



# Situational Awareness with WINLINK

Quickly and easily getting a picture  
of operator locations and their  
statuses

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Clackamas ARES Training Program

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# WINLINK Mapping

## Using WINLINK for Situational Awareness

1. Situational Awareness
2. WINLINK Mapping and GPS
3. Generating Map Data
4. Mapping the Output
5. Obtaining Insights

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# Situational Awareness

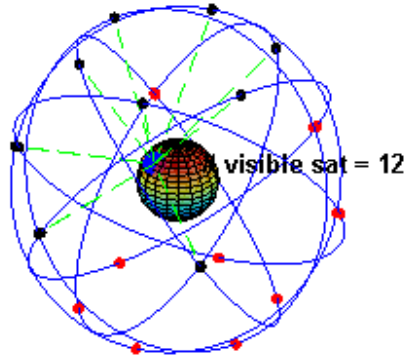
FEMA - Situational Awareness is **the ability to identify, process, and comprehend the critical information about an incident.** More simply, it is knowing what is going on around you. Situational Awareness requires continuous monitoring of relevant sources of information regarding actual incidents and developing hazards.

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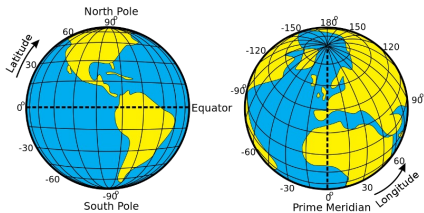
# ECOMM Mapping

- Maps help emergency management and public safety personnel visualize physical geography and operations information during an incident or event.
- During a communications outage, understanding resource locations and their status can help optimize deployments and reduce response times.
- If mapping and status reporting is automated, critical communications channels can be preserved for other information



# GPS

- The Global Positioning System (GPS), uses 24 satellites, fully operational in 1993. Originally, high accuracy was limited to the military, but in 2000, this was disabled, and today, most GPS have about a five-meter (16 ft) accuracy (although there is new L5 band capability for theoretical 2cm accuracy).
- Most satellites operate at L1, at 1575.42 MHz, and L2, at 1227.6 MHz.
- Many ways to get location readings: Your phone, many handheld amateur radios, expensive modules, cheap GPS "dongles"
- Phones use many methods to get location - cell tower triangulation, WiFi address mapping, and GPS.
- GPS typically requires being: Outside, good view of the sky/horizon providing "line-of-sight" to the satellites.
- Your first readings can take a LONG time - receiver needs to download the satellite location data (can take 15 minutes). This is called "Time to First Fix (TTFF)." Later readings can take a couple of minutes (data block takes 30 seconds, (potentially needing to be re-received) and might take 30 seconds to begin).



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# What is a GPS “Dongle?”



- Provides a GPS input to your computer.
- Dongles vary by chipset, built-in or external antenna, antenna gain, attach via USB or Bluetooth, built-in ground plane. Tiny inexpensive ones work, but recommend USB extension cable and metal plate underneath to provide a ground plane.

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# WINLINK Mapping

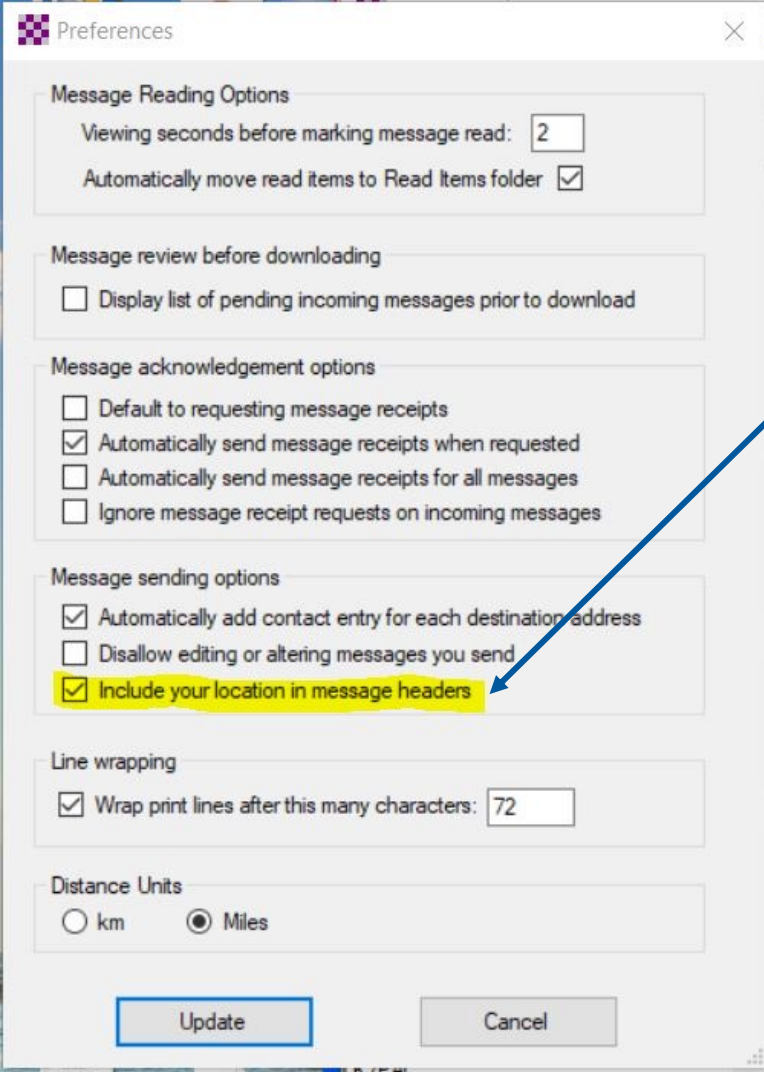
- WINLINK has had the ability to map the input of certain forms for over 10 years.
- WINLINK can read the output of a GPS “dongle” (or you can enter in location information manually.)
- **IMPORTANT: New feature added in WINLINK version 1.7.1.0 (in October 10, 2022) – there is a preference to send location (latitude/longitude) information automatically with every sent message. The default to this is set to ON.**

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# Why WINLINK Mapping?

- Can find out the locations of operators so that you can understand where we are staffed, who might be near an important location, estimate propagation, locate “mobile” operators, give served agencies situational awareness on deployments.
- Location enabled fillable forms give the ability to send information with location so the recipient can display and drill down into map “pins.” Receiver can even color code pins based on criteria they choose.
- It isn't like APRS, where locations are automatically updated and recorded for all to see, but recipients can get a new location fix every time a message is received.





## “Automatic” Mapping

- In the past, locations were only sent in “location enabled forms.”
- With this new feature, by default, location is included with messages. You can turn it off on Settings->Preferences if you want.
- Preferred is to have you enter your location into WINLINK, either using a GPS dongle or by entering it into WINLINK manually.
- This is powerful – someone collecting messages can map the locations of their operators.
- With great power comes great responsibility – if you deliver maps, know that locations can be inaccurate in the absence of GPS - warn any served agencies

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# How Default Position is Determined

- If a GPS unit is present, use GPS latitude/longitude.
- If no GPS is present and "Use Position Report Location" is checked, use GPS/Position Report **Latitude/Longitude.**
- If no GPS is present and "Use Position Report Location" is not checked, use **Center of Grid Square** latitude/longitude.

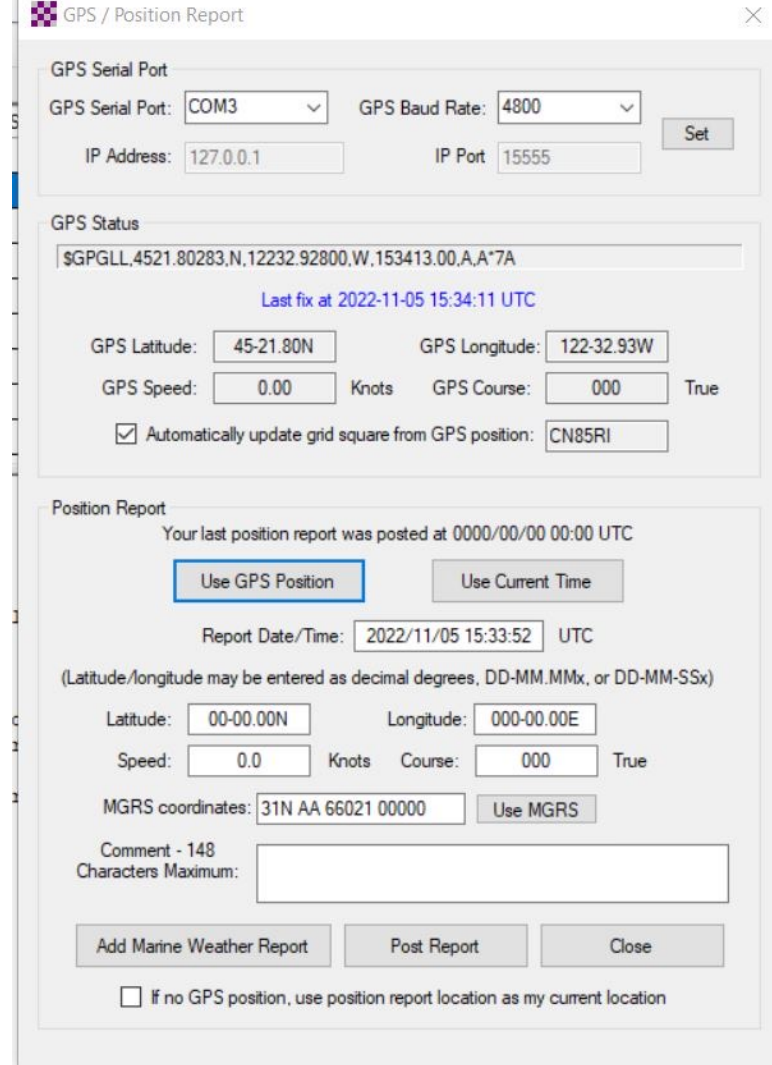
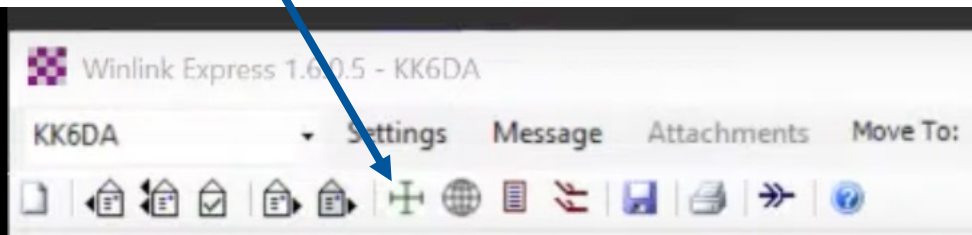
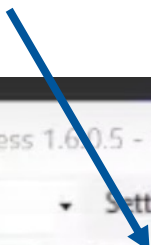
You can manually enter latitude and longitude to override the default position.

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# Getting location into WINLINK

- A GPS receiver can send the data to WINLINK via a COM port. (The receiver needs to send the NMEA protocol, which most do)
- If you don't have a connected GPS receiver, **you should set your LATITUDE/LONGITUDE position manually in the GPS/Position Report Screen.**
- **IMPORTANT:** If you don't get your LATITUDE/LONGITUDE from a GPS and don't set it manually, then WINLINK will set your location by using center of the 6-character grid square you have entered. **(Grid squares are 3-4 miles "square." Your location could be wrong by up to 3-4 miles! If you are in the field, your grid square might be old!)**

# Setting up location in WINLINK



# If you have a GPS Dongle...

1. Install drivers for your device

2. Go outside

3. Set the Port  
(Most dongles use 4800 Baud so no need to touch this)

4. Wait typically 2-3 minutes (First position in 90 days can actually take 15 minutes while it downloads the satellite map data (this is called the "Time to First Fix"))

GPS / Position Report

GPS Serial Port

GPS Serial Port: COM3    GPS Baud Rate: 4800

IP Address: 127.0.0.1    IP Port: 15555

Set

GPS Status

\$GPGLL,4521.80283,N,12232.92800,W,153413.00,A,A\*7A

Last fix at 2022-11-05 15:34:11 UTC

GPS Latitude: 45-21.80N    GPS Longitude: 122-32.93W

GPS Speed: 0.00    Knots    GPS Course: 000    True

Automatically update grid square from GPS position: CN85RI

5. When data is coming in this part of the form will fill in with automatic updating and the cross in the menu bar will turn green.

Position Report

Your last position report was posted at 0000/00/00 00:00 UTC

Use GPS Position    Use Current Time

Report Date/Time: 2022/11/05 15:33:52    UTC

(Latitude/longitude may be entered as decimal degrees, DD-MM.MMM, or

Latitude: 00-00.00N    Longitude: 000-00.00E

Speed: 0.0    Knots    Course: 000    True

MGRS coordinates: 31N AA 66021 00000    Use MGRS

Winlink Express 6.0.5 - KK6DA

KK6DA    Settings    Message    Attachments

Home    Back    Forward    Stop    Refresh    Print    ...

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# If You Don't Have a GPS Device/Dongle

- Before an event occurs, install an app like “Coordinates – GPS Finder” or “Ham Square” on your smart phone. Google Maps also has LAT/LON at the bottom.
- In the iPhone/Android app, set the output format to: DD.DDD,DD.DDD (this is called “decimal degrees”).
- Many smart watches, high-end portable ham radios, and cars can also output decimal GPS location now as well.
- Enter your latitude and longitude in GPS/Position Report 3/4 of the way down the window near Speed and Course.
- At the bottom of the screen check the box "If no GPS, use position report position as my current position."

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# GPS Enabled Forms

- Many forms are “GPS Enabled”
- Data is entered with GPS Location
- Output can mapped in many mapping programs
- Can “double click” on a pin to see the map data
- Can filter the pins displayed, and color code the pins according to criteria you choose.

# Filling out a GPS Enabled Form

The image shows a software interface with a 'Template Manager' window. The window has a menu bar with 'Select', 'Close', 'Add', 'Remove', and 'Edit'. The main area is divided into two panes. The left pane shows a tree view of 'Standard Templates (version 1.0.217.0)' with categories like 'ARC Forms', 'CA STATE Forms', 'CANADIAN Forms', 'FEMA Forms', 'FMRE Forms', 'GENERAL Forms', 'GENERAL MEDICAL Forms', 'HI STATE forms', 'HICS Forms', 'IARU Forms', 'ICS USA Forms', 'MAPPING-GIS FORMS', 'OR STATE Forms', 'RADIOGRAM & RRI Forms', 'SHARES Forms', 'TX STATE Forms', 'USGS', 'WA STATE Forms', and 'WEATHER Forms'. The right pane shows a list of templates under the 'MAPPING-GIS FORMS' category, including 'Catalog Map Capable Downloads.txt', 'Field Situation Report.txt', 'Hospital Bed Report.txt', 'Hospital Status.txt', 'Hurricane Report.txt', 'LAX Bed Availability Report - HSA.txt', 'Local Weather Report.txt', 'SDG ARES Hospital Status.txt', 'Severe WX Report.txt', 'USGS DYFI English.txt', 'USGS DYFI Espanol.txt', 'Winlink Check In.txt', and 'Winlink Check Out.txt'. Three numbered callouts are present: '1' points to the 'Edit' button in the menu bar; '2' points to the 'MAPPING-GIS FORMS' category in the left pane; '3' points to the 'MAPPING-GIS FORMS' category in the right pane.

1

2

3

Template Manager

Select Close Add Remove Edit

Standard Templates (version 1.0.217.0)

- ARC Forms
- CA STATE Forms
- CANADIAN Forms
- FEMA Forms
- FMRE Forms
- GENERAL Forms
- GENERAL MEDICAL Forms
- HI STATE forms
- HICS Forms
- IARU Forms
- ICS USA Forms
- MAPPING-GIS FORMS
- OR STATE Forms
- RADIOGRAM & RRI Forms
- SHARES Forms
- TX STATE Forms
- USGS
- WA STATE Forms
- WEATHER Forms

Global Templates

W7MDB Templates

Catalog Map Capable Downloads.txt

Field Situation Report.txt

Hospital Bed Report.txt

Hospital Status.txt

Hurricane Report.txt

LAX Bed Availability Report - HSA.txt

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Winlink Check In.txt

Winlink Check Out.txt

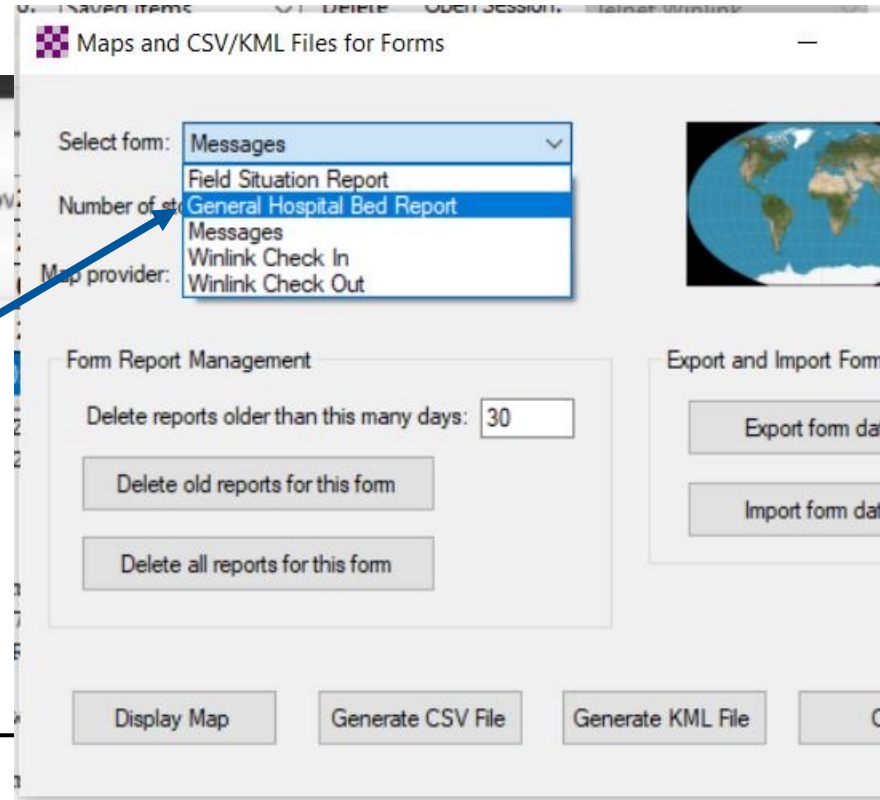
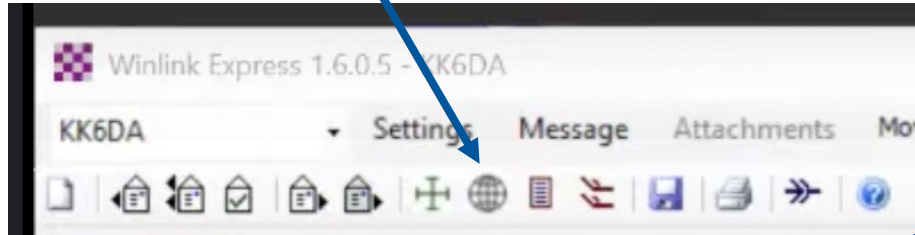
OR STATE Forms

RADIOGRAM & RRI Forms



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# Mapping the Output



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# Output can be displayed in WINLINK or fed into Geographic Information System Programs

- When you receive messages with GPS coordinates in them, you can then map them.
- WINLINK is not a full GIS system, but data can be exported to put into a GIS program
- You can display simple from in WINLINK
- Can export to GIS Programs like:

Google Maps/Google Earth  
ARCGIS QGIS

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# Demo –What the output looks like in WINLINK

- *Show the input into a hospital bed report form and the output from many Hospital Bed Reports received. Show how one can click on a pin and see the data, use the filter function to color code the pins based on status and roll up the information into sums.*

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# Displaying Maps with no Internet?

- Map grids that are viewed in WINLINK while you have internet are saved (cached) on your PC. Whatever you have looked at can be displayed. Recommend that you look at and zoom into lots of local locations on your PC while you still have Internet.
- The more you practice in our area, the more likely it will be to have the maps you want up to date when you need them.

# Questions and Answers