# ExitCount™

## User Manual

Version 20211103
for App Version 1.0.0

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## RISKS AND WARNINGS TO COMMUNICATE

*Communicate the following information to all users of the app:*

Ground speed can change over the course of jump run. Check ExitCount at the moment the prior-group exits. The ExitCount app is not meant to replace knowing how to determine safe exit separation; it is merely a tool to help. Necessary adjustments to ExitCount's recommended separation time, due to group size, discipline, etc., is the responsibility of the jumper(s).

## DEVICES

The application relies solely on GPS. Therefore, you do not need a device that has cellular reception or even an active cellular subscription service. With no cellular service, connect to WiFi to install the app and future updates. If your dropzone can't afford to buy a device, we recommend asking the community if anyone has an old phone or GPS-enabled tablet laying around!

WARNING: Not all devices have been tested so it is imperative to validate the app is working properly on your device. See 'Validating the App' section for more information.

*Below is a list of potentially compatible devices:*

Compatible Phones

Just about any modern smartphone will work since they all have real GPS. It does not need active cellular subscription/service.

Compatible Tablets

Not many tablets have real GPS capability (GPS (US), GLONASS (Russia), Galileo (EU), BeiDou (China)). Below is a list of tablets that have not been tested but should, in theory, work properly. It is the responsibility of the app user to validate the app works correctly on your chosen device.

iPad's with Cellular capability (Wifi-Only iPads will NOT work.)
Google Nexus 9
Samsung Galaxy Tab E Lite
Samsung Galaxy Tab A
Hongtao Tablet
ZONKO Black Tablet
Winsing MTK6580
ZONKO K105
Winsing WSTB101I
Asus MeMO Pad 7
Dragon Touch K10
Google Nexus 7
Azpen A1040
Simbans TangoTab
NeuTab 7
Fusion5
Proscan 10-Inch

**Separate GPS Module**

If you are having issues with GPS reception or update-rate, a potentially option is a separate GPS module, such as the Garmin GLO*. This is a plug-in device to give more accurate GPS location to any phone or tablet. It also gives you the ability to mount the GPS receiver in a window for better reception and place the phone or tablet in a separate location for better viewing by all skydivers on the plane.

*The Garmin GLO has not been tested with the app.

## VALIDATING THE APP

WARNING: It is IMPERATIVE that you check the specific device and app are working properly before implementing in your plane(s). Use of the ExitCount app signifies that the chosen device has been validated with the app for your particular dropzone and airplane. Validation must be completed with the initial installation and after any future updates to the app.

The device model, your location, any surrounding enclosures (the plane), and other factors can affect proper functioning of the app.

*Below are GUIDELINES for validating that everything is working properly:*

First, download and install an app called 'GPS Test' (or another similar app, there are several) to check GPS functionality of the device you have chosen. In most cases, the app will show a 3D fix, 10+ satellites in use, an AVG SNR of 16+, and a location accuracy of < 30 ft. If it meets all of these, that is a good start. If it does not, it might be a good idea to try other devices to compare and determine if the issue is the device itself or if it's the satellite coverage you have in the area.

Next, using the speed functionality (there is a setting to change units to kts), ride along in the plane and compare the speed displayed in the GPS Test app to the plane's GPS ground speed. The values may lag by a few seconds and be off by a few knots. This is normal based on the update frequency of the devices and difference in algorithms they use. A general rule would be ideally +/- 1 knot during consistent flight. Note that +/- 2 knots is within the margin of error produced by the 5 knot increments displayed on most exit-separation charts. Banking, turning, accelerating, and de-accelerating will increase the gap and lag for longer. Luckily, not much of that is happening during jump-run and the plane's GPS (which we normally use to determine ground speed and exit separation) is subject to these draw-backs also. Ultimately, it is up to YOU as the dropzone/plane owner to determine if the values are accurate enough.

Finally, we want to perform the same test we just did but using the ExitCount app and the speed displayed in the app. Units and separation distance can be set in the Settings menu of the app. ExitCount errs on the side of safety and always rounds UP to the next full second. See "Calculations" section for more detailed info. Below is a chart of the seconds ExitCount will display for commonly used 1000 ft separation and USPA-recommended 1500 ft separation:

| Knots | 1000' | 1500' | Knots | 1000' | 1500' | Knots | 1000' | 1500' | Knots | 1000' | 1500' |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 | 20 | 30 | 60 | 10 | 15 | 90 | 7 | 10 | 120 | 5 | 8 |
| 31 | 20 | 29 | 61 | 10 | 15 | 91 | 7 | 10 | 121 | 5 | 8 |
| 32 | 19 | 28 | 62 | 10 | 15 | 92 | 7 | 10 | 122 | 5 | 8 |
| 33 | 18 | 27 | 63 | 10 | 15 | 93 | 7 | 10 | 123 | 5 | 8 |
| 34 | 18 | 27 | 64 | 10 | 14 | 94 | 7 | 10 | 124 | 5 | 8 |
| 35 | 17 | 26 | 65 | 10 | 14 | 95 | 7 | 10 | 125 | 5 | 8 |
| 36 | 17 | 25 | 66 | 9 | 14 | 96 | 7 | 10 | 126 | 5 | 8 |
| 37 | 17 | 25 | 67 | 9 | 14 | 97 | 7 | 10 | 127 | 5 | 8 |
| 38 | 16 | 24 | 68 | 9 | 14 | 98 | 7 | 10 | 128 | 5 | 7 |
| 39 | 16 | 23 | 69 | 9 | 13 | 99 | 6 | 9 | 129 | 5 | 7 |
| 40 | 15 | 23 | 70 | 9 | 13 | 100 | 6 | 9 | 130 | 5 | 7 |
| 41 | 15 | 22 | 71 | 9 | 13 | 101 | 6 | 9 | | | |
| 42 | 15 | 22 | 72 | 9 | 13 | 102 | 6 | 9 | | | |
| 43 | 14 | 21 | 73 | 9 | 13 | 103 | 6 | 9 | | | |
| 44 | 14 | 21 | 74 | 9 | 13 | 104 | 6 | 9 | | | |
| 45 | 14 | 20 | 75 | 8 | 12 | 105 | 6 | 9 | | | |
| 46 | 13 | 20 | 76 | 8 | 12 | 106 | 6 | 9 | | | |
| 47 | 13 | 19 | 77 | 8 | 12 | 107 | 6 | 9 | | | |
| 48 | 13 | 19 | 78 | 8 | 12 | 108 | 6 | 9 | | | |
| 49 | 13 | 19 | 79 | 8 | 12 | 109 | 6 | 9 | | | |
| 50 | 12 | 18 | 80 | 8 | 12 | 110 | 6 | 9 | | | |
| 51 | 12 | 18 | 81 | 8 | 11 | 111 | 6 | 9 | | | |
| 52 | 12 | 18 | 82 | 8 | 11 | 112 | 6 | 8 | | | |
| 53 | 12 | 17 | 83 | 8 | 11 | 113 | 6 | 8 | | | |
| 54 | 11 | 17 | 84 | 8 | 11 | 114 | 6 | 8 | | | |
| 55 | 11 | 17 | 85 | 7 | 11 | 115 | 6 | 8 | | | |
| 56 | 11 | 16 | 86 | 7 | 11 | 116 | 6 | 8 | | | |
| 57 | 11 | 16 | 87 | 7 | 11 | 117 | 6 | 8 | | | |
| 58 | 11 | 16 | 88 | 7 | 11 | 118 | 6 | 8 | | | |
| 59 | 11 | 16 | 89 | 7 | 10 | 119 | 5 | 8 | | | |

## CALCULATIONS

ExitCount uses the following mathematical formulas to calculate speed and exit separation in seconds based on the chosen units in settings.

Speed

Raw GPS Speed (m/s) x 1.944 = Ground Speed in Knots

Raw GPS Speed (m/s) x 2.237 = Ground Speed in MPH

Raw GPS Speed (m/s) x 3.6 = Ground Speed in KPH

Separation

ROUNDUP( Separation Distance (ft) / ( Raw GPS Speed (m/s) x 3.28 ) ) = Seconds of Separation

ROUNDUP( Separation Distance (m) / ( Raw GPS Speed (m/s) ) ) = Seconds of Separation

## INSTALLING DEVICE IN PLANE

It is YOUR responsibility to consult the appropriate personnel before installing any devices in your plane. In general, if devices are not installed permanently (e.g. Velcro, removable mount) and do not tap into any other functional plane equipment (e.g. onboard power), the "installation" will not need to be certified. However, this is case-by-case. Again, consult your mechanic, installer, owner, FAA/TSO representative, or any other appropriate personnel.

## POWER / CHARGING

Any portable phone charging bank is a simple way to keep your device charged without having to tap into the plane's power. We recommend having a few so you can swap them as needed without removing the display device.

## KEY SAFETY FEATURES

- Seconds of Separation is always rounded UP
- Display goes blank within 2 seconds of losing GPS reception
- Seconds of Separation displays a max of ">99" in red
- App uses fastest GPS update rate available for the device

## KEY DESIGN FEATURES:

- Limited customization for simplicity and consistency from DZ to DZ
- Ability to change units
- Ability to choose separation distance
- Ability to display messages on screen