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## Apple Monitors: Why Screen Flickers When Image Is Dragged

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TOPIC -----

There seems to be a flicker in the Apple High-Resolution Monochrome Monitor and AppleColor High-Resolution RGB Monitor.

To produce the flicker, use MacPaint to create a black box approximately 1 inch by .5 inch. Then select the black box and move it from left to right. In one area of the screen (approximately the bottom one third), you will notice the black box flickering or breaking up as you move it.

This flicker also happens on some Macintosh SE screens (approximately the top one third).

What causes this?

DISCUSSION -----

The flicker is a result of non-synchronous timing between drawing the bitmap to the screen and refreshing the screen. It is a difficult programming task to synchronize the drawing of the image to the screen refresh rate. When this anomaly affects only the moving of selected images, the synchronization is often not implemented. When smooth animation is vital to the application's function, the problem generally does not occur.

The flicker can be seen with most bitmapped-based graphic applications (HyperCard, SuperPaint, MacPaint, FullPaint) that select an image and then directly drag the image. In applications like MacDraw, where only an outline of the image is moved, the flicker is not as evident.

The flicker has been reproduced with several combinations of applications and Macintosh models, and with a variety of monitors. Different combinations demonstrate the effect more prominently than others. We have unable to determine the exact reason certain areas of certain screens display this

effect more than others. Timing issues play a large part in this anomaly.

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