# Step by Step Guide to Setting up a Demo Event for MapRun (or MyOMaps)
### Version 8.0

**support@fne.com.au**

## Overview

This document describes how to setup an event using smartphone punching/timing (rather than SportsIdent). These same instructions can be followed to use a smartphone for checking the placement of controls for a conventional Orienteering Event.

The App uses GPS to "punch" controls and so it is important to position controls accurately to with a metre or two of the Lat/Lng of the control feature. The best way to do this is to position controls by dropping a pin on a feature visible in Google Earth satellite imagery. This means the App is best suited to Street-O/Park-O events where there are more options for control sites (visible in satellite imagery) than orienteering in the forest, where desired control sites may be difficult to see in the satellite imagery.

In summary:
- As of January 2018 the recommended App is MapRun
  - From version 41.2 (Android) and 7.0.1 (iOS) it supports all event types and has the latest bug fixes.
- Two files are required for the App for an event:
  - A map file –
    - This needs to be in Google KMZ format, usually created out of OCAD version 10, 11 or 12
    - Alternatively, if you are using maps from OpenOrienteeringMap (www.oomap.co.uk) we can automatically produce the KMZ file.
  - A course file –
    - This needs to be in either IOF XML or Google KML file format.
    - KML format is highly recommended, as created by Google Earth or Google Maps, as this allows accurate placement of controls on features visible in satellite imagery
    - Alternatively, IOF XML can be created by any of the orienteering course setting systems including OCAD, Corpse, Condes, PurplePen, but extreme care must be taken with the accuracy of the O-map used and the placement of controls on the map. (Remember that moving a control by 1mm on a 1:10000 map moves it by 10m on the ground). We are able to convert exiting IOF

XML files to KML so that the real-world position of the controls can be checked in Google Earth.
- The files can either be:
  o sent to a MapRun administrator to publish on the server for any user of the Apps to use (although a PIN can be set). For published events, the naming of the course file sets the characteristics of the event – eg line course vs scatter (See Appendix 1 for details)

  or
  o used with the full version of MyOMaps on Android, using the option where the files can be copied directly to the smartphone and used privately on that device.

Detailed instructions follow.


## Version of MapRun/MyOMaps

Use the latest version of MapRun/MyOMaps from the Google Play Store or the Apple Store. If updates are not set to automatic, check for the latest version of the App.

MapRun and MyOMaps are available for Android SmartPhones from the Google Play Store:
- MyOMaps (paid version - $5.99)
- MyOMaps Club (free)
- MapRun (free)
and for iOS (iPhones) from the Apple Store:
- MyOMaps (free)
- MapRun (free)
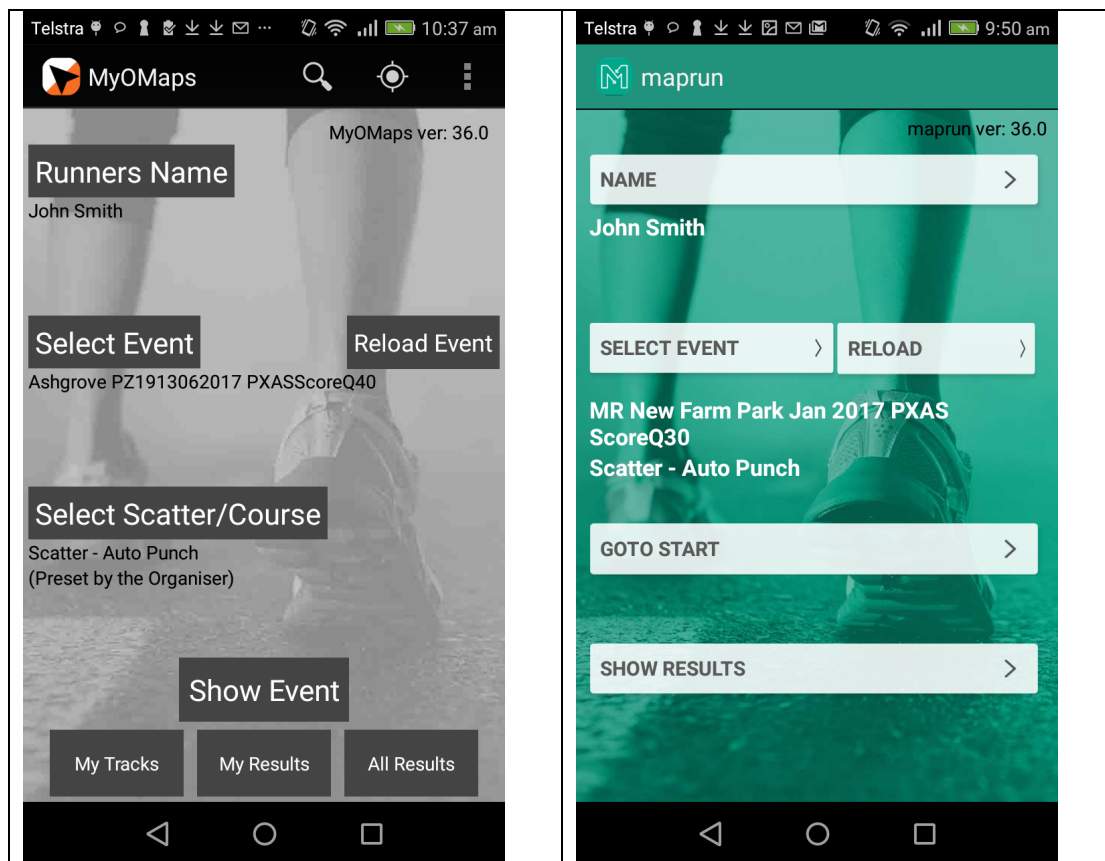
There are two basic modes of operation:
- Event Mode – This mode is which is used to participate in an orienteering event. The map and course are displayed, but not the user's location or track. In this mode, the App creates a splits result file, a GPX track and in the case of score events, a score result. For runners in organised events, MapRun is the preferred App.
- MyTracks Mode – This mode is used for mapping, course setting, control placement, control checking etc. The map, course, user's location and user's track are displayed. The user can drop location Pins. MyOMaps provides some additional capability for this mode.

The following summarises the differences between the versions:
- The most capable App is MyOMaps for Android which includes all features and suits users who want to create/set their own Maps and Courses which can be stored locally on the phone (and do not need to be published to the MyOMaps server).
- MyOMaps Club has all the features required for a runner to participate in a published event.
- Up until Jan 2018, MapRun was a simplified version that was targeted at Score Events (using AutoPunch). It did not support MyTracks mode at all. It only displayed folders and events with names starting with "MR".
  - From Jan 2018 (Android v41.2 and iOS 7.0.1), MapRun has been expand with the aim of effectively replacing MyOMaps Club.

- MyOMaps and MapRun are variants of the same code base (consisting of Java code for Android and Objective C for iOS).

Functionality differences are tabulated below:

| Functionality Differences between versions of the App | | | Android | | | iOS (iPhone) | |
|---|---|---|---|---|---|---|---|
| | | | MyOMaps | MyOMaps Club | MapRun V41.2+ | MyOMaps | MapRun V7.0.1+ |
| Event Mode | Punching | Auto | √ | √ | √ | √ | √ |
| | | User | √ | √ | × | √ | × |
| | | Manual | Currently Disabled | | × | | × |
| | Mode | Line Course | √ | √ | √ | √ | √ |
| | | Scatter | √ | √ | √ | √ | √ |
| | | Score | √ | √ | √ | √ | √ |
| MyTracks Mode | Map & Course files can be manually loaded to the phone | | √ | × | | × | |
| | Create a KMZ file from an image | | √ | × | | × | |
| | Change transparency of Map | | √ | √ | | × | √ |
| | Change GPS settings | | √ | × | | × | |

## Maps – KMZ Files

The App needs a KMZ file as the map file for display. Note that the App only uses the map for display to the user. The map, its accuracy, or the positioning of controls relative to features on the map, play no part in the logic of the App. The App uses only the course file for determining the location of the Start/Finish and Controls.

*Use an OpenOrienteeringMap ([www.oomap.co.uk](www.oomap.co.uk))*

A quick way to produce a map for Street-O is to export a map from OpenOrienteeringMap.

Just produce a blank map (without controls) and note the Map ID. This can be converted into a KMZ file automatically.

This capability is expected to be available online in the future, but for the time being send the Map ID to support@fne.com.au. Alternatively, local administrators can access this from the **o-utils** system.

## *Create KMZ from a Geo-Referenced OCAD Map*

If you have a modern orienteering map produced in a recent version of OCAD using a coordinate system eg WGS84, the KMZ file is simply an export from OCAD.

The file should be created in OCAD version 10,11 or 12 with the following settings:
- 512x512 tiles – this enables the App to manage memory more effectively than having one large image file
- 150dpi – This is typically adequate. 300dpi could also be used, but the general guidance is to keep the KMZ file to less than about 1MB in size

This process is described at www.myomaps.com/ocad---maps-and-courses.html and in the video: https://youtu.be/a1C1Ioo_neY

## *Geo-Reference a Map in OCAD*

The process described above requires a geo-referenced OCAD map, that is the map is not just a drawing, but it contains locational information that places the map accurately on the surface of the Earth.

If your map is not geo-referenced, one option is to use OCAD to create a geo-referenced version.

The process for this, using Google Earth and OCAD version 10,11 or 12 is as follows:
- Print the map and look at the Google Earth imagery for the area covered by the map and mark on the map some key features you will use to align the map to the surface of the Earth (features that are visible in the satellite image)
- Use Google Earth (or Google MyMaps) to drop pins at the selected locations:
  - Be careful with the pins to know what point is actually being marked.
  - Also it's best to have Google Earth set to Lat and Lng (and not UTM)
- Create a KML file of these locations using the "Save Place As" feature of Google Earth
- Convert this KML file to GPX (as OCAD (Orienteering Version) does not currently import KML files)
  - An online converter such as KML2GPX.com works well
- Open your un-georeferenced map in OCAD and import the GPX file

- Use the Map > Transform > Affine to align the matching points on the map to the location of the Pins. OCAD will determine an optimal match of the map to the specific points.
- You may need to rotate the map (Map > Rotate) to bring the magnetic north back to vertical – In Brisbane Australia that angle is about -11degrees
  - It is sometimes easier to delete all the extra "chrome" off the map before rotating it and then pasting this information back from an old un-rotated copy, after rotating the map. Otherwise, the rotation of these objects back to horizontal can take some time.
- Delete the pins and re-import them and examine how good a match has been achieved. Repeat the Map > Transform process if desired.
- Delete the pins and save the file as your geo-referenced map.
- Use the process described above to create a KMZ file (remember to select 512x512 tiles).
- Open the KMZ file with Google Earth and examine the accuracy of the geo-referencing/mapping.
- Repeat the above process if desired

See the YouTube videos that demonstrate this process:
- Geo-referencing an OCAD Map - https://youtu.be/OQMNnfC3bus
- Creating a KMZ file in OCAD and checking it in Google Earth - https://youtu.be/a1C1Ioo_neY

*Geo-Reference a PDF (or Image) in OCAD*

If you only have a PDF of the map or an image file, you can load this into OCAD 10, 11, 12 as a background map and georeference it in a similar way to that described above (although obviously you won't be able to edit the map).

One approach for Urban events is to use OpenOrienteeringMap  www.oomap.co.uk to produce a quick orienteering map in PDF format, which then needs to be geo-referenced.

In OCAD:
- Select: File > New > Orienteering Map (of the scale you want)
- Open the image file as a Background Map with:  Background Map > Open
- Import your GPX file.
- Then instead of using "Affine" as above, use: Background Map > Adjust, to match points on the image to the GPX points.
- Export the KMZ file and check it in Google Earth as mentioned above.

*Geo-Reference an Image in MyOMaps*

The Android MyOMaps (full version) has a function to create a KMZ file from a photo taken of a map on the phone (or an image file on the phone). This can be useful for a

quick, simple geo-referencing of a photo you might take of an existing printed map. It is not as accurate and high quality as the OCAD methods mentioned above.

See: http://myomaps.weebly.com/creating-a-map.html

## Course - Setting the Course (Google Earth)

Course setters should open the map KMZ file in Google Earth on their PC/Mac to see their map's position in the real world.

The process of setting a StreetO event is demonstrated in the following YouTube video:https://youtu.be/GizFb7z5pZQ

Help in the use of Google Earth is readily available on-line (Just Google your query). A few tips are provided below:

- Layers can be turned on or off.

- If the screen goes into 3-D mode rather than the view from directly overhead, this can be quickly restored using >View>Reset>Tilt. The shortcut key is "R".

- To add a control in the current folder, click the yellow pin on the tool-bar.

- To reposition an existing control, hover the cursor "hand" over it, right-click to show a menu and left-click on 'Properties' (or 'Get Info' on a Mac) at the bottom of the menu. This will activate the yellow flashing square, and an 'Edit Placemark' window will appear. While the yellow square is flashing, just put your cursor hand over it and drag it to your desired position. Then press OK in the 'Edit Placemark' window. See below:
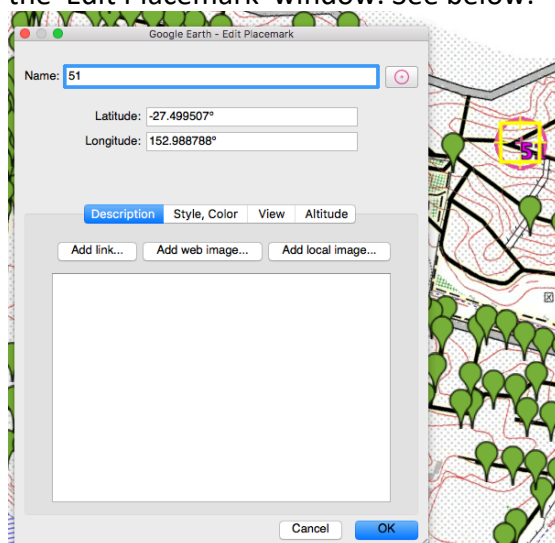


- To change the icon (eg to a an orienteering control, or start or finish control), click the icon symbol to the right of its name in the dialog box shown above.

You can create custom icons like the ones shown here using the following URLs:

http://fne.com.au/pins/control_circle.png
http://fne.com.au/pins/start_triangle.png
http://fne.com.au/pins/finish_circle.png

- Note that the icons used are cosmetic only. The actual icons that will appear in the App are set automatically (independent of what icons are used in Google Earth).

- The transparency of the map can be changed by selecting the map in the folder hierarchy and then using the slider at the bottom on the panel as shown below:
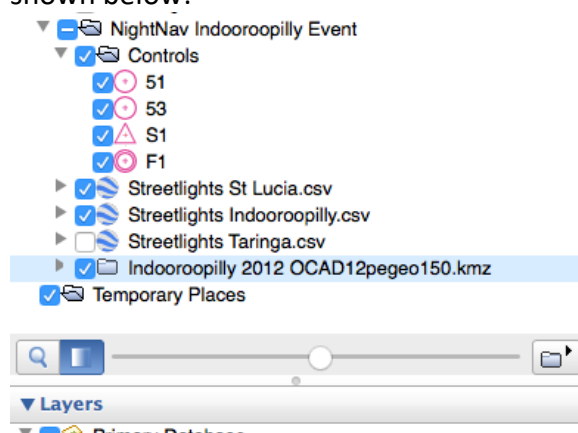


- A recommended approach is:

    o Place all the controls to make an interesting event, by placing pins in draft locations with the Orienteering Map displayed. In this step, decide on the overall spread of controls and the navigational challenges to be posed. Don't worry about the exact control locations in this step.
    o Next, switch off the Orienteering Map lay and now adjust each control (pin) to a nearby streetlight (for StreetO) or other feature that is visible on the Google Earth satellite image.

- For StreetO, place controls directly on the base of streetlight poles or similar features that are visible in the imagery. Often there is a shadow of pole that helps position of the control at the base of the pole (ie the intersection of the shadow and the image of the pole).

- Note that placing controls using the Orienteering Map is NOT accurate enough. It is best to aim for controls to be within 1-2m of the feature (streetlight). Remember that 2m is only 0.2mm on a 1:10,000 map and this is too small a distance on the map to make it workable. However, using Google Earth, you can zoom in to place to control accurately in the real world.

- For night StreetO - double-check that the poles you select have streetlights on them. Street lights can be seen from:

    o The imagery of the pole showing a streetlight, or
    o The shadow of the pole showing a streetlight.
    o Streetview should be used to positively confirm that there is a streetlight on the pole.

Satellite Imagery:



StreetView:
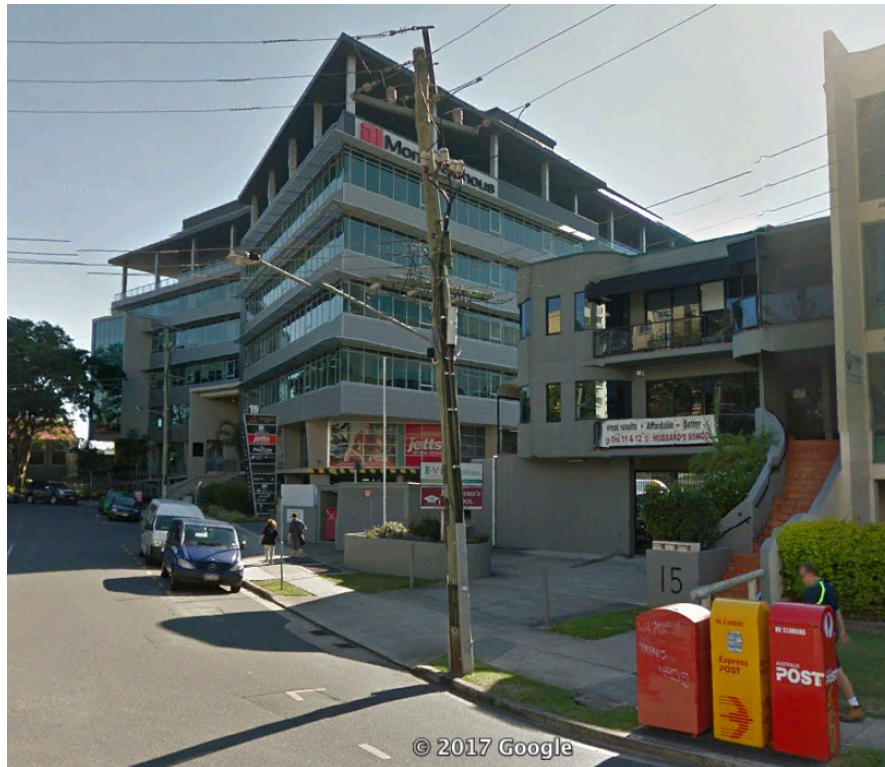
*Course Requirements*

The App needs the start to be named: "S1" and the finish "F1" and for these to be the first and last pins in the list.

Normal controls should be named using a two-digit or three-digit number. Do not including letters or spaces in the names.

Manually sort the pins by dragging them up/down in the folder-structure. For line courses, the order of the controls in the list will be the course order. For scatter/score, any order of the normal controls is OK.

Check for omissions or duplicates.
Double check that first control is "S1" and the last "F1".

*Multiple Courses*

KML files can only contain one "course".

In the case of multiple line courses the recommended approach is:
-   Set all control locations as above in one folder in Google Earth.
-   Then copy this folder of controls as the starting point for each course. For each course, delete unused controls and drag the remaining controls into the required order on the course.
-   Export each folder of controls as a separate KML file.

Unlike for SI units where we can decide the precise location of the Start and Finish flags on the day, for the App, the location needs to be pre-determined and included in the course files.

- A single location for the Start and Finish controls is preferred (ie co-located Start and Finish). That is, put the start and finish pins at the same point on the map. This is not mandatory, and separate Start and Finish locations is fine.
- Choose a location for the Start that is ideally on a feature that you can see in the Google Satellite view and is approximately 30m from the registration table. This allows runners to assemble near the table and then press "Start GPS" with their time starting when they move to the Start location.
- With a co-located Start/Finish, when the runner first approaches this location, Start will be punched. After punching at least one other control and returning to this location Finish will be punched.
- It is best to position the Start/Finish in a location that runners will NOT run past part-way through their run, as this will result in Finish being punched. The general instruction is: "Don't go near the Finish unless you want to finish."

Earlier versions of the App did not allow for co-located Start and Finish, so runners should be sure to have the latest version.

*Exporting the Course File (KML)*

In Google Earth right-click on the folder containing the controls, and select "Save Place As". Choose KML (not KMZ) and save the file to your PC.

## Opening the Map and Course in MyOMaps/MapRun

The files can either be published to the MyOMaps server for general access as described below, or the copied onto an Android running the full version of MyOMaps and used privately on that device. To do the latter:
- Transfer the files to the Android. This can be done by emailing them, USB lead, Google Drive etc
- In MyOMaps set the file location to local using: Menu > Settings > Map and Course File Location > Local on Device
- Then open map/course and browse to the folder you have saved the files in.

## Publishing on the MyOMaps Server

To make an event available publically for all users of the App, it is published to the MyOMaps server.

At this stage, this step will normally be undertaken by Peter Effeney or a local Administrator

Peter (or the local Administrator) will publish the event either as a draft for your checking or as the final. He will send you back:
- the PIN for the event, and
- the Purple Pen files to allow printing of paper maps.

*Confidentiality Prior to the Event*

The event will normally be protected with a 4-digit PIN, which is announced just prior to start time on the day of the event. The setter/organiser will be told this PIN to allow them to do any testing they want to do in advance.

If SI units are being used, it is also useful to use the App to confirm that the SI unit locations agree with the GPS locations when putting out controls (if applicable).

*Producing a Printed Map/Course*

To reduce the chance of discrepancies between the App and the printed map/course (and the physical placement of SI units if applicable), it is best to derive the printed Map/Course from the Google Earth placement of controls.

### 1. Purple Pen (Preferred Method)

An interface has been developed that uses the exported Google Earth files to automatically create a Purple Pen file which can then be fine-tuned (and printed.

At this stage, when you export the Google Earth package as a KMZ file and send it to Peter Effeney for uploading for MyOMaps, Purple Pen files matching the event uploaded for the App will be returned to you.

Open the Purple Pen file and make any final cosmetic adjustments (eg print area, the position of labels on the controls, control description table if applicable) and print the course.

### 2. Print from Google Earth (Alternative Method)

To print the map/course directly from Google Earth:
- Rotate the map to have Magnetic North vertical and scale it to fill the screen
- Do a screen capture of the map into a jpg file
- Print the jpg file

To get the best quality map, expand the display on the screen to as large as possible (on your largest screen) before using a tool such as Windows Snipping Tool or Mac – Shift-Command-4 to select a rectangular area close to the boundaries of the map on the display.


## Publishing of Results

For events published on the MyOMaps server, a scoring system operates on the server. To be included in published results, participants need to "Upload Results" in the App. To do this they need to be connected to the Internet.

Results are immediately available on the SmartPhone:
- Participants can see their track, their splits and their points (in the case of a score event) using the local auto-saved copy of results on their phone.
- Participants with access to the Internet, should press "Upload Results" and use "All Times" to see a table of results:
    o In the case of Score Events, this will be a table of Scores
    o In the case of Scatter, this will be a table of splits
- The tracks of all participants are available on RouteGadget. This is best viewed on a PC screen.

Results can be be viewed at:
- If using MyOMaps for the event: www.myomaps.com/results
- If using MapRun for the event: www.maprunners.com.au/results


## Related websites
- www.myomaps.com
- www.maprunners.com.au
- www.smartphoneadventures.com.au

# Appendix 1 – Map and Course File Naming

## Map Files

The map file name (KMZ) is not required to be of any specific format except:
- it cannot contain underscore characters (i.e. "_"), and
- it should have a lower-case .kmz file extension.

## Course Files

The naming of the course file:
- becomes the Event Name in MyOMaps and RouteGadget
- can determine the course type (line, scatter…) and punching mode (auto, user…)
- if set this way, the user cannot change the option set for that event,
- should have a lower-case .xml (or .kml) file extension.

Older versions of the MapRun App only display events and folders that have names starting with "MR". Newer versions (Android v41.0, iOS v7.0.1 or later) remove this restriction and so the preferred naming now excludes this prefix

**Scatter:**

A course file name containing:
- PXAS is autopunch scatter
- PXUS is user punch scatter

If PXAS or PXUS is followed by a number, this is the number of controls at need to be punched, otherwise ALL controls need to be punched.

For example if 20 controls are placed:
- Taringa Long PXAS16.kml – requires 16 controls to be punched (using autopunch)
- Taringa Medium PXAS12.kml – requires 12 controls
- Taringa Short PXAS08.kml – requires 8 controls.

Details:
- "Taringa Long" – Any name for the event except the filename cannot contain underscore characters (i.e. "_").
- "PXAS" – The punching format for this event is "Auto Punch" i.e. the App automatically punches the control when it comes in range of the control. The event is also a Scatter (as distinct from a Line Course event). All controls need to be punched for a valid run.
- "PXUS" - The punching format for this event is "User Punch" where the user needs to tap a button to punch. The event is also a Scatter (as distinct from a Line Course event). All controls need to be punched for a valid run.

- "PXASxx" or "PXUSxx" – Is an AutoPunch/UserPunch Scatter event with a specific (minimum) number of controls that need to be punched for a valid run.
- Controls can only be punched once.


**Score:**

For a score event, the course file should contain:
"PXAS" or "PXUS" followed by "ScoreQxx" or "ScoreVxx"  or "ScoreWxx" where xx is the time in minutes.

For example:
- Taringa PXAS ScoreQ40.kml
- MR Taringa PXAS ScoreQ40.kml (for a MapRun event)

Details:
- "Taringa" – Any name for the event except the filename cannot contain underscore characters (i.e. "_").
- PXAS" – as described above for scatter events.
- "ScoreQ40" – This is a score event with a 40min time limit, and "Q" designates "Queensland scoring" rules i.e.: The points for a control are the control number rounded down to the nearest multiple of 10 and the penalty for late completion is 30 points per minute (or part thereof).
- An alternative scoring system is available ie ScoreV40 for a 40min time limit with "V" designating "Victorian scoring" rules: All controls are worth 20 points and there is a penalty for late completion of 10 point per minute (or part thereof).
- ScoreW  (Waikato) is similar to score Q except:
  o Controls 9xx, are 100 points but will not punch in the first 10min or last 10min of the event duration.

Note: ScoreB and ScoreM are in development

The full set of score options are shown below.

| Scheme | Scoring per control | Penalty for late return (per minute or part thereof) | Notes and Special Conditions |
|---|---|---|---|
| ScoreVxx  (eg Bendigo Park Series) | 20 | 10 | |
| ScoreQxx(eg Queensland NightNav; MTBO) | Control number rounded down to the nearest multiple of 10 | 30 | |

| | | | |
|---|---|---|---|
| ScoreWxx (eg Waikato Urban Rogaine) | Same as ScoreQ except for special conditions | Same as ScoreQ | Controls 9xx, are 100 points but will not punch in the first 10min or last 10min of the event duration |
| ScoreNxx (eg Sydney Summer Series, North Glouchester UK) | 10 for 1-10 20 for 11-20 30 for 21-30 (pattern continues) | 10 | |
| ScoreGxx (Street-0) | 2 for 1-5 3 for 6-10 4 for 11-15 5 for 16-20 6 for 21-25 (pattern continues) | 3 | Same as ScoreM except for the penalty |
| ScoreMxx (Street-0) | 2 for 1-5 3 for 6-10 4 for 11-15 5 for 16-20 6 for 21-25 (pattern continues) | 2 | Same as ScoreG except for the penalty |
| ScoreBxx (Two Blocks of Controls – useful to increase distance on a small map) | Control number rounded down to the nearest multiple of 10 | 30 | Runners punch even numbered controls first and then odd numbered controls (or vice versa). See details below. |

Where xx is time in minutes. It is typically two digits but can be 1 or more digits.
If xx is 00, no time penalty applies

**ScoreB Details:**
1. This is a time-limited scatter event with two sets of controls (ie of different "parity" - odd numbered and even numbered) on the same map.
2. Runners select to run either evens or odds first and then the other.
3. The runner's first block is determined by whether two odds or two evens are punched before two of the other (or stated another way, of the first three non-duplicated controls visited, two are even or two are odd).
4. The flip to the second block is signaled by visiting two controls in the second block in succession. (ie two odds after an initial block of evens or vice versa)
5. Runners don't need to visit all evens or all odds and could just visit one block of controls.
6. Controls of the wrong parity in a block (ie odds visited in an even block and vice versa) do not count towards the points score but can be visited in the correct block for points. These controls are listed as "Extras" in the results table.

**PIN:**

If the course file name includes "PZ" there is a PIN on this event. The map is still visible without the PIN, but not the course. If the PZ is followed by a time and dates of the format: "PZHHDDMMYYYY" there is a PIN on this event up to HH hours (00 to 23) on day DD of Month MM in Year YYYY. The time is a UTC/GMT time NOT a local time.

The time is typically set as the time of the end of the start window, so that after that time, it is not necessary to remember (or know) a PIN.

PINs are automatically determined based on the filename. They are not stored by the server or the App. The PIN for an event can be displayed using a function on the MyOMaps Admin Page.

PINs restrict access to the course in both the App and RouteGadget.

**Example:**

Taringa PZ0921022017 PXAS ScoreQ40.kml
  Is a Taringa event, with a PIN that expired at 7pm on 21 Feb 2017. It is a 40min score event using auto-punch to Queensland scoring rules.