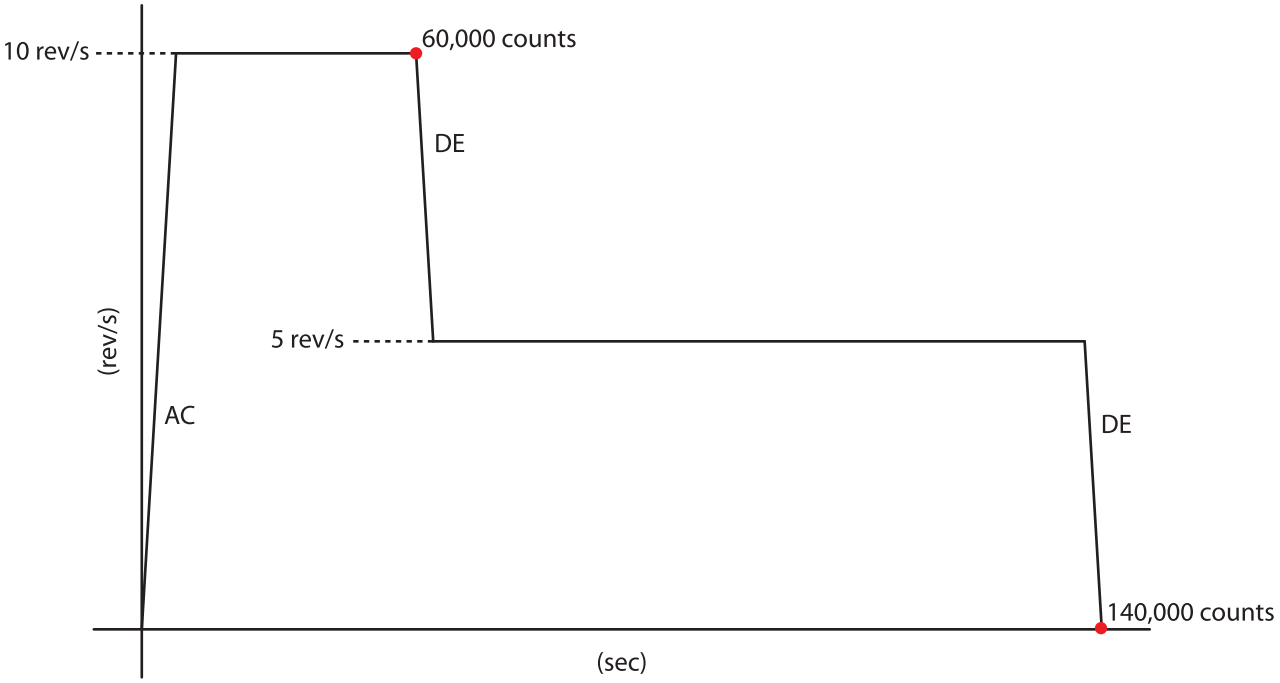
Multi-segment move profiles

The easiest way to make a multi-segment move is using the Feed to Length with Speed Change (FC) command. This command works just like a Feed to Length (FL) command in that you define an overall feed distance (DI), along with a velocity (VE), an acceleration (AC), and a deceleration (DE). With the FC command, though, you also define a Change Velocity (VC) and a Change Distance (DC). The change velocity is what the motor will accelerate/decelerate to once it reaches the change distance.

NOTE: If DC is larger than DI minus the distance required to stop, you will not see a velocity change.

Here is what the motion profile of an FC command would look like if you chose the following parameters: DI=140,000, VE=10, AC=100, DE=100, VC=5, DC=60000.



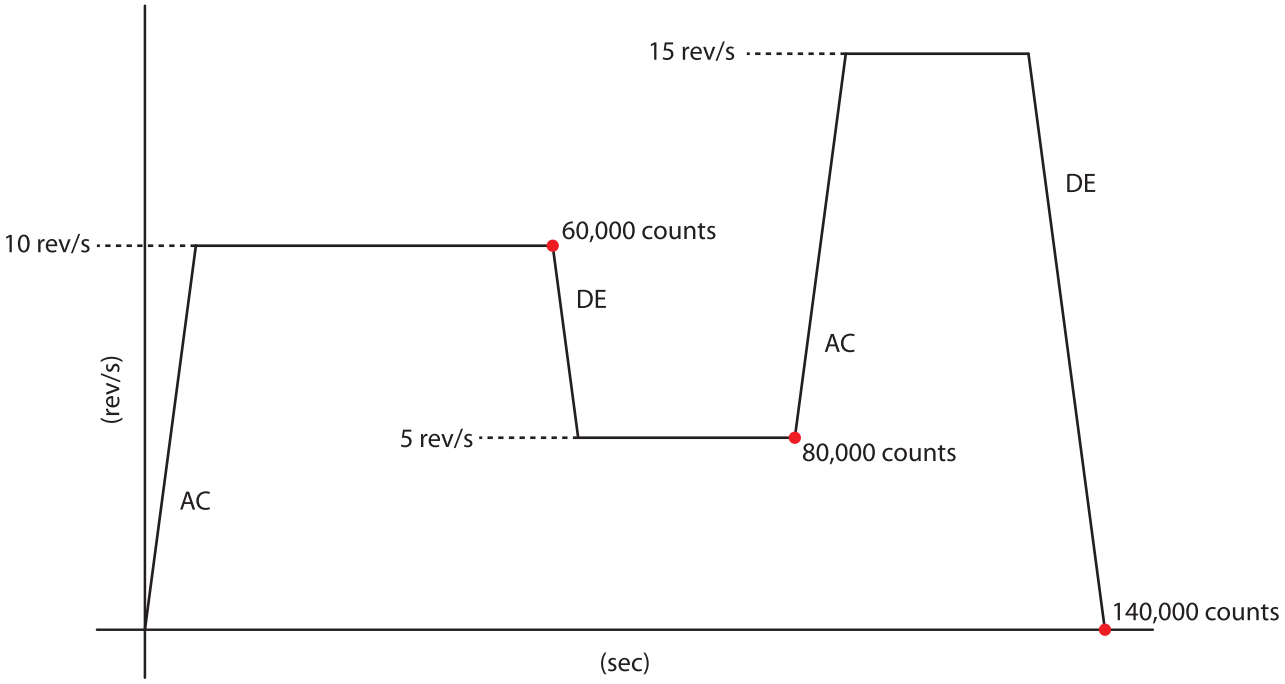
The motor velocity increases to 10 rev/s (VE) at a rate of 100 rev/s/s (AC), then maintains that velocity until the motor reaches 60,000 counts (DC) where it decelerates at 100 rev/s/s (DE) to the new velocity of 5 rev/s (VC). The motor finally stops at the overall feed length of 140,000 counts (DI) by decelerating at 100 rev/s/s (DE) to zero velocity.

NOTE: The DC value is the distance at which the motor velocity begins changing, whereas the DI value is the final stop distance.

The FC command can also be used to execute move profiles with more than two segments. This is done by using the FC command in the same way as listed above, in conjunction with additional DC and VC values, one set for each change distance and change velocity required. These additional DC and VC commands follow the FC command, and to separate the additional DC and VC commands, the Wait Position (WP) command is used. An example below shows how this works.

NOTE: Multi-tasking must be turned on to use the WP command with multiple DC and VC commands. (For more information on multi-tasking with your Q drive, consult the Q User's Guide).

In the example below we will take the same AC, DE, VE, DI, and initial DC and VC values as the above example, but this time change the motor velocity at 80,000 counts as well as 60,000 counts. Here is a diagram of what that move profile will look like.



In this example the motor accelerates at 100 rev/s/s (AC) to its first velocity of 10 rev/s (VE). Once the motor reaches 60,000 counts (first DC) it decelerates at 100 rev/s/s (DE) to 5 rev/s (first VC). Once the motor reaches 80,000 counts (second DC) it accelerates (AC) to 15 rev/s (second VC). Then finally the motor decelerates at 100 rev/s/s (DE) to zero velocity, reaching the overall feed distance of 140,000 counts (DI).

Here is a Q Programmer sequence that will execute this move profile. On Line 1 multi-tasking is turned on. On lines 2 - 7 the AC, DE, VE, DI and initial VC and DC commands are set. Then on line 6 the FC command is initiated, followed by the WP command. After the WP command come the second set of DC and VC commands to be used for the third segment.

If you want to make more than three segments, you can follow the last line of this program with another WP command followed by another set of DC and VC commands. Continue adding WP then DC and VC commands to make more and more segments.

NOTE: The FC command always obeys the DI command and will stop at that distance even if additional DC and VC commands have not been executed.

Segment 1

Line	Label	Cmd	Param1	Param2
1		MT	1	
2		AC	100	
3		DE	100	
4		DI	140000	
5		VE	10	
6		DC	60000	
7		VC	5	
8		FC		
9		WP		
10		DC	80000	
11		VC	15	
12				