# Nat3
Technological terms/ processes/controls & effects

| National 3 | beat | backup copy | delay |
|---|---|---|---|
| | capture | format mix/mixing/balance | EQ (equalisation) |
| | channel | normalising | gain/trim |
| | distortion/overload | sampled | mono(phonic) |
| | dry/wet | save | panning |
| | frequency (hertz, kHz) | audio/stereo master | playback |
| | microphone | USB (port) | record |
| | MIDI | | reverb(eration) |
| | sequenced data | | stereo(phonic) |
| | session log | | time domain |

# Nat 3 Technological Terms

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|---|---|
| beat | The basic pulse you hear in music. The pulse may be in groups of two, three or four with a stress on the first beat in each group.  e.g here the bass and snare play on the beat |
| capture | the process of recording music. |
| channel | each instrument is assigned a channel to record into. This is the name given to the track that is being recorded. |
| Distortion/overload | This is the term for having **too much audio signal gain** on a channel during the recording process.<br>With the audio signal input gain set too high, the signal will overload and distort, which is indicated by a red light on the channel.  **Distortion can also be used deliberately as an effect on electric guitar.** |
| Dry/wet | The amount of audio signal to which an effect is mixed.<br>Completely set to 'dry', no effect will be added. Completely set to 'wet', only the effected signal will be heard. The balance can be altered infinitely between these two extremes.<br>**Mix**, also known as wet/dry **mix**, **controls** how much of your wet signal (signal with **reverb**) is **mixed** into your dry signal (without **reverb**). |
| Frequency (hertz, kHz) | The rate per second at which an oscillating body vibrates.<br>Usually measured in Hertz (Hz), humans can hear sounds with frequencies in the range of 20Hz to 20kHz. |
| microphone | A device (transducer) that converts sound into an electrical signal.<br>You will mainly use dynamic or condenser mics. Dynamic mics are robustly made and can handle very loud source signals, such as guitar amps and drums. Dynamic mics are typically used for live vocals.<br>Condenser mics have a greater frequency response, especially for high frequencies, and are great for acoustic instruments and recording vocals in a studio. |
| MIDI | Musical Instrument Digital Interface.<br>A digital language that enables devices to talk to one another in a standardised format. While MIDI was originally devised for keyboards and musical instruments, more and more effects processors and devices are responding to it and may be programmed using MIDI. |

# Nat 3 Technological Terms

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| Sequenced data | Information relating to the input of MIDI data in the form of note information (length, velocity, etc) and associated controllers. |
| Session log | Used to capture information about a recording session such as track information on signal gain, type of microphone/DI, how many takes to achieve recording, EQ, compressors, noise gates, panning and effects. |
| Track (names/ list | A single channel of recorded audio. Can also be the final finished product |
| Virtual instrument tracks | Virtual instruments are generally controlled via a MIDI input.<br>They emulate the sound of a wide range of instruments and are commonly used in recording studios. It is normal on a digital audio workstation for a special track to be created for a virtual instrument, which can be assigned a MIDI channel in order to control it. |
| volume | Used to describe how loud or quiet a source of sound is. |

# Nat 3 Processes

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| backup copy | An additional copy made of data and used in case the original copy becomes corrupted. |
| format | The process of erasing a disc drive either for initial use or for setting up file systems. |
| mix/mixing | The act and art of creating a balance of all the recorded tracks, engineering and processing where appropriate and necessary, and creating a two-track stereo-mixed version of the music.<br>The two-track stereo-mixed result is sometimes known as a mixdown or bounce. |
| **Mix** control | **Mix**, also known as wet/dry **mix**, **controls** how much of your wet signal (signal with **reverb**) is **mixed** into your dry signal (without **reverb**).<br> |
| normalising | The process of affecting the overall gain of an audio file.<br>It can be thought of as having the same effect as turning a volume control up or down. Peak normalisation will scan an audio file, adjusting the entire amplitude of the wave by the same amount, based on the peak level. For example, if the track 'peaked' at −6db and the normalisation was set to -3db, the gain of the entire track would be +3db. |
| sampler | A device which can record sounds digitally and then assign a musical pitch so that it can be played as musical notes.<br> Listen to this excerpt in which a dog barking and howling has been sampled and used as part of the song. |
| save | The process of storing a file digitally. |
| audio/stereo master | The final mixed recording of any project.<br>As most replay systems are stereo, the multitrack recording has to be mixed down to a two-track master in order for it to be replayed. |

# Nat 3 Controls & Effects

EQ (equalisation)
https://blog.landr.com/eq-basics-everything-musicians-need-know-eq/

EQ (or equalization) in music is the process of changing the balance of different frequency components in an audio signal. **By using EQ you can selectively cut or boost selected parts of the audio spectrum, useful in shaping the desired sound of a voice or instrument.** Equalisation is used for a variety of reasons for correcting, enhancing, contextualising or blending the sound source. EQ is used in mixing to help reduce the effect of masking so that each instrument can be heard clearly. As with all effects and processes; less-is-more and you can quickly add too much making your recordings sound worse!

*If you want the vocals to sound warmer, cut the highs (6-10kHz) rather than boost the lows. This will only work on vocals that already sound full. If the vocal sounds thin, cutting around 300Hz will only make it sound worse! If you have a muddy mix but the vocals can't afford to lose anything around 300Hz, cut the other instruments around this frequency instead.*
*Muddiness is one of the biggest issues in most mixes. Especially when we have the typical band set up of several guitars and a vocalist. Most of these instruments are centered around 250-350Hz, so we soon get a build up of frequencies in this area.*
***Try a cut of 3-5dB around 300Hz (move it around a bit until you find a sweet spot).***
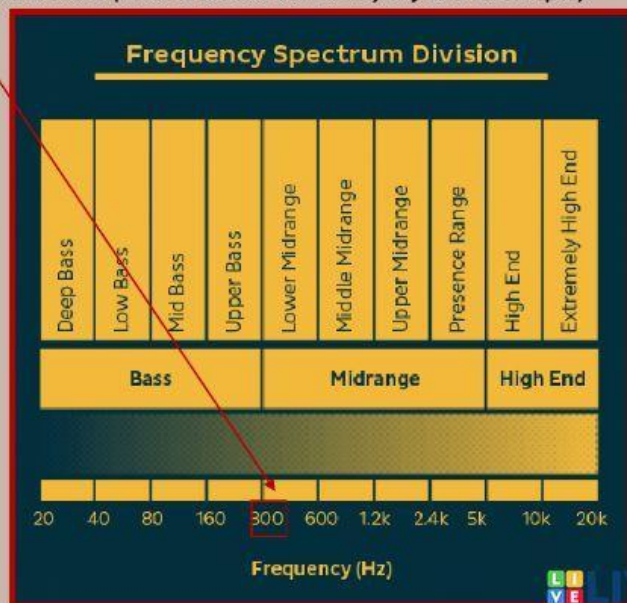
See next page for more detail on Equalisation

### 50 HZ - LOW BASS FREQUENCY
THE LOW EQ BOOST adds fullness to those bass instruments like the kick drum, toms and bass. LOW EQ CUT if they are getting too thick and interfering with the clarity of the low-end of your mix. LOW EQ CUT can also add extra punch to dance music, because it adds a dimension of "feeling" the bass instead of hearing it.

### 100 HZ – MID BASS FREQUENCY
Boosting here will give the low-frequency instruments a 'harder' sound. It adds fullness to guitar and snare. Too much can also clutter up and add boominess so cut in this area for added clarity in the low end. It also adds warmth to piano and horns.

### 300 – 600 HZ – LOW- MID FREQUENCY
Cuts here will increase punch for kick drums. It'll reduce 'boxiness' and give it a thicker sound. Boosting at 400 Hz can add clarity to bass lines, especially when you're mixing for smaller speakers.

### 7 00– 800 HZ – MIDDLE-MID FREQUENCY
Boosting 700 – 900 Hz can bring out the bass line without cluttering up the low end. You're targeting the upper harmonics to make them audible in the mix, all while leaving the bass sound itself alone. Reducing 800 Hz takes out the cheap sound of an acoustic guitar as well as reduce the DI sound of plugged in acoustic guitars.

### 1 – 4 KHZ – UPPER-MID FREQUENCY
Boost 1.5 kHz to increase the string sound of the bass guitar. Cut to reduce nasal sound of vocals.. 3 kHz adds attack to most everything. Gives you more punch out of your acoustic guitar chords. Gives presence to piano parts, especially if you've needed to cut its low-end. It brings out the clarity of the voice. It helps to cut the electric guitars here to make extra room for the vocal if you're having problems with them clashing. Boosting between 2 – 4 kHz brings out the beater of the kick drum.
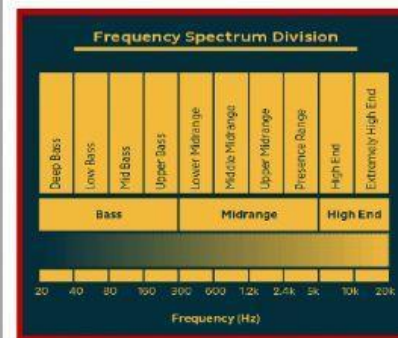
### 5KHZ- HIGH FREQUENCY
Adds extra presence to vocals. Brings more attack to the tom drums. Cuts will make instruments more distant so cut here if you need to pull something back without using volume.

### 7KHZ
Use a de-esser targeting the frequency range between 6 – 8 kHz to reduce sibilance. Exact frequency range depends on the singer. Boosting can add extra life to dull vocals. Boost for more "finger sound" on acoustic bass. Increase to add sharpness to synthesizers, rock guitars & piano.

### 10KHZ AND ABOVE
Most everything above 10 kHz adds air and high-end 'sheen' to instruments. It doesn't always sound good so don't go boosting everything up there excessively. It can quickly result in a trebly and obnoxious high-end craziness.
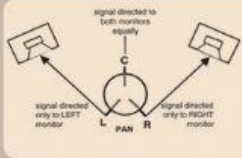
# Nat 3 Controls & Effects

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| delay | *Delay* is an **echo** effect. Delay effects store the input signal—and hold it for a short time—before sending it to the effect input or output. The held, and delayed, signal is repeated after a given time period, creating a repeating echo effect. Each subsequent repeat is a little quieter than the previous one.<br>Delay is different from reverb in that reverb makes the sound 'roomier' whereas <u>delay is a full-blown echo</u>. Delays can be edited so that the speed of the repeat is altered (*time/ rate*), as can the length of time that the echo goes for (*feedback/ release*). *Delay* is best used in moderation and is particularly effective in **solos** and on **ballad vocal tracks.** |
| gain/trim | **The gain control on a mixing console or hardware device is a small <u>signal amplifier.</u>  It** controls the volume being **input into** the channel, <u>not</u> the amount of volume output through the channel.<br>To set a proper mix gain structure the overall S/N (signal to noise) ratio should be maximised. The signal input is the first stage of the signal path of the recording procedure, and it is important when using the gain control of the recording device to capture the best signals to record.<br>*Setting a signal gain too low will mean the engineer has to compensate after the recording (use a compressor) for low-level signals by increasing output volumes; this results in increased noise floor levels. Too much gain on the signal will overload the input circuitry and result in a distorted signal.*<br>*Every microphone, every instrument and each vocalist produces different quality source levels. The gain control allows the engineer to bring each signal source to an equal level for recording purposes.* |
| mono(phonic) | A single channel of audio. *Mono* = One :: *Phonic* = Sound<br>All early recordings were monophonic. Although developed during the 1920s stereo recordings were not available through mass production until the late 1950s. |

# Nat 3 Controls & Effects

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| panning | In audio, a pan control is to position a sound or track in the left/right stereo field. It is critical to the sound design and placing of sounds in the stereo image of your audio mix. The stereo image has two basic perspectives, left to right and front to back. The pan pots control the left-to-right axis. Output Level, *Reverb, Delay, Filtering* and *Ambience* create the front to back. |  |
| playback | To recall and play pre-recorded music. | |
| record | To store a performance onto a medium so it can be played back or edited. | |
| reverb(eration) | **An electronic effect which** imitates natural reflections of sound created in enclosed spaces e.g. halls or stadiums. This creates a sense of space and distance. For example, reverb can make a piece of music sound as if the performance is taking place in a cathedral. **Reverb is the name given to the natural series of very short and dense reflections of a sound that occur in a confined space such as a room or a hall.** While echoes with a longer delay would be discernible, in reverb the echoes happen so fast and are so dense it is impossible for the listener to hear individual repeats. Reverb is the essence of natural sound. Listening to a close mic'd instrument is like having the instrument play in your ear in a very small room. The addition of reverb to a sound makes it appear as if the instrument is being played in a real acoustic environment, for example a church or concert hall. Nowadays reverb can be emulated digitally very easily and nearly all effects processors have a wide range of reverb types for different applications | "Dry" recording of bass and snare drum. i.e. no reverb added.    "Wet" recording. i.e. after reverb has been added. <br><br> https://youtu.be/YZ9XMT5qXXU <br> *This video demonstrates how a singer sounds without reverb, and then how the same voice sounds when reverb is added* |
| stereo(phonic) | A two-channel audio system with the channels designated as left and right. | |
| time domain (effects) | Those types of effects processes that <u>change the time characteristics</u> of an input signal by adding to it. Delay, reverb, chorus, phasing or any of the delay or reverb-related effect variations. | |