



Sceptre Application Notes Camshaft

Sceptre has recently been enhanced with a specialized option to CAM Analysis, which deals with camshafts, that cause axial motions such as found on barrel cams.

The primary data collection mode is the SCAN \RXY Command and its ability to measure an unknown free form surface while maintaining a constant XY radius to the part Z axis.

This makes it ideally suited to the task of gathering data on unknown CAM shapes where the data collection requires no prior knowledge of the shape and thus requires no pre programming. In many cases over time Cams were developed empirically (on the fly) to cause some type of machine motion. Many of these CAM shapes simply evolved from manual hand polishing and filing by machinists.

Modern CNC machine tools today need these CAM shapes in a digital format to replicate the cam. The Cam Analysis tries to determine the physical reaction parameters of the shape

Figure 1- Typical Axial Cam

These are the general parameters that can be determined from the CamShaft Analysis in the Z Theta Mode:

Max Z: The angular location at which the cam surface achieves its **Maximum Z** coordinate value or where it achieves maximum lift.

Min Z: The angular location at which the cam surface achieves its **Minimum Z** coordinate value or where it achieves no lift and lies somewhere on the base plane.

Rise: Maximum Z value minus Minimum Z value

Max Vel: The angular location at which the cam surface achieves a **Maximum** (opening or rise) **Velocity**.

Min Vel: The angular location at which the cam surface achieves a **Minimum** (closing or sink) **Velocity**.

Max Acc : The angular location at which the cam surface achieves a **Maximum** (opening or rise) **Acceleration**.

Min Acc: The angular location at which the cam surface achieves a **Minimum** (closing or sink) **Acceleration**.

Not only does this analysis give you the actual dimensions, but, it sets graphic markers that permit the system to pictorially show the operator where the CAM analysis element decided that these critical parameter measurements occurred. (Figure 2)

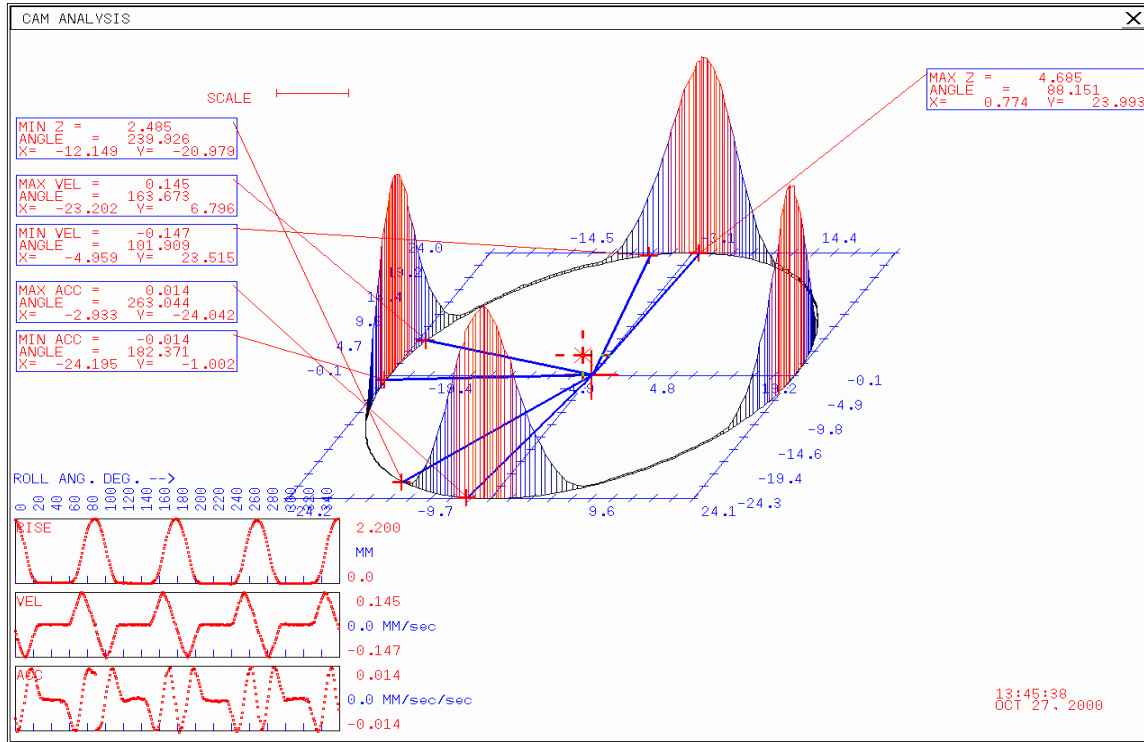


FIGURE 2
Graphic Report of Cam Analysis. In this case the cam is symmetrical and identical.

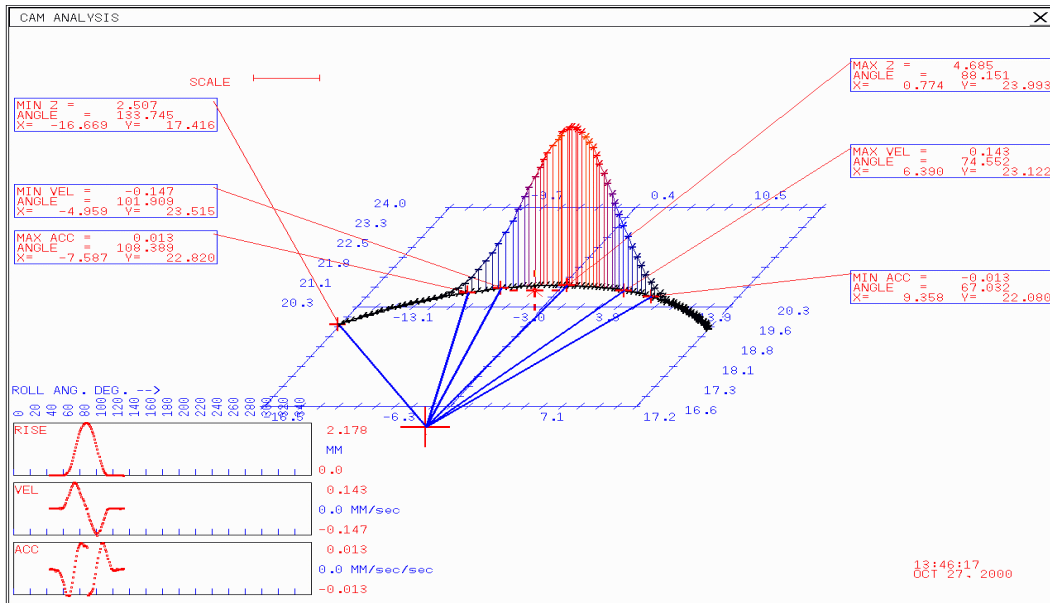


FIGURE 3
 Analysis of a 90° sub section of the entire data from 45° to 135° in the +X to +Y angle range.

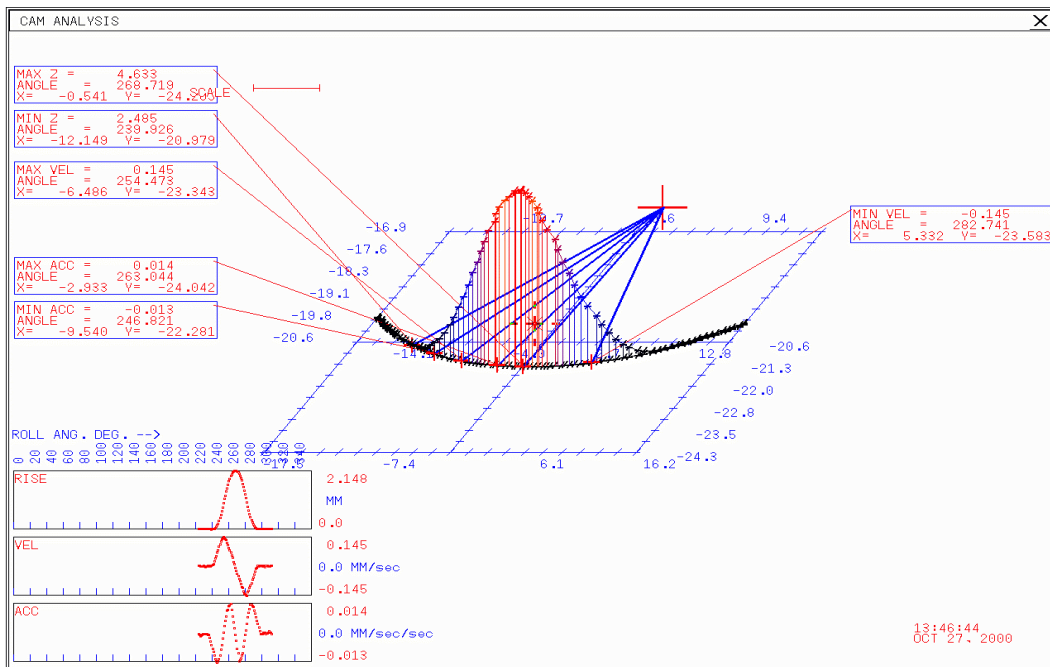


FIGURE 4
 Analysis of a 90° sub section opposite of illustration in Fig 3.