How to create smooth curves with the „Create Curves“ button

With this button you can create smooth curves between two WPs - starting WP (SWP,white) and destination WP (DWP,yellow). The starting direction is derived from the WP before (SWP-) and the the WP after (SWP+) the starting WP. The same with the destination direction - WP before (DWP-) and WP after (DWP+) destination WP.
The following WPs will not change after curve creation: SWP-, SWP, DWP and DWP+, that‘s why these WPs should already in the right position. Later I will descibe a way, if the 3 DWPs are not in the right position (f.e. at the end of the pitroad).

You should also know, that with this method there should be no change in direction between SWP and DWP, in other words it should be a complete right or left corner but not any mix of them. So a good SWP or DWP could be where the optimal path changes from left to right corner or vice versa. I will not say, that it is in general not possible to create curves with one or even two changes in direction, but its easier to do it this way. If you are interested in the mathmatics which lays behind you can read here:

http://en.wikipedia.org/wiki/B%C3%A9zier_curve

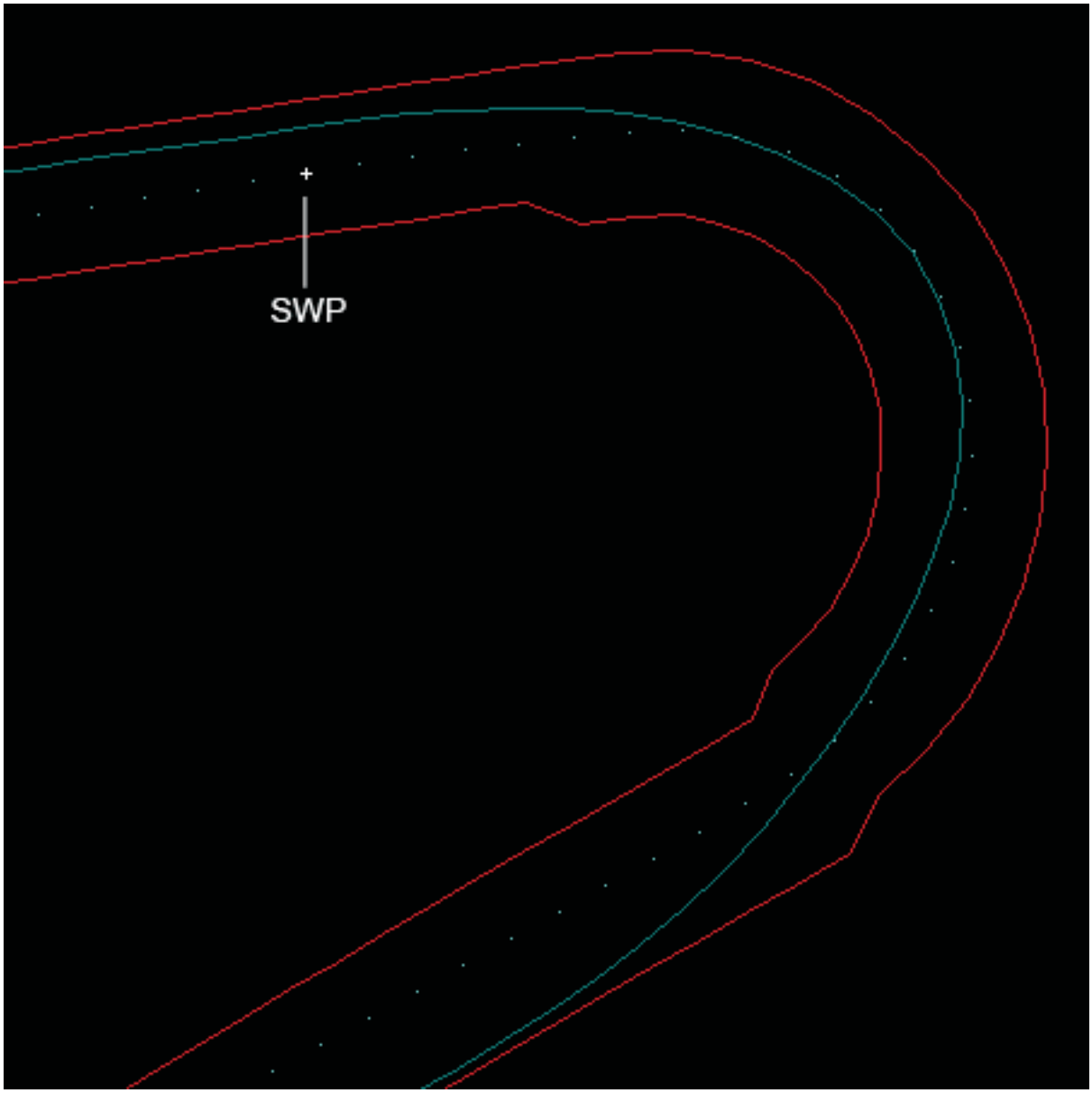
If you want to learn how it works you can play with this little applet:

http://www.theparticle.com/applets/nyu/BezierApplet/

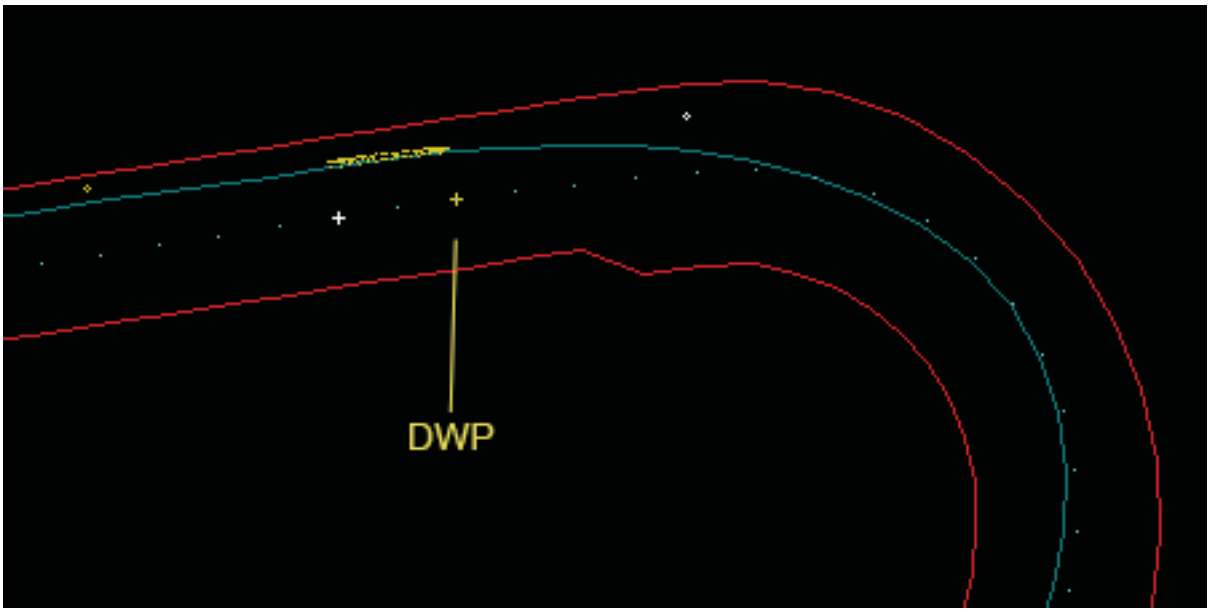
or look at the External Link section from the first link.

There are two controlpoints, one belonging to the SWP (CPS,white) and one belonging to the DWP (CPD,yellow). The CPS stays on a line with the SWP as origin and the direction of SWP- and SWP+ and very likely the DWP which stays on a line with the DWP as origin and the direction DWP- and DWP+. The moveability of these two points is restricted to these lines to ensure that the transition between unchanged and new part of the curve is very smooth.

OK, lets start with the HowTo:
First, zoom into the desired area, where you want to change the curve. Now klick on the desired SWP in order to highlight it. You can always change this SWP with the x and c keys.



Next, press the „s“-key in order to enter „Spline Mode“. Now it looks like this:

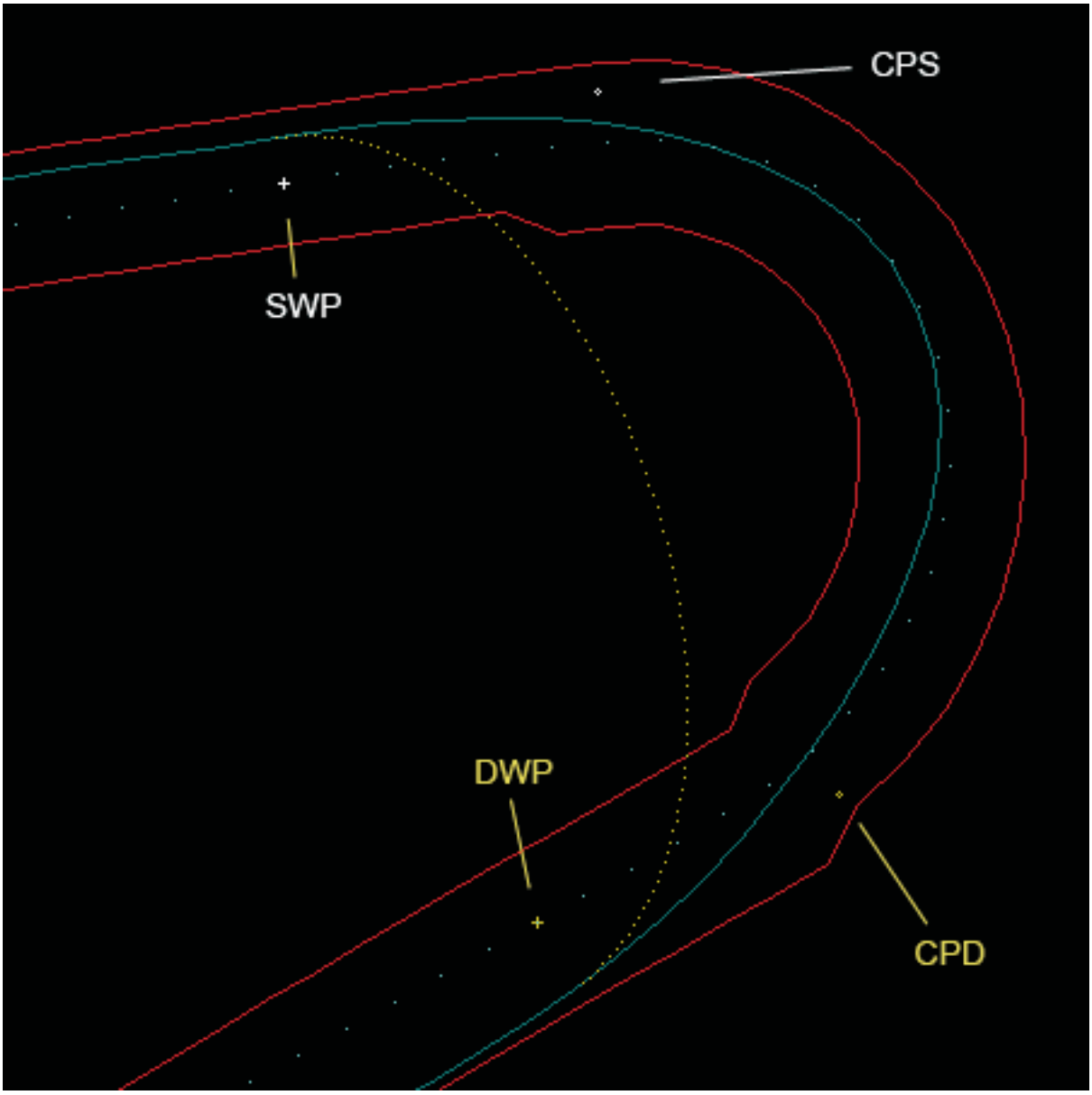


You should see a white cross (SWP), a little white circle (CPS), a yellow cross (DWP) and a little yellow circle (CPD). These all could be moved as said before:

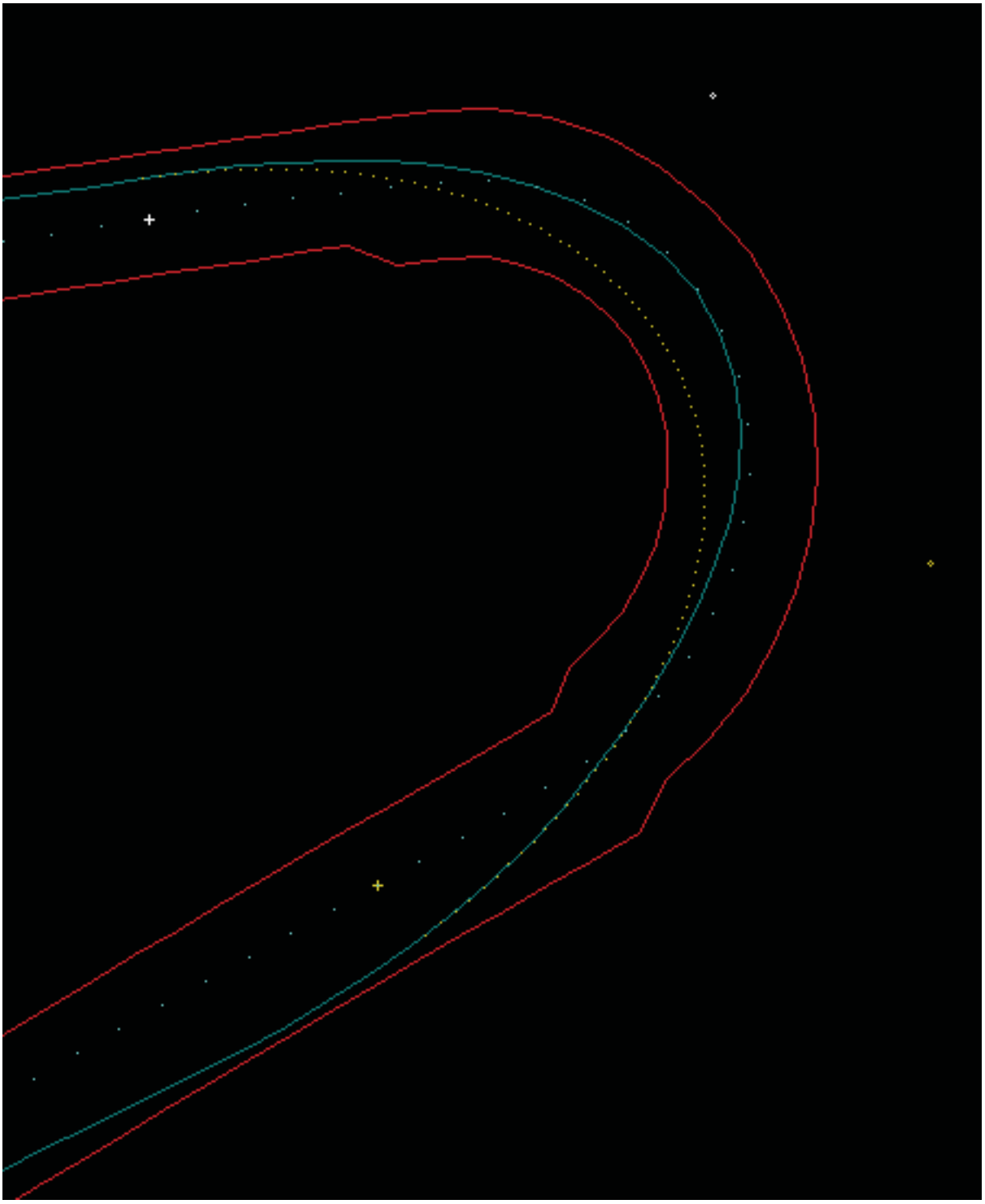
x, c	: move SWP
SHIFT x, c	: move DWP
pageup,down	: move CPS
SHIFT pageup,down	: move CPD

You should also see a yellow doted thing which represents the resulting curve.

Next you should move the DWP to the desired position.

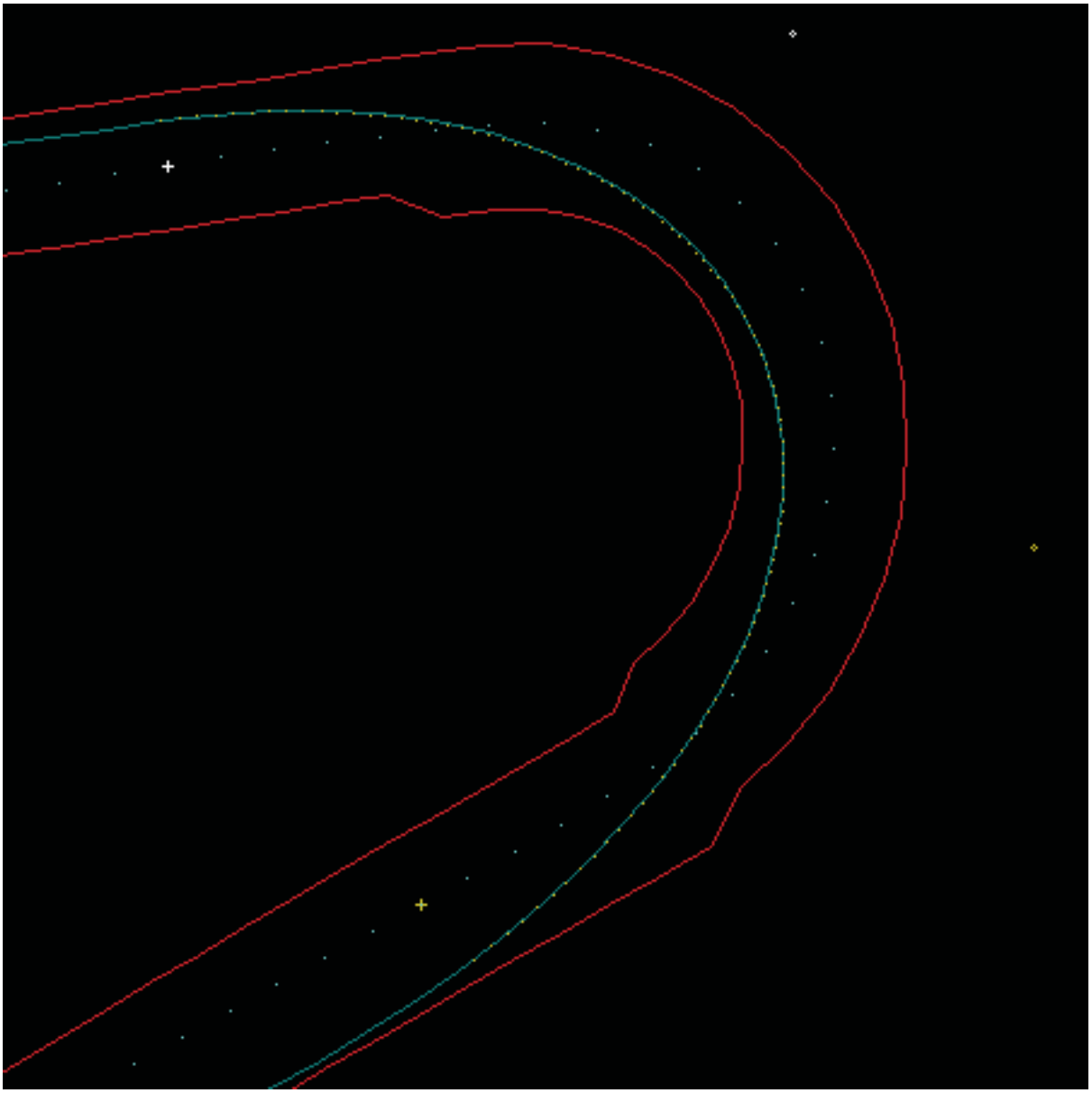


Now you have to move CPS and CPD to a position where the resulting curve fits your image of an optimal curve. You can also move the SWP and DWP at this time (having in mind what I said at the beginning).

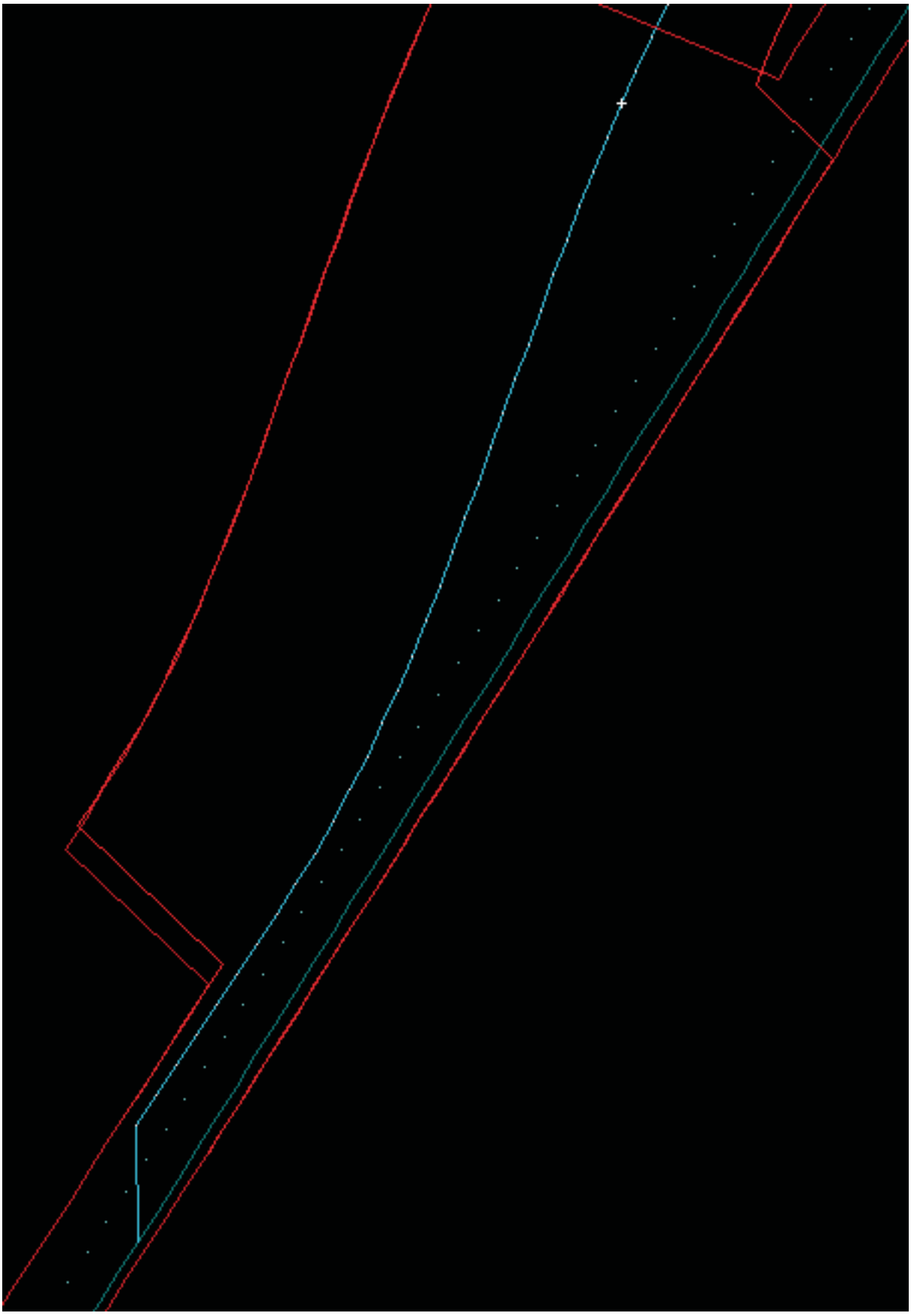


Last step is: click on the „Create Curve“ button to let the yellow dotted line be your new curve for this sector. Press s again to leave the „Spline Mode“. If you leave the „Spline Mode“ without clicking on the „Create Curve“ button, then nothing is changed. This means you can play around with this function, move all 4 control points at your will without destroying anything unless you klick on the „Create Curve“ button in „Spline Mode“.

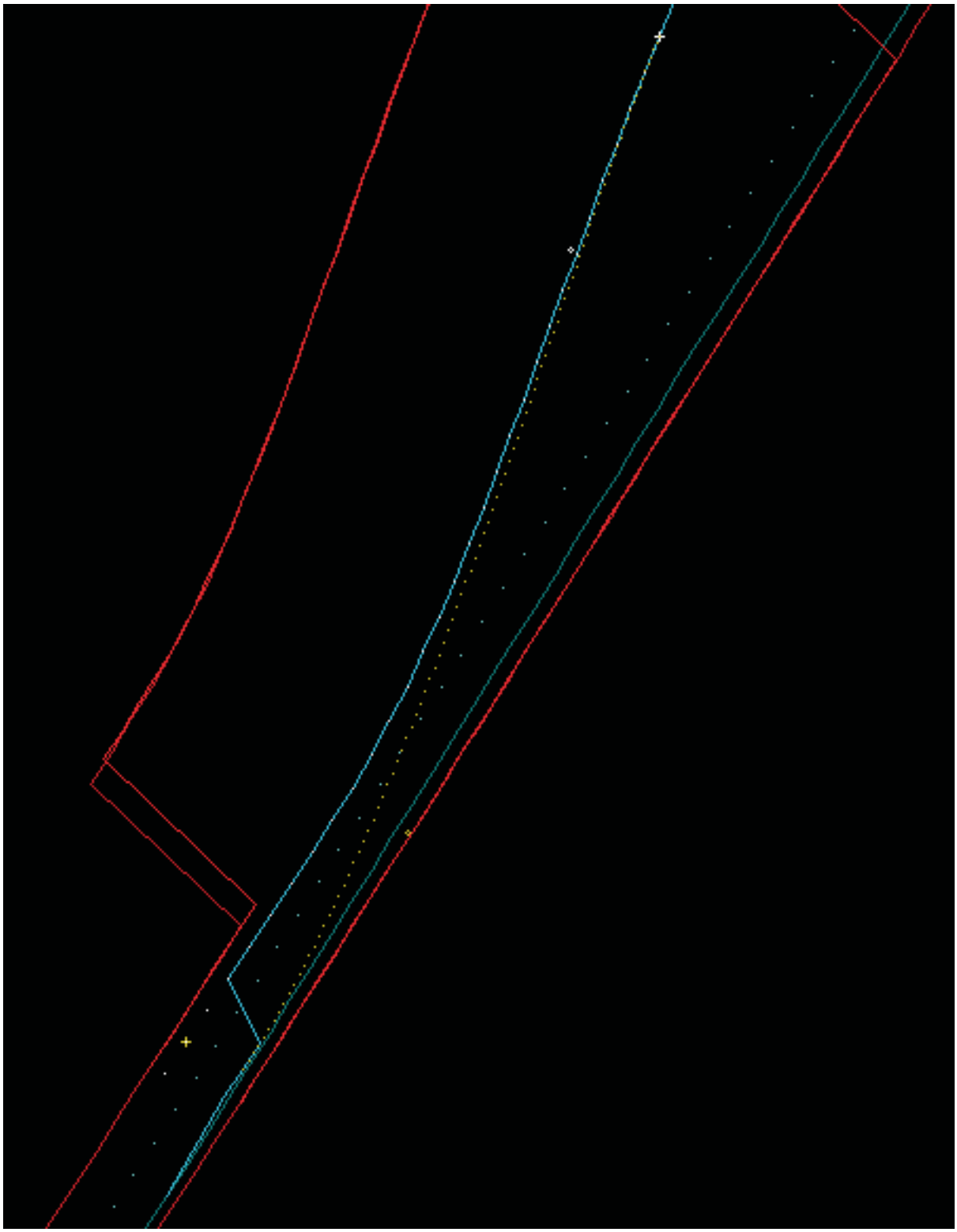
CAUTION: You do change the track at once if you move the DWP sideways (CTRL-KP+/-)



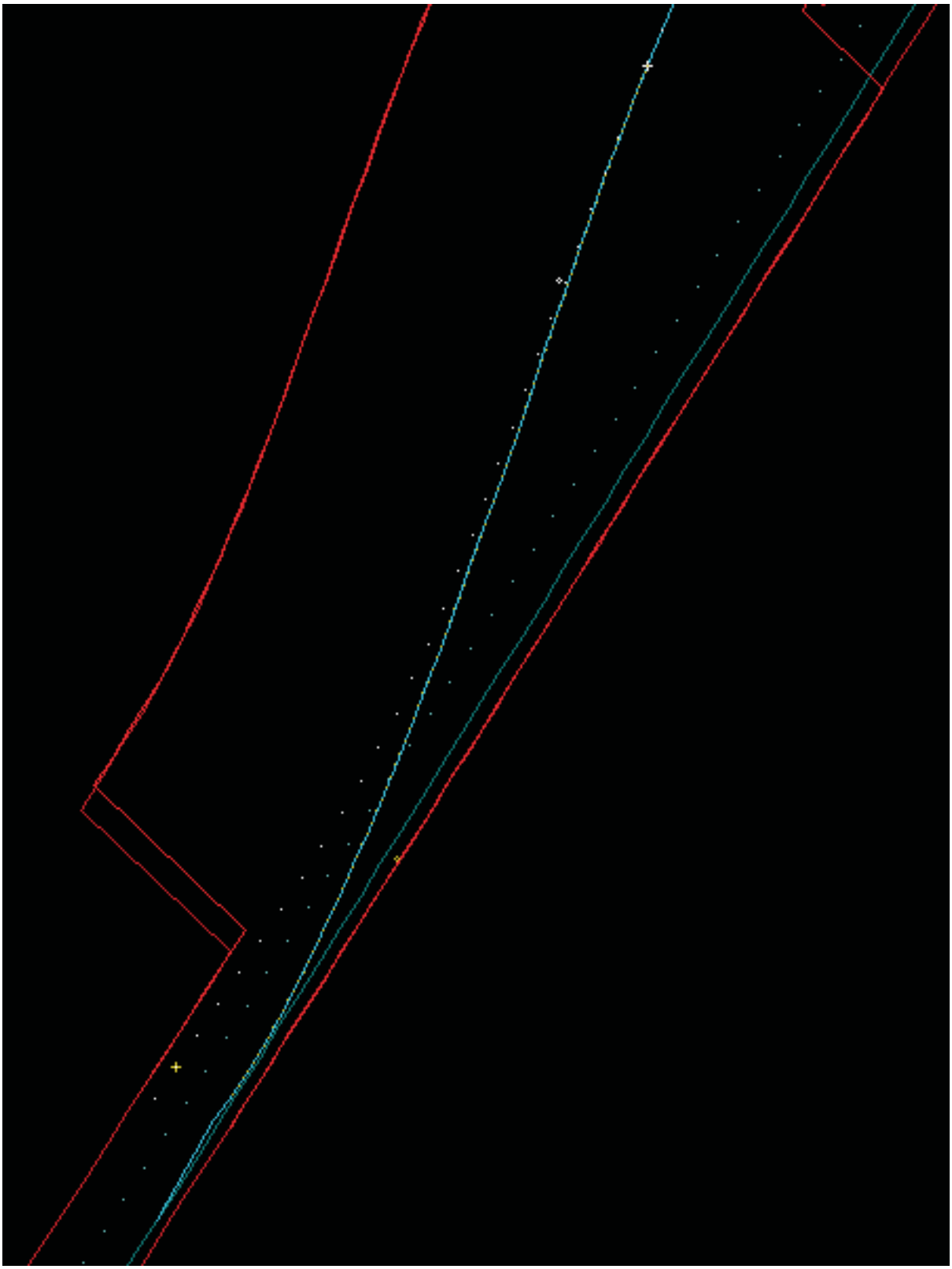
Now we are looking at the little tricky part when the start or the end of the curve is not where you want it to be. On the next page you will see a typical situation where the end of a pitroad doesn‘t go smoothly into the fastpath of the track. What we have to do here is to bring the last 3 WPs of the Pitroad to the right position. In fact we are not changing the WPs but the fast path of the WPs, which is the first input field right of „WP_PATH“. You can do a smooth curve for all 4 paths (explained later).



In this situation the end of the pitlane seems to be parallel to the optimal path (dark green line), that means you can move the DWP to the highlighted WP in the next pic and then move the DWP sideways with the CTRL-KP+/- keys and you are ready.



Be sure to select th WP before the last pit WP for the DWP. The next steps you‘ll know already.
Move CPS and CPD to match your image for a good pitout way and finaly press the „Create Curve button. (see next pic)



Some more hints:
- for sure you can also create straights with this method, because straights are also curves with a big, big radius. At the end you can create a complete new fast path without driving it.

- Some words on the 4 path fields and the 4 toggle buttons in front of them. With the two big buttons you can choose between MultiLatPaths (WP_MPATH) and fast path dry and wet (WP_PATH). MultiLatPaths are mainly for ovals (inside and outside path) but also for the formation lap on all tracks. Fast path dry is the most common path to change or optimise, fast path wet is not used yet (as far as I know).
With the buttons „1" and „2" you can choose which path to plot but you can also choose where the red border is. Remember: the field with the red border is the only affected when klicking on the „Create Curve“ button.