

## bus pistols

- 1 - 0.039 width, 10k at 512 bin size, some smearing
- 2 - 0.032 width, 14.9k at 512 bin size, some smearing, not decay slope

# Events Individually

## Event B05a Details

- has 3 parts
  - A Primary Sonic
    - clipped
    - data points in clipping indicate substantially larger peak waveform
    - 0.0012 s width
      - 5 front
      - 7 back
  - B Echo/Boom
    - non-clipped
    - peak to peak reflection time is 0.003945 us
  - C Hit/Ring
    - clipped
    - higher peak frequency than primary (A)
    - more energy
    - has decay waveform of damped system
  - D
    - echo?
    - Reflection?
- Timing (lvmpd) Bleachers Woman Killing Ray
  - A->B 19.5 ms not 24.1 24.4 16.9
  - A->C 35.7 ms 32.5 28.4 30.6 31.2
  - A->D 135 ms 131.2 not not not
  - A 6.1 ms 3.6
  - B 6.3 ms
  - C 7.0 ms
  - D 1.8 ms
- 0.237 on 12 sec shot from sonic to echo/boom
- Nearest burst 1st shot
  - 0.007256 peak to peak reflection
  - retort immediately follows sonic
  - sonic to retort is 0.001587
- Buldge takes 5 frames (0.167s) from first shot to "peak" out, a distance of about 1.5 feet. Or about 9 feet per second.

## **Event: 0m 05.109s Single Shot**

- Start: 0m 05.109s
- Type: Audio
- Duration: 0.089s
- Summary:

## **Event: Video, Fragments, Bulges, Disappearing Post, Netting Oscillations**

- 5.266 1st signs of bulge (spots A & B)
- 5.300 1st sign spot C, forms line and angle upwards, biggest bulge near A & B
- 5.333 "Bulge" gets substantially bigger, particularly near C, first 2-3 feet of netting tighten up
- 5.366 "Bulge" continues to increase, cone forms where netting tight extending 5 or more feet
- 5.400 "bulge" continues another 1 or 2 feet, tension getting maxed out
- 5.433 "bulge" grows particularly top and bottom, consumes all points top thru bottom
- 5.466 "bulge" grows north 2 more feet to edge of visible region close to next upright
- 5.500 wave near top develops on bulge, 3 small points 2 at top develops
- 5.533 "bulge" now converting to standing wave as middle of fence oscillates
- 5.566 wave from top propagates down towards ground
- 5.600 top wave starts to oscillate below middle tensor
- 5.633 more oscillations both horizontal and vertical
- thru 5.933 oscillations and A,B,C are returning to normal
- thru 6.300 oscillations (11 frames)
- 06.333 post disappears or is smudged out of existence for 8 frames
- then pops back into focus/existence
- 
- after watching many times, there are numerous places where this defocusing occurs
- watch tape to 56, couple places where can clearly see some bullet holes in fence
- near 35 secs there are some clear frames

## **Event: Single Shot**

- 0m 12.019

## **20.116 Single Shot**

## **44.034 7 shot Burst**

## **46.254 6 shot Burst**

## **51.803 8 shot Burst**

57.133 10pm 9m 59s on bodycam

57.166 ===== Split to 2nd bodycam unit 245 just later in time

57.166 10:11:28 on bodycam 2

1:02.110 Burst

- Duration: 9.102s

1:28.566 ===== Split to 3rd bodycam no time displayed

1:36.716 Burst

- Duration 9.575

1:57.171 Single Shot ?

1:58.401 Single Shot ?

2:10.465 Burst

- Duration 8.166

2:27.700 Single Shot ?

2:29.651 Burst of some kind

- Duration: 9.291

Event: Fence Deformation

Event: Single Shot

Event: Burst

Profile of bullet is single,single, single, 7 burst, 6 burst, 8 burst, time must be approximately 10:09:08

This series of shots exists in the long gap between the 5<sup>th</sup> volley and the next long volley.

Looks like B05a, not on taxi video, so can't tell if it is there also.

Does this shot exist on other sound tracks, if so what does it look like there?

## Left & Right Channels

The sound(s) recorded by the officers body camera contain two channels. Because of their physical separation these channels have a small delay between them of approximately

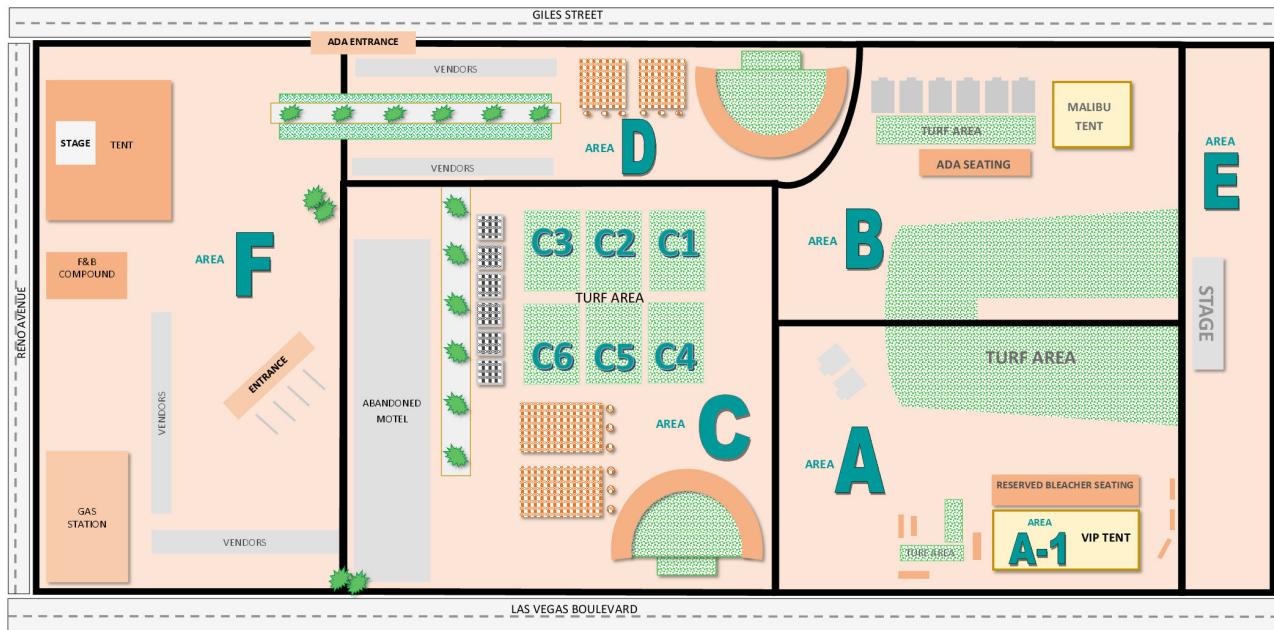
Near 33.31, Channel A precedes B by about 7 samples. Each sample being about 22.675 us is approximately 158.7 us or 0.0001587. At about 1000 ft/sec this is the equivalent of 1.9 inches.

At this point in the video the officer is facing east, looking towards the cloth tent north of the gate and wagging his fingers at some folks, yelling, telling them to go back. He uses his left hand. Channel A is on the "inside", not sure whether his right or left shoulder.

At 5 seconds, near the fence bulge the officer is kneeling next to the cinder block wall looking south, his left shoulder facing east. Channel A leads Channel B by about 6 ticks when the "ringing" sound is recorded. When the "bullet" sound is recorded, again chan A leads by about 6 ticks. All that can be asserted is that the "sounds" are all coming from the same general direction.

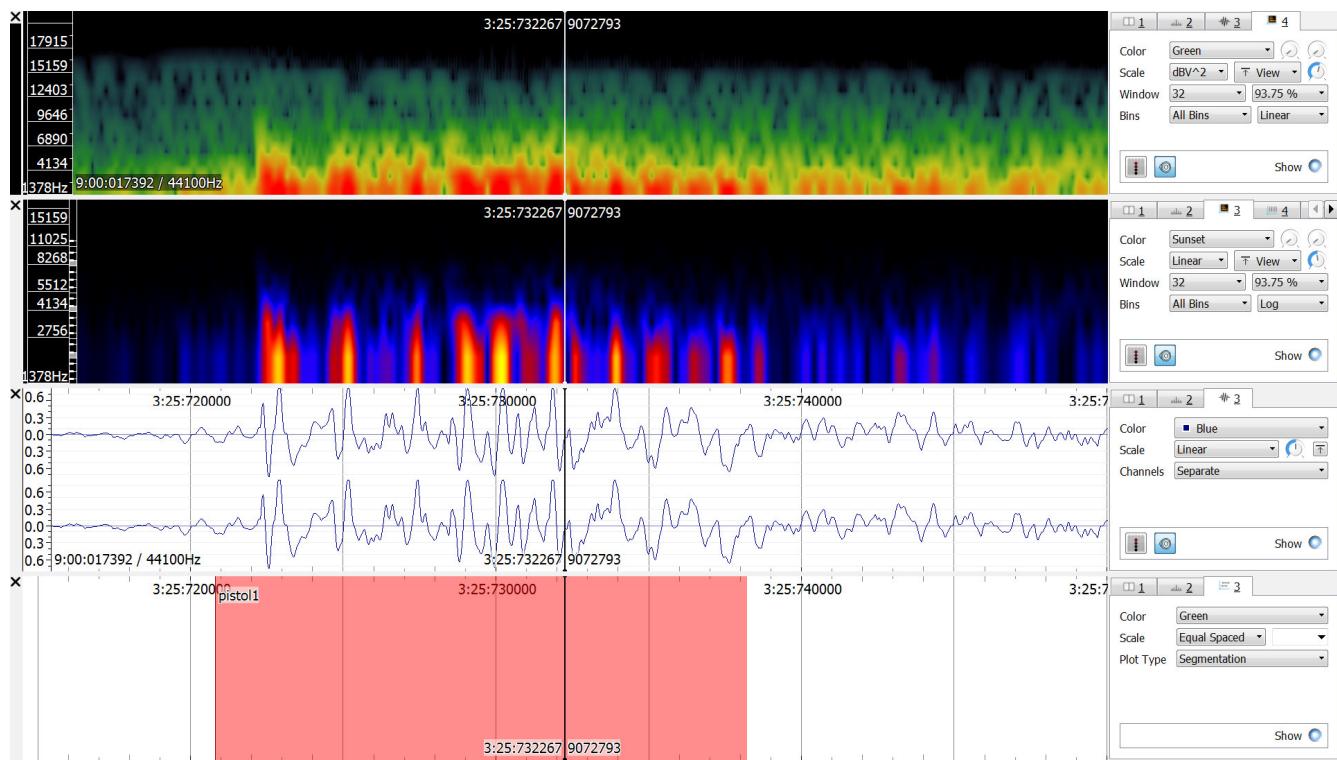
Chan B appears to have a slightly different frequency response or is more muffled than chan A as it recovers more quickly to stimulus.

# Route 91 Harvest Festival Site

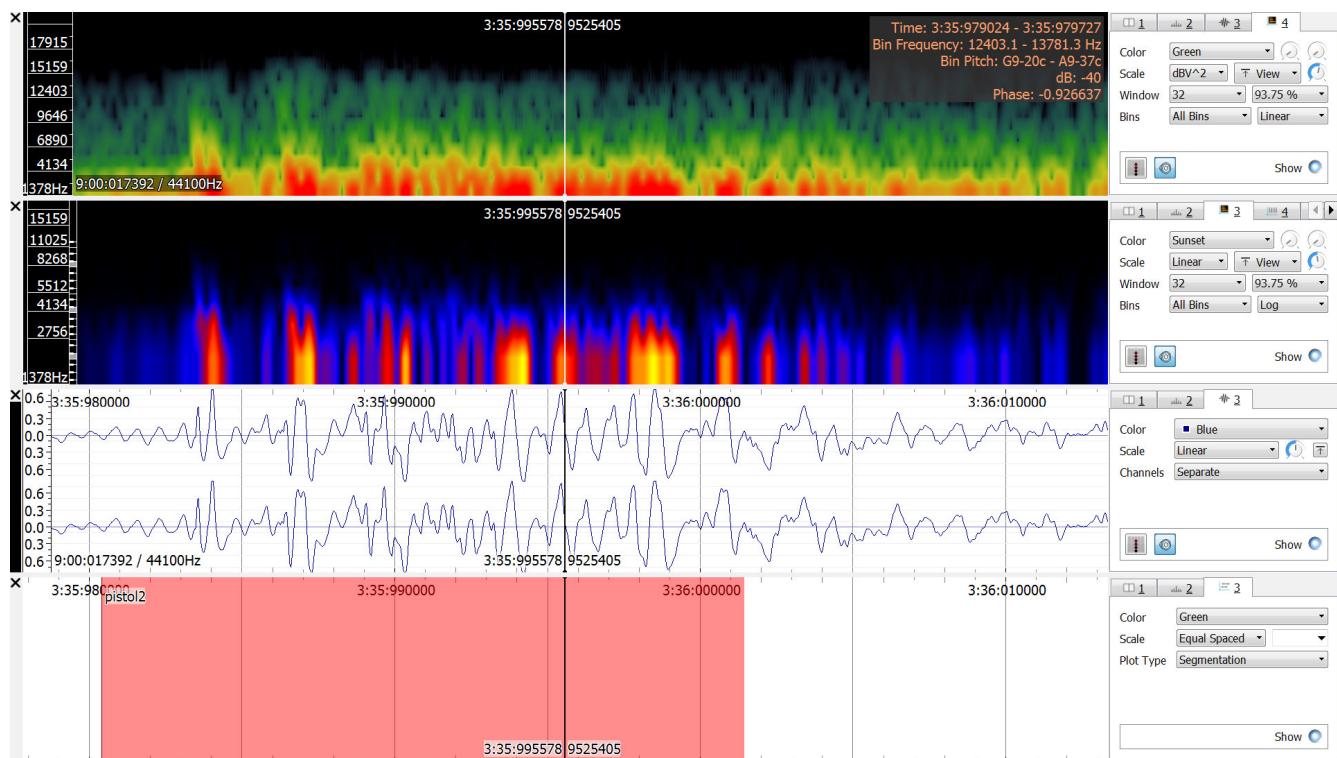


## **Spectographs & Waveforms**

## Pistol Shot 1 – Mandalay Bay Bus Stop

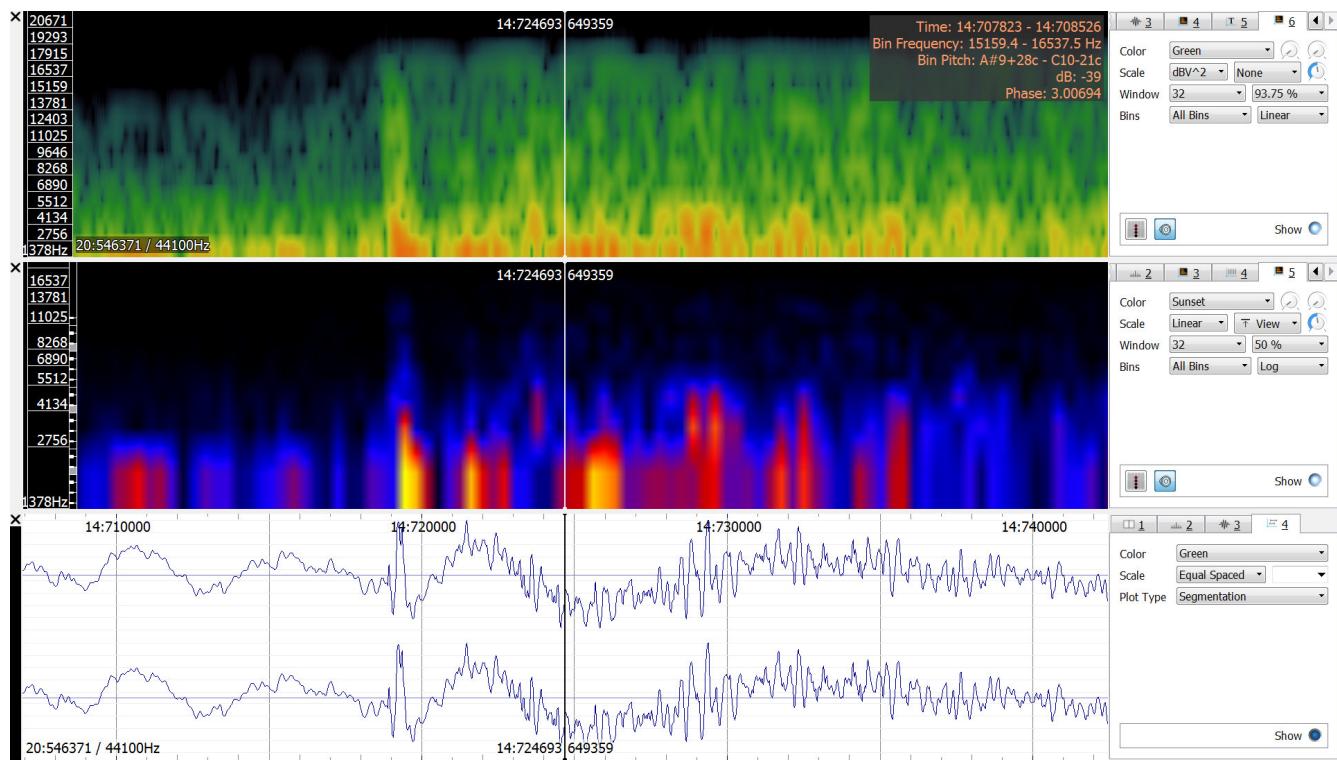


## Pistol Shot 2 – Mandalay Bay Bus Stop

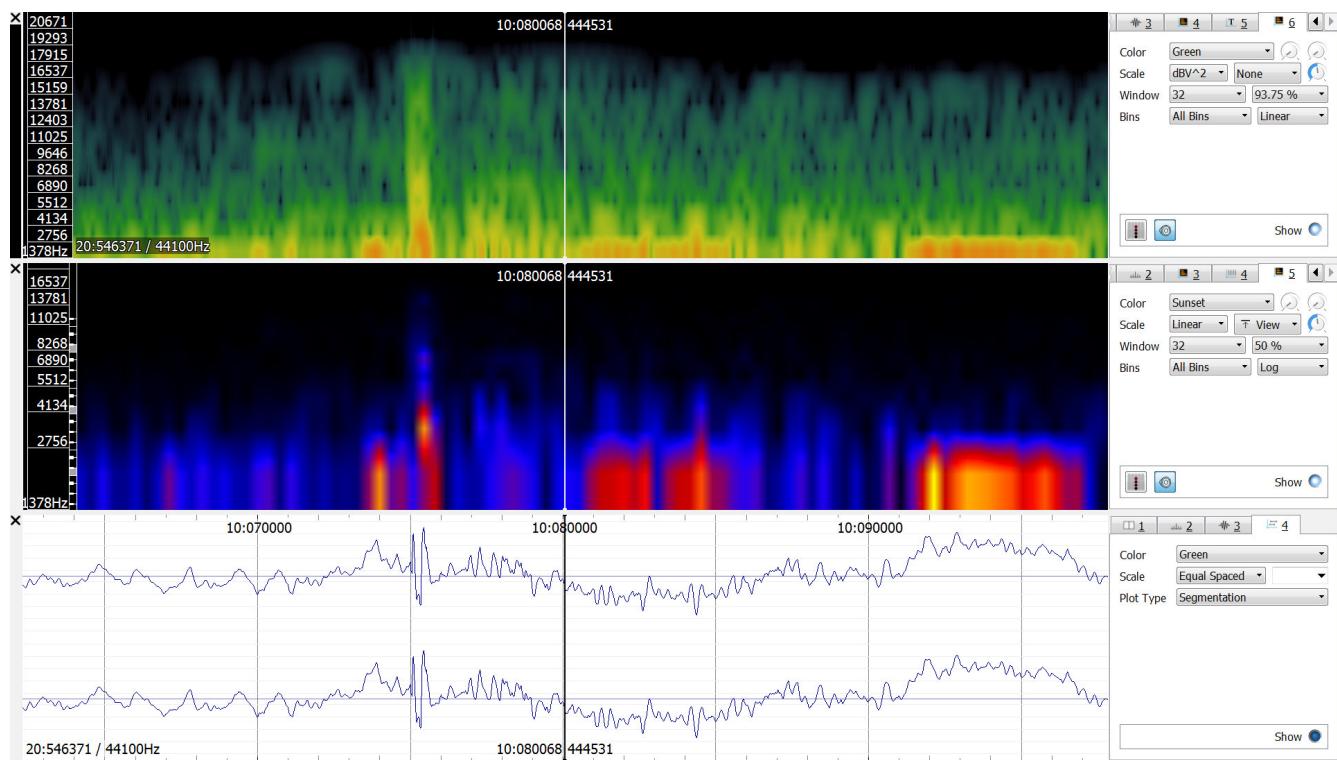




## Single (hit) – Tonelli

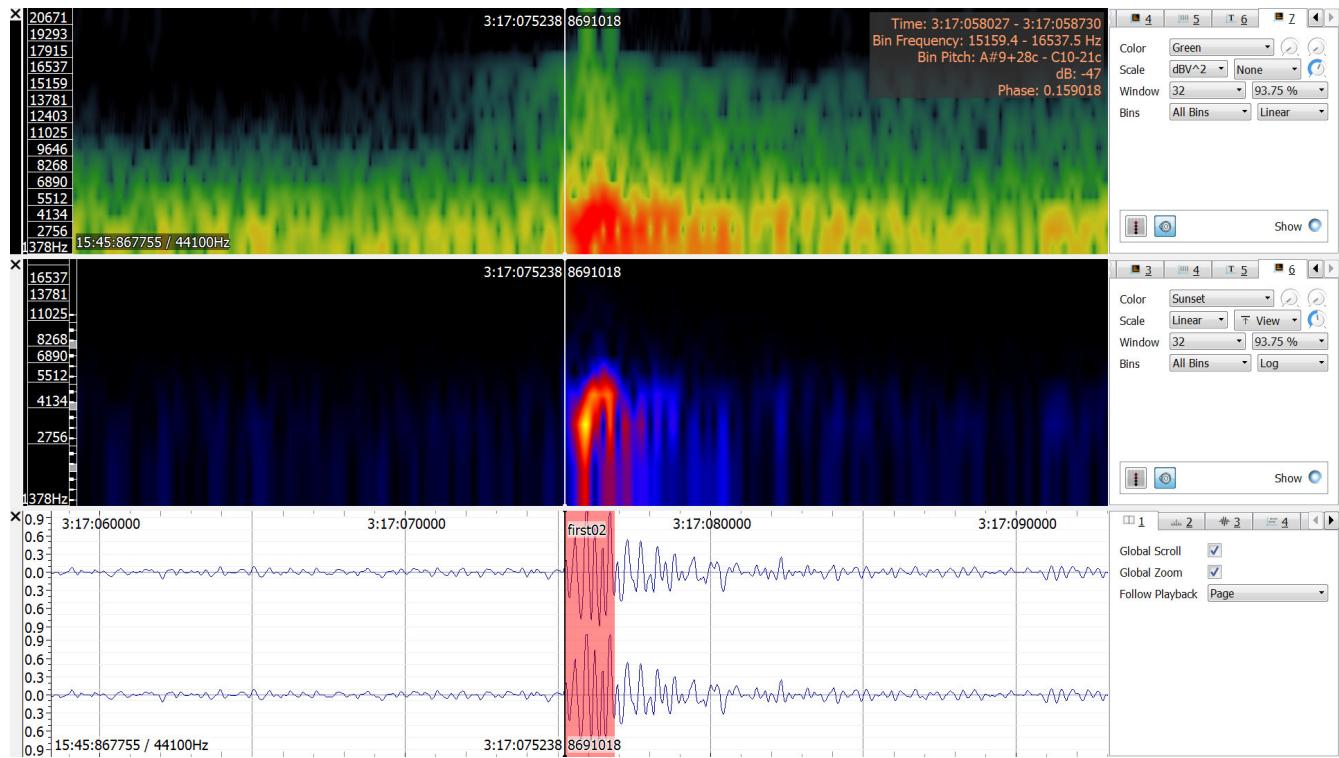


## Single (no hit) – Tonelli

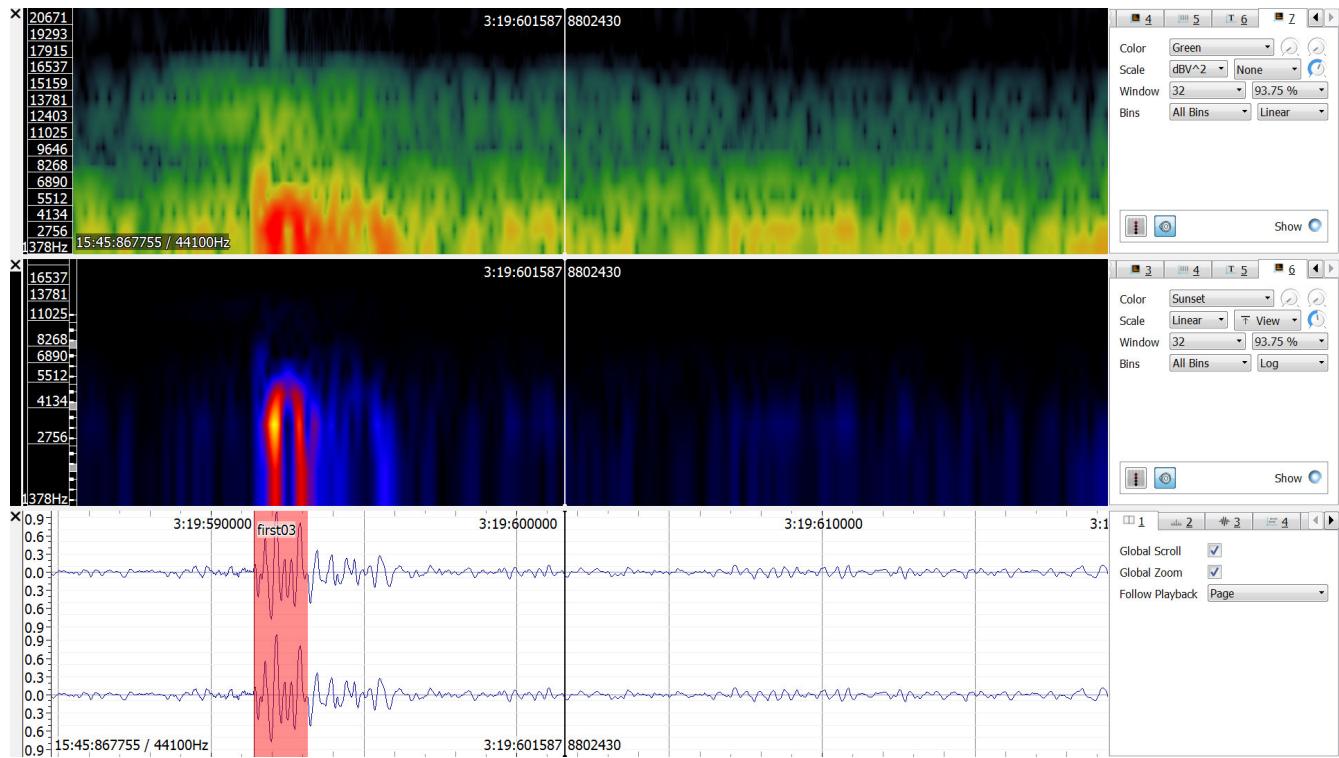




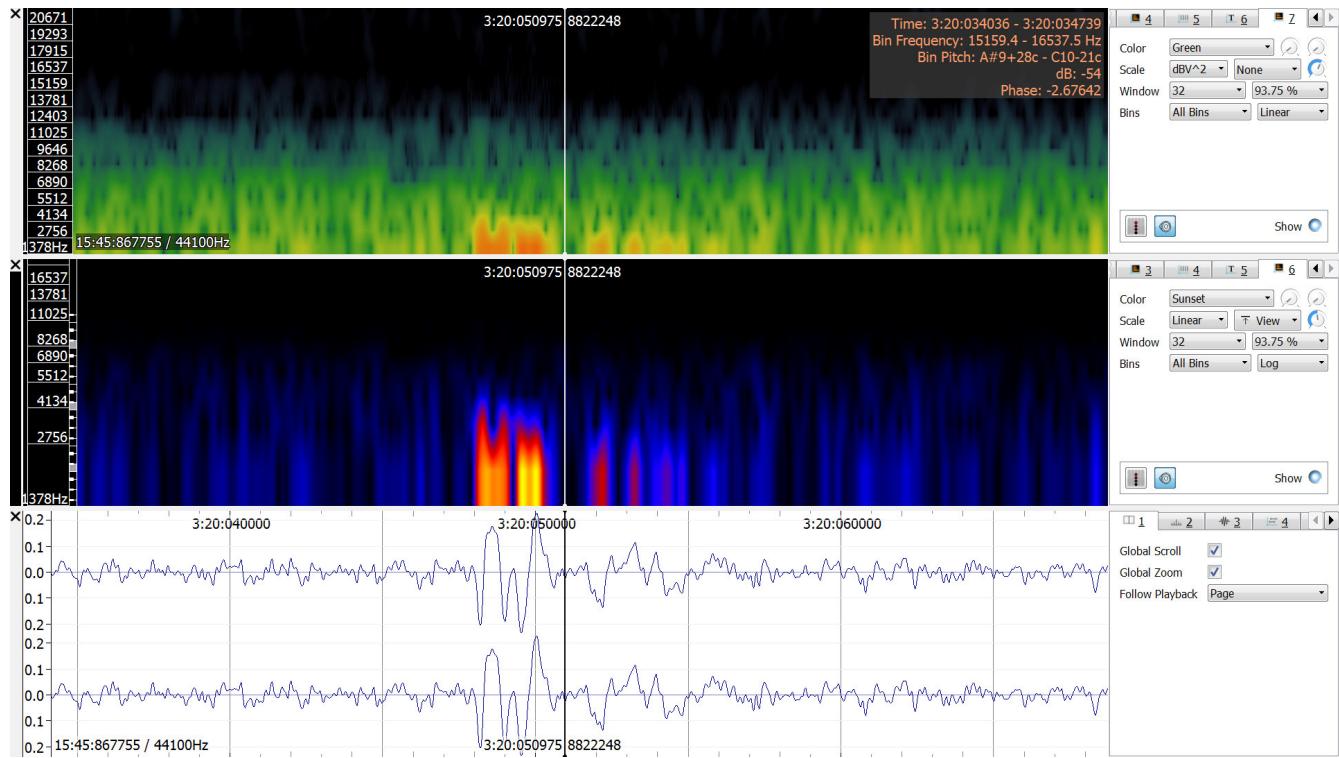
## First02 – First Shots Fired – Gate 7



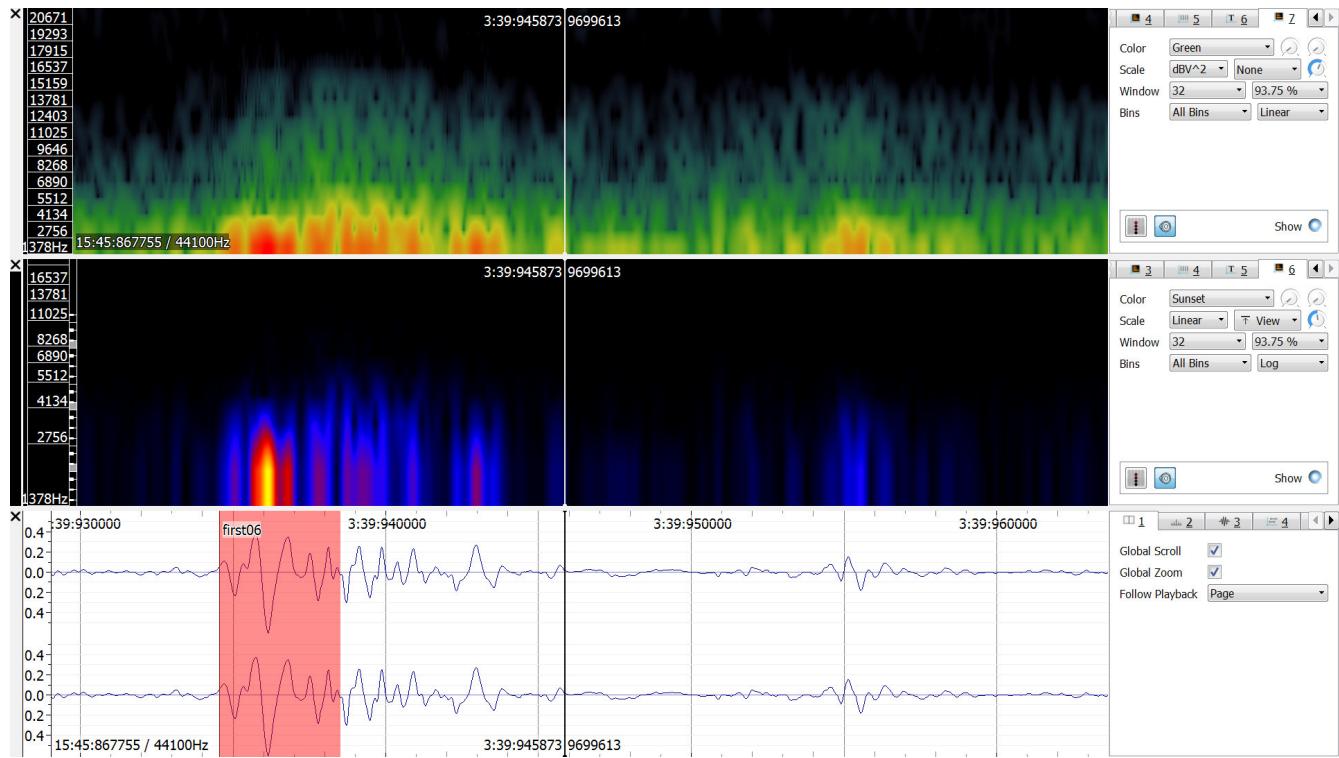
## First03 – First Shots Fired – Gate 7



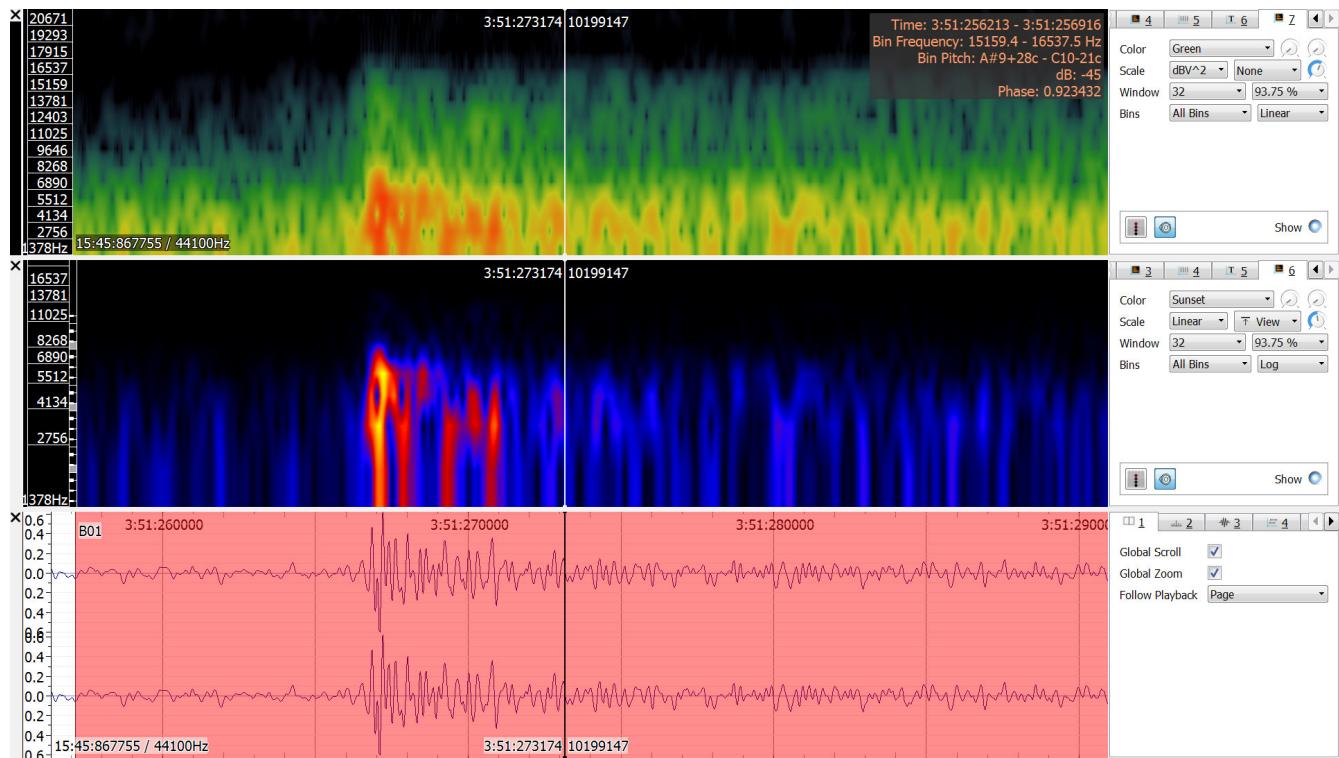
## First03 (muzzle?) – First Shots Fired – Gate 7



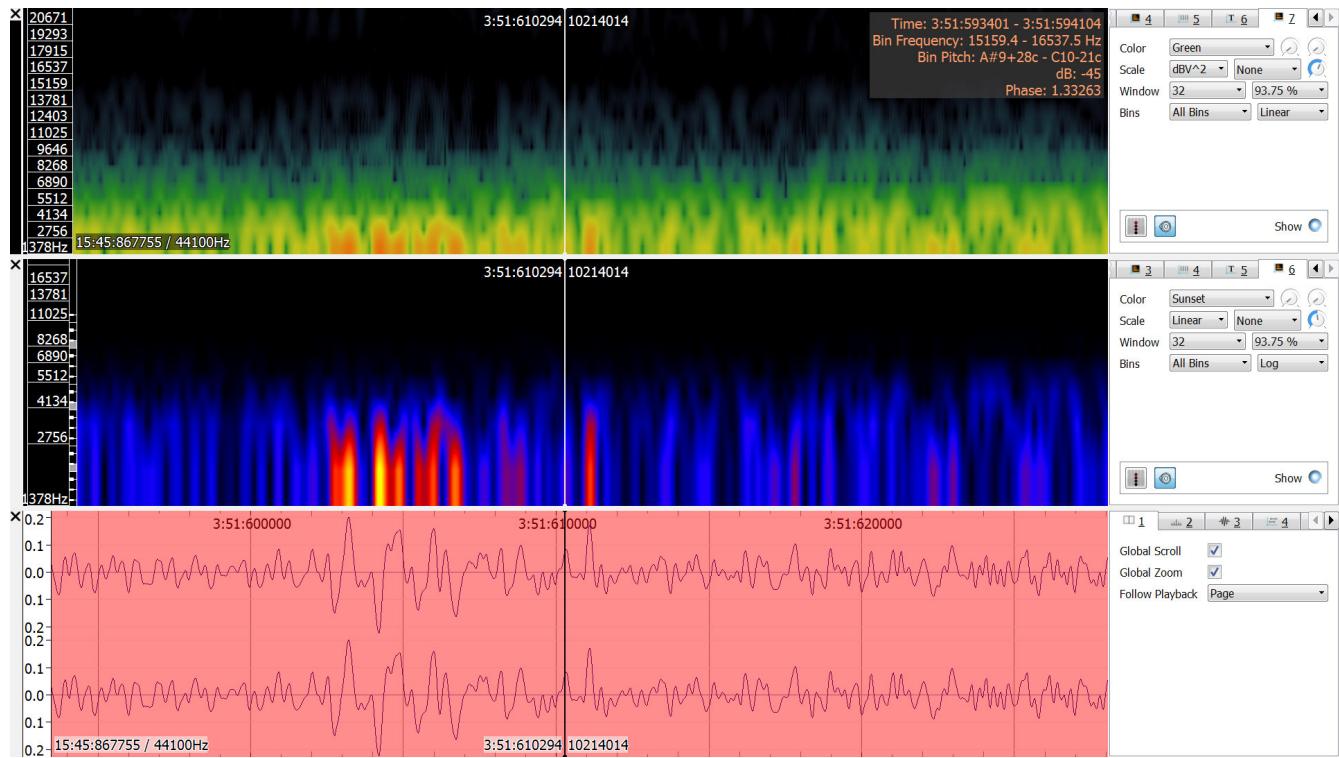
## First06 – First Shots Fired – Gate 7



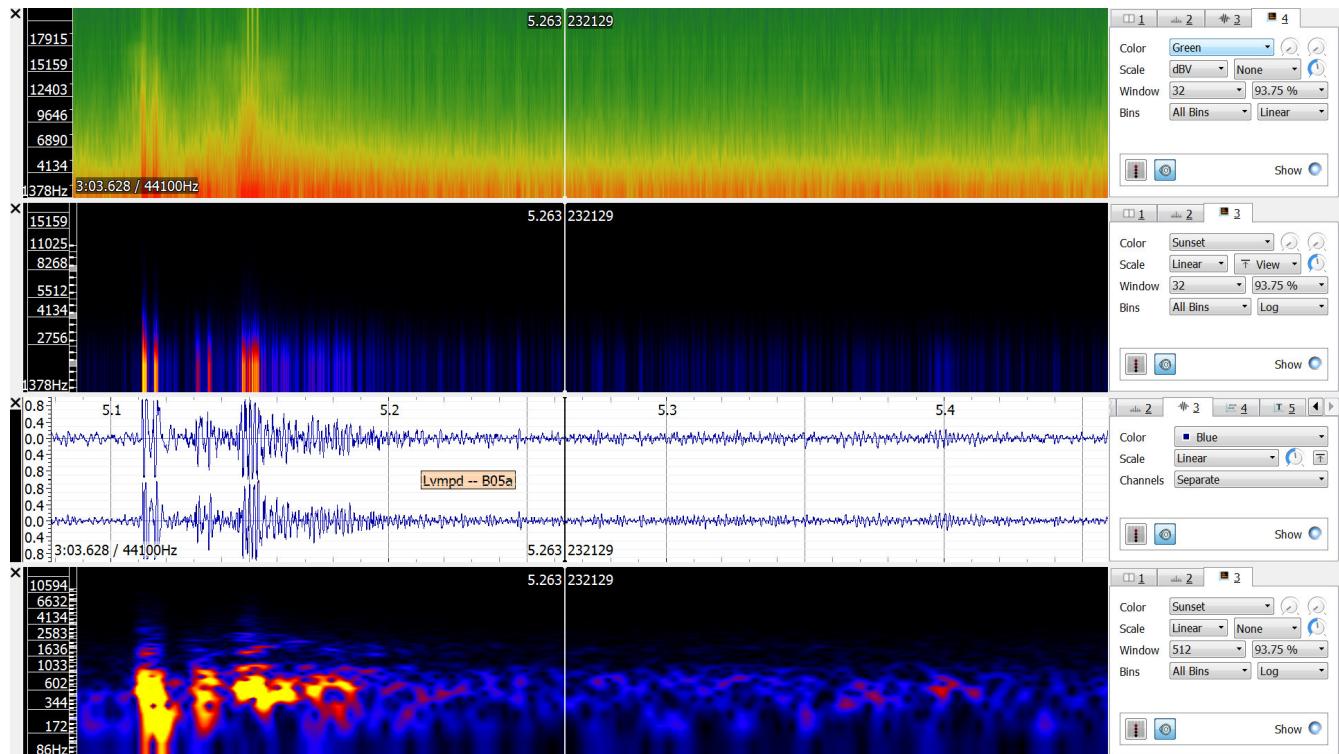
## Burst01 – first shot – First Shots Fired – Gate 7



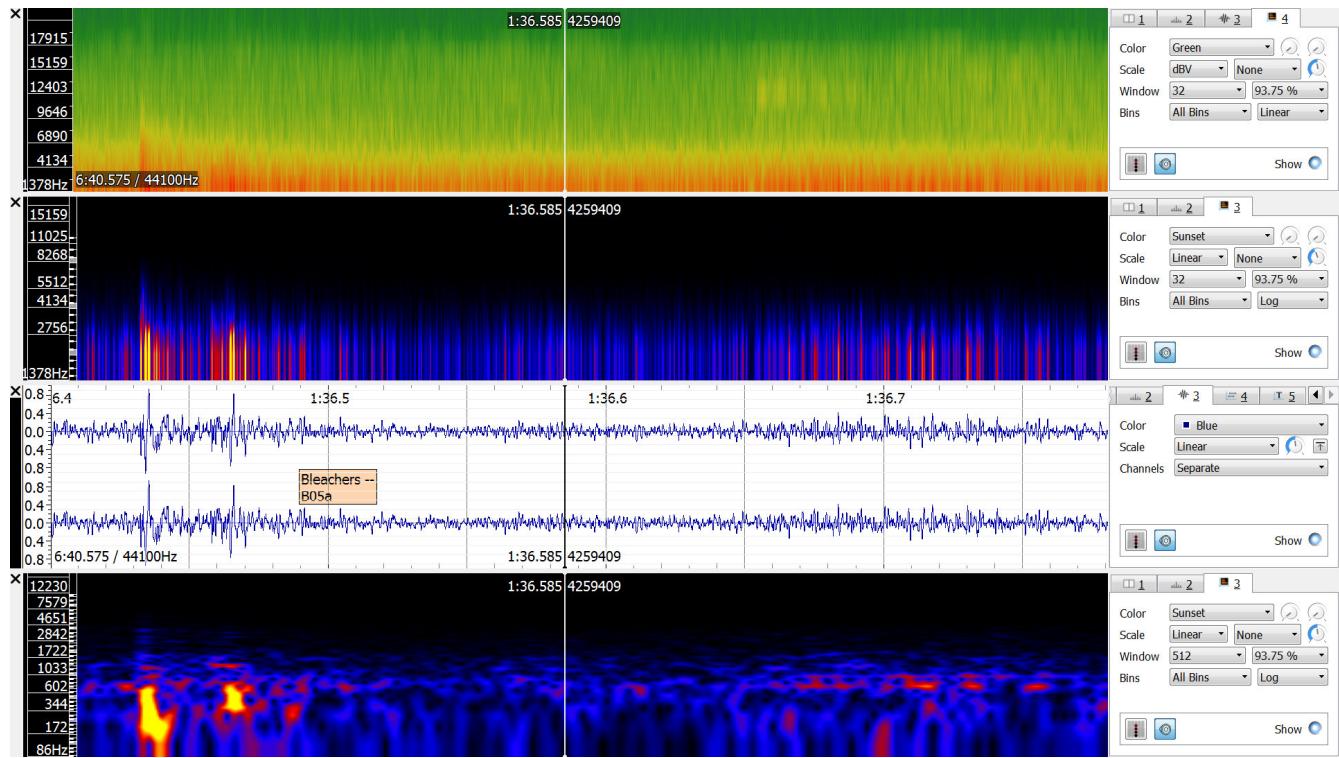
## Burst01 – first shot – muzzle -- First Shots Fired – Gate 7



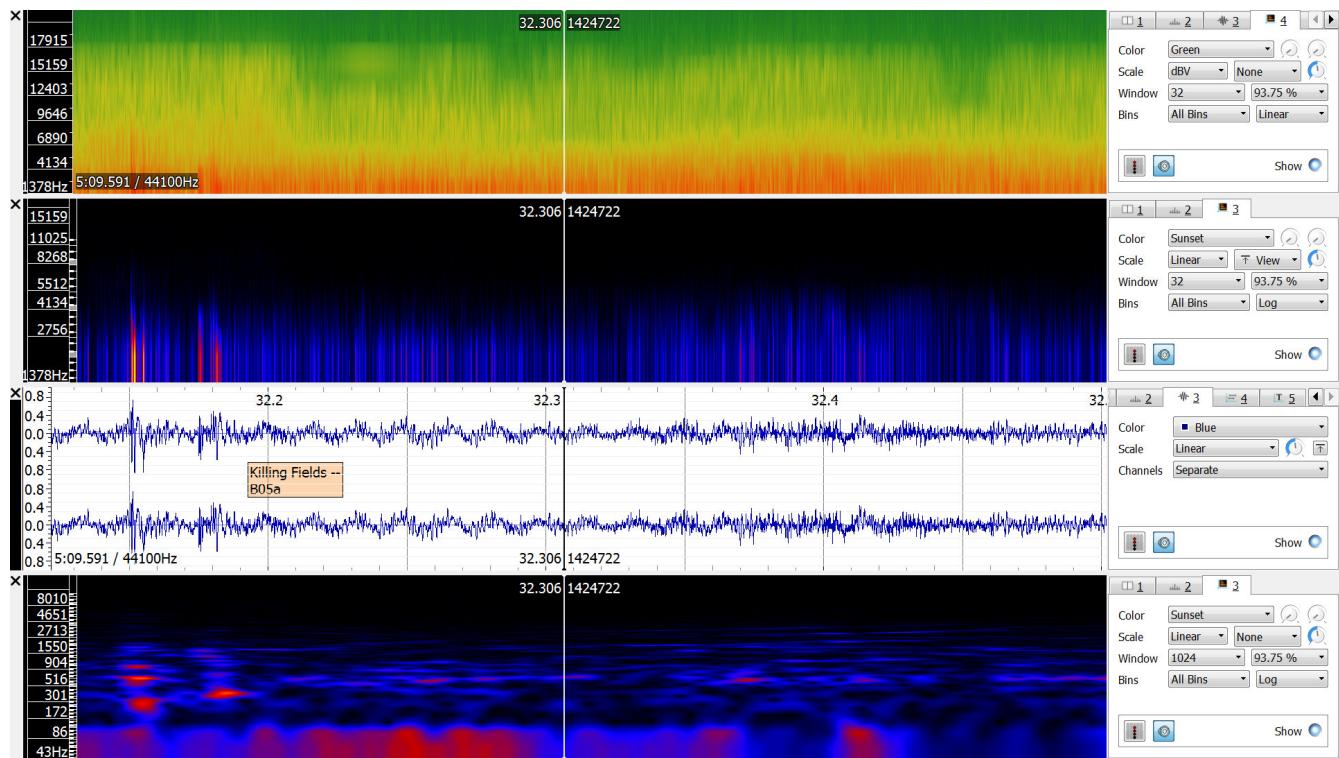
## Spectographs & Waveform -- Lvmpd 5 Second Mark Event



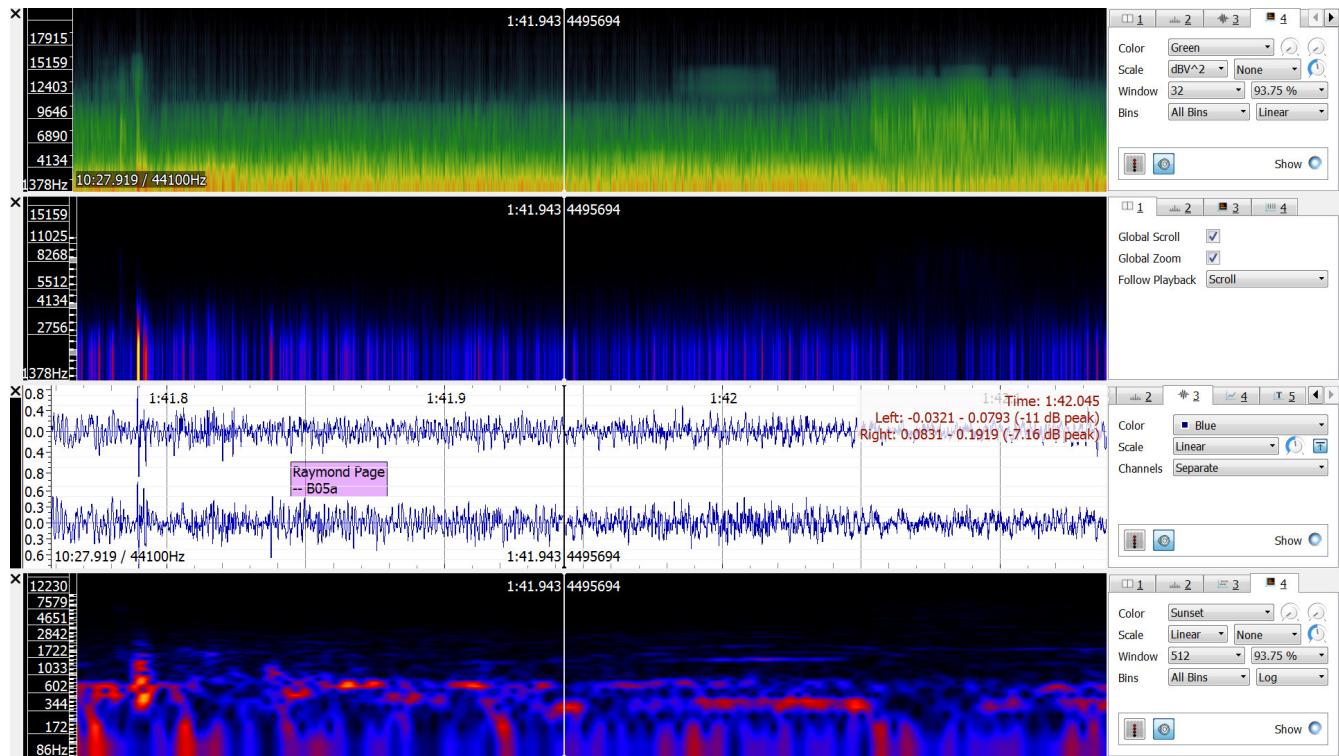
## Spectographs & Waveform – Under Bleachers (fence event)



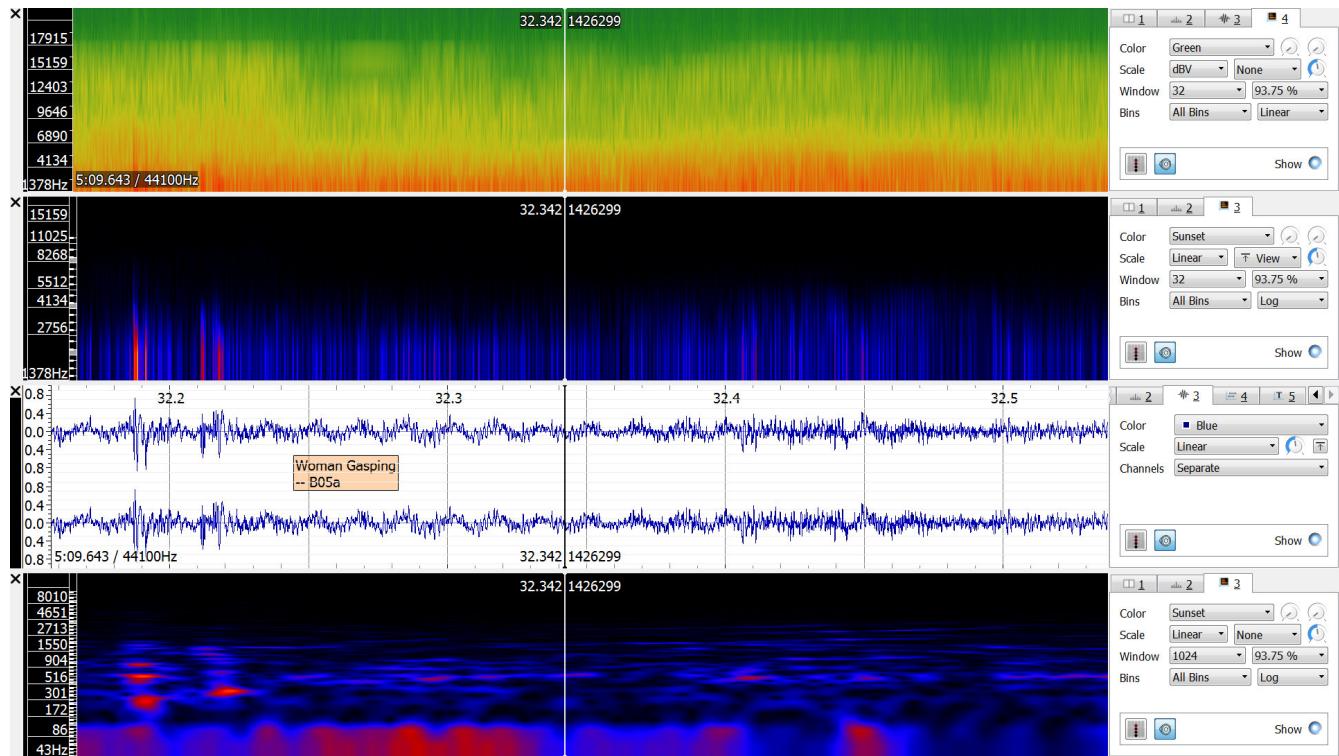
## Spectographs & Waveform – Stage Left (fence event)



## Spectographs & Waveform – Raymond Page (fence event)



## Spectographs & Waveform – Stage Right? (fence event)



## Definition of Terms

FFT

## Sample Sounds

whoosh



# **URLs**

Raymond Page

1st Shots (angel)