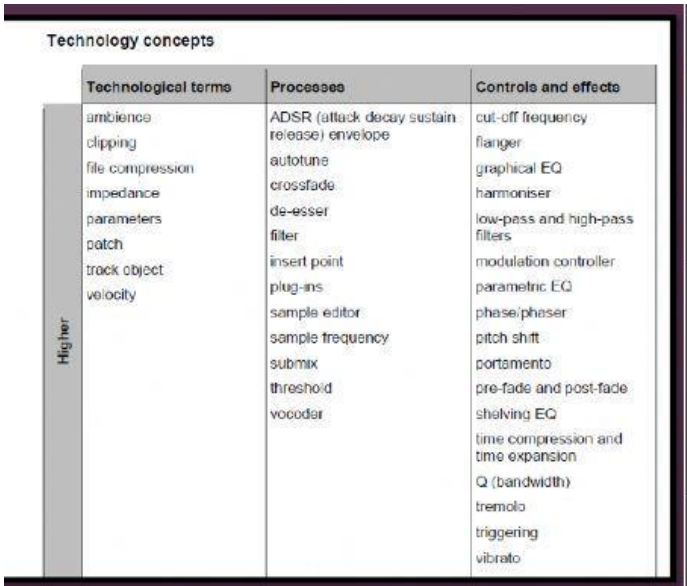


Technology concepts

	Technological terms	Processes	Controls and effects
Higher	ambience	ADSR (attack decay sustain release) envelope	cut-off frequency
	clipping	autotune	flanger
	file compression	crossfade	graphical EQ
	impedance	de-esser	harmoniser
	parameters	filter	low-pass and high-pass filters
	patch	insert point	modulation controller
	track object	plug-ins	parametric EQ
	velocity	sample editor	phase/phaser
		sample frequency	pitch shift
		submix	portamento
		threshold	pre-fade and post-fade
		vocoder	shelving EQ
			time compression and time expansion
			Q (bandwidth)
			tremolo
			triggering
			vibrato

Higher

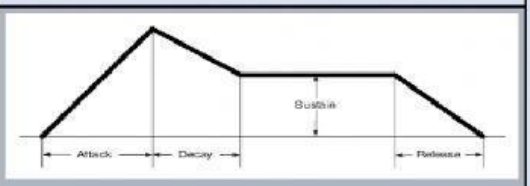
Technological terms/ processes/controls & effects

Technology Concepts

ambience	Similar to a room's acoustic although generally the term only refers to small spaces. Ambience is the acoustic sound generated by a room. With the judicious use of microphone techniques, the ambience of a room in which an instrument is being recorded can be picked up and added to the direct sound of the instrument. This gives a greater sense of space within the recorded sound and can lead to a very natural-sounding stereo image.
clipping	This is where a threshold level has been passed. In digital recording, any signal above the 0db threshold will cause clipping. It can be a severe and potentially damaging form of distortion that happens when a signal is too high for the piece of equipment it is being fed into. This can be particularly damaging to loudspeakers. Manufacturers include many safeguards to avoid clipping in their equipment. It is very important to monitor meters and input lights. Flashing red is never a good sign!
File compression	The conversion of a larger file such as a .wav audio file into an .mp3 file, allowing a greater capacity for numbers of files to be stored. Smaller files also allow easier transfer over networks and the internet. Compressing an audio file does, however, cause a loss in audio quality.
impedance	Impedance is the amount of resistance to the current flowing through an electronic device. It is measured in ohms.
parameters	A variable value that affects an aspect of a device's performance or programming.
patch	The name given to the routing of a signal to an audio recording device. In large setups with many routing options, a patchbay may be used which provides greater flexibility in routing the signal. A patch is also the name given to a preset sound on a synthesiser.
Track object	Data that is recorded in the arrange window of a digital audio workstation.
velocity	A MIDI parameter which registers the force in which a MIDI input device such as a keyboard plays a note. This information is registered and can be edited and adjusted. The velocity of notes can be [illegible]

LIVEWORKSHEETS

Higher Processes

ADSR envelope	**The 'shape' of a sound in relation to time and volume.** **ADSR stands for Attack, Decay, Sustain, Release** One way ADSR envelopes are used is shaping sounds in things like synths. **Attack** is what happens when a sound begins. It is the amount of time it takes for the envelop to reach the end of that first stage, usually the peak level. So, an increased attack time means the sound will fade in more gradually **Decay** is what happens to the sound after the attack phase is complete. It is the amount of time it takes for the envelope to decrease to some specified sustain level **Sustain** is the level at which the sound stays until the note is stopped **Release** is what happens when the sound stops (opposite of attack). It is the time it takes for the output to decrease to zero after the key is released or the sustain instruction ends. So an increased release time means the sound will stay louder for longer – it will fade out more gradually *When a key is pressed, the envelope generator will begin to rise to its full level at the rate set by the attack parameter, upon reaching peak level it will begin to fall at the rate set by the decay parameter to the level set by the sustain control. The envelope will remain at the sustain level as long as the key is held down. When a key is released, it will return to zero at the rate set by the release parameter*	 In the diagram above, the sound looks like it will fade in (slow attack) then reduce in volume (decay), maintain a volume level (sustain) and when the sound stops it will fade out (release). These are all measured in seconds.
autotune	Autotune can be used correctively or creatively. When being used correctively, it should be difficult to hear that it is even being used. For example, someone sings or plays slightly out of tune and the engineer wants to rectify this using an autotune plugin. Here, the attack of the autotune would be set to slow so that the changes in tuning aren't as noticeable. When used creatively as an effect, the attack would be set much quicker, so that the voice or instrument sounds almost robotic.	Autotune as an effect: Listen to Cher – Believe, https://www.youtube.com/watch?v=nZXRV4MezEw Daft Punk – Digital Love. https://w[illegible]

LIVEWORKSHEETS

Higher Processes

crossfade	Crossfading is fading one piece of audio out whilst at the same time fading another piece of audio in. There are 2 reasons to crossfade. 1. A DJ will crossfade two songs so that they seem to merge. If using an app such as Spotify, you can set your music to crossfade so that there is never a gap between tracks. A good DJ will beatmatch the different tracks so that not only do they crossfade, but they also stay at the same tempo and maintain the same beat. 2. You might crossfade 2 pieces of audio in a project when creating a loop to eliminate pops or clicks.	
De-esser	This is primarily used on vocal tracks. Think of a De-esser as an automatic LPF (low pass filter). The de-esser senses when really high frequency noises are present in the recording *(think of an 'sssssss' sound).* These frequencies can be a bit harsh, but they don't happen all the time. So the de-esser will listen for these frequencies, and when detected, it will apply the appropriate amount of LPF (reduce the very high frequencies). Put another way, a de-esser takes out really high, offensive frequencies only when they happen.	
filter	An electronic circuit designed to boost or attenuate a designated range of frequencies. Filters have 2 properties. *Cut-off* and *Resonance.* A filter can be applied to an entire track, or to a single track and everything in between. Think of a filter as a LPF or a HPF. When you adjust the frequency of the filter, this is known as the cut-off frequency. If you add resonance to your filter, it will make a phaser-type sound when the filter is opening and closing.	
Insert point	A mixing desk connection that takes the signal from an input and sends it to an external processor in such a way that the signal flows through the external processor before being returned to the rest of the mixer channel. Insert points are used predominantly for patching in dynamic processors due to the fact that such processors need to change the basic nature of the signal in some way. Insert points tend to be in the form of a single TRS jack socket where the tip of the socket sends the signal out, the ring of the socket returns the signal to the desk and the sleeve is earth. More complex mixers may have a separate socket for each function, send and return	
Plug-ins	A software programme that can apply effects processes to an audio file.	

LIVEWORKSHEETS

Higher Processes

Sample editor	Also known as a wave editor, this allows the user to undertake detailed editing on a waveform. E.g *Audacity, Sound Forge*.	
Sample frequency	The speed at which an A/D converter takes snapshots of the incoming signal in a second. The more samples it can take in a second the greater the increase in the frequency response and therefore the better the quality of the A/D converter. CDs feature a sample rate of 44.1kHz, or 44,100 individual snapshots in any 1 second, DVDs feature a sample rate of 48kHz, but it is not unusual to find digital recording systems and hardware with sample rates up to 192kHz.	
submix	a grouping of instruments or tracks that are mixed or inserted into the "main" mix as a composite signal (usually as one or two inputs).Most mixing boards have a number of subgroups that can be used to help the engineer organise different kinds of sources. Drums may be on one subgroup (sub, for short), while vocals are on another. This can make it much easier to control groups of instruments without having to make identical changes across many channels of a mix.	
threshold	Control on various dynamic processors that determines the point at which the process is applied to the signal. **Threshold is the point at which something starts to work.** For example, on a noise gate, the threshold is the point at which the gate opens and lets the signal pass. Signals that do not reach the threshold remain unaffected.	
vocoder	A synthesizer that produces sounds from an analysis of speech input and makes the vocals sound inhuman and robotic. Certain synths and keyboards have a vocoder built into them. When in 'vocoder mode' the player will press a key and then speak into the mic. The keyboard will then 'merge' the voice and the synthesiser.	Listen to Mr Blue sky https://www.youtube.com/watch?v=aQUlA8Hcv4s (2 min39)

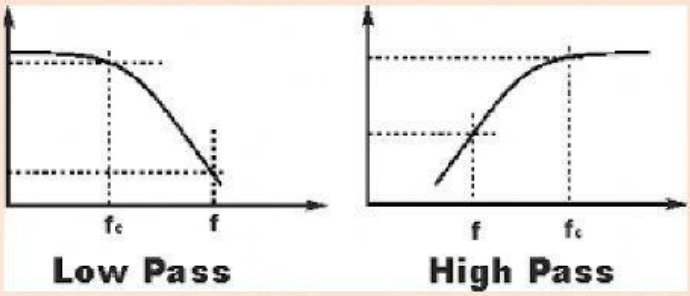
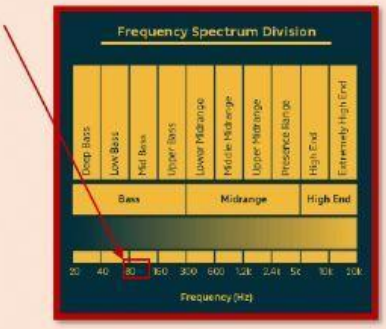
LIVEWORKSHEETS

Higher Controls & Effects

Cut off frequency	The frequency above or below which reduction begins in any filter. Filters have 2 properties. Cut-off and Resonance. A filter can be applied to an entire track, or to a single track and everything in between. Think of a filter as a LPF or a HPF. When you adjust the frequency of the filter, this is known as the cut-off frequency.	
flanger	A flanger sounds similar to a phaser. It uses the same basic premise as a chorus effect, but with a shorter delay.	https://www.youtube.com/watch?v=ndiA-U8U1g8&ab_channel=MacdaddyMusic
Graphic EQ	As you'll see from the picture, a graphic EQ is one where you can adjust fixed frequencies amplitude. The graphic EQ in the picture is a 10 band eq but you can get a different amount of bands depending on the hardware . This means that there are 10 different frequencies you can adjust.	
Parametric EQ https://www.youtube.com/watch?v=8erPNLiMkpM	An equalizer, or EQ, is a filter that allows you to adjust the volume level of a frequency, or range of frequencies, within an audio signal. A **parametric equalizer** offers continuous control over the audio signal's **frequency content.** This give the most precision control over specific areas of frequency range. The width of the band is variable, set with a control called 'Q'. The difference between this and the graphic EQ is that in a parametric EQ, you can **adjust the frequency of each band whereas** with the graphic EQ, you cannot adjust the frequencies. Just like the graphic EQ, you can have a 10 band parametric EQ, or a 3 band, etc. The one in the picture is a 5 band EQ. The top row of rotary controls adjust the amplitude and the bottom row adjusts the frequency of each band.	 **Features of a parametric EQ:** • Frequency (low/mid/high) • High/low pass filter • Q (bandwidth) • Shelving • gain

LIVEWORKSHEETS

Higher Controls & Effects

Harmoniser https://www.youtube.com/watch?v=TK6PCITil-c	A harmoniser is a type of pitch shifter that combines the 'shifted' pitch with the original pitch to create a two or more note harmony. If a performer plays a single note through a harmoniser, a chord is heard. The harmoniser would be set to a particular key/mode and the performer would play a single melody line. As a result, the melody would be harmonised according to the set key/mode.	
Low-pass filter https://www.youtube.com/watch?v=slB-76kEjl4	**A control which allows lower frequency data to be transmitted, rejecting higher frequencies.** A method of using an EQ using a shelfing technique. If you apply a LPF, you basically *attenuate* (cut out) high frequencies. If you apply a HPF, you attenuate low frequencies. A way to remember it is, LPF, allows the LOWS to PASS through. HPF, allows the HIGHS to PASS through. Many subwoofers have low-pass filters built in set around 80-120Hz meaning only the low end, kick drum and low bass instrument parts, come out of the speaker.  	
high pass filter https://www.youtube.com/watch?v=Q-LGOQ-Hh4k	A control which allows **higher frequency data** to be transmitted, rejecting lower frequencies, sometimes used in Graphic EQ's. For example, if your HPF is set at 100Hz this means everything below 100Hz will not be as present in your audio signal. If you had a bass drum mic'd, you would not get any low end thump.	

LIVEWORKSHEETS

Higher Controls & Effects

Modulation controller https://www.youtube.com/watch?v=u4-y3_-x1hc	At the most basic level, the modulation controller can be used to create vibrato effects using MIDI. On a keyboard this is a wheel mounted on the surface The controller is assignable and can be used to create other effects, such as controlling the tremolo on a Hammond organ plug in, or the attack and swell of MIDI string instruments	
Phaser 	A phaser is an effect which, when applied gives a **'swishy'** type of sound. Popular in **funk,** but in many other genres, a phaser is basically a 1 band EQ which moves up and down the frequency spectrum. So you could essentially make your own phaser by putting a lot of automation onto an EQ plugin. Two important controls in a phaser are; **Depth.** This controls how intense the 'swishy' sound is. **Rate/Speed.** This controls how fast or slow the 'swish' happens	
Pitch shift https://www.youtube.com/watch?v=xceq3vB2atY	Pitch shifting where you change the pitch of an individual track or indeed an entire project. Pitch shifting is usually measured in 2 ways. When changing the pitch in small increments, we move it up or down a certain number of 'Cents'. If changing it in larger intervals, we refer to changing it in 'semi-tones'. Autotune plugins share the same type of technology as pitch shift plugins. Pitchshift can make the sound like a chipmunk or darth vader!	
Portamento https://www.youtube.com/watch?v=VUR-us9oUhc&ab_channel=LindenLecturer	A MIDI control which allows the user to 'slide' between notes. The time the slide takes can be adjusted so that it happens slowly or quickly. Portamento happens between two pre-defined notes, whether or not the user actively does anything Portamento is something which is used on both hardware synths and software synths. *If playing the note C for example on a synth and then playing the note C an octave above, portamento (when added) will make the note slide from the low C to the high C. How much portamento determines how long the slide takes.*	
Pre-fade https://www.youtube.com/watch?v=9clp2if6UhA	A signal that is monitored or routed **before** it has passed through the channel fader and is therefore independent of the fader position. **Pre-fade** auxiliary sends are used primarily for monitoring or *foldback* mixes, enabling musicians to hear a mix that is separate to that being monitored in the control room or heard through the PA system	
Post-fade https://www.youtube.com/watch?v=9clp2if6UhA	Post-fader is where plugins or busses are inserted in the chain **AFTER** the signal is processed after the fader. *Post-fade **auxiliary sends** are used to send signals to effects processors. The fact that the amount of signal going through a post-fade send is determined by the fader position gives the engineer greater control over the positioning of the sound. More fader level and less aux send will make the sound closer, while less fader level and more aux (auxiliary) send makes it sound further away. This gives the mix engineer control over the front-to-back dimension of the music*	

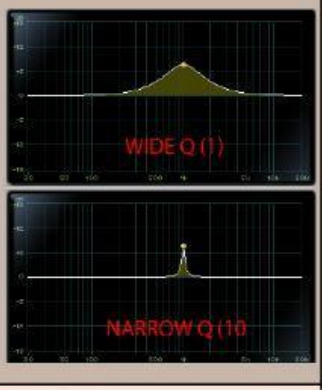
LIVEWORKSHEETS

Higher Controls & Effects

Shelving EQ https://www.youtube.com/watch?v=7HmPFCuBWa4	Shelving is a method of using an EQ. Shelving is where you boost (or more commonly) cut all frequencies above or below a certain point. So for example in a vocal recording we know that our voices tend not to produce any useful noises below 100hz. Rather than leave these frequencies in our mix, we would cut everything below around 100hz. To do this we use a shelving EQ. It looks like this: 
Time compression	The **speeding up** of an audio recording without pitch change. Digital audio workstations and audio editing software often provide a function to correct the length of audio material either in a track or part of a track through **shortening** the audio recording. *Go to a youtube app and tap the ... at the top right. Change the playback speed and you will hear how time compression and expansion sound.*
Time expansion	The **slowing down** of an audio recording without pitch change. Digital audio workstations and audio editing software often provide a function to correct the length of audio material either in a track or part of a track through **lengthening** the audio recording.

LIVEWORKSHEETS

Higher Controls & Effects

Q (bandwidth) 	*Bandwidth* is defined as *a* range within a band of frequencies or wavelengths. Bandwidth is also *the* amount of *data* that can be transmitted in a fixed amount of time. For digital devices, the bandwidth is usually expressed in bits per second(bps) or bytes per second. For analogue devices, the bandwidth is expressed in cycles per second, or Hertz (Hz). Q adds a third dimension to an EQ. With a **parametric EQ,** have the ability to adjust amplitude, frequency and we can also add in a 'Q' control. Q adjusts how wide or narrow a bandwith you're adjusting. The picture here shows a wide Q setting at the top and a Narrow Q setting at the bottom.
Tremolo https://www.youtube.com/watch?v=ZWx7B8APbuU	An electronic effects in guitar amplifiers and effects pedals which rapidly turn the **volume** of a signal up and down, creating a 'shuddering' effect as well as gentle or intense pulsating effects. (compare with vibrato) In a tremolo you can control the **depth and rate** of the volume change.
triggering	To cause an event to begin. To trigger a sample is to start the sample playing
Vibrato https://www.youtube.com/watch?v=ZWx7B8APbuU	**Vibrato** is a pulsating tone that wavers from slightly above to slightly below the actual **musical pitch** and has a rich, emotional quality.(compare with *tremolo*). Vibrato is an effect which changes the **pitch** of a sound in a similar way to a LFO. In vibrato you can control the **rate and depth** of the pitch change.

Tremolo is a steady increase and decrease in volume.
Vibrato is a steady increase and decrease in pitch

https://www.youtube.com/watch?v=ixtQ4lgAxB8&ab_channel=Scott%27sStuff

LIVEWORKSHEETS