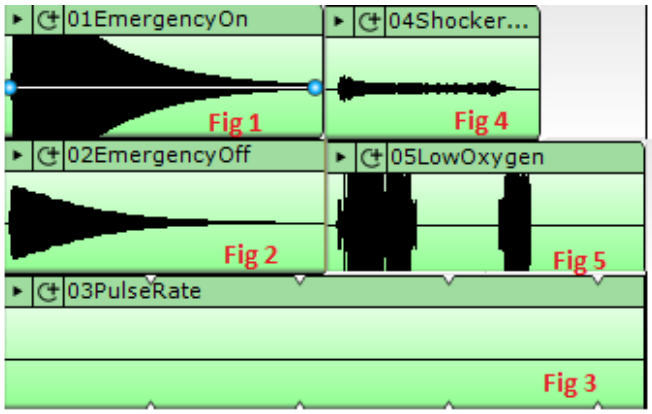
DECO1013: Sound Sonification EKIN TRAN
Assignment 1: Functional Sound Design Documentation 309232813

Effective emergency medical care often depends on how quickly and accurately of the data transmitting to medical practitioners in order to properly assess, treat and transport patients in as timely a manner as possible. These tasks pose a difficult challenge to field medical practitioners, who must devote their eyes and hands to patients.
A prototype system was designed through sound analysis and sound design. Hopefully it'll enhance the current emergency medical care's audio system. To ensure rapid and accurate interpretation of equipment signals, noise cancellation, and it must be unique sounds.

The five sound functions were designed specifically for the operating rooms.
01Emergency On - Indicates the emergency room is engaged. This sound designed to be a hard ping sound and then fades out slowly.
02Emergency 0FF – Indicates the emergency room is unengaged. This sound designed to be a soft ping sound and then fades out slowly.
03PulseRate – Indicates the pulse rate of the current patient in the emergency room. The way this sound was designed to be a soft beep sound and then fades out quickly.
04ElectromagneticShock – Effects of the defibrillator fully charged. The sound was designed to be a simple moderate pitch beeps without fades out or in.
05LowOxygen – Alert low oxygen on the patient and needs urgent attention. The sound was designed to sound like eeh eh as the second eh is half cut off sound.



High frequency dropping to low frequency over time create the effects of the high ping sound (as shown in fig 1). Low frequency dropping to lower frequency over the time creates low ping sound(as shown in fig 2).The shorter sound induces a seemingly quicker pace and thus it gets the user's attention(as shown in fig 3). Whilst the protruding peek produced by volume acknowledges pitch peek, distinguishing the sound. The sound with small fluctuation gives a steady pitch sound(as shown in fig 4) . Urgency can be induced by having two high sound frequencies with intervals between them (as shown in fig 5).

The idea of the simulation is a simple idea to simulate 40 seconds of a real world hospital sound. To do so, five different kinds of functions sounds were designed to alerting people, monitoring of patient's conditions and warning signals. Amongst those, four pre-made sound wav files are used to recreate hospital background noise such as the ambulance siren, people are walking, running etc. The techniques used includes synthesiser (vacuum plugin) to generate artificially sounds, modulation to change the amplitude or frequency, filtering emphasized or attenuated the frequency.

Minor Protools controls that was also used to generate the sound includes:
VTO - as one of the Env knobs is moved to the right, more and more modulation occurs.
Mixer – mixed two signals, their levels balanced relative to one another.
Env one – manage the time and level of attack, decay, sustain and release of a note.
Age - Dust Adds glitches and noise to the signal.
VTA – adjust the overall volume.

Beside controls, edit tool was heavily used namely the zoomer, trimmer, selector, grabber tool. Each sound function was generated separately and bounced to the disk as a wav format. Create a new session with five tracks (first three tracks, was dedicated to sound functions, last two tracks were used for background noise). With each track there eq band 1-3 was inserted to A-E so some tracks could have higher or lower overall volume than other tracks. After the tracks were composed, another bounce to the disk was done.

The five sounds provide operating room with the better sounds for the functions. This means the medical practitioners can work more efficiently. For example, sound that indicates emergency room is engaged or unengaged to prevent unauthorised people to enter the room. Also sounds such as pulse rate, electromagnetic shock and low oxygen allow the medical practitioners easily determining condition of the patients.

Hopefully, this prototype can influence the emergency medical care in terms of take a serious researching on sound and use it in the near future.