Step and Repeat

After having a lead with points, you can now repeat the same lead in another location several times. The new points will be added to the original ones after the original ones.

The path in the right picture was initially created on one edge, shown in green. Using the new Step and Repeat function many more child points were created in fixed offsets from the original lead. One possible motion is shown in the picture below, but several other ways are available.

Step & Repeat is an option for a lead so it is available on the right-click menu on any lead in the Path Manager. It is also available for any segment of a lead, such as one edge etc.

The settings for this operation determine how the new points will be added to the lead, and how the motion will be performed on the new points.

The original lead and its points will be executed first, before any new points.

The motion options are:

- **Continuous** - The motion will be along the original lead, then the step will be taken (in J speed) and the next segment will be repeated in reverse direction of the previous.

- **Directional (V)** - The motion will be along the original lead, then a reverse motion will be taken (in J speed). This motion will include a reverse of the lead, and the step. The following segment will have the same direction as the original lead.

- **Progressive** - The motion will be along the original lead, then double of the step will be taken (in J speed) in reverse, then the next segment will be done in the original direction with step spacing, either more positive or negative depending upon the chosen Trend.

Click on the buttons below to see the three different modes.
In this mode the whole path runs in process speed L. The repeats are going back along the same lead but in reverse, and in the step distance.

Here the lead copies are always going in the same direction, however the retrace is going in straight line (watch for collisions!!!) and most of it in J speed.

Here the lead copies are going in the same direction, but the retrace is done above each copy in reverse, so collision is avoided as well as accidental touch with the previous layer.

You may override the J speed assignment and assign L to those moves as well.

The X direction determine if the tool will still "look forward" when moving in reverse or not. The default is "always looking forward" (like RobotWorks default on any path), so the tool will go back while looking back. The other option will make the tool go back while still looking forward (like a ceremonial walking away from a king etc.)

The Offsets page is where you enter what is the step and how it repeats. RobotWorks gives you ways to create un-even steps and combine translation and rotation (even if unequal) in one operation.

You begin by filling the step size in the XYZ...Rz boxes above. This is the change between the original lead and the next copy of it (unless you click Total Offset, then the numbers will represent to total size of all the changes).

After filling the step size enter how many repeats, and click Fill Grid. You may now edit the table yourself and change any value if you wish.

Click Preview before you click OK to see how that change will look like. Just like other lead modifications, this function can not be un done after OK (many points will be created, and to delete them you have to reset the lead).

Notes:
1. When points are moved and rotated they not always end where you expect. Move-then-Rotate brings points to a different position than Rotate-than-Move (see more in the theory of Part Orientation). You might consider XYZ copies first, then RxRyRz, or the opposite, depending what you are trying to get.

2. Make sure you don’t change anything important in the original lead you used for this operation (e.g. change of pitch or number of points), as it will destroy the copies.

3. Step & Repeat can be used on any lead, even if the lead was modified before, either manually (point by point) or by using other functions (Approach / Depart , Takeoff & Landing etc.). It is your obligation to assure that the result "makes sense". RobotWorks can't decide for you if the final result is "good" or not.