'Incident Commander Pro' V7 - Tracking Devices

'Incident Commander Pro' provides the unique capability to track personnel with a broad range of GPS-equipped tracking devices.

Depending on the user's requirements either a single type or multiple types of tracking devices may best suit their tracking needs.

The tracking devices use four methods of communication to transmit their GPS location to 'Incident Commander Pro'.
Each communication system has its own benefits and limitations.

Similarly the different hardware tracking devices also have their own benefits and limitations.
This document details the capabilities, benefits and limitations of each communication system and their tracking devices.

'Incident Commander Pro' can track personnel with all of the listed communications systems and devices. To meet the broadest range of tracking demands these different systems can all be used simultaneously, providing the most reliable, flexible and wide-range tracking capability.

Tracking Systems
'Incident Commander Pro' will track personnel and equipment using four types of tracking systems:

1. Smartphone Cellular Tracking

**2. GPS Satellite-based Message Tracking**

**3. VHF Radio-GPS Tracking**

4. GPS-Connected Tracking

1. Smartphone Cellular Tracking – with 'Track Commander'
SAR Technology's 'Track Commander' is a powerful Android-based cellphone Tracking, Messaging and Navigation app that is fully compatible with 'Incident Commander Pro'.
Designed for the professional responder 'Track Commander' delivers reliable, low-cost Tracking, Messaging, Mapping, GPS and Navigation capabilities.
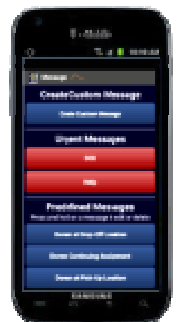
Benefits of smartphone tracking with 'Incident Commander Pro' & 'Track Commander'
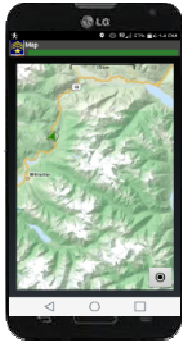
- Employs the existing cellular network available in many regions.
- Utilizes the owner's smartphone, with no additional tracking devices required.
- Very low-cost/no-cost tracking system, using existing activated smartphones.
- All map, compass, GPS and navigation features continue to work - even without cellular coverage.
- Track Commander' provides an immediate large-scale, low-cost tracking system for large numbers of users.
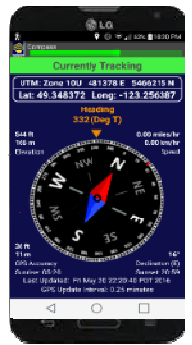
- Tracking locations are permanently stored on servers for both immediate and later retrieval.

- Tracking locations can be plotted on any computer, from any location, at any time, with internet access.

The limitations of cellular communication include:
- Communication range is generally limited to urban, urban-interface and highway networks.
- During major disasters the cellular network might become overloaded, however responders may be given priority service.
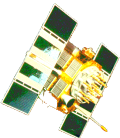
2. GPS Satellite-based Tracking – with 'Incident Commander Pro'
Satellite-based tracking with 'Incident Commander Pro' generally offers the widest range tracking system. Satellite-based GPS tracking devices are specifically designed for tracking and emergency communications in remote locations.

GPS Satellite-based device messages, in almost any geographical location, can be tracked without the distance limitations of the cellular or line-of-sight VHF radio-based systems.

The benefits of GPS satellite-based tracking with 'Incident Commander Pro' include:

- Virtually unlimited tracking range, world-wide.
- **Live beacon tracking in Google Earth** – with **Incident Commander Pro/Global Earth Tools**.
- Only practical tracking system in remote, wilderness regions.
- Employs existing commercial GPS satellite-tracking infrastructure.
- Independent emergency '911' Help and SOS feature.

- Relatively low-cost personal GPS tracking/messaging devices.

- Utilizes separate (radio-independent) beacon tracking devices.
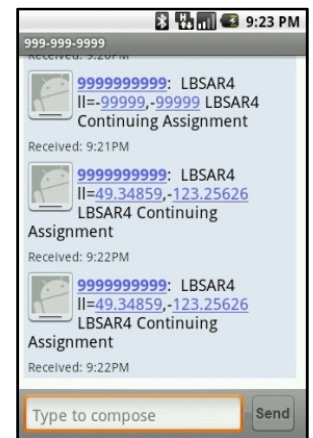- Provides an alternate basic communications system, in case of radio-system failure.

- Simple, one-button, single and auto-tracked, beacon tracking.
-No radio hardware, serial-USB cabling, drivers or COM port configurations, required.

- Many days of tracking with long-life lithium batteries.

- Real-time preset messages may be sent immediately to 'Incident Commander Pro'.

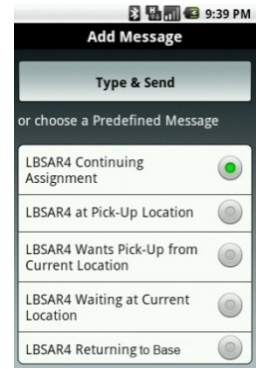- Prepared custom messages may be sent to 'Incident Commander Pro'

- All track locations and messages can also be sent to smartphones.

- Tracking can be monitored from multiple locations away from the radio system.

- Tracking locations and messages are permanently stored on servers for both immediate and later retrieval.

- Tracking locations can be plotted on both 'Incident Commander Pro, and Google Earth.

- Tracking locations can be plotted, messages read, and tracks downloaded, from any computer, at any location, at any time, with internet access.

The limitations of GPS satellite-based tracking include:

- Requires an internet connection at any convenient time or location (e.g. a command post, SAR base, office, home, coffee shop, etc.) to display tracking. Wired internet access, local free WiFi, cellular air-card (e.g. Telus, Rogers) and satellite-based internet (e.g. HughesNet) may provide this connectivity.
- Modest user-fees for GPS satellite-based device tracking.

3. VHF/UHF Radio-GPS Tracking – with 'Incident Commander Pro'
VHF/UHF radio GPS-microphones, with NMEA183 output, may be tracked by 'Incident Commander Pro' from command posts equipped with a permanent, fixed VHF/UHF-radio/computer system, within the radio range of the portable radio.

VHF/UHFradio – GPS microphone tracking systems are typically designed for fleet-tracking within an urban region that has an established, permanent radio network.

The benefits of the radio/GPS-microphone tracking with 'Incident Commander Pro' include:

- Employs existing VHF/UHF-radio system.
- Simple tracking on pressing the microphone's Push To Talk (PTT) button.
- No tracking fees.

The limitations of radio/GPS-microphone tracking include:

- Short-to-medium range tracking within radio line-of-sight/repeater range.

- If the portable radio's main radio battery fails, tracking also fails.
- If the portable radio changes channels, with respect to the base radio, tracking fails.

- Expensive external GPS-microphones (if the GPS is not integrated into the radio).

- Relatively complicated radio/microphone hardware, programming, serial-USB cabling, Proprietary drivers and COM port configurations are usually required to maintain tracking connectivity.

- Requires that the portable radios have an internal or external GPS receiver.

- Tracking capability is restricted to sites within a fixed VHF/UHF-radio/computer range.
- No ability to track locations unless the radio/computer is operational and manned.
- No tracking data is received if the base radio changes channels with respect to the portable radio.
- No ability to auto-store or save tracks if the fixed radio loses power.
- No ability to auto-store or save tracks when the fixed radio/computer system is off-line.
- No custom messaging, emailing, text-message, 911-SOS or Google Earth capability.

4. GPS-ConnectedTracking
GPS devices with NMEA183 output may be connected by USB cable to a computer and have the location tracked by 'Incident Commander Pro'.

The benefits of the GPS-connected tracking with 'Incident Commander Pro' include:

-Hi resolution tracking, with map auto-panning, of the current location of the connected GPS unit.
- Suitable for tracking the location of a mobile command post, response vehicle, rescue boat etc.

The limitations of the GPS-connected tracking with 'Incident Commander Pro' include:

- Tracking data is contained within the connected computer/tablet, unless it is specifically exported.