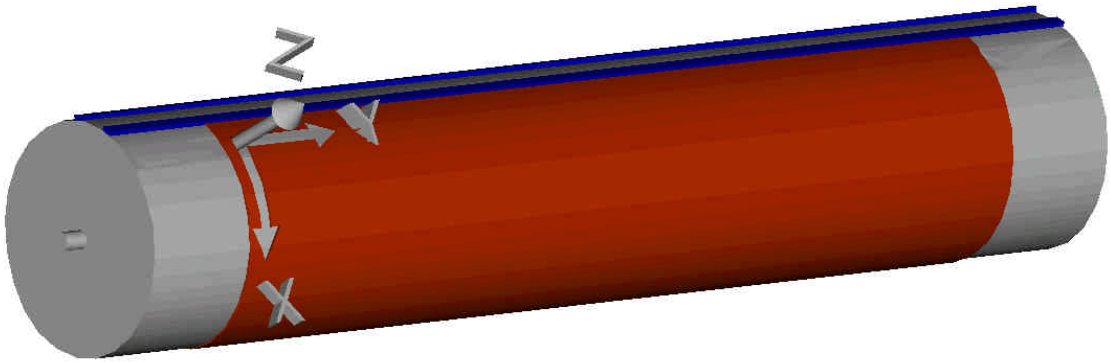
Creo Technical Note
How The Platesetter Positions The Image On The Plate

Plate axis definition:

X = **Mainscan** = Drum circumference = Plate cut-off

Y = **Subscan** = Drum axis = Plate width

Z = Perpendicular to drum surface



The following NVS values change the image position and clipping

SET GC MSS - the nominal distance from the leading edge of the plate to the first pixel imaged. The GC calibration is done to make sure that the image is actually at the MSS position (300mils for 3244 size drums and 240mils for VLF size drums). The recorder always assumes that the first pixel is at the MSS position regardless of the image source (recorder or workstation). One way to think of this value is as a recorder clipping line. Pixels will not be placed above the line.

Temperature variables

If the whole imaging engine were made out of the same material as the plates such as aluminium, there would be no temperature correction necessary. If the engine was 10C hotter, the drum would grow by the same amount as the plate. The angular position of the pixels with respect to the plate wrapped around the drum would be the same for all temperatures. The image would scale with the plate in the mainscan direction, and when the plate cooled, the image would be exactly the same size as a plate imaged at the nominal cool temperature. In the subscan direction, the ball screw would grow at the same rate as the plate and again the image would scale the same as the plate.

Unfortunately, our platesetter uses a steel screw which has a temperature coefficient (≈12ppm) different from that of aluminium (≈23ppm). This difference means that the image subscan size which is dictated by the ball screw does not increase with temperature at the same rate as the plate. The image would be too small by 11ppm per C in the subscan direction if we made no temperature correction. Temperature sensors on the engine and the ball screw plus a software algorithm are used to compensate for temperature effects so the image is always within spec.

Length of the Image

The length of the image is determined differently between workstation plots and test plots. For workstation plots, the length of the image is specified directly by the workstation. For test plots, the following is done:

SET MODE <n> MIS - mscan image size. This parameter specifies the length of the test plot. Note that the units are in pixels. If the mode RIP_DPI is specified is 2400, then the length of the plot (in inches) will be MIS divided by 2400.

If the image length is larger than the length of the plate minus the total mainscan shift minus the trailing edge margin, then

image_length = length_of_plate - total_mainscan_shift - trailing_edge_margin

trailing_edge_margin (3244s) = 500 mils

trailing_edge_margin (VLFs) = 250 mils

SET SYS MAXIS - maximum image size. This parameter specifies the maximum length of the image. If the image size is larger than this parameter, an error will be generated.

GC Calibration settings derived from GC plates and the GC table.

SET GC TINC - ?

SET GC TRK - track correction.

SET GC MSSA - main scan shift adjust. This parameter adjusts for assembly tolerances which lead to image shifts in the mainscan direction. For example: encoder disk angular tolerances, carriage height, track height, encoder electronics timing, registration pins, writing beam position.... MSSA value is the image shift necessary to put the image at the MSS position. MSSA is added to the MSS before imaging. Example: Assume MSS=300 and MSSA=0. A GC plot is done and the image is found to start 250 mils from the leading edge. This is 50 mils too close to the leading edge so the image needs to be moved 50 mils to be in the correct position. Setting MSSA=50 will move the image 50 mils further away from the edge and into the correct position. After doing a GC, MSS=300, MSSA=50 and the image starts 300 mils from the leading edge. On the 5880 drums, the MSSA value is larger than normal because the encoder disk is in a slightly different position.

SET GC SSSA - subscan shift adjust (green head only). This parameter adjusts for assembly tolerances which lead to image shifts in the subscan direction. For example:

edge detect, writing beam position, temperature, ... The image is always assumed to start at the edge of the plate so there is no SSS equivalent to MSS. If there was, it would be zero. The SSSA value is the image shift necessary to put the image edge on the edge detect edge of the plate.

SET HDP SSSA - subscan shift adjust (thermal head only). This parameter adjusts for thermal head differences which lead to image shifts in the subscan direction. As the thermal head uses the focus laser for edge detect (unlike the green head which uses the write laser beam to find the edge), this parameter is head dependent; therefore, this parameter is saved in the head (hdp) nvs.

SET GC MSCA - mainscan scaling adjust. This parameter adjust for manufacturing tolerances which lead to image scaling errors in the mainscan direction. The drum diameter and plate thickness are assumed to be at nominal values such as 286mm for the 3244 drum. If the drum diameter is larger than 286mm, then the image would be too large on the plate in the mainscan diirection. The plate would not wrap around the drum as far as it should but the image would go the same angular distance around the drum.

SET GC SSCA - subscan scaling adjust. This parameter adjust for manufacturing tolerances which lead to image scaling errors in the subscan direction. The ball screw is assumed to be precisely 5.08mm pitch. If the screw pitch is larger than 5.08mm, then the image would be too large on the plate in the subscan direction. The subscan scaling is also effected by temperature. If there is error in the temperature compensation, then the GC values for subscan scaling will have large linear variations with temperature.

SET GC PROT - plate rotation adjustment. Tolerances which cause rotational errors are, registration pin to track non-parallelism, track spacing variation....

SET GC ORTHO - image orthogonality adjustment. This correction is to make sure that the image sides are square to the top and bottom. In other words, it corrects for image skew.

There are also ‘MODE’ versions of the GC calibration variables. The mode versions are to compensate for differences in different plotting modes. For example, perhaps the writing beam in 2400dpi mode is always 0.5 thou higher than the 3200dpi writing beam. This would result in 2400 dpi images being 0.5 thou closer to the leading edge. The mode mssa value could be set to 0.5 which would bring the 2400dpi mode image to the same position as the 3200dpi mode. Mode gc values are usually left at their defaults.

Workstation recorder interaction

The recorder always places the first pixel of a stripe at the MSS position on the plate. This means that any image manipulation done at the workstation will always be clipped to the MSS value at the leading edge. The goal is to match where the workstation thinks it is putting the first pixel and where the recorder actually puts it (MSS). By default, this is done by the creostrt.### (where ### is the version) file on the workstation. The creostrt file is a postscript file which among other things, specifies the leading and trailing edge clipping of the postscript image in points (72 points per inch). If the postscript leading edge clipping matches the recorder MSS clipping, then the first pixel

will be where it should be. If the postscript clipping is different from the recorder clipping, then the image will be offset by the difference. For example, it the postscript clipping is 0.5” and the recorder clipping is 0.25”, then the image will start 0.25” from the leading edge but be 0.25” (0.5 minus 0.25) too close to the leading edge. A feature that is supposed to be one inch from the edge would be imaged 0.75” from the leading edge.

Summary of final Image corrections

The image is rotated in postscript.

The image is clipped in postscript by the workstation to the creostrt file values.

The image shift in the mainscan direction is: MSS+MSSA+(MODE # MSSA).

This should place the first pixel from the workstation at MSS from the leading edge of the plate.

