Southwestern Area

Latitude-longitude* procedures

For our purposes in the Southwestern Area on any dispatches, fire locations, aerial ignition plans or anything that might need to be located from an aircraft will use the **Degrees decimal minutes (B) format.**

Latitude and longitude may be shown in three formats:

A. Degrees Decimal Degree (Seldom Used)	48.3612° N 114.0812° W
B. Degrees Decimal Minutes (aka) Degrees Minutes Decimal Minutes or Degrees Minutes Tenths) ~ Aircraft mounted GPS units ~ Contracts ~ FAA documents such as airport guides	48° 36.12'N 114° 08.12'W
C. Degrees Minutes Seconds (Many maps) ~ ROSS ~ Nat'l Mob Guide ~ TFR requests forms	48° 36'12"N 114° 08'12"W

Plotting the three formats above will place the location in <u>three different locations,</u> so it is critical that we all remain on the same page.

There is also a format specific to the National Mobilization Guide, for requesting TFRs, which is an exception to the above formats. An example would be 483612N/1140812W (uses *no punctuation* at all with degrees, minutes and seconds).

<u>It is CRITICAL that you use correct punctuation!</u>

<u>Degrees:</u> ° (MS Word- hit Ctrl+Shift+@, then space for ° symbol OR use insert Symbol)
<u>Minutes:</u> '
<u>Seconds:</u> "

Note : In "**A**" above, only the ° is used.

      (Said "forty-eight point three six one two degrees.")

Note: In "**B**" above, both ° and ' are used.

      (Said "forty-eight degrees, thirty six point one two minutes.")

Note: In "**C**" above, the ° and ' and " are used.

      (Said "forty-eight degrees, thirty six minutes, and twelve seconds.")_

Note: In requesting a **TFR** no punctuation is used.

      (Said "forty-eight thirty six twelve North/one hundred and fourteen zero eight
      twelve West.")

Most handheld GPS units and mapping software can be easily set up to do any of the formats. Most aircraft mounted GPS units are not easily changed from the degrees decimal minutes format. There are conversion charts, software programs, and formulas available at the following sites:

      http://www.fcc.gov/mb/audio/bickel/DDDMMSS-decimal.html

      http://www.calculatorcat.com/latitude_longitude.phtml

To manually convert **degrees minutes <u>seconds</u>** to **degrees decimal minutes** divide seconds by 60.

Example: 48° 20' <u>30</u>" →   <u>30</u>" ÷ 60 + .5'   →   48° 20.5'

To manually convert **degrees <u>decimal minutes</u>** to **degrees minutes seconds**, multiply hundredths (i.e. .12) by 60.

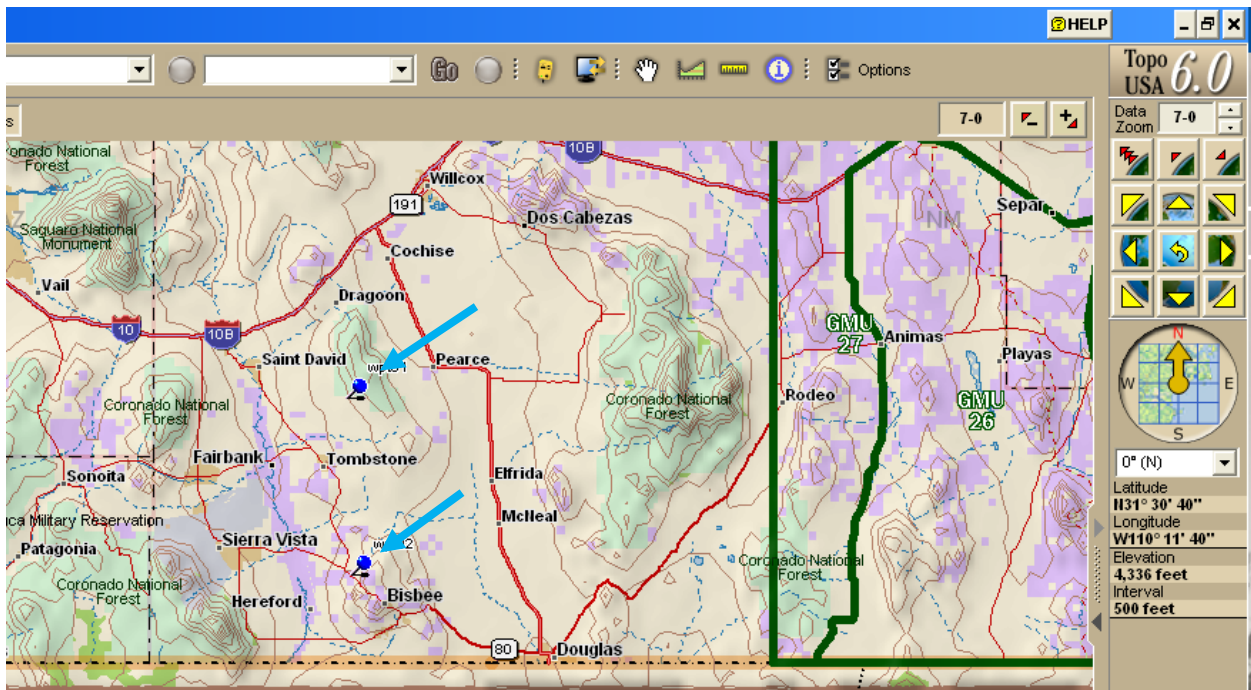Example: 48° 20.5'   →   .5' x 60 = 30"   →   48° 20' 30"

Important "Etiquette"

- ➢ Use ONLY ONE period/decimal point when writing a latitude or longitude.
- ➢ Do NOT use ANY periods/decimal points when writing a latitude or longitude in Degrees Minutes Seconds format (C).
- ➢ When requesting a TFR use the format of ddmmssN/ddmmssW, (no periods, commas or spaces)
- ➢ Remember there can never by more than 60 seconds in degrees minutes seconds format (C).
- ➢ For clarity, insert a zero "0" in front of single digit minutes as many GPS units and map programs require two digits.
- ➢ Do NOT mix formats.

Degrees and <u>**whole minutes**</u> don't change with either "B" or "C" formats.
Only seconds and decimal minutes change. A minute is broken into either 60 or 100 parts, depending on which format you want to use. For our purposes, we want to divide a minute into 100 parts: **decimal minutes**.

So, how much error is there if you confuse latitude/longitude format?

EXAMPLE: Here is map showing the variation if a location was given in degrees decimals (A) and used in the degrees, minutes, seconds format (unknowingly not converted).

The distance between location #1 and location #2 is 20 miles. This is a tremendous difference not only for operations, but for emergency response. Knowing where the aircraft is and should be is crucial for initiating emergency response.

Here is a table of ground distance for latitude and longitude.

<div align="center">

Approx. Distance in Feet

	Latitude	Longitude
Degree	363,600	282,600
Minute	6,060	4,710
second	101	78.5

</div>

Let's look at the Phoenix area: **33** degrees **26.58** minutes, more specifically the .58 minutes. Using the distance for a minute of latitude from the table, this location is 3515 feet (.58 minutes X 6,060 feet/minute) north of the 33 degree 26 minute latitude line.

If this latitude was meant to be 33 degrees, 26 minutes, 58 seconds, then this location is 5858 feet. (58 seconds X 101 feet/second) north of the 33 degree 26 minute latitude line. The distance error between these two locations is 2343 feet (5858 – 3515 feet), which is almost ½ mile.

If you have any doubt which lat-long format ('? "?) you have been given, ASK!! You need to be sure.

*LATITUDE: The imaginary survey lines running east to west. From the equator, there are 90° North latitude and 90° South latitude, each degree being sixty minutes, each minute being one nautical mile (approx. 1.15 statute miles) for a constant distance apart of about 69 miles.

*LONGITUDE: The imaginary survey lines running south to north. There are 360° of longitude, each degree varying in width from about 69 miles wide at the equator to convergence at the North and South Poles.