Moiré

Xitron Navigator Technical Note

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Moiré can be caused by a number of factors, not the least of which being screen angles. The Xitron RIP has a feature (HPS - Harlequin Precision Screens) that is specifically designed to eliminate moiré when used correctly. A little background about screens and PostScript may be helpful, so we will begin there. It would take an entire book to discuss the intricacies and theories about moiré patterns and screen angles, so we will touch only on issues relevant to using the Xitron RIP.

Background:

This information will be highly simplified, but will give some background about the use of screen angles and moiré. When using CMYK to print color items there will always be a "pattern" of dots. The object of screen angles it to attempt to create a pleasing pattern, a rosette, rather than an offensive pattern, a moiré.

It is easiest to create a pleasing pattern with only three colors. This is because they can be set at the correct angle from each other to create a good rosette. The fourth angle has to be a compromise. Normally, the "compromise" angle is given to the color Yellow. Yellow is a harder color to see compared to Cyan, Magenta or Black, so it is often set to an angle of 90 degrees or 0 degrees. One of the most common causes of moiré is simply printing a color that is primarily yellow, a light green or orange for instance. When yellow is predominant its "compromise" angle is easier to see and you will get a vertical or horizontal pattern - a moiré.

Many other factors contribute to moiré patterns, among them are, resolution and line screen. When a RIP creates dots it has a limited number of pixels that it can use. When creating dots at a low resolution with a high line screen the RIP will not have enough pixels to create a perfectly shaped dot (for instance, a round dot will not be very round). The anomalies created by the limited pixels will often create a visual pattern in the screen that can manifest itself as a moiré. This is not a traditional moiré, because it is not created by "bad angles" but its appearance is equally offensive.

Solutions to moiré problems.

The two major problems that contribute to moiré, as mentioned above, are screen angles and dot shape anomalies (resolution and line screen). A common way of eliminating moiré has been to use screen angles that vary from the traditional angles of Cyan at 15 degrees, Magenta at 75 degrees, Yellow at 0 degrees, and Black at 45 degrees. Some alternate angles that have met with success are as follows:

Color	alternate angle set 1	alternate angle set 2	alternate angle set 3
Cyan	18.43	67.5	7.5
Magenta	71.56	37.5	127.5
Yellow	0	-7.5 (352.5)	82.5
Black	45	97.5	67.5

Setting the RIP to use one of the alternate angle sets listed above has been successful in eliminating moiré at a number of Xitron customers. Alternate angle sets 2 and 3 above are often successful at eliminating moiré caused by a predominant yellow.

The alternates address moiré issues caused by angles. Moiré caused by anomalies in dot shape or a combination of dot shape and angle are a little more complex to overcome. A number of changes can be made to overcome moiré based on dot shape and angle combinations. Three basic steps can be followed to correct these problems:

1. Increase resolution and leave the angles as they are.
2. Increase resolution and choose alternate angles.
3. Turn on HPS with default settings and use original angles.
4. Turn on HPS with default settings and use alternate angles.
5. Turn on HPS with default settings, original angles and increase resolution.
6. Turn on HPS with default settings, alternate angles and increase resolution.

By trying one of the above combinations most moiré issues can be overcome. NOTE: HPS (Harlequin Precision Screens) is designed to alter both angle and line screen in order to achieve a moiré free dot and angle pattern. Settings can be altered in HPS to control the amount of change that HPS will allow. For more information about the use of HPS locate the Technical Note “Hqn002 - Getting the best out of HPS” which can be found on the Xitron Web Site or the Xitron Navigator Installation CD.

Special Note

If you chose to use HPS (Harlequin Precision Screens) we suggest that you not use “clear centered rosettes.” Clear centered rosettes is an option in the HPS dialog. It defaults to being on. We have noticed better results when this option is off.