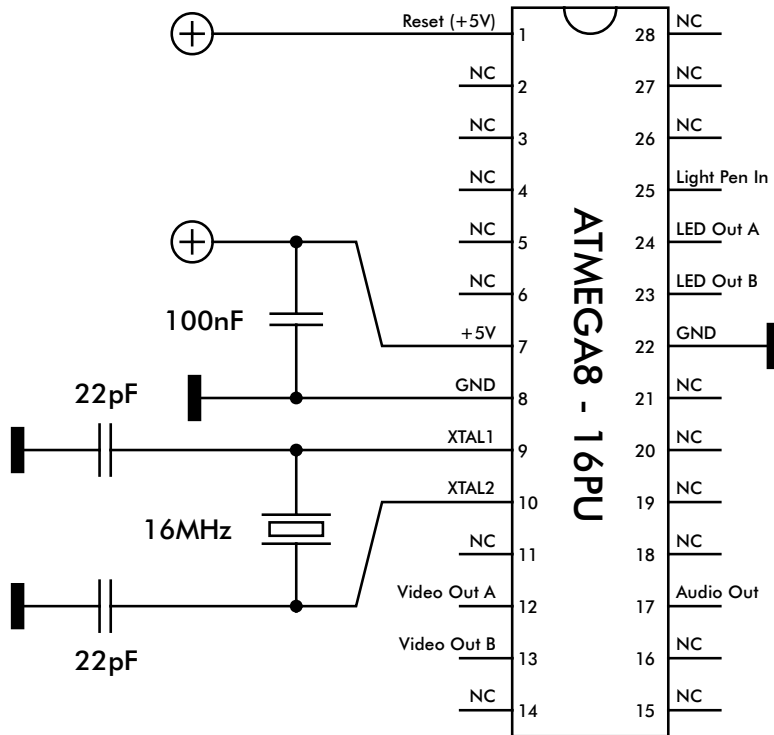


ATMEGA16

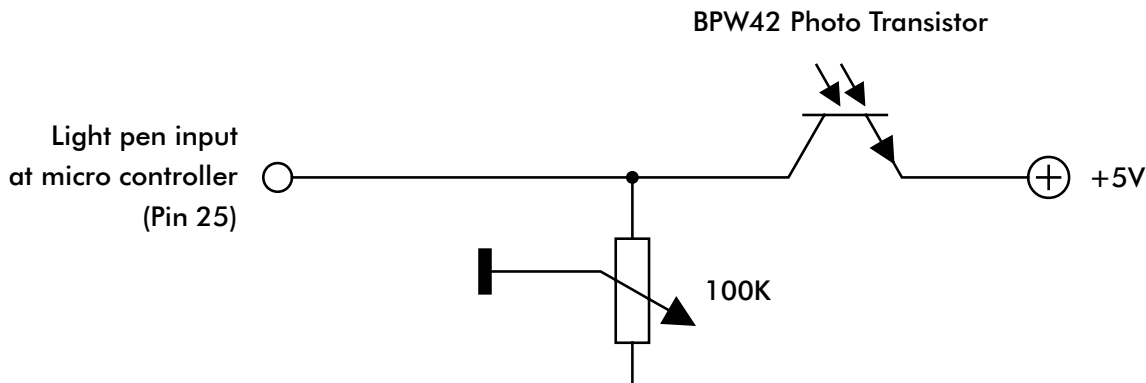
LIGHT PEN CONTROLLED A/V SYNTH

Microcontroller pinout and basic setup:



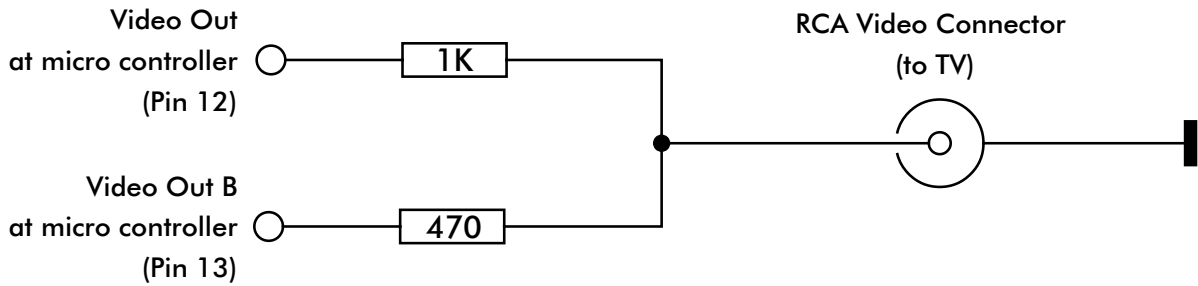
Place 100nF capacitor, 16MHz crystal and 22pF capacitors close to the chip.
GND = Negative pole of power supply, NC = Not connected

Light pen circuit:



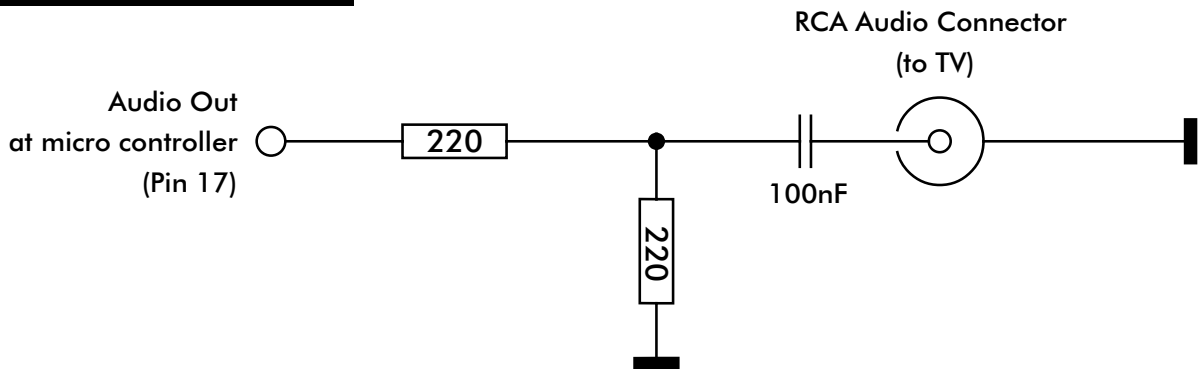
The light pen circuit is a simple voltage divider.
The sensitivity of the light pen can be adjusted with the poti.
The BPW42 photo transistor looks like a clear LED. Its **short** leg goes to the +5V power supply.

Video output circuit:



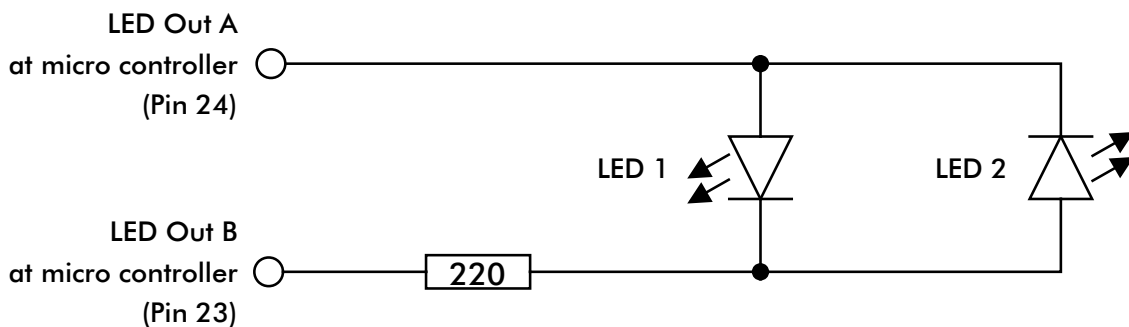
By switching the two digital output pins at the controller LOW (0V) and HIGH (5V), this circuit can generate 4 different analog voltages:
0V for the sync signal, 0.3V = black, 0.7V = grey and 1V = white.

Audio output circuit:



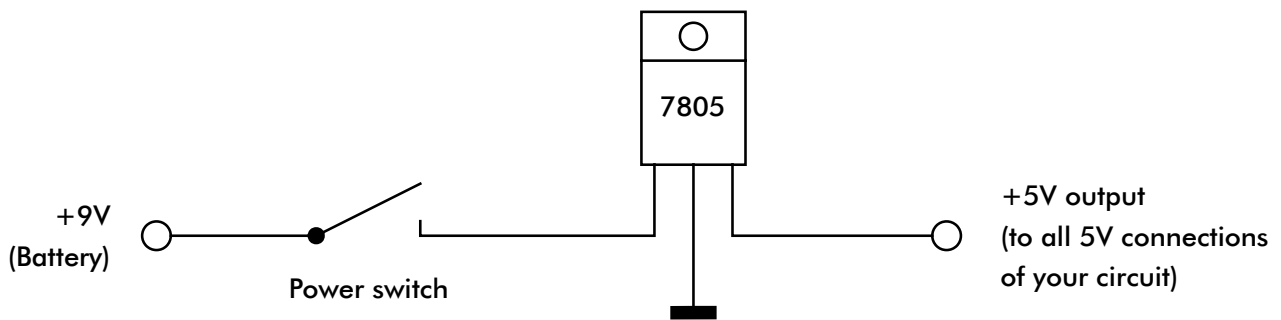
The digital output pin of the controller oscillates between 0V and 5V.
The voltage divider reduces this to a lower range of 0V and 2.5V.
For good engineering style you can also add the 100nF decoupling capacitor.

LED circuit:



By switching either 'LED Out A' HIGH and 'LED Out B' LOW or vice versa, these two LEDs display if the pen is on the screen or not. This is handy to adjust the sensitivity of the pen.
LED 1 lights up if the pen is on the screen, LED 2 lights up if it is not.

Power supply circuit:



A good way to operate your circuit is to use a 9V battery and a 7805 voltage regulator which reduces the voltage to stable 5V. Also a power switch is useful if you don't want to disconnect the battery after every noise session.

Parts list:

IC's:

ATmega8 Microcontroller
7805 Voltage regulator

Clock:

16MHz Crystal

Resistors:

100 K Ω poti
1 K Ω
470 Ω
3x 220 Ω

Capacitors:

2x 22pF
2x 100nF

Photo transistor:

BPW42

LED:

2x standard LED's

Mechanical:

Switch
2x RCA Connector
9V Battery clip

