Quick Acoustic Analysis

of

Volley 5, 3rd Burst

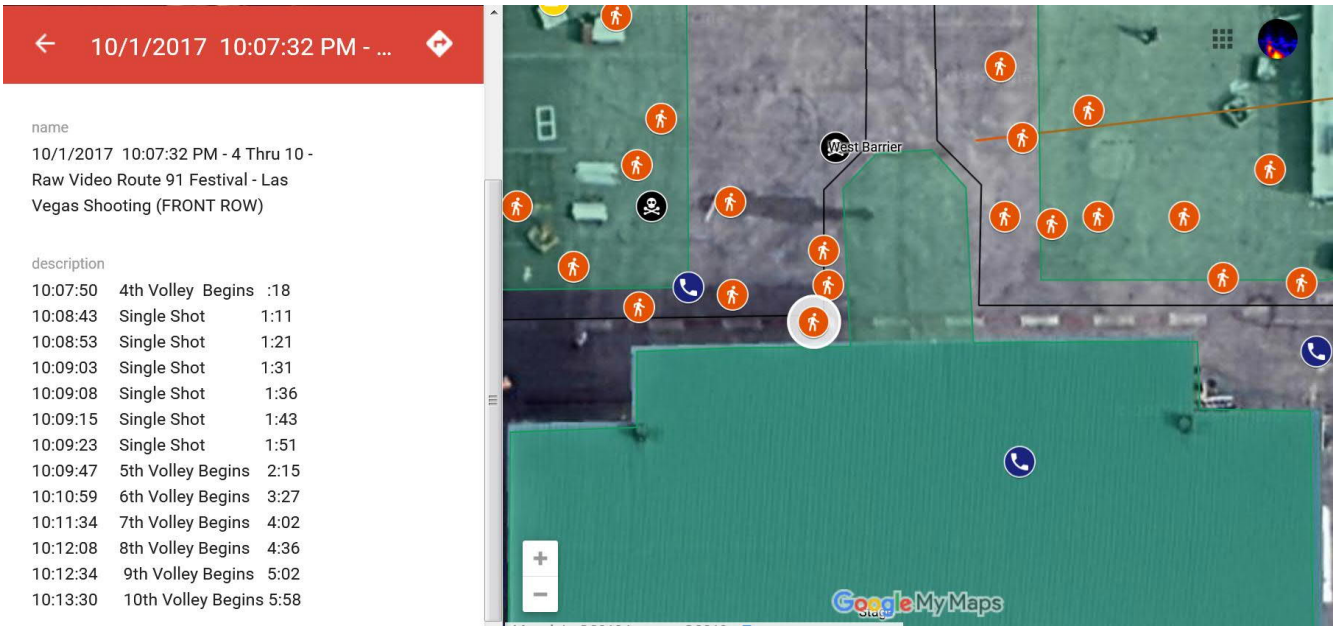
Front Row – Center Stage

author
date
version

Introductions

Background Material

Video Source



Very near front of stage in middle, hidden by lattice.

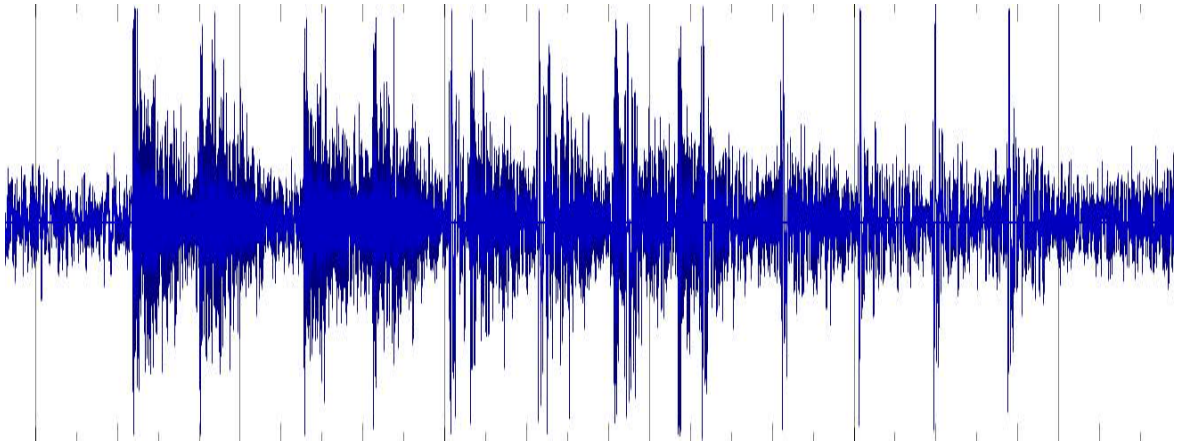
https://youtu.be/l-IEme0aGMA

A 1.37 second segment beginning at 2:23.05. This is the 3rd burst of volley 5.

Listen

Hear 11 or 12 shots, the first ones “snap” like sound, the last ones a “boomish” sound.. Screaming in the background.

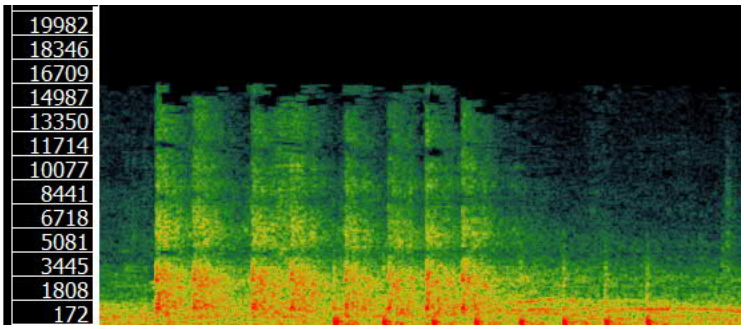
Waveform



Observations:

- possible 12 – 16 total pulses.
- possible 8 pulses starting from end of segment that are fairly narrow in scope.
- 8 wide/noisy pulses at start of segment
- 3 or 4 of the narrow pulses overlap with earlier “wider” pulses
- most of all pulses are larger in amplitude than background sounds.
- Spacing between narrow pulses more regular than spacing between wider pulses.
-

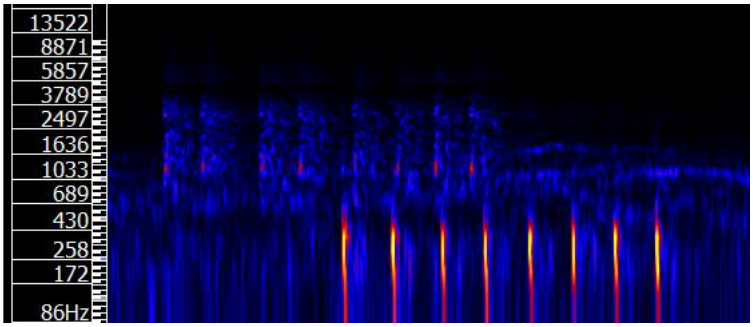
Db2 Spectrogram (a measure of energy)



Observations:

- 12 pulses
- first 8 pulses are broadband and have their power spread over a large range of frequencies.
- First 8 pulses are spread over time.
- Last 4 pulses much narrower frequency band
- Last 4 pulses more confined over time

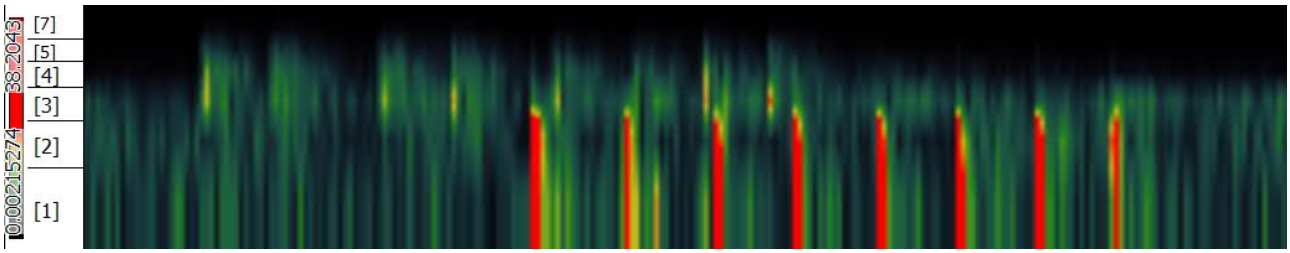
Log Frequency v Time Spectrogram



Observations

- 8 pulses in the upper band, 8 pulses in the lower band. Upper band of lower “intensity”. Upper band smeared over time. Indirect path for upper band.
- Muzzle centered between 500-150 hz.
- Sonic centered between 4,200 – 600 hz

Spectral Contrast Color Plot



Observations:

- two distinct frequency groupings
- 8 strong pulses in the band 2/1,
- 8 weaker pulses in bands ¾.

Muzzle Blast Data

Plus or minus 2 m.s.
Raw data (all digits) taken directly from an “instants” layer of the above spectrograms created by Sonic Visualiser.

Vid. Time	Delta	R.P.M.	Variance	
2:23.505215				
2:23.612698	0.107483			

2:23.719954	0.107256			
2:23.812925	0.092971			
2:23.909297	0.096372			
2:24.004535	0.095238			
2:24.095011	0.090476			
2:24.186621	0.091610			
	0.0973	616 r.p.m.		

Shock Wave Data

Lag Calculations

Summary

Compare to Other Video/Audio

Other Observations

Theory Would Predict