Leif Rebård, owner and leader of Rebård Kartservice AS

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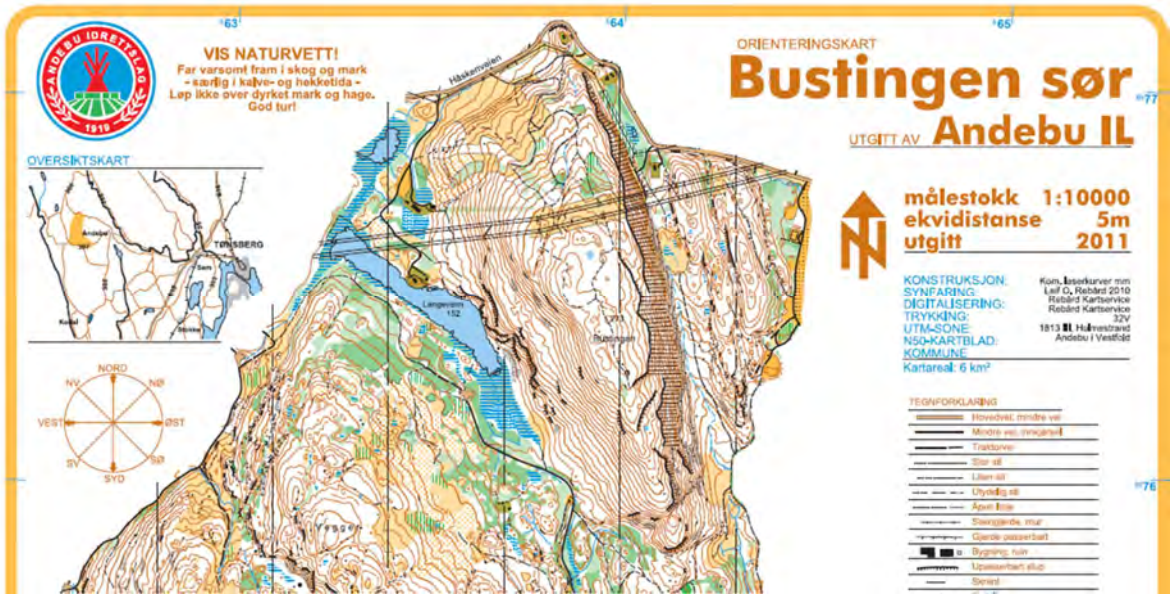
by Anders Nesse

Leif Rebård, born 1937, is one of the few professional orienteering map makers in Norway. Orienteering is not well known outside its sphere of practitioners, but it is a very common sport and hobby in many countries all over the world. Originally Rebård was a school teacher, but in 1974 he resigned his contract with the school and started with his hobby, map production, as a full time job. Today he also sells many accessories used for orienteering: The software called O-CAD, compasses, eyeglasses, pencils, etc. He also invested in a large, high-quality printer that can plot thousands of maps on waterproof paper.

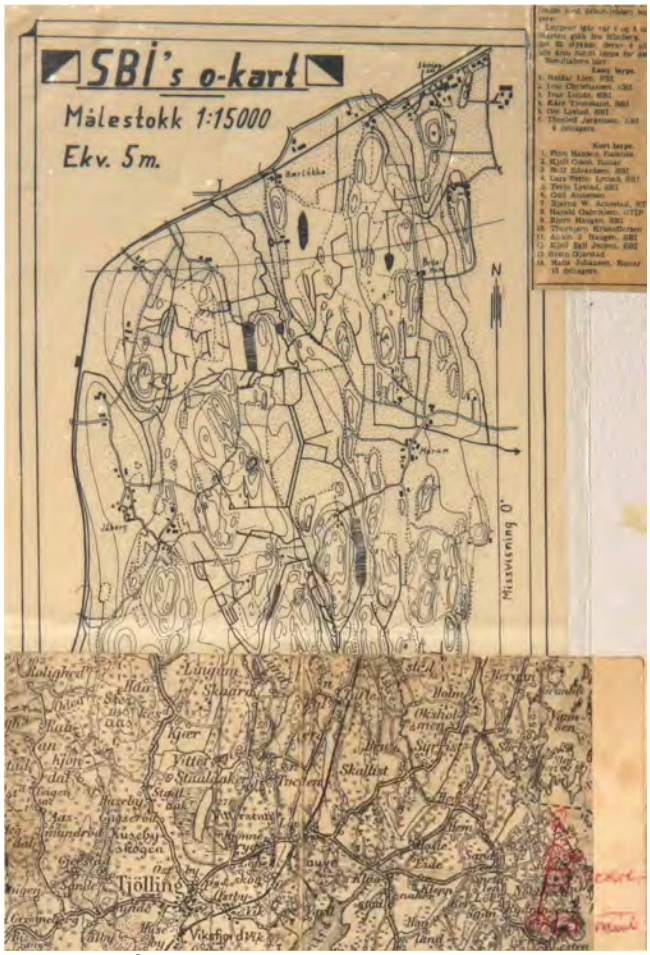
Orienteering competitions use specially prepared orienteering maps. They are topographic maps, although much more detailed than general-purpose maps. The International Specification for Orienteering Maps (ISOM) map scales are 1:15,000 or 1:10,000, with grids aligned to magnetic north. Map symbols are standardized by the International Orienteering Federation (IOF) and designed to be readable by any competitor, no matter his background or native tongue.

Orienteering is a family of sports that requires navigational skills using a map and compass to navigate from point to point in diverse and usually unfamiliar terrain, and normally moving at speed. Participants are given a topographical map, usually a specially prepared orienteering map, which they use to find control points. Originally a training exercise in land navigation for military officers, orienteering has developed many variations. Among these, the oldest and the most popular is foot orienteering. For the purposes of this article, foot orienteering serves as a point of departure for discussion of all other variations, but basically any sport that involves racing against a clock and requires navigation using a map is a type of orienteering. (Wikipedia contributors, "Orienteering," *Wikipedia, The Free Encyclopedia,* http://en.wikipedia.org/w/index.php?title=Orienteering&oldid=484674003 (accessed April 11, 2012).)

Leif Rebård started making such maps in 1955. At that time, he used single aerial images to find terrain details such as water bodies, rocks, open fields, etc. Contour lines came from national topographic maps. He purchased a pocket stereoscope, but couldn't manage how to use it, so instead he used single images with an overlay to digitize map details. The accuracy of the map information was of course not very good; it was more like an illustration of the terrain, but good enough for orienteering.



A modern orienteering map produced by Rebård Kartservice



One of Rebård's first orienteering maps. The lower part of the image is an example of the original 1:50,000-scale topographic maps that were used as orienteering maps before Rebård started his production.

In the beginning, the maps were only in black and white, but now they are all produced in color. Rebård uses color in orienteering maps as follows: "Blue is wet" (water or swamp, difficult to run), "black is hard" (roads or tracks, easy to run) different brown, yellow and green colors indicate if it's open area, wooded area, dense wood, etc. These colors are also more or less an international standard, like the map symbols

Rebård Discovers Summit Evolution

In 2009, at the age of 71, Rebård went to DAT/EM's reseller in Norway, Norconsult Information Systems, to take a look at the modern softcopy system that he had read about on the internet. He immediately found out that such a system could be helpful to make better orienteering maps.

The day after the visit, he ordered a Summit Evolution Professional with DAT/EM Capture for MicroStation and a couple of days' training.

After the training was done, he was able to make much better maps or drafts of maps for the field checkers who refine the maps while they are out in the woods. Rebård's job in Summit is to find as many details in the images as possible and place it on the map with the correct signature or symbology. Then he or someone else takes the draft out and looks at it while they are out in the field. They make changes, add features that not are possible to find in the images, remove details that not are necessary or change the position for cliffs, man-made details and more.

A typical "draft file" made with DAT/EM Summit Evolution

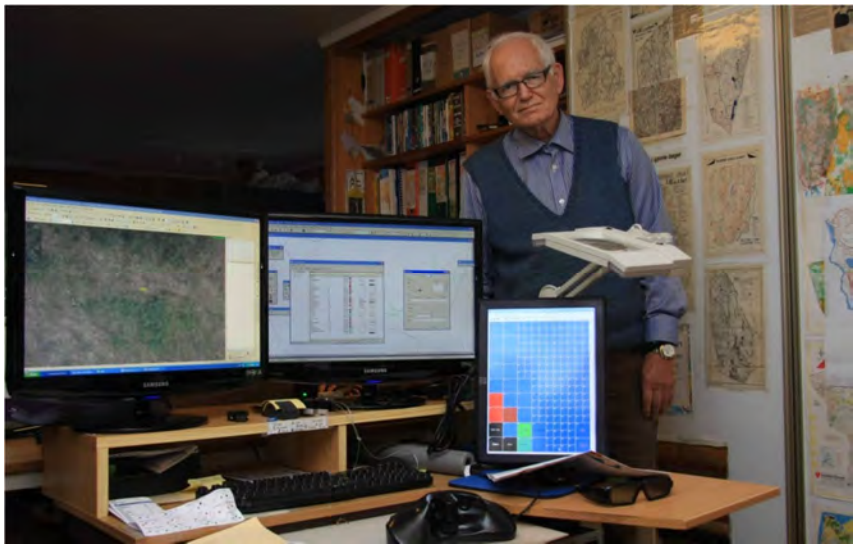

Leif Rebård's "Hall of Fame" displays some of the maps he produced from 1955 until 2012

Status for 2012

Today Rebård Kartservice uses Summit Evolution as the main production environment and O-CAD for the finishing process. From Summit, data is exported in DXF and then imported to O-CAD.

Images from Ultracam with a resolution down to 10cm per pixel are used for construction, and airborn LIDAR data are used for generating the contour lines in Summit. The feedback from the customers (orienteering clubs around the country) is very good. Rebård has increased the quality of the maps significantly after he started using his Summit Evolution, and with high quality aerial images from UltraCam, they are even better than the days when they used film-based images. Leif Rebård has so many orders now that he believes his will be occupied until he is 80. He has no plan to retire; every morning he does the same excersise as Madonna, 50 crunches with legs at a 90-degree angle.

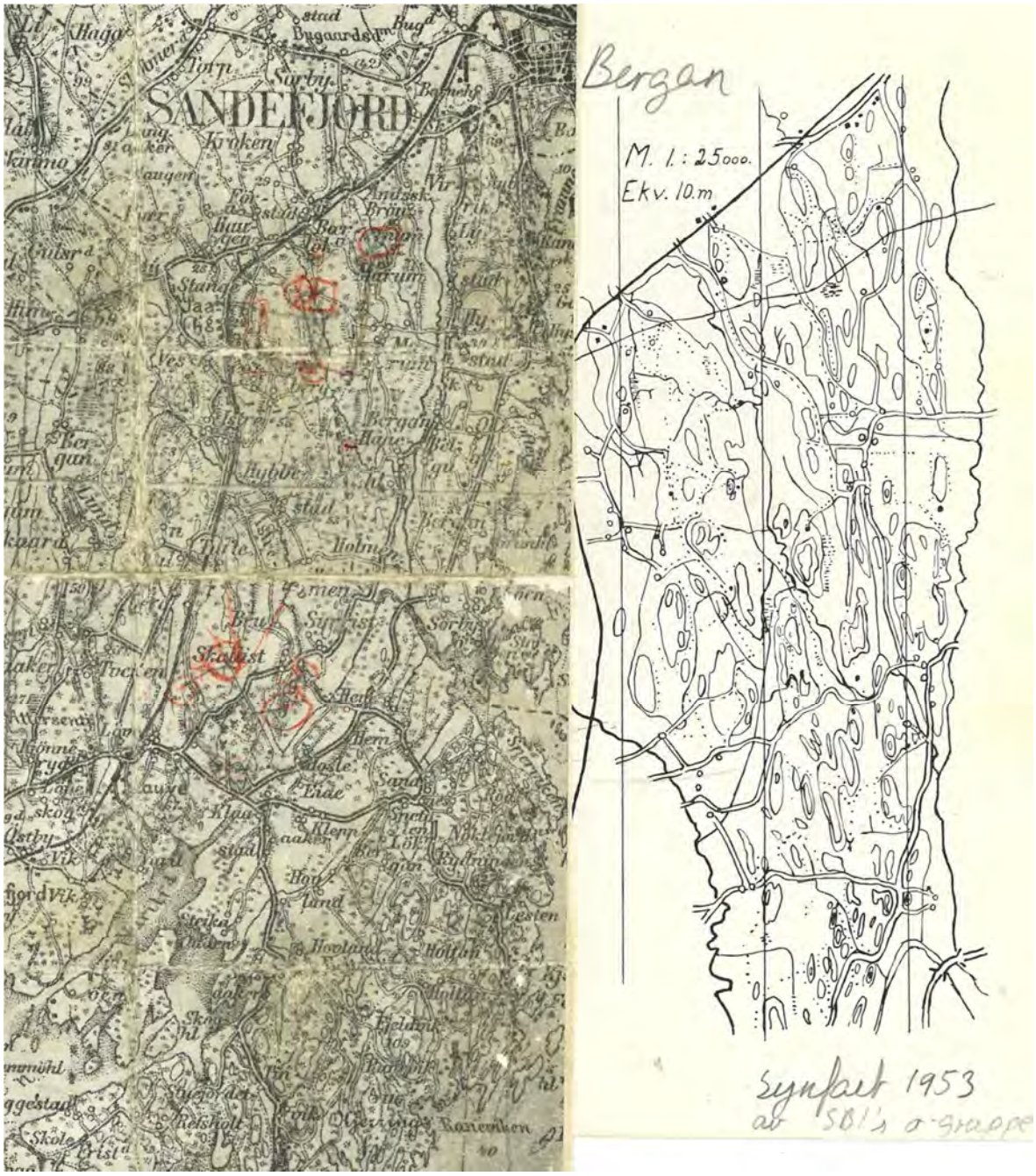
To be more efficient, he just invested in the new TouchScreen where all his feature tables are stored. "It's much easier to hit the right feature on the TouchScreen than on the keypad, since I can make the buttons as large as I want" he said.



Leif Rebård displays his Summit Evolution workstation with the TouchScreen

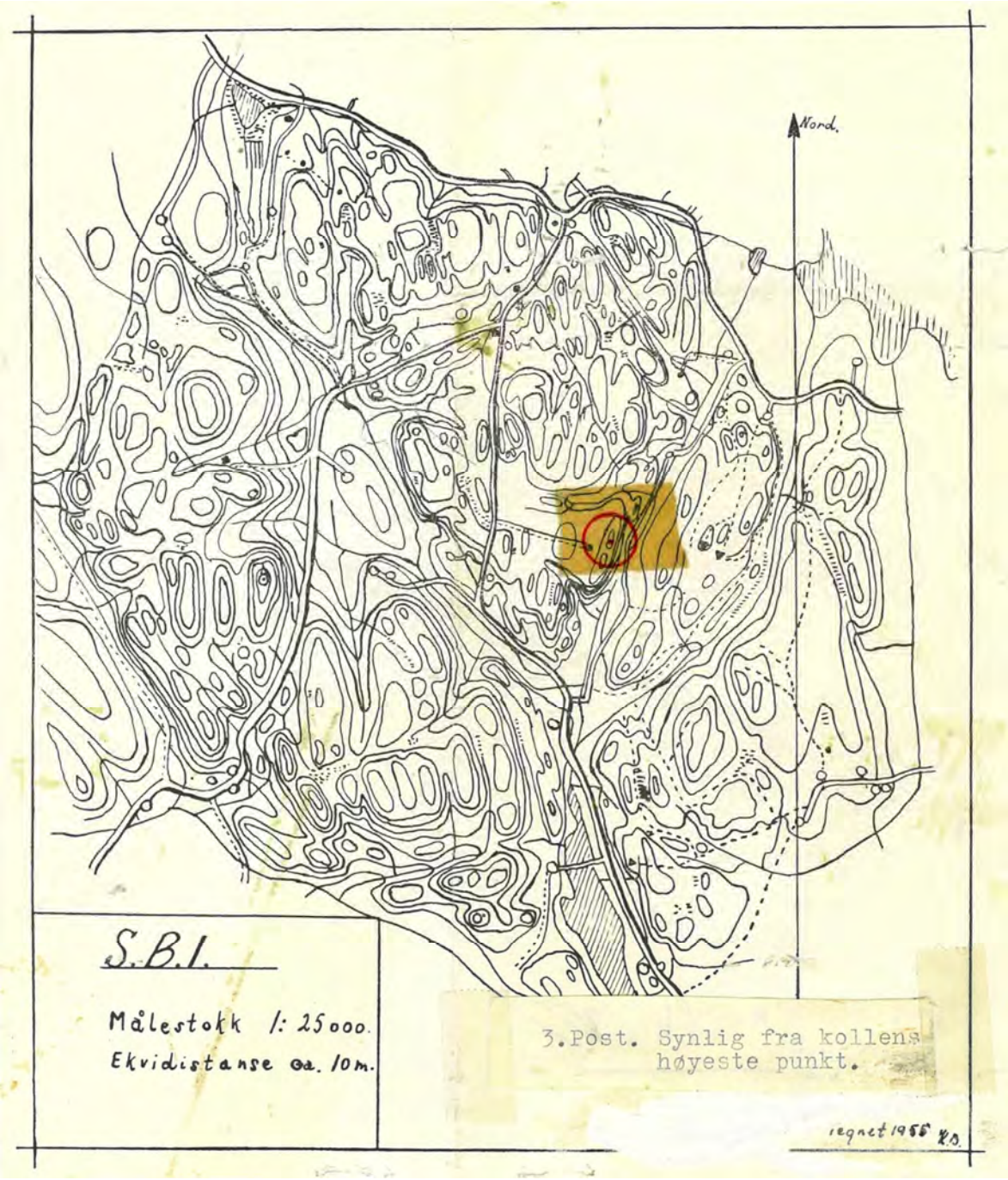
Map Gallery

In the map below, Rebård demonstrates how the maps looked in the “old days”. To the right is the map made by Leif Rebård and his friend, Kåre Tjomsland, in 1953. This is the beginning that inspired him to continue making orienteering maps.



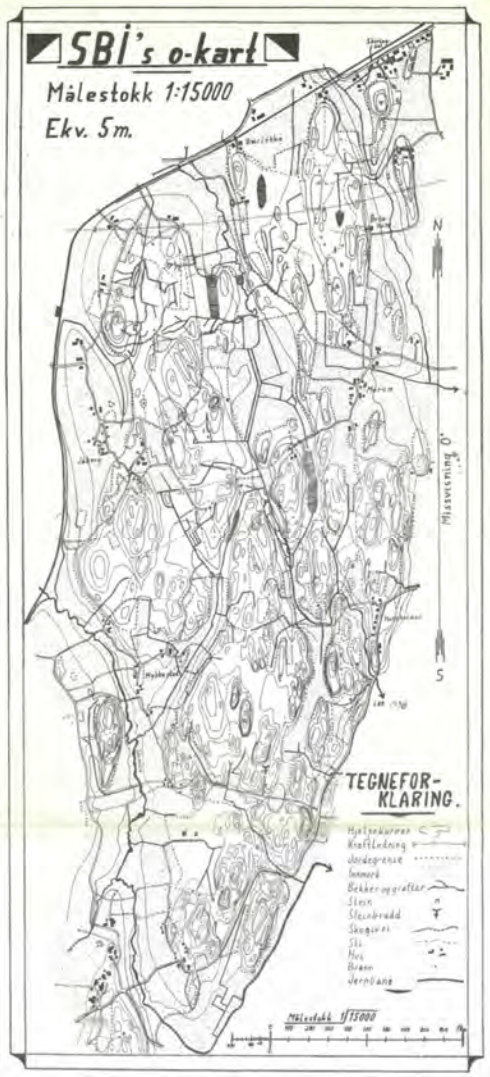
Topographic map basis (left) and orienteering map (right), 1953

Shown below is the most detailed part of one of Rebård's first maps. The basis was old 1:50.000-scale topographic maps.

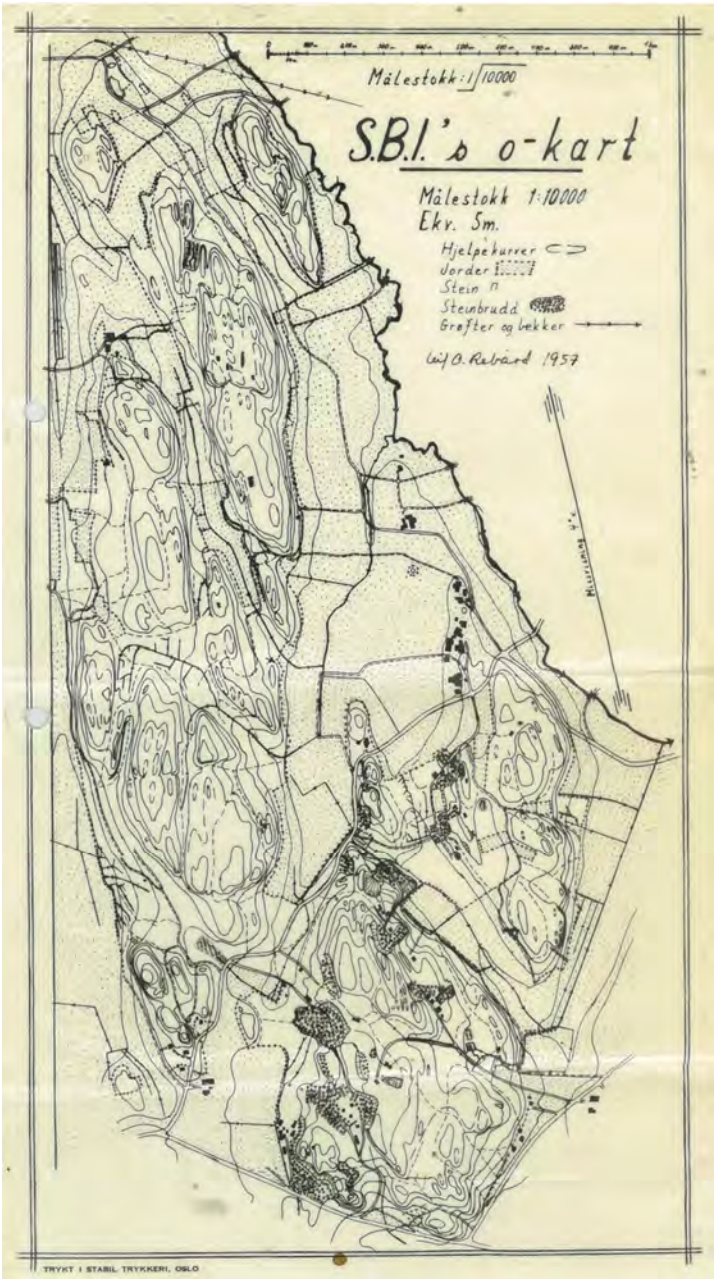


One of Rebård's first maps, 1955

In 1956 Leif Rebård received some new 1:5.000-scale topographic maps, which were from a new map series for Norway at that time. He felt that this was a breakthrough, since a lot of information was already in place and made from photogrammetry. It was a huge step forward to use 1:5.000 as basis instead of 1:50.000. Rebård received a lot of good feedback from the runners on this map, but it was still too expensive to produce in color.



Orienteering map based on 1:5,000-scale topographic map series, 1956



Orienteering map, 1957

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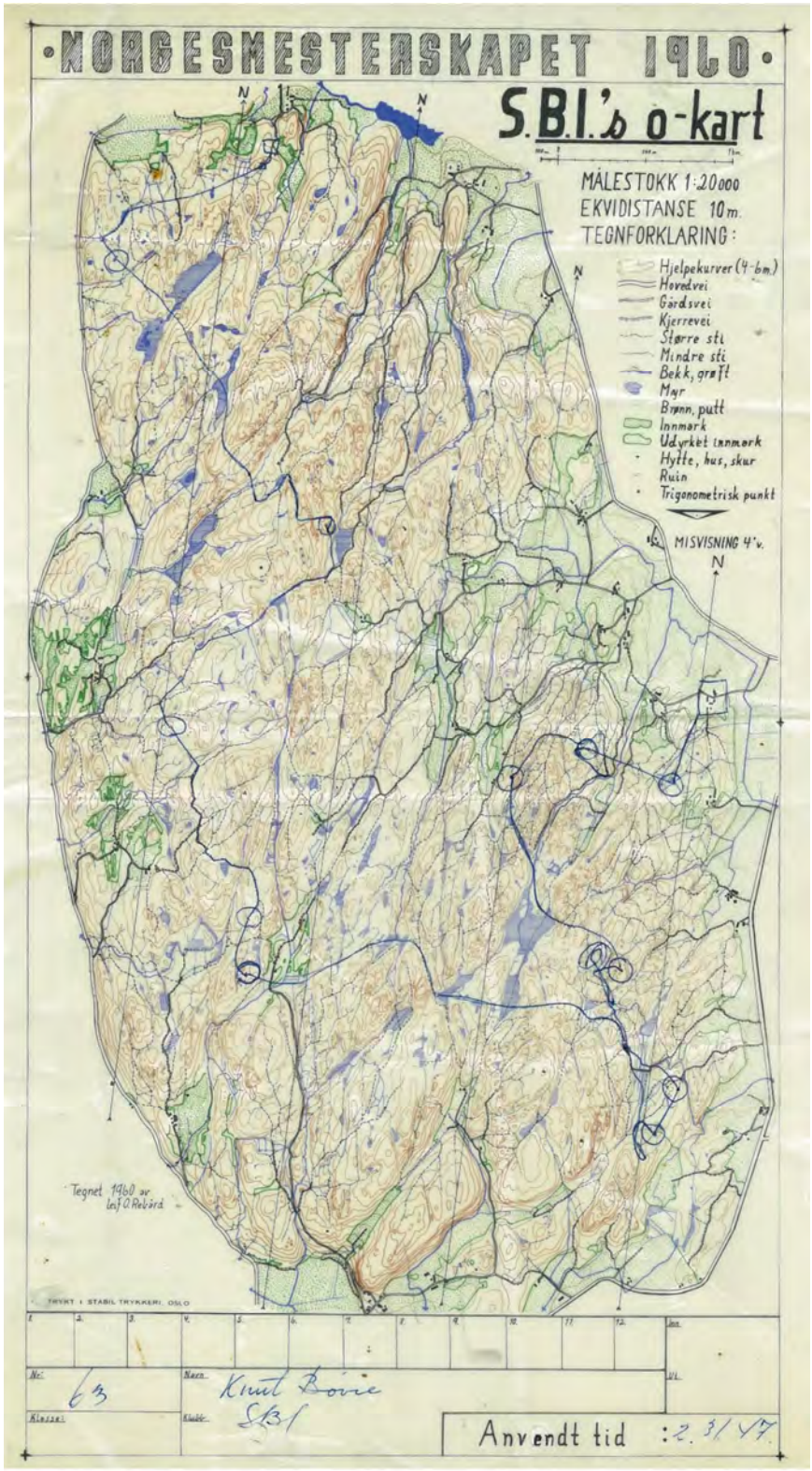
While Rebård was studying to become a teacher, he got his first aerial images. He used these as a basis for a map around the University. He tried to find as many details as possible in the images, but for the contour lines, he had to find another solution. He had a scooter, and his passenger was his girlfriend, who was later to become his wife. She sat behind him on the carrier with an altimeter, and shouted every time they passed a 5 meter contour line. Rebård marked this as a point on the image and transferred it later to the map.

Contoured with a scooter, a shout, and romance, 1959

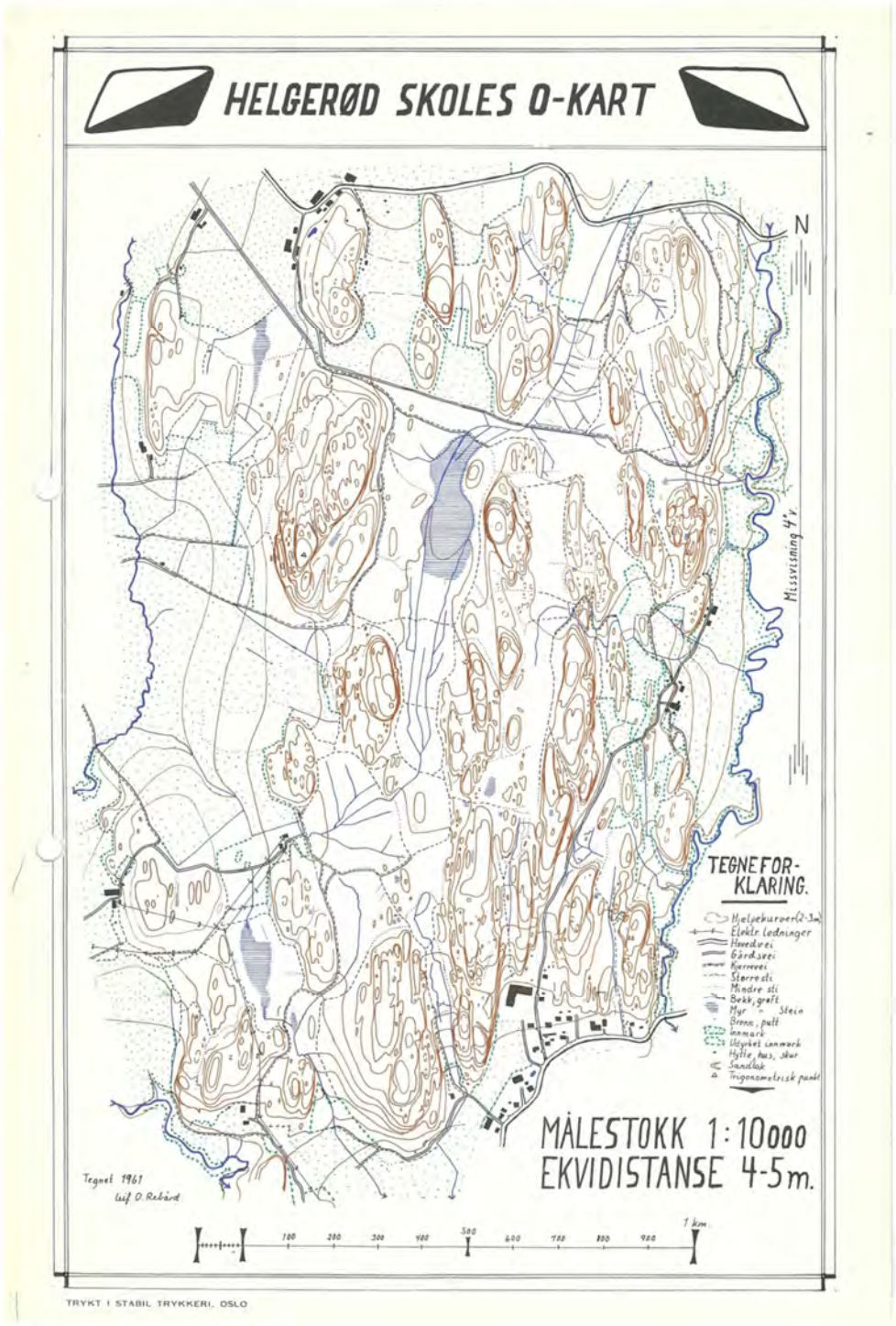
Another Hall of Famer, 1959

And then, Rebård's "masterpiece of a map" came in 1960. This became a standard for how orienteering maps should look in the future. Unfortunately, the equidistance was only 10 meters, but the runners were impressed.



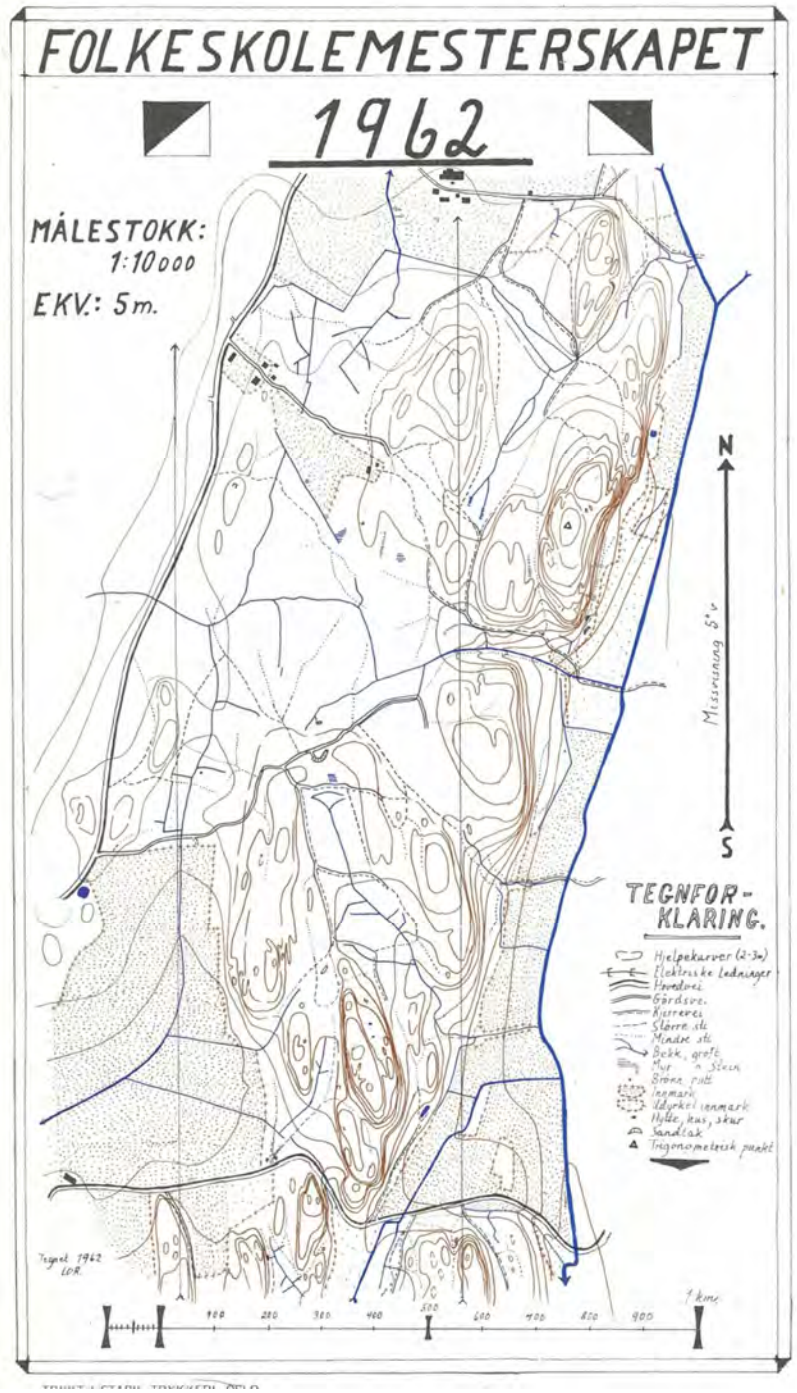
Rebård's "masterpiece of a map" sets the standard in 1960

When Rebård worked as a school teacher, he made a map of the area around the school for the pupils.



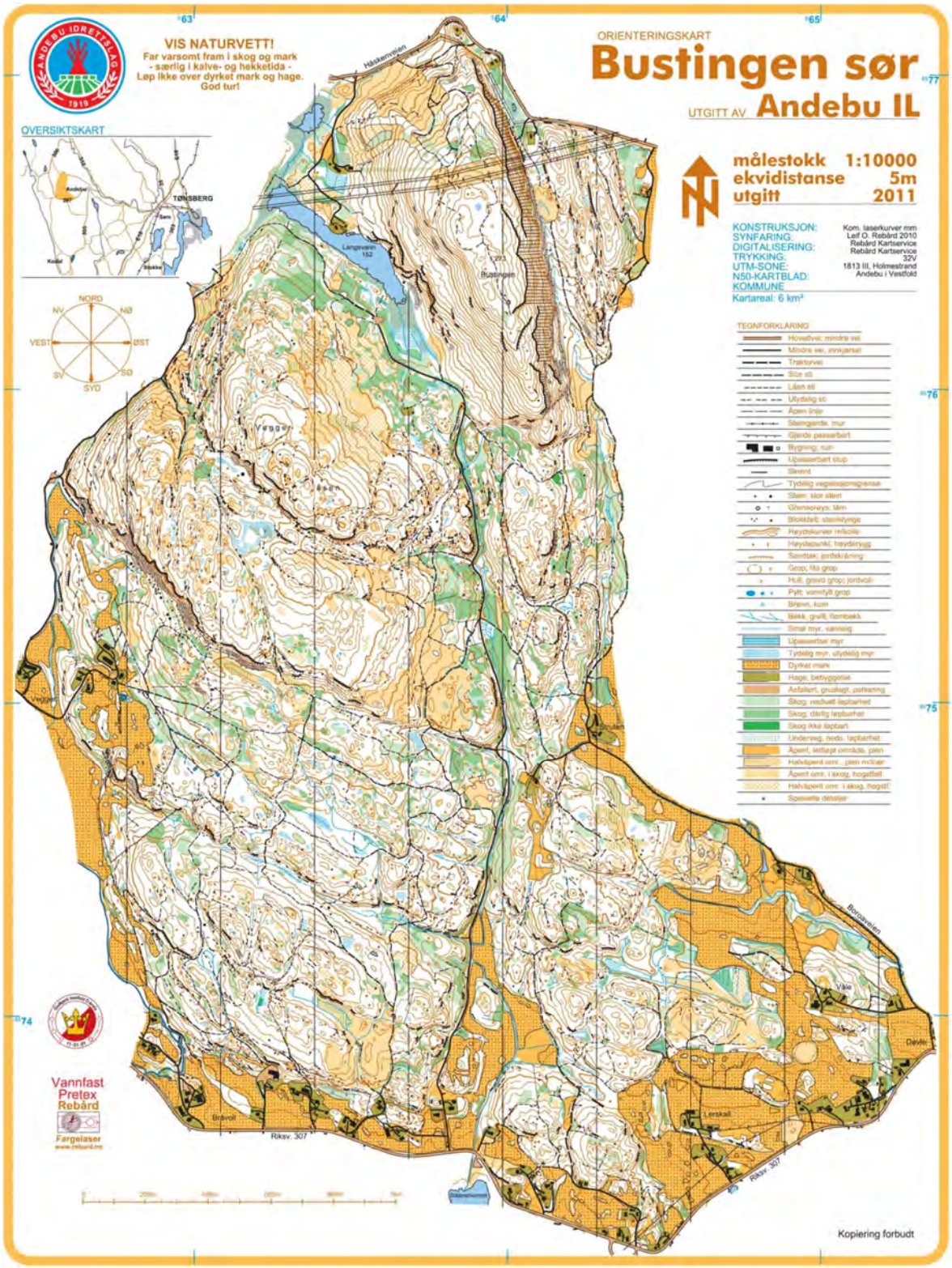
Helgerød Skoles (school) area, 1961

In 1962, he got married, built a house in 1963, and in 1964, had two children. Despite these worthy distractions, Rebård continued to make his orienteering maps.



Map for the Scholl Championship, 1962

Shown below is Rebård's newest map made in 2011. Contour lines (1m equidistance) were based on LIDAR data and the other map details were done in Summit Evolution from aerial UltraCam XP images with a ground resolution of 10 cm. Rebård says, "For me, this is a pre-taste of Nirvana."



Rebård's newest maps employ UltraCam XP images, LIDAR data, and DAT/EM Summit Evolution, 2011