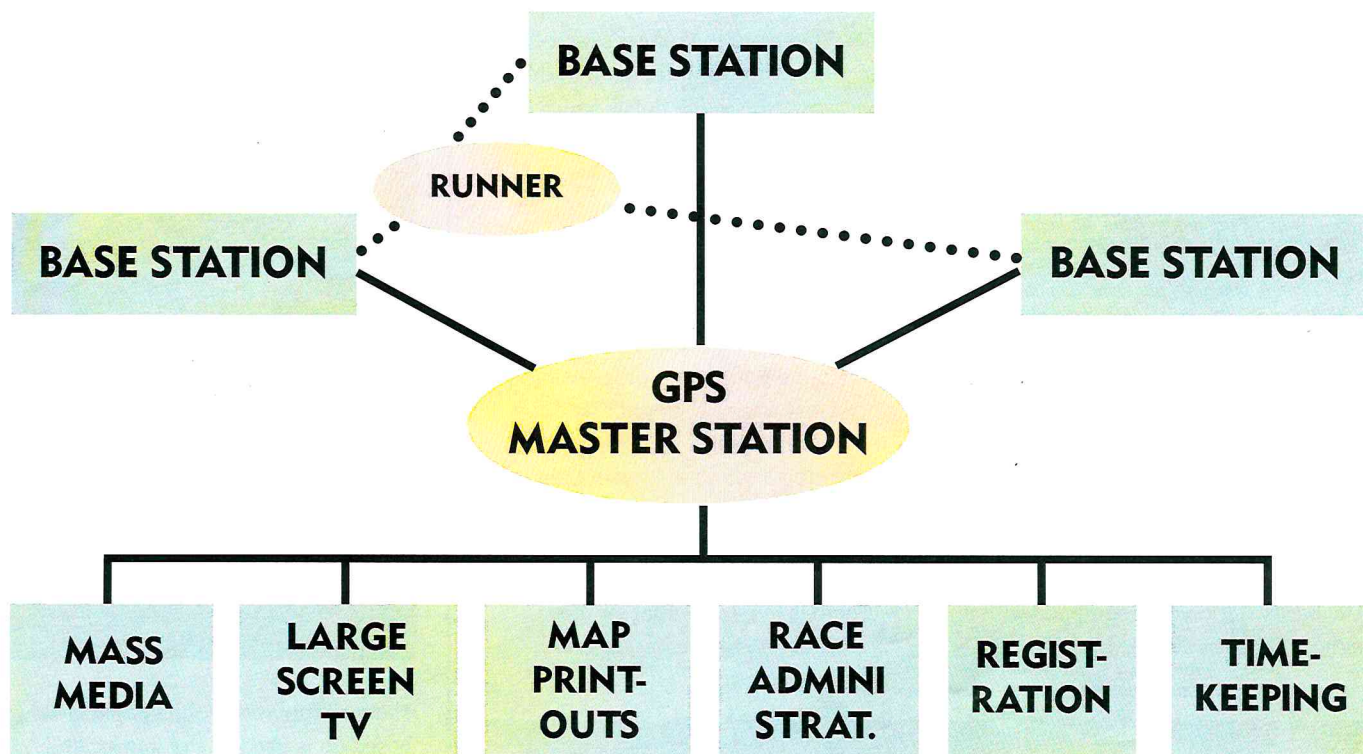
The important thing was, as a viewer, that you felt the tension as you saw the athlete racing through the forest or while you waited for him to appear at the control.

You experienced the disappointment and frustration as he missed the control because you could see on the map what he was doing, and the clock meanwhile ticked up the seconds. You could feel the excitement our ancestors must have experienced as they hunted down their prey in the forests of old.

This is the fascination of orienteering when you take part yourself. We still need to add close-ups of the runners, and terrain modelling to make it more understandable for the less specialist, but when technology can enable the viewer to participate in the story of the competition as it proceeds, then orienteering will provide some fantastic viewing.

Such development is not so far away now. Technology development is about to offer our sport the richest prize.





*The principle of Silva's Time Track System. The diagram has been published in Skogssport, the Swedish orienteering magazine.*

#### REAL TIME POSITION MONITORING SYSTEMS

## On the tail of the orienteers

BY SARA THÖRN

**B**eing able to follow the runners' routes through the terrain during a race – is this the key to creating interest in orienteering? Opinions on this are divided, but the fact is that many, many hours of thought have been invested during the 1990s on developing a technology that can make this possible.

There are several more or less fully developed systems for tracking orienteers in existence. Most of them are based on the runner carrying a GPS transmitter which continually transmits the runner's position.

All the information is then processed by a computer program and then displayed on a digital map where the spectators and possibly also TV viewers can follow the progress of the race. What is common for all the systems is the high cost which is hampering development and making the companies doubt its financial viability.

### Four runners in a historic competition

A small group of technologically interested orienteers in the Finnish o-club Korahdus developed a tracking system which was tested in September 1997. One of the leading figures of this group was Marko Häkkinen who is also a member of the IOF Technical Development Committee.

55 senior men battled for the four places in the historic final round of the race, which was followed "live" on a big TV screen by a large interested group of spectators. This first real race to use GPS technology was won by the Finnish national team member Timo Karpinen.

Experience from this race was overwhelmingly positive. In spite of apprehension about the reliability of GPS technology there were never any problems in tracking the runners whose position was updated every five seconds. A similar system, Veosport,

was also being developed in Norway but this development project was discontinued a couple of years ago.

### 4,000 runners simultaneously

Silva's Time Track System is partly based on different technology. Here the runner does not carry a GPS transmitter but a considerably cheaper radio transmitter instead.

– In the initial stage of the project we did intend that the runner would carry a GPS transmitter, but it proved too expensive. We are now planning to have a transmitter weighing about 200 gm which can be carried on the runner's arm or leg, says Stefan Dahl at Silva.

The idea is not only to equip the elite runners with transmitters, but all runners at the event. The runners will then be able to buy a print-out of their own race map complete with their split times and their own actual route drawn on the map.



– We have a system that works fully acceptably for the needs of orienteering. It means that we can follow 4,000 runners simultaneously and track them in the terrain to an accuracy of ten metres for 98 per cent of the competition time, adds Stefan Dahl.

### **Base stations track the runner's position**

The signals transmitted from the runner are received by a number of base stations in the terrain. The number of base stations required is determined by the nature of the terrain.

The bases stations are equipped with a radio receiver, radio transmitter and

GPS. They track the runner's radio signals and transmit them on to the master station at the finish, which processes the information by computer.

A whole range of interesting information can be created from the master station. This may be the display on a big TV screen of how the most interesting runners are progressing through the terrain, or printing out maps for individual runners with their exact route plotted in. Stefan Dahl can also see many development opportunities in other areas.

– There is huge potential for the application of the technology, with

regard to military exercises for example. The system has the capacity to track each individual soldier, and subsequently after the exercise to replay exactly how all the participants have moved, thus providing unique opportunities for analysis.

### **Poor profitability means that companies are hesitant**

Cartesia is a Swedish company at the leading edge of the development to link GPS and digital maps. The system which Cartesia is developing for its realtime presentation of an orienteering race is based on each runner being equipped with a combined GPS and radio transmitter, which weighs around 500 gm.

The technology that the system is based on is used by the transport industry among others, in order for example to follow the route of an aircraft or to track the route of a lorry.

– Designing a transmitter for such a purpose is straightforward. The problem with a transmitter suited to orienteering is both that it has to be small in size and also that it requires a

*Finnish Jouni Kahelin had the honor of being the first test competitor of the Korahdus tracking system and equipment (left and next page).*

*The audience was very excited about the test race (below).*

PHOTOS: MARKKU LEINONEN









# Electronic punching, of course

BY ERIK BORG AND IAIN ROCHFORD

In Norway about 90 per cent of orienteering races use electronic punching. Electronic punching has become so popular with the youngsters of Løten Orienteering Club that they are not very happy when they have to go back to using traditional control cards and pin punches.

The latest technological developments will soon allow almost instantaneous transmission of runners' split times from a control in the forest to the finish where they can be displayed on-screen for the spectators. Since 1997 electronic punching has been used for all the major events in Norway. It is now also being used at all national-

level competitions. The yellow or orange e-card has now become as important a part of the orienteer's kit as his compass.

– I have my e-card along with my compass in the bag I take with me to orienteering races, so I always remember to take it with me, says Magne Dæhli.

12 year-old Magne is the son of Sigurd Dæhli, the Nordic champion from 1977 and Norwegian team member in the 1970s and 80s. Sigurd is also one of the club leaders of Løten Orienteering Club, located about 120 kilometres north of Oslo.

– The youngsters really like electronic punching and I have never heard any of our older members complaining either, comments Sigurd.

– It's so easy to use and to carry with you. I think the old way is so cumbersome in comparison, adds his son Magne.

Ingrid Urseth from Tolga, 300 kilometres north of Oslo, also thinks it's OK using e-cards.

– Using the e-card means that you can eliminate mistakes which may arise when you have to look at the map or the control card to find the exact place on the card where you have to punch. It's so simple with the e-card, explains Ingrid.

In Bergen, Norway's second city located on the west coast, electronic punching is used at all the midweek corporate races held on summer evenings. The introduction of this new form of punching has seen a 30 per cent increase in participation levels, from 350 to 450 runners every week.

## Saves work

The person responsible for electronic punching at Løten Orienteering Club, Willy Grønstad, says that he really enjoys comparing split times with other competitors. When he gets home he logs onto the Internet to download all the split times for his class. He also relates that the Løten club can organise a race with far less people than before. All the volunteers who used to manually check control cards and work out results are no longer needed.

– Electronic punching means that for our major competition at Whitsun every year we need seven to ten fewer people than before. In total we need about 100 helpers, but with electronic punching we require fewer people for the start and results teams. Although there is a bit more work to do prior to the competition, we are saved a lot of work during and after the race, he adds.



*Ingrid Urseth thinks it's very convenient to use electronic punching.*

PHOTO: ERIK BORG



Dag Olav Rønning, technical consultant at the Norwegian Orienteering Federation, believes that the only disadvantage of the system is the financial aspect. The initial investment is quite costly, but prices are getting lower.

### Two rival systems

At present there are two main rival, Emit and Sportident. Emit has sold equipment to 25 different countries and over 50,000 individual e-cards. Sportident has reached a figure of 15–20 nations and around 25,000 e-cards sold. There are many countries where only a few control units and e-cards have been sold and the two companies are battling for market share. Finland and Norway have chosen Emit while Sportident is the market leader in Sweden and has been used at most of the big events this year. Emit was chosen for the World Championship in Scotland and for Tiomila while Sportident was used at the Swedish 5-day and most of the other big summer events.

– I think the orienteering world is big enough for two different companies. We have started planning for other sports, comments Gunnar Larsson, one of the four Swedish partners of Sportident International, which markets the system in most countries.

Sportident in Germany does all the programming work and also the marketing in some selected countries. The Norwegian Emit company already supplies timing systems for other sports, such as cross-country skiing. Orienteering accounts for about 40 percent of the company's activity.

### Finish line

Both Emit and Sportident incorporate the facility to lay a cable from the control unit in the forest to the finish. When someone punches at the control it will then be possible to view the time directly. Soon the cable will be redundant. From next year Sportident will have the facility to transmit registration of punching by the runner at the controls to the finish by radio signal. Emit is designing make a solution using a mobile phone or satellite phone.



*Magne Dæhli has become very used to using his e-card. He now prefers events which use electronic punching.*

PHOTO: ERIK BORG

– Everything will then go directly to the Internet and everyone in the world can in theory see what is happening at the control with this kind of transmission of data, comments Bjarte Dyngjeland from Emit.

Other future features from Emit include the facility for the data to be downloaded automatically as the runner crosses the finish line without any human intervention at all.

### Not such a large difference

Emit and Sportident are quite similar both in terms of equipment, price and method of use. Emit has a better manual punching backup with the mini-control card on the reverse of the e-card while Sportident is a bit easier to punch with and it also gives a small beep and lights up to indicate to the runner that the punching has been correctly registered. Many orienteers appreciate this beep but Bjarte Dyngjeland say that Emit don't want to

include any audio signal in their control units.

– It should be silent in the forest so the control site is not given away to other runners by the sound of a beep, but the control unit can be equipped with a light if this is required, states Bjarte.

Both Emit and Sportident have also designed equipment so that you do not need a computer at all in order to use electronic punching. Do orienteers like this kind of punching?

– I think a lot of orienteers are “technologically-minded” and one of the fascinating things with the sport is to be able to compare different route choices by viewing split times.

– Our e-card costs around US\$ 30. That is not really a big investment for sports equipment. I think it is very favourable in comparison with most other sports, replies Bjarte.



# Internet and email

BY IAN BAKER

It's the year 2003. Communication within orienteering in Australia has changed in the last few years. In a way it all started in 1997 when a survey of orienteers showed 52 percent had access to the internet.

In 2003 there is still a magazine *The Australian Orienteer* but it is devoted now to features which are not time sensitive; people still like to hold something in their hand and to read this sort of thing in a well produced magazine, which they can keep; the age of paper has not entirely passed.

The cost of colour printing has come down due to electronic technology and the whole magazine is now in colour.

Thanks to the up-to-date central data base with members' addresses, the magazine is posted direct to orienteers' homes the same day it comes off the printing press.

The few orienteers who do not have internet are served by being sent print-outs of essential information.

The above is not just a dream.

The Canberra area association emails a brief weekly bulletin to all members who register their email addresses.

Content includes coming events for the week with any update information, functions and club meetings.

The vast majority of Mountain Bike Orienteers are on the web which means that results and topical news are circulated quickly that way.

Ski Orienteering will create a web site for winter 2000; particular use will be to give updates on fixture changes through snow conditions.

There are plans to promote orienteering on the net by constructing web pages on schools and development activities, junior squad and school team members.

## Changing roles

In recent months the Orienteering Federation of Australia (OFA) has taken steps to prepare for greater use of electronic communication and administration.

Australians are among the world's heaviest internet users per capita, behind Finland, Sweden, Iceland and USA. About 19 percent of Australian homes currently have internet access with the number growing by 50 percent a year.

Two thirds of children and teenagers are current users of the internet. More than 80 percent of adults are expected to be connected by 2005.

The Orienteering Federation of Australia saw the need to get an accurate fix on members' access to internet and to update this on a once-a-year basis. Uses of the information would include hard data to enable the federation to review:

- Changing role of national magazine
- Changing role of state and other newsletters
- SportNet or similar facility; benefits include membership data base, event data base, on-line event registration, shopping with commissions to the sport. Potential to improve administrative efficiency and thus save costs;
- Communication with members generally.

In view of the increase in internet usage and facilities available, there might be other areas of interest in the future.

Research by including questions in membership forms showed that internet access by orienteers in the range 65–75 percent (52 percent at Easter 1997), compared with 19 percent for all people.

The Australian Sports Commission and Telstra officially launched SportNet in May. Their intention is to offer sports an integrated package based on electronic technology. The OFA is currently seeking to evaluate this option.

Whether the federation decides to take part in the ASC/Telstra program, develops its own or does something different depends on more detail, especially cost/benefit and timing. One possibility would be to trial SportNet in one state for a period. This would probably be New South Wales since it has the greatest number of members and a high proportion of pre-entry events.

## The national magazine

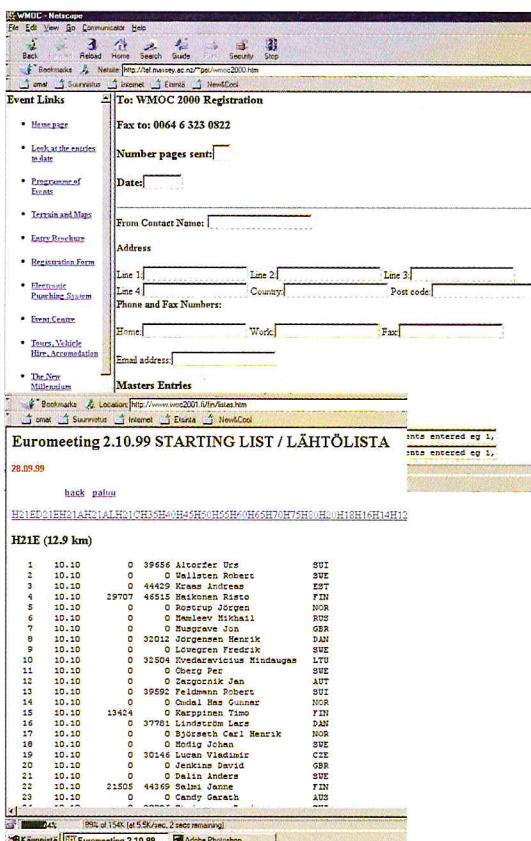
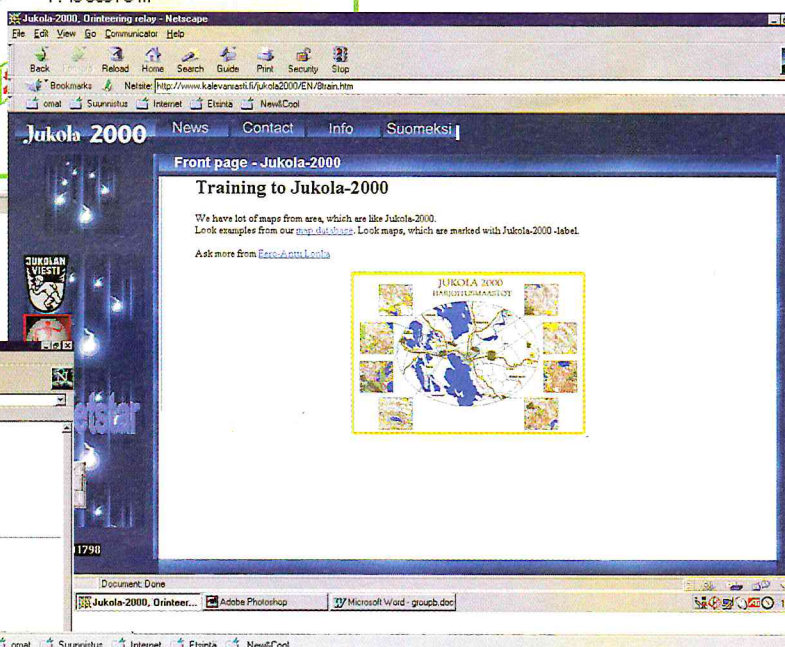
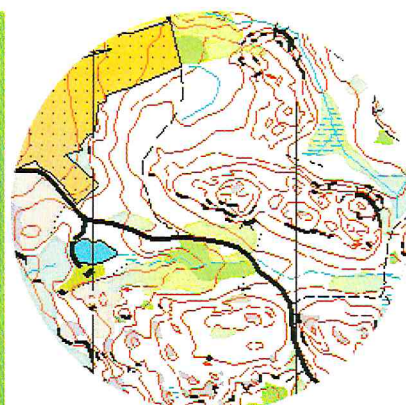
*The Australian Orienteer* is sent to all registered members four times a year. Many articles now include references to web sites and an innovation is a new regular feature "Web sites for Surfing Orienteers".

Event information and above all results are normally available so very much faster than a quarterly magazine can bring them to members.

With the high and increasing penetration of the web among Australian orienteers, the role of *The Australian Orienteer* and similar magazines is in a state of change and will continue to evolve.

*You can find a lot of information from the Internet. You can find out about the sport of orienteering by learning for instance how the compass works. You can also find maps and information about the competitions, even your own start time. You can enter races from your PC by filling-in an on-screen entry form.*





Kjetil Kjernsmo's illustrated guide on

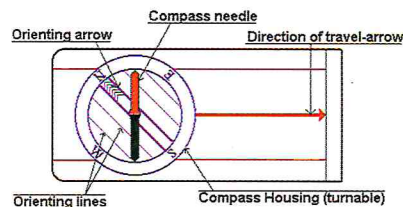
## How to use a compass

### Using the compass in interaction with a map

This is the important lesson, and you should learn it well.

It's when you use both compass and map the compass is really good, and you will be able to navigate safely and accurately in terrain you've never been before without following trails. But it'll take some training and experience, though. I am not covering map reading here, guess you would have to consult other sources for that, but the lesson will be useful if you have a sense of what a map says.

Here is our compass again:



The principles are much the same as in [lesson 1](#) but this time, you are using the map to tell you which way is correct instead of your intuition.



# Swiss orienteering on the Internet

By PATRICK ZEHNDER

**T**hank you very much for organising the junior championships so well last weekend. We had some great competitions, a roof over our heads and plenty of good food.

These words of praise from a young team leader were not written in a personal letter to one of the organisers, but in the half-public discussion forum on SOLV's (the Swiss Orienteering Federation's) world wide web site at <http://www.solv.ch>.

Thanks to the many services it offers, this forum serves, above all, as a means of internal communication, even though some of the topics are directed at those who do not participate in orienteering.

The Swiss Orienteering Federation first appeared on the Internet over three years ago. Felix Moser was the far-sighted initiator of the web site, which is now an indispensable part of the Swiss orienteering scene.

The fact that up to a thousand people access the site daily speaks for itself. In 1996, Moser considered a web site as a necessity of modern times. He stood aside at the beginning of this year, when Björn Tiemann succeeded him as head of the association's own Internet group.



Björn Tiemann

Four people started working with no apparent pecking order. Mostly they dealt with invitations to competitions, information about the national team and ranking lists.

The ideal staff member logs on to the Internet several times a day and has plenty of free time – especially on Sunday evenings when the results of the weekend's races are being compiled.

Along with their enthusiasm for this new means of communication, the helpers – who are usually young – possess tremendous staying power and they update pages of the web site as necessary.

Tiemann, whose first experience with the Internet was in 1992, well remembers the inception of the web site.

– Everything grew slowly. At some point we decided on a simpler design. The ensuing disagreement caused some people to step down. Services for the active orienteering competitors were then added.

– The organisers also benefit when they are able to display their invitations and information in a prominent position. The electronic race entry scheme failed initially, because electronic methods of payment were not sufficiently developed.

– So, what does the Swiss Orienteering web site have to offer outside visitors?

– We have some topics which interest those who are new to orienteering. For example newcomers want to know what orienteering is, or would like to know about the Federation and how it works, explains Tiemann and continues.

– Besides, we can be found through some search engines and via links. However, promoting the Federation

was never the aim of our presence on the web. In any case, just how effectively the Internet site can target the general public, is questionable.

– Additional measures such as competitions with attractive prizes, or an advertising campaign, will certainly boost the site's presence on the Internet. Large companies do this at some cost to themselves. At present, the Swiss Federation spends 3000 Swiss Francs yearly on its web site. Only part of the costs are covered by the sale of advertising space.

On normal days 300 users access the Swiss Federation's website, and on peak days there are up to a thousand users. This was the case when competitors from the world championships held in Scotland could be followed live, or when commentary of the junior championships in Bulgaria was first hand, and up-to-date pictures were posted on the web site.

Other enthusiasts are also involved. There are those who follow the competitions – holding a mobile phone to their ear – in order to make interim reports to Switzerland.

At such times the discussion forum – which was set up thanks to Björn Tiemann – is very active. Discussions include justified criticism of the Federation's representatives, and modest words of appreciation for the well-organised weekend of races held at the foot of the 2120 meter high Mt. Pilatus, near Luzern.



# Towards the screen

By NINA VANHATALO

In the future the digital television could offer for instance the following opportunities for an orienteering race.

**A:** The opportunity to track a selected runner live during the race and to show the runner's current time compared to the other competitors.

**B:** The opportunity to show a map extract showing where the chosen competitor is at a given moment.

**C:** The opportunity to display selected statistics, for example split times or total running time at the different controls.

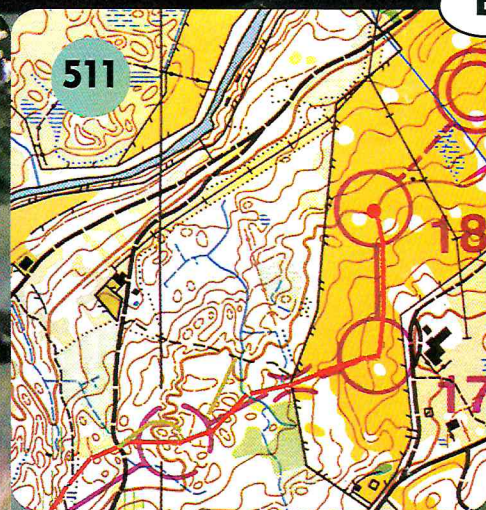
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511	Kirsi Boström	FIN	1.17.16	-1.20	17-18
1. 514	Yvette Baker	GBR	1.18.36		0.38

B



## Control 12 (6 still to come)

				11-12	Rank
1.	511 Kirsi Boström	FIN	1.03.44	2.47	16.
2.	508 Hanne Staff	NOR	1.05.38	2.31	3.
3.	518 Vroni Koenig-Salmi	SUI	1.05.46	2.14	1.
4.	507 Reeta Kolkkala	FIN	1.05.58	2.28	2.
5.	514 Yvette Baker	GBR	1.06.08	3.12	31.
6.	512 Külli Kaljus	EST	1.06.43	2.40	9.
7.	522 Gunilla Svärd	SWE	1.06.51	2.47	16.
8.	526 Brigitte Wolf	SUI	1.07.30	2.43	13.
9.	516 Anna Garin	ESP	1.07.54	2.54	18.
10.	530 Danute Mansson	LIT	1.09.06	2.42	11.
11.	528 Frauke Schmitt-G	GER	1.09.16	3.10	27.
11.	515 Giedre Voveriene	LIT	1.09.16	3.11	30.

505 Johanna Asklöf FIN -4.28

C





**O**rienteeing is a competitive sport which is carried out in an ever-growing number of countries throughout the world. It is a sport suitable for all kinds of people, young and old, recreational orienteers and top athletes.

Skills required in orienteering are also used by most people in their everyday life. Yet the media coverage of orienteering is not as extensive as one might imagine or it deserves.

In some countries, such as in Scandinavia, orienteering is appreciated among the sports journalists and articles are included in

the newspapers. The Finnish Broadcasting Company, Yleisradio, broadcasts the annual Jukola night relay event live all through the night on the radio.

Thus, there is some media coverage of orienteering, but in today's world, all sports need to be on TV to attract more people and in order to get sponsors and thereby resources. Why isn't this popular sport seen on the TV screens more often?

### **Where is he and how is he doing?**

As a sport, orienteering meets with all the existing criteria of television. At the international level, orienteering is practised in a sufficient number of

countries and there are enough potential viewers.

– First of all, the event format is difficult, says Kalevi Uusivuori, a TV director at the Finnish Broadcasting Company, Yleisradio.

According to Uusivuori, the format of the orienteering course is not so easy to match with the format of a modern, live television sports broadcast.

– The entire competition needs to be over within 90 minutes and with the traditional orienteering event format that is not possible, adds Uusivuori.

Television is interested in two fundamental issues which appear simple enough to answer. The aim is to show to the audience the competitor's whereabouts and tell how well he is doing.

But when applying that to orienteering, where the competitors run in the forest looking for the controls, answering those questions becomes more difficult than it first might seem.

To be able to capture the essence of the sport and to be able to present this to the audience is the key interest of





Kalevi Uusivuori, an internationally renowned sports director. He has been responsible for many challenging TV broadcasts, for instance at the Winter Olympics in Nagano.

Uusivuori is also an orienteer, so the challenge of broadcasting an orienteering event is close to his heart. Now he will get his chance: he was recently chosen as the director of the production of the World Orienteering Championships in Tampere in 2001.

– I would like to help the viewers to understand the philosophy of orienteering, he explains.

In his vision the television audience will be able to follow the orienteers' route to the controls, their route choices, their success in finding the control, their hesitation and their mistakes.

He wants to show the whole process going on in the forest and not just a sudden appearance at one control and then maybe crossing the finish line.

In order to achieve this vision, some key issues will have to be addressed. The main one is the course. It may be well planned from the orienteers' perspective but not necessarily from the television broadcaster's perspective.

– The control points need to be placed in a more television-friendly way. The first question: Where is the competitor now?, will be answered if the needs of the television are taken into account when planning the course and choosing the control points.

To answer the second question: How well is he doing?, there is a need for a rapidly working results service.

Television as a medium requires the facility to provide the results in real time and, according to Uusivuori, that is particularly difficult in relay events where course spreading methods (gaffling) are used to ensure that the runners do their own navigating. Then it is impossible to show in real time how well a particular competitor is



*There were also radio journalists as well as TV journalists and press representatives in attendance. Here, Finnish sports journalist Jörgen Nyman interviews Mats Haldin of Finland after the men's classic distance race in the World Championships in Scotland.*

PHOTO: NINA VANHATALO

doing. The lack of adequate technology is still a key question.

The question of money cannot be ignored, either. When the orienteering events are organised in a wide area in the forest, the production costs are high.

– To build all the equipment in the forests takes a lot of time and a lot of testing, and that is not cheap, Uusivuori explains.

### **Brighter future**

Even though there still are a few things to be solved in order to pave the way for more extensive TV coverage of orienteering, Kalevi Uusivuori expects that most of them will have vanished in two years time.

There are already some new more TV-friendly formats of the sport, like park orienteering. Being an orienteer himself, Uusivuori is able to make an apposite analysis:

– The sport is different then. In park orienteering events the emphasis is more on running, whilst in the forest, you can be at the top of the results without running at top speed all the time.

It is easy to conclude that the problems are not technical. With today's technique it is easy to get close-ups of the competitors if the other issues are solved.

According to Uusivuori, digital television will enable the viewers to follow an orienteering event on the screen even better than now.

– With digital television the viewer may choose which orienteer he wants to follow. He can also choose to have the results service on the screen, and maybe even the map so that he can follow the route of the orienteer he has chosen, Uusivuori explains.

– This technique mainly serves for those who already know the sport. For those who don't have any knowledge of orienteering beforehand, it doesn't help that much in making the sport understandable.



# From the beep to performance

By MICHAEL GRILL

In an interview with Lucie Böhm the Austrian Short Distance World Champion in 1997 who narrowly missed out on defending her title this year in Scotland, Lucie comments on technical developments in modern orienteering:

"A compromise will have to be found between the demands of the media and the essential characteristics of orienteering."

**OW: In the stone age of orienteering, people headed out to the forest**

wearing athletics spiked shoes and equipped with a three colour 1:25.000 map. They ran round in circles looking for dubious controls after navigating roughly on massive long legs between controls, losing a quarter of an hour in the process but had a lot of fun. Nowadays, World Orienteering Championship (WOC) medals are decided by seconds, and we are discussing the application of live TV coverage from the forest.

**L**ucie: That must have been a totally different era. Although I

never competed on such a map, I think I would prefer today's technical orienteering.

**The technological development which has the closest impact on the orienteer is the new electronic way of punching. Comparing the two most frequently used systems, Emit and Sportident, what is the difference between them for an elite runner such as yourself?**

**P**ersonally, I prefer Emit as it fits into the palm of my hand better. There are different opinions, of course, but the Sportident e-card (SI card) is difficult to fit into the hole of the control unit. And waiting for the unit to beep distracts me.

The first time I used the Sportident e-card, I reacted to the blinking of the light, but didn't hear the acoustic signal at all. Maybe I was too concentrated on the competition and dashed off without the unit registering my time. I find it particularly difficult to wait for the 1-2 seconds it takes for the unit to register the runner's e-card, maybe because it disturbs my rhythm of moving and thinking.

**Many ordinary orienteers prefer the smaller SI-card. Any wishes for further improvement of the punching systems?**

**Y**es, the back-up paper of the Emit e-card is easily either spoilt or totally lost. It would be good if I didn't have to bother about this at all.

**As you are not organising events yourself, you might not be aware of the enormous costs of these units. Is orienteering heading into a two-class society, where only well-off federations and large clubs are able to afford such systems for their competitions?**

**P**rices will continue to go down to make the punching systems



Former World Champion Lucie Böhm is already very familiar with electronic punching.

PHOTO: ERIK BORG



available even for smaller nations and clubs, still, I think only one set per area is enough so that it can be used for all ranking events and championships.

At the recreational level of orienteering, the traditional paper control card will still be used.

**With WOC 2001, the orienteering community is about to experience the ultimate visibility for the public: Director Juntunen announced that there will be live TV coverage from all controls – as did some of his predecessors in previous WOCs. Are you looking forward to carrying around a GPS box weighing 250 grams?**

I assume they will only use devices which have been thoroughly tested beforehand for the runners. If these are as light as forecast, I'd be pleased to carry such a box secured around my waist.

**Talking about the internet, about media coverage in orienteering. Do you enjoy the benefits – what should a brilliant TV programme on the sport be like?**

In Sweden, an entry official does the entries for me in the Lidingö club. As I am not very often with my club, e-mail communication is of great help. And I browse the net some days before the competition to get information about the course length and so on.

About the TV-program: Two or three controls with a camera are enough, but you need to choose the right ones, either a longer running distance prior to the control, or a tricky technically-demanding control. Definitely not one where the runners come uphill or stop for a long time.

It takes a good director, who knows the essence of the sport, like the way in which some Austrian TV directors handle the broadcasting of ski races: the right picture from the control, running time counting down for the previous leader and runner to come, like in cross country skiing. And a knowledgeable speaker is needed.

*- We need to find a compromise between the demands of the media and the essential characteristics of orienteering, says Lucie Böhm.*

PHOTO: ERIK BORG



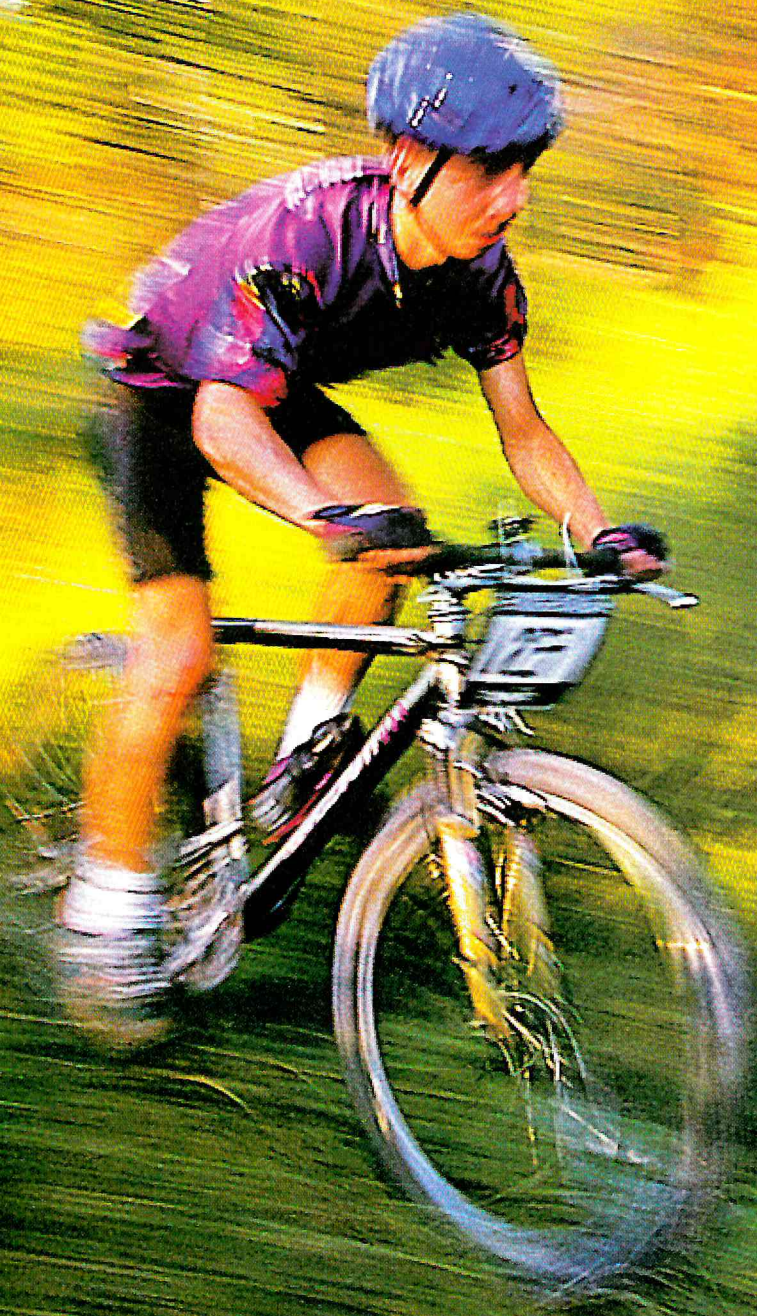
It's definitely time now to put some effort into the presentation of the sport. Even if coverage is costly, we need to take the step towards creating more publicity for the sport and making it more public now. A world championship must present itself to the people, not as it has been done recently, although the areas were perfect.

But I think orienteering must cease to carry an image of "people performing

out in the dark forest". To a certain degree, a compromise has to be found between the demands of an elite competitor and the demands of the media:

"We, the elite, the sport have to address the different requirements and sometimes accept easier controls for the public. A spectator control is not always easy, even getting the direction of the next control right is difficult when you are in the limelight of spectator."







# From basic navigational aid to lifestyle product

BY NINA VANHATALO

**I**t all started 69 years ago. Tuomas Vohlonen, a Finnish land surveyor and himself an orienteer, invented a compass which was much more stable than its predecessors. The secret of his invention lay in the liquid. The needle of the compass was considerably steadier because it was situated in a liquid filled capsule.

That was also the beginning of the Finnish company Suunto. The company has grown much bigger since the first invention.

The number of models has increased, the models and the designs have changed, and the development of advanced technology has brought new aspects to compass production, but the basics of compass manufacture are virtually the same as they were in 1936.

## Choose your favourite compass

– We now have hundreds of different compass models to suit all kinds of requirements, explains Kimmo Pernu, the Mechanical Design Engineer at Suunto.

Compass development has now reached the level where there are different compass models for different requirements. For those who just need a compass for a camping purpose there is a simple model at a reasonable cost.

And there are compasses equipped with stronger magnets to meet more demanding requirements for extremely precise measurement and navigation. There are even fluorescent models for use at night.

You can also choose your favourite compass according to its size. There are smaller ones that can be attached to your fingers or your thumb, so-called thumb compasses, or larger hand held models designed to sit in the palm of your hand.

In the compass world the globe has been divided into five geographical zones. Because of the small space the needle has in the capsule, it has to be balanced according to which zone of the earth the compasses are to be used.

– The closer you are to the North Pole, the more there has to be weight at the end of the needle. But, if you use that compass in Australia it stops working. The magnetic field pulls the needle to the upper position so that it can't move anymore, relates Kimmo Pernu.

With the newest invention these "problems" have also become history. After fulfilling nearly all the requirements for a compass, Suunto decided to take a step further.

## All in one

With previous experience of the use of electronic technology for use underwater, the development team started to investigate the possibilities of applying the same technology for use above the surface. In 1996 they obtained the first indications that this might work, and so began the story of the development of the wristop computer family.

At first, the people at Suunto predicted that Vector, the first product in the wristop computer product line, would have to assume the role of a challenger. However, after a few months, it turned out that Vector was able to assume the role of a forerunner in this newly established product category.

Vector has already received some international awards. It was introduced in August 1998 and it was designed for outdoor use, for people who besides needing a compass also want to know what time it is, how high up they are, what the temperature is and what the changes in weather conditions will be.

Vector even functions as a logbook and records the course of events.

– Mainly these devices make sports more interesting, and because they have so many different capabilities, you get all the functions in one single device and you don't need many different devices anymore, explains Kirsti Laasio, Marketing Manager of Suunto.

Today there are already six members in that model group serving different target groups. There are models for the needs of hikers, skiers, mountain bikers and orienteers, not forgetting yachtsmen. The newest member of the wristop computer family is called Advizor, and it even features a heart rate monitor. The compass has become a lifestyle product.

– There is definitely a market for these kinds of electronic computers. Our sales have been much bigger than expected, Laasio continues.

The computerised technology now takes up most of the development team's time but everybody at Suunto still believes that the normal "mechanical" compasses are needed as well. Today the share of the "mechanical compasses" accounts for a quarter of the total production.

The current rules do not allow the use of wristop computers in competitions. But they could still be used for training purposes.

– We are working together with the International Orienteering Federation to develop the products to serve the sport and the athletes, adds Laasio.

– And the team already has a lot of new ideas on how to improve the existing products.



# A new era for ski orienteering

By ERIK BORG AND IAIN ROCHFORD



*New technology and spectator and media friendly venues can reveal the speed and excitement of ski orienteering to the public. The photo shows Bertil Nordquist at full speed.*

PHOTO: ERIK BORG

**T**he traditional image of ski orienteering consists of long, tough races in cold remote forests.

The new millennium may see a change of image and a migration of the sport, at least for the major races, to spectator and media friendly venues where the speed and excitement of super sprint distances and multi-loop races will add a new dimension to ski orienteering.

The IOF ski-o committee hope that combining the best of the traditional

aspects of the sport with the new ideas will help develop growth and also facilitate admittance to the Winter Olympic programme in the near future.

– If ski orienteering were to become an Olympic sport, it would be easier to achieve better media coverage and greater recruitment, states Bertil Nordquist, the winner of the individual race in Estonia.

Raino Pesu, who was second in Estonia and the overall winner of last season's Ski Orienteering World Cup, is

not sure whether the sport will gain admittance as an Olympic sport but does not believe that remaining outside the Olympic world is necessarily negative.

## **Ski orienteering will survive**

– The sport will survive. It's an excellent sport, even if it will never become a mass participation sport like football, comments Pesu.

Stefan Frick, the Swedish national team coach, feels that the Olympics are important for the sport in Sweden.



– The media is very focused on the Olympic sports and most of the money goes to the sports with Olympic status.

Bertil Nordquist is very keen that ski orienteering gains admittance to the Olympic dining table; "Finance is a major factor for the future of our sport and media exposure, especially TV coverage, determines how much interest the major sponsors have in the different sports. The ideal way of attracting public is to organise the important ski orienteering races at the famous skiing venues in the Scandinavian countries, such as Holmenkollen in Oslo, Falun and Lahti.

### **Application for Olympic admittance in 2006**

Ski orienteering is already qualified as an Olympic sport in terms of the number of participating countries, but this was not enough for the sport to be admitted to take part in the Salt Lake City Olympics. The application for these games was negative.

Work on a fresh application for the 2006 Olympic Winter Games in Torino is underway and will be submitted to the IOC before the end of this year.

Juraj Nemec of the Slovak Republic is the Chairman of the IOF Ski Orienteering Committee. He has been in Italy to check out the conditions necessary for ski orienteering to be part of the Olympic programme in 2006.

### **New markets**

Nemec also wishes to develop interest in ski orienteering in new countries. The most important targets are the countries in East Asia. "But I do not believe so much in the mass development of ski orienteering. Few countries have the required conditions for mass participation, it's not really possible to do much about adverse snow and weather conditions", comments Nemec.

Some weeks ago the members of the ski-o committee met in Nemec's home country to design a forward plan for ski orienteering. In addition to Olympic participation, the other main goals are to make the sport more visible and to make it easier to organise.

With regard to the actual race programme, the traditional long distance races may be on the way out to be replaced by multi-lap races organised from ski stadiums. This is advantageous, not just from the spectator aspect but also because there will already be an extensive track network within the vicinity of the stadium so a new network does not have to be driven up specifically for the race. The orienteering technique may not be as difficult as in traditional areas, but the orienteering will still be demanding enough.

– If all the details of a ski-o race are hidden from view, as in traditional races, this acts as a negative factor for recruitment", comments Kåre Kirkevik, another member of the IOF ski-o committee. "We have to make ski-o more attractive to the spectators and the media if the sport is to survive. Ski-o is quite a large sport in Finland, but is quite small almost everywhere else.

– The sport should be as visible as possible, comments Raino Pesu.

– The one-man relay with 2–3 loops is an excellent form of competition. I'm also looking forward to testing out the "super sprint" variant in the World Cup with 10–15 minute winning times, but maybe this option should not be part of the World Championships.

### **Short race success**

Last season four super sprints were organised in Sweden at spectator-friendly venues, one of which at Åre ski stadium. This initiative was met by a very good response and TV covered one of the races.

TV was also present at a similar race in Estonia. This was organised in the skiing district of the country but with regard to spectator interest and publicity it might well have been better to organise the race in a more populated and accessible area, for example the big stadium in the ski city of Otepää where the training event was held.

In the future this kind of location will be the ideal venue for races in line with the ski-o committee's goals. Kirkevik

believes that ski-o can still be technically challenging, even if the runners are familiar with the terrain, as long as the skiing tracks are changed. The main tracks can remain the same, but the underlying network of small tracks should be changed from competition to competition. Raino Pesu, the overall World Cup winner last season, agrees:

– The competition will be fair if the tracks are changed, then no one will gain an unfair advantage.

Kåre Kirkevik believes that there may be 6–7 relevant venues for major national or international ski-o races in Norway. There may be a greater number of such venues in Finland and Sweden, and maybe only 2–3 in other established ski-o nations. Smaller races can of course be held anywhere but Arja Hannus, last season's World Cup winner, thinks that it is important that these competitions too are held close to population centres although the same high standard of tracks and competition is not necessary.

The sport of ski orienteering is facing new challenges and changes in the new millennium.



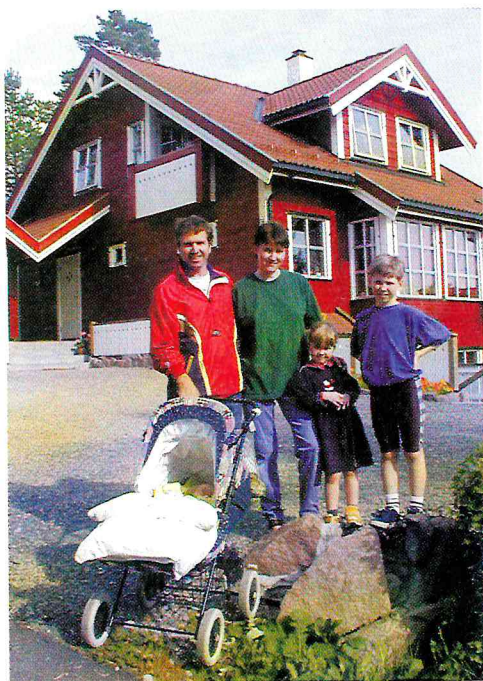
*Kåre Kirkevik suggests that the major ski-o events are held at major skiing stadiums.*

PHOTO: ERIK BORG



# Busy days for Vidar Benjaminsen

BY ERIK BORG AND IAIN ROCHFORD



*Vidar Benjaminsen and his wife Anne and children in front of their house just outside Oslo. It's been newly painted this summer. Guess who did that? Vidar of course (above).*

*Vidar Benjaminsen was among the three best in a World Championship race an amazing total of 15 times. Now he is a father of three, as well as the trainer and coach of the Norwegian Ski Orienteering team.*

PHOTOS: ERIK BORG





**D**o you remember the name of Vidar Benjaminsen? Of course, he was Mr Ski Orienteering with a long and successful international career and a stack of medals and titles from major competitions. Nowadays he is recognised more as a football trainer – of his son's football team.

Vidar is also kept busy in his other capacities as a father of three, as the trainer and coach of the Norwegian Ski Orienteering team, running his own printing business and training maybe a couple of times a month... among other things. Vidar still likes training but it is no longer the most important aspect in his life. A lot of other things like his children's interests and activities now have a higher priority.

– I don't want to be a father who just sends his children to training. I want to stay there and see what is happening. It's good to follow what your children are doing, states Vidar.

Vidar became the trainer of his son Mathias's football team when he accompanied Mathias to training – most of the other parents weren't very interested in getting involved. The boys on the team are quite young and they haven't got more than a couple of victories in 25 matches, but Vidar praises them regardless of whether they lose or win.

– Gaining praise and recognition is very important, especially when you're just starting out in a sport. I remember that from my own career. One of the most vital aspects is to gain recognition and support from your immediate surroundings, both when starting your sporting career and also as an elite athlete when back-up support is essential, such as from the Norwegian Olympic committee with money and other support, explains Vidar.

Vidar's son Mathias also takes part in orienteering. Wednesday is orienteering day.

Did you have any holiday this summer?  
– I had a day off in Lillehammer and a few days in Nord-Østerdal. Maybe not

so much normal holiday, but it's also a holiday for me to accompany the Norwegian team to World Cup races or a ten-day training camp in Ramsau, as I did in September.

Anne Veijalainen from Turenki, 15 kilometres south of Hämmeliina in Finland, and Vidar met in the ski-o-trails. They married in 1987 and that was a big secret even for their parents. The sporting couple first lived for half a year in Finland before moving to Oslo. Anne and Vidar have three children, Mathias (9), Andrine (4) and Juni Marie (born on March 21 this year).

The family live in a new house in Ammerud, one of the suburbs of Oslo, only 50 metres from his parents' house where he runs the printing business and just 100 metres from the hilly forests of Oslo.

– I now look out for hills when I come back to Finland. After living so long in Norway, Finland seems rather flat, smiles Anne.

### A part of life

It's now three years since Vidar Benjaminsen retired from his international career in ski orienteering. One year after retiring he returned to the sport, this time in a capacity as the trainer for the Norwegian Junior Team. Just over a year ago he took over as the chief trainer and coach of the Norwegian Senior Team.

That's on paper. In reality he is still Mr Ski Orienteering in Norway. Vidar has the ideas, the drive and the energy and makes time to fit all this into his life. The Norwegian federation pays him for about 40 per cent of the work he puts in. But as Vidar says, he never counts the hours.

– This is a way of living. I have always worked hard in order to get results. That is a good philosophy for all areas of life. And I am always looking to the future. Ask me about the good old days and I can't answer very well.

And the future for ski orienteering?

– There are opportunities and challenges both nationally and

internationally, even if ski orienteering is not a major sport. The challenge is to get people involved. In Norway we are working to turnaround a negative situation into a positive one. Perhaps the clubs may need resources to organising ski-o races. They can now obtain some financial assistance and can obtain help to acquire snow scooters. Internationally I think it's important that the different parts of the IOF work together in the same direction. At the moment I feel that this co-operation is not always at its best.

### One of the best

In his career as a top athlete spanning 14 years from 1983 to 1996, Vidar won 15 World Championship medals, including four gold – two individual and two relay medals. He won the overall Ski Orienteering World Cup twice and he won the Europa Cup once, before it was replaced by the World Cup. Vidar also won a total of 22 individual World Cup races.

– Why did I succeed? Motivation was important. I'm very competitive and really wanted to beat the other competitors. The prizes weren't so important. One day last week I came across my old medals in a box in the loft. I didn't know they were there. Of course I am glad of them and I think I will be even more glad of them when I get older, but the main thing from the sport is all the joy and pleasure it has given me. I enjoyed it immensely, gained friends and I even my wife and family, relates Vidar with a smile.

Anne was also doing well before she finished her ski orienteering career in 1990. Her best performances were a fifth and an eighth position in individual races and a relay gold medal for Finland in 1998 when the WOC was held in Kuopio, Finland.

– And over there lives Toril Hallan who was in the Norwegian relay team in Kuopio, she says and points to a house about fifty metres from the Benjaminsen household.

– The world is a small place sometimes, at least the orienteering world, laughs Vidar.



# Bright outlook for orienteering at the World Games in Akita

BY BARBRO RÖNNBERG

I have never seen better preconditions for a high-quality orienteering event. That was the spontaneous reaction of the IOF event adviser Knut Nord when he recently acquainted himself with the venue of the orienteering events to be included in the programme of the World Games in Akita, Japan, in 2001.

– The event centre is the brand-new Prefectural University in Akita City. The university is situated right in the middle of the forest area chosen as the venue for the events. The start and finish will both be in the same place, just outside the university building. We will have access to top modern technical equipment for the event administration and the media services as well as to all other facilities required. The terrain is quite open pine forest with good runnability. All in all, I feel confident that the event will meet with all the requirements of a world class event, Knut Nord concludes.

## Thirteen nations already eligible

The International World Games Association (IWGA) and the World Games organiser have approved the IOF proposal to include three orienteering events in the Games programme: individual events for men and women and a mixed relay with an equal number of men and women. The events are scheduled for 18 and 19 August, with a model event the preceding day.

To date, thirteen nations are already eligible for the World Games orienteering events. On the basis of the results of the 1999 World Championships relay event, twelve nations have qualified and are allowed to enter a team of 2 men and 2 women. Those nations are: Norway, Finland, Sweden, Switzerland, Great Britain, Lithuania, Czech Republic, Australia, France, Germany, Denmark, and

Estonia. Additionally, as the host nation, Japan is allowed to enter 2 + 2 runners.

The IOF has been allocated a total number of 80 athletes. The final results of the World Cup in 2000 will be used to fill up the remaining places to the total of 80 runners. The maximum number of runners per nation will, however, be restricted to 4 men and 4 women.

## Olympic Committee support for Belgian athletes

The Belgian Olympic Committee will intensify its involvement with the preparation for the Belgian athletes to compete in the World Games in Akita. That was one of the issues discussed when Jacques Rogge, member of the IOC Executive Board and president of the European Olympic Committee (EOC), for the first time attended the meeting of the IWGA Executive Committee in his capacity as IOC observer on the committee.

The assistance will include not only free travel but also a free period of stay of an extra three days in addition to the normal period as prescribed for their specific sport. Besides, all athletes will receive financial support for training in preparation for the

qualifying competitions in order to meet the qualifying criteria for participation in the World Games events.

In addition to designating Jacques Rogge as an observer on the IWGA Executive Committee, the International Olympic Committee has begun supporting the IWGA by covering the expenses for doping controls at the World Games. The closer working relationship with the IOC will, no doubt, contribute to the goal of giving the World Games the status the sports included and, in particular, the athletes deserve.



The International World Games Association, IWGA, was established in 1980 by 12 International Sports Federations. The IOF became an IWGA member in 1995.

## Previous World Games

Year	Venue	Number of athletes	Number of sports
1981	Santa Clara (USA)	1,265	18
1985	London (GBR)	1,550	23
1989	Karlsruhe (GER)	1,965	19
1993	The Hague (NED)	2,275	25
1997	Lahti (FIN)	1,952	25
2001	Akita (JPN)	2,494	31



# New names and new nations

BY NINA VANHATALO

**T**hirty five national teams gathered in Inverness in the north of Scotland in the first week of August to fight for the medals at the 18th World Orienteering Championships. The new world champions would be decided in tough races in the stunning scenery of the Scottish highlands. The host nation, Great Britain, also had the honour of becoming the tenth nation to have a world champion in orienteering in the 33 year-old history of the World Championships. It happened when Yvette Baker finally fulfilled the dream she has cherished since 1976 and became the 1999 World Champion in the women's short distance race.

– I watched Liisa Veijalainen become World Champion last time the World Championships were held in Britain in 1976 in nearby Aviemore, and this has been my dream ever since, 32-year old Yvette revealed after her victory.

She almost achieved this ambition in the first race of the championships, in the women's classic distance, but at the finishing line she was left a frustrating fourth, a little over one minute behind the victory and 37 seconds away from another medal.

– This was the first world championships that I've felt that I could

win. But I was too nervous for the classic race, because I'm not used to knowing that I could win, explained Yvette.

But when she stood on the start line for the short distance final, she knew that it was her day. The nervousness had gone and she was ready to win. Yvette also liked the terrain a little bit more than that of a couple of days earlier.

– I wouldn't call the classic race home terrain exactly, it was not very British. The terrain in the short distance was more like it, fast-slow, fast-slow whereas the classic was more steady, Yvette commented.

## Historical moments

Another athlete on the podium for the women's short distance race was winning her first WOC medal and the first ever orienteering medal for her country: Frauke Schmitt-Gran from Germany who finished third. Another historical moment was to look through the result lists and to see that for the first time in the history of orienteering, the Scandinavians were left out of the top three. The silver medal went to Austria with the defending champion from WOC 97 in Norway, Lucie Böhm.

Besides Yvette Baker, Kirsi Boström of Finland was the other runner who was

able to fulfil her long-term dream when she found the control points the fastest of all and stormed in to the finish to win the classic distance. She was a little over 30 seconds faster than silver medallist Hanne Staff of Norway, and the bronze winner, Boström's little sister Johanna Asklöf. The women's relay went to the Norwegians, the Finns were second and the Swedes' got their first medal when taking the bronze.

## Long live the king!

The major surprise of WOC 99 must surely be when a young man mounted the victory rostrum amid tremendous applause to receive his gold medal after the men's short distance race: Jörgen Rostrup. The main goal before the race of this 20 year-old Norwegian was just to win a bet and beat his fellow countryman, Petter Thoresen, himself formerly three-times world champion. A chance to win his idol's compass was the small thing that spurred Jörgen on. While one Jörgen was crowned world champion, the other one and most people's favourite, Jörgen Mårtensson of Sweden was hampered by injury and was forced to withdraw before running a competitive step. That gave Johan Ivarsson, Mårtensson's team-mate a chance to exclaim.

– The king is dead! Long live the king.

Second and third places in the men's short distance race both went to Finland in the form of Juha Peltola and defending world champion, Janne Salmi.

The men's classic race saw Norway's Bjørnar Valstad outclassing his rivals over a very tough 15.8 km course to win by almost three minutes ahead of his team-mate and silver medallist Carl Henrik Björseth. Alain Berger of Switzerland raised his country's overall medal tally through the years by winning bronze, but this proved to be the only Swiss medal at WOC 99.

The first three places in the men's relay were a repeat of the women's relay results: Norway, Finland and Sweden.



*Prince Andrew gave a historical royal visit at the World Championships in Scotland.*

PHOTO: PIIRJO VALJANEN



# Orienteering marathons – a developing discipline

By EDMOND SZECHENYI

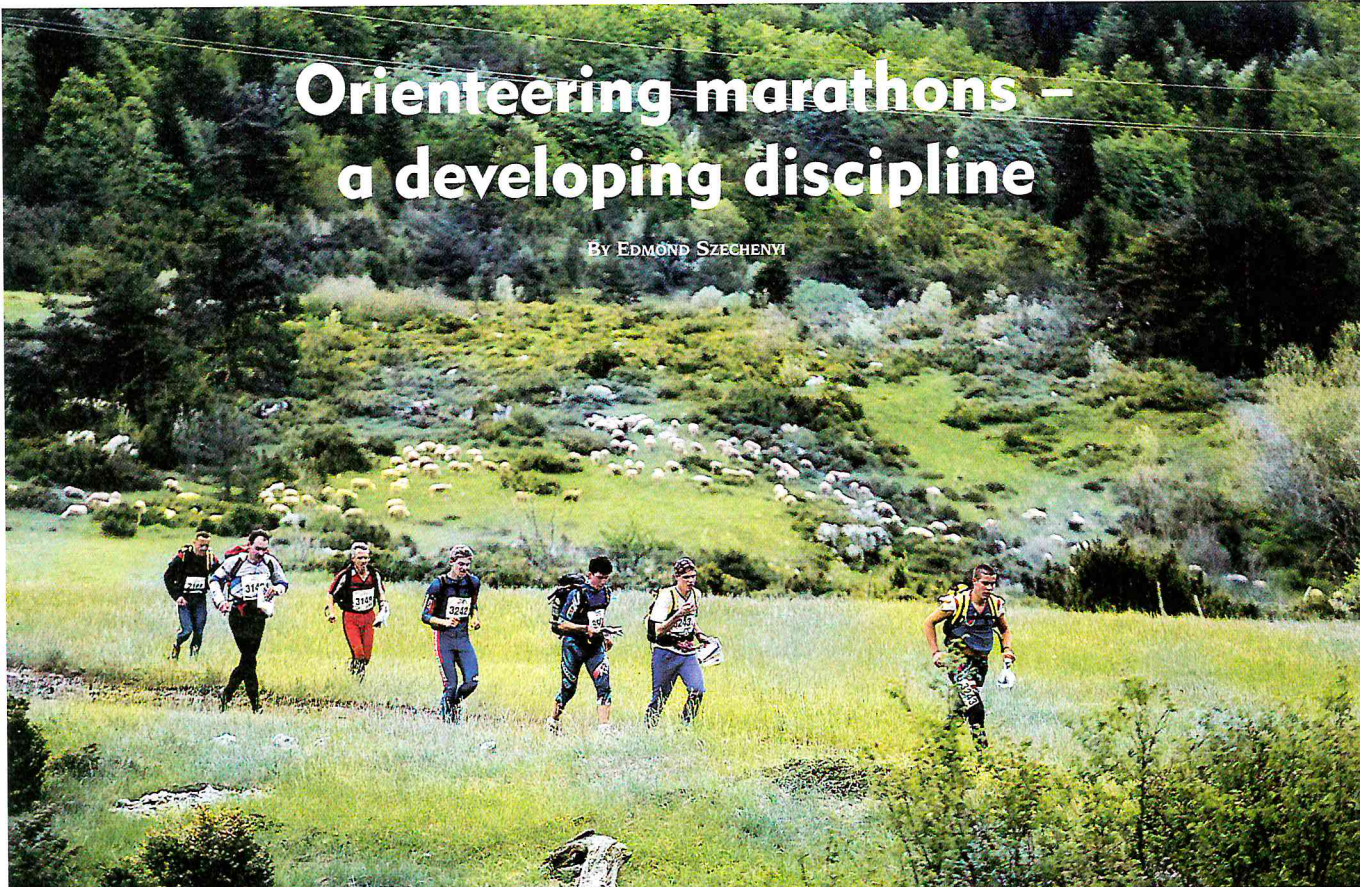


PHOTO: GILLES BERTRAND

Ever since orienteering has been a sporting or leisure activity, orienteers have developed new forms of practice to answer their physical and intellectual fancies.

Among these there has always been a breed of enthusiasts looking for increasingly tough physical challenges.

They have developed what we agree to call orienteering marathons. They made different rules and used different names in different parts of the world. Britons talk of "mountain marathons",

Swedes of "fell orienteering", Australians of "rogaining", the French and Belgians of "raids d'orientation", but the sporting essence of all of these remains the same: navigating on foot over large distances.

Moreover, for reasons of safety, a practice common to most is that runners must compete in teams of two.

In recent years extreme sporting events, including orienteering

marathons, have gained considerably in popularity. The best athletes seek recognition for this very demanding discipline and want to compete internationally. The IOF has undertaken to promote this grass-roots development of orienteering.

However, the diversity in the forms of practice that have developed over the years works against any immediate attempts at unifying rules and it is necessary to take a pragmatic view when considering international competitions.

In 1999 the IOF created an official World Orienteering Marathon Trophy (WOMT). In its first edition it involved a single competition on 23/24 May at la Chapelle en Vercors (France).

The support event was the now traditional « Raid IGN-Francital », in which over 1300 teams of two competitors of all ages and abilities take part every year. The IOF Trophy was awarded in the senior Women's, Men's and Mixed classes.

In the coming years, the WOMT will be a series of events, each run according to different rules.

In 2000 there will be three events with ranking on the two best results. The calendar for this series is:

**15-16 January:** The NZL rogaining championships (held immediately after the Masters World Orienteering Championships). The Australian rules for 24-hour rogaining will be used here.

**11-12 June:** The 19th Raid IGN-Francital (FRA). Standard British/French rules will apply. These include a compulsory bivouac with competitors carrying all necessary equipment.

**October:** The Slovenian Orienteering Marathon championships run according to central European rules which are similar to those of the French event but competitors do not carry any bivouac equipment.



# Can tough Arja Hannus take another WOC title?

PER NYLANDER

**T**he year 2000 will be the first year when both the World Cup and World Championships (WOC) in ski orienteering will be organised in the same season. In January, Sotkamo in Finland will be the host venue for both the Nordic Open Championships and the World Cup competitions. This will give us an indication of the athletes' form prior to the World Championships in Krasnoyarsk two months later. Normal distance, short distance and relay races are all on the competition schedule. The question is how the world's best competitors are thinking.

Is it possible to win both the World Cup (WC) and the World Championship, or do you need to take it easy in the WC races in order to attain peak form at what must remain the highlight of the ski orienteering season – the World Championships. A world cup victory is ranked very high, but a World Championships gold medal is the pinnacle of an athlete's career.

One who already has decided to aim just for WOC is last year's World Cup winner Arja Hannus; the 40 year-old Swedish woman who is unique in having won individual and relay gold medals at World Championships in both orienteering and ski orienteering.

If Arja, who won her first gold medal at Aigen in Austria in 1982 (when the 40 year-old Finn Olavi Svanberg won the men's gold medal), qualifies for the Swedish team in Krasnoyarsk, she will have the chance of becoming the oldest ever women's world champion.

Arja's family (which in addition to her husband Ivan Kuzmin consists of their two sons Julius and Alexander) and her work take up a lot of her time so instead of travelling abroad to World Cup races she will stay home and train

hard in Borlänge (she lives 50 yards from the ski tracks of Bergebo) and will compete in Swedish national competitions.

– We'll see how far that will take me, says the "girl" from Kovland, 10 km north of Sundsvall, and who set out on her sporting career 30 years ago.

She may well face her toughest competition for the world title from her Swedish team-mates Annika Zell and Lena Hasselström who will probably be her most difficult rivals in the fight for new gold medals and the top position in the WOC overall standings. The all-time list is currently topped jointly by both Annika Zell and Virpi Juutilainen on the same points score.

The reigning ski-orienteering queen from the last World Championships at Windischgarsten, Liisa Anttila of Finland, who left the Austrian village with two gold medals (long distance and relay) and a bronze, has opted to prioritise cross-country skiing. The exceptionally talented Flying Finn won the Scandinavian cross-country skiing cup last season. But if her results in the cross-country skiing tracks don't work out as hoped, she may well be found on the start line in Krasnoyarsk after all.

Natalia Frei and Svetlana Khaustova, who finished fifth and sixth at both distances in WOC 98, will be dark horses this winter, especially in "home" terrain at WOC at the beginning of March.

Their male team-mates led by Victor Korchagin, the king of WOC 98 with two gold medals and a fourth place in the short distance race, have already demonstrated their strength and will also be dangerous in home terrain. Korchagin, who has been training in Finland this summer, will start as pre-race favourite and along with team-

mates Vladislav Kotmshtchikov and Eduard Khrennikov (reports from Russia indicate that the Khrennikov could be a big surprise this season) will give Raino Pesu of Finland and Björn Lans of Sweden, last season's best two in the World Cup, a hard fight in front of the Russian spectators.

Another athlete who must not be forgotten is Nicolo Corradini – the Italian "veteran" who has taken a medal in the long distance race at the last three World Championships. Other dark horses in the men's class may be Lithuania's Nerijus Sulcys, Norwegian Kjetil Ulven and Bertil Nordquist of Sweden. The Swedish athlete has just missed out on a top three placing at WOC several times by the narrowest of margins. In Windischgarsten he was in the lead at halfway in the men's long distance race but ended in fourth spot, only twenty seconds behind gold medallist Victor Kortchagin and just nine and eight seconds from the silver and bronze medals respectively. Maybe this time...

One thing is sure, it promises to be another exciting season for ski orienteering.



Arja Hannus.  
PHOTO: PER NYLANDER



# Looking for new horizons

By EDMOND SZECHENYI

It is now more than ten years since orienteers first started organising competitions on mountain bikes. In the intervening years this form of orienteering has come a long way. From an alternative form of practice it has become a fully-fledged discipline of the sport of orienteering.

Competitive activity takes place in at least twenty countries with national championships in more than a dozen of these. International competition is also growing.

The first world cup series in 1999 has events organised in the Czech Republic, Austria and Spain. The 2000 World Cup will be held in Belgium, France, Hungary, the Czech Republic and Slovakia.

The first World Championships will be held in 2002 in France and already three countries have shown an interest in organising the second of these championships in 2004.

The discipline is developing all over the world. In some countries Mountain Bike orienteers are foot orienteers looking for new horizons, while in others they are often mountain bike enthusiasts new to orienteering.

After a good deal of experimentation, international mapping and competition rules have now been elaborated.

The philosophy of this discipline is close to that of ski-orienteering. Tracks and paths must be kept to and the

essential orienteering skill is map reading for effective route choices.

Specific equipment such as swivelling map-holders fixed to the handlebars has been developed and is available from orienteering suppliers.

Rugged polyvalent mountain bikes are used, preferably with a front fork suspension in order to limit vibrating of the map and so make map reading possible while moving.

Foreseeable competition developments include the organisation of multi-day events, of mountain bike orienteering marathons and in particular of "bi-orienteering" events, combining foot and mountain bike orienteering.



*An elite level MTB orienteer needs excellent map reading skills.*

PHOTO: FERDINAND SUGG



# PROGRESS IN TRAIL ORIENTEERING World Cup success

By BRIAN PARKER

**T**rail Orienteering took a major step forward (and a major wheel turn forward) at its first ever World Cup event held in Scotland in conjunction with the 1999 World Orienteering Championships.

Also held at this time was the first IOF Controllers' Clinic for Trail-O whose purpose was to train and license controllers for international events in this orienteering discipline.

This inaugural World Cup was a two-day event which demanded exceptionally high standards of terrain and planning. For trail orienteering at elite level the terrain must have both visual attraction and sufficient variable detail to allow a full range of testing and rewarding problems to be set. The Scottish Highlands forests offered such terrain with the added benefit that the paths and tracks required only minor work to make them passable to wheelchair competitors.

For the planning, the event was fortunate to have the services of Caleb Gould, an elite foot orienteer but an experienced Trail-O planner. He produced a wide range of interesting problems for the World Cup, exploiting the potential of the terrain to full effect and achieving the difficult balance between difficulty and fairness. Elite trail orienteering sets difficult problems which require skilled judgment and analysis by the competitors in arriving at a single correct answer, but not so difficult that the process becomes a lottery.

The Open Competition of the World Cup was open to all comers and not restricted to those with physical disabilities. There was a good mixture of disabled and able-bodied

competitors but the dominance in the results of the disabled entrants shows the value of training and experience at this elite technical level of trail orienteering.

The winner, Sue Boyt (GBR), a one-time foot orienteer photographed leaping streams until a serious knee injury made even walking difficult, is a British Trail-O Champion with a wealth of experience of elite trail orienteering. It is interesting to note that she uses the whole 150 minutes allowed for the course, not because of mobility difficulties but because she studies each problem in careful detail before committing an answer. Her technique obviously pays!

The National Team Competition for disabled entrants was won by the host country with a very strong team indeed.

## IOF Controllers' Clinic

The Clinic, led by Brian Parker (GBR), examined those aspects of elite trail orienteering which differ from foot orienteering. Mapping standards were set - an elite scale of 1:5000 and the depiction of visibility not runnability. The need for controlling to be more closely integrated with the planning and mapping than is usual was stressed.

Caleb Gould presented a comprehensive analysis of the different types of problems in elite trail orienteering, illustrated by examples from the World Cup courses.

The Clinic was attended by representatives from the USA, Ukraine, Australia, Japan, Hong Kong, Finland, Denmark and Great Britain.

## World Cup results

### Open Competition Results

1. Sue Boyt	GBR	28
2. Valery Tsodikov	UKR	27
3. Bernard Legrand	BEL	27
4. David Irving	USA	26
5. Peter Palmer	GBR	26

Max possible score was 29, tied scores were split by performance at timed controls.

### Team Competition Results

1. Great Britain	78
2. Norway	64
3. United States	44
4. Belgium	42
5. Ukraine	27

Teams had up to three disabled competitors.



*Valery Tsodikov (UKR) studies a marsh control behind the camera whilst competitors from the USA and Norway consider the quarry opposite.*

PHOTO: BRIAN PARKER



## Greece and Jamaica new IOF members

The IOF Council has approved the membership applications from Greece and Jamaica. Additionally, Brazil has been given the status of full IOF member.

The decisions are to be ratified by the 2000 IOF General Assembly in Austria. Since the 1998 Congress, the IOF has obtained seven new members. Greece and Jamaica included, the current membership figure is 55.

## TV contract for the 2001 World Orienteering Championships

An agreement has been signed between YLE, the Finnish Broadcasting Company, and the organiser of the World Orienteering Championships in 2001 for the production of 60-90 minutes of TV coverage for each of the three races, i.e. the classic distance and the short distance finals and the relay.

As the host broadcaster, YLE will provide free access to the signal. Additionally, YLE has agreed to produce a one hour programme of edited coverage for Eurosport.

## Appointment of future organisers

The 2003 Junior World Orienteering Championships have been awarded to Estonia. The events will take place in Põlva, some 230 km southeast of Tallinn.

Norway has been appointed organiser of the 2003 World Masters Orienteering Championships. The event will be organised by Halden SK. The town of Halden is located in the south-east corner of Norway, close to the Swedish border.

## Co-operation WOC2001 and WWF

The World Orienteering Championships (WOC) organising committee and WWF (World Wildlife Foundation) Finland have signed a co-operation agreement with the aim of organising the world's most environmentally-friendly sports event in 2001 in Tampere, Finland.

WOC 2001 is the first sports event to participate in the WWF's national

Living Planet Campaign. The aim of the campaign is to guarantee a viable future for our planet.

The WOC 2001 environmental programme will concentrate on the protection of the natural environment, reduction of material consumption and amount of waste, and on minimising the energy consumption and amount of emissions.

## Royal presence at orienteering event



*An orienteering event including a demonstration of electronic punching was on the programme of His Royal Highness King Carl XI Gustaf of Sweden when he recently visited Sundbyberg near Stockholm. The former World Champion, Anna Bogren, had been asked to act as host and had the opportunity of showing His Majesty how the Sportident system works.*

PHOTO: KEITH SAMUELSON



## MAJOR EVENTS



### Foot Orienteering

#### 2000:

WORLD MASTERS CHAMPIONSHIPS  
1–7 January, Feilding, NZL

WORLD CUP

**Events 1 & 2:** Classic distance and Relay, 15–16 April, JPN

**Events 3 & 4:** Short and Classic distances, 22–24 April, AUS

**Events 5, 6 & 7:** Relay, Classic and Short distances, 30 June–4 July, UKR

**Events 8 & 9:** Short, Medium and Classic distances + Ultra short distance, 18–21 July, FIN

**Events 10, 11 & 12:** Short and Classic distances, Relay, 11–14 October, POR

JUNIOR WORLD CHAMPIONSHIPS  
10–16 July, Nove Mesto Na Morave, CZE

WORLD MARATHON TROPHY

**Event 1:** The NZL rogaining championships, 15–16 January, NZL

**Event 2:** The 19th Raid IGN-Francital, 11–12 June, FRA

**Event 3:** The Slovenian orienteering marathon championships, October, SLO

#### 2001:

WORLD MASTERS CHAMPIONSHIPS  
1–5 July, Nida, Kursiu Nerija, LTU

JUNIOR WORLD CHAMPIONSHIPS  
9–15 July, Miskolc, HUN

WORLD CHAMPIONSHIPS  
28 July–5 August, Tampere, FIN

WORLD GAMES  
16–20 August, Akita, JPN

#### 2002:

JUNIOR WORLD CHAMPIONSHIPS  
July, dates to be confirmed, Villena, ESP

WORLD MASTERS CHAMPIONSHIPS  
6–11 October, Bendigo, Victoria, AUS

#### 2003:

WORLD MASTERS CHAMPIONSHIPS  
Dates to be confirmed, Halden, NOR

JUNIOR WORLD CHAMPIONSHIPS  
Dates to be confirmed, Pölva, EST

WORLD CHAMPIONSHIPS  
Dates to be confirmed,  
Rapperswil/Jona, SUI



### Ski Orienteering

#### 2000:

WORLD CUP

**Events 1 & 2:** Long and Short distances, Relay 1, 12–16 January, FIN

**Events 3 & 4:** Long and Short distances, 28–30 January, AUT

**Events 5 & 6:** Long and Short distances, Relay 2, 31 January–6 February, SVK

**Events 7 & 8:** Long and Short distances, Relay 3, 28 February–5 March, RUS

JUNIOR WORLD CHAMPIONSHIPS  
31 January–6 February, Banska Bystrica, SVK

WORLD MASTERS CHAMPIONSHIPS  
21–27 February, Velingrad, BUL

WORLD CHAMPIONSHIPS  
28 February–5 March, Krasnoyarsk, RUS

#### 2001:

WORLD CUP

**Events 1 & 2:** Long and Short distances, Relay 1, 24–28 January, AUT

**Events 3 & 4:** Long and Short distances, Relay 2, 29 January–3 February, BUL

**Events 5 & 6:** Long and Short distances, Relay 3, 28 February–4 March, RUS

**Events 7 & 8:** Long and Short distances, 14–17 March, FIN

JUNIOR WORLD CHAMPIONSHIPS  
Dates to be confirmed, Trento, ITA

WORLD MASTERS CHAMPIONSHIPS  
Dates to be confirmed, Trento, ITA

#### 2002:

WORLD CHAMPIONSHIPS  
Dates to be confirmed, Borovets, BUL



### Mountain Bike Orienteering

#### 1999:

WORLD CUP

**Event 1:** Classic, 12 October, Innsbruck, AUT

**Events 2, 3 & 4:** Sprint, Classic and Relay, 15–17 October, Brno, CZE

**Events 5, 6 & 7:** Score, Classic and Relay, 30 October–1 November, Barcelona, ESP

#### 2002:

WORLD CHAMPIONSHIPS  
Dates to be confirmed, FRA



### Trail Orienteering

#### 2001:

WORLD CUP  
Early August, Tampere, FIN

## MEETINGS

### IOF Congress & General Assembly

31 July–6 August 1999, Graz, AUT

### IOF Council

3–5 December 1999, Paris, FRA  
28–30 April 2000, venue to be decided  
1, 2 and 5 August 2000, Graz, AUT



# World Orienteering Championships

INVERNESS, GREAT BRITAIN, AUGUST 1-8, 1999

## Classic Distance

**Women:** 1) Kirsi Boström FIN 1.17.56, 2) Hanne Staff NOR 1.18.29, 3) Johanna Asklöf FIN 1.18.32, 4) Yvette Baker GBR 1.19.09, 5) Hanne Sandstad NOR 1.19.37, 6) Reeta-Mari Kolkkala FIN 1.19.45, 7) Külli Kaljus EST 1.19.57, 8) Heather Monro GBR 1.21.21, 9) Brigitte Wolf SUI 1.21.41, 10) Giedre Voveriene LTU 1.22.27, 11) Frauke Schmitt Gran GER 1.22.33, 12) Katarina Allberg SWE 1.22.34, 12) Vroni König-Salmi SUI 1.22.34, 14) Anette Granstedt SWE 1.22.37, 15) Sabrina Meister SUI 1.23.51, 16) Danute Månsson LTU 1.24.01, 17) Lucie Böhm Austria AUT 1.24.39, 18) Elisabeth Ingvaldsen NOR 1.24.42, 19) Tracy Bluett AUS 1.24.52, 20) Anna Garin ESP 1.25.22.

**Men:** 1) Björn Valstad NOR 1.37.24, 2) Carl Henrik Björseth NOR 1.40.20, 3) Alain Berger SUI 1.40.26, 4) Jimmy Birklin SWE 1.42.29, 5) Johan Ivarsson SWE 1.42.50, 6) Petter Thoresen NOR 1.42.57, 7) Bernt Bjornsgaard NOR 1.43.15, 8) Jon Tvedt NOR 1.43.34, 9) Thomas Bühner SUI 1.43.41, 10) Christoph Plattner SUI 1.44.07, 11) Carsten Jørgensen DEN 1.45.03, 12) Steven Hale GBR 1.45.37, 13) Edgaras Voveris LTU 1.46.37, 14) Marian Davidik SVK 1.46.42, 15) Flemming Jørgensen DEN 1.46.45, 16) Håkan Eriksson SWE 1.47.14, 17) Kenneth Cederberg FIN 1.47.26, 18) Marius Mazulis LTU 1.47.51, 19) Allan Mogensen DEN 1.47.59, 20) Timo Karppinen FIN 1.48.37.

## Short Distance

**Women:** 1) Yvette Baker GBR 25.55, 2) Lucie Böhm AUT 26.57, 3) Frauke Schmitt Gran GER 27.48, 4) Sanna Nymalm FIN 27.50, 4) Marlena Jansson SWE 27.50, 6) Hanne Sandstad NOR 27.55, 7) Vroni König-Salmi SUI 28.24, 8) Johanna Asklöf FIN 28.39, 9) Sabrina Meister SUI 28.44, 10) Gunilla Svärd SWE 28.56, 11) Eija Koskivaara FIN 29.09, 12) Heather Monro GBR 29.15, 13) Külli Kaljus EST 29.17, 14) Tracy Bluett

AUS 29.18, 15) Simone Luder SUI 29.24, 16) Tatiana Pereliaeva RUS 29.27, 17) Kirsi Boström FIN 29.34, 18) Dorte Dahl DEN 29.40, 19) Helene Hausner DEN 30.00, 20) Pamela James CAN 30.19.

**Men:** 1) Jörgen Rostrup Norway NOR 25.48, 2) Juha Peltola FIN 26.11, 3) Janne Salmi FIN 26.14, 4) Jani Lakanen FIN 26.15, 5) Håkan Eriksson SWE 26.24, 6) Johan Ivarsson SWE 26.44, 7) Petter Thoresen NOR 26.59, 8) Steven Hale GBR 27.01, 9) Mikael Boström FIN 27.15, 10) Björn Valstad NOR 27.20, 11) Alain Berger SUI 27.24, 12) Tore Sandvik NOR 27.28, 13) Jörgen Olsson SWE 27.30, 14) Michal Horacek CZE 27.34, 15) Rudolf Ropek CZE 27.53, 16) Edgaras Voveris LTU 27.55, 17) Timo Karppinen FIN 27.58, 18) Jimmy Birklin SWE 28.04, 19) Allan Mogensen DEN 28.16, 20) Marius Mazulis LTU 28.20.

## Relay

**Women:** 1) Norway 2.55.56 (Birgitte Husebye 45.51, Elisabeth Ingvaldsen 44.43, Hanne Sandstad 41.37, Hanne Staff 43.45), 2) Finland 2.56.10 (Reeta-Mari Kolkkala 45.49, Sanna Nymalm 43.33, Kirsi Boström 44.07, Johanna Asklöf 42.41), 3) Sweden 2.57.59 (Katarina Allberg 45.46, Marlena Jansson 47.43, Anette Granstedt 41.47, Gunilla Svärd 42.43), 4) Great Britain 2.58.05 (Kim Buckley 45.48, Heather Monro 42.07, Jenny James 47.42, Yvette Baker 42.28), 5) Switzerland 2.59.37 (Vroni Koenig-Salmi 45.52, Kaethi Widler 47.46, Brigitte Wolf 43.49, Sabrina Meister

42.10), 6) Lithuania 3.19.11, (Giedre Voveriene, Vilma Rudzenskaite, Rasa Jaugeliene, Danute Månsson), 7) Australia 3.24.20 (Tracy Bluett, Alix Young, Natasha Key, Nicki Taws), 8) Germany 3.24.25 (Judith Keinath, Anke Xyländer, Karin Schmalfeld, Frauke Schmitt Gran), 9) Czech Republic 3.24.28 (Petra Novotna, Eva Jurenikova, Marcela Klapalova, Jana Cieslarova), 10) Hungary 3.27.05 (Bernadett Kovacs, Agnes Wengrin, Maria Lubinski, Ildiko Kovacs).

**Men:** 1) Norway 3.21.50 (Tore Sandvik 56.59, Bernt Bjornsgaard 44.14, Petter Thoresen 43.16, Bjorn Valstad 57.21), 2) Finland 3.25.27 (Jani Lakanen 56.44, Juha Peltola 44.33, Mikael Boström 44.23, Janne Salmi 59.47), 3) Sweden 3.26.50, Jimmy Birklin 57.53, Håkan Eriksson 46.02, Jörgen Olsson 44.57, Johan Ivarsson 57.58), 4) 3.28.09 (Daniel Giger 1.04.17, Alain Berger 44.32, Christoph Plattner 43.33, Thomas Buehrer 55.47), 5) Great Britain 3.28.59 (Jon Duncan 56.46, Jamie Stevenson 45.55, Stephen Palmer 47.02, Steven Hale 59.16), 6) Lithuania 3.31.47 (Svajunas Ambrazas, Nerijus Sulcys, Marius Mazulis, Edgaras Voveris), 7) Denmark 3.37.58 (Morten Fenger-Gron, Flemming Jørgensen, Carsten Jørgensen, Allan Mogensen), 8) Czech Republic 3.40.42 (Tomas Prokes, Michal Horacek, Michal Jedlicka, Rudolf Ropek), 9) Estonia 3.42.44 (Tarvo Avaste, Erik Aibast, Olle Karner, Sixten Sild), 10) Australia 3.46.36 (Grant Bluett, Stephen Craig, Rob Walter, Tom Quayle).

## WORLD ORIENTEERING CHAMPIONSHIP MEDALS

Country	Men			Women			Total
	Gold	Silver	Bronze	Gold	Silver	Bronze	
NOR	3	1	—	1	1	—	6
FIN	—	2	1	1	1	1	6
SWE	—	—	1	—	—	1	2
GBR	—	—	—	1	—	—	1
AUT	—	—	—	—	1	—	1
SUI	—	—	1	—	—	—	1
GER	—	—	—	—	—	1	1



# Junior World Orienteering Championships

VARNA, BULGARIA, JULY 5-11, 1999

## Classic Distance

**Women:** 1) Regula Hulliger SUI 52.57, 2) Tatiana Perelyeva RUS 53.05, 3) Katalin Hecz HUN 53.37, 4) Heli Jukkola FIN 54.39, 5) Vendula Klechova CZE 54.53, 6) Sara Forsström FIN 54.55, 7) Salla Sukki FIN 55.42, 8) Samantha Saeger USA 56.07, 9) Zuzana Macuchova CZE 56.38, 10) Tatiana Kostileva RUS 57.16, 11) Marine Riddervold NOR 57.43, 12) Astrid Fritschi SUI 57.48, 13) Johanna Seppinen FIN 58.18, 14) Evgeniya Belova RUS 58.18, 15) Darlya Smolik RUS 59.10.

**Men:** 1) Andrei Hramov RUS 69.18, 2) Mikko Heikelä FIN 72.32, 3) Troy de Haas AUS 73.03, 4) Sergey Dedkov RUS 73.52, 5) Pasi Ikonen FIN 75.01, 6) Michael Reinhard SUI 76.42, 7) Jakiv Sidliarenko UKR 77.10, 8) Thierry Gueorgiou FRA 77.15, 9) Andreas Muller SUI 78.38, 10) Mykhailo Andreev UKR 78.55, 11) Ed Nash GBR 79.22, 12) Mikkel Lund DEN 79.46, 13) Henrik Jorgensen DEN 80.03, 14) Jaromir Svihovsky CZE 80.48, 15) Robert Dittmann GER 81.31.

## Short distance

**Women:** 1) Regula Hulliger SUI 26.31, 2) Salla Sukki FIN 27.41, 3) Johanna Seppinen FIN 28.21, 4) Vendula Klechova CZE 28.48, 5) Pernilla Eriksson SWE 28.54, 6) Zdenka Stara CZE 29.10, 7) Kajsa Guterstan SWE 29.42, 8) Tatiana Perelyeva RUS 30.10, 9) Zsuzsanna Domjan HUN 30.11, 10) Tatiana Kostileva RUS 30.15, 11) Anu Annus EST 30.29, 12) Viktoria Plokhenko UKR 30.39, 13) Rachel Elder GBR 31.21, 14) Susanne Berchtold SUI 31.22, 15) Marine Riddervold NOR 31.24.

**Men:** 1) Jonne Lakanen FIN 24.41, 2) Sergey Dedkov RUS 24.50, 3) Thierry Gueorgiou FRA 25.01, 4) Felix Bentz SUI 25.03, 5) Mikko Heikelä FIN 25.39,

6) Pasi Ikonen FIN 25.45, 7) Andreas Muller SUI 26.15, 8) Christian Hansen DEN 26.36, 9) Mykhailo Andreev UKR 27.04, 10) Francois Gonon FRA 27.22, 10) Troy de Haas AUS 27.22, 12) Andrei Hramov RUS 27.24, 13) Zbynek Hora CZE 27.28, 14) Christoph Bruder GER 27.30, 14) Christian Kahrs NOR 27.30.

## Relay

**Women:** 1) Russia (Tatiana Kostileva, Evgeniya Belova, Tatiana Perelyeva) 2.13.20, 2) Ukraine (Iryna Kupriyanova, Viktoria Plokhenko, Natalia Potopalska) 2.13.22, 3) Switzerland (Angela Wild, Astrid Fritschi, Regula Hulliger) 2.14.00, 4) Czech Republic (Zuzana Macuchova, Zdenka Stara, Vendula Klechova) 2.15.27, 5) Finland (Johanna Seppinen, Salla Sukki, Heli Jukkola) 2.19.52, 6) Norway (Lye Tone Ellefsen, Julie Blobel, Anne Marie Bleken) 2.21.33, 7) Hungary (Alma Biro, Zsuzsanna Farkas, Katalin Hecz) 2.22.19, 8) Austria (Fruzsina Hejjas, Birgit Eisl, Andrea Eisl) 2.23.09, 9) Sweden (Caroline Kaipe, Linda Karlsson, Lin Torsel) 2.24.56, 10) France (Perrine Manissolle, Magali Coupat, Laetitia Piolat) 2.30.48.

**Men:** 1) Finland (Pasi Ikonen, Jonne Lakanen, Mikko Heikelä) 2.23.18, 2) France (Benoit Peyvel, Thierry Gueorgiou, Francois Gonon) 2.25.05, 3) Switzerland (Beat Studer, Christian Ott, Felix Bentz) 2.25.06, 4) Czech Republic (Jaromir Svihovsky, Zbynek Hora, Petr Losman) 2.27.02, 5) Sweden (Jan Troeng, Peter Öberg, Martin Lampinen) 2.29.14, 6) Poland (Radoslaw Bala, Michal Parzewski, Maciej Stachowiak) 2.30.04, 7) Norway (Christian Kahrs, Rune Strandberg, Ivar Haugen) 2.34.16, 8) Ukraine (Dmytro Durkin, Sergiy Mykhidynov, Mykola Dovzhenko) 2.37.33, 9) Australia (Troy de Haas, David Brickhill-Jones, Andrew Hill) 2.38.56, 10) Russia (Dimitry Syichev, Dimitry Safonov, Dimitry Somov) 2.39.43.

# World Masters Orienteering Championships

AARHUS, DENMARK,  
JULY 18-23, 1999

## Women:

Class 80A

1) Elizabeth Brown GBR 44.43.

Class W75

1) Astrid Andersson SWE 42.11.

Class W70A

1) Ulla-Britta Hall SWE 45.26.

Class W65A

1) Clarie Ek SWE 38.02.

Class W60A

1) Eivor Steen-Olsson SWE 35.24.

Class W55A

1) Carol McNeill GBR 34.47.

Class W50A

1) Karin Gustafsson SWE 33.57.

Class W45A

1) Roz Clayton NZL 34.09.

Class W 40A

1) Heidrun Finke GER 46.40.

Class W 35A

1) Laila Höglund SWE 46.19.

## Men:

Class M85

1) Gunnar Lillieroth SWE 45.19.

Class M80

1) Erik Sillerström SWE 35.0.

Class M75

1) Harry Ahlqvist SWE 39.26.

Class M70A

1) Ture Gunnarsson SWE 43.38.

Class M65A

1) Per-Olof Bengtsson SWE 46.26.

Class M60A

1) Roland Karlsson SWE 48.57.

Class M55A

1) Rune Rådeström SWE 47.31.

Class M50A

1) Dieter Wolf Søiliamt SUI 49.42.

Class M45A

1) Vitali Chegarovski RUS 52.23.

Class M40A

1) Sixten Westlund SWE 1.02.14.

Class M35A

1) Mats Hellstadius SWE 1.13.16.



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EWS Chairwoman, Ms. Birgitta Kervinen  
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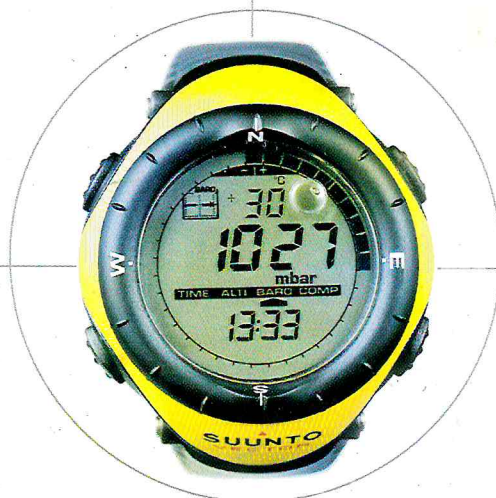
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