

RADIOPHONICS BODY PLAY AND VOICES FROM THE GRAVE

Fighting against ignorance, male egocentric stupidity and selfish criticism etc. has taken many different shapes during history. At quEAR! 2013 we will open up a new quearfighting shape! We will build and play with circuit bending, using radiocassette devices, and then making full body interaction with those devices to generate and modify their sounds and noises. The plan is to also build a „Voices From The Grave Electronic Circuit“ which will generate homo-noise from the zombie underground that will make normal people freak out.

Workshop Parts:

1. x. piezo electrico
y. radios
2. intro circuit bending
3. kits (circuitos a ensamblar): voices from the grave & lm386 amplifier

1.

x. Piezo electrico:

marie, jacques y pierre curie --> efecto piezoelectricidad.cristales y su conduccion

y. Radios

jugar con radios; intro al circuit bending; hablar del tapehead; libros;

2. intro circuit bending

3. Possibles Kits:

- a. Voices from the grave
- b. LM386 Amplifier

1.x.

1880

“Piezoelectricidad”

Jacques, Marie y Pierre Curie descubren la “Piezoelectricidad”(o efecto piezo electrico), propiedad de algunos cristales de generar cargas eléctricas cuando son sometidos a presión, así como de transformar en vibraciones mecánicas la energía eléctrica que les es aplicada.

Podríamos considerar este descubrimiento como el inicio de la electrónica moderna, ya que su corazón se basa en los osciladores de cuarzo.

Efecto piezoelectrico: (del griego piezein "estrujar o apretar") es un fenómeno presentado por determinados cristales que al ser sometidos a tensiones mecánicas adquieren polarizacion electrica en su masa, apareciendo una dif de potencial y cargas electricas en su superficie. Este fenomeno tmb se presenta a la inversa, se deforman bajo la accion de fuerzas internas al ser sometidos a un campo electrico. este efecto es reversible: al dejar de someter los cristales a un voltaje exterior o campo electrico recuperan su forma. Los materiales piezoelectricos son cristales naturales o sinteticos que no poseen centro de simetria. el efecto de una compresion consiste en disociar los centros de gravedad de las cargas + y -. apareciendo los dipolos elementales en

la masa

2 grupos de materiales: los que poseen caracter piezoelectrico de forma natural (cuarzo, turmalina) y los llamados ferroelectricos que poseen propiedades piezoelectricas tras ser sometidos a una polarizacion (tantalio de litio, nitrato de litio, berlinita en forma de materiales monocristalinos y ceramicas o polimeros polares bajo forma de microcristales orientados).

observada por primera vez por pierre y jacques curie en 1881 estudiando la compresion del cuarzo. que al someterlo a la accion mecanica de la compresion, las cargas de la materia se separan y esto da lugar a una polarizacion de la carga. esta polarizacion es la causante de que salten chispas. de las 32 clases cristalinas, 21 no tienen centro de simetria.

propiedad inversa:

-si sometemos la placa de material piezo electrico a una tension variable, se comprime y se relaja oscilando a los impulsos de una señal electrica

-si esta placa está en contacto con un fluido, le transmite sus vibraciones y produce ultrasonidos.

cositas interesantes:

la primera aplicacion practica de la piezoelectricidad, que surge de la cualidad de transformar una señal mecanica en electrica es la del sónar.

al final de la la guerra mundial se descubrio que las ondas sonoras producidas por submarinos podian ser detectadas por un trozo de cuarzo sumergido en el agua, en el que se median las corrientes generadas pudiendose detectar de que direccion venia el sonido.

el sonar consta de una sonda (piezoelectrico) que es un transductor, es decir, que funciona con la siguiente sucesion de eventos:

a. emite vibraciones que producen ondas

ultrasonicas en el agua en la direccion del eje polar, es decir recibe su eco.

b. el emisor se mueve para que la onda emitida barra el espacio hasta localizar la direccion en que se encuentra el obstaculo.

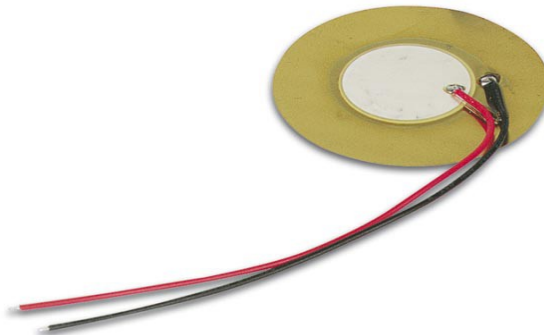
c. el eco recibido golpea el cristal

piezoelectrico y produce una corriente electrica

d. finalmente la distancia a que se encuentra el

obstaculo que reemite un eco, se obtiene aplicando calculos derivador de la teoria del

efecto doppler.



1.y. radios: abrimos radios y jugueteamos
jjjjj!!

2. intro circuit bending

ofrecer pdf de: **Hand Made Electronic**

Music(<https://www.4shared.com/office/sJbjZMy7/>) + **Build your own alien**

instruments(<http://www.sumotorrent.sx/en/details/934174/torrent.html>)

Tickle the clock: from "**handmade electronic music** "

-the majority of the manufactured toys after 1980 are computers dedicated to running one program. In most, a crude clock circuit determines the pitch and speed of sound and light.

--> open and study the circuit. detect passive components:

detecting Passive Components:

-IC: (Integrated circuit): set of electronic circuits of semiconductor material (silicon)

-R: (resistors) are passive electric elements that "burn" electric energy. They are used for setting the voltage drops. (it limits and defines the electric current). different types: a.normal resistors b.variables resist.-->

potentiometer + LDR

-C: (Capacitors) passive 2 terminal electric component used to store energy electrostatically in an electric field.

Ohm's law states that: the current of a conductor between 2 points is directly proportional to the potential difference across the 2 points. $P=VI$ $I=P/V$ $V=IR$
 $I =V/R$ I =current(A) V = potential diff R =resist (ohm) R in this relation is constant independent of the current.

R is the inverse of conductance $R=1/C$

After detecting the different components:

SMD is surface mount devices

we look for R lying near IC flanked by a disk or square capacitor.

put our hands, fingers, wet fingers to detect it.

Hack the clock: from "handmade electronic music"

wet fingers will make the clock run faster. our body will act as another resistor. so as we are connecting 2 resistors in parallel, the one the circuit has and our body, this will act like two tubes where current passes making the current go faster.

To slow it down: we need to make the resistor larger. when we are sure which one is the resistor near the IC we unsold it and replace it for a large one.

Adding a pot: normally we will need a pot larger than the resistor. so we will use a 1Mohm poten. Resistance between A&C is fixed. When you rotate clockwise the resist between B&A(outer terminal) goes up for 0 to 1Mohm. While resistance goes down between B&C. Connect B&C.

Mostrar y pasar pdf "Build your own alien instruments" de reed ghazala.

Aplicar lo aprendido en las radios y o juguetes

3. Kits

x.Voices from the grave → <http://thedeathmarch.wordpress.com/2013/09/03/voices-from-the-grave-lm386-ic-evil-genius-power-supply/>

This a device that will magically receive whispers and voices from beyond the grave, or at least it will sound like. Project taken from book "**51 high-tech practical jokes for the evil genius**" by Brad Graham and Katy McGowan chapter 6 pg.22 Project 22-Voices from the grave. → <http://es.scribd.com/doc/150251470/51-High-Tech-Practical-Jokes-for-the-Evil-Genius>

This circuit has an *infrared light* that carries an audio signal generated by a *transmitter* that can be plugged into an audio source used to generate the ghost sounds or voices. As the audio signal is carried on a beam of weak infrared light, the recieved audio will seem to fade in and out. The unit will also pick up kinds of bizarre buzzing and crackling sounds from stray light sources.

To construct this device we need to mount 2 small circuits both using the same IC. A **trasmmitter** taking sound from an audio source and a **reciever** that will also amplify the sound.

The trasmitter unit can be done from a TV remote cause we will be using the infrared light from it and use it as a good place to hide the circuit so people dont catch you.

A commercial example of this device can be found by looking at any wireless headphone system that uses infrared leds to trasmit the signal instead of radio frequencies. Our device is not as complex as this one, so it will suffer signal dropouts and a lot of noise interference.

To send audio we need to modulate the infrared led with some audio source feed through a low-power amplifier. The lm386 1-watt audio amplifier IC is perfect, will require only a single resistor to limit the led current and a capacitor to remove any DC voltage from the audio source input.

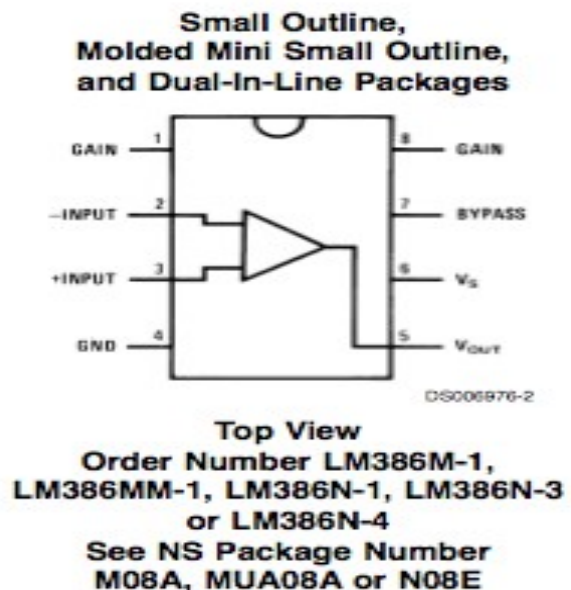
We will use a 9volt battery that will allow the reciever to work across a large open space, even around some corners if the wall is able to reflect the invisible infrared light.

The 100ohm resistor can also be swapped for a lower value between 10 and 50 ohms if you ant to try pumping up the output from the infrared LED.

We have the option of using or not the PCB. Cause the circuit is very simple.

LM386 Pin-out: ->

Pin 1: Gain
Pin 2: Input -
Pin 3: Input +
Pin 4: Ground
Pin 5: Vout (Output)
Pin 6: Vs (Power)
Pin 7: Bypass
Pin 8: Gain



Esquemático del trasmitter

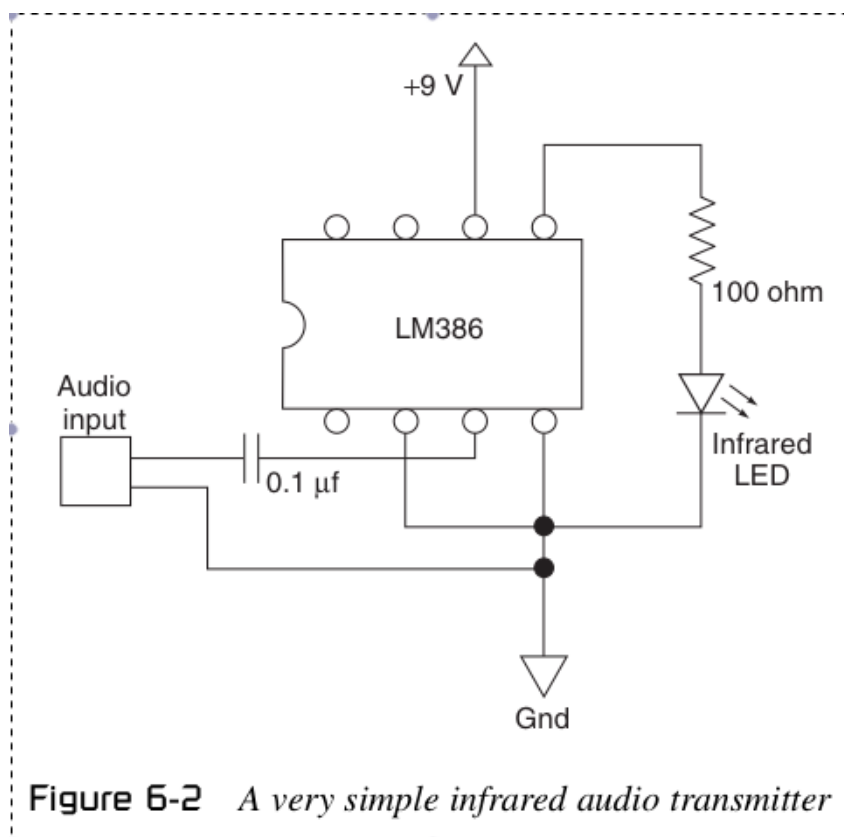


Figure 6-2 *A very simple infrared audio transmitter*

Reciever also uses an LM386 1-watt audio amplifier IC. Differences from the schematics are that this one uses a speaker or a pair of headphones, and that does not use the infrared LED anymore, the input now takes the form of an NPN phototransistor, which will create a modulated voltage on the input pin of the audio amplifier as it recieves the modulated infrared signal sent from the transmitter unit.

In this case, the input will not be an audio source, it will be the Phototransistor, connected to Voltage source and to the input pin (3) that will detect the modulated signal sent by the infrared led from transmitter circuit.

The IC will work as a amplifier and will have a headphone jack as output so we can connect it to a speaker.

The ghost voices sent by the transmitter will be the loudest sounds heard as long as the transmitter and reciever are pointed in each other's general direction at a distance of less than 30 feet.

The 10microF capacitor can be removed of the circuit or added to a switch if you find that the reciever's output is too loud, as this controls the gain of the amplifier.

Tv will be exceptionally noisy as well as lights..

When done, put it in a box and test to see how much range you can get in a lit room and the a dark room.

Esquemático del reciever:

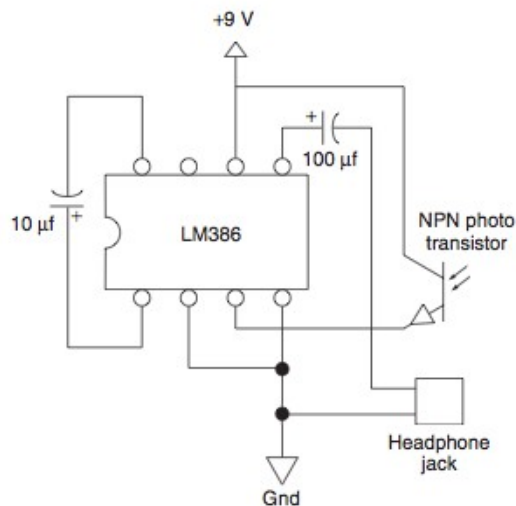


Figure 6-5 *Infrared receiver schematic*

y. LM386 OP AMP CHIP: is a low voltage audio poer amplifier. Is designed for use in low voltage consumer applications. Adding some external components to the IC you can create an Amplifier with gain 200 using a 9volt battery. The Gain is internally set to 20 but the addition of an external R between pin 1&8 will increase the gain up to 200.

Applications: AM-FM radio amplifiers, Portable tape player amp, intercoms, TV sound systems, ultrasonic drivers, line drivers, small servo drivers, power converters.

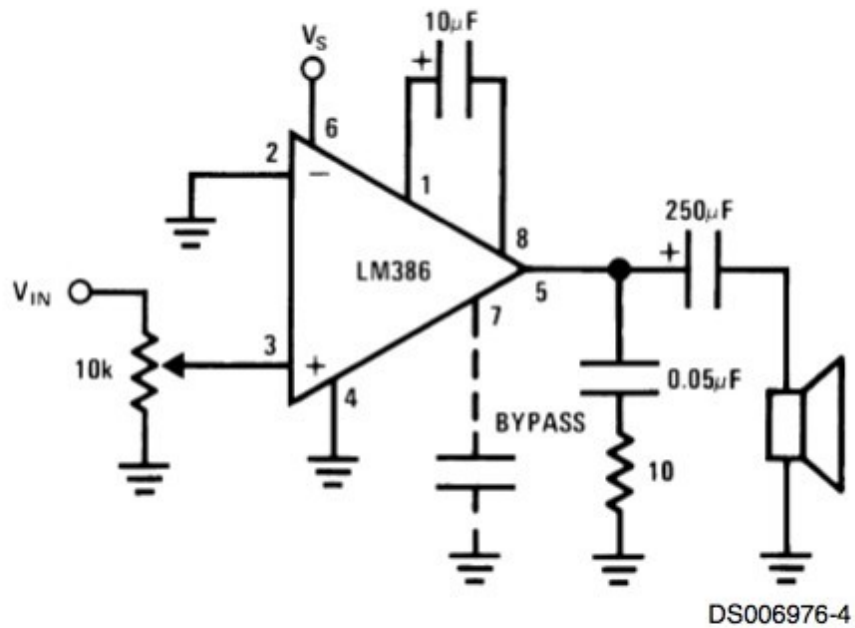
Gain: ability of a circuit to increase the power or amplitude of a signal from the input to the output.

OP-AMPS CHIPS: Op-amps are perfect when you need to take a signal and have it go much higher than the original, for example doing audio amplification. Wikipedia has a great history of the op-amp and it's development.

LM386 is made specifcly for low voltage applications. Different op-amps will have different requirements, always check out the data sheet! The LM386 can take 4V-12V or 5V-18V depending on the wiring and pump that up 20 to 200 times.

The most interesting part about this chip i feel is the gain function. If you put a capacitor between pins 1 and 8, you can control the amount of gain the amp has. The bypass allows you to access the input un-amplified, if you so desire.

Amplifier with Gain = 200



Another nice amplifier using TDA2030, for those who would like to go further on building a DIY Amplifier, can be found here:
<http://thedeathmarch.wordpress.com/2013/08/12/nice-amplifier/>