

GUIDELINES FOR MAKING AND DRAWING MTBO MAPS

1. INTRODUCTION

MTBO map makers should be familiar with the International Specifications for Orienteering Maps (ISOM) MTBO version (see lazarus.elte.hu/mc/isom/mbo/mbo.htm). Australian MTBO map makers should also be aware that a submission has been made to the IOF MTBO and Mapping Commissions regarding suggested changes in the ISOM MTBO Specifications.

The following guidelines are for production of MTBO maps using OCAD. The references to OCAD functions and commands are for OCAD 7 menus. Most of these should be identical in OCAD 8.

2. BASE MAPS

MTBO maps can be made from a number of base maps. Ideally, a specially prepared photogrammetric base map would be used, as for Foot-O maps, but the cost of this type of base map will usually be prohibitive for all but the MTBO WOC. In most instances in Australia, MTBO maps have been (and are likely to continue to be) made based on existing Foot-O maps or State Lands Department 1:25,000 (or similar scale) maps, possibly supplemented by aerial photographs.

2.1 Conversion of Existing Foot-O Maps

2.1.1 Conversion of non-OCAD Foot-O Map

A non-OCAD Foot-O map can be scanned and then used as a template in OCAD for drawing the MTBO map.

It is preferable to re-scale the scanned map to the MTBO map scale after scanning, in say Adobe Photoshop or any other drawing package that allows resizing of scanned images. The bitmap is then resaved at the correct MTBO scale. The resizing should be done in a manner that maintains the original scanned image quality (dpi). In OCAD Options/Scales, the map scale and draft map scales are then set to the same value (20000 or 25000 for 1:20,000 and 1:25,000 MTBO map scales respectively).

It is also possible to do the rescaling in OCAD by setting the draft map scale (in Options/Scales) to the scanned Foot-O map scale, and setting the map scale (in Options/Scales) to the desired MTBO map scale.

The process for tracing and drawing the map is the same as that described below for Lands Department base maps, except that the deletion of Foot-O detail below should be noted.

2.1.2 Scale Conversion of OCAD Foot-O Map

The rescaling of an OCAD Foot-O map must be done correctly to preserve the line widths for the contours and other features.

This must be done using the Extras/Change Scale function. The Actual scale indicated will be the current Foot-O map scale (15000 for a 1:15,000 map). The desired MTBO map scale should be entered or selected in the New scale box. The Enlarge/reduce symbols box should be unchecked. If this box is checked, all the line widths will be too narrow, and all other symbols too small. Following this scale change, the map should then be saved using File/Save As with a new MTBO map file name.

Do not rescale the map by using the Print scale box in the File/Print window. This will also result in the line widths being too narrow.

Note that the above is a different procedure to that used for rescaling a 1:15,000 Foot-O map to a 1:10,000 Foot-O map. In this case, the symbols are enlarged. This difference has caused confusion, and has resulted in many MTBO maps made from existing Foot-O maps being rescaled incorrectly resulting in the line widths being too narrow.

2.1.3 Deletion of Unnecessary Foot-O Detail.

For clarity of the MTBO map, particularly at small scales, it is important to remove unnecessary detail from the Foot-O map:

- Delete all form lines (auxiliary contours), unless they are absolutely necessary in flat areas to show land form.
- Delete other brown detail (for example gold mining detail), and generalise showing only major features and possibly brown dots (widely spaced) for broken ground.
- Delete minor watercourses and creeks, particularly dashed lines.
- Delete small areas of green, unless near tracks and useful for navigation. Delete areas of green stripes and replace with green screen, if appropriate.
- Delete rock detail, particularly rock faces (which may be confused with tracks), and generalise showing only major features and possibly black (widely spaced) for distinct rocky areas. If rock faces are included, they must be shown with tag lines (uncrossable rock face symbol).

It may also be necessary to move close features (for example fences along roads or tracks), since the rescaling (while maintaining line widths) may mean that these lines merge or overlap. This may also need to be done again after the tracks are redrawn with the MTBO track symbols.

2.2 Lands Department Base Maps

State Lands Department topographical maps of most areas are generally available at 1:25,000 with 10m contours. In some areas 1:10,000 maps with a smaller contour interval may be available, particularly near major towns. The quality of contours and track information on these maps can be very variable, and a significant amount of fieldwork can be required to make a good quality MTBO map from these base maps.

The base maps can be supplemented by aerial photographs, which can also be scanned and used as templates in OCAD.

In some states, rectified aerial photographs are available. These are photographs which have been corrected for the camera angle to all points on the photograph, meaning that they can be used directly in conjunction with a contour base map, without the need for adjustment of the usual distortion.

2.2.1 Using non-Orienteering Base Map

A non-Orienteering base Map can be scanned and then used as a template in OCAD for drawing the MTBO map.

Again it is preferable to re-scale the scanned map to the MTBO map scale after scanning, in say Adobe Photoshop or any other drawing package that allows resizing of scanned images. (see above for non-OCAD Foot-O map).

The OCAD grid should be set to match the scanned base map grid (usually 1000m). In Options/Scales, select Real world coordinates. Set the Grid distance to the base map grid interval. Set the Horizontal offset and Vertical offset to map grid values near the centre of the map (for example 63000 and 35000). Set the Angle to the grid/magnetic angle (typically in the range 5 to 10 degrees anti-clockwise - i.e. magnetic north is 5 to 10 degrees east of grid north. OCAD will then show the grid lines angled west of map (magnetic) north.

The template then needs to be adjusted to the map grid. If the grid/magnetic angle is greater than 8 degrees, the template will need to be rotated before use as an OCAD template (this may not be a problem in OCAD 8; in OCAD 7 there is a maximum angle of rotation which is supposed to be 10 degrees, but in practice is less). Use Adobe Photoshop or any other drawing package that allows rotation of scanned images.

See the OCAD manual or OCAD on-line help for adjusting the template.

3. DRAWING MTBO MAPS

3.1 Tracks - Dash Control, Track Junctions

On an MTBO map, the tracks are the most important information on the map. Significantly more effort is required when drawing the tracks on an MTBO map compared to a Foot-O map.

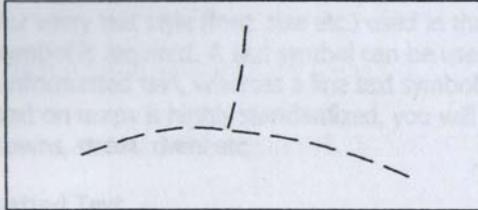
It is absolutely essential that all tracks and track junctions are clearly and unambiguously represented. Hence it is important that the map drawer is familiar with the use of corner points and dash points for dash control in OCAD.

The following pages are extracts from the OCAD User Manual. The examples given are for simple track junctions. The more complex the track junctions (multiple tracks, track loops etc), the more care and effort is required to have the tracks and junctions appear clearly and unambiguously.

Influencing Dashed Lines

OCAD always creates dashes of equal length, you never get half dashes. Normally the dashes are calculated for the entire line object. However if the line object contains a corner point, the dashes are calculated before and after the corner point separately. In the corner point you get 2 adjoining dashes.

In cartography you have often the need to influence the dashes. As example we take a road junction:



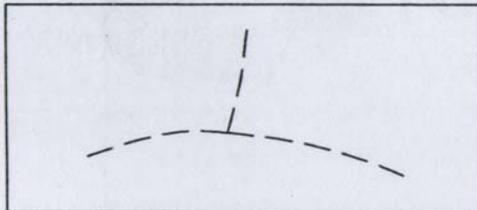
The solution is to create a corner point on the horizontal line where the vertical line meets. To create a corner point:

1. Select the Edit point button  in the toolbar.

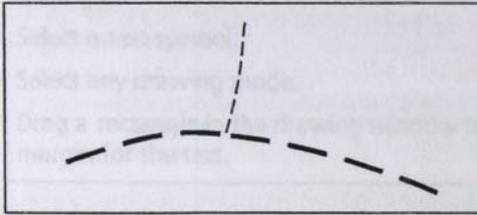
2. Select the horizontal line.

3. Select the Corner point button  in the toolbar.

4. Click on the junction. A corner point is inserted and you get 2 adjoining dashes.



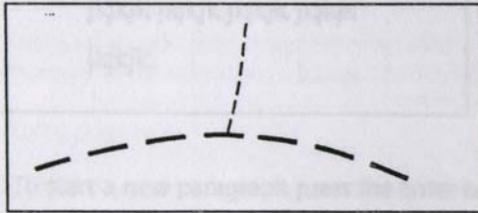
Sometimes you do not want to have 2 adjoining dashes, for instance if a small path exits from a road:



In this case you place a dash point in the junction. The dashes are calculated in a way that the dash point is in the center of a dash.

1. Select the Edit point button  in the toolbar.
2. Select the horizontal line.

3. Select the Dash point button  in the toolbar.
4. Click on the junction. A dash point is inserted and one dash is placed exactly in the junction.



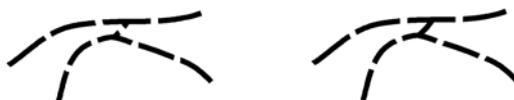
3.2 Tracks - Very Short Tracks

Great care must be taken when drawing short lengths of dashed tracks in OCAD. The problem is that OCAD will always give a gap, no matter how short the dashed track. This can result in essentially "almost no dashes and all gap".

The solution is to draw very short tracks, particularly short link tracks between other tracks, with the corresponding continuous line symbol. This is illustrated below.

In the drawing on the left, the link track is drawn with exactly the same symbol as the two main tracks. The "stubs" of the dashes are barely visible since OCAD has insisted on maintaining a "gap".

In the drawing on the right, the link track has been changed to a continuous line of the corresponding width, making the link track clear.



The impact of incorrectly drawn link tracks can be very significant for the competitor. The drawing on the left could be (a) interpreted by some competitors as being a link track which does go through, or (b) interpreted by other competitors as being two short tracks which do not connect, or (c) not seen at all by some competitors due to the very short dashes. These competitors will therefore make different navigation decisions, resulting in an unfair situation.

4. PRINTING MTBO MAPS

4.1 Printing Mode

The options for printing an MTBO map are identical to those for other Orienteering maps. However, the smaller print runs for MTBO maps mean that the relative economics of the printing are different to those for Foot-O maps.

It is unlikely that offset printing or four colour printing would be economic for printing other than possibly MTBO World Championship maps.

Colour laser printing is the preferred printing method for MTBO maps.

Colour photocopying (of say a high quality inkjet original) is not a preferred printing method due to the loss of detail, and the colour distortion. Given that the costs of colour laser printing and colour photocopying are generally similar, there is little justification for use of colour photocopying.

4.2 Printing Colours

See OFA Mapping Web page for information on colours and using the correct Colour table.
(could include more detail here ?)