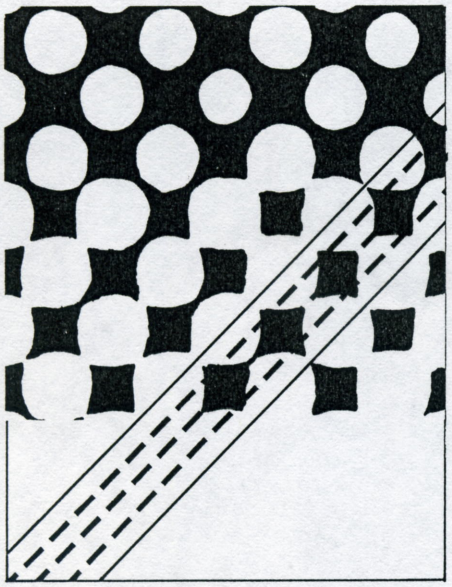

Figure 4. The solid black lines show the width of one row of halftone dots. The dashed black lines illustrate how the width of the dot row is estimated into quarters. For a 150-line halftone, the spacing between adjacent dotted lines is 0.0017 in. (0.04 mm).

misregister during the pressrun. In the strictest case, it could represent the maximum allowable misregister. In that case, the pressman would try to hold misregister below these limits—perhaps by about 0.002 in. (0.05 mm). This is to allow for the normal statistical press variations that would cause a few sheets to exceed the limits. In a more liberal case, such as a lower quality job, the pressman might set the control limits about 0.002 in. (0.05 mm) higher before he would readjust the press to correct misregister. Knowledge of the shop's policies on register and of the customer's specifications are essential to setting the control limit for any given job.

Measuring misregister with a microscope micrometer would be too time-consuming to use for press control. Most pressmen can estimate the misregister with a hand magnifying glass. For example, where the images are in 150-line halftones, the spacing between rows of dots is 0.0066 in. (0.17 mm). Visually dividing the width of the row into quarters allows him to estimate the misregister to within 0.0017 in. (0.04 mm). An estimate of this accuracy is sufficient for most press register control purposes. See Figure 4.

SUMMARY

The relationship of an observer's impression of color register to misregister in the press sheet images is complex and influenced by many factors. Two of these factors, color contrast and edge sharpness of detail, were found to have significant effects.

The prints used in this study suggested that for the casual, nonexpert observer, an ink layer misregister of less than 0.004 in. (0.10 mm) would not be noticed in most cases. However, the rating for color register is quite sensitive to even small changes in misregister for high-rated prints.

The control of color register during the pressrun can be considered in two parts: control of gripper and side-guide edges of the sheet, called press sheet register, and control of the fit of the ink layers in each image on the sheet, called internal register. Small, random, sheet-to-sheet variations in these registers, usually about 0.001 in. (0.025 mm), are to be expected, due to chance. Greater variations, either at random or in one direction on the sheet, indicate assignable causes. These causes are usually the press register controls or defects in the paper.

In selecting his register control limits for a pressrun, the pressman must consider all the above factors in regard to the customer's specifications.

Table I is a summary of color register control procedures. In addition, it includes some typical causes of misregister that are not discussed in this paper. For further information on misregister caused by the paper, the reader should refer to GATF's *What the Printer Should Know about Paper* (4). For further information on adjustments to the press register system, refer to GATF's *Offset Press Operating–Sheetfed Presses* (5), *Advanced Pressmanship–Sheetfed Presses* (6), and *Solving Sheetfed Offset Press Problems* (7). For those misregister conditions that also apply to webfed presses, refer to GATF's *Web Offset Press Operating* (8) and *Web Offset Press Troubles* (9). These textbooks are recommended as supplements to the press manufacturer's press manual in analyzing and correcting register faults.

REFERENCES

1. "Process Control Procedures, V," pp. 13-30, Annual Research Department Report, 1979. GATF Order No. 8558.
2. "Process Control Procedures, VI," pp. 12-14, 23, Annual Research Department Report, 1980. GATF Order No. 8559.
3. "Image Control Marks System," GATF Technical Services Report 7228.
4. *What the Printer Should Know about Paper.* GATF Order No. 1308.
5. *Offset Press Operating–Sheetfed Presses.* GATF Order No. 1505.
6. *Advanced Pressmanship–Sheetfed Presses.* GATF Order No. 1513.
7. *Solving Sheetfed Offset Press Problems.* GATF Order No. 1501.
8. *Web Offset Press Operating.* GATF Order No. 1516.
9. *Web Offset Press Troubles.* GATF Order No. 1518.