area26

VGA-LCD

The idea of using the LCD panel from an old broken laptop as a VGA monitor seems to be a very common one, yet I could not find a single webpage telling me how to do it. All I could find was a lot of people asking other people how it could be done, and the other people saying "forget it, it's way to complicated".

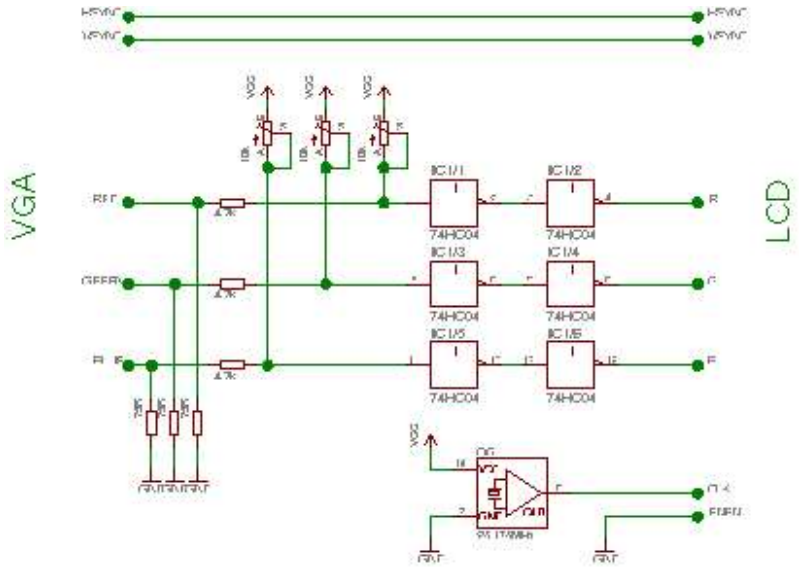
Of course, that wasn't good enough for me... On this page I present the first version of a very simple circuit that allows an old TFT panel from a 486 class laptop to be used as a VGA monitor good enough for text mode (BIOS setup, Lilo prompt, Linux text console etc...). The circuit does have some important limitations:

- Not "multisync" in any way, only a fixed pixel clock (25.175 in this case).
- Only works with video resolutions that are directly supported by the LCD panel.
- Only 1bit resolution per primary color (total of eight colors).
- No way to properly center the image, may cut off part of the image.
- Does not work with "Dual Scan" panels.

Some of these problems can be worked around in software, some will be fixed/improved in later versions of this circuit.

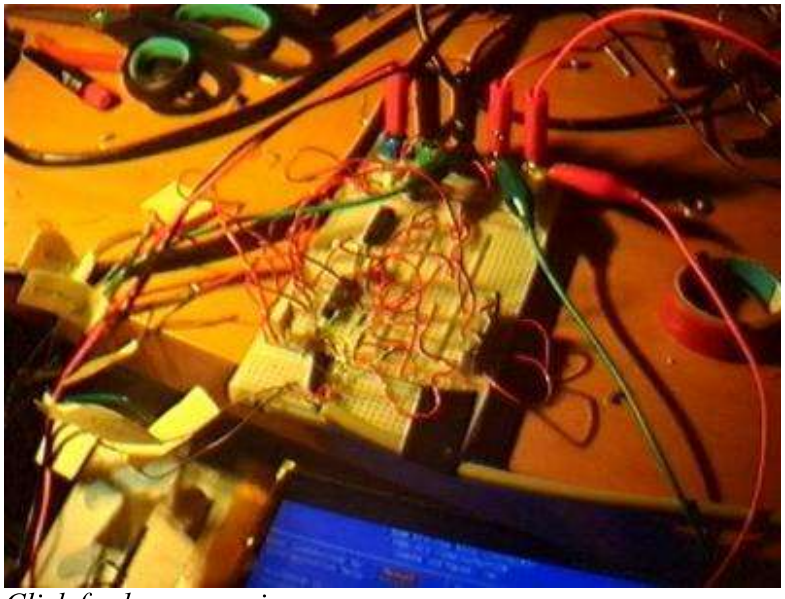
The LCD I've used comes from my old laptop (Zenith z-note 425Lnc), it is a Sharp LQ9D011 TFT panel that supports the standard VGA modes (640x400 and 640x480) and has 3 bits of color per primary. (Click here to download data sheet.) Since my circuit only delivers 1 bit resolution for each primary I have connected the 3 data bits for each color together. The HSYNC and VSYNC are connected directly from the VGA cable to the LCD, while the color signals are buffered and "digitized" (amplified) by 74HC04 inverters. The clock input is fed from a 25.175MHz crystal oscillator I snagged from a (very) old VGA card, and the ENAB line (used to center the display) is simply grounded for now.

An improved version of this circuit with at least 2 bits of resolution per primary color, and a properly centered image, will appear here at some point in the future. For now, here is the schematic and a couple of images to prove that it works...



Click for readable schematic

Click for larger version



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