

Air Raids in Europe 1939-1945

The medium of sound is particularly suited for conveying certain types of information over other types of information, and one must be careful not to use the medium of sound to try and visualise information that could both be more easily interpreted through other mediums such as the graphic. Information visualisations should also have a degree of entertainment to them, and by keeping these factors in mind, I have chosen to tell an interesting story about history as the purpose of my visualisation.

My MaxMSP patch uses a custom-data set that I created by scouring various historical information published, and extracting approximate information on air-raids conducted by either the RAF, the Luftwaffe, or related forces in Europe during World War II (1939-1945).

My dataset consists of:

Date	Allied or Axis force	Devastation caused by the air-raid	Casualties caused by the air-raid	Force/Power of the air-raid
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Of course, one thing to note about my dataset is that this is in no way a concise, or even remotely accurate, portrayal of all the air-raids conducted in Europe between 1939-1945. The purpose of this visualisation is to present to the user a way of experiencing an interesting story of history through the medium of sound alone. The visualisation focuses specifically on air-raids during World War II, however an overarching storyline of how the entire war was fought and won is possible to be gleaned from the experience. Thus, my visualisation is a learning experience, as well as a piece of entertainment.

A	B	C	D	E
1939	sep	BOMBING DEVESTATION	CASUALTIES	AMOUNT OF BOMBS
allies	17	0.15	0.1	0.1
allies	18	0.15	0.2	0.1
allies	19	0.15	0	0.1
allies	20	0.15	0.1	0.1
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allies	2	0.15	0.1	0.1
allies	3	0.1	0.1	0.1
allies	4	0.15	0	0.2
allies	5	0.2	0	0.1
allies	6	0.15	0.1	0.1

The medium of sound is suited for extracting information about events over time, and I have coupled this with the sense of urgency and panic that sound has the ability to evoke in a listener. Through my visualisation, The listener is able to follow the struggle of axis forces during the war; take in information about both the intense timing of air-raids during parts of the war and sections of no air-raids across stretches of months (Winter); and also be able to experience a sort of visceral reaction to the visualisation, linking the sometimes alarming cacophony of sounds to the real-life information that is the source of the visualisation, and hence leading to a deeper understanding of the information being presented.

Each column of data is represented in a different way, which makes my visualisation multi-dimensional:

- The date controls the timing of the sounds
- Allied and Axis forces each get a separate 'channel' of sound. This is because on the same day both forces may conduct air-raids, and likewise in many days only one force will

be conducting air-raids. The Allied and Axis forces each get a distinct sound, so one can easily discern which force conducted which air-raid.

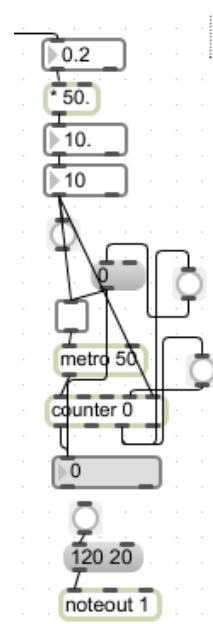
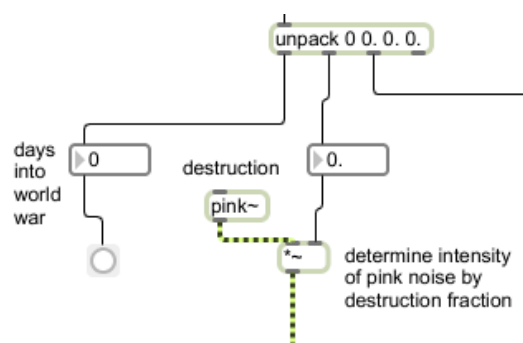
- The devastation caused by the air-raid is visualised through a pink-noise generator. The pink-noise is increased in amplitude in direct relation to the devastation caused by the air-raid. The pink-noise is meant to simulate the sound of an air-raid bombing.

- Casualties caused by the air-raid is visualised through a ‘tink’ sound that is rapidly fired. The rapid-firing lasts longer the more casualties were affected by the air-raid.

- The force, or power, or amount of bombs used during the air-raid is visualised through the amplitude of the unique sound attached to either the Allied or Axis forces. This sound is meant to mimic that of a bomb being dropped—that is, an off-pitched whine that exponentially slides down in pitch. The more power behind the air-raid, the louder the sound. This sound is coordinated with the pink-noise generated by the devastation data, which is to act like the exploding of a bomb.

In order to understand MaxMSP I have gone through a number of the tutorial patches and utilised what I learnt by applying the tutorial concepts to my patch. For instance, the pink-noise generator that determines the level of destruction for a raid is varied in intensity by multiplying the pink-noise generated by a fraction. The Data Scaling and Data Viewing tutorials were of also great help. Through these tutorials I have combined the technique of using a *coll* object with an *unpack* object with further advanced bang techniques such as the *uzi* object, which I use to visualise the casualty-rate for a particular raid.

Further functionality to add to my patch which I hope to achieve is to increase the number of dimensions the data visualises through the use of panning sound. The idea came to me as I was converting air-raid information into a tabled dataset. Considering the scale of the war is an entire continent, it makes sense that the visualisation should also carry spatial information about each air-raid. This can be accomplished via stereo-sound, and so what I hope to achieve is to add locational information to my dataset, which can be processed by my MaxMSP patch to pan left or right, depending on whether the air-raid took place on the Western-front or the Eastern-front. From this extra-dimension, more knowledge could be extracted from the sound-visualisation such as the initial Axis push across Western-Europe, and their gradual retreat back to Germany. It would also add a dizzying (and fun) experience to the visualisation, with allied and axis sounds firing sometimes only from one channel, and at other times when raids were increased, firing from multiple spatial points. I also hope to add a visual histogram of these spatial points so you can watch the bombings across a crude map of Europe.



Sample of my patch that determines the visualisation for casualties

