Microphone

The microphone is the front-end of almost all sound engineering activities and, as the interface between real acoustic sound traveling in air and the sound engineering medium of electronics, receives an immense amount of attention

Different makes and types of microphones sound different to each other, but the differences don't make or break the end product, at least as far as the listener is concerned.

There are two ways we can consider microphones, by construction and by directional properties.

Basic 3 types of Microphones

- Dynamic
- Capacitor or Condenser
- Ribbon
- Lapel Mics

Dynamic Mic

This is ‘dynamic’ as in ‘dynamo’. The dynamo is a device for converting rotational motion into an electric current and consists of a coil of wire that rotates inside the field of a magnet. Re-configure these components and you have a coil of wire attached to a thin, lightweight diaphragm that vibrates in response to sound. The coil in turn vibrates within the field of the magnet and a signal is generated in proportion to the acoustic vibration the mic receives. The dynamic mic is also sometimes known as the moving coil mic,

Capacitor or Condenser Mic

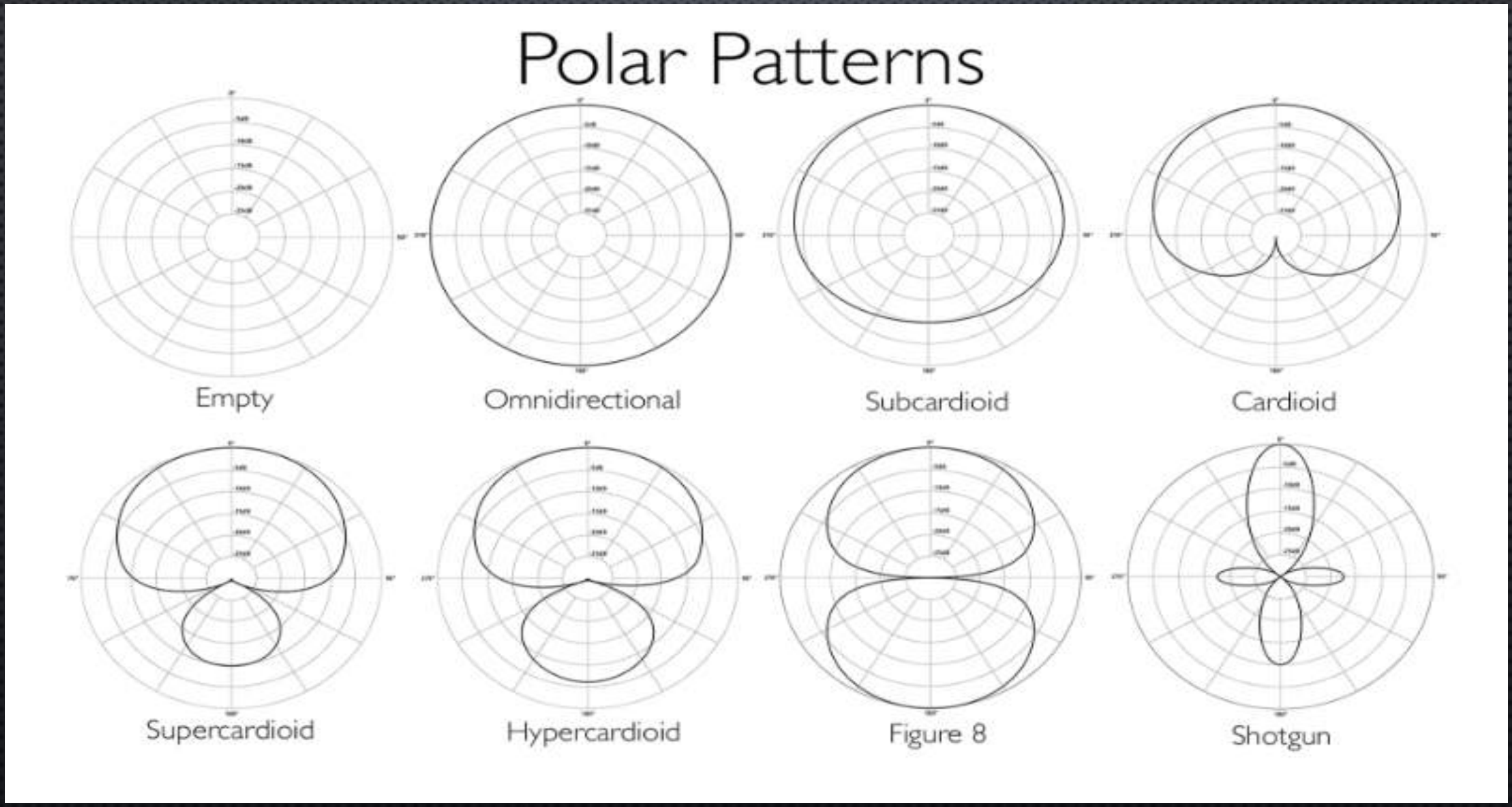
The great advantage of the capacitor mic is that the diaphragm is unburdened by a coil of any sort. It is light and very responsive to the most delicate sound. The capacitor mic is therefore much more accurate and faithful to the original sound than the dynamic.

Ribbon Mic

Ribbon technology dates back to the earliest days of microphones. Photos from the golden age of broadcasting are filled with presenters speaking into classic ribbon mics.

use an ultra-thin (wait for it) ribbon of electro-conductive material suspended between the poles of a magnet to generate their signal.
Early ribbon designs were incredibly fragile. Moving them improperly, or even subjecting them to high SPL could cause the ribbon to break.
But their sound was worth the trade off in durability. Ribbon mics are prized for their warm, vintage tone.

Polar Patterns of a Microphone



Audio Equalization

Equalization, or *EQ* for short, means boosting or reducing (attenuating) the levels of different frequencies in a signal.

2 basic type of EQ that home audio systems have is Treble & Bass, which controls the entire frequency spectrum

Advanced equalization systems provide a fine level of frequency control. The key is to be able to adjust a narrower range of frequencies without affecting neighbouring frequencies.

Example : If a sound was recorded in a room which accentuates high frequencies, an equalizer can reduce those frequencies to a more normal level. Equalization can also be used for applications such as making sounds more intelligible and reducing feedbacks.

Types of EQ

Shelving EQ
In shelving equalization, all frequencies above or below a certain point are boosted or attenuated the same amount. This creates a "shelf" in the frequency spectrum.

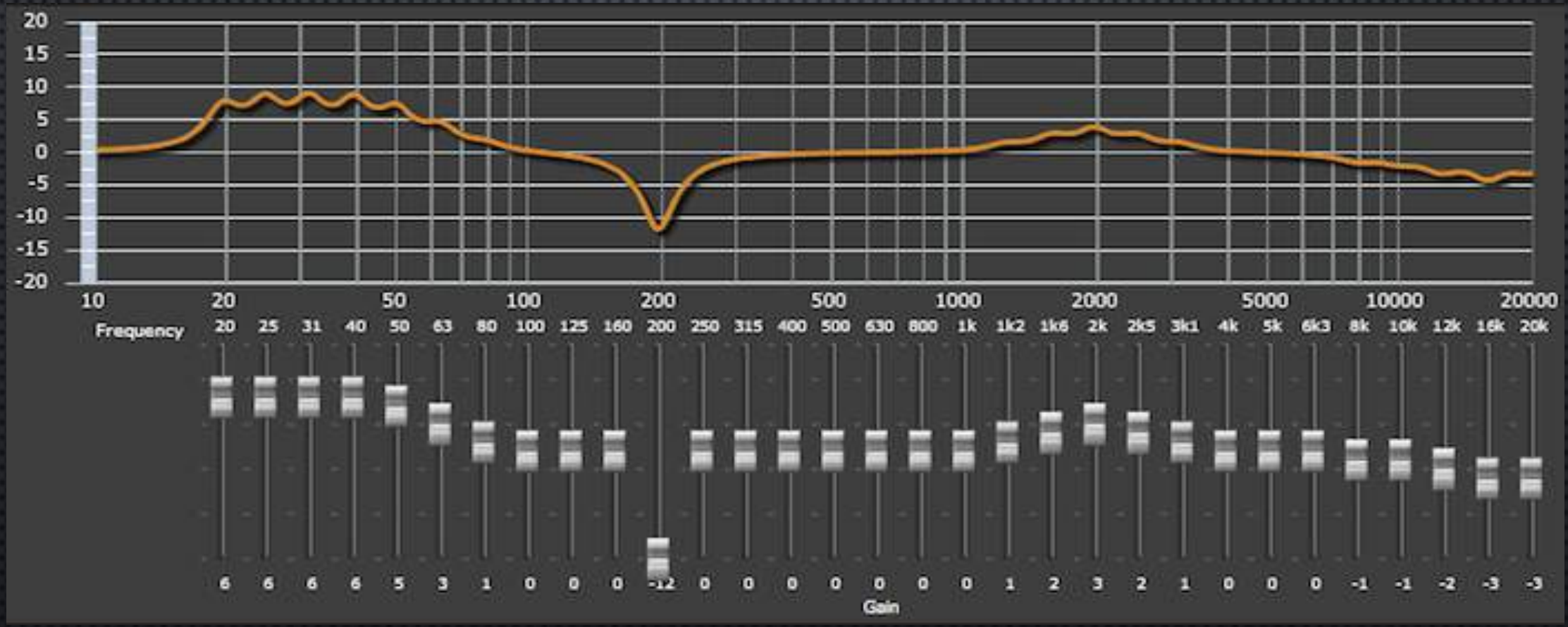
There are 2 types of shelves – the high shelf and low shelf, High shelf can be applied to the trembly high end of sound frequency, while low shelf to the bass bottoms .

Low shelf is good for cuts and boosts on bass, solo acoustic guitar, strings, piano, and anything that needs more low end taming or power . High shelf boosts can be used to add crispness to hats, cymbals, shakes and vocals

Bell EQ
Bell equalization boosts or attenuates a range of frequencies centred around a certain point. The specified point is affected the most, frequencies further from the point are affected less.

Graphic EQ

Graphic equalizers provide a very intuitive way to work — separate slider controls for different frequencies are laid out in a way which represents the frequency spectrum. Each slider adjusts one frequency band so the more sliders you have, the more control.



Parametric EQ

Parametric equalizers use bell equalization, usually with knobs for different frequencies, but have the significant advantage of being able to select which frequency is being adjusted. Parametric are found on sound mixing consoles and some amplifier units (guitar amps, small PA amps, etc).

A parametric EQ has 3 basic controls, Level, Frequency, and "Q", or width of the section of the spectrum you are adjusting

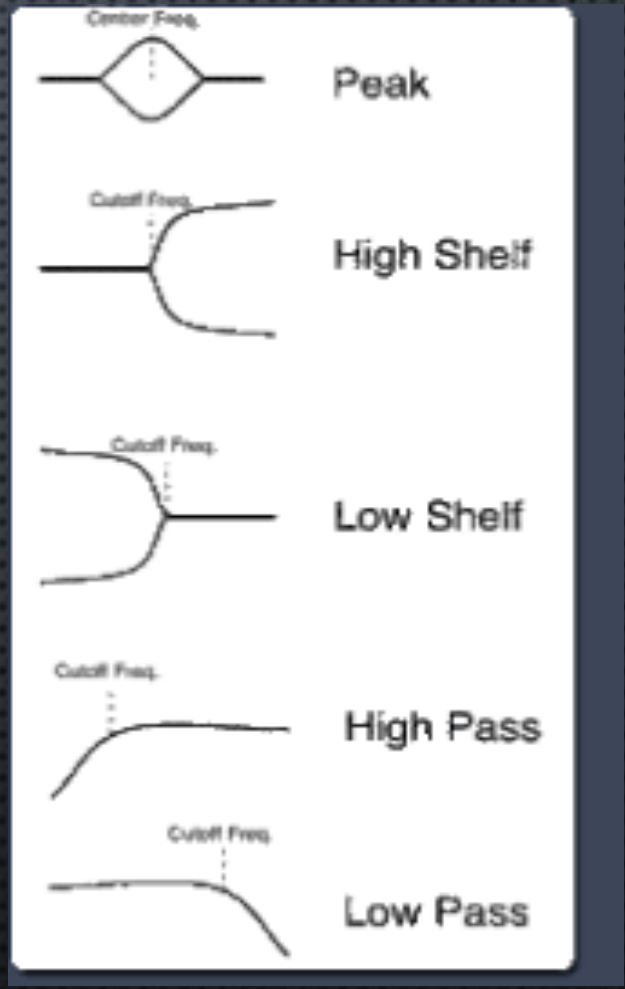
Audio Spectrum

Frequency Range	Frequency Values
Sub-bass	20 to 60 Hz
Bass	60 to 250 Hz
Low midrange	250 to 500 Hz
Midrange	500 Hz to 2 kHz
Upper midrange	2 to 4 kHz
Presence	4 to 6 kHz
Brilliance	6 to 20 kHz

Filters

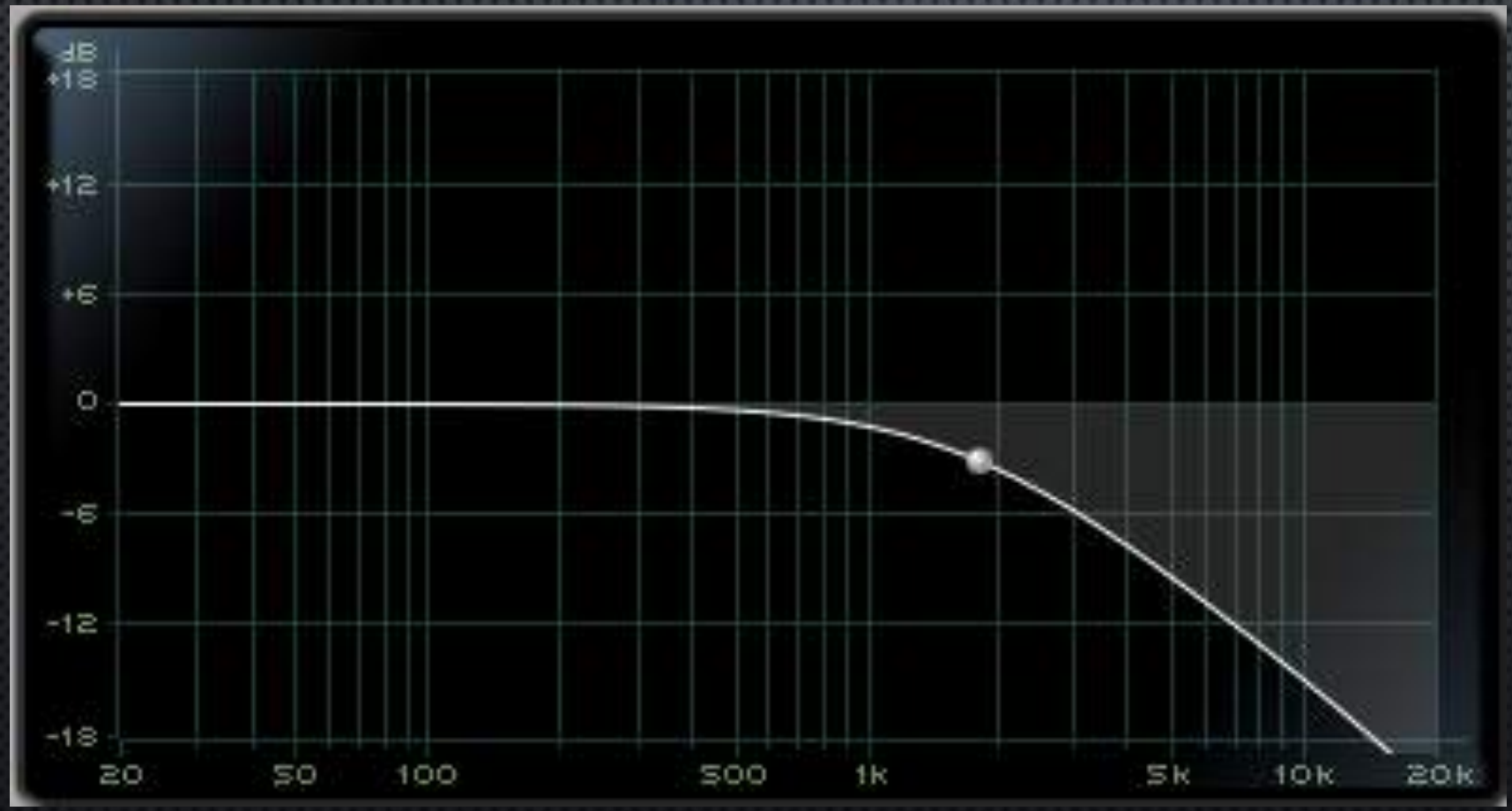
The filter is the simplest form of equalizer.

A filter removes bands of frequencies. It never boosts. There are five principal types of filter



Types of Filters

Low Pass Filter: where low frequencies are allowed to pass through but high frequencies are reduced in level (‘attenuated’).



High Pass

High-pass, where high frequencies are allowed to pass through but low frequencies are reduced in level.

Band Pass

Band-pass, where both low and high frequencies are attenuated; mid frequencies are allowed through.

Band Stop Filter or Notch filter

Band-stop, where both low and high frequencies are allowed to pass, but a region in the mid-band is attenuated.