

# UTM SYSTEM

•COMPOSED AND PRODUCED BY :

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# UTM SYSTEM

UTM stands for Universal Transverse Mercator which is a technical term for the type of map projection.

The position or coordinates on the map are described much the same way as LATITUDE and LONGITUDE only UTM uses an Easting and a Northing designation to form a grid.

With UTM the grid starts at the International Date Line (180°) and is measured EASTWARD around the world back to the International Date line. This distance is divided up into 60 UTM ZONES numbered from 1 to 60.

360 ° around the world divided by 60 zones means that each zone is 6° wide.

# UTM SYSTEM

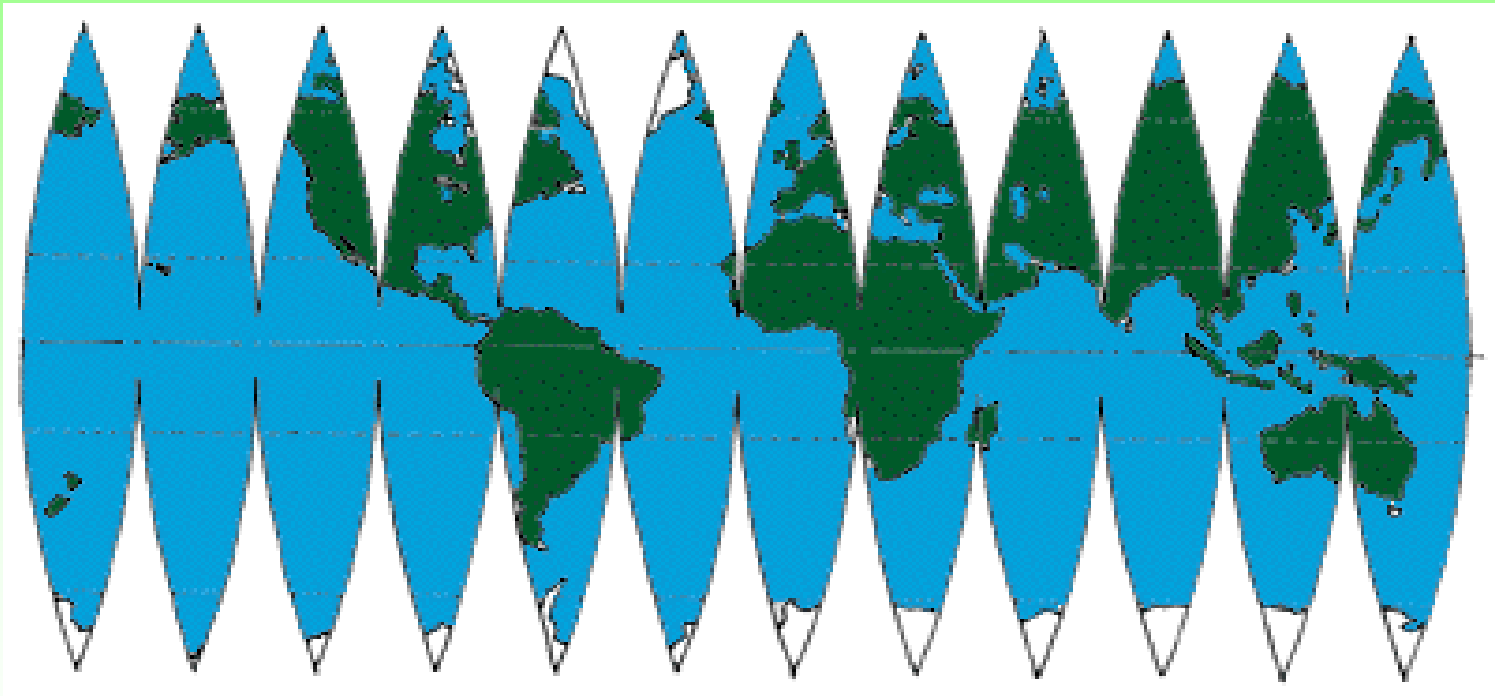
The position or coordinates are described much the same way as LATITUDE and LONGITUDE where the EQUATOR is considered the zero degrees ( $0^\circ$ ) or the starting point for measuring locations to the North.

The Northings go from  $0^\circ$  to  $84^\circ$  in the northern Hemisphere and to  $80^\circ$  in the southern Hemisphere.

Northings are measured in meters from the EQUATOR

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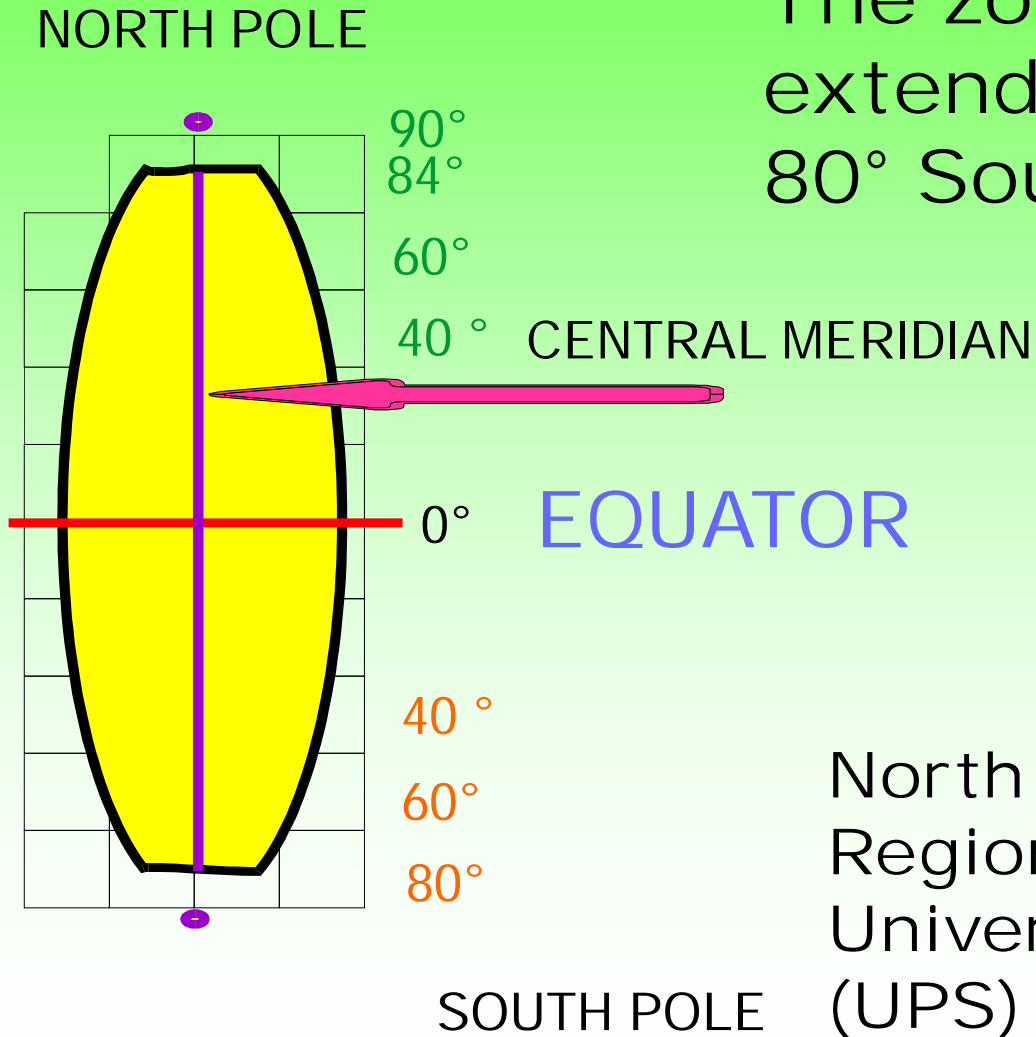
Because the world is round and maps are flat, some distortion occurs. UTM maps handle this by dividing the world into zones. It is not perfect but it works.



This shows the world divided into 12 zones, UTM uses 60 zones.

# UTM SYSTEM

The zone (yellow area) extends to 84° North & 80° South latitudes.

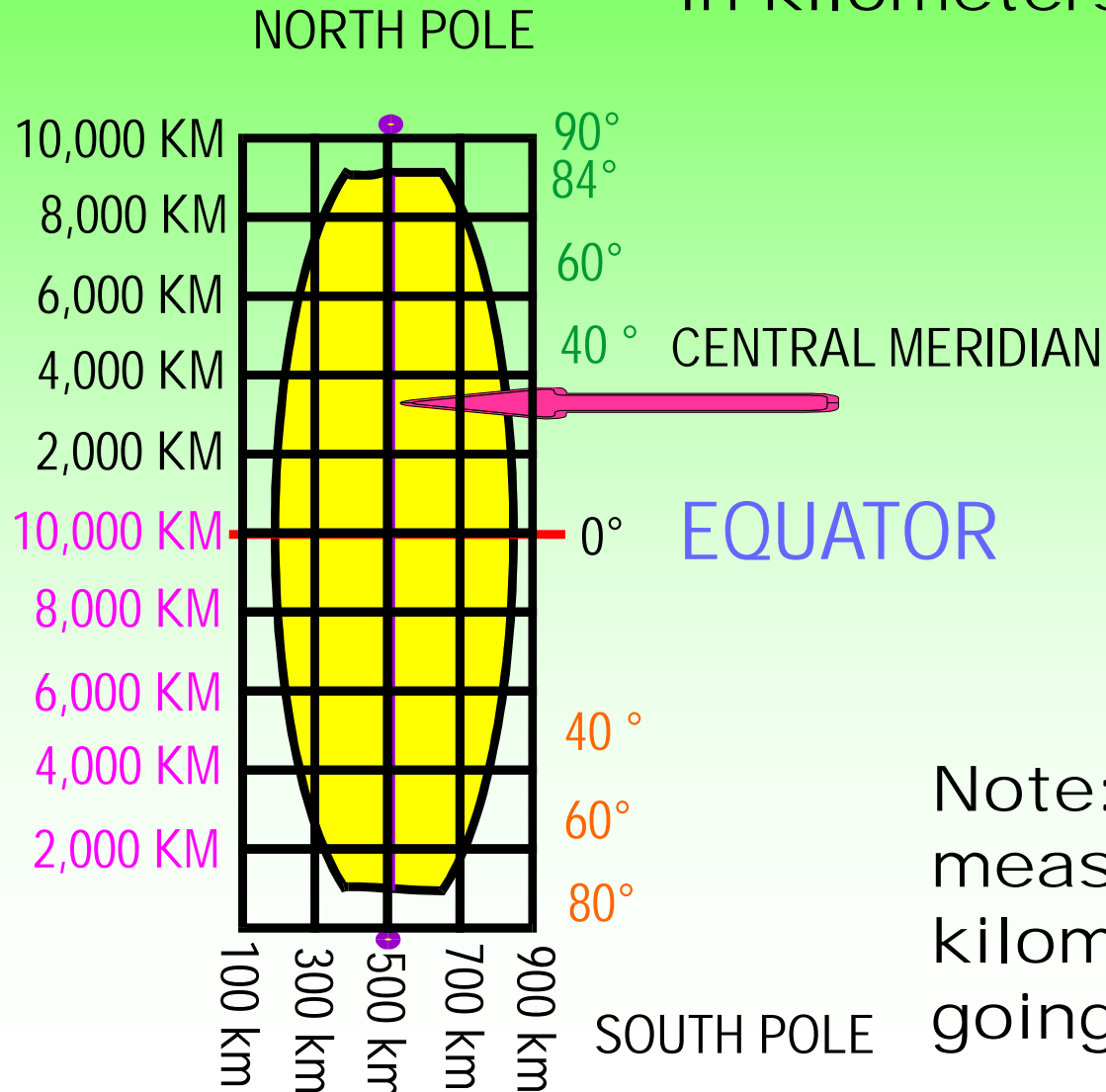


Each zone has a Central Meridian

North and South Polar Regions have maps called - Universal Polar Stereographic (UPS) Grid System

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UTM then overlays a metric grid in kilometers over the zone

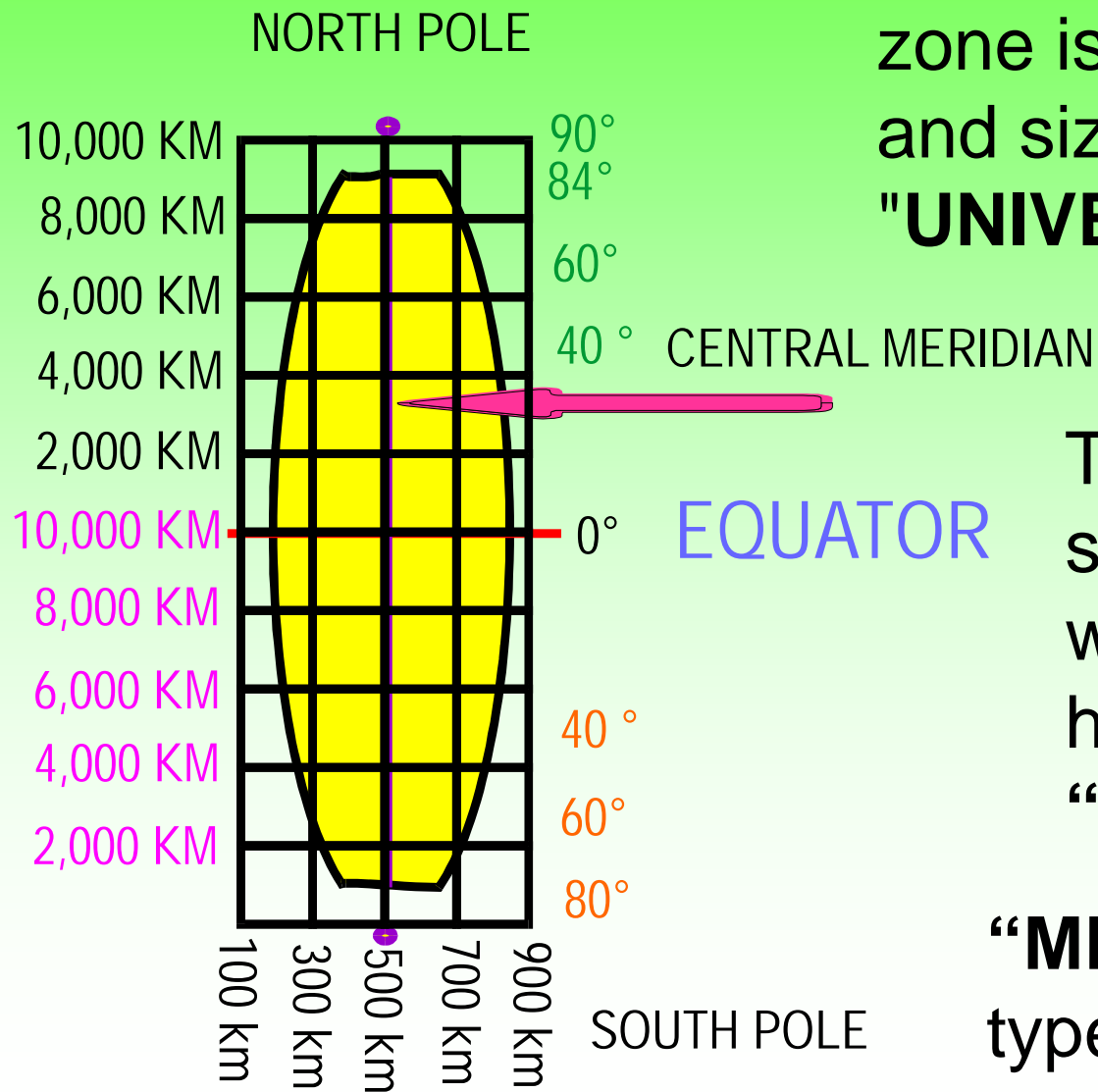


Note: at the EQUATOR the measurements begin at 10,000 kilometers and decrease going SOUTH

Note: at the EQUATOR the measurements begin at 0 kilometers and increase going NORTH

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Every grid square in every zone is the same shape and size (hence the name "**UNIVERSAL**").



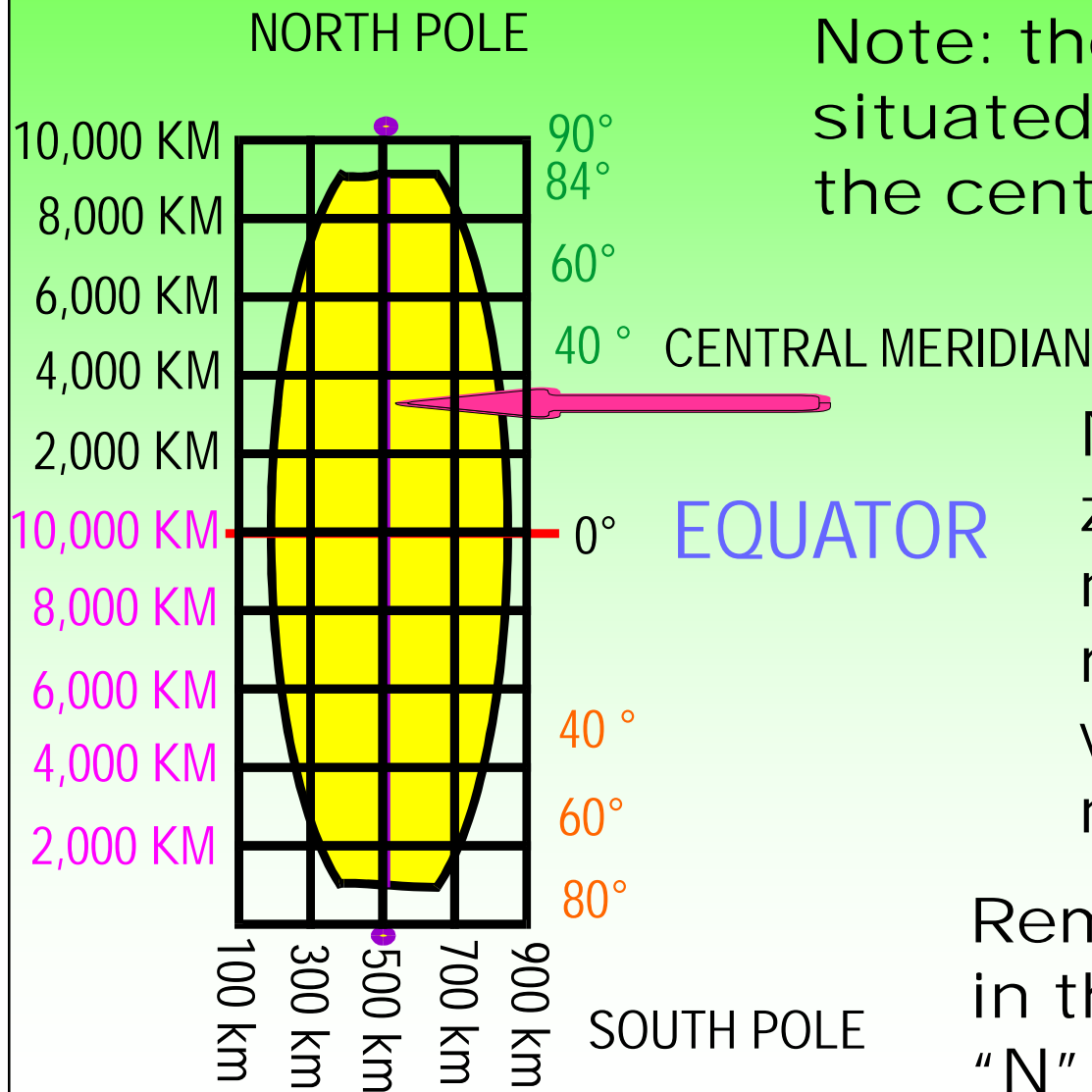
The zones run north-south rather than east-west along the equator, hence the name "**TRANSVERSE**".

"**MERCATOR**" is the type of map projection

# UTM SYSTEM

UTM is a metric grid in square kilometers

Note: the Central Meridian is situated at 500 kilometers or the centre of the grid



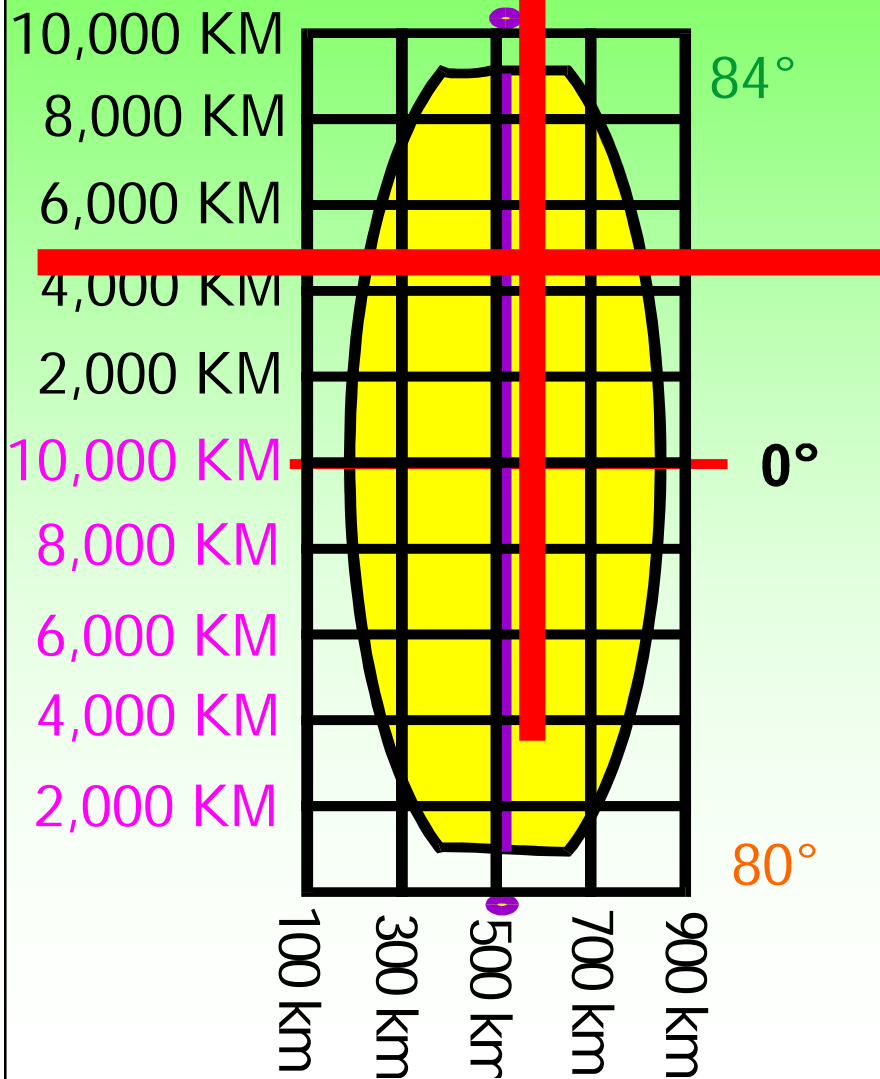
Note: all locations in a zone are positive numbers, no need for minus or plus, east or west, just use the number.

Remember: Zone numbers in the North start with an "N" and in the South "S"



# UTM SYSTEM

Example: **Zone 15 559741 mE. 4282182 m**



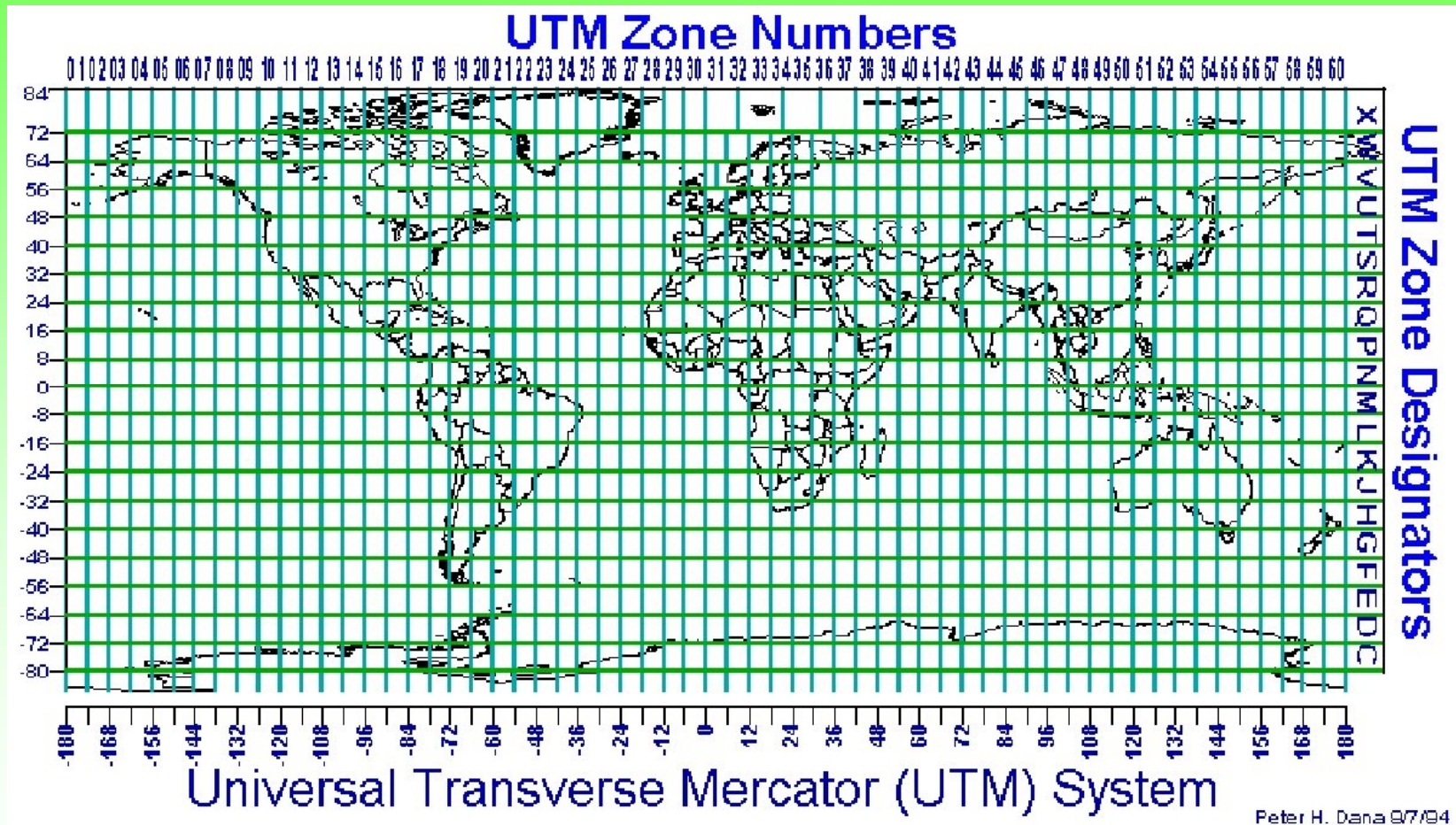
Means ZONE 15  
(the one shown)

559,741 are the  
meters Easting  
(560 km approx.)

4282182 is the  
number of meters  
Northing (4,282 km)

# UTM SYSTEM

A look at the WORLD UTM GRID

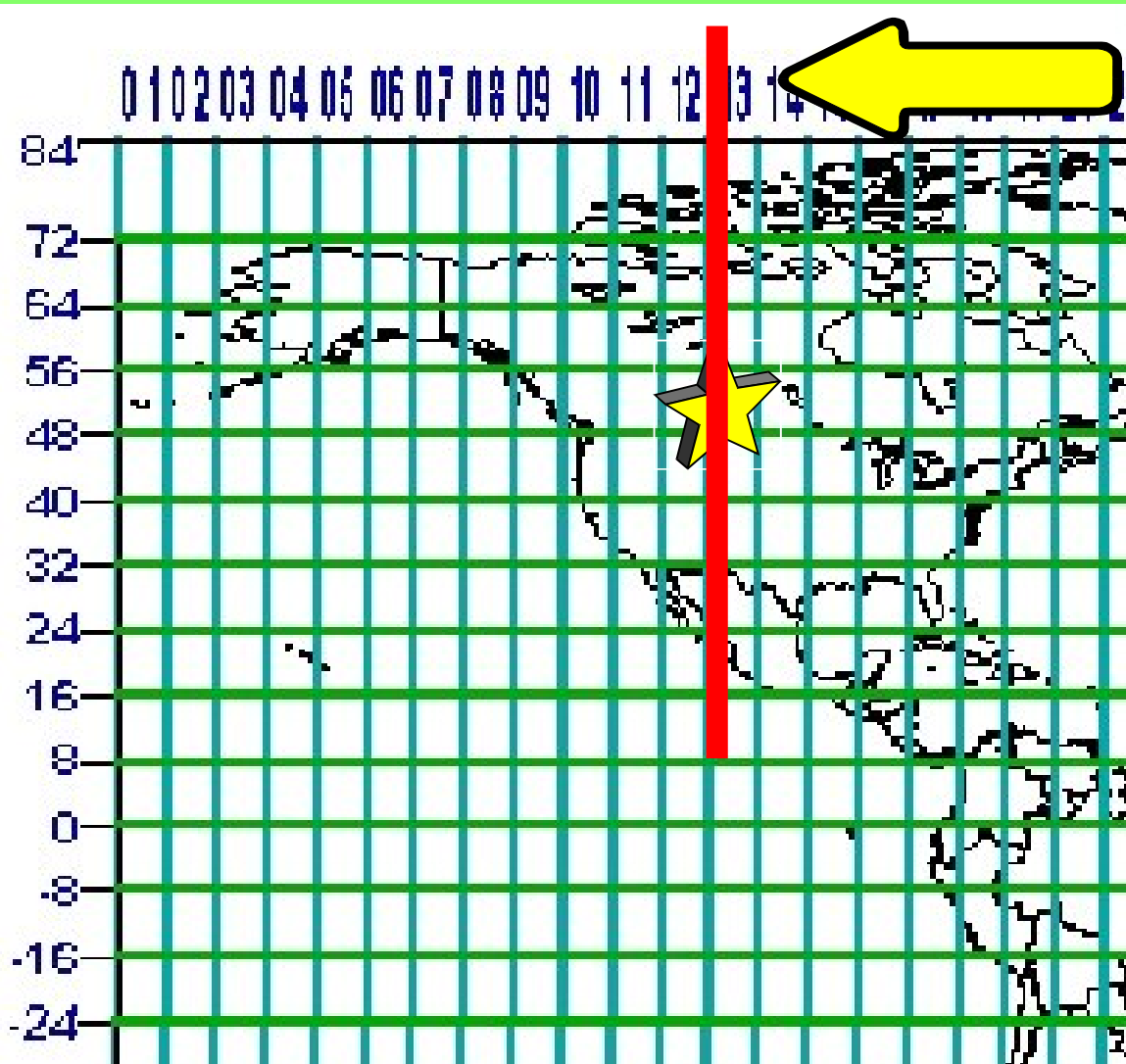


Zone Numbers from 1-60 on the top

Letters C to X on the side for each belt (I and O excluded)

# UTM SYSTEM

## SASKATCHEWAN AND THE UTM GRID

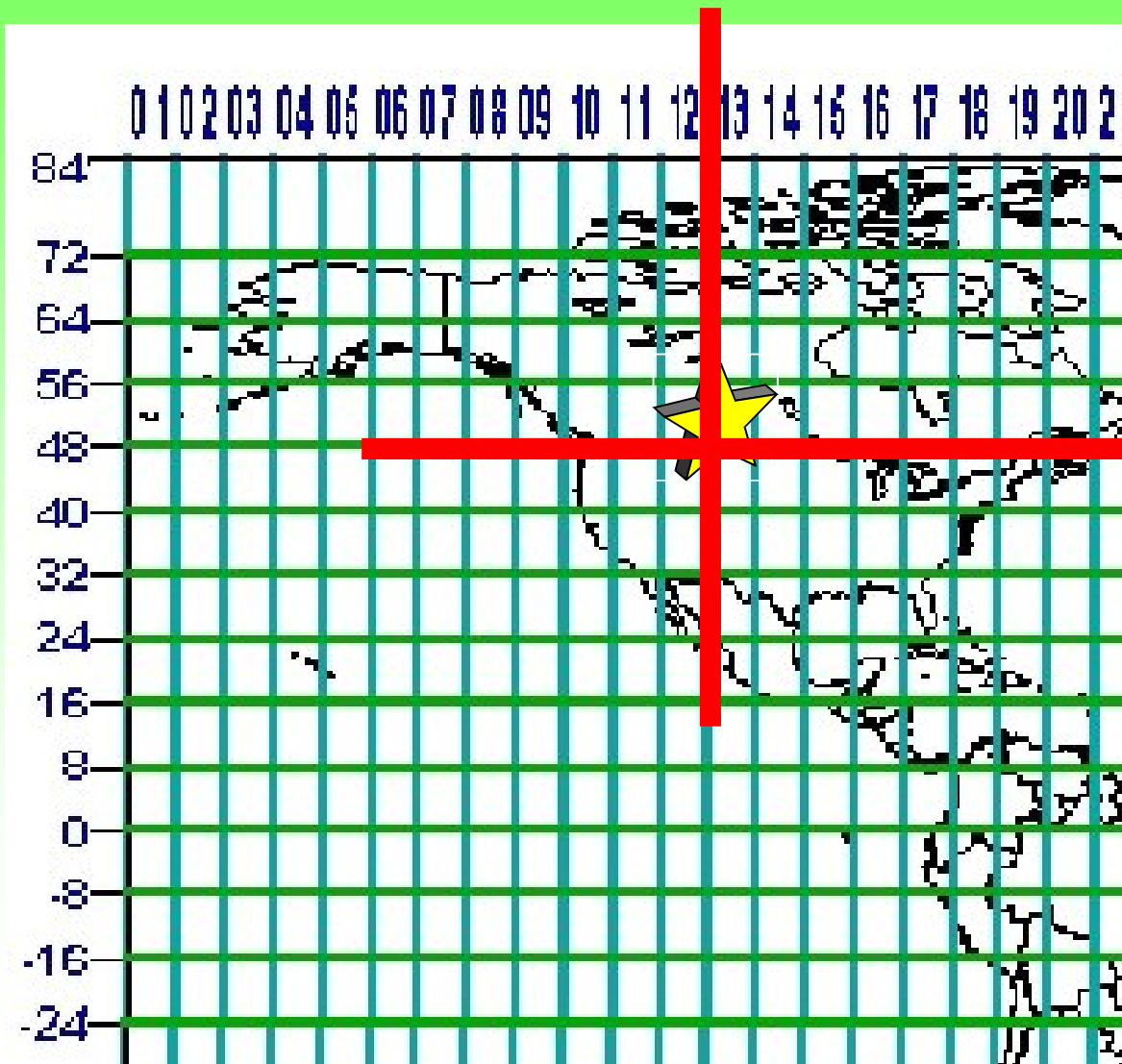


SASKATCHEWAN  
IS ABOUT HERE

EASTING OF  
ZONES 12  
AND 13

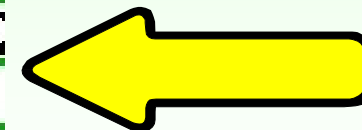
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## SASKATCHEWAN AND THE UTM GRID



SASKATCHEWAN  
IS ABOUT HERE

The SASK-US  
border has a  
NORTHING around  
"48" or 4,800,000  
meters from the  
EQUATOR



The EQUATOR at  $0^{\circ}$

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Let's review !

*I recently saw a map designated  
Z 13 E47 N610 What does that mean?*

Z 13 - is zone 13 which covers part of  
SASKATCHEWAN

E 47 - is an Easting of 470  
kilometers

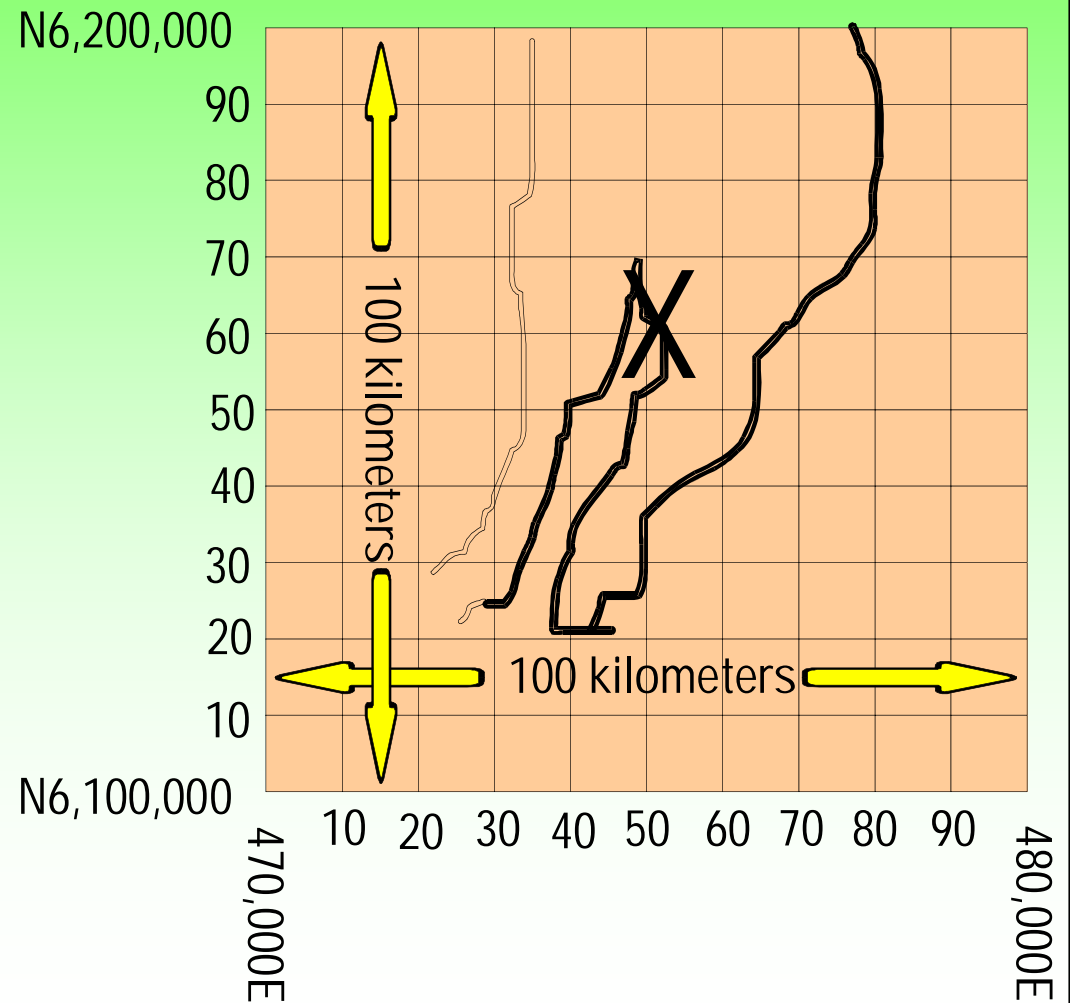
N 610 - north of the Equator  
6,100 kilometers

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Let's review !  
Z 13 E47 N610

Now find Big  
Joe's camp fire.

Z13 E475 N616



# UTM SYSTEM

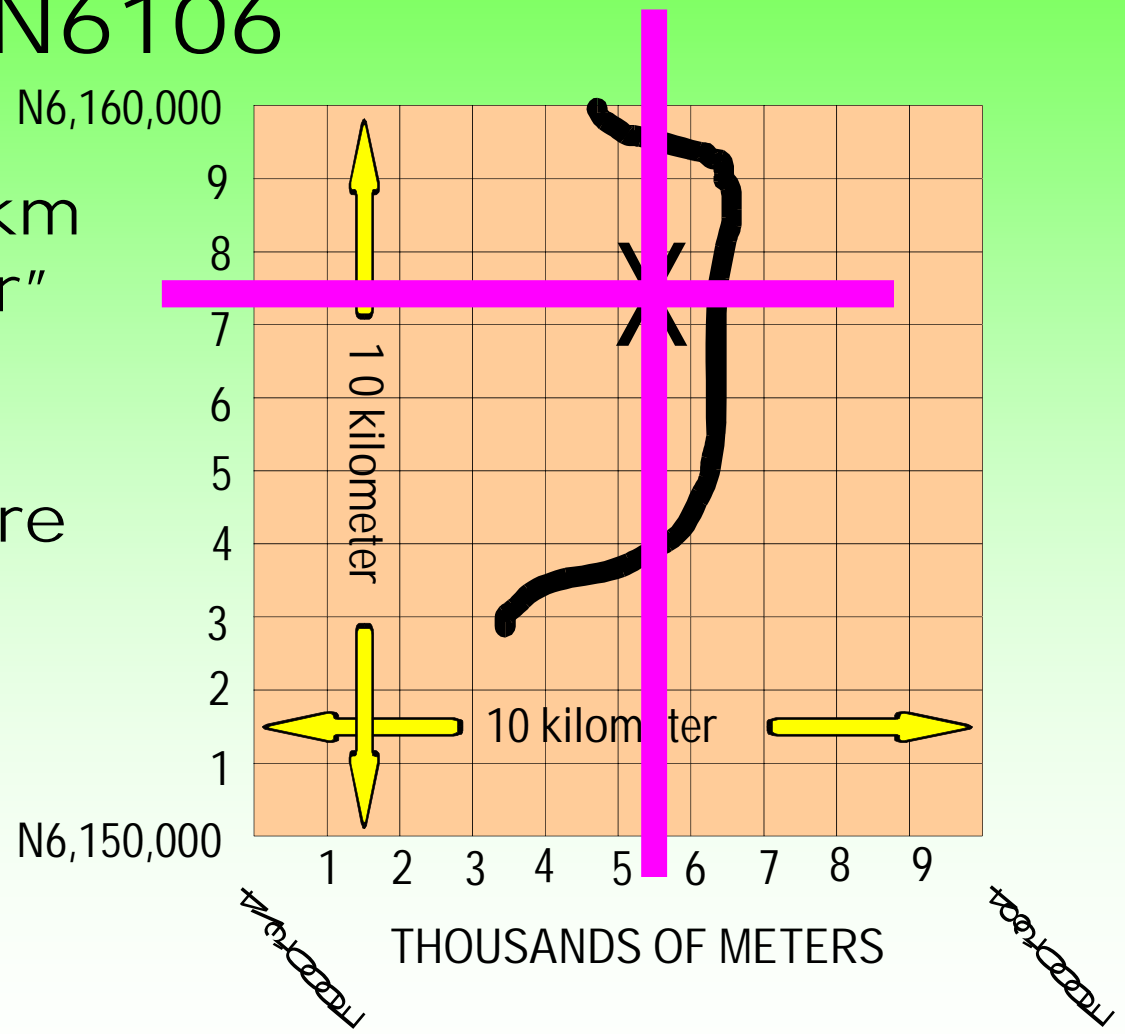
Find Big Joe's camp fire  
Z13 E475 N6106

When you get to 10 km grids - use a "roamer" - a clear plastic overlay with the metric grid, for a more exact pinpoint.

Joe's camp -

Z13 E 4805

N61575



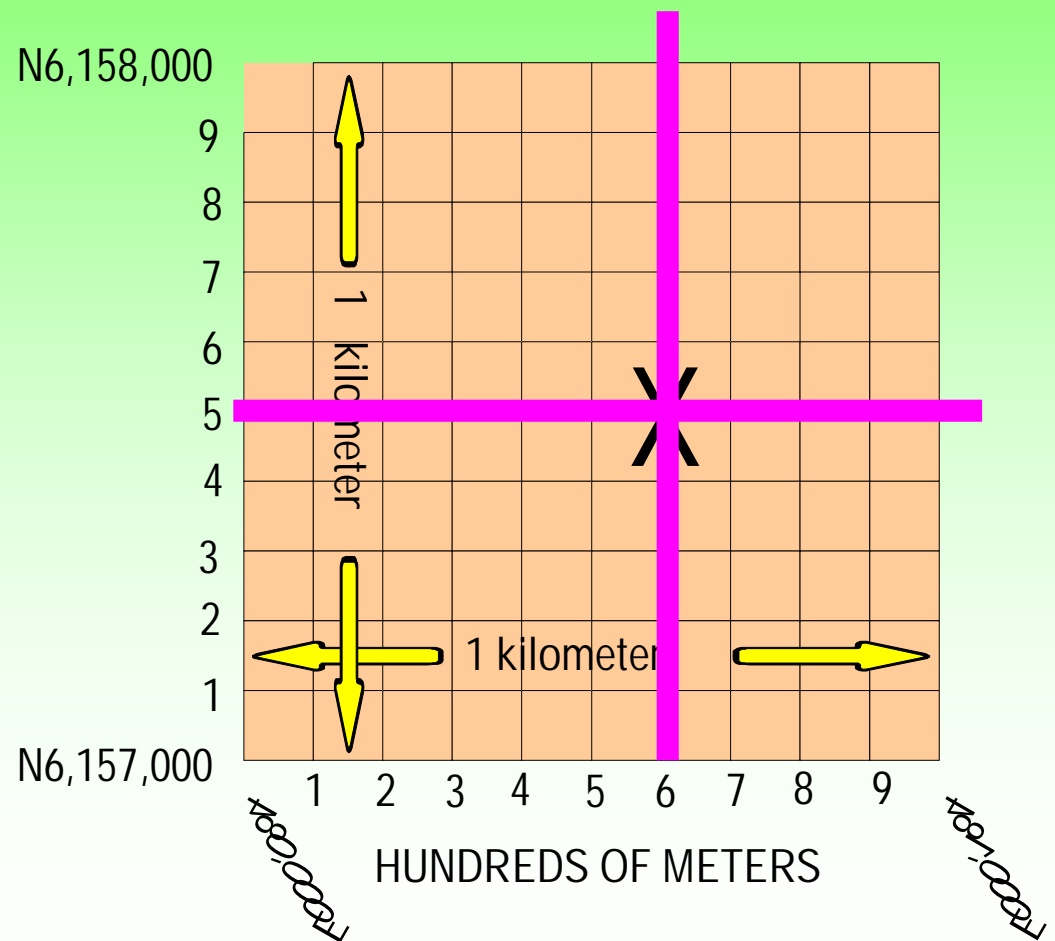
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Find Big Joe's camp fire using map  
Z13 E47555 N6106

We now have....  
E 480600

and N 6157500

OK, now we  
will go  
crazy!!!



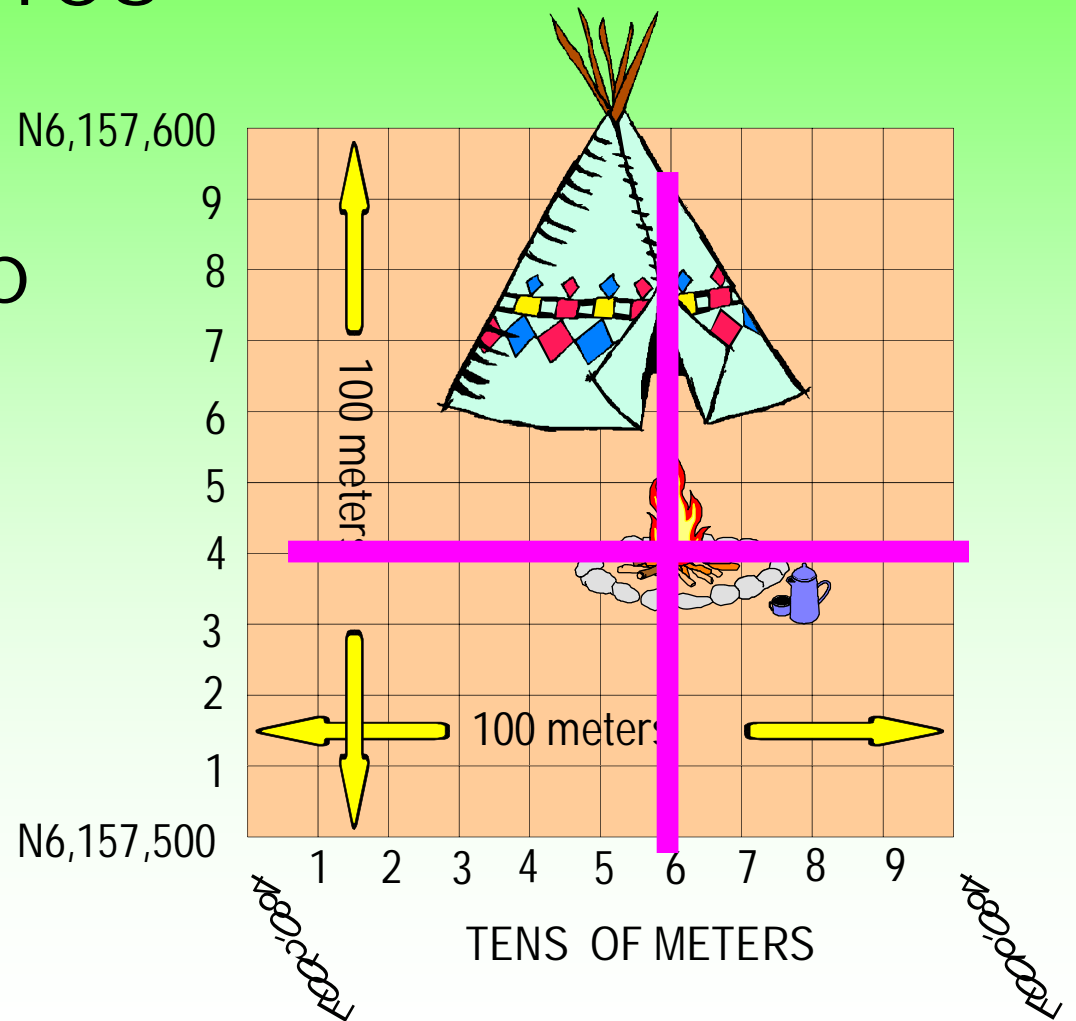


# UTM SYSTEM

Find Big Joe's camp fire using map  
Z13 E47555 N6106

Big Joe's camp  
fire located at  
E 480560

N 6157540



# UTM SYSTEM

Nothing beats practical experience... So try some UTM Mapping...

You will soon discover that the notion of zones falls away and we are left with a simple rectangular coordinate system to use with our large scale maps.

Practice using a roamer for accurate pinpoint locations

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Frequently, in land navigation, the zone information and the digits representing 1,000,000m, and 100,000m are dropped. The 1m, 10m and 100m digits are used only to the extent of accuracy desired. Note that it's the smaller digits that are dropped in the notation used by the USGS (*United States Geographic Survey*) on the edges of their maps.

For example 4282000 mN. becomes  
82mN (meters North)

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Take Note: that when you abbreviate coordinates you should not do any rounding. 0559651 becomes 596 not 597. (remember the 05 in front was dropped)

This ensures that your position is still within the reported square.

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Military Grid Reference System (MGRS) works on the same principal except the zones are 8° wide instead of 6°, and letters are used to designate zones.

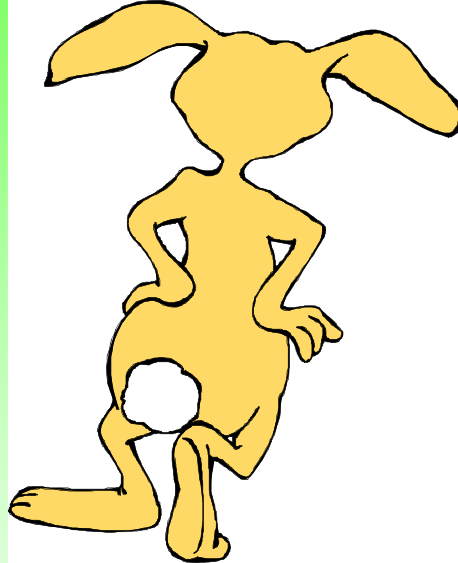
Be sure to check the map to see what type it is, UTM or MGRS.

# UTM SYSTEM

This concludes a brief overview of UTM mapping....

The more you use it, the easier it will become.

# UTM SYSTEM



**THE  
END**