Route Planning for Oruxmaps

The concept of waypoints, tracks and routes can differ in Oruxmaps (OM) from some longer-established mapping programs (like those from Garmin). Indeed, the terminologies of tracks and routes are sometimes used confusingly in OM (eg in the manuals up to v9, the heading "Recording our Routes" is above the instructions for recording a track). The idea in OM is that a Route is something to follow, so any Track (however it is created) is a potential Route.

Although routes can be planned directly in OM, it cannot create a route from waypoints on a map (only from a waypoint list). Even for those who do not want direct navigation between existing waypoints, there are limits of screen size and precision of finger tips as marking devices. Most users will likely find it more satisfying to create routes on a larger computer screen with a mouse or trackpad pointer, then transfer the routes to a phone for use in OM. Various paid on-line services can help with this, or you can use Garmin Basecamp for free off-line.

Using Garmin Basecamp

I can not find a way to make OM (v 7.4.28) build a route (for waypoint navigation) connecting waypoints that are visible on the map screen. For me it just builds a route to those map locations, without waypoints (so no waypoint navigation later); or it makes duplicate/default waypoints. OM can build a route from a list of waypoints, but for long or complex routes it is hard to create the right list and order of waypoints in OM while not viewing those waypoints on the map screen.

For off-line computer use, BaseCamp (available free from Garmin) does the job easily. All my old waypoints are shown there, I have the Garmin topo maps installed, and it can also use free OSM maps like the pre-made topo maps from https://alternativaslibres.org/en/ or .img files such as these if placed in a removable drive>Garmin directory or virtual drive. The Australian .img files combine 10m contours and high-visibility waterways from government sites with OSM data. This is useful for hikers, but the government sites include other useful topographic data, and may provide aerial imagery which can help planning. Alternate between such resources to form the clearest mental image of a planned route (and your "escape route" if things go wrong).

BaseCamp does a better job of displaying .img files, even after tweaking OM settings under Map>Garmin. In OM, it is probably better to alternate between WM(T)S maps from the State government sites and OSM maps from OpenAndro. The WM(T)S mosaic is lower in resolution than geopdf, but easier near mapsheet edges (because OM can only load one geopdf at a time). OSM often has better tracks/footpads but remember that it also has many errors.

You could even use gdal to make kml files from the State government geopdf maps and a UTM grid, if you prefer to plan (or print a backup copy) with these and your route plan etc displayed.

In BaseCamp, if you hover over a waypoint while building a route, you get the option to use that waypoint as a route point. Then (when the route is completed) File>Export>Export Selection >Save (after choosing your preferred name and destination folder).

Copy the gpx file to your phone (OM tracklog folder), and open in OM as above. Note that if your Route includes any route points that are not waypoints (if you chose a point on the map instead of a waypoint, on purpose or accidentally) those route points will not be used for waypoint navigation! This differs from Caltopo (the programs differ in what they place in an exported gpx file, and this interacts with the way OM uses imported gpx files). Unfortunately if you have already done all the work to get your waypoints with their custom icons from Basecamp into OM, you have to do much of it again for clean display of the same waypoints in each route.

To navigate a route (after GPX transfer from Garmin BaseCamp to OM tracklog):

(A) Top menu>Routes&Tracks{symbol}>Track /Route tools>**Load** KML/GPX file>choose tracklog or other desired route folder and select the route (blue tick)>OK>Wpt Nav>Wpt Alarm> (Options are also here to Start GPS and Track Logging if not done already)>Accept.

Or, (B) For routes previously '**Imported**' from tracklog to an OM database folder: Top Menu>Routes {symbol}>**Manage**>select Folder & Route>Follow>Wpt Nav/Alarm etc> Accept.

After either A or B, the selected route should appear on screen. Dashboard should show distance and bearing to the next Wpt. Status bar should show route, Wpt-nav and alarm icons.

__Cautions__: (1)Wpt Nav only goes to waypoints (not route points). Wpts in a route will show on screen (probably as duplicates of your saved wpts, with a default icon). If the route is accessed by method __B__, and (duplicated) wpts under --- are deleted, there will be no Wpt Nav!! (2) Pink 'Navigation Dashboard' uses True bearing; use 'Top Dashboard' for Magnetic bearing. (3) Wpt proximity switch is not adjustable, but you can use Next/Prev Wpt.

Because of the danger of deleting (apparent duplicate) route waypoints from ---, it may be better to 'load' routes as in **A** above. But you will see duplicates of your saved wpts, with a default icon. If you delete and then re-import the route using method **B**, OM will recreate the (default icon) waypoints under ---. I cannot find any way to change the default wpt icon, or turn off text for imported route wpts only. After **B**, it is possible to use (Top Menu>Wpts {symbol}>Manage>--->tap a wpt>Edit Properties>Type) to match each of the route wpts in --- to your custom wpt types at the same map locations. On routes with many wpts, this is a lot of work (which risks loss by later deletion), but it does give a clearer appearance on the map screen. Afterwards, you can export the tailored route for later use (to load or overlay).

You can use "Add to Route" in OM to display and save custom wpts with a route (with or without other waypoints); but the route is not diverted through the added wpts, it is just as much added work, and the order seems unpredictable, so it does not suit Wpt Nav.

To make a KML file (no real benefit unless you want it more easily as an overlay): Top menu> Routes&Tracks{symbol}>Track/Route tools>Manage>choose desired route folder>Import from file {bottom menu symbol}>choose source folder (eg tracklogs)> select GPX route (blue tick)>Export {bottom menu symbol}>KML>processing, created. The KML file will now be in 'tracklogs'; if you want to move it to 'overlay' (&/or remove the date added to the name) you will need to use a file manager. Either way, you can now 'load' the KML as above. Unless you have exported a route with route points tailored as above, the 'overlay' will have those duplicates of your saved wpts, each with a default icon.

GPX is Non-Proprietary, but Mapping Programs Differ in How They Use It

Programs vary in the way they handle GPX (and other format) files. From what I can tell:

OM strips waypoints from routes stored in database folders (those that show only in OM) and places them in the default folder --- (where they are in danger of deletion as apparent duplicates). It does this when the routes are 'Imported' to those database folders.

OM does not strip/duplicate waypoints from routes stored in non-database folders such as 'tracklogs' and 'overlays' (which show in file managers, but not usually under 'Manage' screens in OM). These routes are used by 'Loading' the file (under 'Track/Route Tools'). They cannot be seen easily under 'Manage Tracks/Routes'. The non-database folders can sometimes be accessed for limited purposes in OM (eg from 'Manage' screens, via >Import from file {bottom menu symbol}>).

On importing from GPX, OM looks in the <type> field not the <sym> field for icon symbols. When it does not find a match to one of its icon designations, it uses the OM default wpt icon.

OM does export a <sym> field to GPX, but assigns a default waypoint symbol there. It also uses the <type> field along with OM-specific <extensions> to denote the required icon. Because this is done in <extensions> by a number rather than a name (reflecting the design of the underlying database), if you change the order of custom waypoint icons (*e.g.* by interpolating alphabetically in your customwpts.txt file) strange things will happen to your existing wpts. To avoid this problem, add any new icon names at the end of the list in customwpts.txt. Then restart OM to use the altered customwpts.txt file.

OM also imports <lat> <lon> <ele> <time> <name> and <desc> (and it imports from <cmt> into <extensions>). Although new versions of OM claim to recognize Garmin track <extensions>, I am not sure which ones (not apparently track colour). In WPT details, OM displays lat and lon rounded to 5 decimal degrees, but it retains 7 decimal degrees in the database as evidenced by gpx files exported from OM.

OM (7.4.28) is not good at everything

There are some things that OM does not do well (or at all). But the app is still developing, and some of these may work better in later versions.

1. OM can not easily show multiple saved tracks on screen, each in its assigned colour. It tries to show saved tracks as routes (eg if you use Track/Route Tools>Load or Manage Tracks/Routes> Load{bottom bar symbol}). Then they appear as route lines (dashed) not track lines (solid), and get the colours of primary and secondary routes.

If you load imported GPX tracks as overlays they are all the same colour: (i) blue if loaded from Garmin BaseCamp GPX by clicking one at a time from Manage Tracks/Routes> Load as a Map Overlay{pop-up menu}); (ii) green if loaded from Maps>Overlay>Load).

They are all blue from (i) because OM unsurprisingly does not respect Garmin GPX <extensions> <gpxx:TrackExtension><gpxx:DisplayColor>. Instead OM uses blue by default, which you can change (one track at a time) under Properties>Route Color, though you have to work from a colour matrix (in 3 steps with default to white), not a simpler list or any place to put a (RGB, HSL, HTML, HEX) colour code number. If you then save in OM as a GPX, OM does not include your chosen colour in the GPX it saves, but on loading from an OM GPX it uses green by default (go figure).

If you select Settings>Tracks/Routes/KML/KMZ settings>Include Path folder, OM saves <Style><LineStyle><color> under <Folder><name><Paths> in KML exports, eg cbe205f0 in HEX means either 94% opacity (f0) yellow (cbe205) or ~80% opacity (cb) magenta (e205f0), which was the assigned track colour (if OM/Android puts opacity first). But OM loads KML track overlays in green anyhow (go figure). {If you set Include Track folder under KML/KMZ settings, OM saves fffaff00 where fffaff is white and 00 is 0% opacity, ie no path color. In both cases, there is also <Document><StyleMap><LineStyle><color>99ffac59 meaning either 35% opacity (59) lime (99ffac) or 60% opacity (99) orange (ffac59). Even if you edit all <color> settings in the KML, track overlays still load green.}

It can be very useful while hiking off-track to see and distinguish your previous tracks, but this is not made easy in OM. You can tailor them in colour (one at a time) then load as map overlays (one at a time, but now with each track in its assigned colour). If you then use Overlay Options>Remove, you will loose them all from the screen (along with your waypoints or anything else loaded as an overlay). But you can instead use Overlay Options>Tweak Overlay to select which overlays are displayed (and even which components within some complex kmz files). There seems to be no way to remove just one from this overlay list, so if you alter a track and re-load it as an overlay you will get two copies (old and new) in the overlay list. It may be more effective to use BaseCamp to see which tracks are relevant and make overlays of them before an expedition.

2. OM can not identify or select tracks or routes on the map screen (eg when you scroll over or click on them). It can identify and give properties of waypoints when you click on them.

If for waypoints you display them using Manage Waypoints>Display{bottom symbol}, you get a pop-up menu of 2 options. If you "Load (in active route)" instead of "Show (as a map overlay)" it

has the annoying old "Jumping waypoints" function (which at least now pops up a confirmation box). Waypoints "loaded" or "shown" under the waypoints top-menu must be cleared from the screen under the routes/tracks top-menu. Manage Tracks/Routes>Display {bottom symbol}, does not give these pop-up options; it goes straight to route display. You can export selected tracks/routes as KML files to use as overlays, as you can for waypoints. But multiple waypoints go into a single file, whereas each track goes into a separate file (even if you choose KMZ). You can also click on a track or route then "Load as a Map Overlay" from the pop-up menu, but this pop-up menu option is not available for waypoints (go figure these inconsistencies).

3. OM can not create routes from waypoints on the map screen. It requires you to put the relevant waypoints in a separate (or filtered) list, and order them, without being able to see them at the same time on the map. This is very difficult for users with lots of waypoints that are used to create complex routes. (It is easy to build routes from existing waypoints and/or map positions on a map screen in BaseCamp).

4. OM can not manage files in Tracklogs, Overlays etc (only database entries). You have to use a separate File Manager (and this gets even harder in recent Android versions that limit access to the "Private" folders created for each compliant App, including recent OM versions.)

5. OM does not handle automatic screen rotation properly (cuts off parts), at least in my A15.

6. I do not understand the "Include" options under Global Settings>Tracks/Routes>KML/ KMZ Settings, and the manual does not help. These options seem to determine how the track is included in the exported KML file code, but Paths/Tracks, Old (painted) / New (unpainted?) format?? I see no difference when the resulting files are loaded as overlays.

7. The ability of OM to handle maps in various formats from various sources is wonderful. However, OM blinks while it loads entire geopdf files at each magnification, including those parts of the file that are off-screen. Eventually the blinking stops (when the whole file is loaded at the chosen magnification), but the problem starts again when you change zoom level, and slows down the whole experience. It does this with or without use of the "Android PDF engine" under Global Settings>Maps. It works much better with WM(T)S tiles, though these are typically lower in resolution than corresponding geopdf files.

For such reasons, those from a Garmin background will probably work mostly in BaseCamp while at home (even though BaseCamp is restricted in map file types). It is then a struggle to get things into OM, which interprets GPX files very differently from BaseCamp.

Saved Tracks

OM keeps past tracks by default in its database under ---, and it also gives an option to save those tracks on completion (or later by export) in GPX or KML format under tracklogs (from which you would need to use a file manager for copy, move, rename or delete operations).

Tracks 'exported' as GPX from OM can be imported by other mapping programs, but don't assume that any of the `<extensions>` (or any features other than track name and trackpoint locations) will work across programs.

I noticed that (new) Samsung A15 battery power dropped from 85% to 80% over about 2 hr of default (min 2 sec, 20 m) track recording, with little screen use. "Power save" GPS mode uses min 30 sec, 80 m; so it should work much longer on the same battery power, at the expense of fine detail in the recorded track. If you will filter a long track later to reduce the number of points, this is probably the option to use when recording.

BaseCamp is much easier to use for removing part of a track (imported via gpx), but you will need to re-apply any features in non-standard extensions (like track colour) in the modified track after re-import via gpx into OM.