

## 2.7 MAX: Maximum Reflectivity

The screenshot shows the 'MAX Product Configuration: max-med' window. It has a menu bar with 'File', 'Menus', 'Type', 'Commands', and 'Help'. The main area is divided into three sections:

- TASK SUMMARY**: Contains 'TASK Name' (PPIVOL\_\*) and 'Scan Mode' (empty), 'DSP Data' (empty), and 'Max Range' (empty).
- PRODUCT PARAMETERS**: A table of parameters for the 'Data:Display' (Z : dBZ) task.
 

Parameter	Value
Max Range	240.0
Layer Top	16.0
Layer Bottom	0.0
ZR relation	200 ** 1.60
XY Smoother	4.0
XZ Smoother	4.0 1.0
- DISPLAY PARAMETERS**: Contains 'Units' (-32 to 96 dBZ), 'Scale' (Default), 'Levels' (16), 'Step' (X/2), 'Resolution' (480 x 480), and '40'.

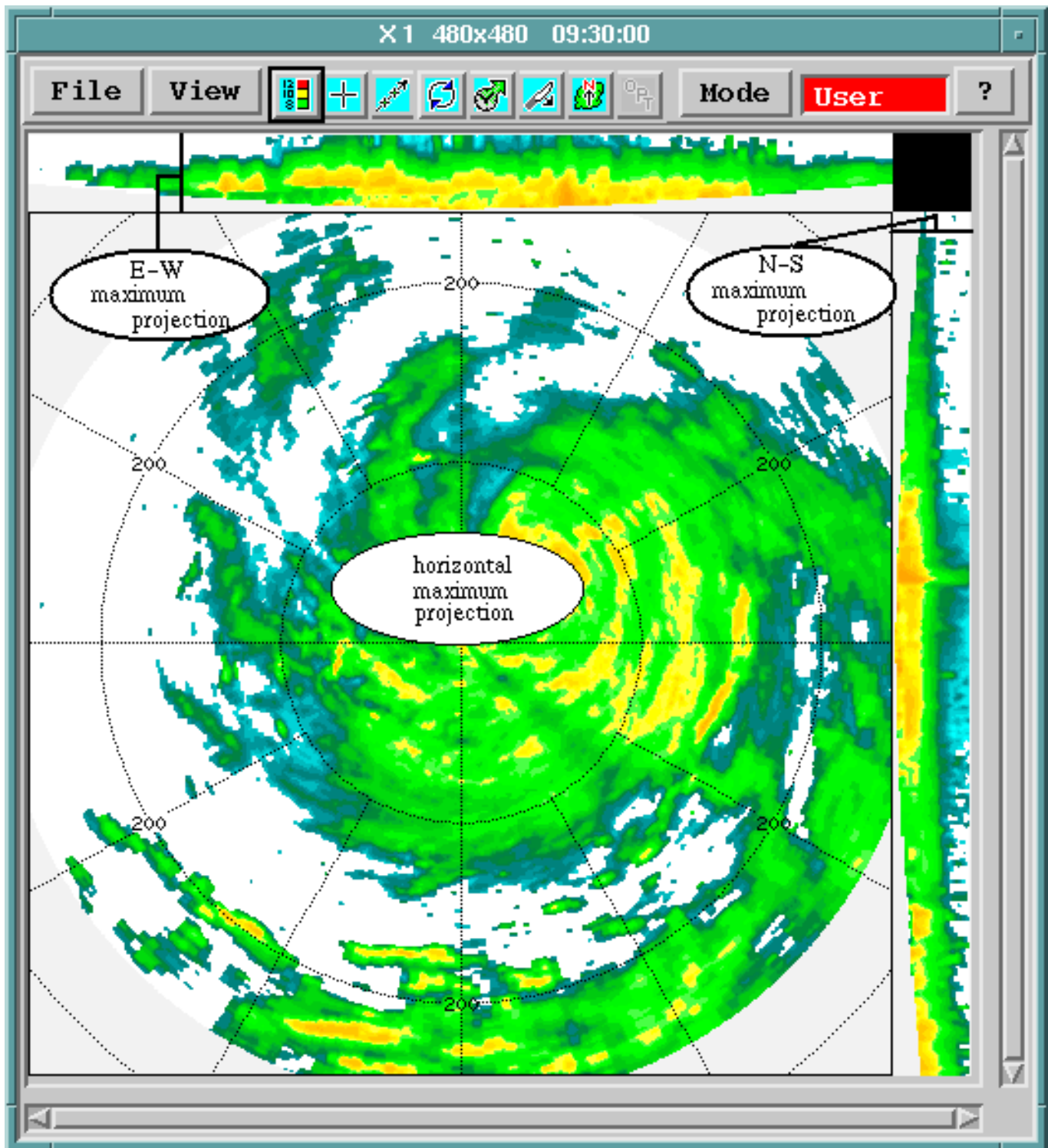
This section describes the fields of the Product Configuration menu that are unique to MAX products. For general information, see these other sections of this chapter:

- Task Summary area, Section 2.1.1.
- Map Projection Area, Section 2.1.2
- Product Parameters, see Section 2.1.3.
- Display Parameters area, Section 2.1.4.

The MAX product provides an easy-to-interpret presentation of the echo height and intensity in a single display. It is especially useful for depicting areas of severe weather. The product is based on a volume scan TASK and is calculated by first constructing a series of CAPPI's to span the selectable layer, and then determining the maxima of either Z or ZT (selectable) for the horizontal and two vertical projections — East–West and North–South.

Figure 2–3 shows an example of a MAX display. Note, that the radar cannot see all the way to the surface of the earth, hence the curved boundaries at the bottom of the side panels.

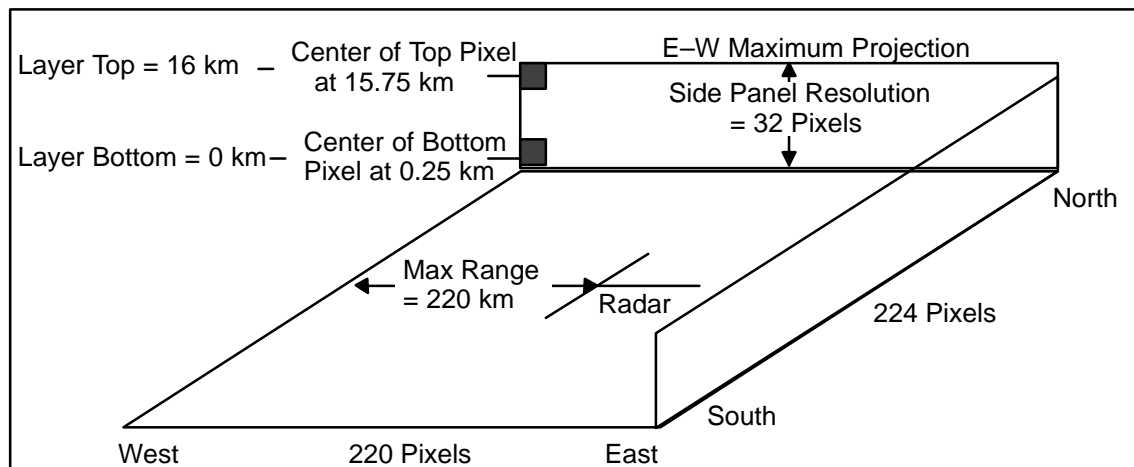
Figure 2-3: Example of MAX Display



The horizontal maximum projection is calculated by taking the highest reflectivity value in a user-specified layer over each pixel. The E-W maximum projection is obtained by taking the maximum reflectivity for each pixel along the corresponding N-S line. Likewise, the N-S maximum projection is obtained by taking the maximum reflectivity along E-W lines.

Figure 2-4 shows the geometry that corresponds to the MAX Product Configuration at the beginning of this section. Before configuring a MAX product, it is a good idea to make a diagram of the layout that you want, similar to the diagram shown in Figure 2-4. Also, compare this to the set of elevations in your task to see if you have a sensible resolution especially in the upper parts of your MAX box.

**Figure 2-4: Example of MAX Geometry**



## To open the MAX Product Configuration menu:

Choose **Type**→**MAX** from the menu bar.

## Product Name and TASK Name

Select a Product Name that is mnemonic, such as Z\_0\_16\_220 to indicate that the product covers the layer 0 to 16 km to a range of 220 km. The associated TASK Name must correspond to a volume scan TASK — at least two elevation angles are required.

## Data : Display

Z	dBZ	If Z is not available when the product is run, T is substituted , and vice versa.
Z	Rain	
T	dBZt	
T	R	
Zd	ZDR	
Zd	R	

## Max Range

The Max Range field corresponds to the span of the image from the radar to the edge of the picture in the East–West direction. In Figure 2–4, the range of 220 km is covered by 120 pixels to yield 2 km per pixel resolution.

## Layer Top and Layer Bottom

The Layer Top and Layer Bottom fields are selected to the nearest 100 m. In selecting the layer top value, keep in mind the maximum data height allowed for your system as configured in the Setup utility. In the example, the layer spans 0 to 16 km. The corresponding side panel resolution is set to 32 pixels so that each pixel represents 0.5 km. The center of the bottom pixel is at 0.25 km height and the center of the top pixel is at 15.75 km height.

## XY Smoother and XZ Smoother

There are two smoothers for this product. The XY Smoother is for the horizontal maximum projection, while the XZ Smoother is for the side panels. The values for the smoothers are in km. In the case of the side panel XZ Smoother, there are two values — horizontal smoothing and vertical smoothing.

## Color Scale, Levels, and 1st Level/Step

The color levels for the Zmax display are identical to those defined for the reflectivity. Input the number of levels, the first level value and the level step in dBZ.

## Resolution

The Resolution field consists of three numbers — the number of E–W pixels, the number of N–S pixels, followed by the height of the side panels. The following default low, medium, high and extra high values can be chosen from a pop-up menu:

Low	240 x 240	20
Medium	480 x 480	40
High	720 x 720	60
XHigh	940 x 940	80

Or, you may enter other values directly into the field. If you enter your own values, remember that resolution values represent the total size of the display, including the side panels. Again it is helpful to make a layout sketch of the product before you do the configuration.

When the product runs, it first generates a series of CAPPI's spaced uniformly over the height interval. The number used is the larger of one for every 500 meters or one for every two pixels of side panel size, up to a maximum of 50. The values are interpolated to make up the side panel image.

Smoothing is performed as a final step. Note that in many applications you may want to use no smoothing so that maxima are not diminished by the smoothing filter.