

A Raster Scan Graphics Suggestion

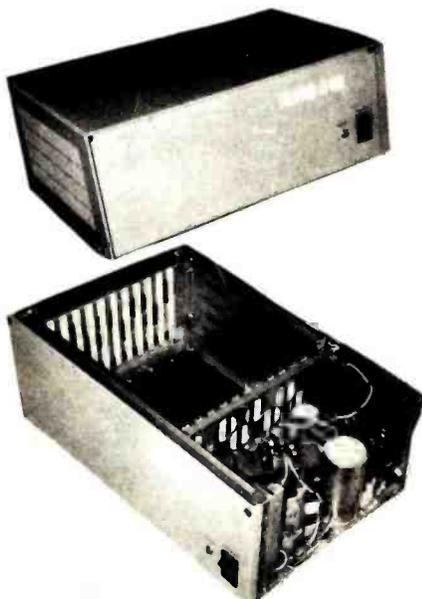
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In reference to your editorial (October 1977 BYTE, page 6) you seem to have overlooked a pertinent color refresh storage method. While a 256 by 256 matrix is great if you want to create a 256 square checkerboard, most graphics (including cartoons) don't look that way; therefore, storage for every picture element is a waste of bandwidth. Most graphics consist of areas of color, usually with a limited number of changes over the screen width.

Let us presume that a representative byte consists of four bits of color information (16 colors) and four bits of intensity data (grey scale = 16). A raster scan system is *not* a series of random events. The beam position can be predicted at all times, therefore, if a clock driven 256 counter (eight bits) is provided, the horizontal position of the beam is uniquely defined. The game now becomes one in which the beginning address on a line (eight bits) and the color and intensity information (eight bits) from that point to the next change is stored (parallel 16 bit or two bytes if your access is fast enough) in sequence in memory. Each 16 bit word is pulled from memory and stored in two 8 bit registers. When the counter (horizontal

line position) matches the address register, the color and intensity information is transferred into a driving register which holds it and drives the video conversion circuits until the next change. This event also causes the next double byte to be retrieved from the memory and loaded into the "standby register." The driving register could also be combined (logically) with a character generator to provide an interesting set of alphanumerics. Now let's look and see what we have got. We need a sync signal to mark the beginning of the frame, but no line counter, unless you want to digitally control the vertical retrace, as a given address only occurs once per line. (But you do need one byte of address which is numerically larger than the first address of the next line. This can be an actual "used" number or a "fake" at $n = 225$.) We use only one double byte per color or intensity *change*. If you assume an *average* of ten changes per line (and in the "cartoon" world that is a lot) and 256 lines, that equates to 2,560 double bytes (5,120 bytes) which is far short of the 64 K + bytes (7.8%) it would take to define every picture element, yet 256 by 256 *resolution* is still achieved (information and resolution are *not* the same). This would seem to provide one practical solution to the high resolution color graphics problem for small users, and is instantly expandable as more memory becomes available. ■

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