

Alpine Rescue Team – Wireless e911 Response

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Prepared by Loren Pfau

Purpose: Guidance in handling responses to SAR missions initiated by or involving cellphones.

Background:

US cellular providers are required by the FCC and state regulatory agencies to provide location information for parties dialing 911 from mobile phones. The accuracy of the position information is impacted by multiple factors that include tower locations handset and carrier systems, technologies, and deployment plans. Depending upon the carrier, handset and PSAP (Public Safety Answering Point – in our case Clear Creek or JeffCo Dispatch). e911 calls are classified as either Phase 1 or Phase 2:

- Phase I
 - Provides calling number and receiving tower location and sector information
- Phase II
 - Adds name of the owner of the telephone number and latitude and longitude information (Both Clear Creek and JeffCo Dispatch are Phase 2 capable but not all carriers in the counties are Phase II capable)

Position information is delivered to a PSAP in decimal degree coordinates using the WGS 84 datum.

Positions can come from either GPS units in the cellphone or from triangulation if the handset can contact more than one tower. While in contact with the subject Dispatch can attempt a rebid of the caller's location, which may result in a Phase I location converting to a Phase II location, or may give an update Phase II position.

Procedures:

1. Upon contacting Dispatch for a mission the first questions to ask are if they were able to obtain position information during the call and if so if the location was Phase II
 - a. If a Phase II position was received use that location as the starting point for search team activities:
 - i. Since the coordinates are in decimal degrees, WGS 84 and Alpine's standard is UTM, NAD 27 either convert the locations to UTM at Ops for the field team or have a single field team member enter the lat/long coordinates and datum into a handheld GPS while others retain UTM format. If at all possible do not ask field teams to convert the coordinates themselves.
 - ii. If subsequent calls are received from the subject ask Dispatch to share all updated location coordinates and advise field teams of the new coordinates.
 - b. If only Phase I information is received ask Dispatch to provide the tower location and sector information
 - i. Analysis of the tower location and sector may narrow down likely locations based upon the terrain (i.e., areas west of Saxon Mtn tower).
 - ii. If the subject calls back to Dispatch:
 1. Ask for rebids of the location to see if a Phase II fix is possible.
 2. Query the subject as to starting point, objective, noticeable landmarks; if they have a GPS unit or smartphone app that can provide location information.
 3. If Ops can contact the subject via a call query the subject as in 2 above.
2. If a mission begins without a 911 call from the subject but one suspects the subjects may have a cellphone:
 - a. Dispatch or a team member should periodically call the known numbers to try and make a connection
 - i. If the subject answers employ usual round of questions to ascertain starting point,

route and intended destination and any landmarks visible that may help determine location. Ask if they have a GPS or smartphone with an app that can provide location coordinates.

- ii. If the subject does not answer try sending a text message to their number. Texts sometimes get through when voice connections cannot be supported by the network. Try to ascertain position information through text questioning.
- b. The following are additional options to help determine if the cellphone is in the search area **but both approaches require Law Enforcement authorization and interactions with the wireless carrier:**
 - i. If the phone is functioning and in contact with a cell tower it may be possible for the carrier to “ping” the handset. This may return the lat/long coordinates of the handset or the tower to which it is connected.
 - ii. On longer searches in which you wish to determine if the cellphone is or has been in the search area the wireless carrier can provide records which show the last set of towers in which the handset had been in contact. This request needs to be made within several days after the start of the search as the retention period for this type of data is quite short.

Other Possibilities:

iPhones have the Compass app preinstalled on the handset; this app provides lat/long coordinates in DMS, WGS 84 below the compass rose.

If you can establish voice or text contact with a subject you might try to have them send you a photo via MMS (texting). If location services are active on the phone the photo metadata will contain a geotag.

Google Maps is installed on virtually all smartphones. Pressing and holding the current location icon on the map will allow the user to send location information via text or email message.

Many smartphone apps are capable of providing location information so explore other possibilities based on information you may be able to collect about the subject’s use of social media (Twitter, Facebook, Instagram) and check-in/location apps (Google Latitude, FollowMe, FourSquare, etc.)

Cautions:

Remember that Phase I calls only give you the location of the tower receiving the 911 call – **don’t dispatch personnel to a Phase I location!** It can provide input to your analysis of the subject’s possible location but that is all.

Treat a Phase II location as the center of a search area and not as “the” location. Network and handset location methods are subject to positional errors due to multiple factors. FCC requirements are accuracy within 300 meters for 95% of network-based solutions, and 100 meters for 95% of GPS-based solutions.

Try not to keep the subject on a call for an extended period of time as doing so will deplete their cellphone battery. Agree to periodic check-in calls at set times so the subject can power down the handset between calls.

Developed to assist the SAR mission incident commanders of Alpine Rescue Team. Provided as-is for the consideration of SAR units. Other SAR units should develop local protocols as appropriate and necessary for your agency's use.