

MapRunG

MapRun on a Garmin Watch

(Document Version 17.0)

1 Summary

Run in a MapRun event with just your Garmin Watch. Get a beep/buzz at each control and see your track and results on your phone, as per normal, at the end of your run.

2 How does it work?

The control locations for the event are passed to the MapRunG App on your Garmin Watch. MapRunG detects the Start, each control and Finish, much the same as MapRun6 does. It beeps/buzzes and shows the controls punched on the watch face.

At the finish, your watch syncs with Garmin Connect which passes the punches and track to the MapRun server. Then on your phone, in MapRun6, your results will be available as if you had just run with the Phone.

3 Quick Guide

Here is a quick guide for experienced users of a Garmin Watch and MapRun6. If you have questions after reading the quick guide, please look for answers in the remainder of this document before you “phone a friend”.

Three Steps to Setup MapRunG:

1. Check that your Garmin Watch is capable of running Apps, that it is paired with your phone and connected to Garmin Connect, and that you are using MapRun6 or later on your phone.
2. Install MapRunG from the Garmin Connect IQ store. MapRunG will assign your watch a MapRun Watch ID (a nine-digit number).
3. Use the Settings in MapRun6 to turn on Watch Mode and enter the MapRun Watch ID of your watch (Do NOT enter the Garmin Unit ID/Device ID/Serial Number). Then login to your Garmin account to give MapRun permission to access your runs.

Two Steps to Run with MapRunG

1. Select the event in the normal way in MapRun6 and instead of “Go to Start”, tap “Send Event to my Garmin Watch”. Ensure you have Garmin Connect running on your phone and start the MapRunG App on the watch to download the selected event. Confirm that the event is the correct one. MapRunG remembers the last event you downloaded.
2. When you are ready, tap the Start/Stop button on your watch and run the event, the same as you would with your phone.

Two Steps to get Results

1. After punching F1, tap Start/Stop on your watch to select “Finish” and then sync your track to Garmin Connect (normally automatic).
2. In MapRun6 on your phone, select “Show Results” > “Get track from Garmin”. Select the track, and your results will be presented (and uploaded) as if you had run with your phone.

Please read the relevant sections of this document for more information.

4 How to Install MapRunG

Older watches may not be able to run MapRunG successfully. Models that are in doubt are those with only 64k of memory. These include: FR230, fenix 3, d2bravo, d2bravo_titanium, fenix3, fenix3_hr, FR920xt and Vivoactive. MapRunG may not run or may be limited to courses with fewer controls (eg FR235 tested to 40 controls).

Basic models (e.g. FR35, FR45) do not support Apps.

If you have a watch that does not support MapRunG, you can still use MapRun AnyTrack (<https://maprunners.weebly.com/maprun---any-track.html>)

Garmin watch users normally have their watch linked to their phone using the Garmin Connect App. This syncs their activities to the Garmin Connect service, and often from there directly on to Strava. Set this up if you have not already done so (Strava is optional).

Install MapRunG using the Garmin Connect App on your phone.

Select: Menu (bottom right) > ConnectIQ Store > search for “MapRunG”.

It is recommended that you have Auto Update turned on so that you get the latest version of MapRunG automatically. To check this:

In Garmin Connect on your phone:

> ... (bottom right) > Connect IQ Store > Display the WatchFaces/Apps/Datafields/... on your device > bottom of screen there a switch "Auto Update"

5 How to use MapRunG

Some test users have indicated that it is important to change the Garmin Watch Setting for Data Recording:

> Settings > System > Data Recording > to “Every Second” (rather than “Smart”) Otherwise, for faster runners, the watch is not getting locations frequently enough for rapid punching of controls.

In MapRun6 on your phone:

- Select the Event. Any source of events is OK (from the server or from your local events including QuickStart or CheckSites).
- Switch to “Watch Mode” (in “Options and Settings”)
- The first time – enter the MapRun Watch ID of your watch shown in MapRunG on your watch into MapRun6 settings (this associates the two devices). This is a nine-digit number and is specific to MapRun. It is NOT your Garmin Unit ID/Device ID/Serial Number.
- The first time you do this you will be also be asked to log into your Garmin Connect account and allow MapRun6 permission to retrieve activities.

- You need to use the same Garmin Connect account here as you are signed into on your phone
- It is important to give this permission **before** you go for your first run with MapRunG as permissions does not give access to prior activity data.
- The “Go to Start” button is replaced with “Send Event to my Garmin Watch”. Tap this button and make sure you get confirmation.

On your watch:

- Start MapRunG (Google “how to run Apps on your Garmin” if you are unsure.)
- MapRunG will automatically fetch the Event you had selected on your Phone, via the connection to your phone and the Internet. Data or wifi are required for this step. Also your watch needs to be connected to Garmin Connect on your phone. You can tap the “Sync” button to confirm that the watch and Garmin Connect are paired and connected to the Internet.



- You can put your phone away at this point.
- Tap the start/stop button on the watch
- Run the course, with your watch giving you beeps/buzzes at control locations, tracking controls punched, and displaying total time and in a Score Event the time remaining.



- At the end, back in range of your phone, let the watch do its usual sync to Garmin Connect.



In MapRun6

- Pickup your phone again.
- Tap “Show Results”. With MapRun6 in “Watch Mode” you will see a button “Get track from Garmin”
- This fetches your track from Garmin Connect, and saves it in MapRun6 on your phone with your other MapRun results. This relies upon you having given MapRun permission to access Garmin Connect when you switched to watch mode in “Options and Settings” before your run.
 - o It may take a minute or two for the track to become available. If the latest track shown is not the one you have just finished running, tap “Refresh”. You can repeat this until the track you need arrives.
 - If this doesn’t happen, check in the Garmin Connect App that your watch is connected and that your phone is online.
 - Tap the sync button in Garmin Connect to manually trigger syncing your run with the Garmin server.
- Now in MapRun6, you will immediately see your track, time, splits, and score (if applicable), as if you had run the Event using MapRun6 on your phone.
- If the event is set to auto-upload results, your results will be automatically sent to the server. Otherwise you will need to tap “Upload (Manual)” to upload your results.
- HITMO (Review Results) is available if you think the GPS missed a control.

6 Requirements

- A compatible Garmin Watch: In broad terms, you need a Forerunner 235 or better. Check MapRunG in the Garmin “Connect IQ” Store for the full list of compatible devices. A popular current model of Garmin Watch is the Fenix 6s.
- MapRun6 version 5 or later on your phone (Android or iOS)
- Your watch needs to be paired with the Garmin Connect App on your phone.

7 Supported Event Formats

MapRunG supports:

- All course types – Line, Scatter, Score
- PINs on events are supported (both permanent and time-limited)

- Start Anywhere is supported
- Co-located start/finish is supported
- Courses can be published club events or CheckSites or even QuickStart events
- The maximum number of controls varies by watch type. Lower-end watches are OK for 35-40 controls. Top-end watches can handle 200+ controls.
- Mass Start Events work as a normal GPS-based punching start (This relates to events with an MX code in their name).

8 Limitations

- The maximum number of controls depends upon the model of the watch. Older or lower-spec watches eg Forerunner 235 can only take courses with 35-40 controls max, whereas a fenix 6 is fine with over 200 controls.
- There is currently no way to “Resume” a partially completed event. However, restarting a watch will normally continue a recording in progress, and the resulting track can be used to create a result.
- There is no live tracking available.
- There is no Start/Finish token uploaded to the server (a feature available in MapRun6 to list non-finished runners).
- In Mass Start (MX code) events, the watch will do a normal GPS-based punching start rather than starting at a fixed time.

9 FAQ

9.1 Can I use a non-Garmin Watch?

- Watch Apps are specific to each manufacturer, so MapRunG will only run on a compatible Garmin watch. Having said that, there are two distinct parts to the system:
 1. The MapRunG App on the watch to detect controls and provide beeps/buzzes during the run, and
 2. The quick-turn-around retrieval of the track into MapRun6 to be treated as a MapRun result.
 3. If you are happy NOT to get beeps/buzzes at controls, you can run with any GPS watch (or other GPS device) and upload your track at the end of your run. If you sync your tracks to Strava, the “Any Track” feature of MapRun 6.5+ allows a simple upload process.
(<https://maprunners.weebly.com/maprun---any-track.html>)

9.2 Which Garmin Watches?

- As a rough guide you need a Forerunner 235 or better, including Fenix, and other capable models.
- Check MapRunG in the Garmin “Connect IQ” Store for the full list of compatible devices.
- It is impossible to run an App like MapRunG on Garmin watches that do not have the capability to run Watch Apps.
- If you have a watch that does not support MapRunG, you can still use MapRun Any Track (<https://maprunners.weebly.com/maprun---any-track.html>)

9.3 Can I change my Watch and my Phone? Can I have multiple Watches?

- Yes, but you need to change some settings before you run.
- So that the event selected in MapRun6 on your phone can be sent to the correct watch, MapRunG on the watch generates a unique Id for each watch that needs to be entered into “Options and Settings” in MapRun6. If you change your watch, you need to enter the unique MapRun Watch Id of the new watch into MapRun6.
- Note that the MapRun Watch ID is a setting in the MapRunG App on your watch. You can change it to any other random number that is less than 2,147,483,648 (ie $< 2^{31}$ and don't enter commas). If you have multiple watches, you can set them all to the same MapRun Watch ID so that if you send an event to that Watch ID, it will be available to all of your watches. To change a setting in an App on your watch, use the Garmin Connect App on your phone (Google it for more details).
- So that the track can be retrieved from Garmin Connect, the Garmin Connect App on your phone needs to be logged into the Garmin account you use. If a different person runs with your phone or you run with a different phone, you need to make sure that the right person is logged into Garmin on the phone.

9.4 Can it go Wrong?

- MapRunG commences recording your track as soon as you tap Start from the initial screen that displays the information about the course. As with MapRun6, for controls to be detected, you need to visit the Start first (or any control other than Finish on a “Start Anywhere” course).
- If the App were to crash during a run, generally your track will still be recorded and uploaded, but you won't get beeps/buzzes at controls
- If your watch battery goes flat, sorry, there is nothing we can do.
- If the connection to your phone or the Internet is not working, you will not be able to download the event or upload results until you are connected.
 - The watch retains the last fetched event. If you are heading out for a run starting at a location with poor Internet access, or if you are not taking your phone with you, you can tap “Send Event to my Garmin Watch” at home. Make sure you open MapRunG on your watch and confirm that the event is available before leaving home. (But don't tap the Start button as your track will be recorded from home!).
 - If you later re-open MapRunG, you will be able to use this event.
 - If you have no Internet connection at the end of your run, your activity will not sync to Garmin Connect, but this you can do this later when you are back online.

9.5 Does it remember the course?

- Yes. Like MapRun6, MapRunG keeps a local copy of the event downloaded. However, in the case of MapRunG, only the most recently selected course is available.

9.6 What is the punching tolerance/radius?

- The distance you need to be from the control is determined by the event organiser. This distance applies to both MapRun6 and MapRunG. This cannot be changed on the watch.

9.7 How fast can I go through a control and still get a punch recorded?

- This will depend upon a range of factors, but for running and cycling events, this is not generally a problem. But if you are experiencing an issue, see the information on “data recording” mode on your watch (mentioned below).
- Consider the following scenario:
 - A run-through/ride-through control on a track where speed is likely to be the highest. If it is an “out-and-back” type of control, then the speed is likely to be lower due to the need to change direction/turn-around.
 - If the punching tolerance for the event is the default setting, that is 15 metres. For a “run-through” control where there is no error in the lat/lng of the control and no error in the GPS position reported by the watch, then the runner will be within the proximity of the control for 30 metres (15m approaching the control and 15m moving away from the control).
 - If locations are being recorded every second, then the runner/rider would need to move more than 30 metres in 1 second for their time near the control to not be recognised. NOTE: This assumes that the watch is set to “data recording” mode: “Every Second” and NOT “Smart” (See the section below on Watch Settings). If “Smart” mode is used there is no guarantee a location will be recorded every second.
 - So, in theory with a perfect control location, no errors in GPS, and locations recorded every second, the control should be detected if the runner/rider is going at less than 30 metres per second, that is 1.8km/min or 108km/hour.
 - In practice, if the control is somewhat off the track, the GPS has some error, then say the runner/rider is only within range for 10m on the track (instead of 30m) the max speed would be 36km/hour.
 - The fall-back for this is that the GPS track will show whether the runner/rider went past the control and the “Revised Result (HITMO)” feature can be used to register the punch. (Although the runner/rider will not get a beep at the control under this scenario).

9.8 Does MapRunG beep/buzz at Repeat Punches?

- MapRunG will beep/buzz **at any control** that it detects as follows:
 - after detecting the start... which is S1 normally, or any control (except F1) in a Start Anywhere event.
 - except sequential visits to the same control, and
 - except visiting S1 again.
 - It will not punch F1 until you have visited S1 and one normal control.
- It will show this control as the last one punched.
- If it is a line course, duplicate controls will be counted in the number of punches (as there may be loops in a line course and so a duplicate may be a

valid punch). For scatter or score courses, duplicates do not count towards the number of controls punched.

- The validity of the run is determined after you finish. That is, checking that you visited the controls in the required sequence for a line course, or the number of required controls in a scatter course etc.

9.9 What quality of GPS reception is required?

- Garmin devices typically have a 4-step scale of GPS signal quality. MapRunG will punch a control if there are 2, 3 or 4 bars (i.e. top three levels).

9.10 Will it start without GPS?

- Garmin users are typically familiar with how their watch signifies that their GPS has a fix.
- Garmin doesn't stop you from starting an activity while your GPS is still waiting to get a fix.
- Similarly, MapRunG doesn't block you from going to the "Go to Start" screen even if your GPS doesn't have a fix:
 - HOWEVER – Start won't punch until your GPS has a fix.
 - MapRunG shows the status of your GPS at the bottom of the screen

9.11 What happens if I accidentally visit the Finish?

- Upon punching Finish, MapRunG prompts with Finish/Continue. The default action is to Finish.

9.12 What if I do not select Finish or Continue?

What happens if I visit another control without selecting between Finish/Continue from my accidental visit to F1?

- Controls will not punch until you respond to this menu item.

9.13 What happens if I say Continue after punching F1, but really want to Finish instead?

- You need to visit one other control before coming back to Finish for F1 to be recognised again.

9.14 What about events with a PIN?

- The Organisers of the events have the choice of either requiring you to enter the PIN when you tap "Send Event to my Garmin Watch" in MapRun6 or not.
- The default setting is NOT to require a PIN so that that user can setup their watch without knowing the PIN (potentially before leaving home). MapRunG does not display the map and controls, so the confidentiality of the event is then determined by access to a printed map.

9.15 What about Mass Start Events (MX code)?

- MX events are those where S1 punches at a nominated time, rather than based on proximity to the S1 location. There is a count-down timer on the phone to a perusal time, where the course is displayed for say 3 mins with this time being counted down to the start time. There are ways of handling late and early starts, but otherwise the event then runs as per normal.

- In “Watch Mode”, the runner can “Send Event to my Garmin Watch” at any time.
- It will then be a punching start for each runner as they approach S1.
- The implication is that runners using their Garmin:
 - Should open MapRunG, but NOT press the Start button until the MX time, particularly if the Assembly area is at the start.
 - If this accidentally happens, they need to exit MapRunG and return to the initial screen until MX time.

9.16 What if my track isn't listed in MapRun6 after my run?

- Go into Garmin Connect on your phone to check that your watch is connected to your phone (under Devices).
- Tap sync to confirm that the connection is working
- Check that your phone is connected to data or wifi
- If all else fails, either:
 1. If you sync your tracks to Strava (via Garmin Connect) you can use MapRun Any Track <https://maprunners.weebly.com/maprun---any-track.html> , or
 2. You can extract a GPX file from the Garmin Connect website later and use the GPS Track Upload function at <http://www.p.fne.com.au/#/gpsupload> .

9.17 What settings should I have on the Watch?

- Sound and Vibration ON
 - To set this, typically: > Settings > System >
- Garmin watches typically have two “data recording” modes:
 - “Smart” or “Every Second”
 - “Every Second” is recommended, rather than Smart, to force more timely GPS location data. Otherwise data points can be several seconds apart, potentially causing delay in detecting controls.
 - To set this, typically: > Settings > System > Data Recording

9.18 How do I fix Watch Connection issues?

- Ensure your phone has Bluetooth switched on.
- Check in the list of Bluetooth devices that your watch is connected (or check this in the Garmin Connect App).
- A common way to get my Garmin to reconnect with a watch is:
 - Phone Settings > Bluetooth > turn off then back on > tap the name of your watch in the list of Bluetooth devices.

9.19 How does MapRun access my Garmin Connect?

- When you switch “Watch Mode” on in “Options and Settings” in MapRun6, you will be taken to a Garmin Connect login page for you to give MapRun6 permission to access your activities in Garmin Connect.
- You may have already done a similar thing for Strava to allow it to access activities on your Garmin watch.
- MapRun6 uses this permission as follows:

- When your device syncs a new track/activity to Garmin Connect, Garmin sends a short update to the MapRun6 server
- When you tap > “Show Results” > “Get Track from Garmin”, MapRun6 downloads the activity file created by your most recent event from Garmin Connect
- You can select previous activities if this is not the one required.
- Activities are typically only available in this way for the last 5-7 days.
- MapRun6 does not access other information in your Garmin Connect account.
- You can revoke permissions by logging into Garmin Connect:
<https://support.garmin.com/en-AU/?faq=lmXLT2CHNO6e2Bj26B5aQ7>
- If you revoke and then restore permissions, or uninstall and then re-install MapRun6, Garmin gives MapRun6 a new permission, but this MAY BE only to activities that are done AFTER the new permission is given.

9.20 Can I use MapRunG without giving MapRun access to my Garmin Connect?

- This is not recommended, but you can run MapRunG to fetch the course you want via MapRun6 on your phone and then run in an event with MapRunG to get beeps at controls as you run.
- At the end, MapRun6 will not have access to your result/track to display and upload.
- You could manually export your track from Garmin Connect as a GPX file and use the existing GPS Track upload function to add a result. (Or if you sync your activities to Strava, you could use MapRun Any Track <https://maprunners.weebly.com/maprun--any-track.html>)
- By giving MapRun6 access to Garmin Connect, your result/track can be integrated into MapRun6 to store it on your phone as if you had run with MapRun6, and your result uploaded almost instantaneously.

9.21 Do I miss out on anything if I run with MapRunG on my watch vs MapRun6 on my Phone?

- Display of the Map/Course and changed colour of controls when punched (if enabled for the event). This allows you to run without a paper map if desired.
- Start/Finish Tokens – Currently MapRun6 tells the server when a runner punches Start in an event and also when a runner punches Finish in an event if their phone is connected to the internet. This can be used to track non-returned runners. This is not available in MapRunG.
- Mass Start (i.e. S1 punches at a designed time, independent of location). This works differently in MapRunG as discussed above.
- Live tracking is a facility to periodically send runners’ locations to the server so that organisers can track runners during their run (e.g. for safety or for spectator events). The use of this facility is in its infancy in MapRun6 and is not available in MapRunG.

9.22 Can I use MapRunG without MapRun6?

- No, currently the MapRun6 phone App is the only way to send MapRunG the details of the event you plan to run in.

9.23 Garmin Watch Id – What is it and can two watches use the same Garmin Watch Id?

- The Watch Id is generated by MapRunG when it is installed on the Watch. It is NOT the Garmin Unit ID/Device ID/Serial Number.
- If you delete and then reinstall MapRunG you will get a different Watch Id (and so will need to change it in MapRun6 on your phone).
- The Watch Id can be changed in the Garmin Connect App on your phone
 - o Display the list of Apps on your watch
 - o Select MapRunG > Settings > User Id (aka Watch Id) ... and type in a different number
 - o It is not recommended that you change the Watch Id without good reason, because if your Watch Id clashes with someone else's, your watch will start receiving the events that they have sent to their watch!
 - o If you do wish to change the Garmin Watch ID, you can change it to any other random number that is less than 2,147,483,648 (ie $< 2^{31}$ and don't enter commas).
- If you have two Garmin Watches, you can change the "User Id" (aka Watch Id) on a second watch to be the same as the first watch and then when you send an event to your Garmin Watch from MapRun6, it will be available on both watches.

9.24 How to deal with delays in getting your results in MapRun6

Sometimes there can be a delay when, after a run, you go to "Show Results" > "Get track from Garmin". You may need to tap "Refresh" multiple times to get your latest run to appear.

In summary, how it works is, when you finish, a Garmin Sync needs to occur to send your track to Garmin Connect. Once Garmin Connect gets the new activity, it sends a notification to MapRun and then the latest track will appear when you tap "Refresh".

Details:

You can track through the sequence of steps as follows:

1. When you visit F1 and then tap the Start/Stop button on your watch to confirm your Finish (or if you exit the MapRunG App), your watch finalises the current "Activity" and tries to Sync this Activity to Garmin Connect.
2. Your watch normally flashes a message saying Sync Complete
3. The Garmin Connect App on your watch may say that a new activity is available - If your watch fails to Sync the new activity to Garmin Connect, it is NOT available to MapRun6 until you force this to happen.
4. If you are connecting to Strava you may get a Strava message about a new activity (this is another indication that the Sync has been successful)

5. When the Sync is complete, Garmin sends a notification to the MapRun Server and when you tap “Refresh”, this checks for the latest track listed on the server and fetches it from Garmin.
6. If this doesn't happen, check in the Garmin Connect App that your watch is connected and that your phone is online.
7. If the result still hasn't appeared, check that your recent run is showing in the list of Activities in the Garmin Connect App or the Garmin Connect Website.
8. If the Activity is not appearing, do what you normally do to get your watch to Sync with Garmin Connect... check it's connected via Bluetooth to your phone, check your phone is online, tap the sync button, check if you get confirmation that the sync has occurred.
9. The Garmin Connect App has a log of all Sync events. You can check this:
> bottom right ... > Settings > Sync Reports >
10. When the new activity does appear in Garmin Connect, Garmin sends a notification to MapRun ... this is normally within seconds after the sync ... but the timing is determined by Garmin.