

GroupTrack **User Manual**

Version 2.4

Off-Road Convoy Tracking for Android

May 2026

1. What is GroupTrack?

GroupTrack is an Android application for off-road GPS tracking and convoy coordination. It works in two modes: as a **standalone GPS tracker** for solo riders (no radio required), and as a **convoy tracking system** using Meshtastic mesh radios to share real-time GPS positions between riders in a group. In convoy mode, everyone sees where everyone else is on an offline map with no cell service required.

Whether you ride solo and want free offline maps with GPS track recording, or you coordinate group rides through canyon country and need real-time position sharing, GroupTrack is built for you.

1.1 What You Need

Item	Details
Android device	Android 10 or later. Samsung and Pixel devices tested. Name-brand recommended.
Meshtastic radio (group mode only)	T1000-E or compatible Meshtastic device. Must be on the same frequency and channel as other riders.
Bluetooth	The app connects to the radio via Bluetooth Low Energy (BLE).
Map tiles (recommended)	Download offline map tiles over WiFi before your ride. Without tiles, the map shows a blank background.

Budget Android tablets (Tab8NEU and similar) have known Bluetooth issues with T1000-E radios. The BLE connection drops after 8-10 seconds. Use a name-brand phone or tablet for reliable operation.

2. Getting Started

2.1 Install GroupTrack

If you received a Google Play internal test invite, follow the installation instructions in the Tester Installation Guide. If you received a direct APK file, see the side-loading instructions provided by your ride organizer.

2.2 Grant Permissions

GroupTrack requires several permissions to function. The app will prompt you for each one.

Location Permission

1. When prompted, tap "Allow While Using the App" first.
2. The app will then explain why it needs background location access and ask for "Allow All the Time."
3. This opens your device Settings. Find GroupTrack and select "Allow all the time."
4. Return to the app.

If you only grant "While using the app," GPS track recording will stop when you turn off your screen or switch apps. Your ride track will be empty.

Storage Permission

1. The app will request "All Files Access" permission.
2. This opens your device Settings. Find GroupTrack and toggle on "Allow access to manage all files."
3. Return to the app.

This permission is required for offline map tiles and track file storage.

If you accidentally deny a permission or revoke it later in Settings, GroupTrack will prompt you again on the next app resume. You do not need to reinstall.

2.3 Connect to Your Radio (Group Mode)

1. Power on your Meshtastic radio (T1000-E or compatible).
2. In GroupTrack, you will see a Bluetooth connection prompt or radio list.
3. Select your radio from the list. The app connects via BLE.
4. Once connected, your position and other riders' positions will appear on the map.

Keep your radio powered on and within Bluetooth range of your phone (typically 10-30 feet) throughout the ride.

3. The Convoy Map

The main screen is the convoy map. It shows your position and every connected rider in the group.

3.1 Map Display

- Your cart ("My Cart") is shown on the map with your position updated in real time.
- Other riders in the convoy appear as separate markers, updated as the mesh network relays GPS data.
- The map uses hybrid satellite/terrain tiles by default.
- Trail overlays display known OHV trails when toggled on (currently southern Utah coverage).
- AutoPan is off by default. During recording, AutoPan turns on to follow your position. When you stop recording, it turns off so you can pan and zoom freely.

3.2 Lead Cart Selection

When you start a group recording, a dialog appears asking you to **select the lead cart**. Tap the callsign of the rider at the front of the convoy. GroupTrack uses the lead cart to compute convoy positions and heading. The tail cart is identified automatically as the rearmost rider.

In solo mode, lead cart is assigned automatically (you are the only rider).

3.3 Cart Position and Tracking

GroupTrack determines each cart's position with a four-tier fallback chain:

- **Live radio GPS** (preferred) - the cart's radio reports its current GPS fix.
- **Last known radio position** - if the radio is currently silent but reported recently.
- **Phone GPS** - for the user's own cart, if the radio cannot be reached, the phone's GPS is used.
- **Trailer cart substitution** - for on-track carts that have gone silent, the cart is shown at the position of the furthest trailing cart still reporting. This keeps silent carts visible.

Carts that have deviated off the planned track keep their own last known position so operators can locate them.

3.4 Speed Display

Your current speed (mph) is displayed on the map HUD after a brief warmup period. During the first 60 seconds, the speed display may show 0 mph while the GPS acquires enough position samples.

3.5 The GroupTrack Menu

Tap the menu button to open the GroupTrack menu. It has two accordion sections:

EVENT / RIDE - Create rides, transfer ride configs, import ride files, apply radio configuration, restore prior configs.

MAP SETTINGS - Work With Tracks (track management + import), Map Viewer (independent map with track overlays), and cloud map sync (coming in V2.5).

Long-press the GroupTrack header for developer settings (password-protected).

4. Recording a Ride

4.1 Start Recording

1. Tap the RECORD button on the map screen.
2. If prompted for location permission, grant "Allow all the time" as described in Section 2.2.
3. **Solo mode:** Recording starts immediately. Lead cart is you.
4. **Group mode:** A dialog appears. Select the lead cart by tapping their callsign.
5. The map immediately centers on your cart position. No delay.

Your cart identity is locked at RECORD time. It will not change or flicker during the ride, even if other carts join the convoy after recording starts.

4.2 During the Ride

- Your GPS position is recorded every 3 seconds and saved to a track file.
- The track line draws on the map as you move.
- Other riders' positions update via the mesh radio network.
- AutoPan follows your cart while recording. You can temporarily drag the map; it re-centers on next update.
- You can lock and unlock your phone — recording continues in the background (requires "Allow all the time" location).

4.3 AutoPause and Auto-Wake

When your convoy is stationary for approximately 10 minutes within roughly 50 feet of one spot, GroupTrack automatically pauses to save battery:

- GPS updates pause
- Radio Bluetooth disconnects
- The screen displays a flashing "ZZZ" indicator

To wake: tap the ZZZ indicator. GroupTrack reconnects to your radio, resumes GPS, and rejoins the convoy. Ideal for fuel stops, lunches, and overnight camps.

4.4 Stop Recording

1. Tap the STOP button.
2. A dialog appears asking you to name the track.
3. Enter a name (e.g., "Bar 10 Trail April 2026") and confirm.
4. The track is saved as a GPX file in your device storage.

5. Work With Tracks

GroupTrack keeps all your imported and recorded tracks in **Documents/my_tracks/** on your device. To manage them, open the GroupTrack menu, expand MAP SETTINGS, and tap **Work With Tracks**.

5.1 Browsing and Searching

- **Search:** Type into the search box at the top. The list filters live as you type.
- **Sort:** Tap the date/name button to cycle through four modes: Date Newest, Date Oldest, Name A-Z, Name Z-A. Default is Date Newest.
- **Filter tabs:** All (every file), Saved (completed tracks, the normal view), In-Progress (orphaned temp files from interrupted recordings).

5.2 Track Actions

Tap any track to open its action menu:

- **Rename** — change the file name; the .gpx or .kml extension is preserved automatically.
- **Delete** — permanent removal; confirms before acting.
- **Share** — opens Android's share sheet. Attach to email, send to Drive, etc.
- **Move to Downloads** — copies the file to your Downloads folder for backup or transfer. The original stays in my_tracks.
- **Fix Creation Date** — updates the file's date to match the earliest GPS timestamp inside the file. The date column updates immediately without leaving the screen.

5.3 Bulk Fix Dates

The **Fix Dates** button next to the track count rewrites date stamps for every visible track at once. Use this once to clean up tracks imported before V2.4 — they will start showing their real recording dates.

No auto-delete: GroupTrack never deletes your tracks automatically. Cleanup of orphan in-progress files is a deliberate user action.

5.4 Import Tracks from Downloads

Tap the **Import** button in the Work With Tracks header to open the import screen. GroupTrack scans your Downloads folder for .gpx and .kml files.

- Each file is shown with filename, file size, date, and type (GPX/KML).
- Select files individually with checkboxes, or tap **Select All**.
- Tap **Import N Selected**. A progress dialog shows each file being processed.
- Multi-track files (like onX bundles with many tracks in one GPX) are automatically split into individual track files.
- Each imported track gets its date corrected to the original GPS recording date.
- A recap dialog shows imported count, skipped (already exist), and failed count with track names.

Also accessible from Map Viewer: tap the TRACKS button, then choose Import from Downloads.

6. Map Viewer

The Map Viewer is an independent map screen for viewing trails and recorded tracks without convoy overlays. Open it from the GroupTrack menu, MAP SETTINGS, Map Viewer.

6.1 TRACKS Dropdown

Tap the TRACKS button to open a three-option dropdown:

- **Select Tracks to Display** — opens the track panel with search, per-track checkboxes to load/unload overlays on the map, fit-to-all, and clear-all.
- **Work With Tracks** — navigates to the full track manager (Section 5).
- **Import from Downloads** — navigates to the import screen (Section 5.4).

6.2 Track Display

Select one or more tracks from the track panel. Each selected track renders as a colored line on the map. Tap a track again to unload it. Use the search box to filter tracks by name, and the Fit button to zoom the map to fit all loaded tracks.

6.3 Track Actions in Map Viewer

Each track in the track list has an overflow icon on the right. Tapping it opens the same action menu as Work With Tracks: Rename, Delete, Share, Move to Downloads, Fix Creation Date. If you rename or delete a track that is currently displayed on the map, GroupTrack automatically removes it from the map first.

7. Offline Map Tiles

GroupTrack works best with pre-downloaded map tiles. Without them, the map shows a blank background in areas with no cell service.

7.1 Downloading Tiles

1. Connect to WiFi before your ride.
2. On the map screen, navigate to the area you want to download.
3. Use the tile download controls to select a region.
4. Select your tile source: SAT (satellite), TOPO (contour lines), HYB (satellite + trails), or TOPO+ (enhanced contours).
5. Select zoom levels. z14 for wide area, z15-18 for detail.
6. Tap Download. Progress shows in the notification bar.

Download z14 for the whole region first, then z15-18 for just the trail system. A typical ride area (20-30 miles of trail) requires 200-500 MB. Both Convoy Map and Map Viewer share the same tile cache.

7.2 Viewing Downloaded Areas

Tap the SHOW DOWNLOADED button to see which areas have cached tiles. The downloaded region is highlighted on the map. A progress indicator shows while the scan runs.

8. Radio Configuration

GroupTrack includes tools to configure your Meshtastic radio for convoy use. The recommended settings are LONG_FAST mode, which provides 3-5 mile range with good data throughput for position updates.

- **Apply Radio:** Applies the convoy master configuration to your connected radio.
- **Archive/Restore:** Backs up your current radio settings before applying convoy config, and restores them after the ride.

Radio programming may require two passes. If any errors are returned on the first pass, run Apply Convoy Config a second time. All 40 of 40 fields must validate successfully. Do not proceed to a ride until the config shows 40/40 applied with no errors.

All riders in a convoy must be on the same frequency, channel, and modem preset. Use the Apply Radio feature to ensure consistent configuration.

9. Known Limitations (V2.4)

Limitation	Details
No mileage display	Trip distance / odometer is not calculated or displayed. Planned for V2.5.
60s speed warmup	Speed shows 0 mph for the first ~60 seconds while GPS acquires enough samples.
GPS interval 3s	Track points recorded every 3 seconds. Higher resolution (1s) planned for V2.5.
Budget device BLE	Low-cost tablets (Tab8NEU, etc.) cannot hold BLE connection to T1000-E radios. Use a name-brand Android device.
BLE reconnect	If BLE drops during a ride, manually disconnect and reconnect in the app. Keep phone close to radio.
Battery optimization	Some devices kill background apps aggressively. Go to Settings, Battery, GroupTrack, Unrestricted to prevent this.

Imported track names	GroupTrack-recorded tracks have _YYYYMMDD_HHMMSS suffix. Location-based naming planned for V
Esri online maps	Sparse labels online vs dense offline. This is Esri's deprecation of legacy services. Your offline maps rem

10. Troubleshooting

Track file is empty (0 track points)

Location permission is set to "While using the app" instead of "Allow all the time." Go to Settings, Apps, GroupTrack, Permissions, Location, Allow all the time.

Map is blank / no tiles visible

Offline tiles have not been downloaded for this area. Connect to WiFi and use the tile download feature before your ride. Also confirm that All Files Access permission is granted.

Radio won't connect

Ensure the radio is powered on and within Bluetooth range. Try toggling Bluetooth off and on in your phone's Settings. If using a budget tablet, try a different Android device.

Radio config errors

Run Apply Convoy Config a second time. All 40/40 fields must validate. Two passes may be needed.

Speed stuck at 0 mph

Wait 60 seconds after starting a ride. The speed display requires a warmup window. If speed remains at 0 after 2 minutes, check that location permission is "Allow all the time."

App killed in background

Go to Settings, Battery, find GroupTrack, set to "Unrestricted." This prevents Android from killing the app when the screen is off.

Other riders not visible

Confirm all radios are running the same convoy config (same frequency, channel, modem preset) and all show as connected in the app.