Sampler based on the ISD1416, with microphone input

The circuit is based around the ISD1416 chip, which can record and playback sound of a maximum length of 16 seconds.

The chip is NOT soldered directly on the board. In the package is a chipholder, which is soldered onto the board. The chip is then only placed onto the circuit when all the soldering is done.

The pins of the chip are numbered from 1 to 28, starting at the upper left, going down, then going up again on the right side. The top of the chip is indicated by a little cavity. See also the picture.

The schematic explains how the circuit should be built up.

Some of the capacitors and the LED have a polarity. In the circuit a '+' is indicated. The +-side corresponds to the longest leg on the capacitor or LED.

Some tips:

First create a layout on the board for the components before soldering them. Put the chip in the middle and try to fit the other components around it.

For the wires: try to stick to a colour scheme for the type of signal that the wire corresponds to. It is a convention to use red for the Vcc wires and black for wires going to ground.

How does it work:

Pushing record, the sampler will record. If you release the button it will stop recording. During recording the LED is burning.
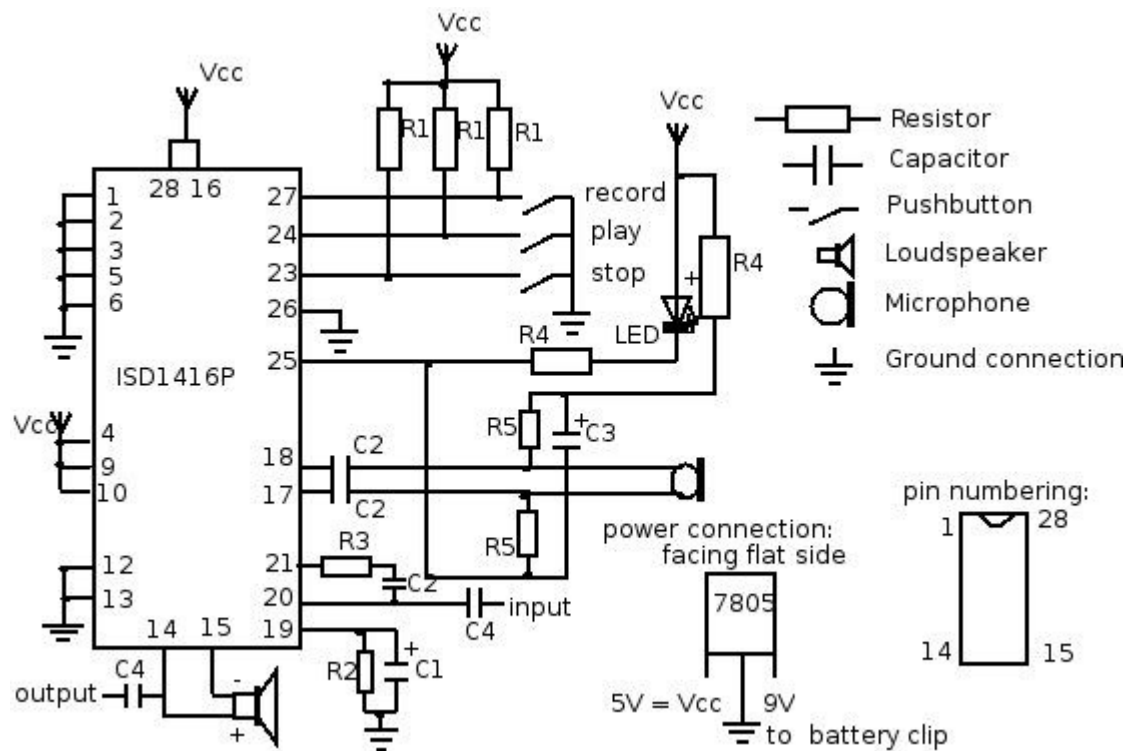
With play, you can start the playback of your recording. The playback will automatically loop.

With stop, you can stop the playback. Alternately, if you keep it pressed the sampler will play as long as you press the button.

Modifications:

If you do not want the sampler to automatically loop, then you should not connect pin 4 of the chip to Vcc but to Ground. You could also take an extra 100kOhm resistor and connect a switch to turn looping on or off. This has to be done in a similar way, as in which the record and play buttons are connected.

If you do not want to use the microphone for input but a line-in, you can attach an audio input connector to the capacitor which in the schematic says 'input'.
If you want to use a line-out for the output, then you can attach an audio connector to the capacitor which says 'output'.

Ingredients

Resistor

R1 - 100 kOhm - (brown, black, yellow) - 3
R2 - 470 kOhm - (yellow, purple, yellow) - 1
R3 - 5.1 kOhm - (green, brown, black, brown) - 1
R4 - 1 kOhm - (yellow, purple, red) - 2
R5 - 10 kOhm - (brown, black, orange) - 2

Capacitors

C1 - 4.7 uF - (check polarity!) - 1
C2 - 100 nF - 3
C3 - 220 uF - (check polarity!) - 1
C4 - 47 nF - 2

Furthermore

3 pushbuttons (for record, play, stop)
Battery clip for 9V battery
Board
Voltage convertor (78L05)
ISD1416P chip
Chip sockel for ISD1416P
Electret Microphone
Loudspeaker
LED
a bunch of wires....
Optional: 2 (mini-)jack connectors (input and output)

Without microphone input and speaker output, you can save yourself some parts
and soldering: