

How to Read US National Grid (USNG) Coordinates

FGDC-STD-011-2001

From www.fgdc.gov/usng

Background. The Federal Geographic Data Committee's (FGDC) consensus based USNG standard provides a nationally consistent *language of location* -- optimized for local applications -- for maps, Global Positioning System (GPS) receivers, and mapping web portals. It is an alpha-numeric point reference system overlaid on the Universal Transverse Mercator (UTM) numerical grid. Truncated USNG coordinates (geoaddresses) range in precision from 1,000 to 1-meter and provide universal map index values for streets and other features. USNG and Military Grid Reference (MGRS) values are identical when referenced to WGS 84 or NAD 83 datum -- USNG only uses a single 100,000-m Square Identification scheme regardless of datum. This example locates the Jefferson Pier at USNG: 18S UJ 23371 06519.

Grid Zone Designation (GZD):

6° x 8° longitude zone / latitude band.

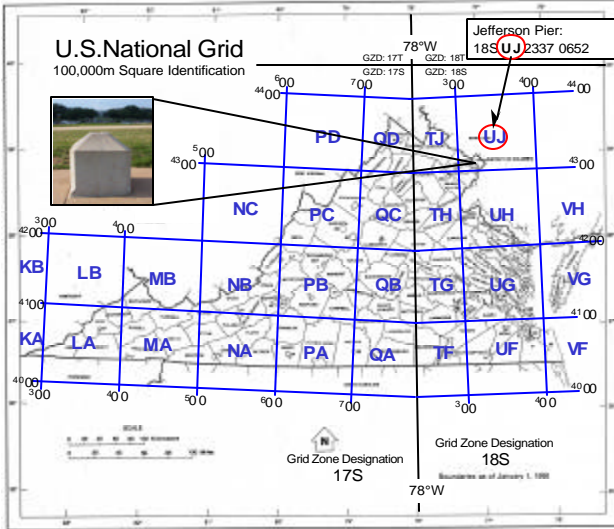
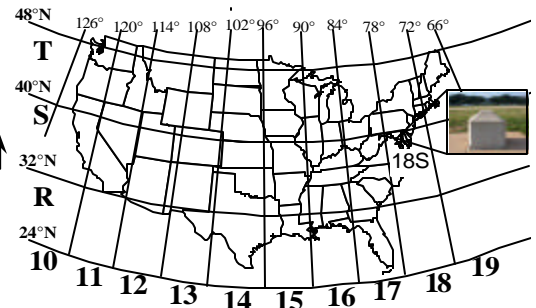
100,000-m Square Identification:

18S UJ 2337 0651

Grid Coordinates:

Read *right*, then *up*.

UTM/USNG Grid Zone Designations



Users determine the required precision. These values represent a point position (southwest corner) for an area of refinement.

Four digits: 23 06 Locating a point within a 1,000-m square.

Six digits: 233 065 Locating a point within a 100-m square.

Eight digits: 2337 0651 Locating a point within a 10-m square.

Ten digits: 23371 06519 Locating a point within a 1-m square.

Only an 8-digit grid is typically required to locate a modest size home out of a local area.

Full USNG: 18S UJ 2337 0651 - World wide unique.

Without Grid Zone Designation (GZD): UJ 2337 0651 - Regional areas.

Without GZD and 100,000-m Square ID: 2337 0651 - Local areas.

Reading USNG Grid Coordinates.

Principal Digits → 07

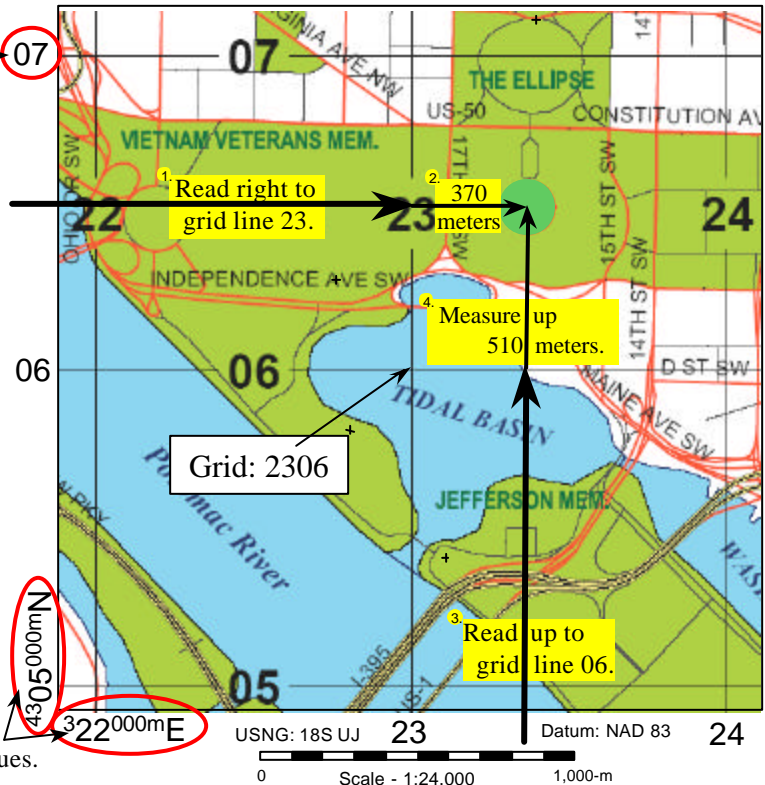
- The UTM 10,000 and 1,000 digit values are known as Principal Digits.

- Coordinates are always given as an even number of digits (i.e. 23370651).

- Divide coordinates in half (2337 0651).

¹ - Read right to grid line 23. ² Then measure right another 370 meters. (Think 23.37)

³ - Read up to grid line 06. ⁴ Then measure up another 510 meters. (Think 06.51)



Grid:	Examples:
228058	FDR Memorial: +
231054	George Mason Memorial: +
2338 0710	Zero Milestone: +
2275 0628	DC War Memorial: +
213017	Ft. Scott Park:



United States National Grid

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Learning Objective: The student shall describe the United States National Grid (USNG) coordinate system standard and how it can be used as a tool during wide-area or single-site incidents.

In most emergencies, responders find their destination using routine addressing tools. But when a street address is unfamiliar, normal landmarks are destroyed, or they are in the wilderness, what should responders use as the primary tool for positional reporting and navigation in land-based operations? The USNG standard is the preferred tool for unified command and coordination because of its ease of use.

All maps need a grid reference system to be usable. Maps already in use or those found in office supply or gas station/convenience stores typically display nonstandard, and therefore noninteroperable, “bingo” grids of letters and numbers. Maps found on the World Wide Web generally are devoid of grids and thus are effectively just “pictures.” Responders need standardized and properly labeled maps, so they can improve position identification and communications.

USNG basically is the same as the Military Grid Reference System (MGRS), in worldwide use since 1949, and is a derivative of Universal Transverse Mercator (UTM). Paper maps always will be critically important, and all should include a properly annotated USNG grid overlay. When created, USNG can be displayed and used easily on your smartphone. Computer-aided dispatch and mobile data terminals also can be made to display properly labeled grids and coordinate readouts at the cursor location. A global positioning system (GPS) receiver or other geospatial technology is not required.

USNG uses an alphanumeric system to plot coordinates and can specify areas of 1 kilometer, 100 meters, or 10 meters accuracy with as little as four, six, or eight digits respectively—per the standard (found at www.fgdc.gov/usng)—without dashes, decimal points, or degrees. This facilitates easier radio communications of coordinates. For example, **18S UJ 0061 9638** represents a coordinate with a precision of 10 square meters (33 ft²) for the J Building Auditorium at the NETC in Emmitsburg, Maryland.

A USNG grid geaddress can be used to the desired level-of-detail (precision) and can be used in combination with or in lieu of street addresses, as needed, to identify helispots, threatened exposures, or other important points. An out-of-area strike team may not be familiar with local addresses, but when versed in the simple coordinate system of USNG, finding a location can be less stressful and more efficient.

Federal agencies comprising the National Search and Rescue Committee designated USNG as the coordinate system for all land search and rescue operations in November 2011. Minnesota and Florida have designated USNG as the preferred coordinate system. The U.S. Fire Administration (USFA) borrowed from Florida’s Statewide Emergency Response Plan to create a sample USNG Appendix for any Statewide Emergency Response Plan (http://www.usfa.fema.gov/downloads/pdf/git_usng_intro.pdf). The Minnesota Geospatial (MnGeo) Emergency Preparedness Committee, Dakota County, Minnesota, and Delta State University worked with the Federal Emergency Management Agency (FEMA) to create a sample map with standard USNG annotations of the NETC that can be found at http://www.usfa.fema.gov/downloads/pdf/campus_map_usng.pdf

This Coffee Break Training topic is courtesy of Al Studt, Florida Fire Instructor 3.



This sign uses the USNG coordinate system standard to identify the main entry to the J Building Auditorium at the National Emergency Training Center (NETC) in Emmitsburg, Maryland.

For archived downloads, go to:

www.usfa.fema.gov/nfa/coffee-break/