

# CatCurve

Tools for drawing catenary or hyperbolic curves.

Cat\_rss



## Catenary Sag Curves with CAT\_RSS

CAT\_RSS draws a Catenary Curve chart in AutoCAD. CAT\_RSS uses differing Horizontal and Vertical scales, Ruling Span and Ruling Span Sag values. This makes a good template for use in checking manual or CAD drawings.

Scales Assume Mapping Units of 1 foot = 1 drawing inch  
20/200 Size Mapping Drawings use: v0.05/h0.005

The image shows a screenshot of the CATCurve 2009 v.1.00 -Ruling Span Chart dialog box overlaid on an AutoCAD Classic interface. The dialog box contains the following fields and options:

- Vertical Scale: 0.0500
- Horizontal Scale: 0.0050
- Conductor Wt/Ft: 1.0940
- Curve 1:
  - Ruling Span Distance: 500.0000
  - Ruling Span Sag: 7.0000
  - Ground Clearance: 25.0000
  - Chart Maximum Span: 3000.0000
  - Layer: 0
- Use Arrow at Low Points (Block Name: ARROW)
- Save to File (File Name: C:\Documents and Settings\...)
- Conductor Desc.: 795 MCM ACSR DRAKE
- Remarks: 31,500 LBS MAX TENSION
- Buttons: OK, Cancel

The AutoCAD interface shows a drawing of a catenary curve. The curve is plotted on a coordinate system with X and Y axes. The curve is labeled with "GROUND LINE" and "30' CLEARANCE". A text box in the center of the drawing contains the following information:

795 MCM AFTER DRAKE  
1.094 LB/FT @ 31,500 LBS MAX TENSION  
RULING SPAN LENGTH=500'  
RULING SPAN SAG=7'  
HORIZONTAL SCALE = 1/200"=1'-0"  
VERTICAL SCALE = 1/20"=1'-0"  
HORIZONTAL TENSION 4884

The AutoCAD interface also shows the command line with the following text:

```
Command: cat  
Command: '_zoom  
Specify corner of window, enter a scale factor (nX or nXP), or  
[All/Center/Dynamic/Extents/Previous/Scale/Window/Object] <real time>: _e  
Command:
```

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## ***PSHOW***

### ***Displays List of Extended Entity Data Values***

The use of Extended Entity Data attached to an AutoCAD polyline was a result of the need to verify correct use of the Catenary Generators by the drafter. The drafter must satisfy the Engineer that all conditions have been met before he accepts the validity of the electronic data. Output to screen and to text file provides substantiating evidence of conformance to Engineering parameters.

1. (H/W) P Value
2. Vertical Scale
3. Horizontal Scale
4. Point P1a
5. Point P2a
6. Point P3
7. Wind Span Length
8. Conductor Length
9. Back Load Span X1
10. Ahead Load Span X2

Selected Catenary Curve Adjustable Values	
P (H/W) Value	4464.2857
Vertical Scale	0.0500
Horizontal Scale	0.0050
Increment	50.0000
Conductor Desc.	795 MCM ACSR DRAKE
Remarks	1.094 LB/FT 31,500 LBS MAX TENSIO

1st Point P1S    3rd Point P3S    2nd Point P2S

Selected Catenary Curve Calculated Values	
Low Point P3SAG	7.0000
Span Length	14.6632
Conductor Length	0.0000
Back Load Span X1	1500.0000
Ahead Load Span X2	1500.0000

Update Curve    Info...    Cancel

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## ***Warning about UNITS and Calculations when Loading***

When loading 3DCAT.LSP a warning is displayed if the Units setting is other than Decimal [2] because the formulas used assume whole units as equal to 1 foot. Otherwise curves may not match your original template.

## ***OUTPUT to screen***

Display on screen of several Autolisp variable names and their set values after a program function run is available by typing (VALUES) at the Drawing Editors Command: prompt.

## ***Calculations of CAT and 3DCAT saved to ASCII file***

The purpose for writing Y3/Sag values to a file was to verify that the results I was getting from 3DCAT.LSP were the same as CAT.LSP. I also have been trying to document my work in the form of an instructional manual with command line prompts and arguments.