

# Search and Rescue Integration

## Meshtastic in Search and Rescue Operations

Search and Rescue teams operate in exactly the environments where cellular infrastructure fails: remote canyons, dense forest, cliff bands, and high alpine terrain. LoRa mesh via Meshtastic provides a lightweight, rapidly deployable communications layer that complements existing SAR tools and significantly improves situational awareness for field teams and command staff alike.

### Subject Tracking

If a missing subject carries a Meshtastic-capable device, SAR teams receive position broadcasts passively. Even without active messaging from the subject, GPS position packets transmitted at the default interval appear on every team member's map, collapsing the initial search area. Teams should consider distributing pre-configured nodes (Heltec V3 at ~\$20 each) to high-risk populations: elderly day hikers, youth groups, and solo adventurers on challenging routes.

### Team Member Position Sharing

Unified Command loses situational awareness as searchers fan into terrain. Meshtastic maintains a live map of every equipped team member. The Incident Commander at the Command Post sees all field teams simultaneously without requiring radio calls, reducing channel congestion and enabling tactical reassignment without breaking ongoing searches. Each team member carries a node set to CLIENT role with GPS enabled; the CP runs a node connected to a laptop running the Meshtastic Python CLI or a mapping application.

### Command Post Communications

In areas without cell coverage, the CP can relay Meshtastic traffic to outside incident management via a satellite uplink (Iridium modem, Starlink terminal) connected to an MQTT broker. Field teams communicate via LoRa mesh, the CP aggregates data, and the EOC sees real-time position updates over the internet. Configuration requires a device in MQTT gateway mode pointing to a private broker.

### Integration with CalTopo and SARTopo

Meshtastic waypoints and position history can be exported via the Python API or third-party tools and imported into CalTopo as GPX files. The workflow: connect a laptop to the CP node via USB or Bluetooth, run a logging script writing received position packets to a GPX track file, import the GPX into the active CalTopo map every 15-30 minutes, then annotate and share with wider incident management.

## Unified Command Considerations

When a mesh operates alongside traditional radio nets, document the channel PSK in the Incident Action Plan communications annex. Designate COML responsibility for mesh infrastructure. Treat the mesh as a supplementary data and messaging layer - not a replacement for ICS radio. Do not allow the mesh to substitute for primary command communications.

## Training SAR Volunteers

Training should cover device power-on, channel verification, GPS status check, and basic messaging. A 30-minute tabletop exercise followed by a field practicum simulating a lost-hiker scenario achieves operational proficiency. Keep laminated quick-reference cards in each node go-bag. The Meshtastic Android and iOS apps require a smartphone with Bluetooth; verify volunteers have compatible devices or carry a standalone node with E-Ink display for message reading without a phone.

## SAR Go-Bag Node Kit

- 1x Meshtastic node (T-Beam or T-Echo) pre-flashed and configured with team PSK
- 1x 10,000 mAh USB power bank
- 1x USB-C cable
- 1x 915 MHz quarter-wave whip antenna (if external antenna port available)
- 1x laminated QR code linking to team Meshtastic channel config
- 1x laminated quick-reference card (power on, channel check, SOS procedure)

Store kits in Pelican 1010 micro cases. Rotate power banks into charging after every deployment. Assign one kit per field team and two to the Command Post.

Revision #2

Created 2026-05-03 06:19:20 UTC by Mesh America Admin

Updated 2026-05-03 13:02:39 UTC by Mesh America Admin