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SYNTHESIS OF THE DISCRETE RASTER CONVERSION  
FOR IRREGULAR FRAMES SQUARE ELEMENTS

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**Research methodology.** One of the important tasks in the synthesis of bitmap conversion is to determine the screen frequency and RIP resolution in which there is a contradiction which depends on the number of gray levels. There has been built another dependence of the number of gray levels to screen frequency of the constant RIP resolution. Besides the considered parameters of screening and resolution, the important technical parameter is the diameter of the laser beam, which is determined by the RIP resolution.

**Results.** For screens L=30 the lpi number of gray levels is 256. When the number of levels of gray screens comes with 40 screens, the lpi is 144 levels. If screens increase to 60 lpi, the number of gray levels is reduced to 64 and does not fully meet regulatory requirements for quality products.

Depending on the brightness of the image the tones can be placed in four shades of absorbance, which correspond bitmap trace elements 1, 2, 3, 4. Highlights can be placed twelve shades of optical density, which correspond bitmap trace elements 5, 6, 7...16. Grading midtones reproduce trace 17, 18, 19...36. Gray tones and shadows reflect trace 37, 38, 39, 64.... In raster cell dimension 8×8 only four elements have the correct square shape, others are of irregular square shape.

**Novelty.** The scheme sequence configuration screen elements use the modified adjacency matrix in which the elements numbering corresponds to the sequence of formation and the quantity of gray levels.

**The practical significance.** The proposed synthesis of discrete raster conversion to square elements of irregular structure with continuous formation of lines and partial symmetry reduces distortion at the manufacturing stage and form printing, which improves the quality of book and magazine production.