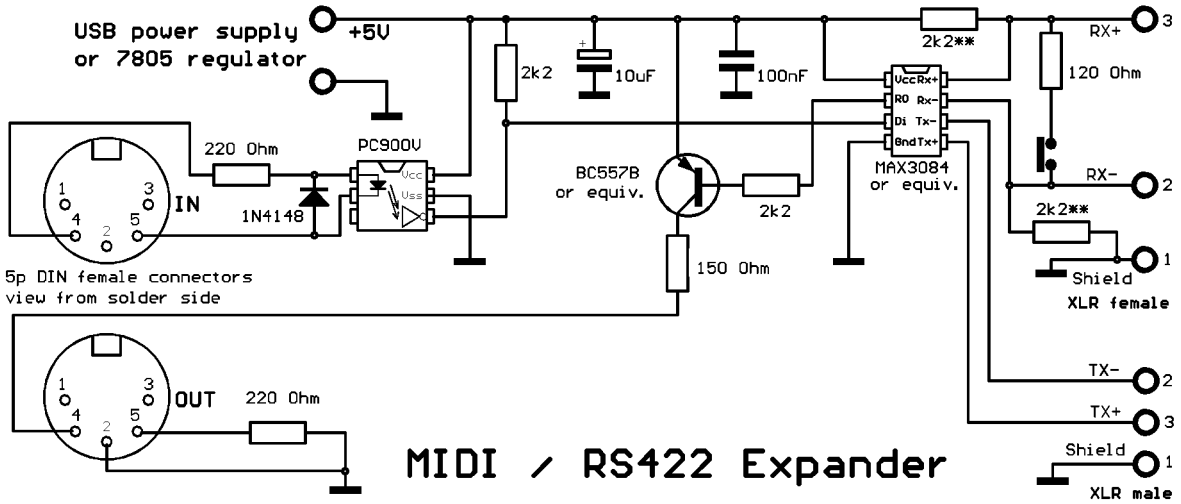
MIDI / RS-422 Expander



Instead of transistor BC557B every standard low frequency/low power pnp-transistor is appropriate.

ICs type MAX3084, as well as MAX3081 or MAX3087 are best suitable. These circuits are "fail-safe", i.e. keep correct high output in idle state, no matter if the input is open or shorted (terminated). In this case both 2.2 kOhm resistors marked with a star ** may be omitted.

Somtimes easier available and usable with some restrictions are MAX488 and MAX490 or equivalent circuits from other manufacturers. These types are not "fail-safe", i.e. have to be externally polarized by the "2k2** resistors. If these resistors are missing, this may cause problems with MIDI software, but no hardware defects.

As long as MIDI software or connected hardware is only started while a signal is present at the RS-422 input, the 2k2** resistors may be omitted, too.

The 120 Ohm terminal resistor at the RS-422 input is only necessary if the data transmission cable is rather long (longer than 100m), but is not a disadvantage if a short cable is used. For long cables the single wires should be as thick as possible: recommended is 0.8mm diameter (i.e. 0,5 square mm).

About power supply: 5V power-plug shaped supplies with USB-connector (or similar) are directly suitable. For other supplies a 7805 voltage regulator has to be inserted between supply and the Expander circuit. This technique is commonly known, therefore not included in the circuit diagram.

The latency of the circuit is about 2 microseconds. This is neglegible in comparison with the latency of 1 millisecond, which is inherently present during every MIDI transfer (serial transfer time of one NOTE ON message).

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