

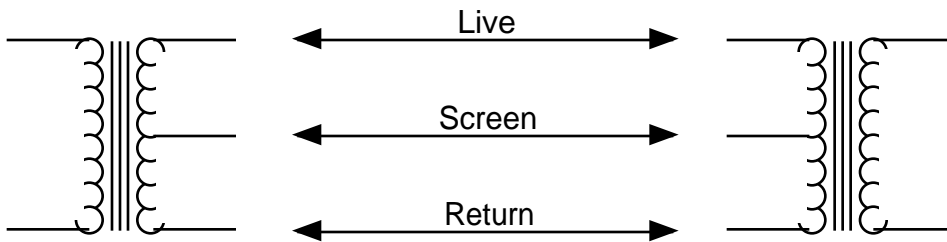
# Balanced Lines



Z stands for 'impedance'.  
To impede is to resist hence impedance = resistance.  
Hi z = high resistance. Lo z = Low resistance.

Typical values would be:  
50k ohms is high (guitar, keyboard tape machine outputs etc)  
600ohms is low, only mics use this impedance.

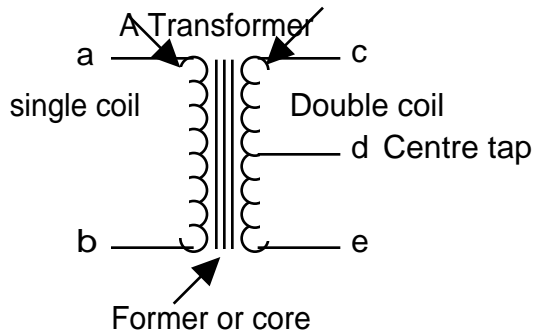
# Connections



The coils of the transformer are wired anti phase!  
1 clockwise, the other anti clockwise.  
This cancels out any hum pickup.in the cable length.

# What is a Transformer?

- a= Hi z input
- b= Hi z earth
- c= Lo z 'hot'
- d= Lo z "screen"
- e= Lo z "cold"



# XLR Connectors

## XLR Stands for:

X= Ground or screen

L= Live or positive (sometimes called 'HOT')

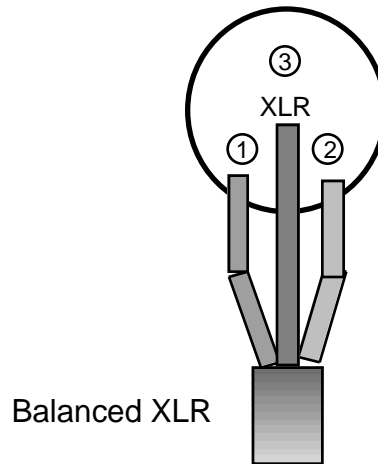
R= Return or negative (sometimes called 'cold')

## The 3 pins are:

1= X

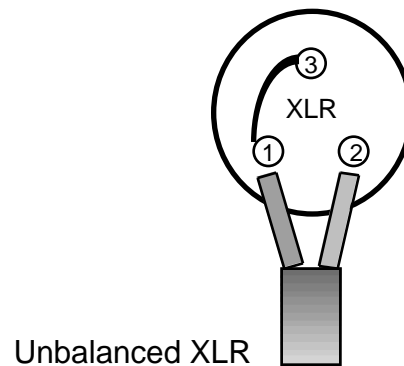
2= L

3= R



For unbalanced connection:

Pins 1 & 3 are wired together.



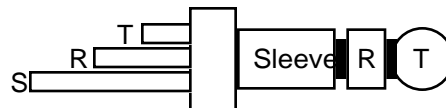
## Tip Ring Sleeve Stands for:

Stereo Jacks have 3 connections:

1. Sleeve= Ground or screen

2. Tip= Live or positive (return on inserts)

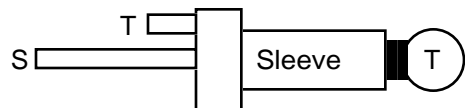
3. Ring= negative (send on inserts)



## Tip and Sleeve:

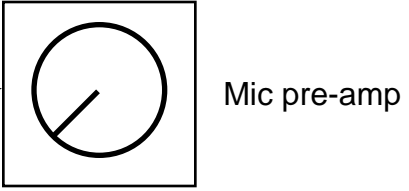
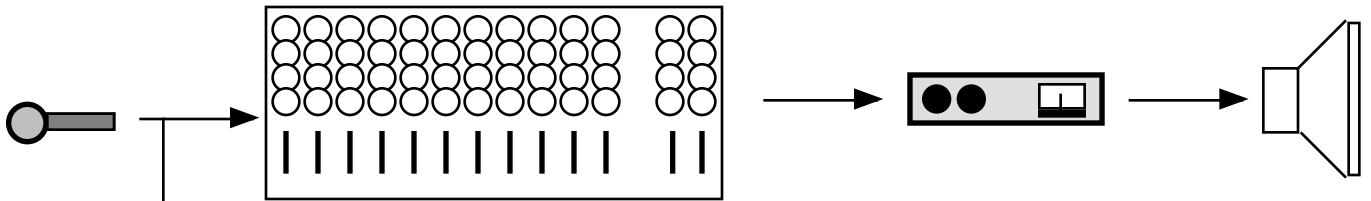
Mono Jacks only have 2 connections:

Tip & Sleeve.

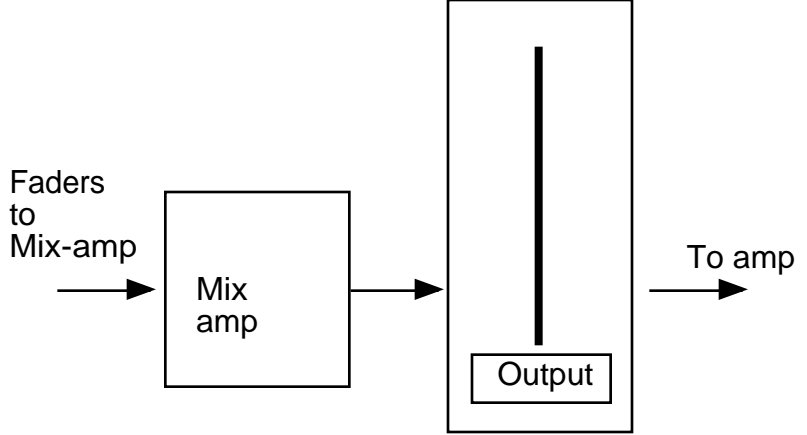
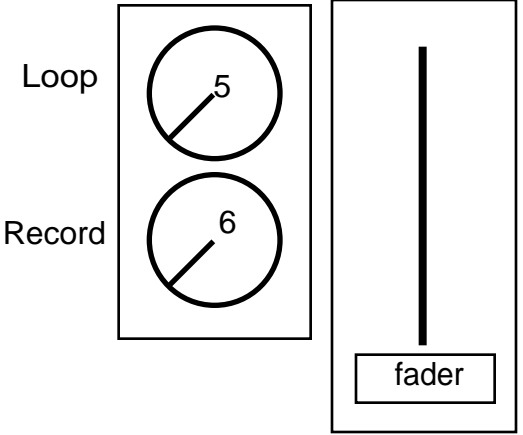
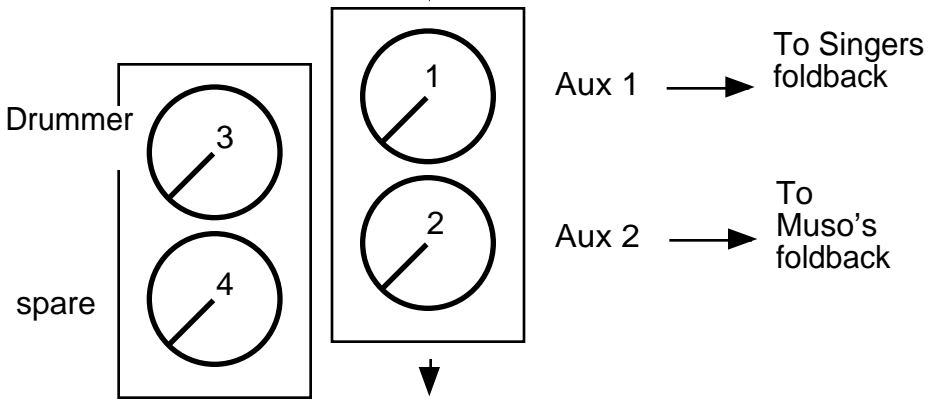
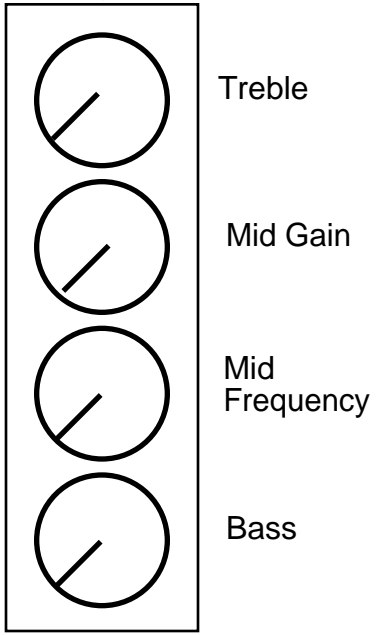


Sleeve is always the longest connector

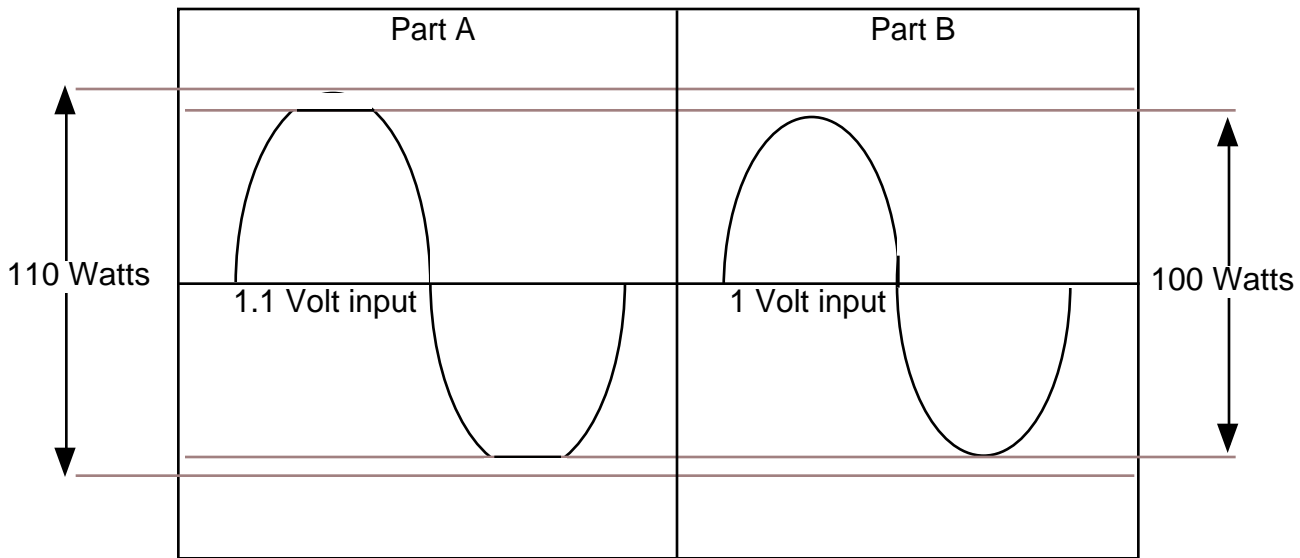
Tip is always the shortest.



Typical signal path and channel gain structure



# Clipped waveform



The output voltage is directly related to the input voltage!

If

1 volt = full output (IE 100 Watts)

then:

1.1 volts = more than full output (IE 110 Watts)

A 100 Watt amp cannot deliver 110 Watts!

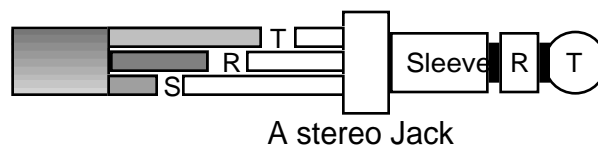
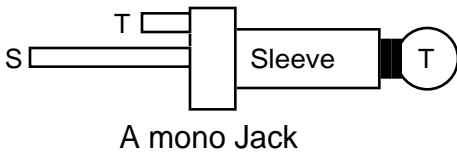
so

The wave will be clipped as in part A

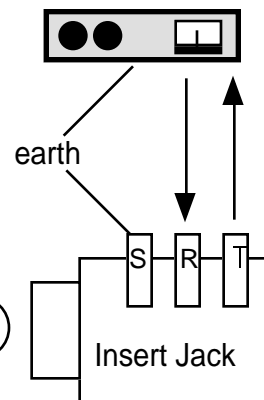
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## Insert points

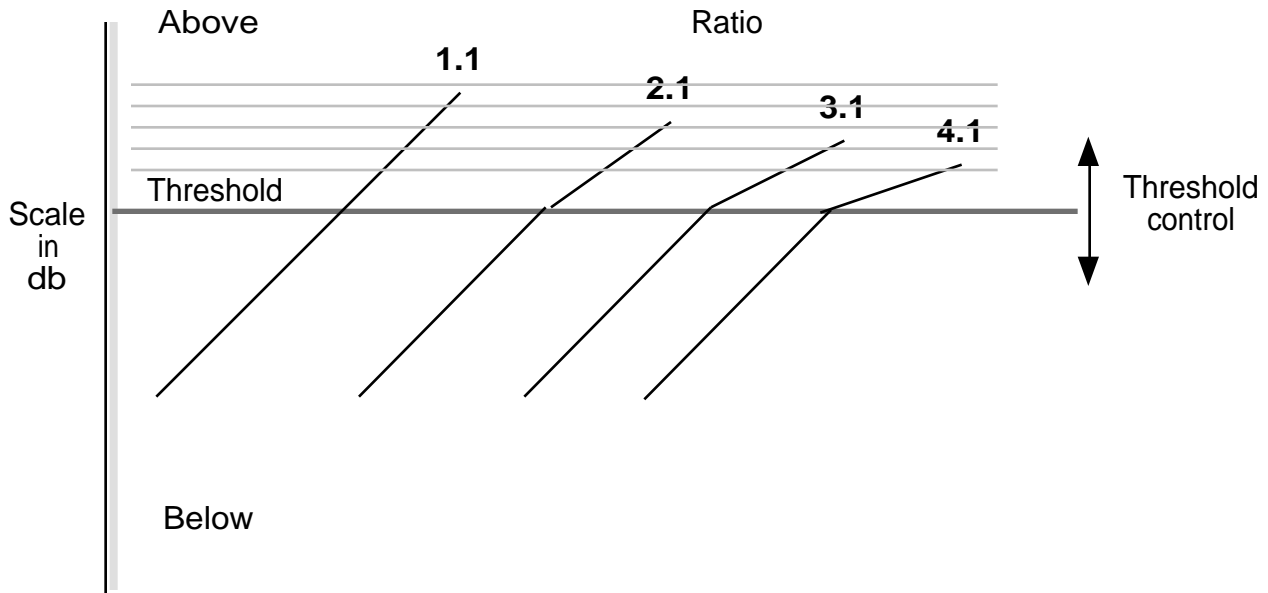
A mono Jack, pushed half way in, can be used to take the signal out to a recorder.



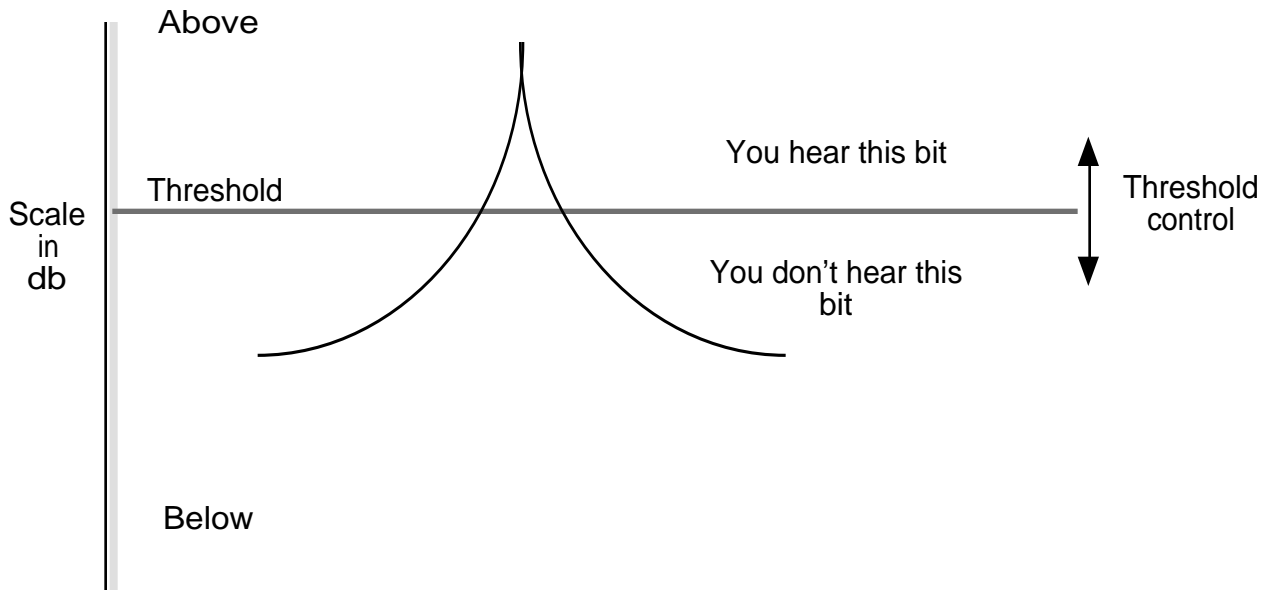
Device:  
Echo  
Compressor  
recorder



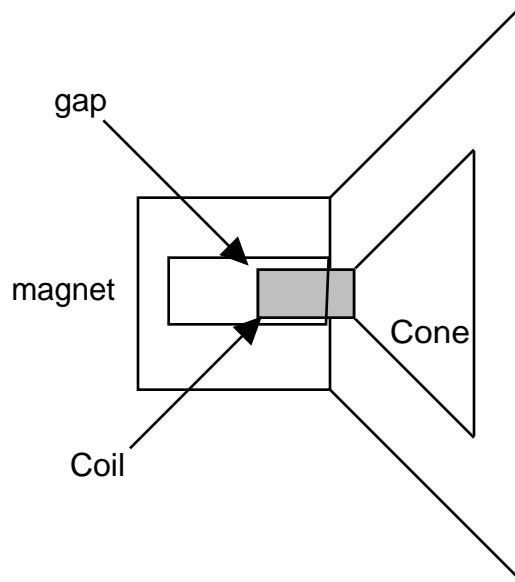
# Compressors



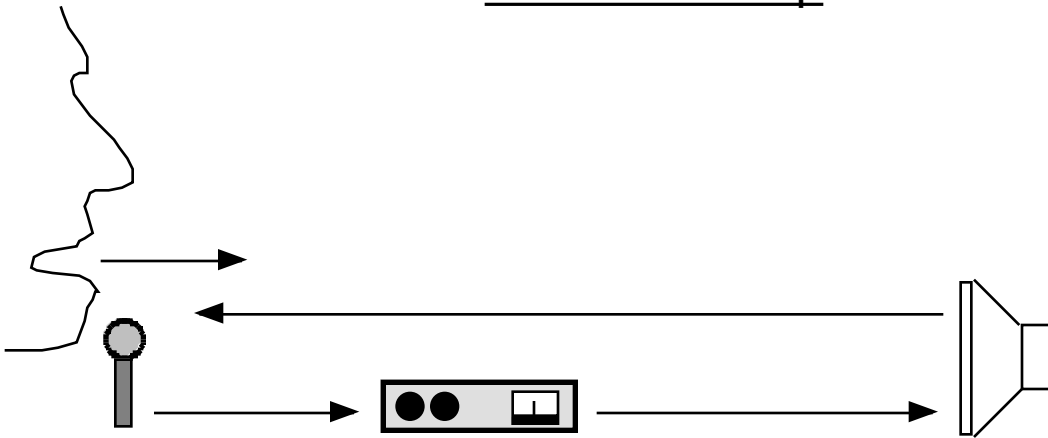
# Gates



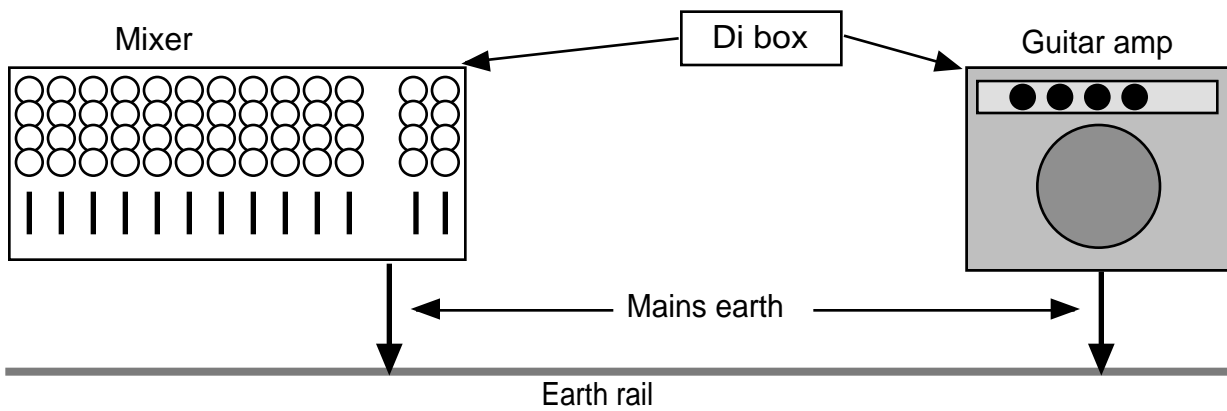
# Speakers



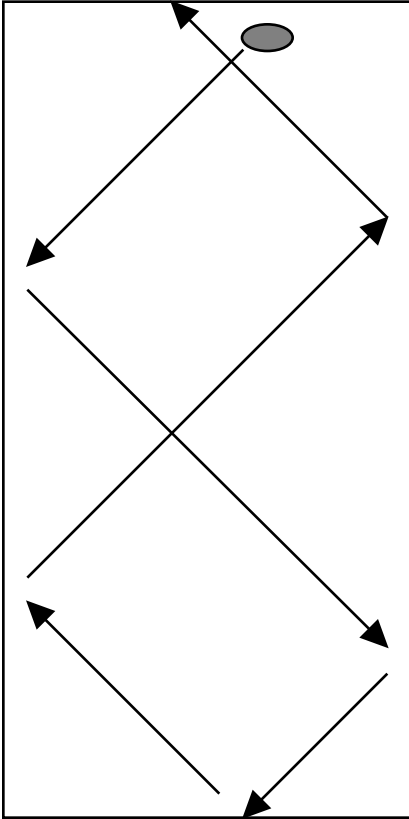
# Feedback Loop



# Earth Loop



# Resonant Frequency



Sound 'bounces' around inside a building. The size, shape, and construction of the walls all play a part on the way sound behaves.

Every room has it's own sound, however large or small it may be. No two are identical.

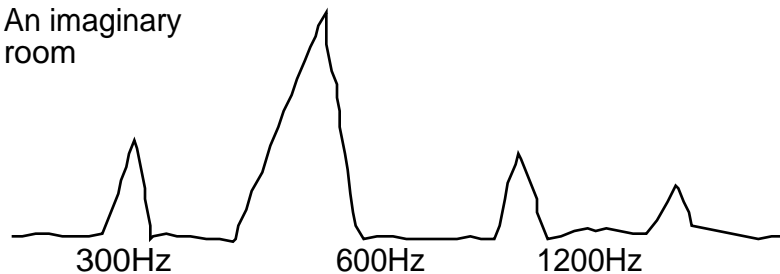
The time it takes for the sound to finish 'bouncing' is called the reverb time.

The actual resonant frequency is determined by the shape of the room.

As the sound 'bounces', it gets coloured by the reflections, or path it takes after hitting a solid wall. The sound waves interfere with one another as they travel, this gives the room it's characteristic sound.

This graph is an imaginary room. You can see a peak at 600Hz. This is the resonant frequency of our room. The sound from the PA is amplified by the room most at 600Hz, hence the mic will feed back first at 600Hz. If we can find 600Hz on the equaliser and reduce it, we will be able to get the mic louder before feedback.

An imaginary room



This then is the key to a good sound.  
The channel equaliser is your best friend.