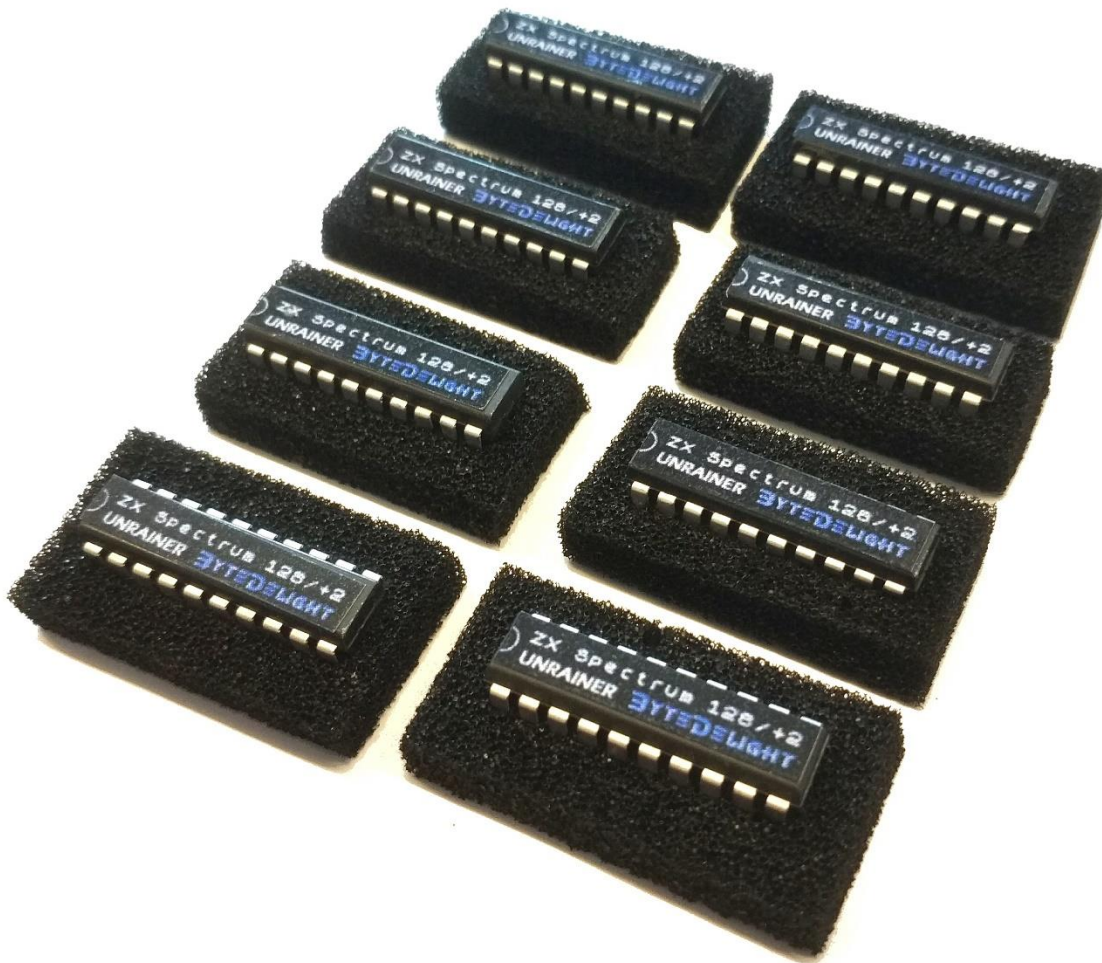


Unrainer Mod

For the ZX Spectrum 128K 'toastrack'
and grey ZX Spectrum +2



Produced by Ben Versteeg
Design by Velesoft

BYTEDELIGHT

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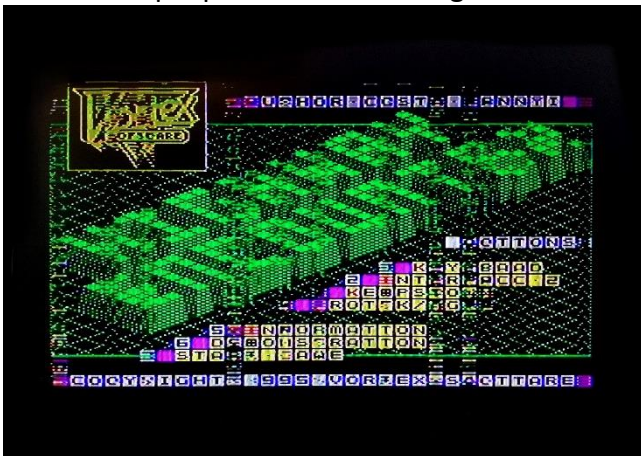
Introduction

The 'unrainer' modification solves the so-called 'raining effect' with the ZX Spectrum 128K toaster / grey +2.

A lot of (often Eastern-European) games and demos show the so-called 'raining-effect', which is caused by a glitch in one of the parts in the ZX Spectrum 128K 'toastrack' and the grey ZX Spectrum +2 models.

This modification is not meant for the black ZX Spectrum +2A or +3!

Example picture with 'raining' effect:



Example picture after 'unrainer' modification:



Credits for the unrainer modification

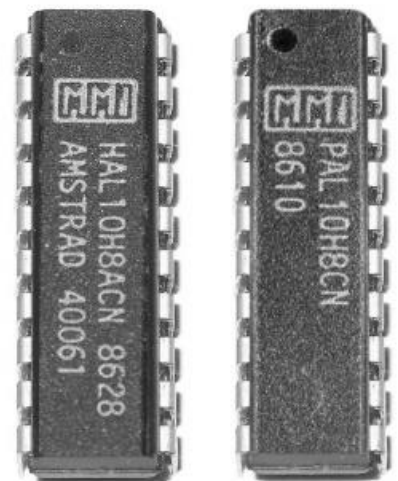
Velesoft developed an upgrade to get rid of this problem.

More information can be found at: <https://velesoft.speccy.cz/zx/umbrella/umbrella.htm>.

Old and new chip

This 'unrainer' chip is a replacement for the HAL10H8 or PAL10H8 chip inside the ZX Spectrum 128 / +2, as shown on the photo on the right.

The replacement chip is a GAL16V8, programmed with the upgraded firmware to solve the 'raining' effect. This chip is programmed and has been tested.



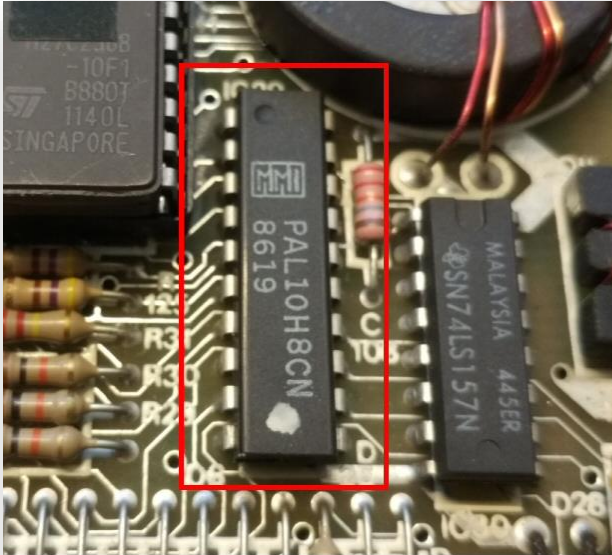
Replacement process

Remove the old chip

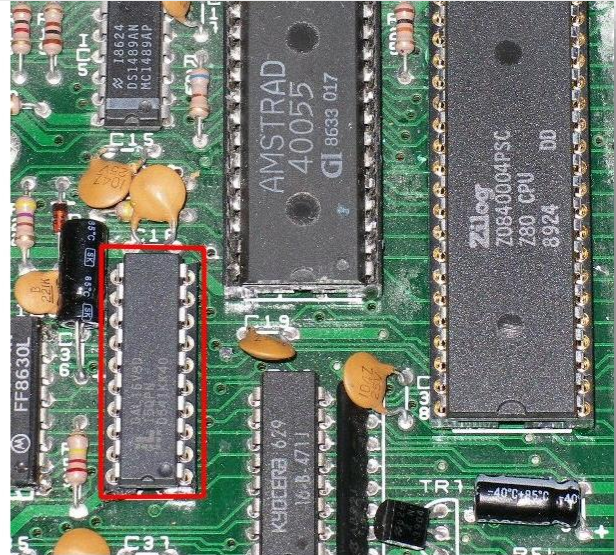
First you will have to remove the current PAL or HAL chip.

Some (de)soldering skills are required for that.

You can use a de-solder pump or de-solder station.

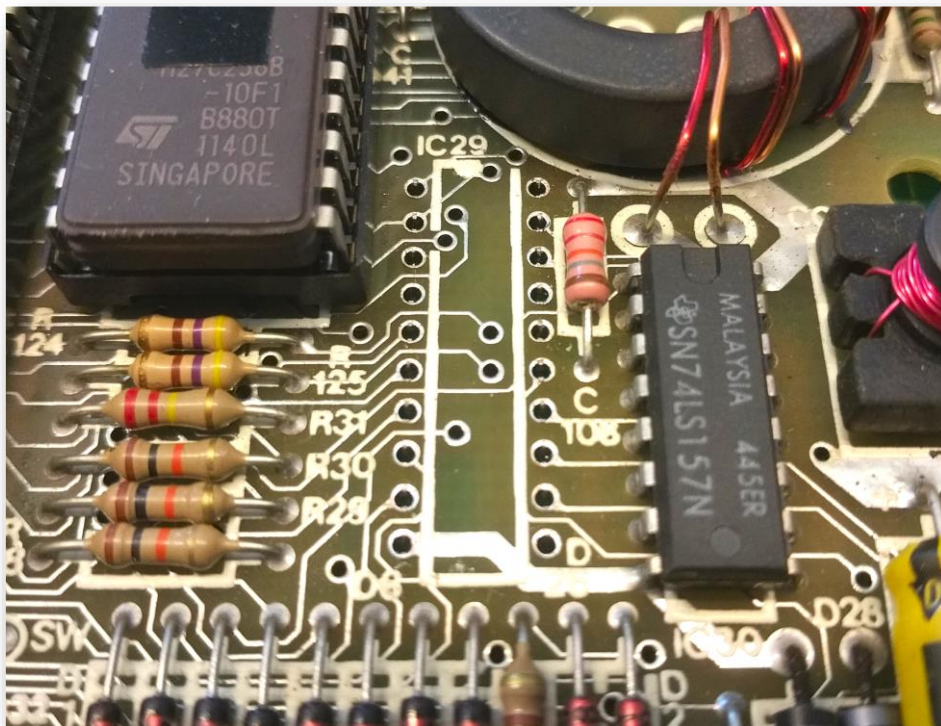


Location inside a toastrack



Location inside a +2

After chip has been removed:



Solder IC socket (optional)

A 20 pin IC socket is included.

After removing the original PAL or HAL chip, you can solder in this 20 pin IC socket.

Alternatively, you could solder the replacement chip onto the board directly – it's your choice.

MIND THE ORIENTATION OF THE CHIP AND SOCKET!

The notch of the chip is aimed upwards in a toastrack.

The notch of the chip is aimed downwards in a +2.

Put in the 'unrainer' chip

Either put the replacement chip into the socket or solder the chip directly to the board as described in the previous paragraph.

Add the 'RFSH' wire

The last step is soldering a wire to add the RFSH signal coming from the Z80 CPU, to the new 'unrainer' chip.

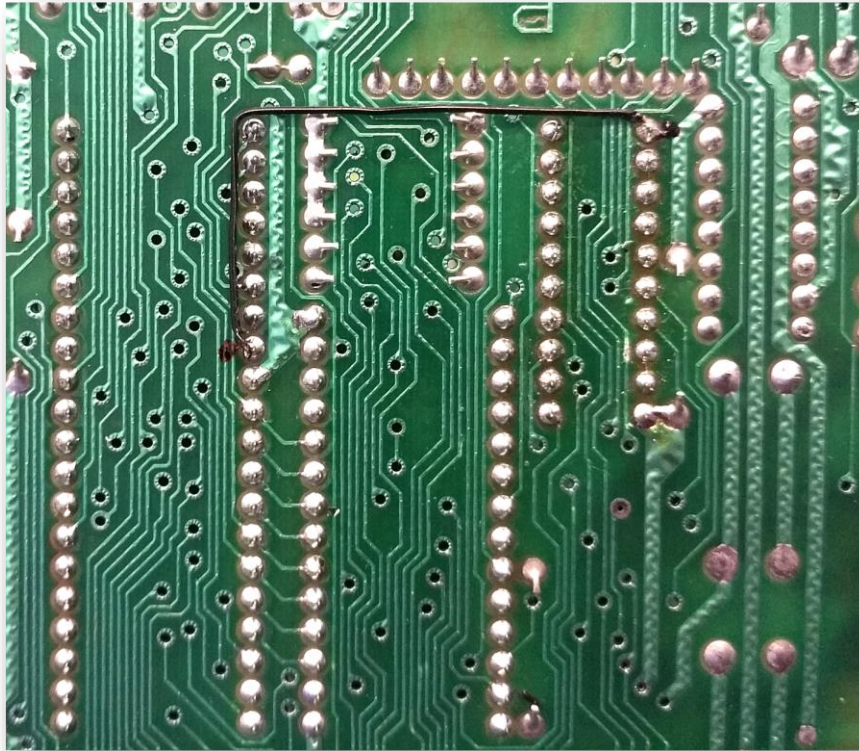
The best way to do this, is by adding the wire to the bottom of the board.

A wire is included with the package.

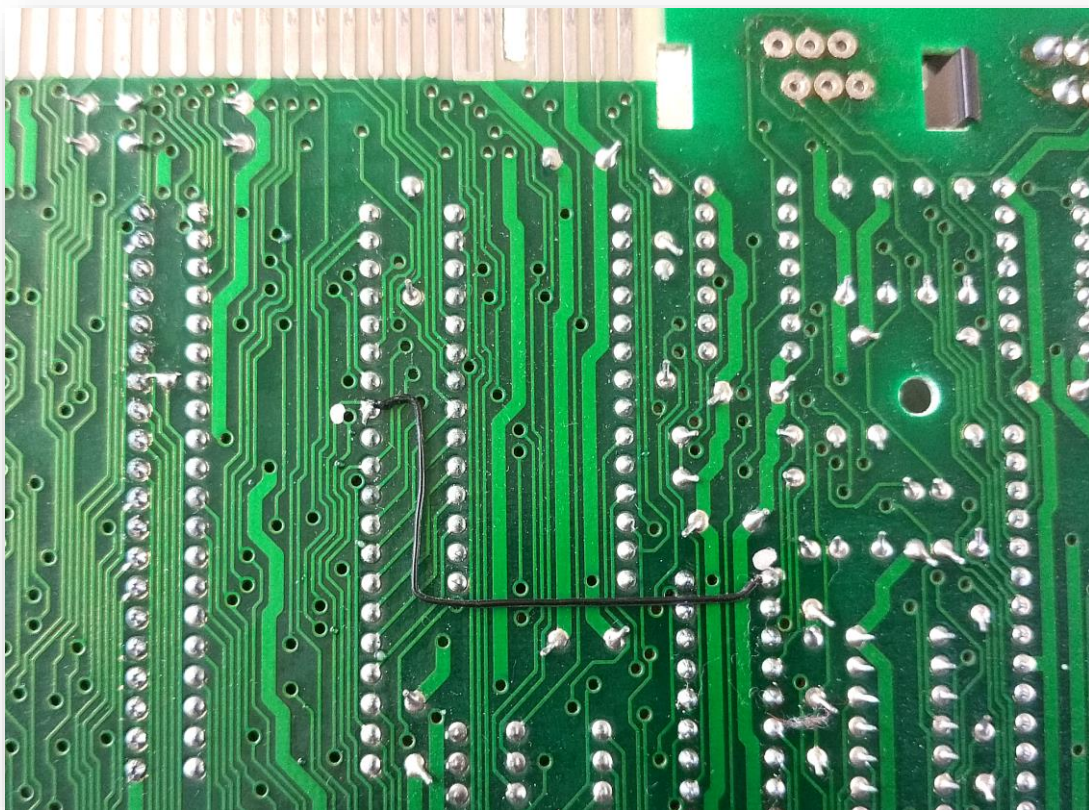
The wire will be connected between pin 11 of the 'unrainer' chip, and pin 28 of the Z80 CPU.

It's good to first mark the correct pins on the bottom of the board with a sharpie.

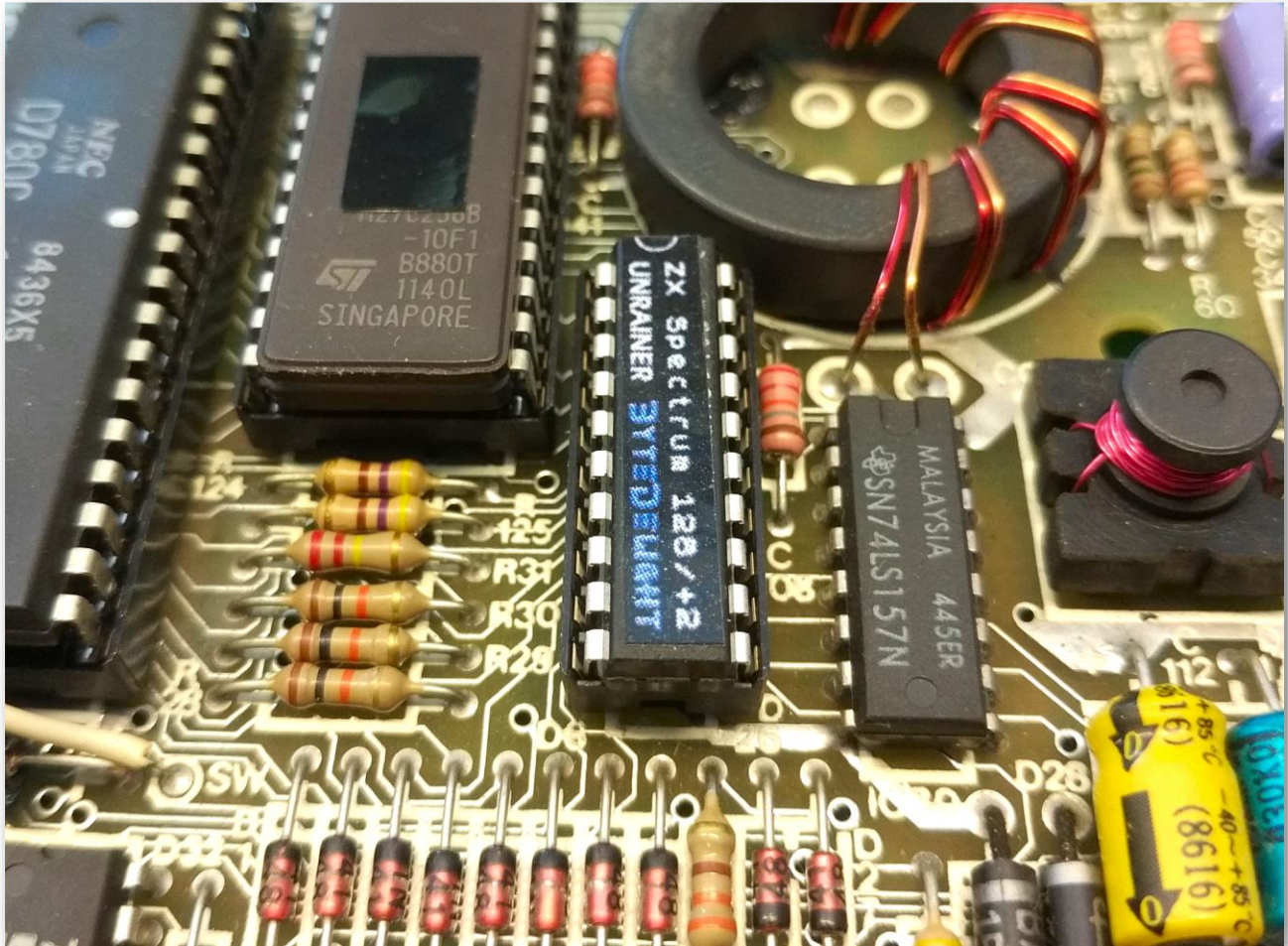
Wire on bottom of ZX Spectrum 128 'toastrack' board:



Wire on bottom of ZX Spectrum 'grey model' +2 board:



Example result on a toastrack board:



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Produced by Ben Versteeg

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