

## 2.3 BEAM: Antenna Beam Pattern Product

<u>F</u> ile	<u>M</u> enus	<u>T</u> ype	<u>C</u> ommands	<u>H</u> elp
<b>TASK SUMMARY</b>				
TASK Name	<input type="text" value="SURVEILLANCE"/>		DSP Data	<input type="text" value="Z T V W XH"/>
Scan Mode	<input type="text" value="PPI Full"/>		Max Range	<input type="text" value="300.0"/>
Angle List	<input type="text" value="Az:Full Circle"/>		<input type="text" value="El:One angle at 0.5"/>	
<b>PRODUCT PARAMETERS</b>			<b>DISPLAY PARAMETERS</b>	
Data:Display	<input type="text" value="V"/>		Display Units	<input type="text" value="+- Vu m/s"/>
Min/Max Rng	<input type="text" value="57.0"/>	<input type="text" value="57.0"/>	Color Scale	<input type="text" value="Default"/>
Min/Max EL	<input type="text" value="0.0"/>	<input type="text" value="5.0"/>	Levels	<input type="text" value="15"/>
CW AZ Inter	<input type="text" value="60.0"/>	<input type="text" value="120.0"/>	1st Level/Step	<input type="text" value="N/A"/> <input type="text" value="N/A"/>
AZ/EL Smooth	<input type="text" value="0.0"/>	<input type="text" value="0.0"/>	Resolution	<input type="text" value="600 x 290"/> <input type="text" value="--"/>

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

- Task Summary area, Section 2.1.1.
- Product Parameters, see Section 2.1.3.
- Display Parameters area, Section 2.1.4.

The BEAM product is similar to a cross-section in that it shows a quasi-vertical slice of the atmosphere. The display coordinates are azimuth (horizontal) and elevation (vertical). It is constructed from a PPI volume scan. The product is used primarily for system testing and evaluation purposes, i.e.,

- Antenna beam pattern testing. Typically a radiator is placed on a tower a few km from the radar. The radar is then scanned in sector or full PPI mode around the target using high resolution (e.g., <0.5 degree) spacing in AZ and EL. The transmitter is typically turned-off for this. The BEAM product can then be used to display the antenna response to the radiator.
- Calibrated sphere measurement. Similar to above except the radar is radiating. The sector scan is made about the calibration sphere which is typically suspended from a tethered balloon. The resulting display shows the location and returned power from the sphere. This can be used for full system calibration.

At near horizontal incidence (low elevation angles), the BEAM product is very similar to a cross-section. Since the product can be configured to average a range interval, the BEAM product can give a picture of the weather or other targets in a spherical “slab” defined as a range, azimuth and elevation interval. The cross-section on the other hand, attempts to show a planar “slice” through the weather.

A sample BEAM Product Configuration menu is shown at the beginning of this section.

### To open the BEAM Product Configuration menu:

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

### Data : Display

The choices are:

Z	dBZ
V	V
W	W
T	dBZt

### Min/Max Range

This is to select the range interval over which averaging will be performed. Note that the BEAM product performs averaging of dBZ or dBT values without linearizing. All distances are entered in km.



**Note that IRIS has a selectable maximum height above which data are not recorded (e.g., 20 km). Thus at far ranges, this height will be exceeded in the upper angles of a volume scan. This should be considered when selecting the Min/Max range. For example, if the height cutoff is set to 20 km, and a volume scan uses elevation angles up to 20 degrees, then the maximum range that includes all of the data will be 55 km.**

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### Min/Max EL

This is to select the elevation window. For example, if the volume scan has elevation angles between and including 0 and 5 degrees, then enter the values 0.0 and 5.0.

### CW AZ Interval

This is to select the azimuth window. The first value will correspond to the left side of the display, while the second value will correspond to the right side of the display. From left to right on the display, the angles will be in the clockwise direction. For example, clockwise interval of 0.0 to 90.0 represents a 90 degree sector, while the interval 90.0 to 0.0 represents a 270 degree sector.

## **AZ/EL Smoother**

The smoother is applied as the final step of the product generation. Enter the values in degrees, first for the azimuth and then for the elevation direction. Typical values would be 1.0, 1.0.