

GATC Blowdown Reporting System

Hikers can report the exact location of blowdowns on the AT and other trails managed by the GATC by taking a few images with a smart phone and sending them as **attachments** to blowdown@georgia-atclub.org. Add this email address to contacts on your phone to make it easy to send blowdown reports. You can attach multiple images, up to 25 MB, to one email. This system works for locations on or near the AT, Approach, Hike Inn, Duncan Ridge, shelter trails, and other trails which are maintained by the GATC which connect to the AT.

The email you send will be automatically scanned for images. The EXIF GPS location data in the image will be used to determine the location within a GATC trail District/Section. Using that information, a new email including the location information, any descriptive text from your email, image files and a GPX file containing blowdown locations will be sent to the sender of the email, Trail Supervisor, District Leader, and Sawyers Committee Chair. If an email from someone whose email address is not in our member database comes in, they receive only a simple thank you reply. The GPX file can be loaded into mapping software and GPS units. Below are examples of location reports for two images.

Image: 2018-08_01_02 Date: 2017:09:24 10:29:48 Make: samsung, Model: SM-G550T
Trail: Appalachian National Scenic Trail Mile: 61.90
Geo: 34.836667, -83.659444 3270' Distance to nearest trail point: 20' Bearing: W
Section 9.9 1.16 mi north of Younglick Knob, 0.16 mi south of Blue Ridge Swag (wilderness)

Image: 2018-08_01_01 Date: 2018:08:04 10:09:01 Make: Apple, Model: iPhone 5c
Estimated GPS location error 32'
Trail: Appalachian National Scenic Trail Mile: 14.93
Geo: 34.657222, -84.057014 2677' Distance to nearest trail point: 17' Bearing: NNE
Section 4.7 0.68 mi north of Justus Creek, 0.77 mi south of Gooch Mtn Shelter (non-wilderness)

The basic requirements for taking and sending images are:

- Location is enabled on phone.
- Phone camera access to GPS Location is enabled.
- Phone not in Airplane Mode while taking picture for (iPhone 6 and earlier).
- Make sure GPS has good fix by having it out of pack or pocket for a few minutes before taking pictures. (See Improving GPS Accuracy, below)
- Send pictures as “Actual Size” if given option.
- Send images from phone as **attachments** to email, **not inserted** in email to blowdown@georgia-atclub.org.

Images downloaded from social media or processed by other apps will not have location information in them. A brief description of the location is very useful in case the GPS does not have valid location data. Sometimes location data is missing from images when everything is set correctly. The last section of this document “Improving GPS Accuracy” gives some advice on how to avoid this problem.

The remainder of this document covers checking if your phone is configured to include location data in images and what to do if it isn't. There are also sections on understanding the location report and improving GPS accuracy.

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About Airplane Mode

The above requirements for sending an image say to not have the phone in Airplane Mode. This does not apply to Android phones or Apple iPhones running iOS 8.3 or later, which includes iPhone SE, 7, 8, & X. There was never any need to disable the GPS receiver for Airplane Mode.

How to Verify Location Data in an Image

If you want to be sure your phone is set up correctly to include location in images, you can use one of these methods.

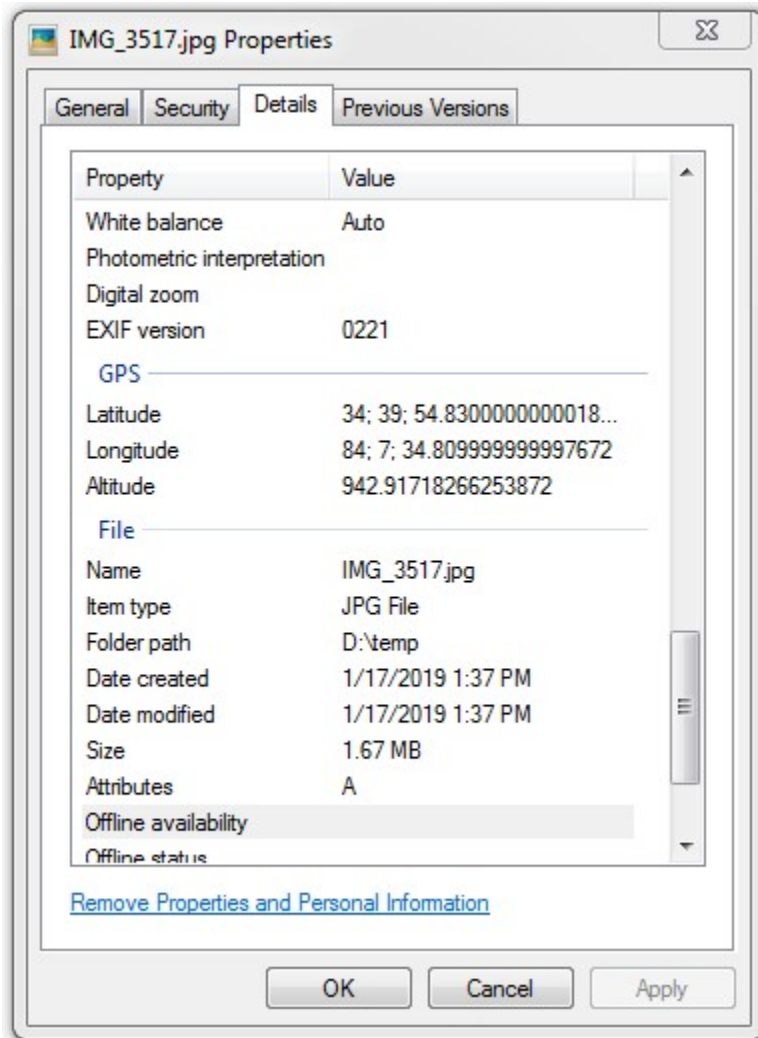
From your phone, you can verify location data if you have your camera images load to Google Photos. On an iPhone you can swipe up on an image and will see a map with the street address. On Android, select Info from the 3-dot menu, tap Info and you will see the map with Longitude and Latitude. There are also apps which allow you to see all EXIF data in the image available for phones.

Alternately you can email the image to yourself, download it to a computer and use the computers properties or information dialogs to verify the location data as shown below.

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Windows

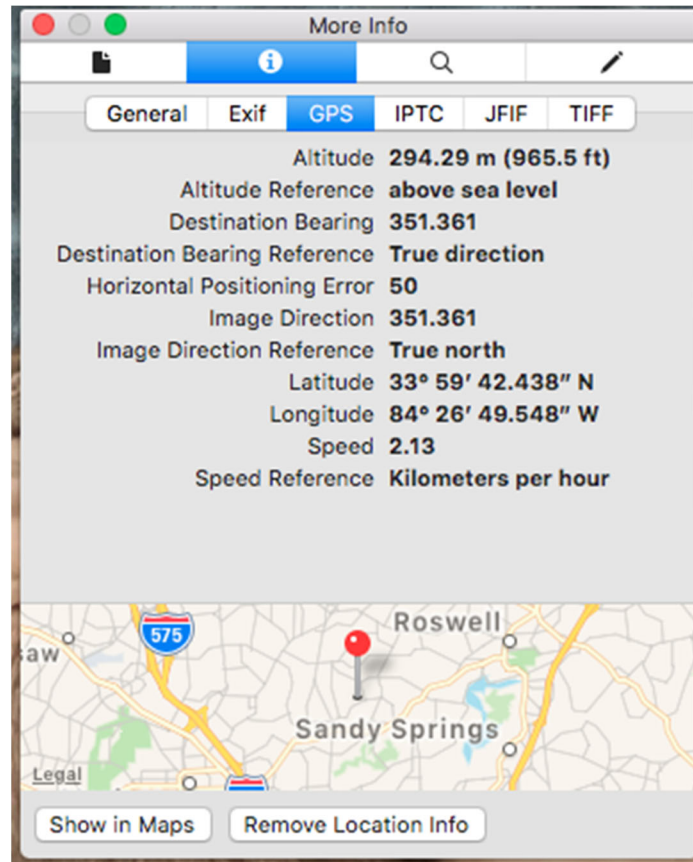
Save the attached image to disk, right-click on the file and select properties. Click on the Details tab and scroll down near the bottom. The next to last section will be GPS, if the image contains this data.



Macintosh

Save the attached image from the email to the computer, find the saved image then open it with Preview by double clicking on it. Go to **Tools -> Show Inspector**; click the "i" tab; then the GPS tab in the inspector. These two tabs are highlighted blue, below.

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How to Enable Location in Pictures

If no location data is in your pictures, the camera may not have permission to access it. On some older iPhones (older than iPhone SE, 7...), Airplane Mode will disable the GPS. To ensure the camera has GPS permission do the following steps.

iPhone

- Launch the Settings app from your iPhone or iPad Home screen.
- Tap on Privacy.
- Tap on Location Services.
- Tap on Camera.
- Choose "While Using the App".

Android

- Launch the Settings app from pull-down at top of screen.
- Tap on Apps
- Tap on Camera
- Tap on Permissions
- Tap Location to On

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How to Attach Pictures to the Email

In order for location data to be available, the entire image file must be **attached** to the email. If an image is inserted into an email, the picture is placed in line with the text of the email and the EXIF metadata including location is not included.

iPhone

- Open Photos
- Select Albums
- Select the first one named "All Photos"
- Tap "Select" in the top right corner of screen
- Find and select the images by tapping on each
- Tap on the icon at bottom left which looks like a box with up arrow.
- Tap on your mail program.
- Enter email address: blowdown@georgia-atclub.org
- Tap the send icon.

Android

- Open Google Photos or Gallery
- Locate first picture and long press it until a check mark appears.
- Tap additional pictures to select
- Tap on "Share" at top of screen.
- Tap on your email program (Gmail).
- Select option "Actual Size", if given option.
- Enter email address: blowdown@georgia-atclub.org
- Tap the Send icon.

You can add a subject to the email and text, if you want to convey any additional information.

How to Turn the GPS On

It is likely that your phone's GPS is already on but both iPhone and Android phones have settings to disable it. The directions for turning the GPS on and off will probably vary with the version of the phone's OS, but here is a general guide. You can Google this subject for your exact phone if necessary. On older iPhones (6 and older), Airplane Mode will disable the GPS.

iPhone

- On the phone's home screen, tap the settings icon.
- Tap "Privacy".
- Tap "Location Services"
- Tap to turn on or off.

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Android

Older versions of Android have an icon for Location on the pull down menu. For newer versions you will need to use the settings menu.

- Pull down the home screen menu.
- Tap the Gear Icon to open Settings.
- Tap Connections.
- Scroll down to Location.
- It should be set to High Accuracy and turned on.

Understanding Location Data

Mountainous terrain can be difficult for GPS reception but a smart phone can usually give results accurate enough for our purpose of locating blowdowns. If the GPS reception is poor enough, an Android phone picture will have no location data. An iPhone may also do the same under some conditions but we have seen cases where iPhone coordinates were off by several thousand feet and in one case, miles. Fortunately in the case of the iPhone, an estimated error is also given and was very large in the case of highly inaccurate locations. If that error is over a few hundred feet, consider the possibility that it is actually much larger.

On the line with the coordinates the distance to the nearest trail point is given as well as the bearing to the point from the trail point. Trail points are about 20' apart on average but sometimes as much as 100' on straight sections and the expected phone GPS error is 10 to 30 feet, so this distance can be larger than the examples below. If the distance to the nearest trail point is a few hundred feet, it could be that the picture was taken from a water trail or other side trail that we do not yet have trail data for.

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The location for the AT is given in terms of the distance from each end of the trail section including the names of the end points. The Trail Mile is the distance from Springer Mountain. This distance is based on wheel measurements and varies a little from the distances shown in the Guthook application. Finally, there is an indication of wilderness or non-wilderness.)

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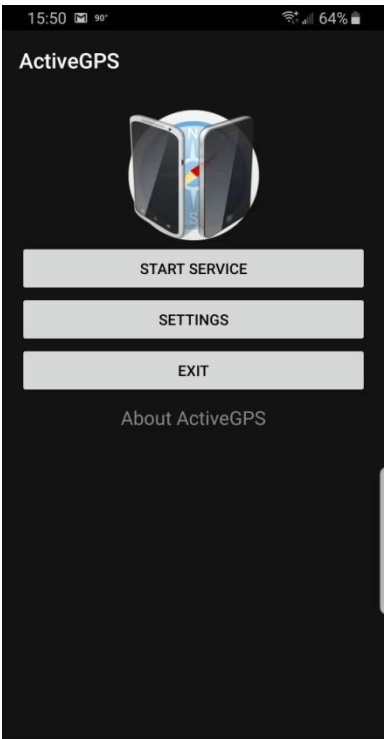
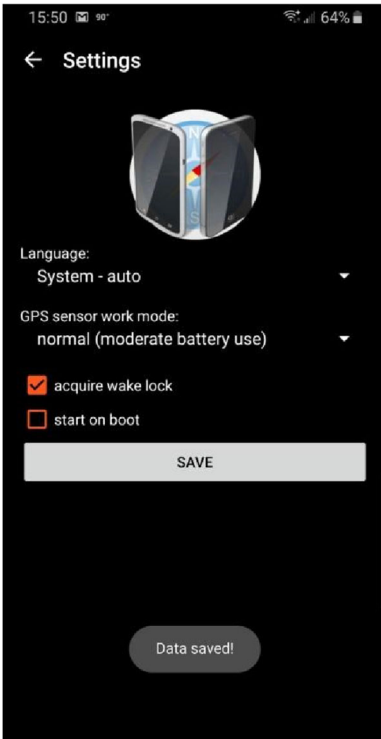
Improving GPS Accuracy

Since we began the blowdown reporting system, there have been some cases of highly inaccurate or missing location data. In the early days of smart phones with GPS, keeping the GPS enabled drained the battery quickly. Improvements have been made which greatly reduce the battery drain. The GPS while enabled is not continually calculation position. When an app needs location, the GPS goes fully active and returns the location. For a mapping application, it doesn't matter if the first obtained location is inaccurate, it will continually get updates. The camera on the other hand gets the first location after starting the GPS. Better accuracy would be achieved if the GPS were constantly active for a while prior to taking pictures.

If nothing on your phone has requested location data within the last few hours, it might take your phone a while to get a GPS location fix. This is because it has to receive orbital data from each satellite to be used in the location calculation and the data is valid for only 4 hours. This data could takes about 2.45 minutes to receive and in mountains, it may take longer. The best way to ensure that the location will be available to the camera is to use an app which keeps the phone's GPS active.

For Android phones, there are several apps which are specifically for keeping the GPS active while it is running and will help ensure a good GPS location in pictures. *ActiveGPS – GPS Booster* is a free, simple to use app with no adds. It has 3 settings for how active it keeps the GPS. The default option is probably fine. You just touch a button to start the service and touch it again to stop. Start the service a few minutes before taking pictures and stop it when finished.

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		<p>Android Application</p> <p>ActiveGPS – GPS Booster</p> <p>There are two Android apps with similar names. Be sure to get the one with the full name above and the icon shown here.</p> <p>Just tap the application icon, then the Start Service button. It will become a Stop Service button which you use to stop the service, then exit the app.</p>
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A search of the Apple App Store did not turn up a similar app to keep the iPhone GPS active but this can be done with any GPS app set to record a track before and during the picture taking.

Recording a track with a GPS application for a few minutes before and during taking pictures of blowdowns will keep the GPS active and improve the accuracy of the location obtained by the phone camera. Some GPS apps will also allow you to see the number of satellites in use and estimated error. This display will verify that the GPS has a fix and that the location will be included in the images. There are literally hundreds of free GPS apps for smart phones.

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11:31 85% 88%

☰ Satellites

N33.995320 W-84.447196, $\delta=4.69$ yd, from gps
12 visible, 11 used in fix

The diagram shows a constellation of 12 satellites, each represented by a numbered circle. The satellites are arranged in a roughly circular pattern. The visible satellites are numbered 12, 22, 24, 27, 28, 70, 71, 75, 76, 77, 85, and 87. The satellites used in the fix are numbered 6, 17, 19, 76, and 86. The diagram also shows the cardinal directions N, E, S, and W.

Typical of many GPS applications, the Satellites screen in *GPS Essentials* shows the number of visible satellites and the number used in the fix. A minimum of 4 satellites are needed for a decent fix. In this case, 11 are used and the estimated error is 4.69 yards. Verifying that the GPS has a fix should ensure that the camera will get a good location.