Mx4 DSPL Moves

Point-to-Point Trapezoidal Move

(A DSPL Command)

Velocity

V

Acceleration

a

Position

P

Time
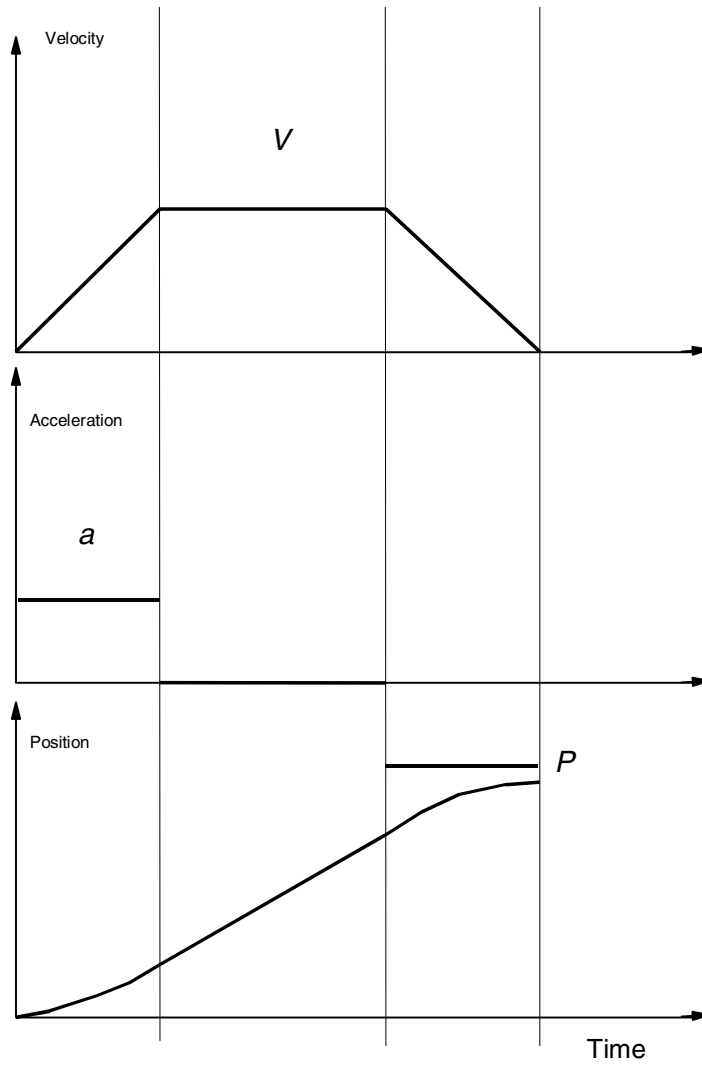
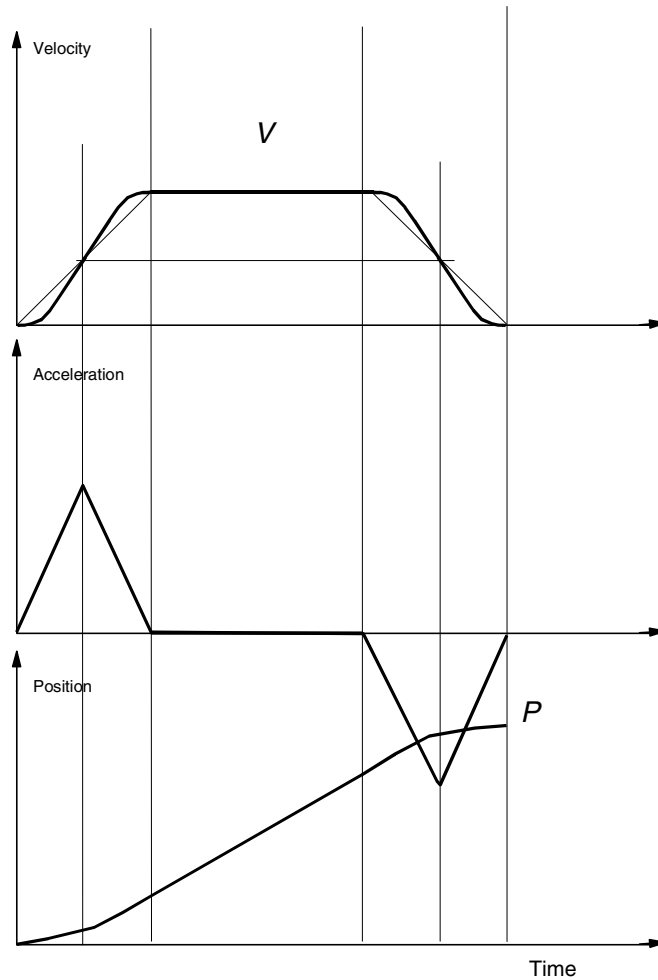The move stops at any programmed position and may be intercepted by another trapezoidal move

Intercepting a Trapezoidal Move

The first move with programmed acceleration, end
position and speed can be intercepted by another move with an entire
different set of arguments at any time.

Point-to-Point "S" Curve Move

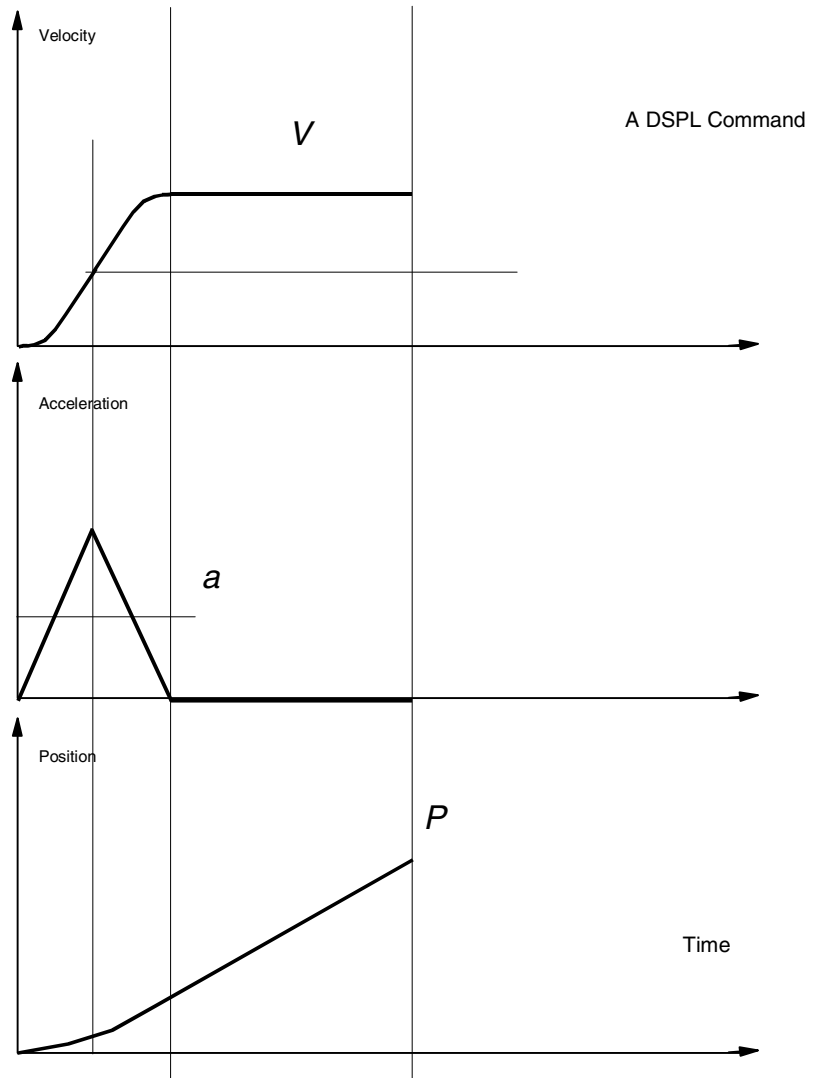(A DSPL Command)

Velocity

V

Acceleration

Position

P

Time

The arguments for this command are similar to those for a trapezoidal move. The Mx4 will automatically calculate jerk
to perform the move in the same time as the trapezoidal move.

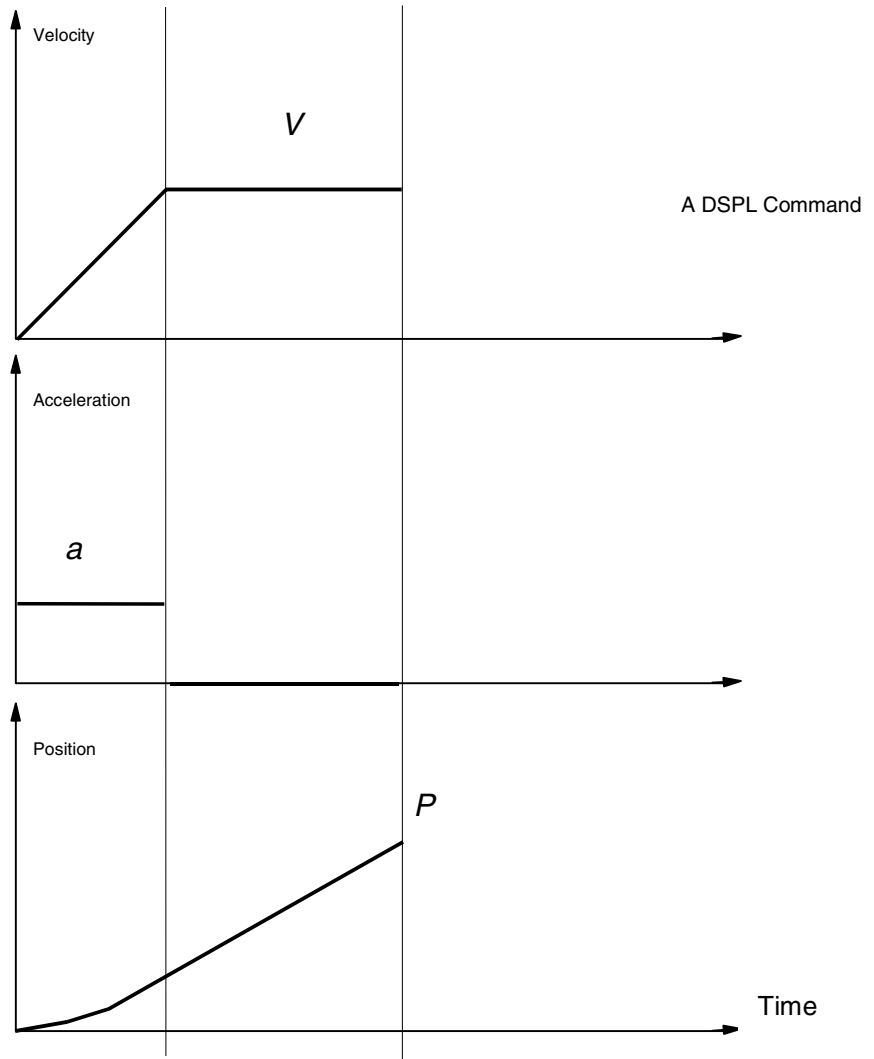# Segment Moves With S-Curve

(A DSPL Command)

A segment is similar to the trapezoidal move, only its end position will be at the programmed slew velocity. Furthermore, DSPL "segment_s" instruction uses the "s curve" profile to accelerate.

How The Moves Are Generated

Trapezoidal Segment Moves
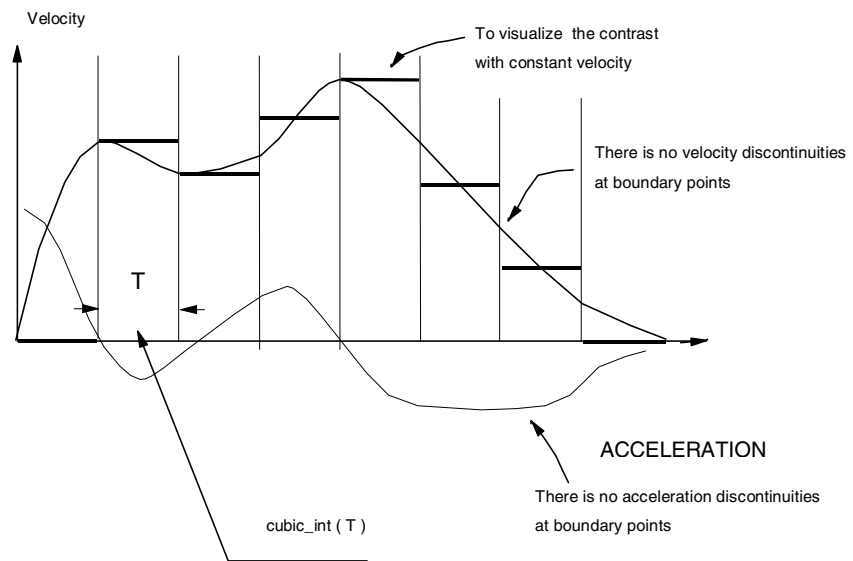
(A DSPL Command)

A DSPL Command

A segment is similar to the trapezoidal move, only its end position will be at its programmed slew velocity.

Cubic Spline Moves

(A DSPL Command)

Velocity

To visualize the contrast
with constant velocity

There is no velocity discontinuities
at boundary points

T

cubic_int (T)

ACCELERATION

There is no acceleration discontinuities
at boundary points

Motion control applications requiring fine moves from one point (a point
with up to four components for positions and velocities) to another
require cubic spline interpolation. Mx4 can run cubic splines either in
contouring mode (the host continually updates Mx4's DPR with a new set
of points), or in table mode (Mx4's table is pre-loaded with a set of points
only once). In table mode the user array can be up to 2,000 points long.
Each point specifies the position and velocity for only one motor.

PVT Hermite Spline

(A DSPL/RTC Command)
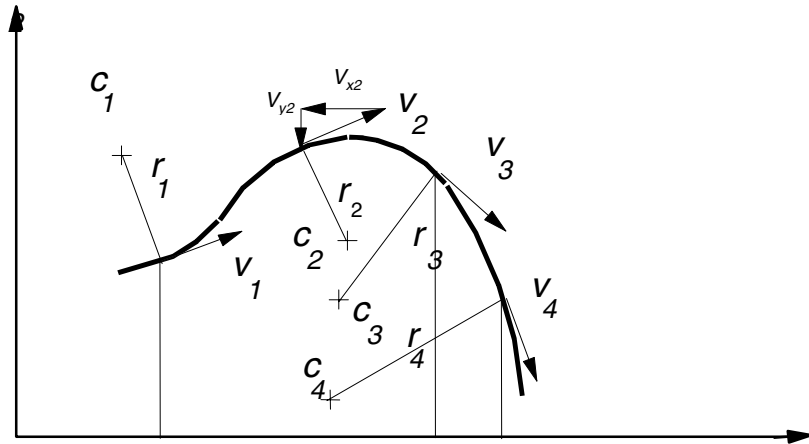
The Hermite Spline or PVT (position, velocity and time) allows the user to specify a set of position, velocity and corresponding time interval for each axis. The velocity for each axis is the resolved component of vector velocity (shown in the figure as Vx2 and Vy2). This vector is tangent to the radius of a local curvature.
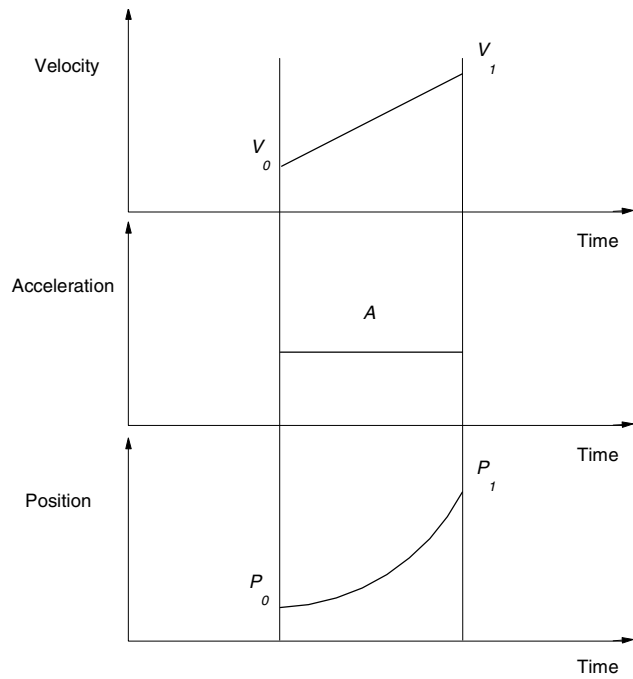
Blending Moves
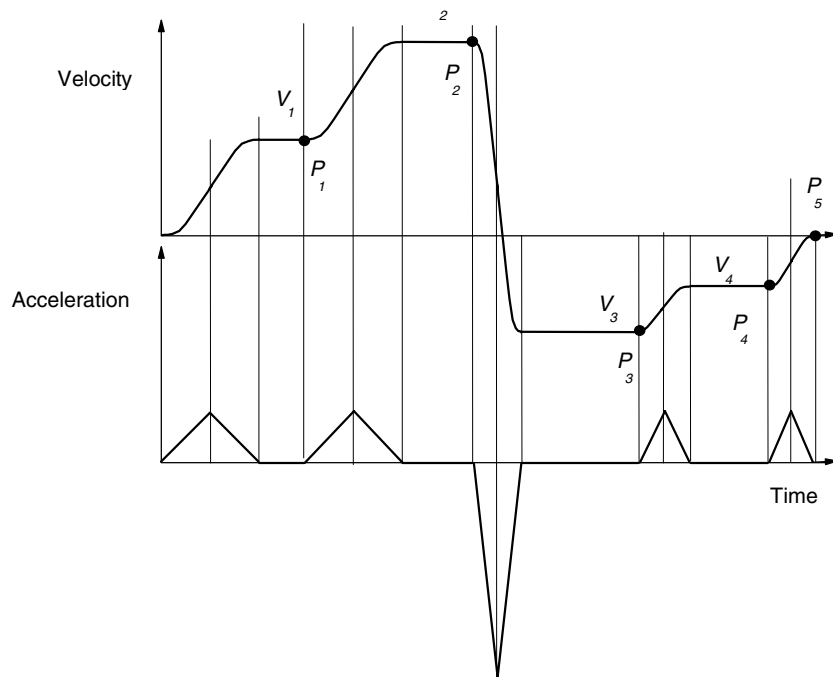
Either one of the DSPL Segment Moves, (segment or segment_s) can be used in blending move applications. Blending allows the migration of one move to another at an exact programmed position without a need to stop the motion.
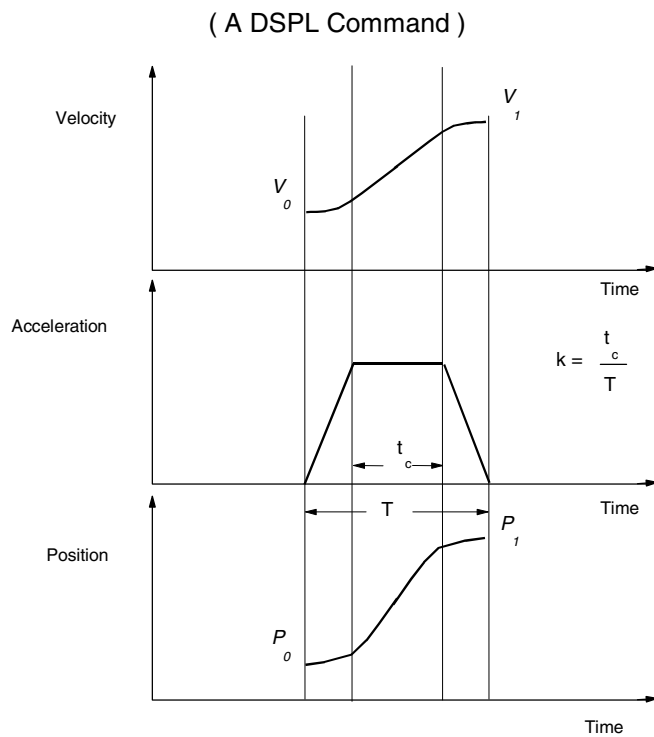
Linear Move

(A DSPL Command)

Velocity

V_1

V_0

Time

Acceleration

A

Time

Position

P_1

P_0

Time

Constrained by a programmed maximum acceleration, the "linear_move" command will linearly ramp the speed from its initial value to a new programmed value at a programmed position.

"S" Curve Linear Move

(A DSPL Command)

Constrained by a programmed maximum acceleration, the "linear_move" command will linearly ramp the speed from its initial value to a new programmed value at a programmed position. The acceleration used with this command is "s" curve and its jerk is determined by: a, k and T.