Converting O'Maps into MTB-O Maps: a step by step guide

Svenska Orienteringsförbundet

Version: 1.0 2012-07-20

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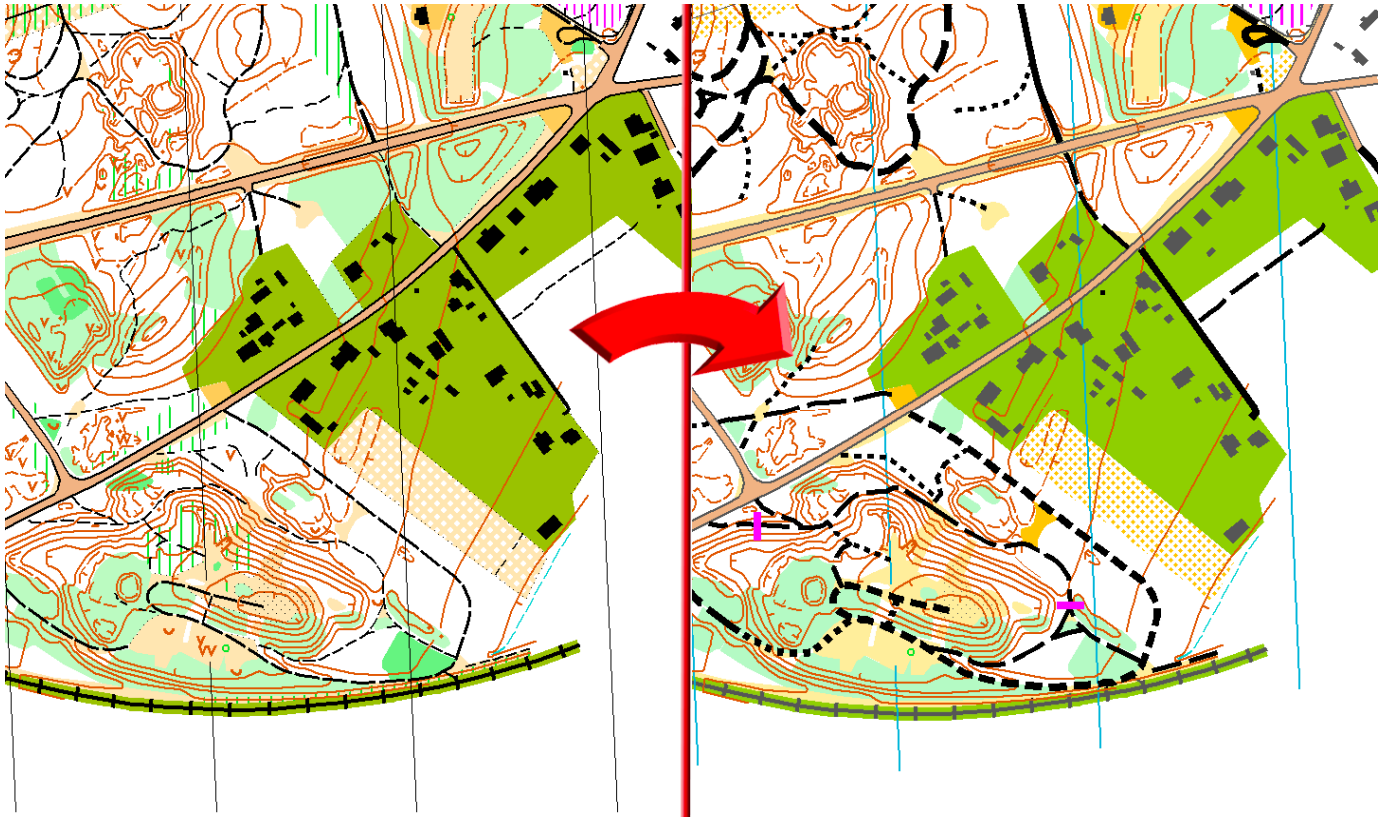

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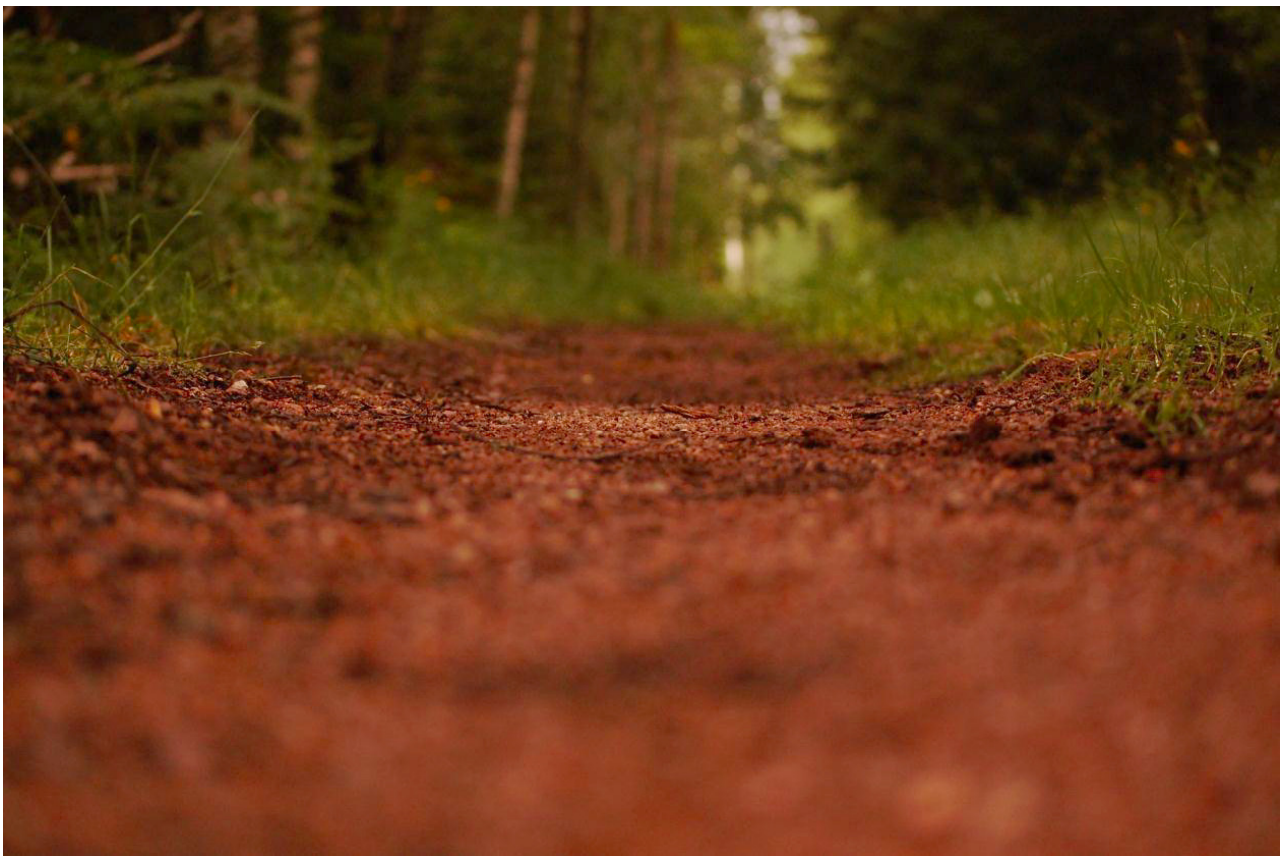


1. Introduction

To make the process simpler and to facilitate for the conversion of orienteering maps to mountain bike orienteering maps in accordance with MTB-O specifications, SOFT (the Swedish Orienteering Federation) has produced this step by step manual for club use. This manual should give more clubs the ability to get MTB-O events underway and in so doing increase MTB-O participation.

The manual should also help get streamlined maps of good quality by encouraging the conversions to be performed using similar standards and interpretations of the MTB-O specifications.

This step-by-step manual relies on the use of OCAD software for producing the map but you can of course use similar software to do the conversion.

The following sections are in this manual:

- What is MTB-O?
- Basics of OCAD
- Basics of the MTB-O specification
- Conversion to MTB-O specification, step by step
- Management of scales

The manual will hopefully help you through the process of converting an orienteering map into a mountain bike orienteering map - good luck!

2. About MTB-O

Mountain bike orienteering (MTB-O), is a sport where the competitor uses a mountain bike to visit a number of controls marked in the terrain in the shortest time possible with the use of a map and compass.

Biking and orienteering skills should be challenged in such a way that orienteering skills are the decisive element. The competitor should end the course biking, carrying or leading his bike. To bike outside of trails and roads is normally not allowed without the consent of the organizer. And by the term “competitor”, we mean an individual man/woman or a team.

3. OCAD

OCAD is a software program for mapping. The maps in OCAD are built with graphical elements and symbols. This is what the toolbar in OCAD looks like:

The most important tools for conversion of the map are the tools that are marked in bold in the box to the right.

- Change object to another symbol
  This tool is the one you will use the most when you convert, especially trails. The tool will change th e symbol for a chosen line or surface object. You mar k the object with "Edit vertex" tool or "Edit object" too l. Choose the symbol you want to change the object to from th e field of symbols and then click the "Change symbol" tool.
- Change all objects
  This tool is very similar to the previous one. The difference is that this tool will change all the ob jects that have the same symbol as the object you have chosen to change to a different symbol. You can for example change all objects on the map that are marked with the symbol for border for water to the blue version for MTB-O. This tool will be used the most for the initial conversion of the map.
- Editing objects
  This tool is used to select and edit objects.
- Editing point
  This tool is used to select objects and edit a vert ex in the object.
- Curved line
  This tool creates a new object on the map, e.g. you can use it to draw new trails. But it can be hard to ha ndle; use the "Freehand line" tool instead.
- Straight line
  This tool creates a new object on the map, e.g. you can use it to draw new trails. But this tool is rarely used; use the "Freehand line" tool instead.
- Freehand line
  This tool creates a new object on the map, e.g. you can use it to draw new trails. To get a better and more accurate result keep the left button pressed when y ou make a new vertex in the line.

Read more about OCAD at www.ocad.ch
To read about how to use the different tools in OCA D visit: http://www.ocad.ch/OCAD10/OCAD10_GettingStarted_Eng lish.pdf

4. The MTB-O specification

For MTB-O there is a requirement for a different specification for maps compared to the one for foot orienteering maps. The aim of the specification is to show the competitors the different characteristics of the trails, from a rideability perspective. The specification highlights these symbol types while downplaying the other features. For example: black features on a foot orienteering map, other than trails, are toned down to 70% black on a MTB-O map.

The International MTB-O Specification:
http://orienteering.org/wp-content/uploads/2010/12/International-Specification-for-MTB-Orienteering-Maps-2010_2.pdf

This is what is different between the two orienteering specifications:

- ✓ Everything black, besides trails, is drawn in 70% black
- ✓ All dense forest (green areas) are drawn in 30% green
- ✓ Undergrowth (green striped) are not shown
- ✓ Borders of marsh and water are drawn with 100% blue
- ✓ North/South lines are drawn with 100% blue
- ✓ All distinct vegetation boundaries and cultivation boundaries are not shown

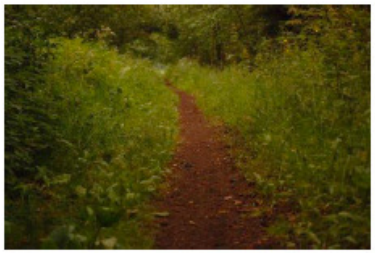
Note! You can leave out objects like rocks, cliffs, boulders, depressions etc if there are many of them and they are not crucial for reading the map.

Trails

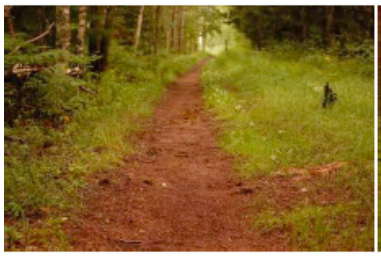
The most important aspect of an MTB-O map is that the trails must represent (bike) rideability, unlike a foot orienteering map. There are four different classifications for the trail's rideability and two different ones for the width of the trail. All in all, there are eight different classifications. Below are the descriptions for the different classifications with a picture as an example of the trail described.

Track: fast riding
The solid broad line trail is a nice broad trail or a forest road of at least 1.5m width, without any obstacles that will slow down one's speed. 75-100% of max speed.

Path: fast riding
The thin solid line trail is a nice thin path less than 1.5m wide without any obstacles that will slow down one's speed. 75-100% of max speed.

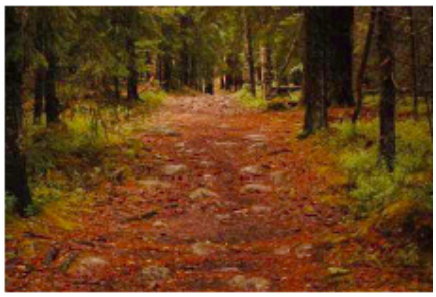


Track: medium riding
The dashed broad trail is a broad trail or forest road at least 1.5m wide. The trail has some ground obstacles such as roots, rocks, sand, smaller holes, etc. It should allow for 50-75% of max speed.

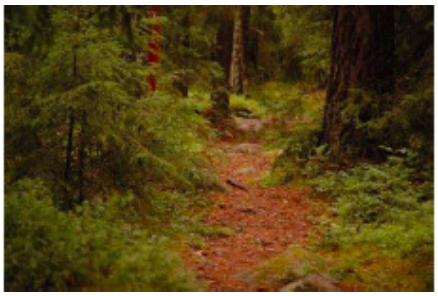



Path: medium riding
The dashed narrow trail is a broad trail or forest road less than 1.5m wide, with some ground obstacles such as roots, rocks, sand, smaller holes, etc. It should allow for 50-75% of max speed.

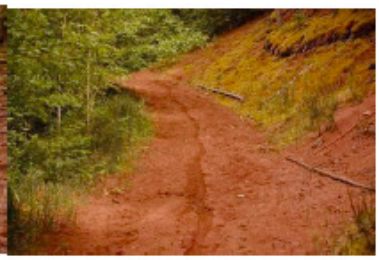
Track: slow riding
The shorter dashed broad trail is a broad trail at least 1.5m wide. The trail has ground obstacles such as roots, rocks, sand, smaller holes, etc. Bikers might need to choose where on the trail to go through. It should allow for 25-50% of max speed.



Path: slow riding
The shorter dashed narrow trail is a trail that is less than 1.5m wide. The trail has ground obstacles such as roots, rocks, sand, smaller holes, etc. Bikers might need to choose where to pass through. Less experienced bikers might have to get off their bikes. It should allow for 25-50% of max speed.



Track: difficult to ride
The dotted broad trail is a broad trail at least 1.5m wide. The trail has severe ground obstacles such as roots, rocks, sand, smaller holes, etc. Bikers might need to choose where on the trail to get through. Experienced bikers might have to get off their bikes. It should allow for 25% of max speed.

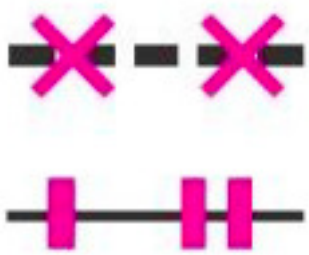



Path: difficult to ride

The Dotted narrow trail is a trail less than 1.5m wide. The trail has severe ground obstacles such as roots, rocks, sand, smaller holes, etc. Bikers might need to choose where on the trail to get through. Experienced bikers might have to get off their bikes. It should allow for 25% of max speed.

Obstacles

Obstacles are another feature that should be marked. Obstacles are objects in the terrain that block trails and prevent biking. These obstacles can be trees that have fallen over the trail or a road barrier. It could also be stairs or a deeper water hole spanning the trail. There are two different classifications for obstacles: passable and impassable obstacles. The impassable obstacles are those that you cannot or are not allowed to pass. These are marked with a violet **X** over the trail. The **X** symbol can also be used to mark a trail that is out of bounds.



The obstacles that are passable are marked with violet bars over the trail.

Some examples of obstacles that are passable:

5. Converting a map: step by step

1. Know the terrain

The first thing to do is to become familiar with the terrain that you are about to convert. The easiest way to do that is to take a bike tour using the orienteering map of the area and bike back and forth on the map, just to get a feeling of how the trails look in general. Everyone should do this step, no matter how well you know the map.

2. Basic conversion

The next step is to do the basic conversion of the map:

1. Download the template with all symbols according to the MTB-O specification that you can find on www.orientering.se/mtbo (for English http://orienteering.org/wp-content/uploads/2010/12/International-Specification-for-MTB-Orienteering-Maps-2010_2.pdf) Mark and copy all objects and paste them into the map that is to be converted. That will get you all the new symbols into the map file.

2. All green areas should have their symbol replaced with symbol 406 in the MTB-O specs. You do that by selecting a green area on the map of each density with the "Edit object" tool and then choosing the new symbol from the set of symbols. Then click "change all objects" tool  . Done!

3. All "black" symbols should be replaced by 70% black symbols. You do that by selecting one symbol on the map with the "Edit object" tool and choose the new symbol from the set of symbols. Then click the "change all objects" tool  . Done!

- ✓ Cliff
- ✓ Boulder
- ✓ Tower
- ✓ Fence
- ✓ Tunnel
- ✓ Rail road
- ✓ Building
- ✓ Powerline
- ✓ Stone wall
- ✓ Pipeline
- ✓ Special item (such as hut, car wreck, etc)
- ✓ Etc

4. Change all borders for water to the blue border according to symbol 301.

5. Remove or hide all green striped undergrowth, by selecting the symbol in the field of symbols, right clicking and then choosing to hide in the menu.

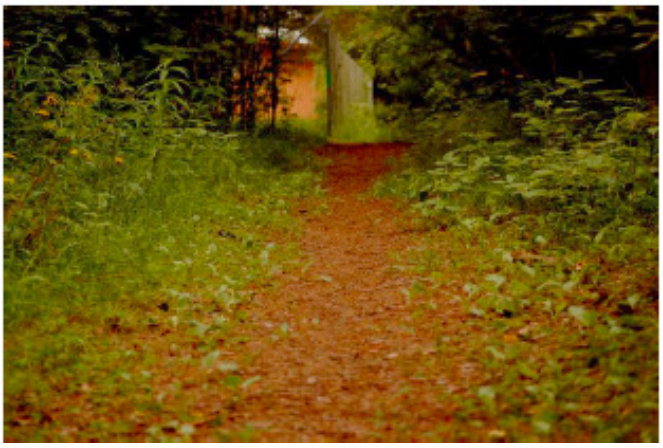
6. Change N/S lines to the 100% blue N/S lines.

7. Hide all distinct vegetation boundaries and cultivation boundaries (401, 416)

8. Start the conversion of the trails directly without having seen them. Most of the time you have some idea about how the trails should look and it will give a good basis for the field checking.

3. Field-checking and final conversion

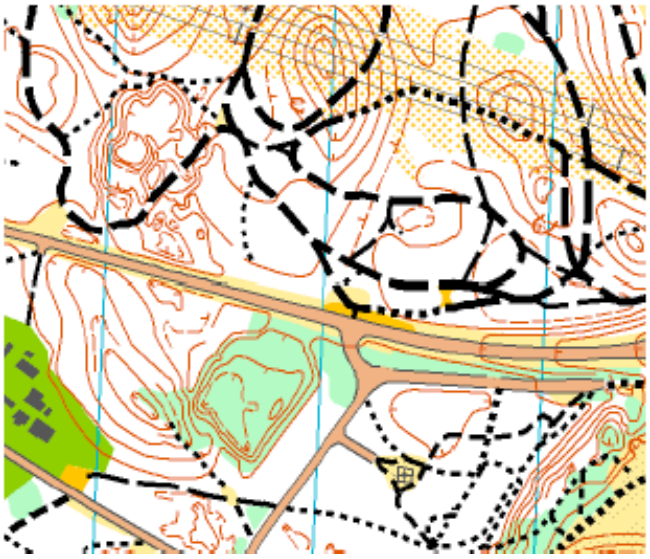
This is the most important step in doing a good map conversion. Without the field-checking there will be many places that won't be correct even if you think you know the area well.



Field-checking means that you should bike all trails on the map, to make sure that the conversion is correct:

- ✓ Make corrections to the trails that don't match what you assumed in the previous step
- ✓ Add trails that were missing from the original orienteering map
- ✓ Remove trails that no longer exist
- ✓ Add obstacles (passable and impassable)

Be especially careful with the trail crossings and trail branches so that they are clearly marked.



A trail between two different crossing/branches could significantly vary in rideability. In that case, use an average of the rideability between the two crossings/branches.

The field-checking can be shared if you prefer, as long as anyone else helping out should also have a good knowledge of MTB-O specs, and you have a common understanding of trail classifications.

The most important part of field-checking is to be consistent and thorough!

6. Scales

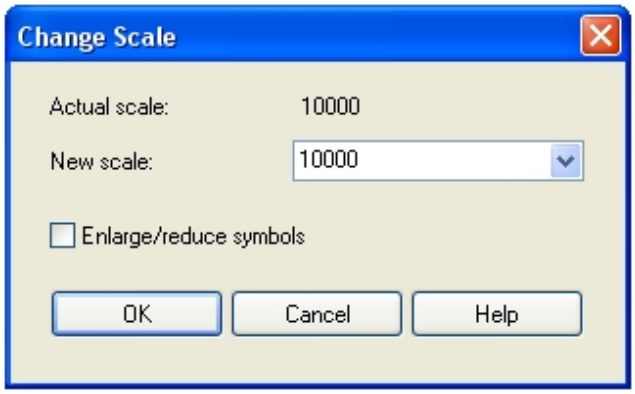
To manage to get the right scale for the symbols in OCAD is not easy until you know how to do it.

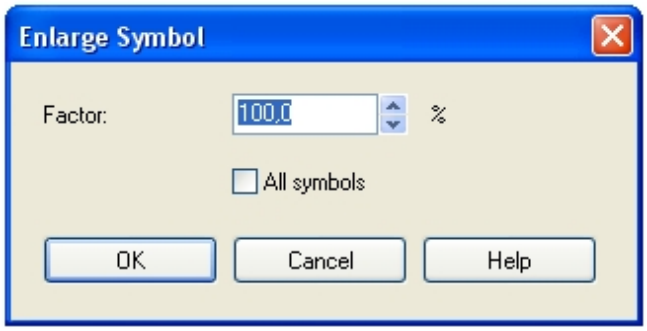
To change the scale (in OCAD 9), go to the menu bar Extras > Change Scaling. Click to unmark the Enlarge/Reduce symbols box. If you don't do that and have all symbols according to the specs from the start, the size will be wrong.

Then go to the menu bar Symbols > Enlarge/Reduce.

If you are changing from a smaller scale (1:15000) to a larger scale (1:10000) you should adjust the symbols on the map to 150%. Then select All symbols. Done!

If you are changing from a larger scale (1:10000) to a smaller scale (1:15000) then you should instead set the factor to 66%. Then select All symbols. Done!





The size of the symbols for different scales:

1:20000	According to spec
1:15000	According to spec

– –

1:10000	1.5x spec
1:7500	1.5x spec
1:5000	1.5x spec

To read more about scales and maps for MTB-O, see section 3 in the official MTB-O specification: http://orienteering.org/wp-content/uploads/2010/12/International-Specification-for-MTB-Orienteering-Maps-2010_2.pdf

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Note to the US mountain bike orienteering community:

Please help Orienteering USA grow MTBO nationwide. Whether at recreational or competitive levels, and whether at local, national or international meets, your support is needed. Together, we can work to create great MTBO maps and host high quality events. We encourage you and your club to contact Orienteering USA both to seek and to offer assistance and ideas – just head to OrienteeringUSA.org and reach out to the Executive Director, the President or any Vice-President. Additionally, help keep the MTBO section of the OrienteeringUSA website up to date by providing information about your club's resources and events. Let's work together to make the nation where mountain biking originated one with plenty of MTBO!