TRIO
MOTION | TECHNOLOGY

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Doc No.:	AN-382
Version:	1.2
Date:	20 August 2018
Subject:	MOVEPICK and PICKLINK Motion Commands

1. Version history

Version 1.0   26 Oct 2017   First release

Version 1.1   26 Jan 2018   Substantial modifications to MOVEPICK and PICKLINK

Version 1.2   17 May 2018   Modifications to parameter sequence

2. Scope

1.   The MOVEPICK and PICKLINK as described are available in system software versions 2.0291 onwards

3. Overview

MOVEPICK is a new move type aimed at making it much simpler to program fast pick and place operations. PICKLINK is a linked move equivalent to MOVEPICK that is linked to the measured motion on another axis in a similar way to MOVELINK or FLEXLINK.
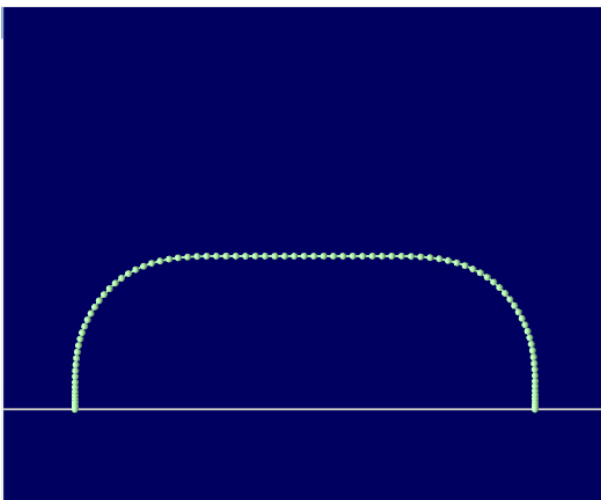
MOVEPICK is basically an absolute move to a position in 3..6 axes. However the motion includes an incremental "withdraw" amount and special controls for the move speed profile to allow fast pick

and place moves.

4. MOVEPICK Parameters

MOVEPICK parameters:

MOVEPICK(mode, x, y, z, withdraw, overlap control A, overlap control B , u, v, w ,withdraw control, xy control, approach control)

mode	–	specify the number of axes 0=xyz, 1=xyzu, 2=xyzuv, 3=xyzuvw
x	-	target x absolute position
y	-	target y absolute position
z	-	target z absolute position
withdraw	-	incremental withdraw distance from the start position on z axis
overlap control A	-	0..1 specify rounding on corner A (optional)
overlap control B	-	0..1 specify rounding on corner B (optional)
u	-	target u absolute position (optional)
v	-	target v absolute position (optional)
w	-	target w absolute position (optional)
withdraw control	-	Adjust the speed for withdraw section (optional)
xy control	-	Adjust the speed for xy section (optional)
approach control	-	Adjust the speed for approach section (optional)

Note:

-   The axes are specified using the BASE parameter

5. PICKLINK Parameters:

PICKLINK parameters:

PICKLINK(mode, x, y, z, withdraw, link axis, link distance, overlap control A, overlap control B , u, v, w ,withdraw control, xy control, approach control)

mode	–	specify the number of axes 0=xyz, 1=xyzu, 2=xyzuv, 3=xyzuvw
x	-	target x absolute position
y	-	target y absolute position
z	-	target z absolute position
withdraw	-	incremental withdraw distance from the start position on z axis
link axis	-	axis to link motion profile to
link distance	-	link distance on link axis
overlap control A	-	0..1 specify rounding on corner A (optional)

| overlap control B | – | 0..1 specify rounding on corner B (optional) |
u	–	target u absolute position
v	–	target v absolute position
w	–	target w absolute position
withdraw control	–	Adjust the speed for withdraw section (optional)
xy control	–	Adjust the speed for xy section (optional)
approach control	–	Adjust the speed for approach section (optional)

Note:

- The axes are specified using the BASE parameter
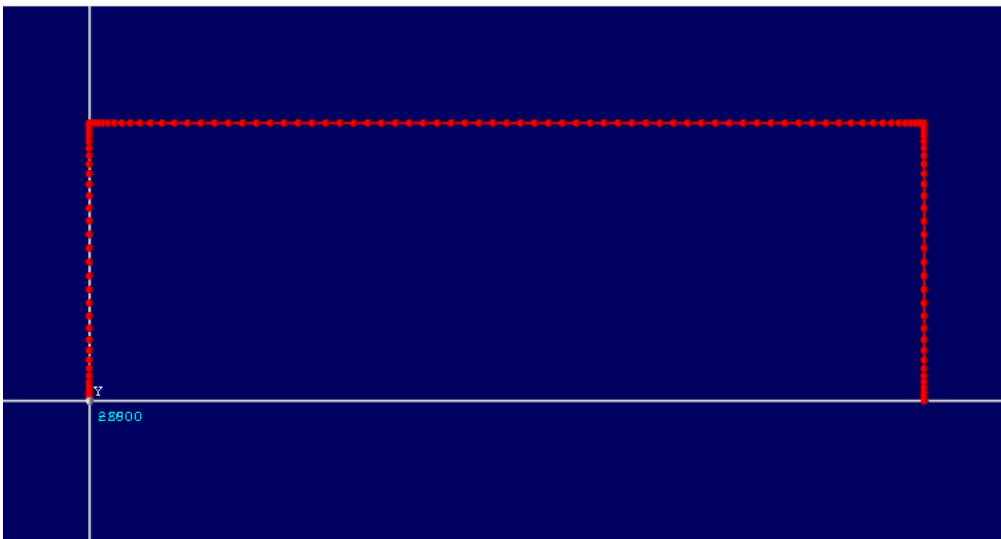
6. Arch control parameters

Only modes = 0..3 are currently supported.

overlap control A   – 0->0.9 larger number for more rounding at first corner (default = 0.5)

overlap control B   – 0->0.9 larger number for more rounding at second corner (default = 0.5)
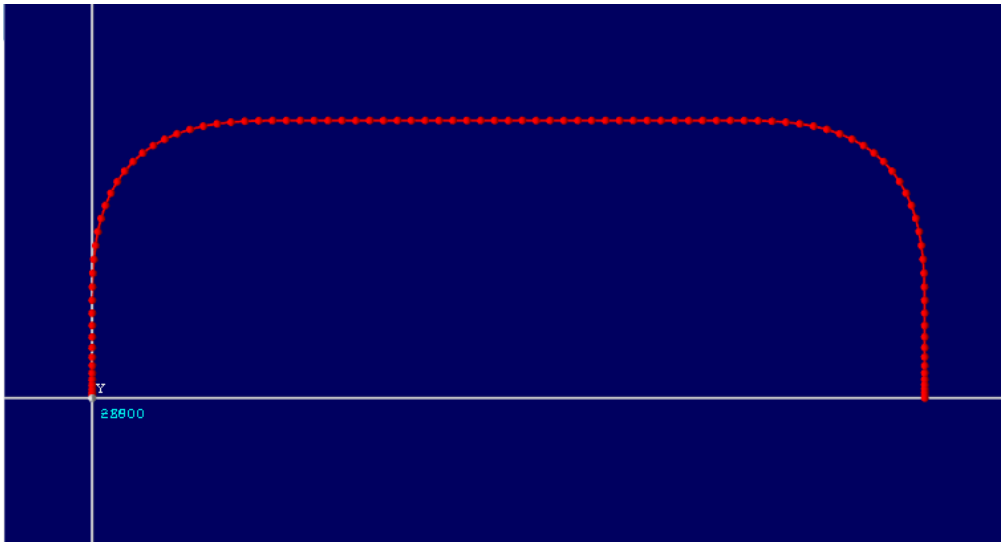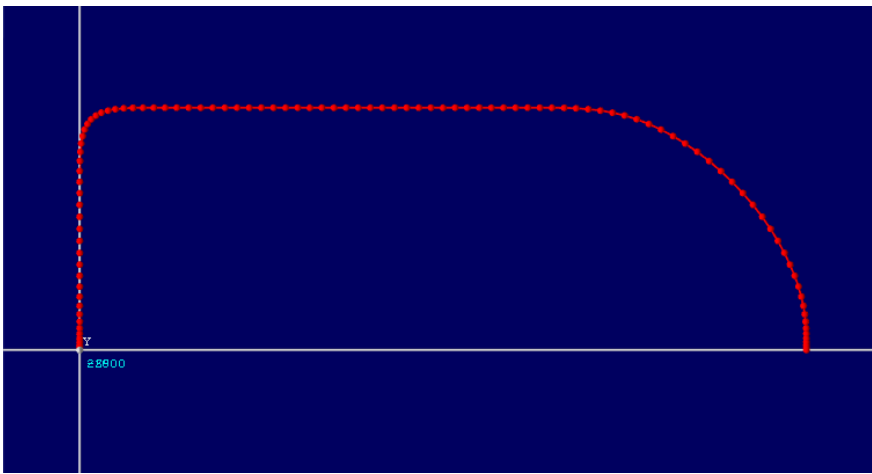

Overlap Control A and B above are 0.6,0.6

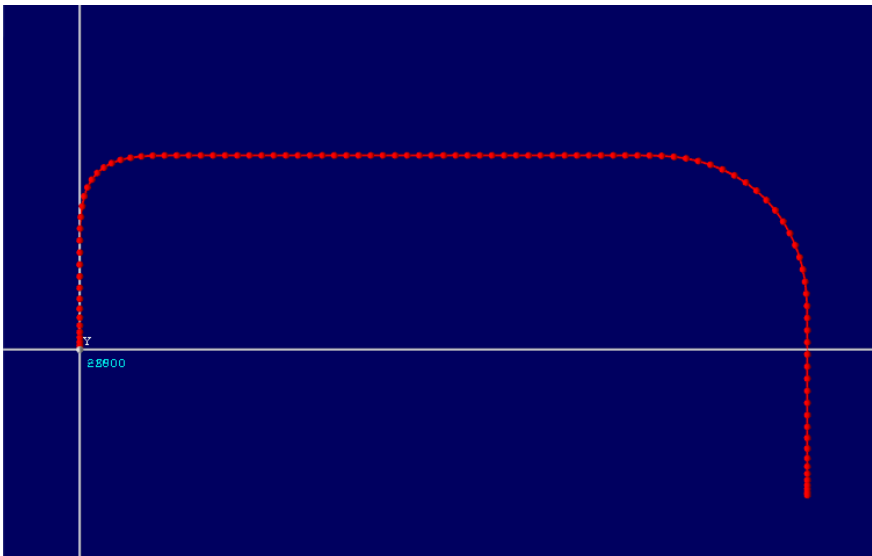Overlap Control A and B above are 0.0,0.0

Overlap Control A and B above are 0.4,0.4

Overlap Control A and B above are 0.4,0.8

Note that the overlap control parameters should always be less than 1.0 Values 0->0.8 are recommended.

Here is an example with different withdraw and approach lengths. The overlap control parameters are 0.5, 0.4

The parameters:

withdraw control   –   Adjust the speed for withdraw section (optional)

xy control   –   Adjust the speed for xy section (optional)

approach control   –   Adjust the speed for approach section (optional)

These parameters can be used to override the speed in each of the 3 sections. A value of 1 produces the specified SPEED value. Lower values generate lower speeds.

In MOVEPICK the acceleration rate is controlled by the length of the shortest move. Therefore if one of the moves is substantially smaller than the others it can result in high acceleration rates. The 3 parameters: Withdraw control, xy control, and approach control allow a slower speed to be assigned to shorter moves to allow lower acceleration rates.

Example:
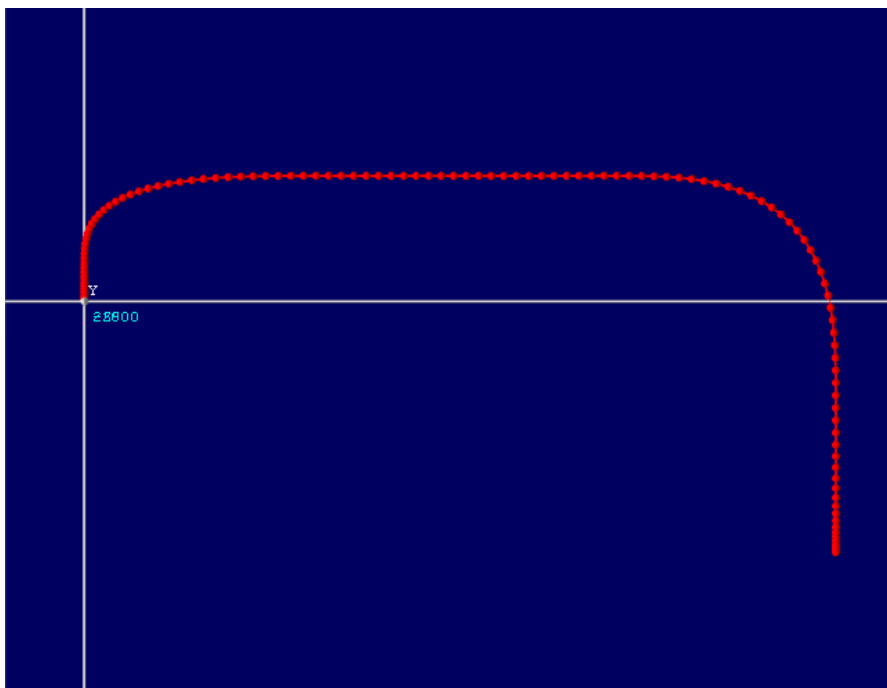
Example: In this example the MOVEPICK (from 0,0,0) is:

MOVEPICK(mode,1500, 0, -500, 200, 0.6, 0.5, 0.0, 0.0,0.0, 0.4, 1, 1)

The withdraw distance (200) is substantially smaller than the xy distance (1500) or the approach (500 +200)

The speed for the withdraw distance is reduced by a factor of 0.4 to give reduced acceleration rates.

7. Approach speed parameters

MOVEPICK does not currently support a lower speed at the end of the approach movement. This will be supported in future versions.

8. Example Program

```
DIM xyz AS FLOAT(3)

UNITS AXIS(0) = 1000
UNITS AXIS(1) = 1000
UNITS AXIS(2) = 1000


SPEED = 5000
ACC(SPEED * 50)

' Absolute Positions:

xyz(0) = -1500
xyz(1) = 0
xyz(2) = -100

overlap1 = 0.6
overlap2 = 0.6

DEFPOS(0,0,0)

REPEAT

    TRIGGER
    MOVEPICK(0,xyz(0),xyz(1),xyz(2),500, overlap1, overlap2, 0, 0, 0, 1.0, 1.0, 1.0)
    WAIT IDLE
    WA(500)
    MOVEPICK(0, 0, 0, 0, 600, overlap2, overlap1, 0, 0, 0, 1.0, 1.0, 1.0)
    WAIT IDLE
    WA(500)

UNTIL FALSE
```