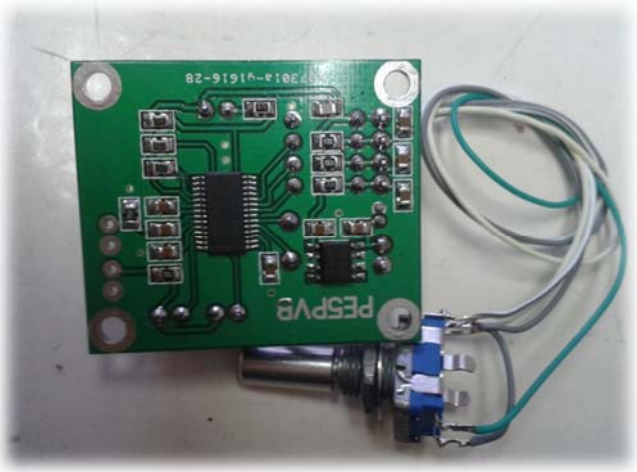
MAX OSD GENERATOR

Introduction



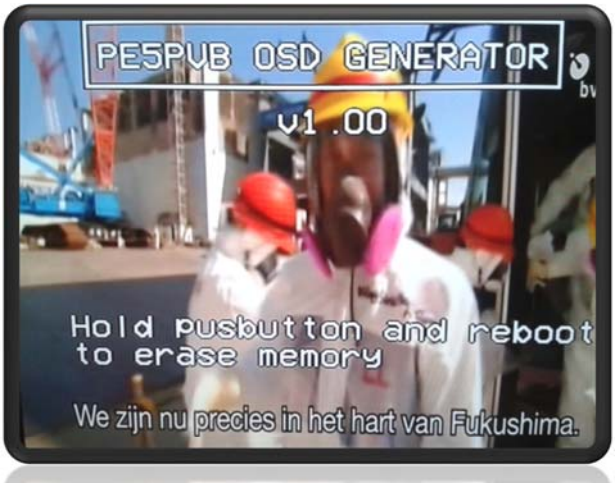
During my ATV transmissions I always ran into a problem: how to add text to the screen in a simple and effective way. Before this project I used several OSD generators. Often they had a very fancy menu, but in practice it was a lot of work to change the text. They used several push buttons and you need a manual to use it. Sometimes those buttons had double functions, so frustration all the time.

At my search for a good OSD chip I found some famous IC's like the STV series. Unfortunately those STV's are out of production for years now and prices are rising. Then my eye was caught on a IC from Maxim. It's a monochrome OSD generator. Unfortunately in TSSOP casing, for less experienced home brewers, this can give troubles. This chip has exactly what I was looking for: Easy to control by the SPI-bus, build-in sync detector and as a bonus, a small amount of free programmable memory (eeprom), where you can put your own drawn characters in. Unfortunately the possibility for a larger character set is missing and when no video is applied you have a grey background instead of the nice blue one.

For some time now I use rotary encoders in my projects. They're much easier to use than pushbuttons (for example, see the iPod), and you only have to drill one hole in your case. The idea was born and in a few days I ended up with this PCB and a nice result.

Software

I wanted to create a simple project with as less components as possible. I choose not to use an external eeprom for the memory of the programmed texts. For this reason I had to limit the number of characters. With the current design you can show 8 lines of 30 characters on the screen (8x30 = 240 bytes). This is nice in line with the internal eeprom of the 12F683 (256 bytes). Just choose the place on the screen with a turn on the rotary encoder (you'll see a flashing cursor on the point on the screen). Push the rotary encoder on the place you want to edit en turn it to choose a character. Push again to store the character. The cursor will now go automatically to the next position.



Do you want to erase the whole screen? Just push and hold the rotary encoder while applying power to the circuit.

As an extra feature I added some characters so you can add a border around a text.

Hardware

The OSD generator is build around the MAX7456 OSD generator. This is a 28-way TSSOP IC. You can easy order this part at your local hardware store or for example via Ebay. Price varies a lot. If you don't have any moral objections, you can also sample the IC's for free at the Maxim Free Sample Service.

The MAX7456 is controlled by a 12F683 from Microchip. This is a small 8-way microcontroller. Ofcourse you have to program this microcontroller with the right software. If you want to use the extra functionality of adding borders around texts you have to program this first. There are separate .hex files for this functionality, you have to load once. The 78L05 (SOIC8) is used for the 5V power. An extra LED is added for the sync detector. Due the easy setup the PCB is small, 40x34mm.

Home brewing

Of course it's a lot of fun to build the circuit yourself. If you etch your PCB's yourself, make sure you create all the via's. I also have some factory PCB's in stock with silkscreen and via's (see photo). If you would like such a PCB with or without a presoldered MAX7456, or a complete build kit, please contact me: pe5pvb@het-bar.net

Have fun with this nice OSD generator en see you on ATV!
Sjef Verhoeven – PE5PVB