

Application Note

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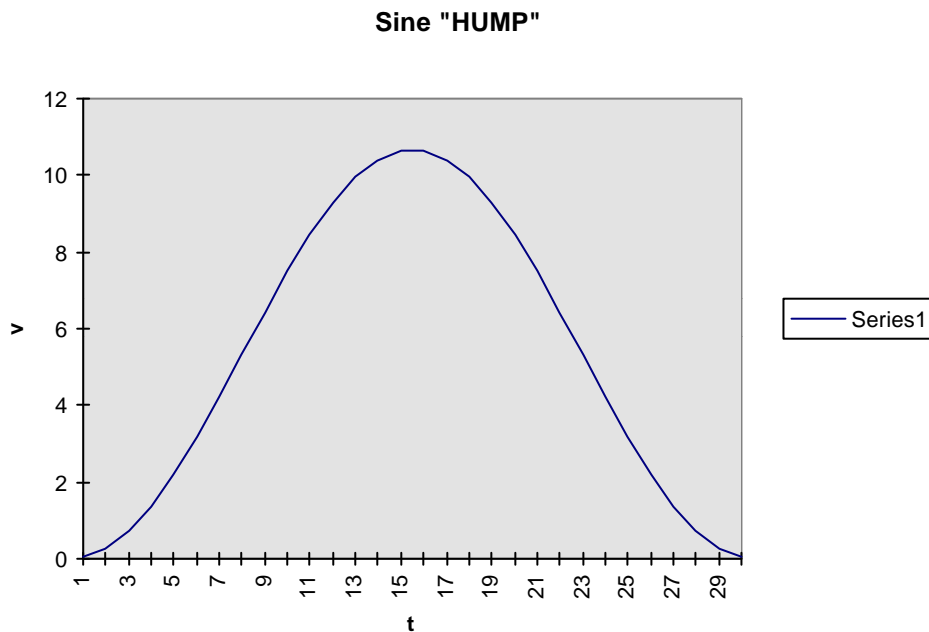
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Subject: Sine Profile using CAM() Function

SINE Acceleration/Deceleration Profile

To reduce jerk when starting and stopping a motion, a sinusoidal acceleration profile can be adopted. There is no built-in function in Trio BASIC to do this but it can be achieved by programming a suitable sine lookup into a TABLE area and employing the CAM function.

SINEHUMP.BAS

The BASIC program listed here calculates the table points to form the sine profile shown.



```
'  
' Subroutine to generate a SIN shape speed profile  
'  
' Uses: p is loop counter  
'       num_p is number of points stored in tables positions 0..num_p  
'       scale is distance travelled scale factor  
'  
num_p=100  
scale=500  
FOR p=0 TO num_p  
    TABLE(p,((-SIN(PI*2*p/num_p)/(PI*2))+p/num_p)*scale)  
NEXT p
```

Program Example

The sine profile in the TABLE can now be used to control the AXIS movement. The program shown below does a move of length m in a time t, where m is in user units and t is in seconds.

```
BASE(0)
DEFPOS(0)
SERVO=ON
UNITS=500
SPEED=1000
ACCEL=1000000
DECEL=1000000
m=10
t=0.1

CAM(0,100,m,SPEED*t)
WAIT IDLE

CAM(0,100,-m,SPEED*t)
WAIT IDLE
```

Notes:

- 1) For simplicity, the values for **scale** in the table and **UNITS** in the program above are the same. This means that the m represents the distance moved. The example shows a move of 10 completed in 100 msec.
- 2) ACCEL is set to 1000 times SPEED so that the CAM table will be processed at a constant rate. If ACCEL is a smaller value, the rate at which the CAM profile is generated will ramp up from zero to SPEED at the ACCEL rate.