

# APPENDICES

**APPENDIX A: MISCELLANEOUS TABLES AND FIGURES ..... - 1 -**

**APPENDIX B: HARMONIC ANALYSIS ..... - 5 -**

NO MUTE..... - 5 -  
STRAIGHT MUTES ..... - 7 -  
    *Humes & Berg Straight*..... - 7 -  
    *Denis Wick Straight*..... - 9 -  
    *Tom Crown Alumnium-end* ..... - 11 -  
    *Tom Crown Copper-end*..... - 13 -  
CUP MUTES ..... - 15 -  
    *Humes & Berg Cup* ..... - 15 -  
    *Denis Wick Cup*..... - 17 -  
HARMON MUTES ..... - 19 -  
    *Leblanc Alessi Vacchiano Harmon, no stem* ..... - 19 -  
    *Jo-Ral Harmon, no stem* ..... - 21 -  
    *Leblanc Alessi Vacchiano Harmon, with stem* ..... - 23 -  
    *Jo-Ral Harmon, with stem* ..... - 25 -  
PLUNGER MUTES ..... - 27 -  
    *Plunger Fully Closed* ..... - 27 -  
    *Plunger Closed for Playing*..... - 29 -  
    *Plunger Open for Playing* ..... - 31 -  
PRACTICE MUTES ..... - 33 -  
    *Yamaha Silent Brass* ..... - 33 -

**APPENDIX C: INPUT IMPEDANCE ANALYSIS ..... - 35 -**

NO MUTE..... - 35 -  
STRAIGHT MUTES ..... - 36 -  
CUP MUTES ..... - 40 -  
HARMON MUTES ..... - 43 -  
PLUNGER MUTES ..... - 48 -  
PRACTICE MUTES ..... - 51 -  
MORE RESOLUTE CURVES ..... - 53 -

## Appendix A: Miscellaneous Tables and Figures

Table 1

Freq	ConcNote	TptNote		
29.14	Bb0	C1	<i>fundamental</i>	below staff
58.27	Bb1	C2	<i>double pedal C</i>	
116.54	Bb2	C3	<i>pedal C</i>	
174.61	F3	G3	<i>G below staff</i>	within staff
233.08	Bb3	C4	<i>C below staff</i>	
349.23	F4	G4	<i>second line G</i>	
466.16	Bb4	C5	<i>third space C</i>	
587.33	D5	E5	<i>fourth space E</i>	
698.46	F5	G5	<i>G above staff</i>	above staff
830.61	Ab5	Bb5		
932.33	Bb5	C6	<i>"Grand C"</i>	
1046.5023	<b>C6</b>	<b>D6</b>	<i>altissimo</i>	
1174.6591	<b>D6</b>	<b>E6</b>		
1318.5102	<b>E6</b>	<b>Gb6</b>		
1396.9129	<b>F6</b>	<b>G6</b>		



Figure 1



Figure 2



Figure 3



Figure 4



Figure 5



**Figure 6**



**Figure 7**



**Figure 8**



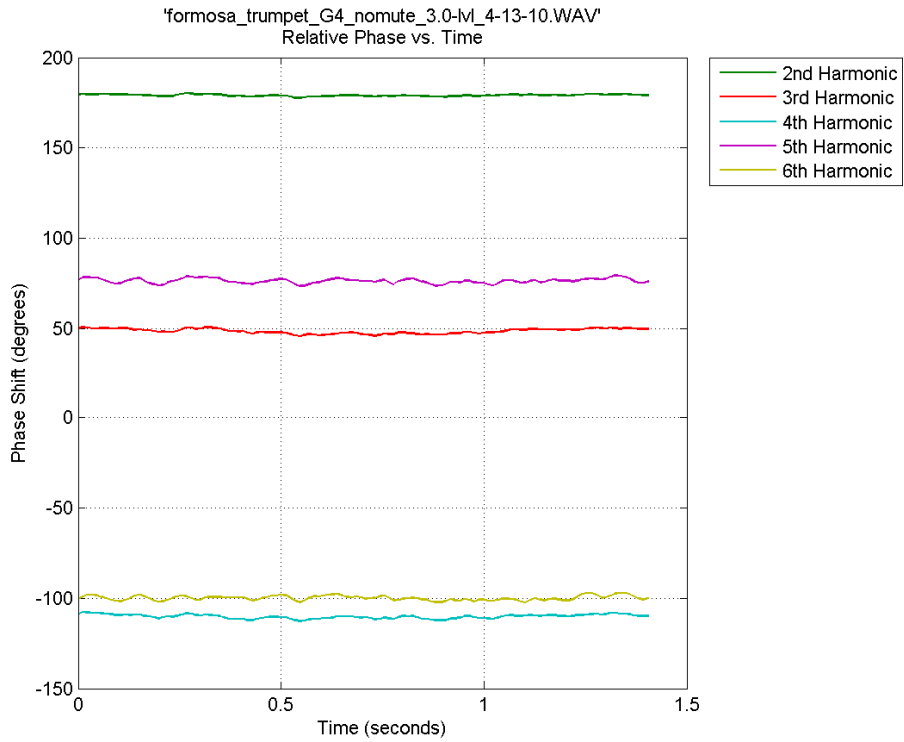
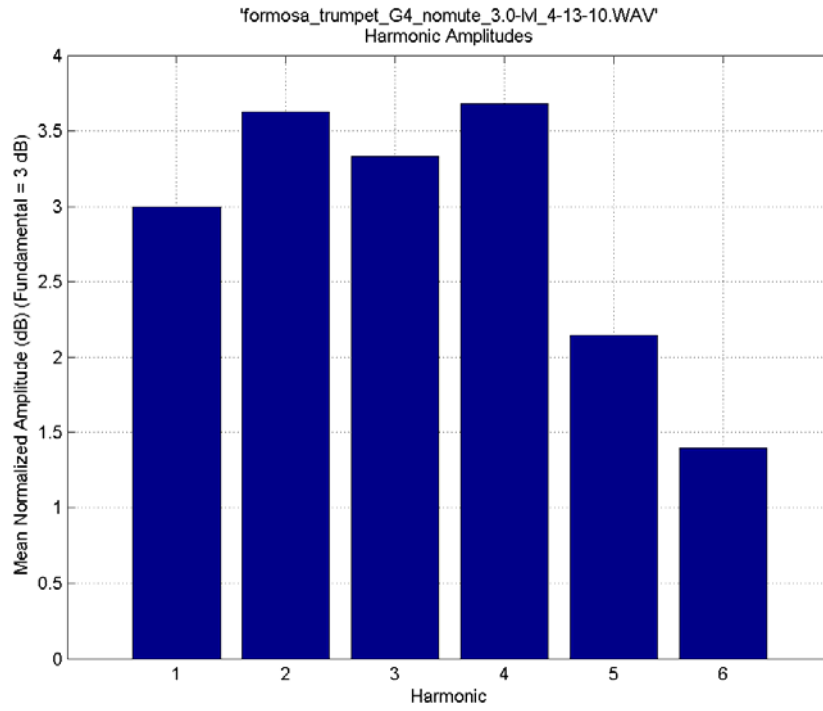
**Figure 9**

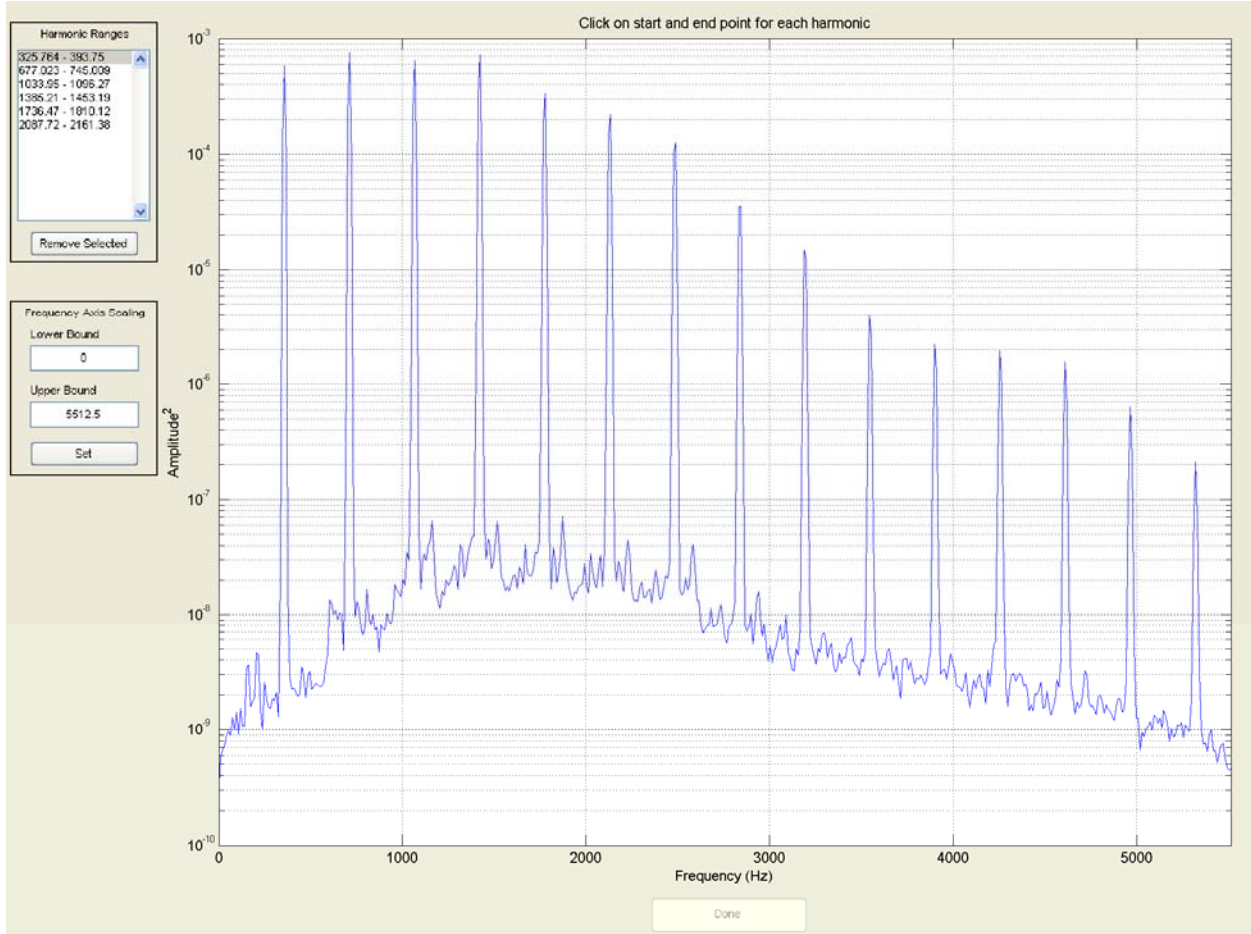


**Figure 10**

# Appendix B: Harmonic Analysis

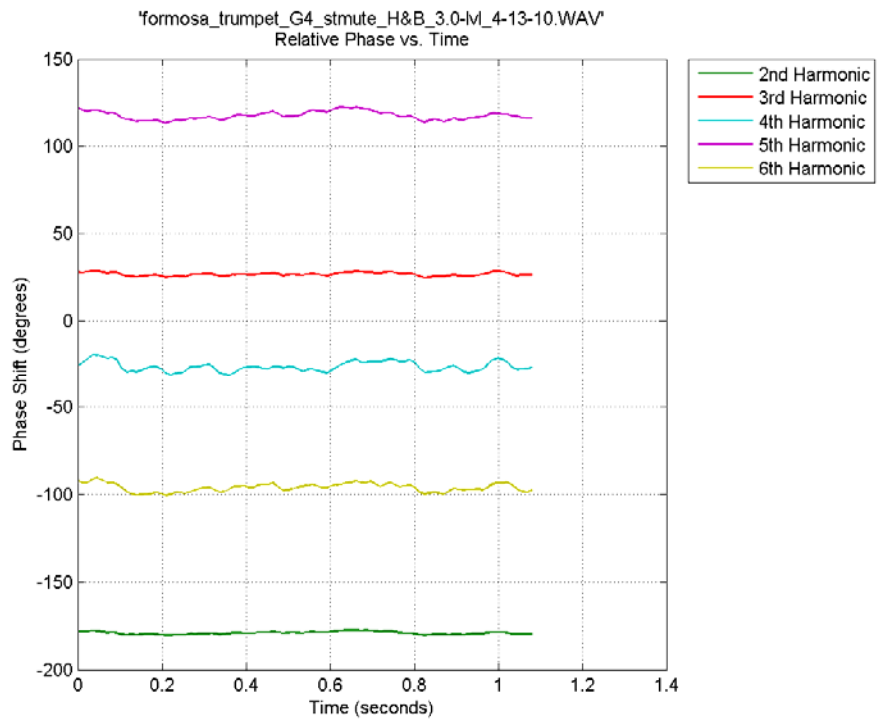
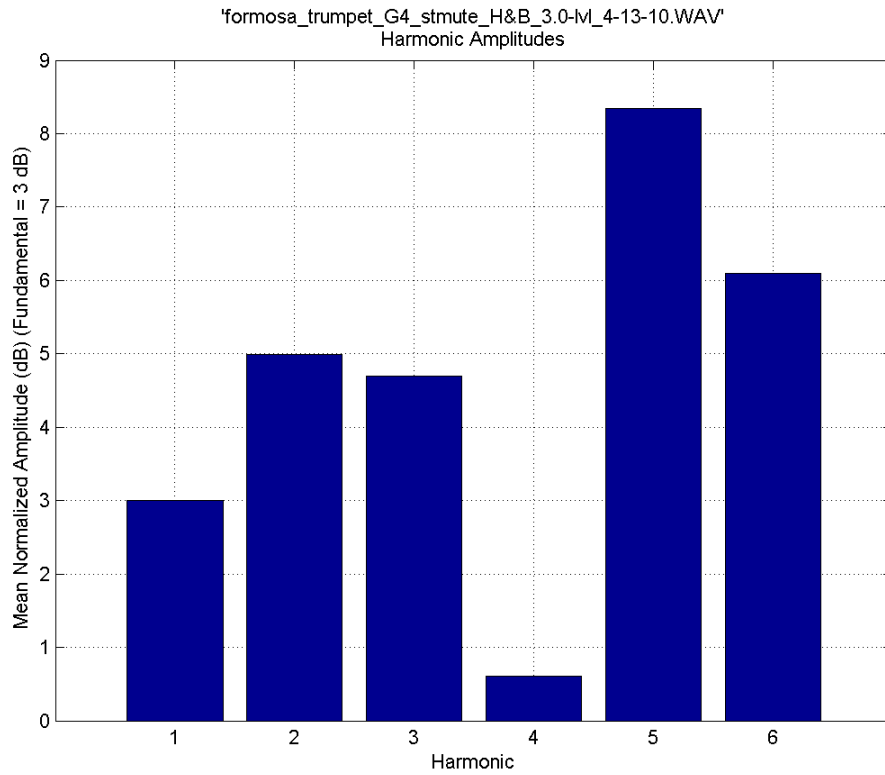
## No Mute



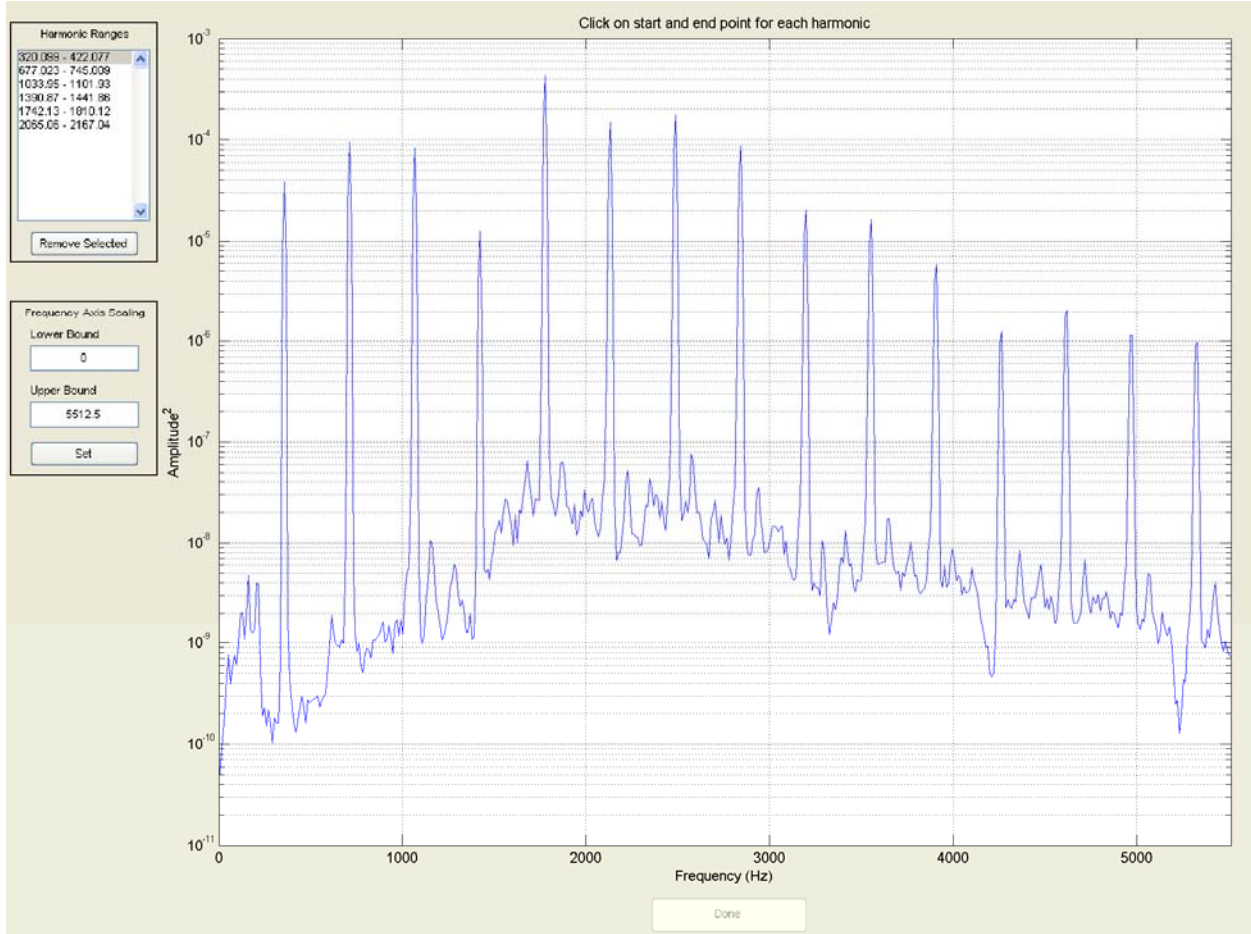


# Straight Mutes

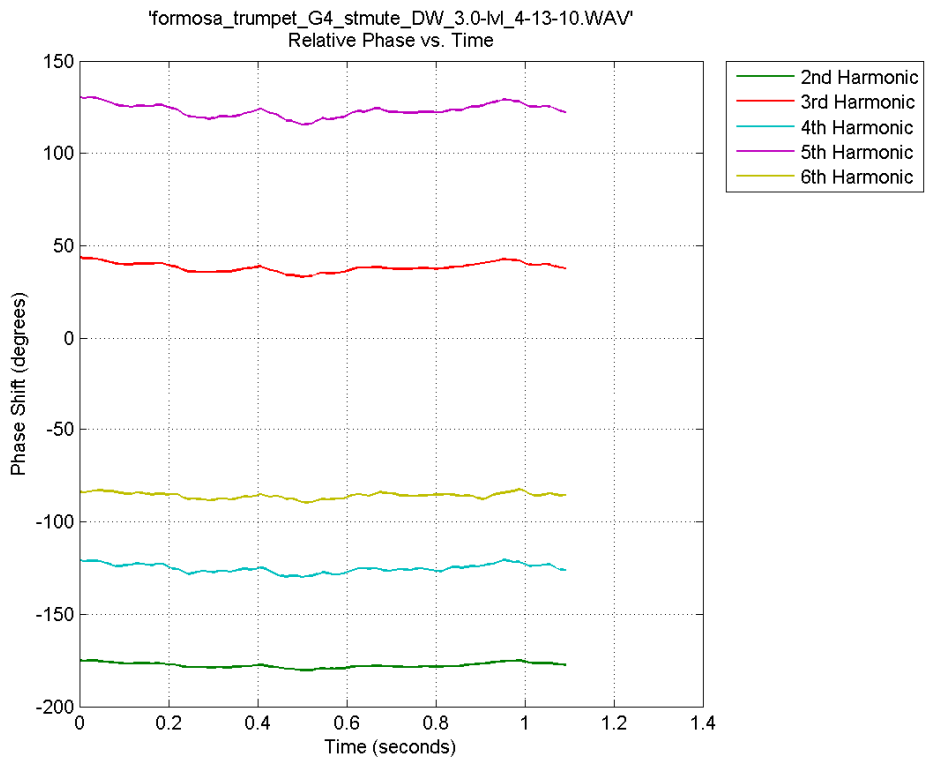
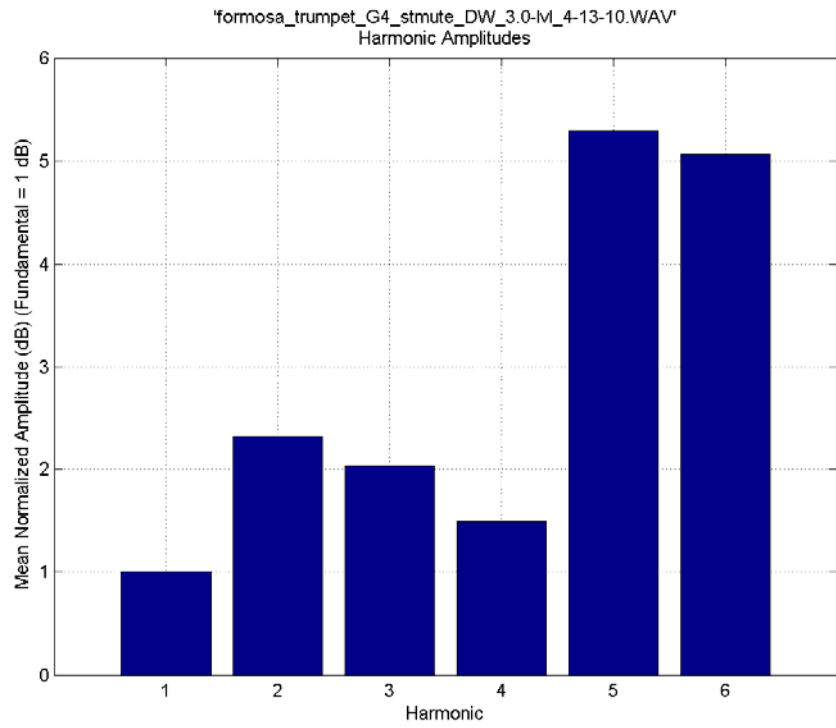
## Humes & Berg Straight

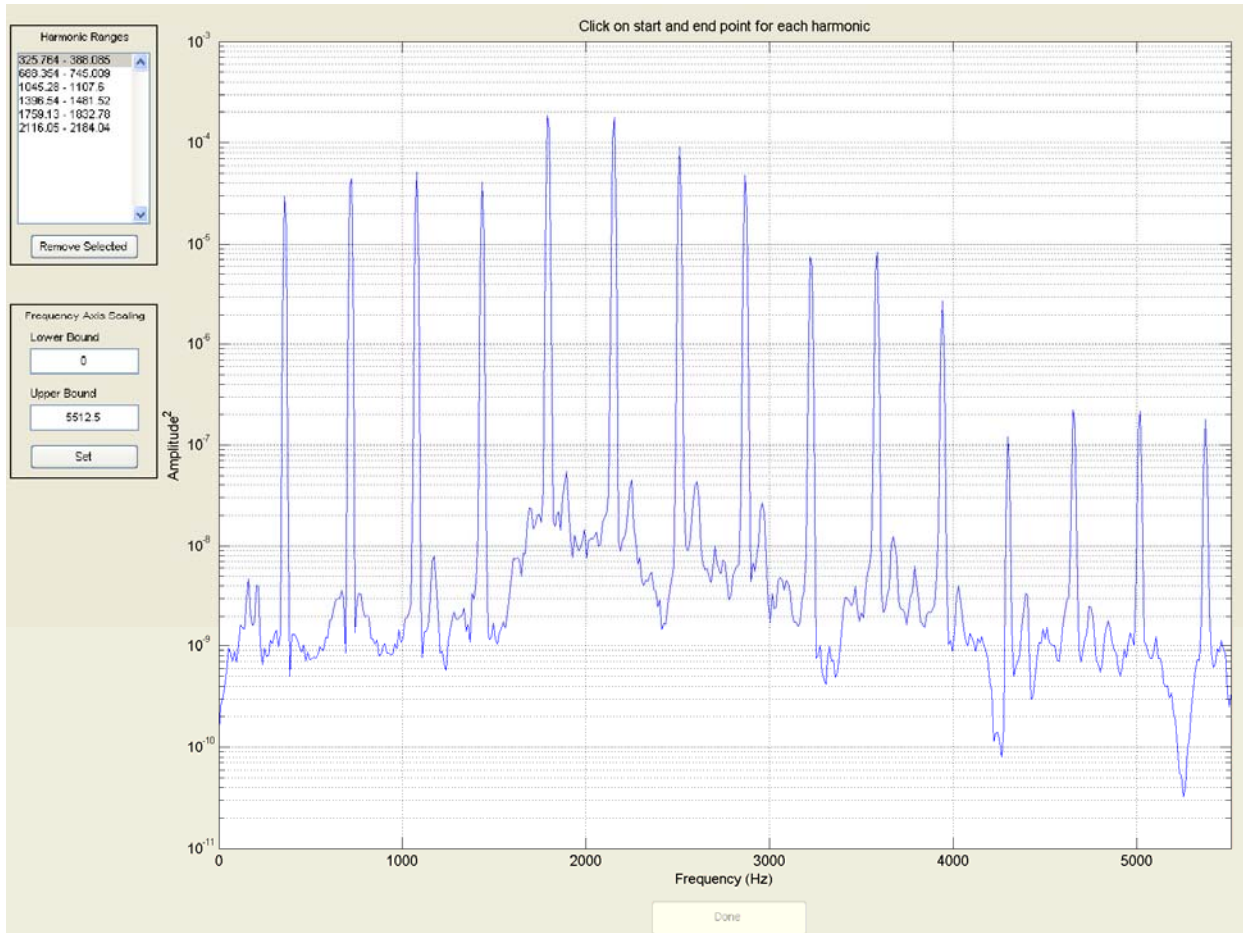






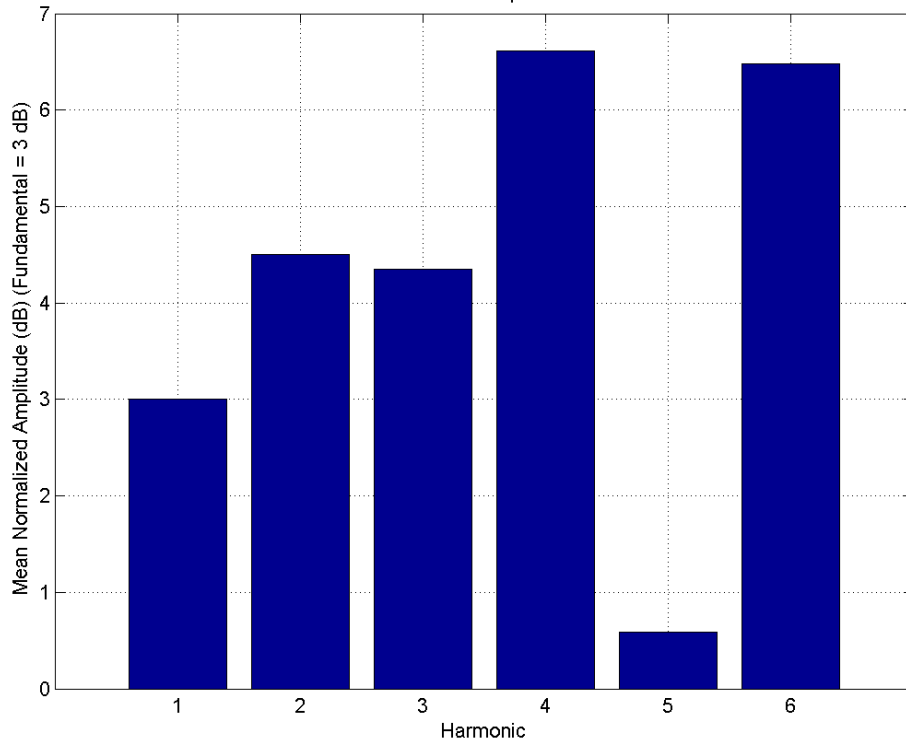
# Denis Wick Straight



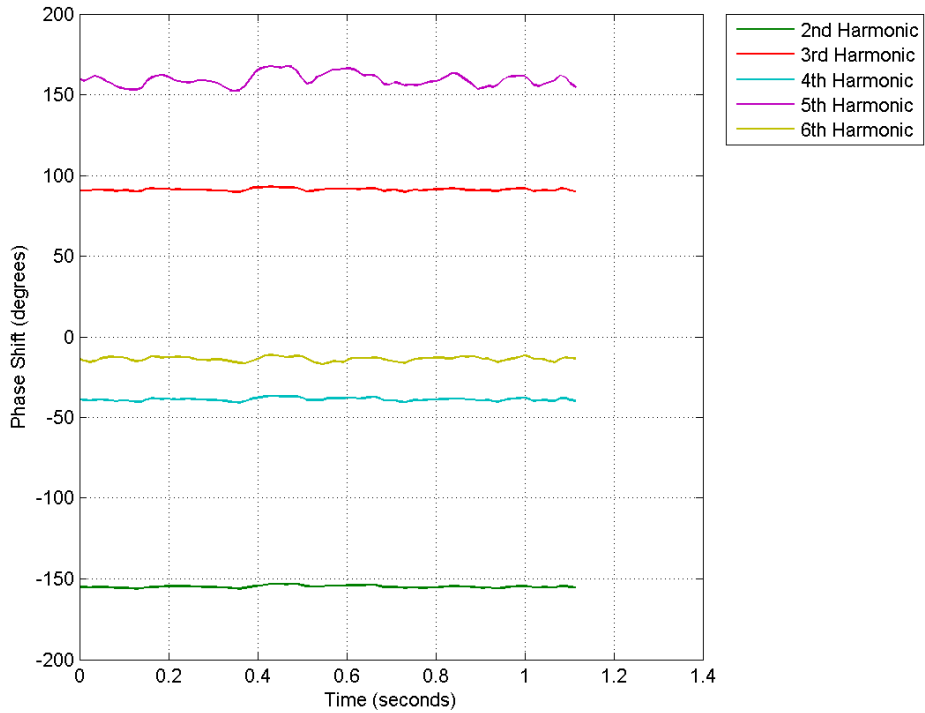


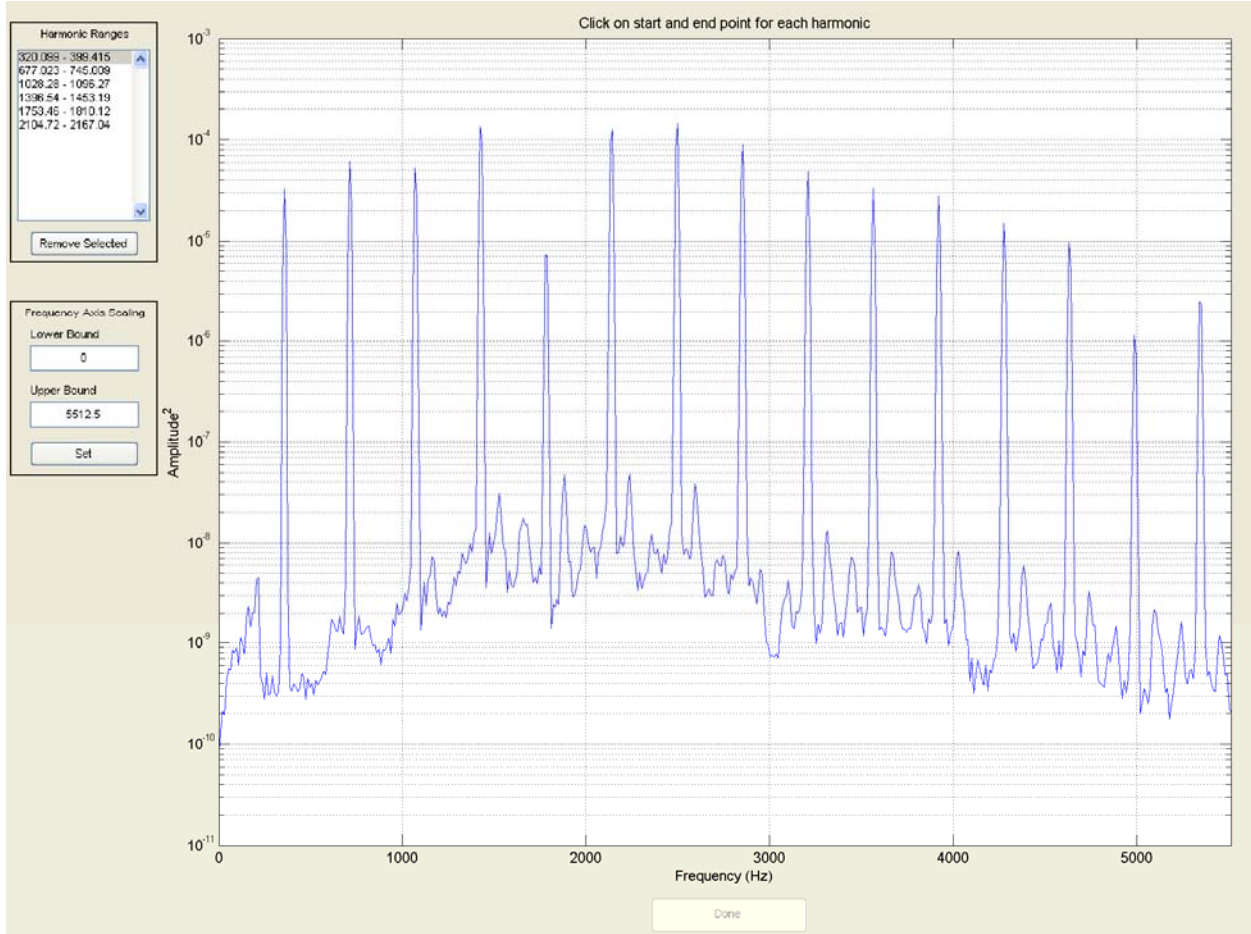
# Tom Crown Aluminium-end

'formosa\_trumpet\_G4\_stmute\_TC-aluminum\_3.0-M\_4-13-10.WAV'  
Harmonic Amplitudes

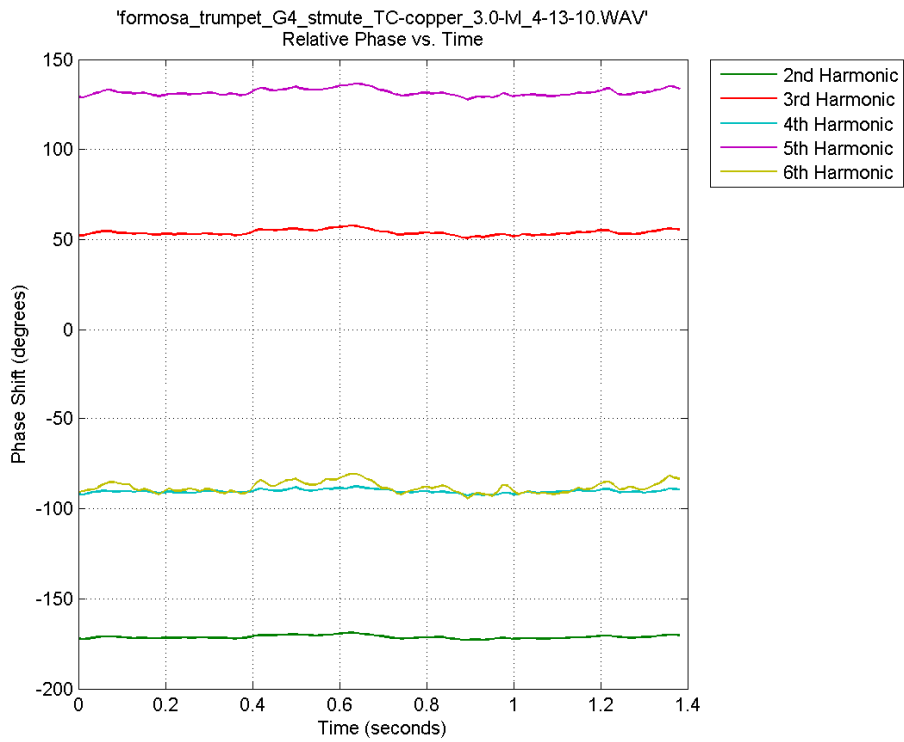
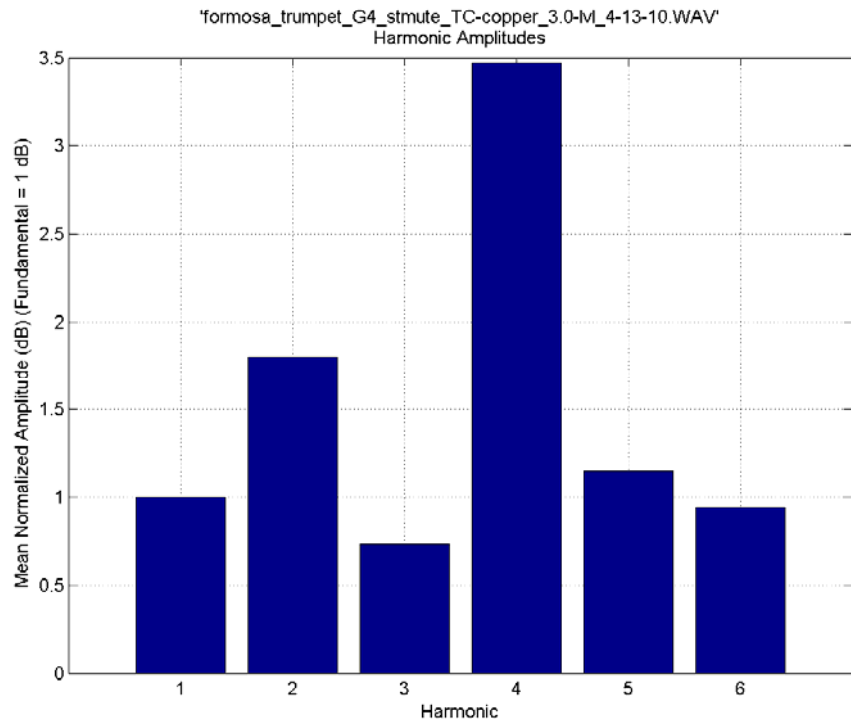


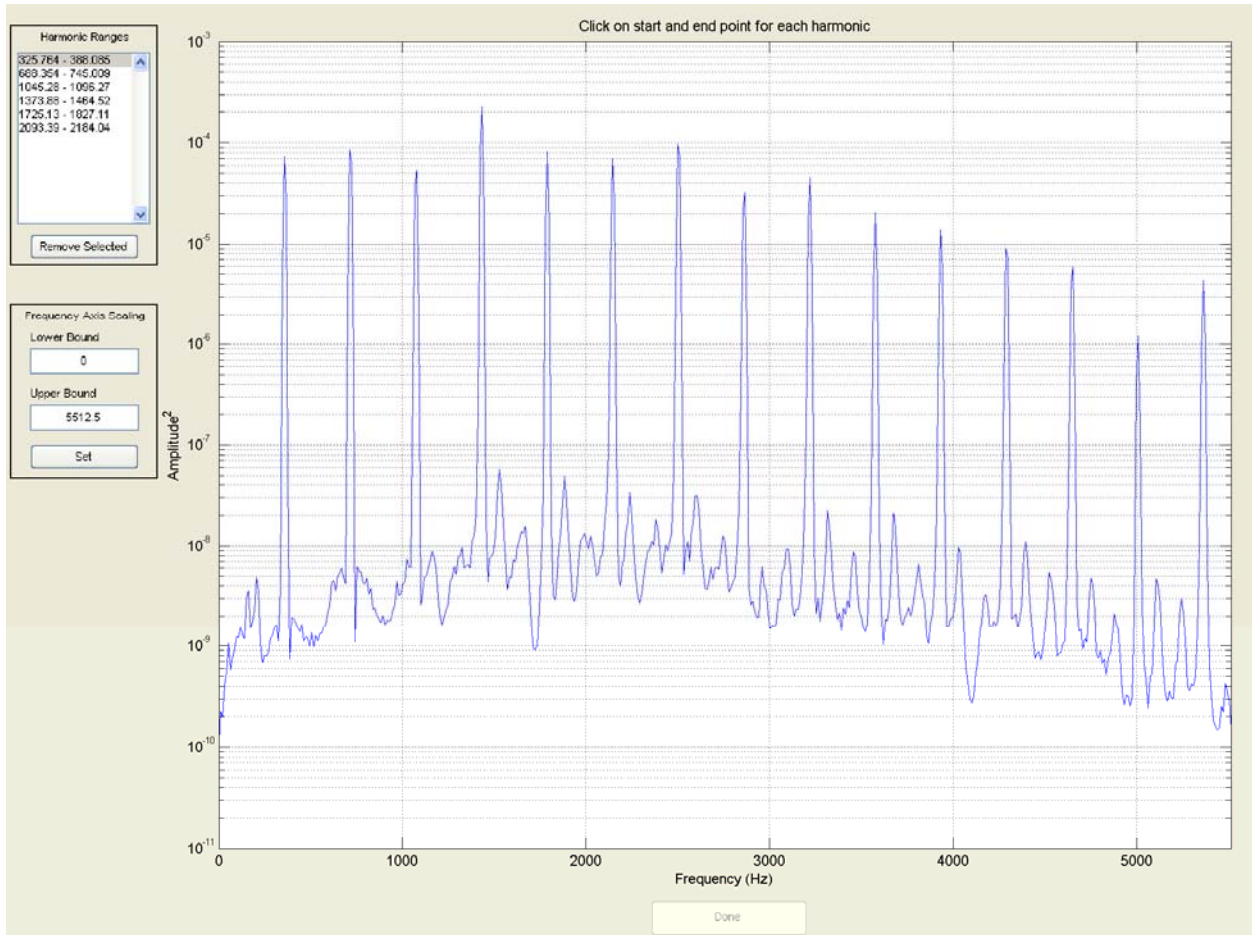
'formosa\_trumpet\_G4\_stmute\_TC-aluminum\_3.0-M\_4-13-10.WAV'  
Relative Phase vs. Time





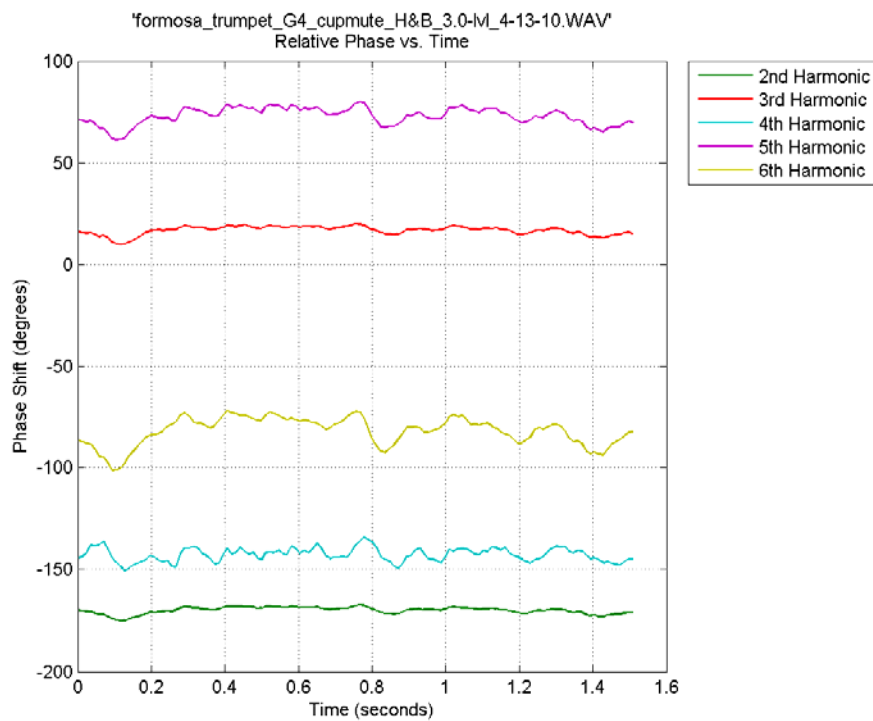
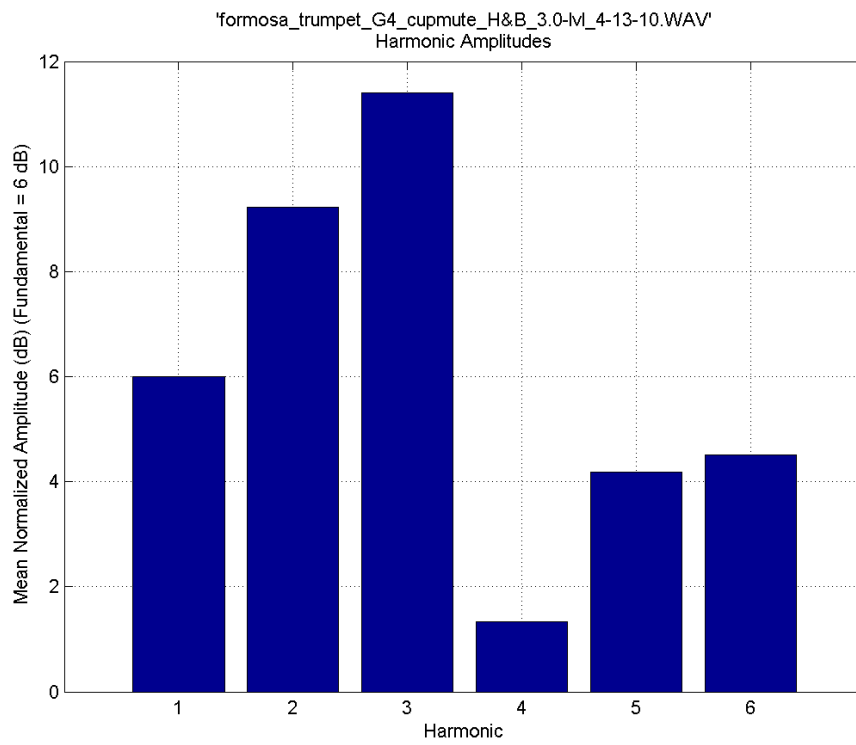
# Tom Crown Copper-end



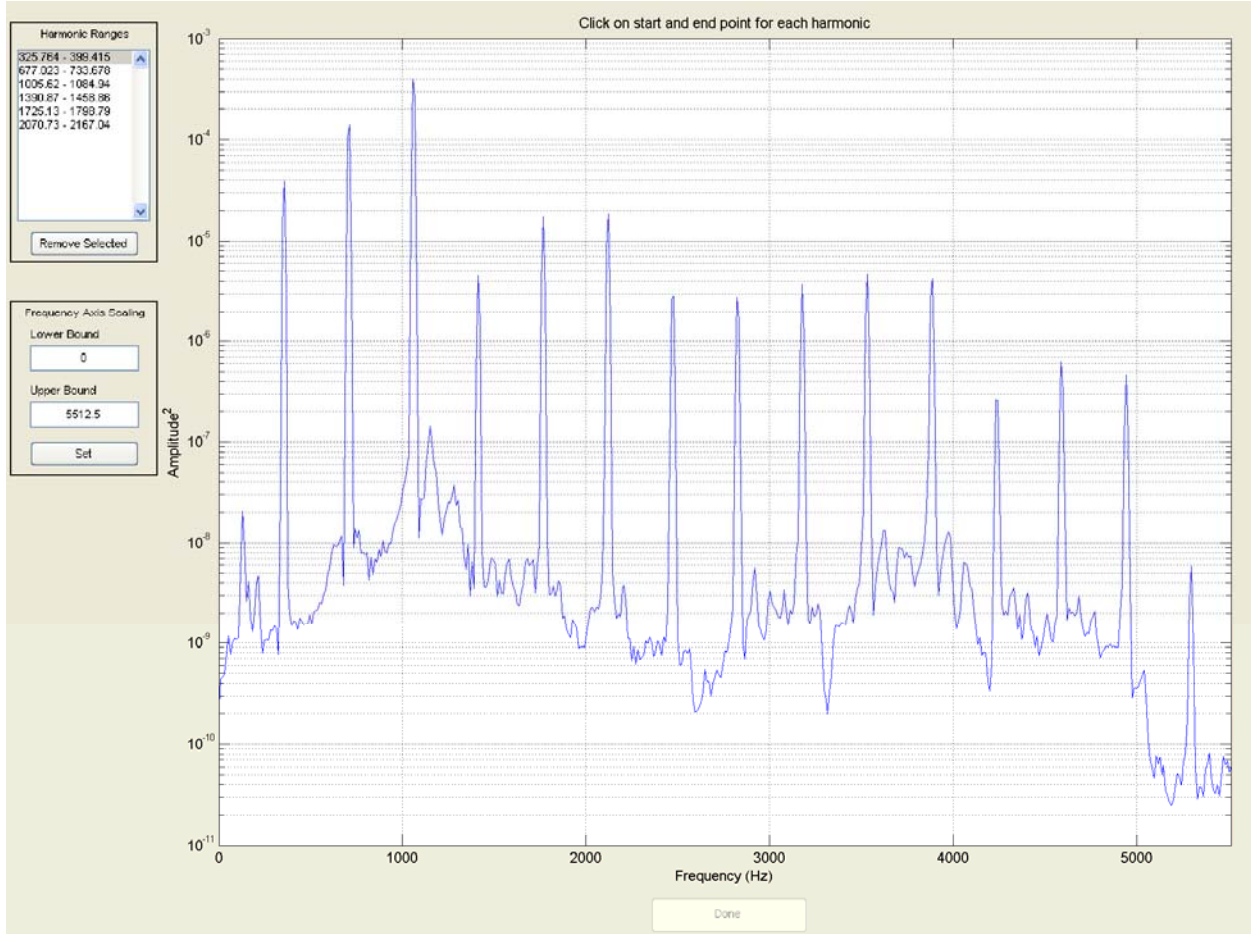


# Cup Mutes

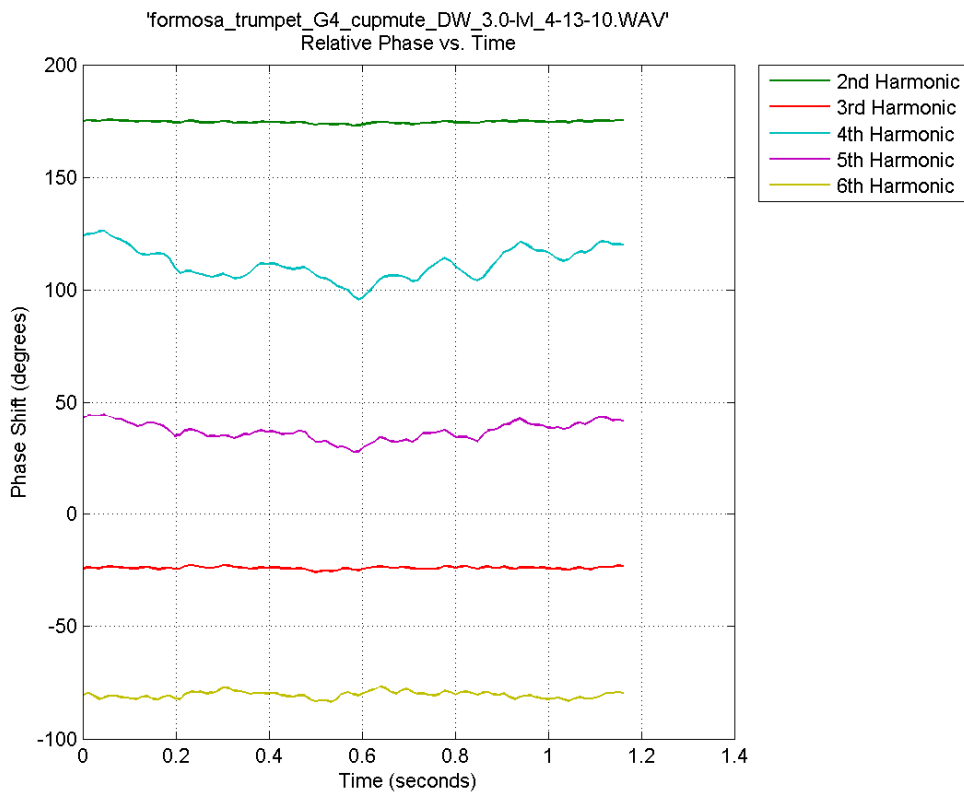
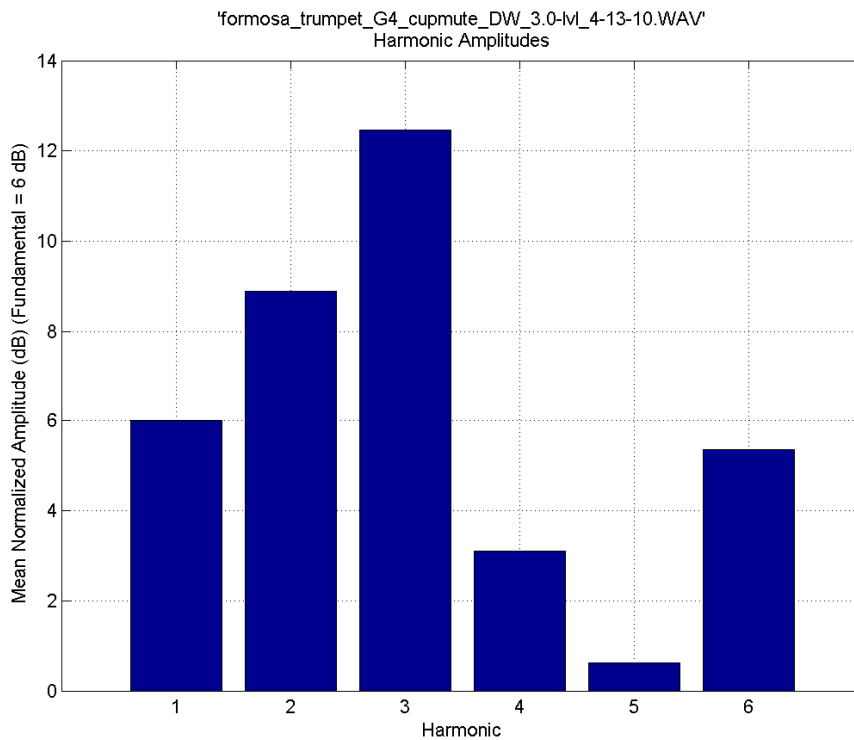
## Humes & Berg Cup

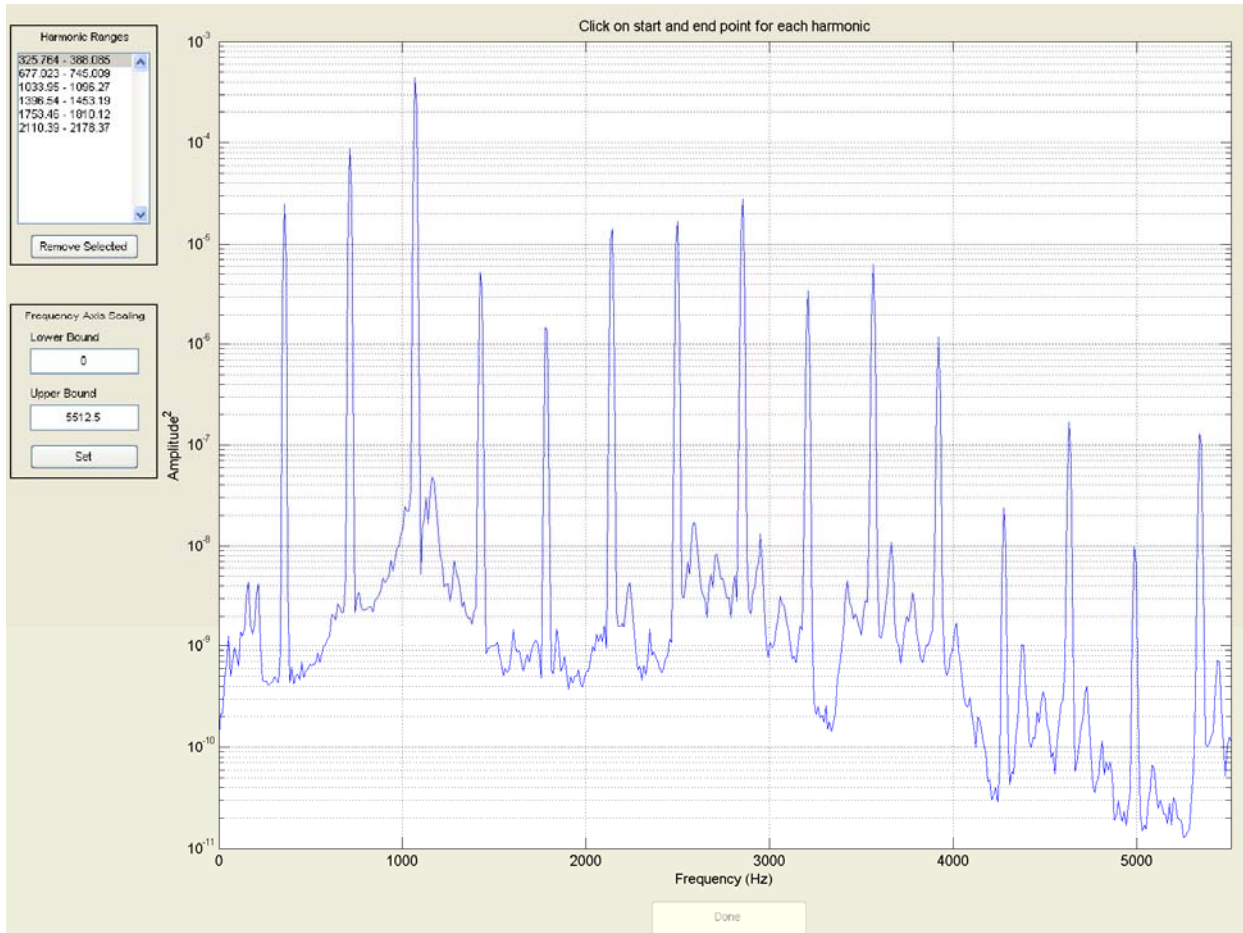






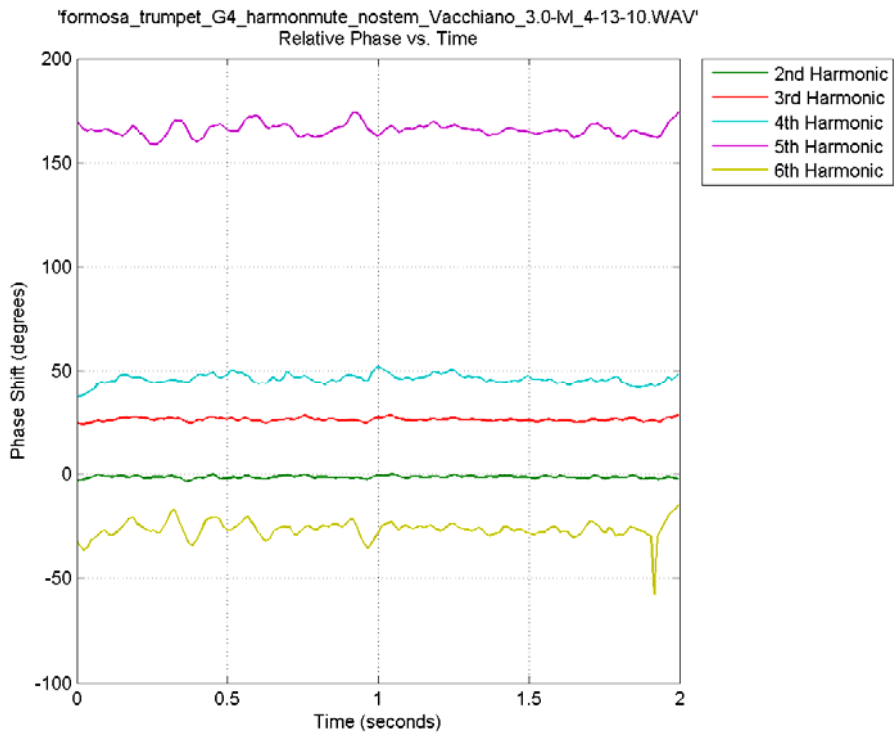
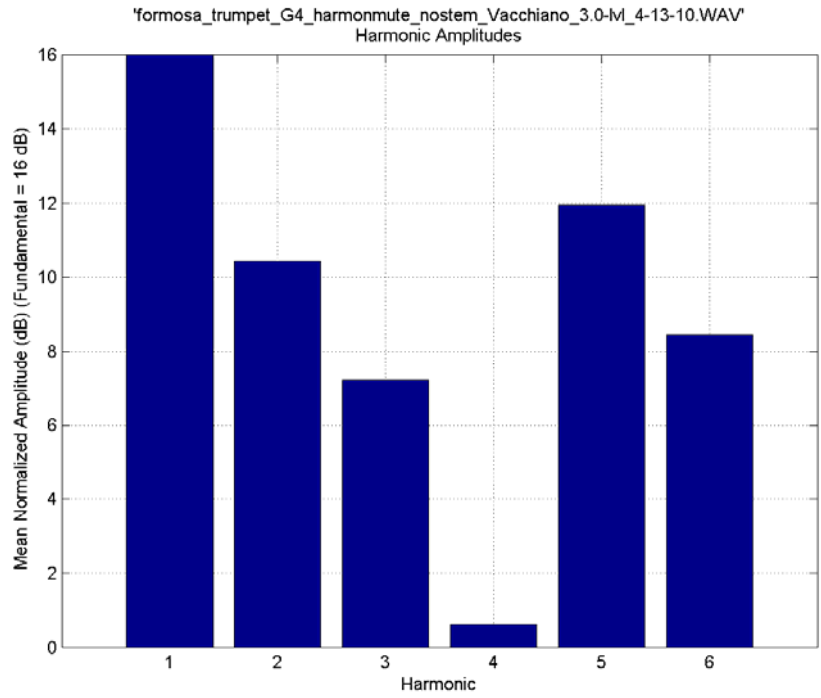
# Denis Wick Cup

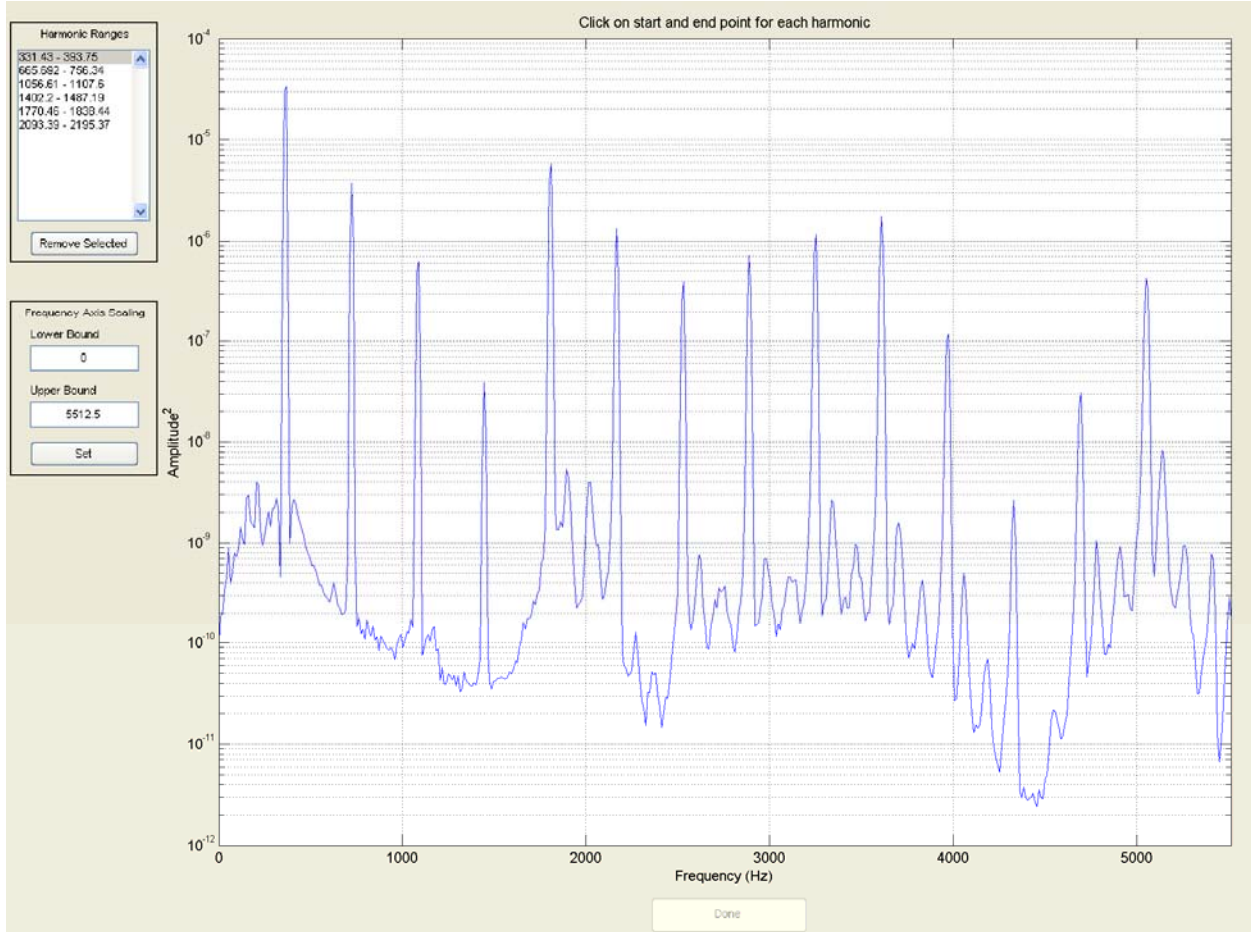




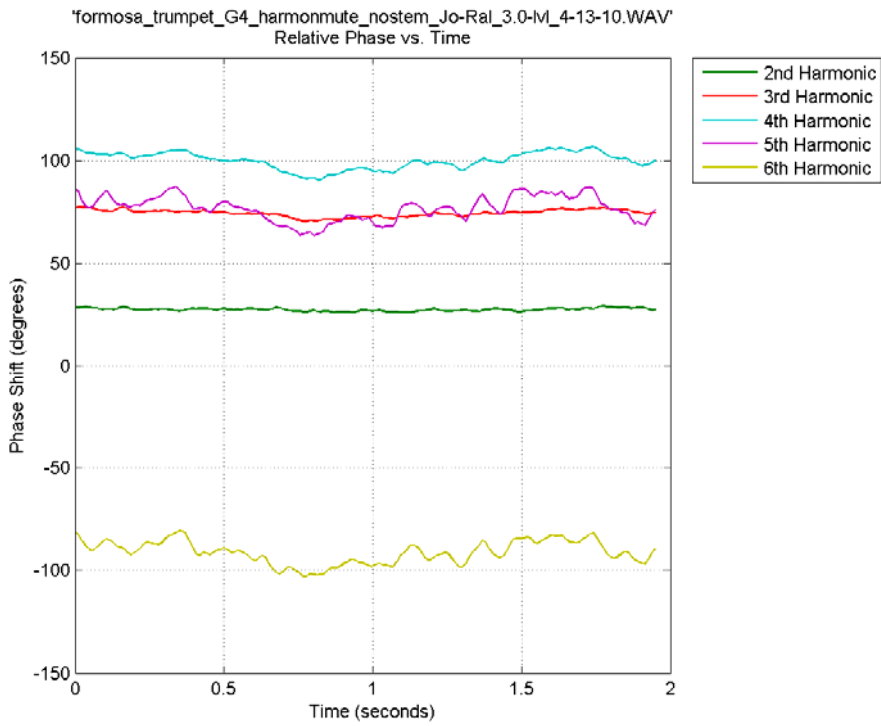
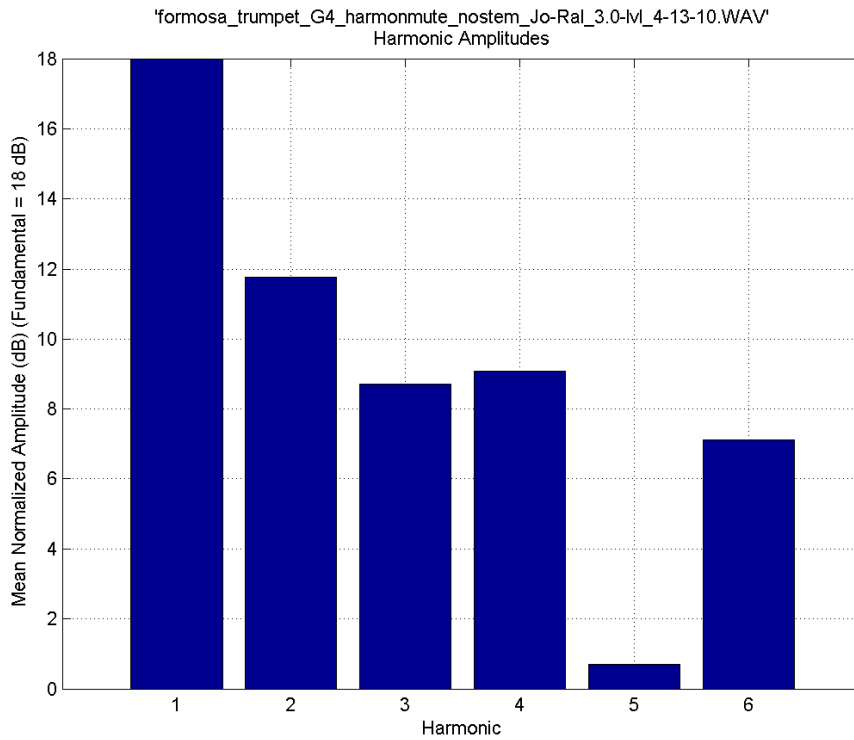
# Harmon Mutes

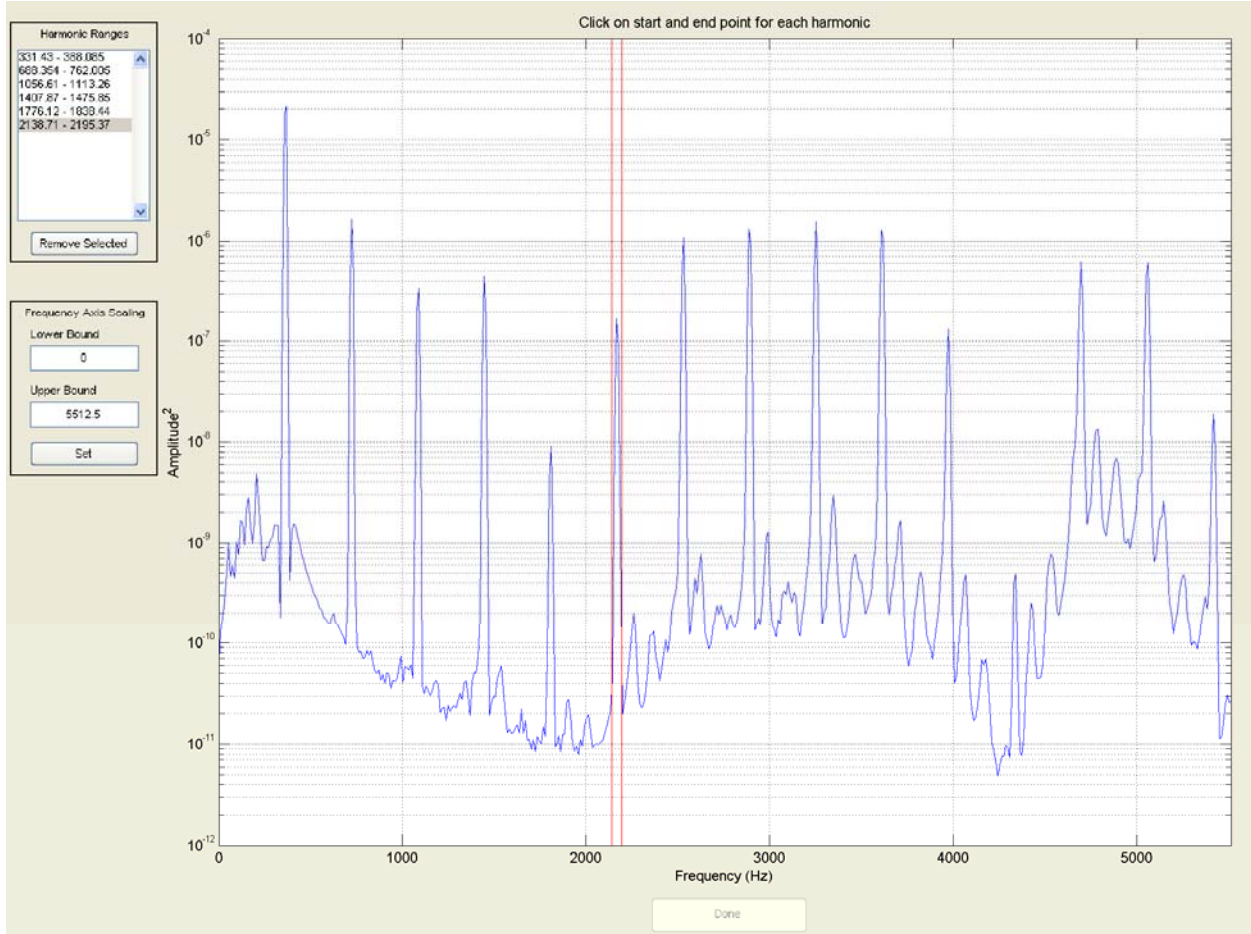
## Leblanc Alessi Vacchiano Harmon, no stem





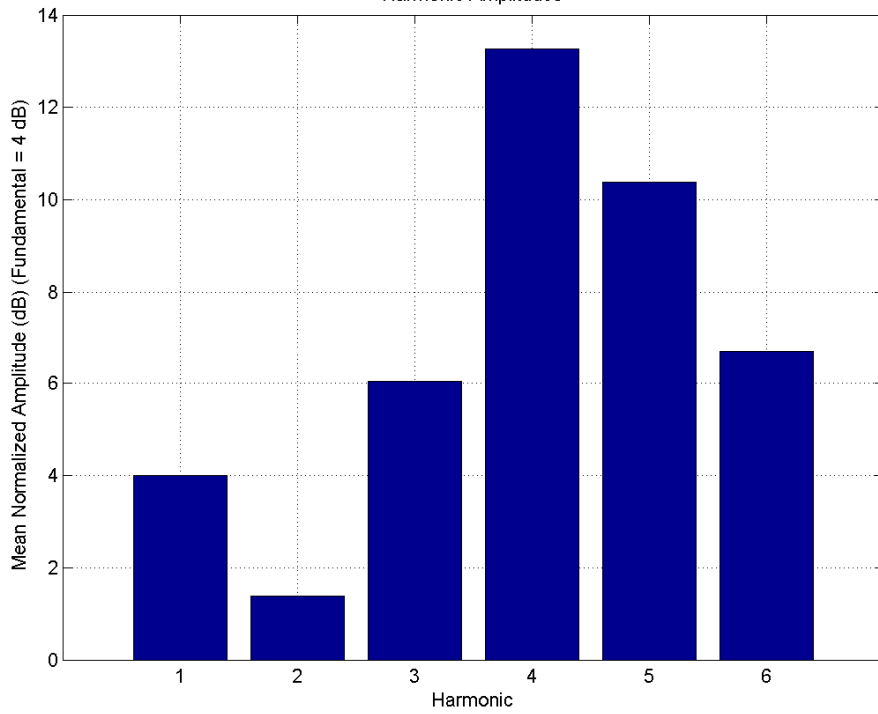
# Jo-Ral Harmon, no stem



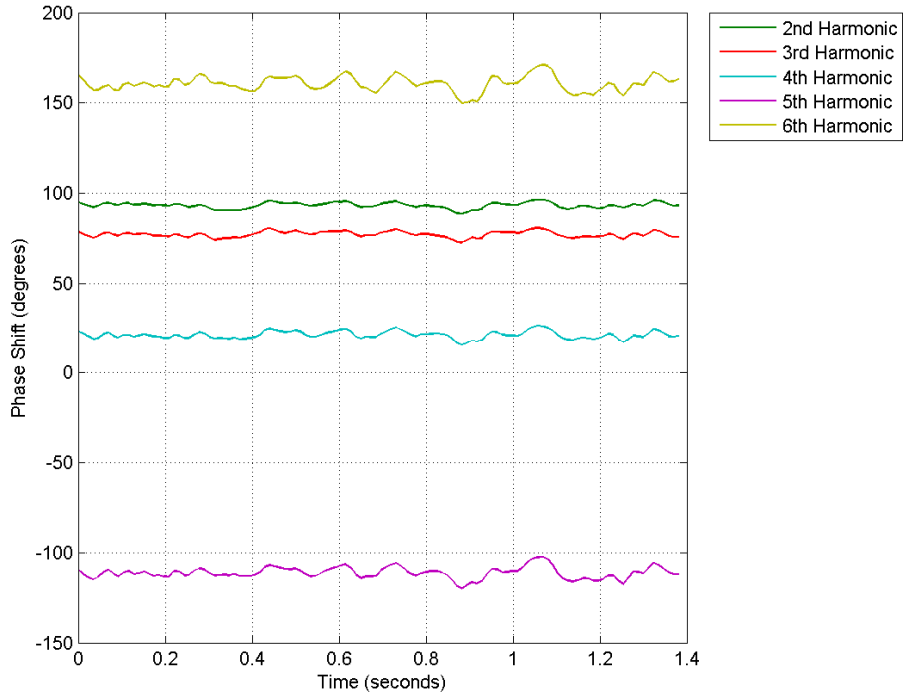


# Leblanc Alessi Vacchiano Harmon, with stem

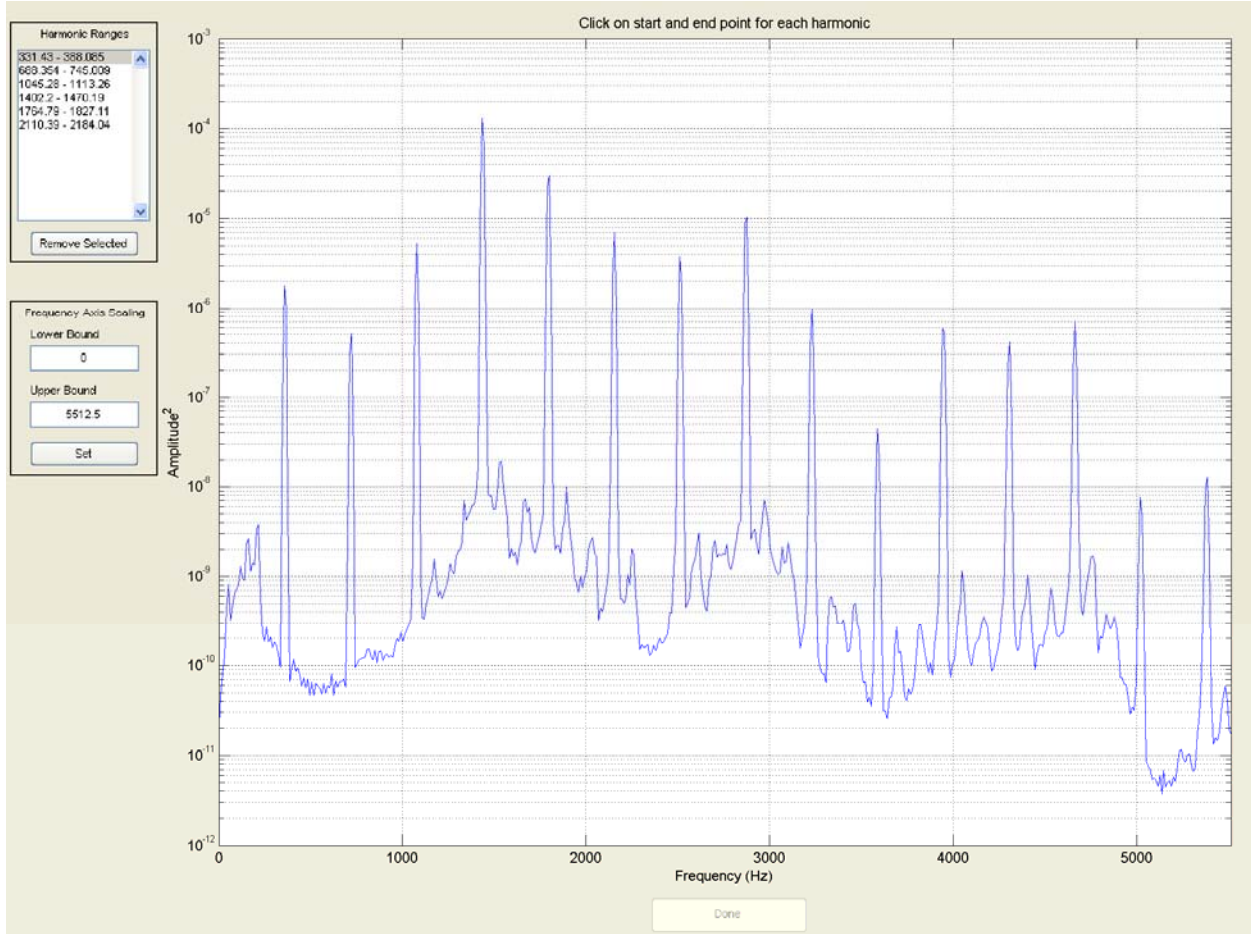
'formosa\_trumpet\_G4\_harmonmute\_stem\_Vacchiano\_3.0-M\_4-13-10.WAV'  
Harmonic Amplitudes



'formosa\_trumpet\_G4\_harmonmute\_stem\_Vacchiano\_3.0-M\_4-13-10.WAV'  
Relative Phase vs. Time

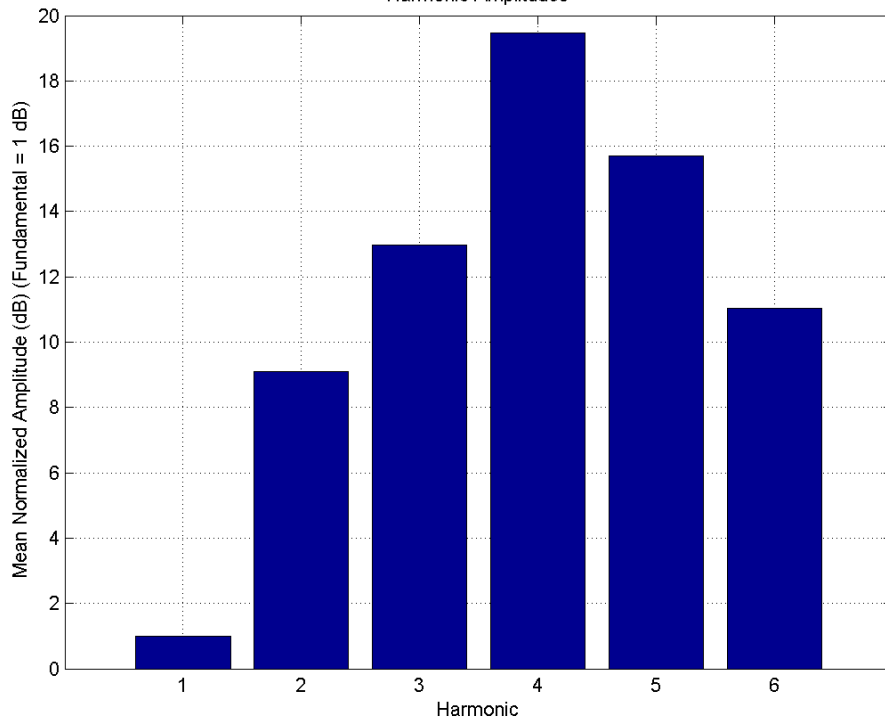




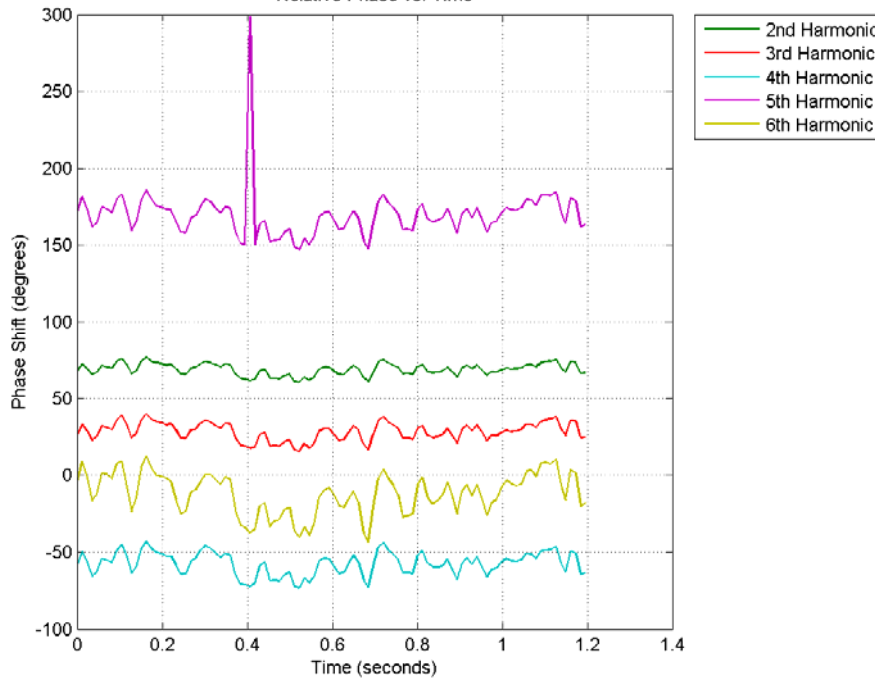


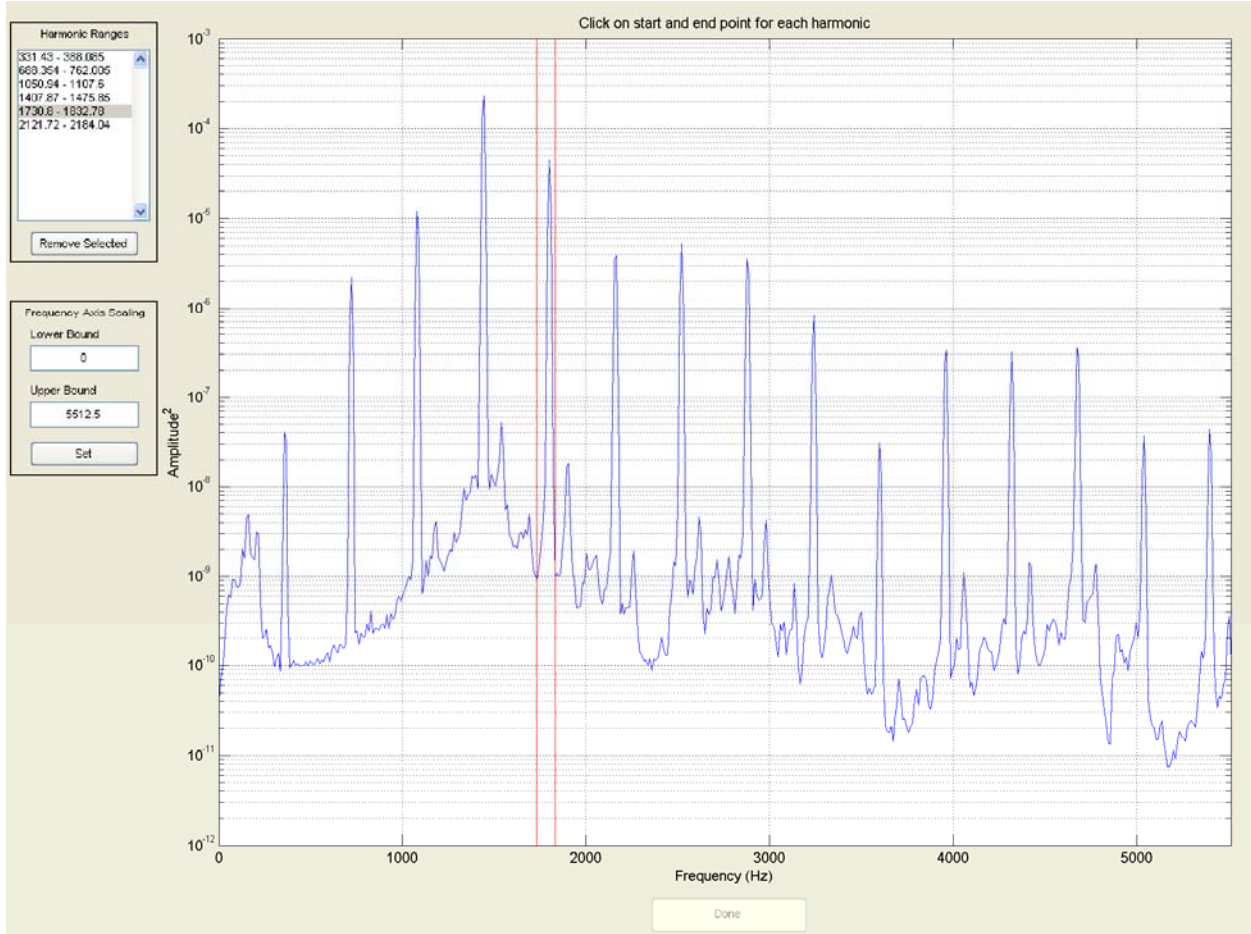
# Jo-Ral Harmon, with stem

'formosa\_trumpet\_G4\_harmonmute\_stem\_Jo-Ral\_3.0-M\_4-13-10.WAV'  
Harmonic Amplitudes



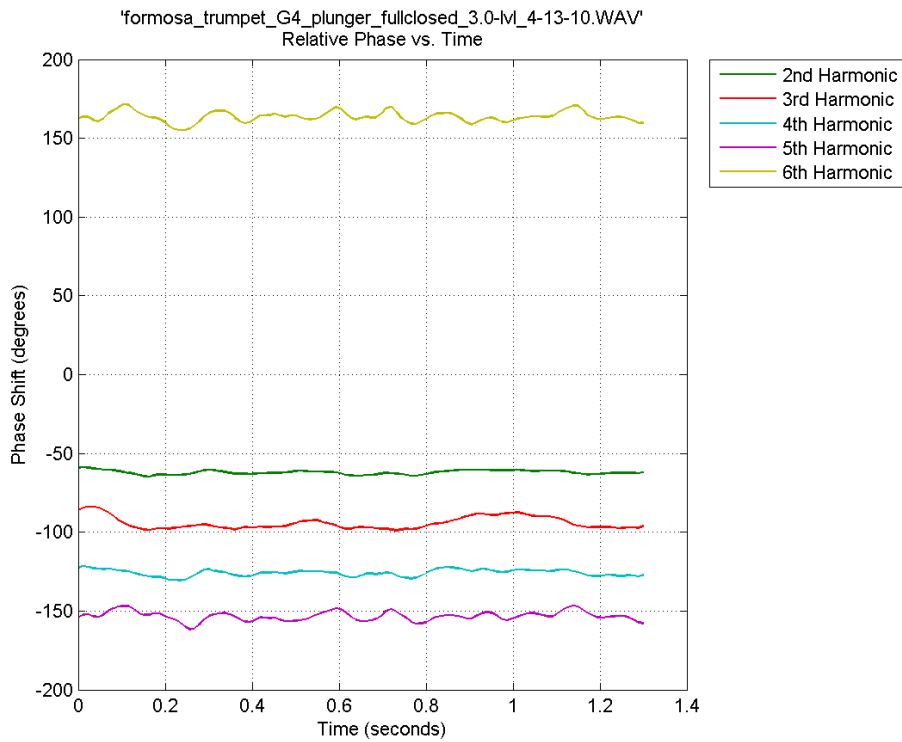
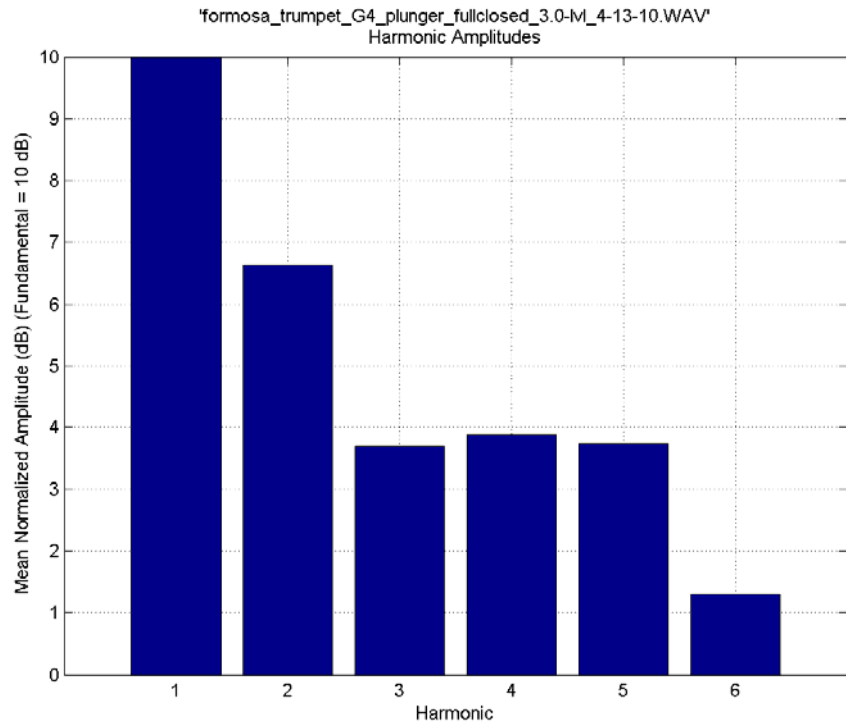
'formosa\_trumpet\_G4\_harmonmute\_stem\_Jo-Ral\_3.0-M\_4-13-10.WAV'  
Relative Phase vs. Time

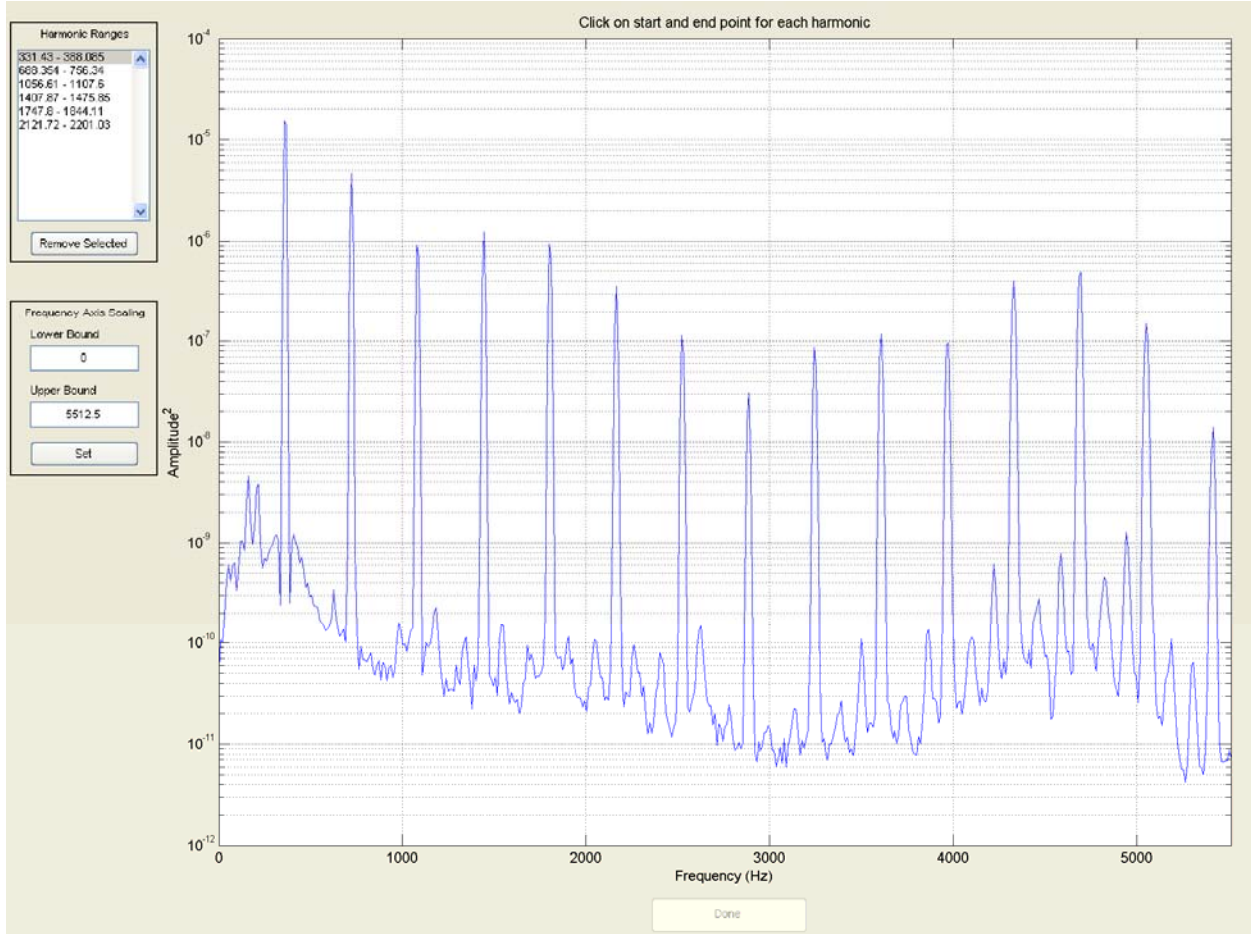




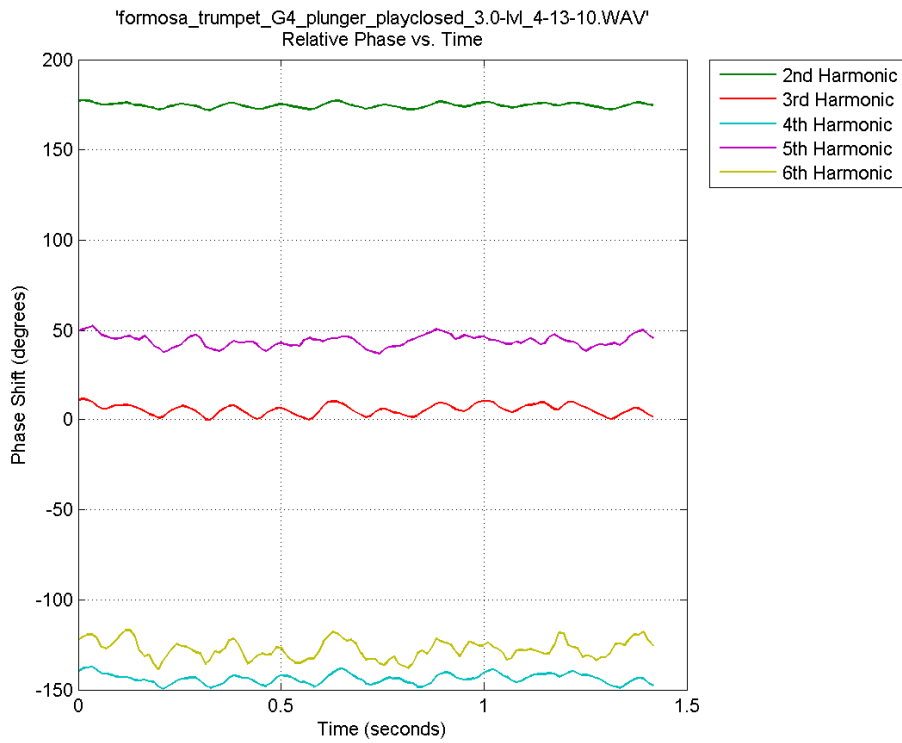
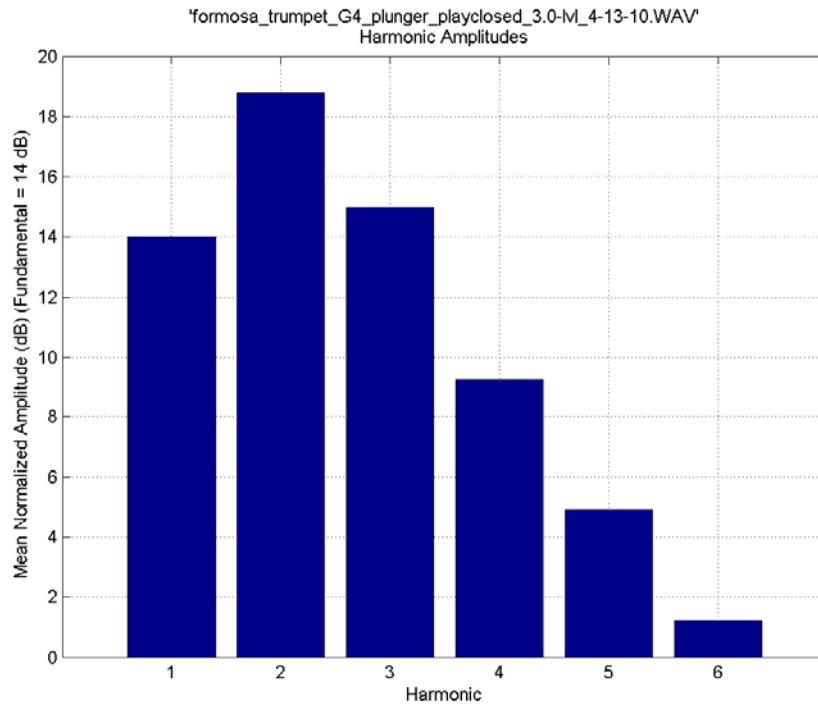
# Plunger Mutes

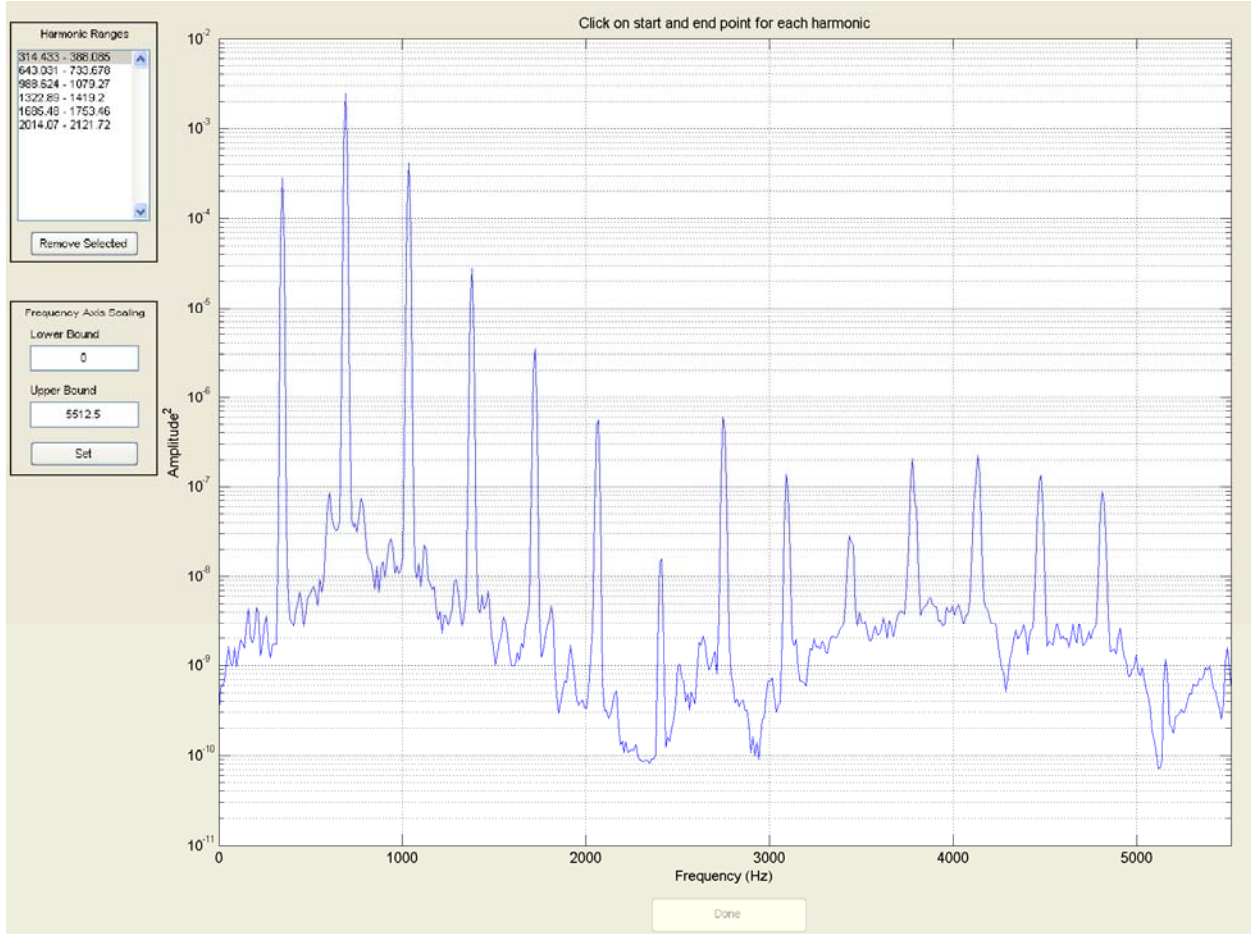
## Plunger Fully Closed





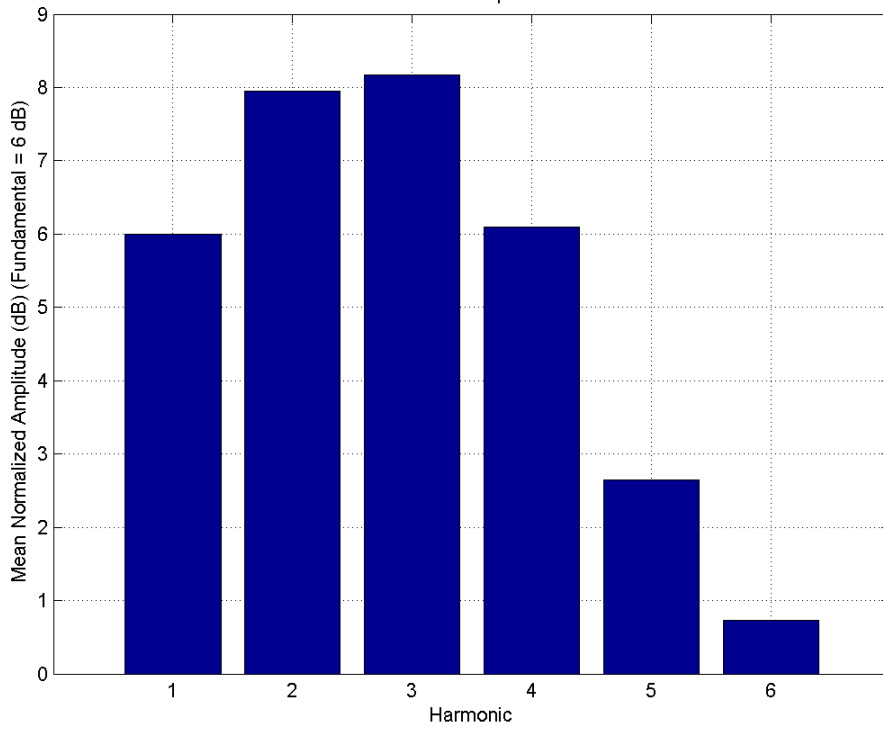
# Plunger Closed for Playing



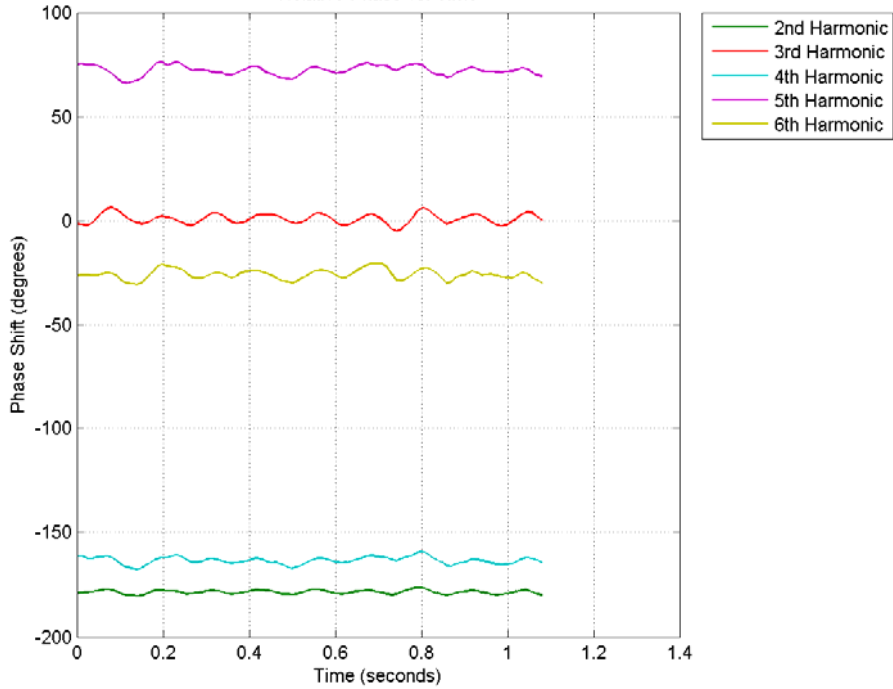


# Plunger Open for Playing

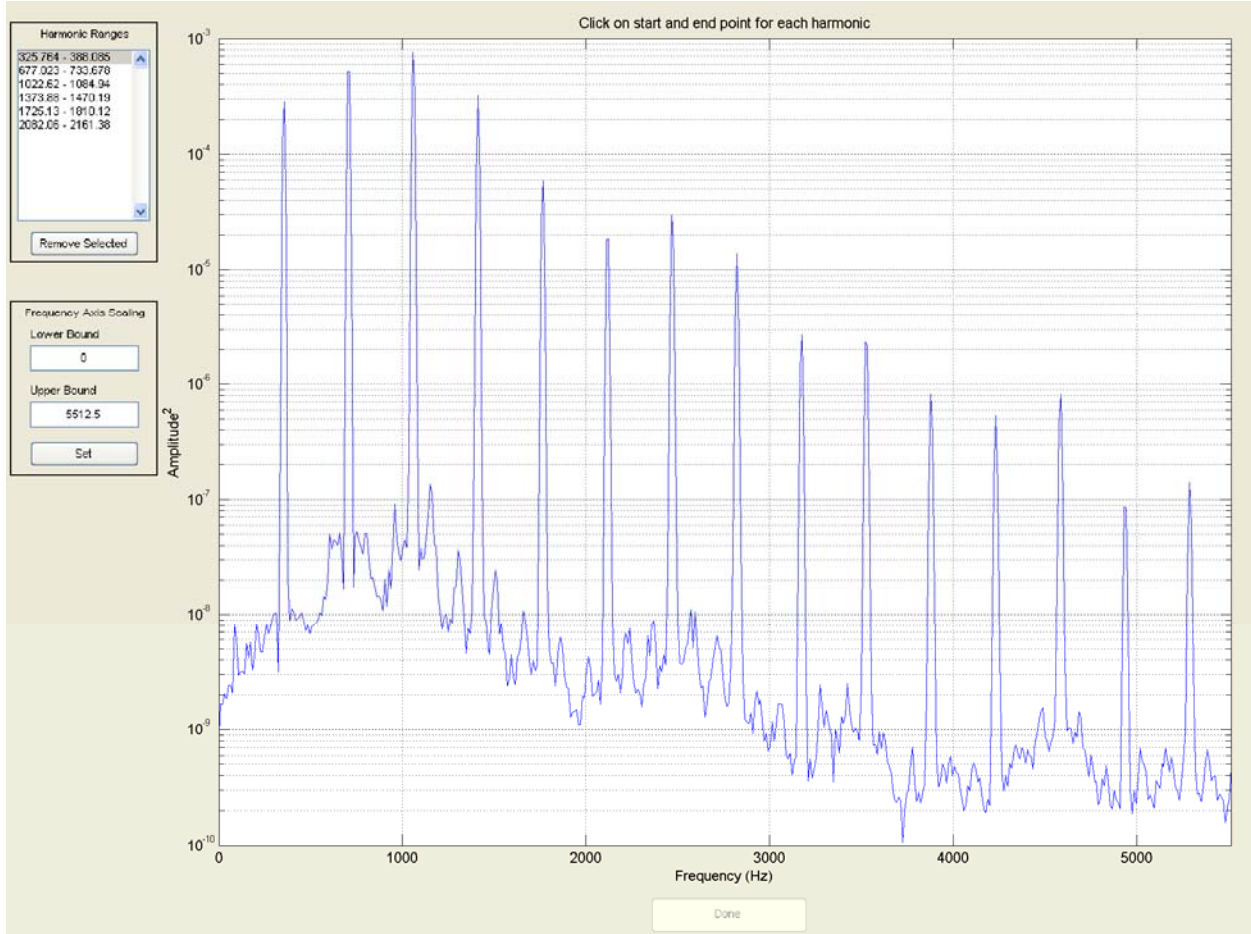
'formosa\_trumpet\_G4\_plunger\_playopen\_3.0-M\_4-13-10.WAV'  
Harmonic Amplitudes



'formosa\_trumpet\_G4\_plunger\_playopen\_3.0-M\_4-13-10.WAV'  
Relative Phase vs. Time

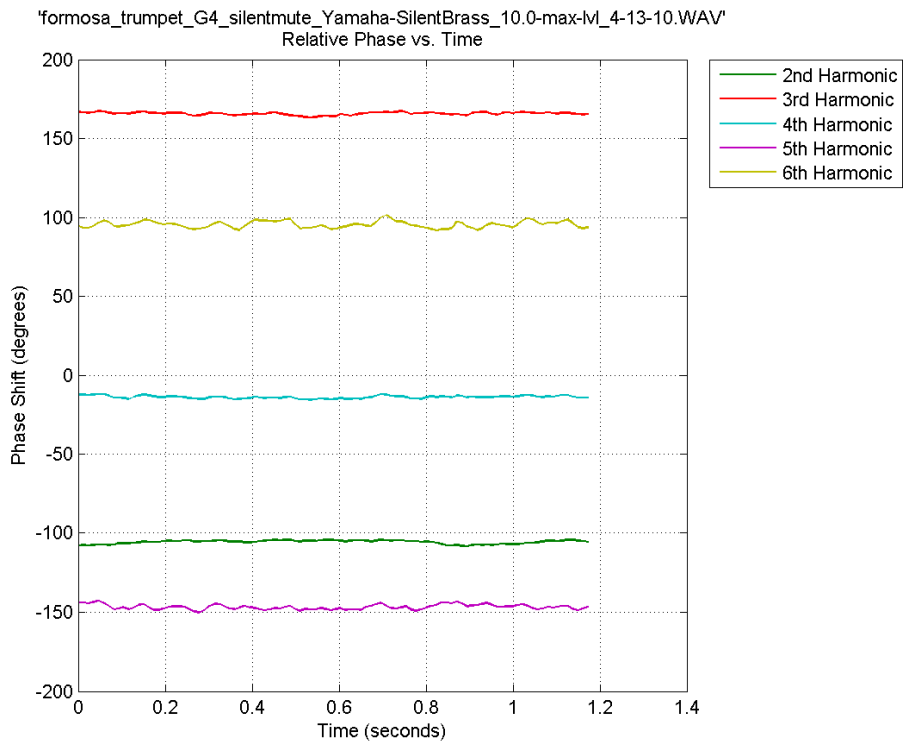
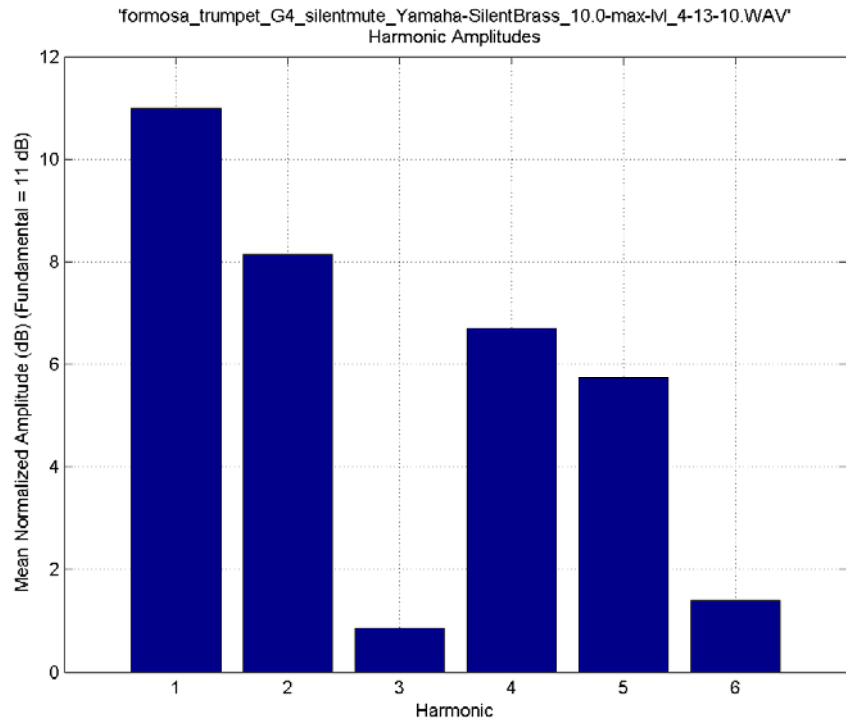


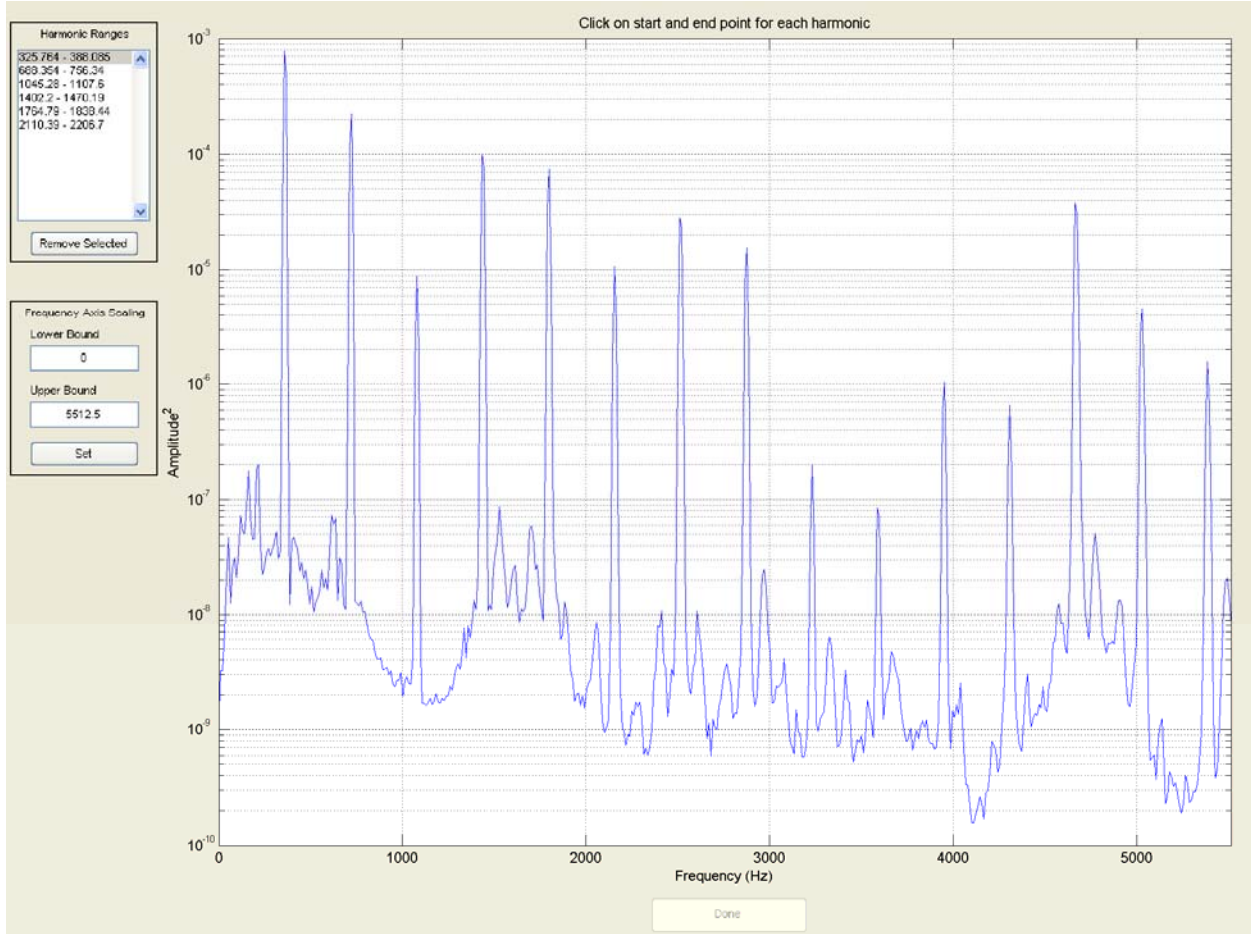




# Practice Mutes

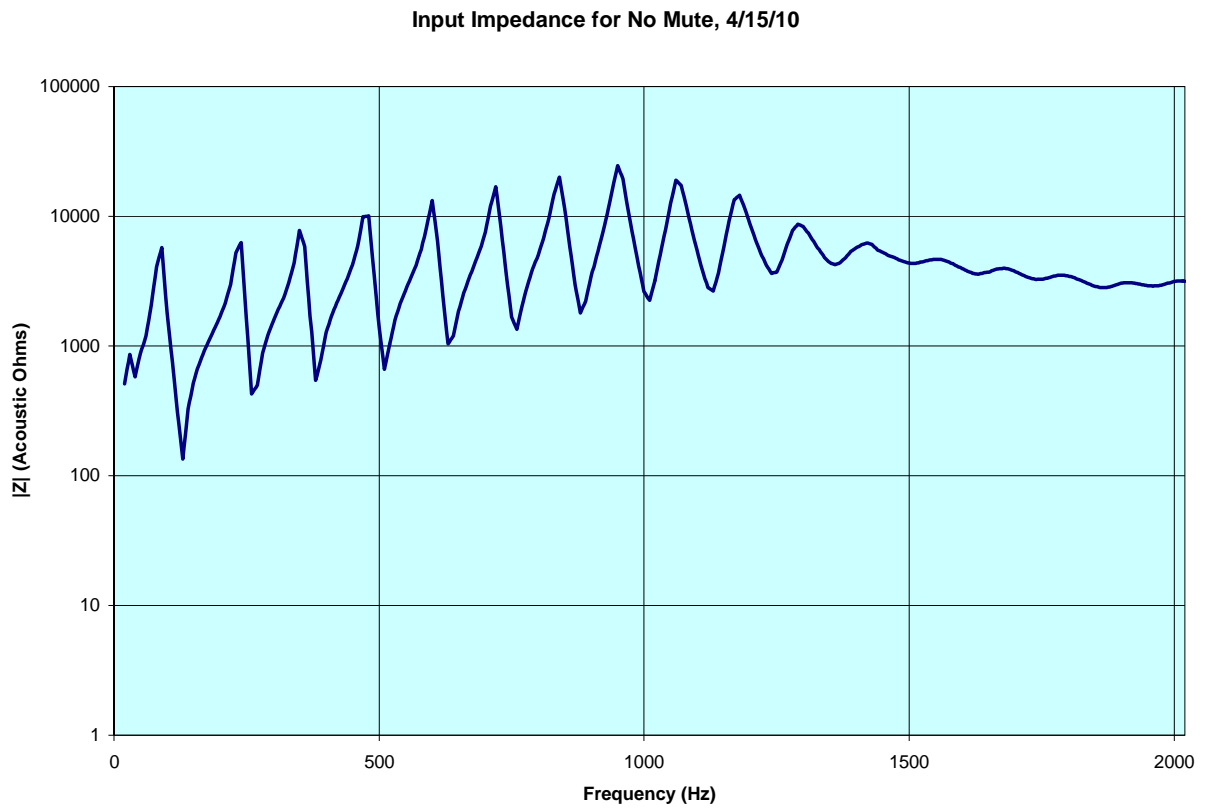
## Yamaha Silent Brass





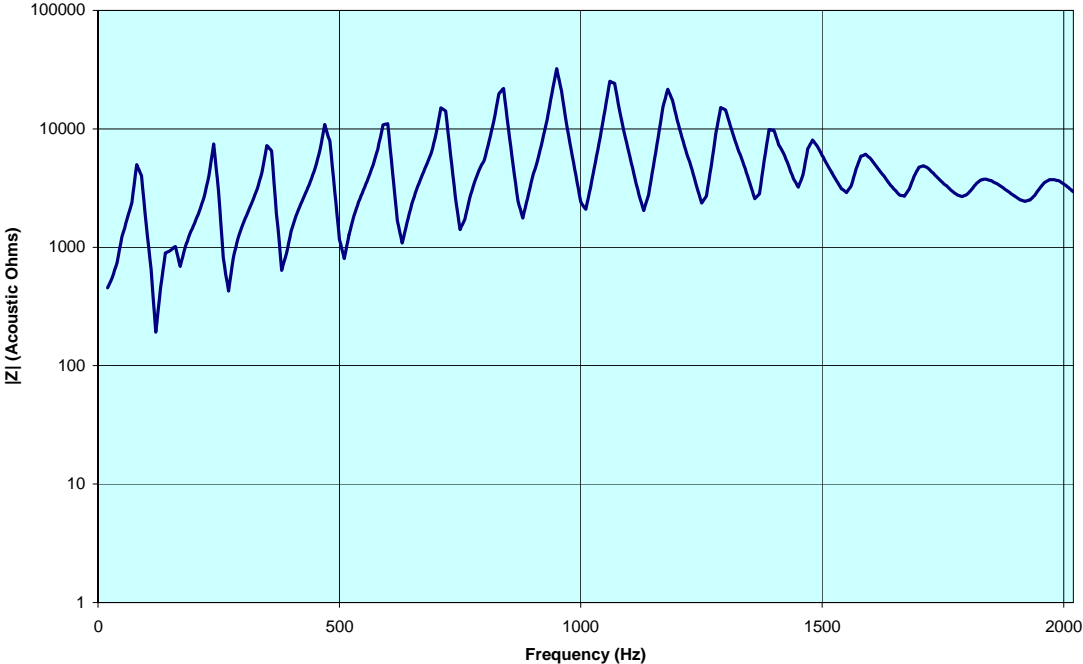
## Appendix C: Input Impedance Analysis

### *No Mute*

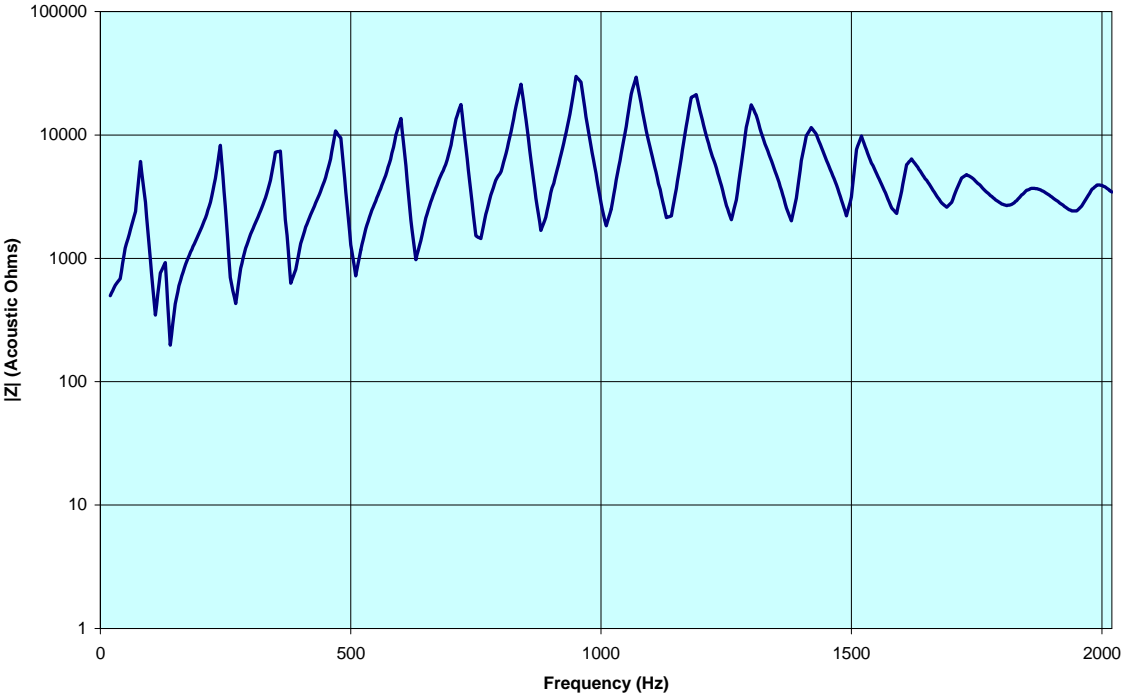


# Straight Mutes

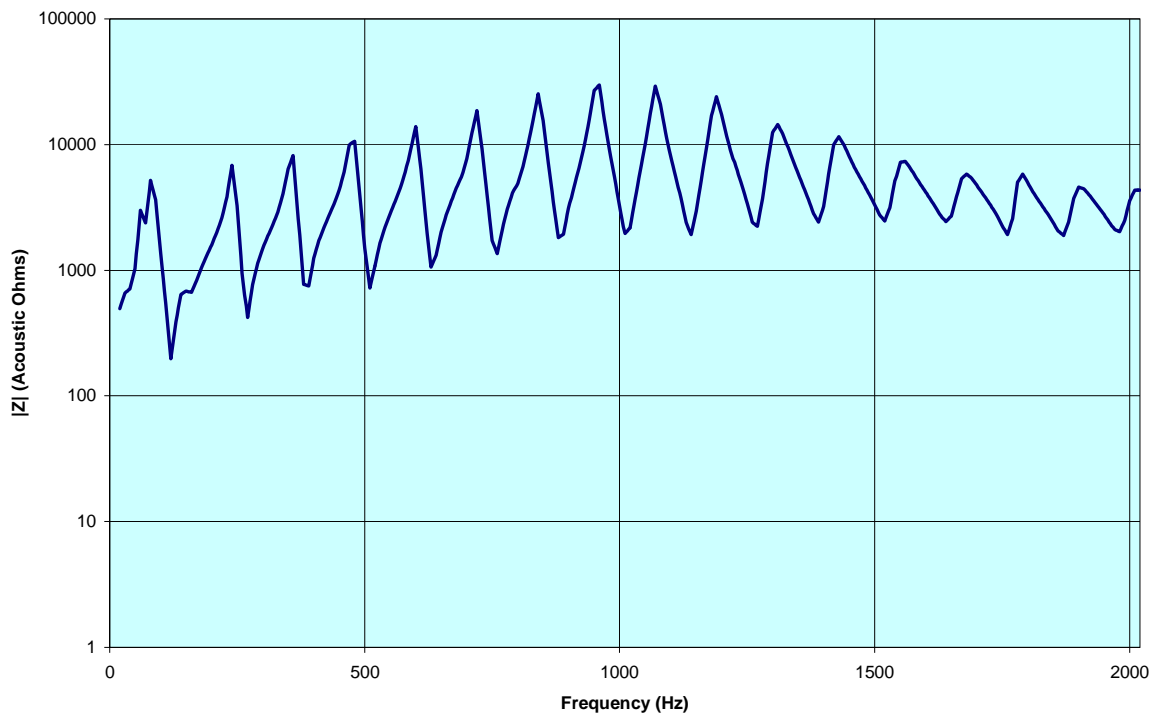
Input Impedance for H&B Straight Mute



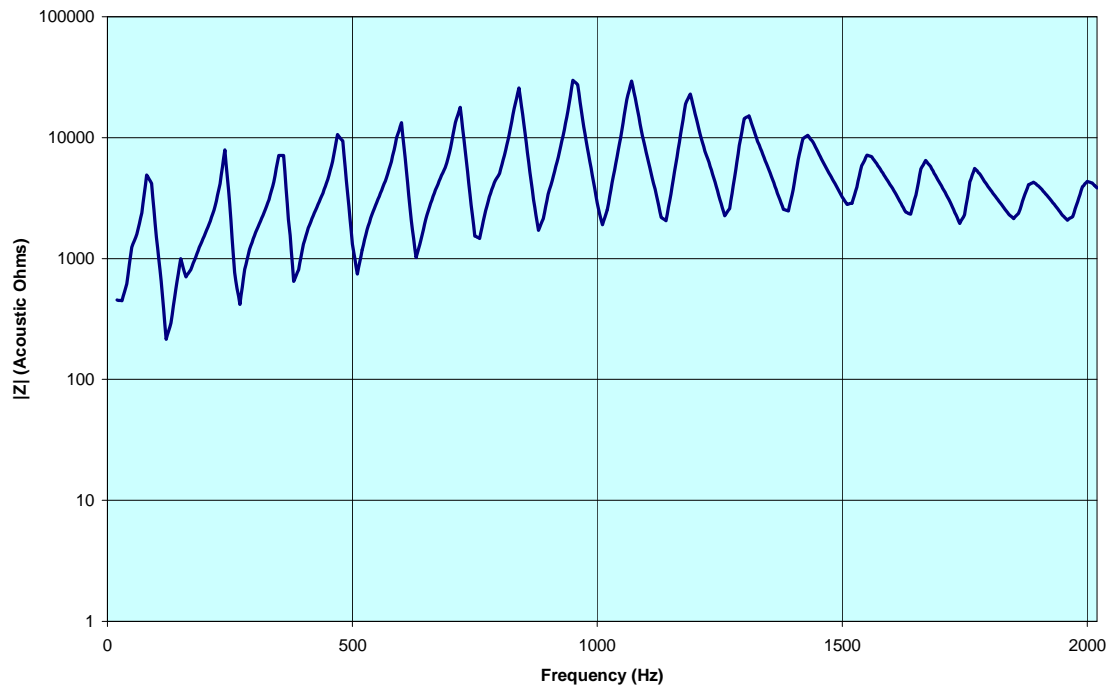
Input Impedance for DW Straight Mute



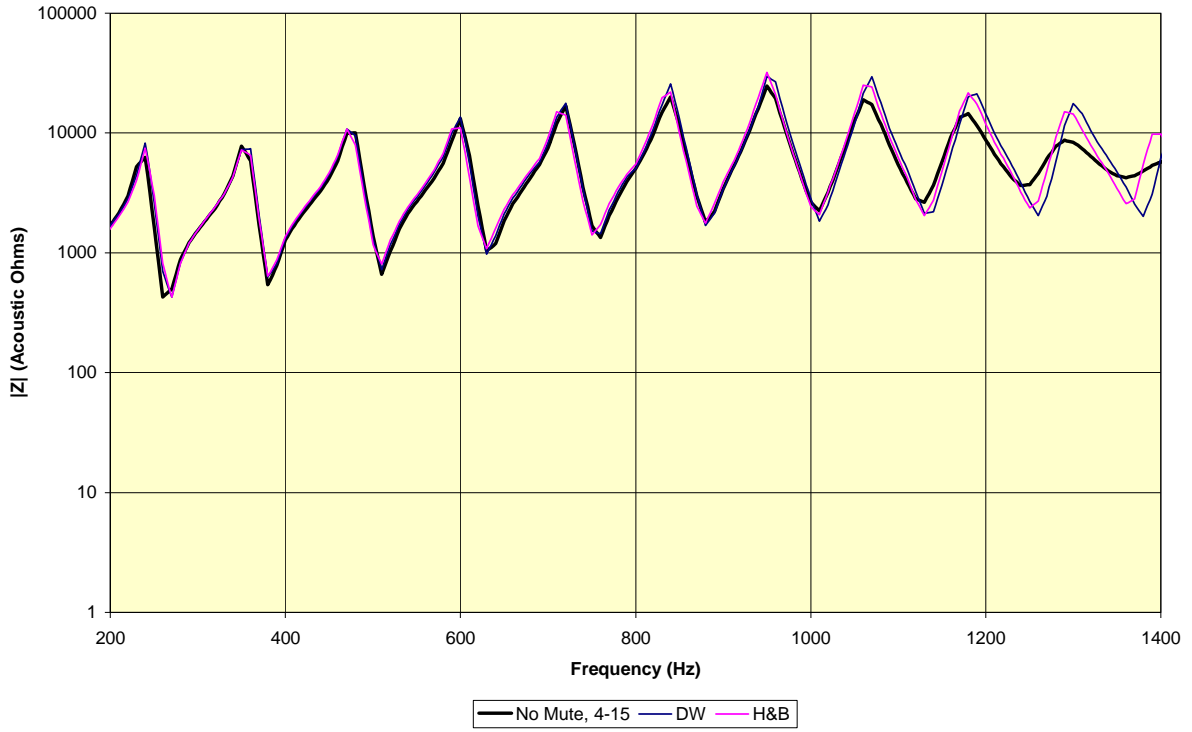
Input Impedance for Aluminum TC Straight Mute



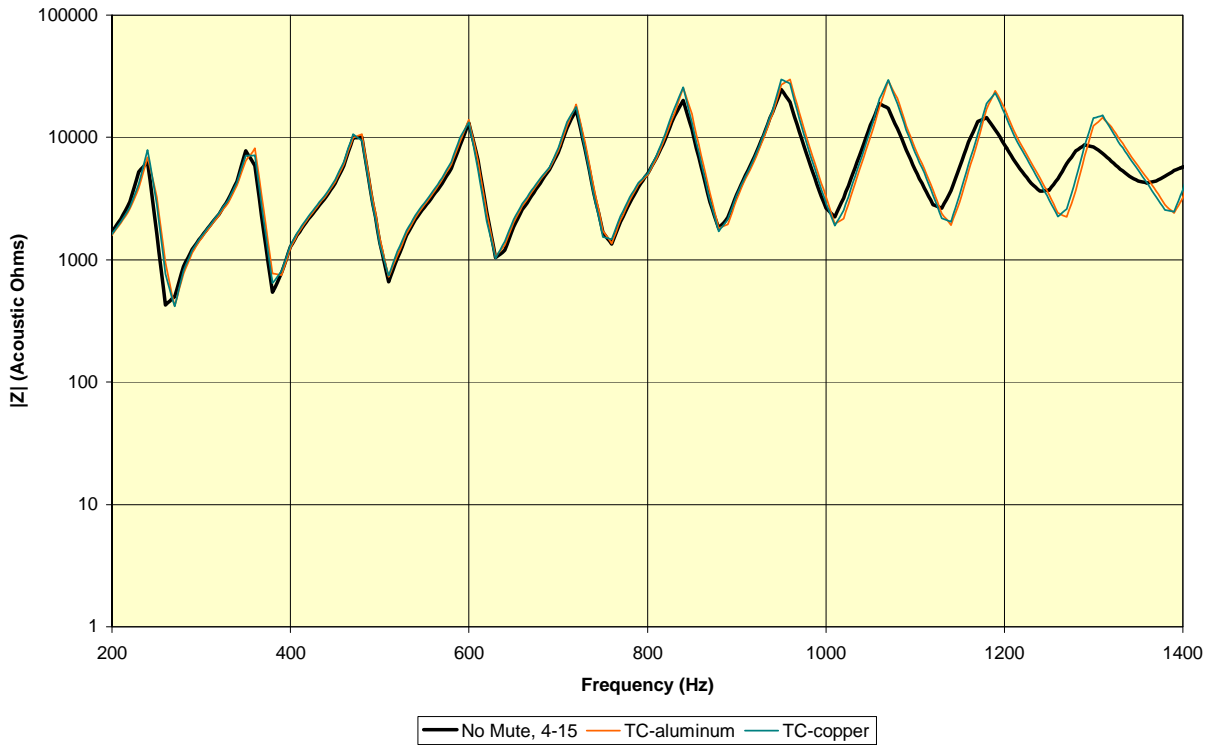
Input Impedance for Copper TC Straight Mute



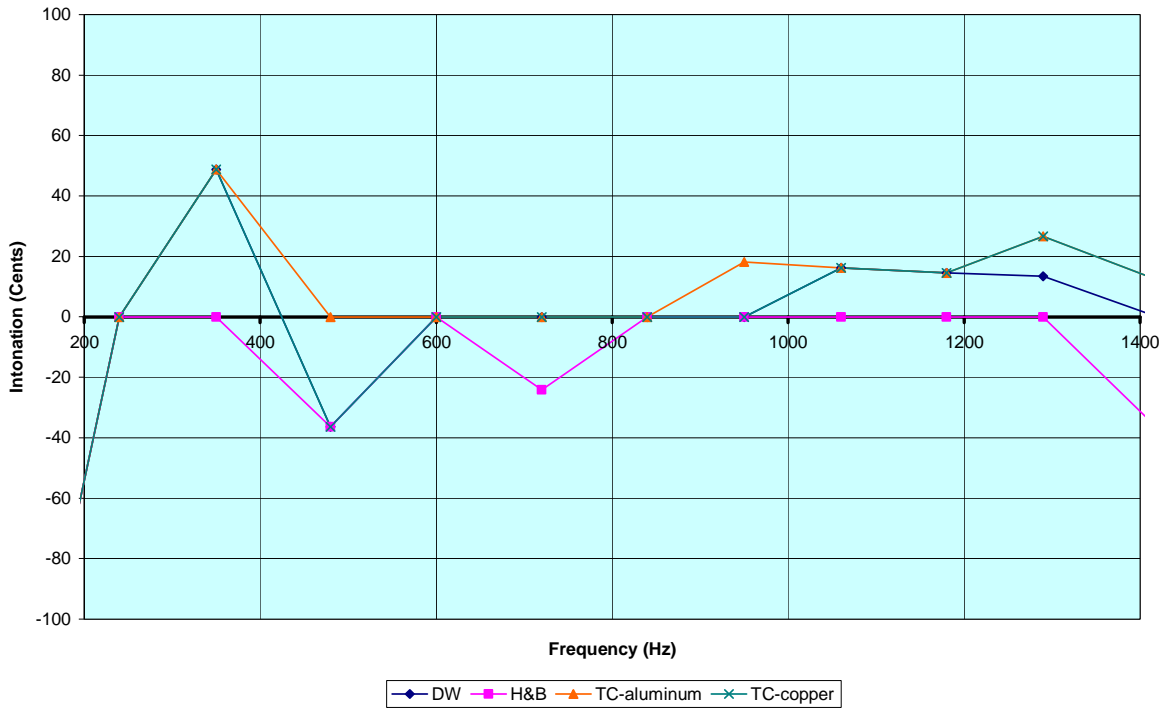
Comparing Impedance Data for Straight Mutes



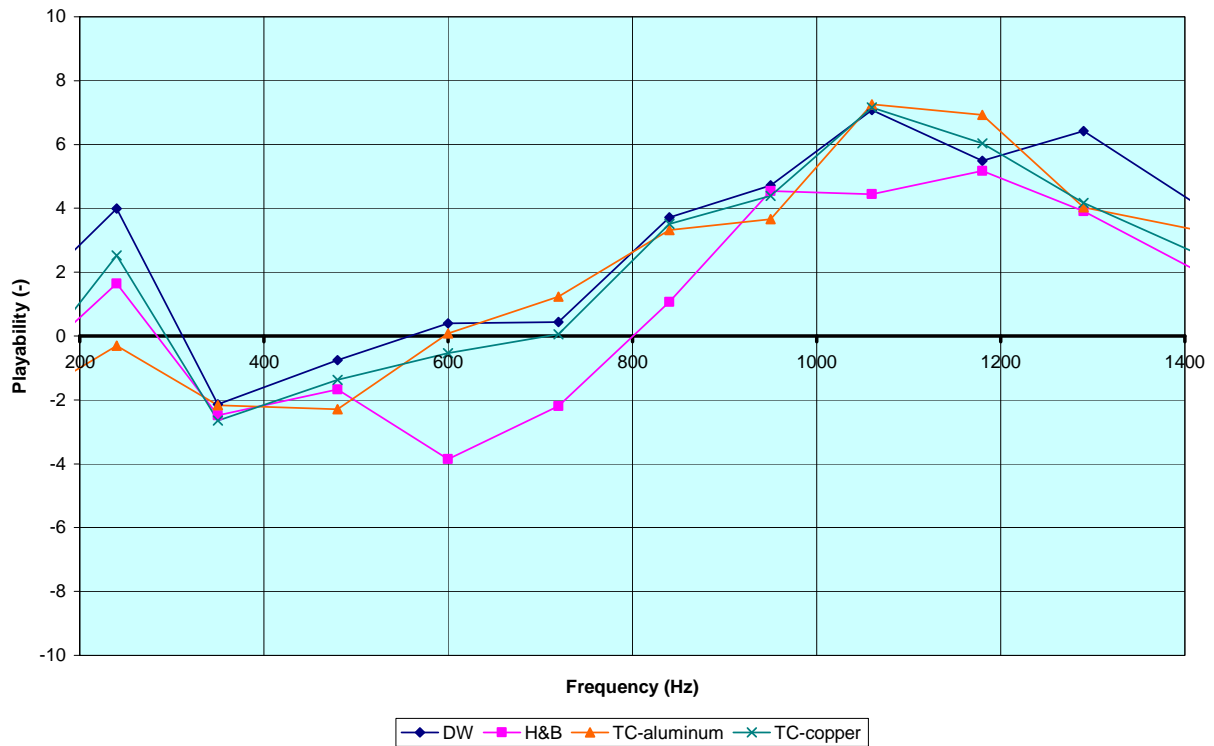
Comparing Impedance Data for TC Straight Mutes



Comparing Intonation of Straight Mutes to No Mute



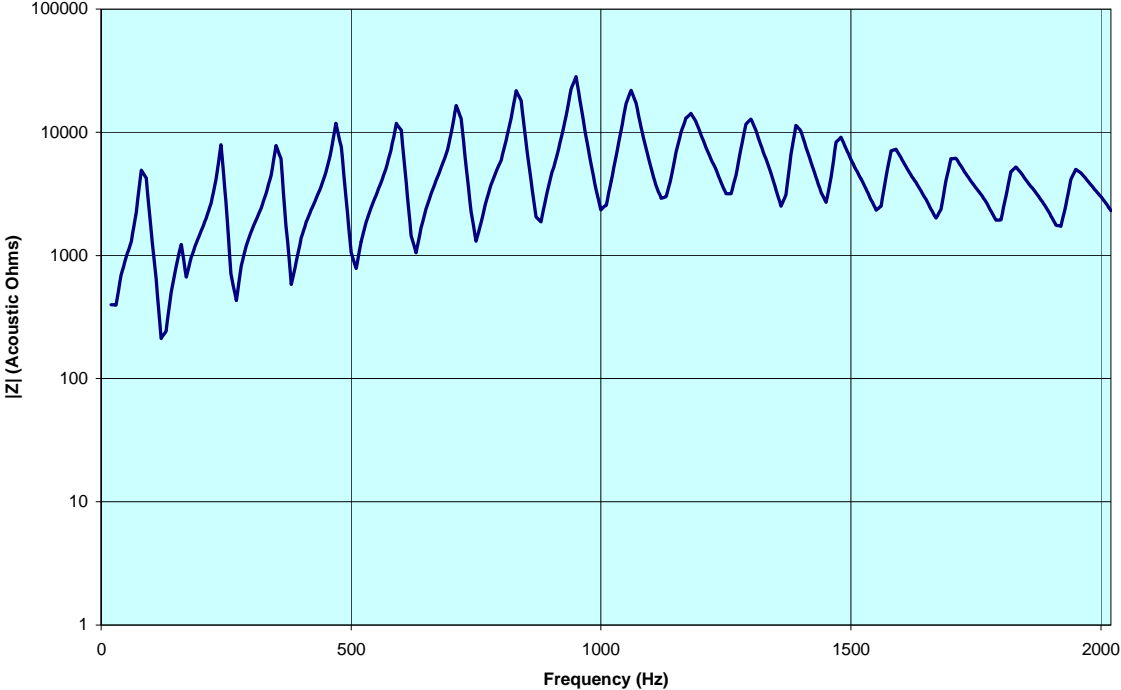
Comparing Playability of Straight Mutes to No Mute



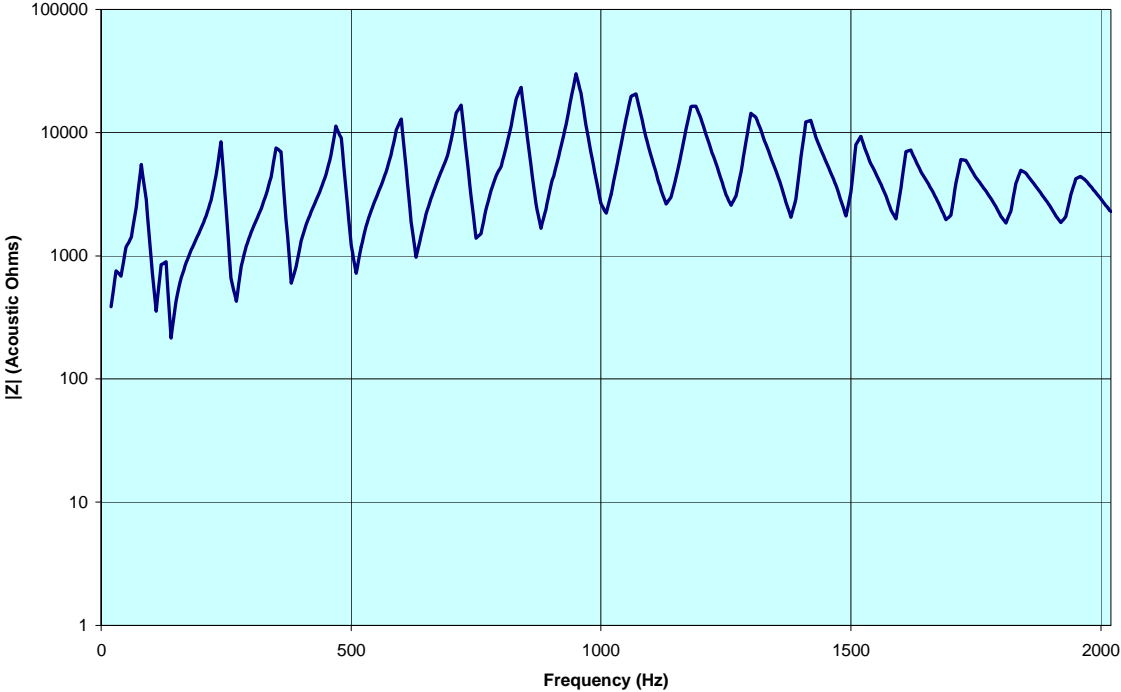


# Cup Mutes

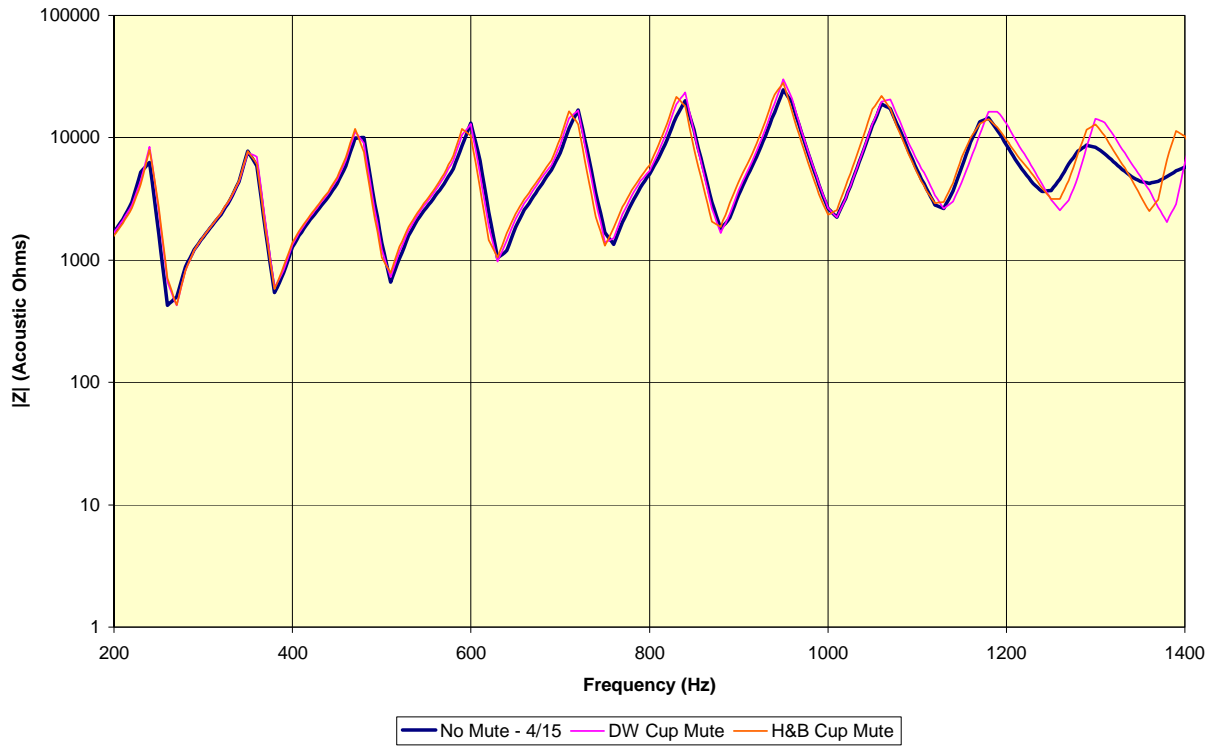
Input Impedance for H&B Cup Mute



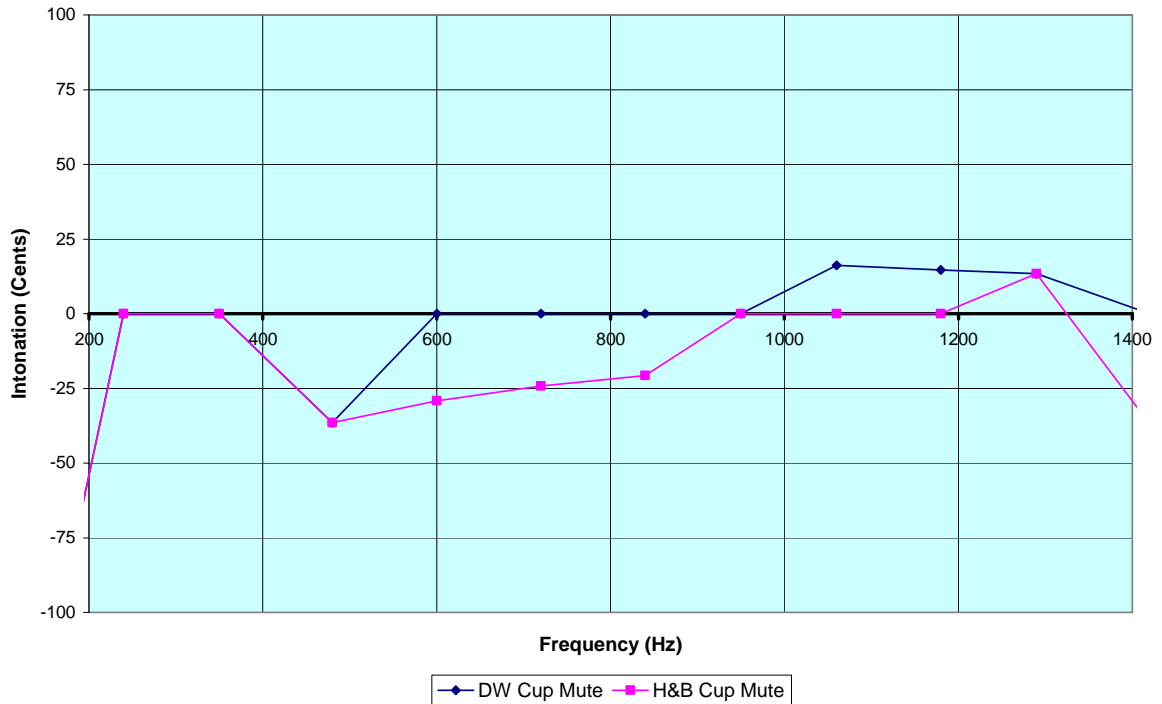
Input Impedance for DW Cup Mute



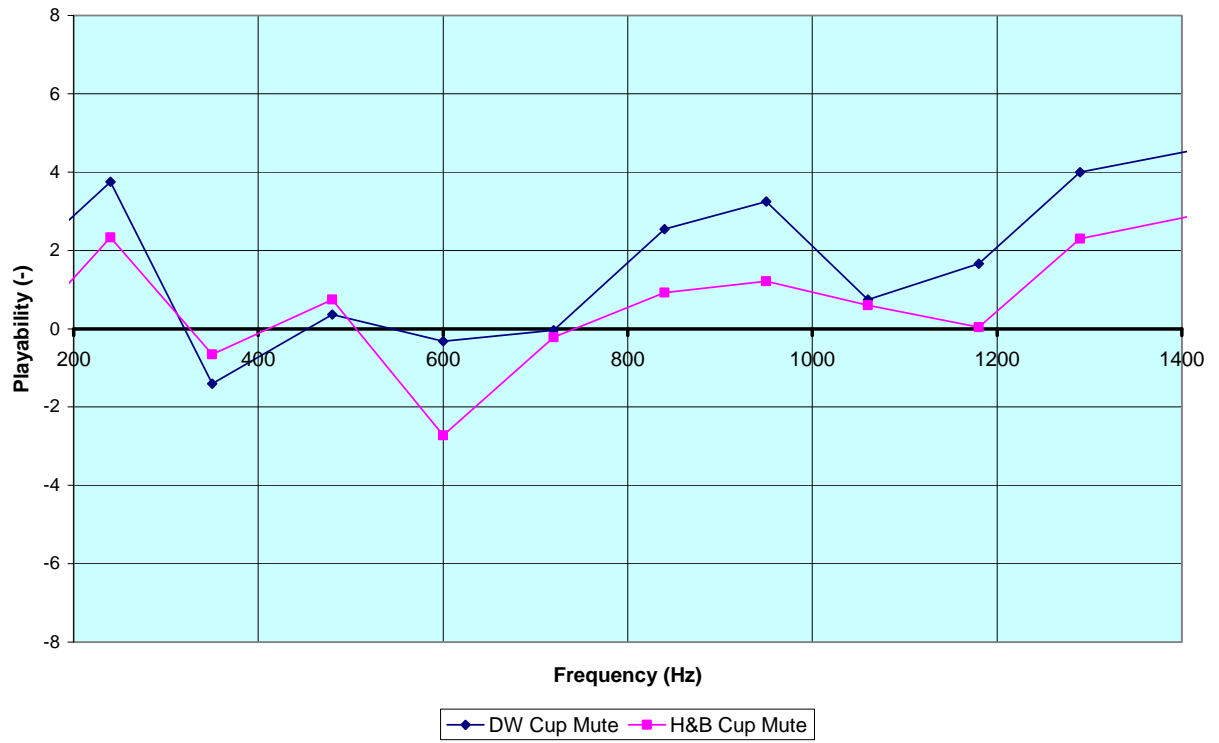
Comparing Input Impedances for Cup Mutes



Intonation Changes for Cup Mutes compared to No Mute

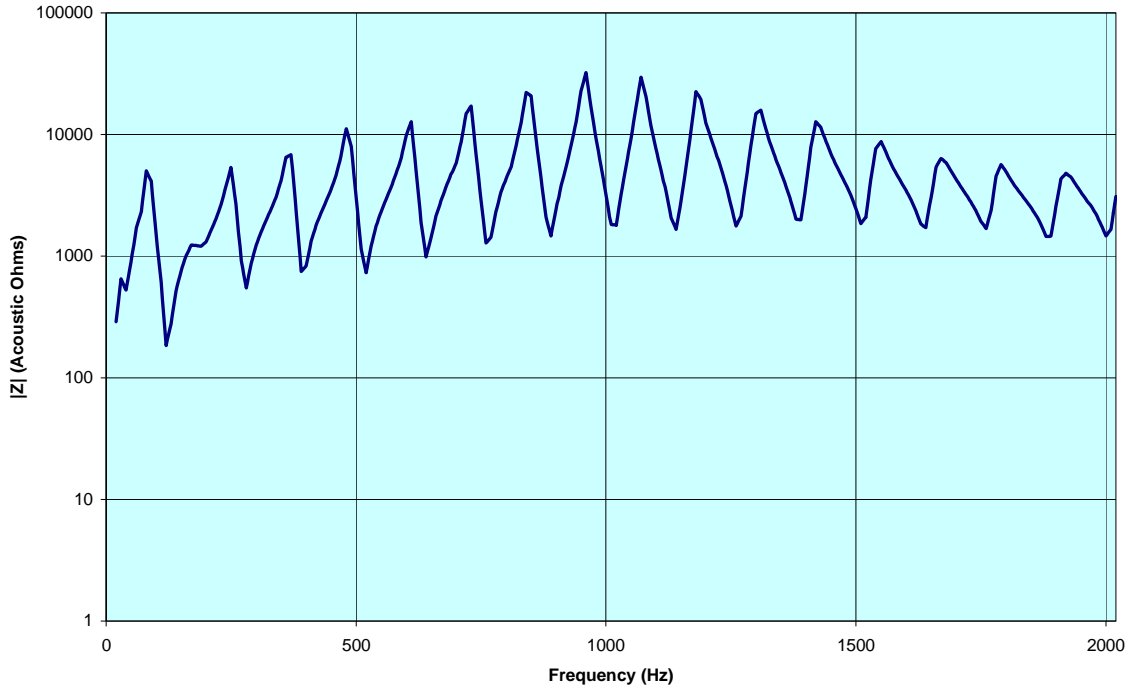


### Playability Changes for Cup Mutes compared to No Mute

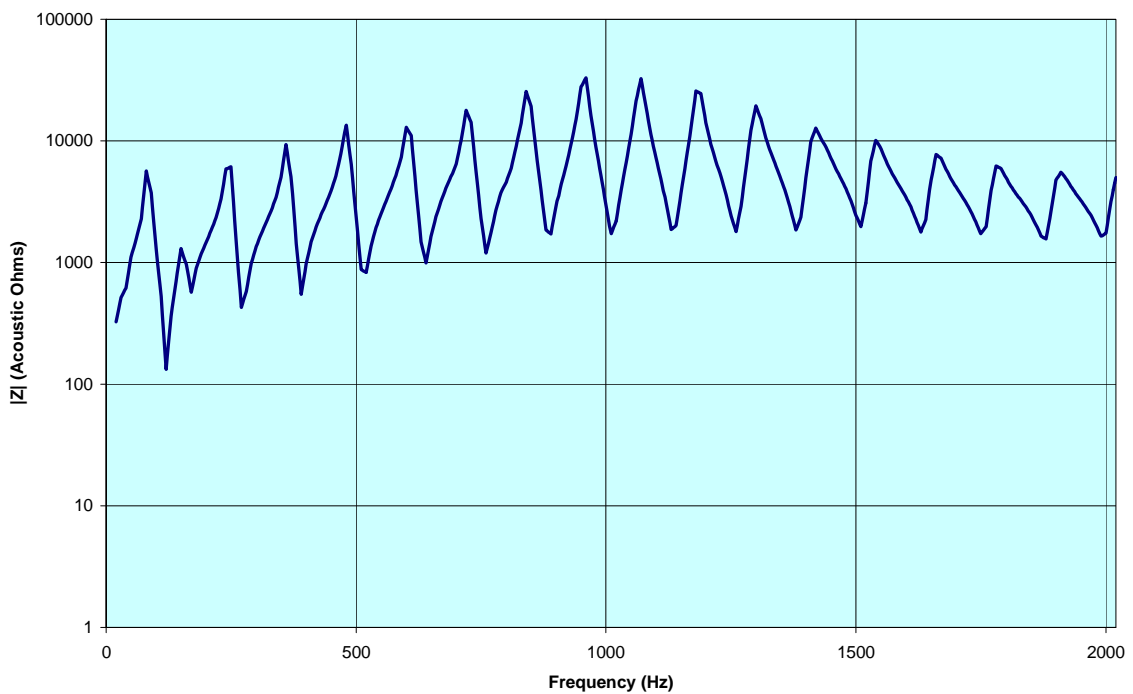


# Harmon Mutes

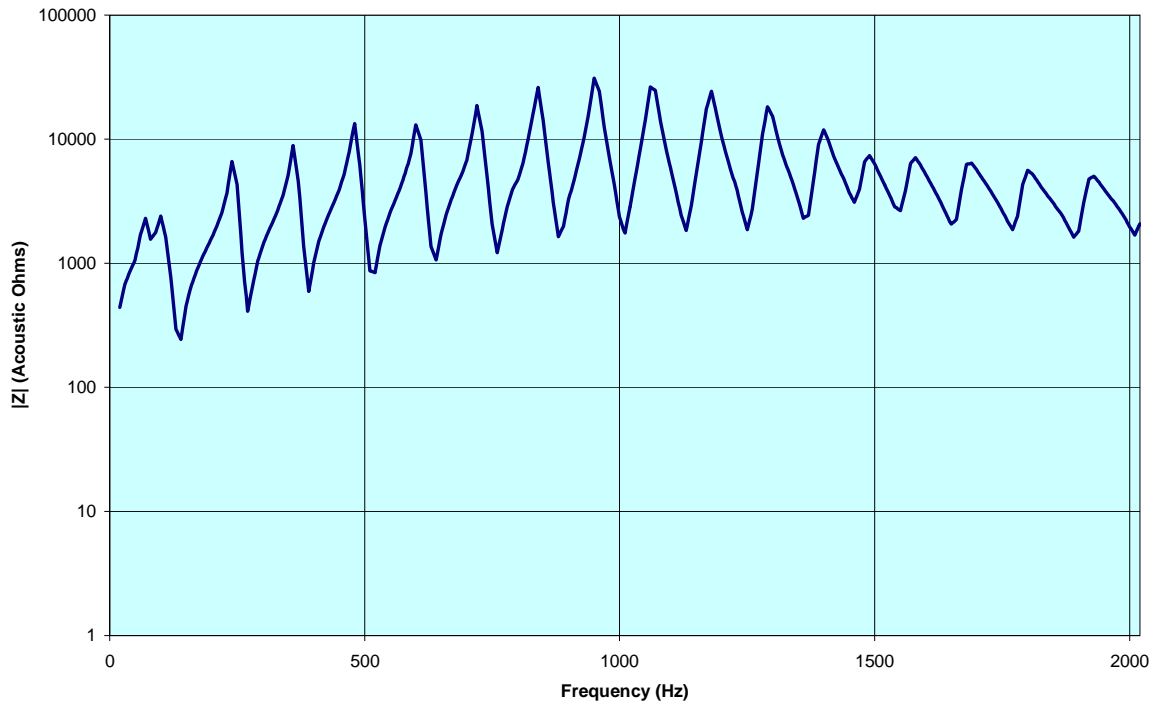
Input Impedance for Vacchiano Harmon, no-stem



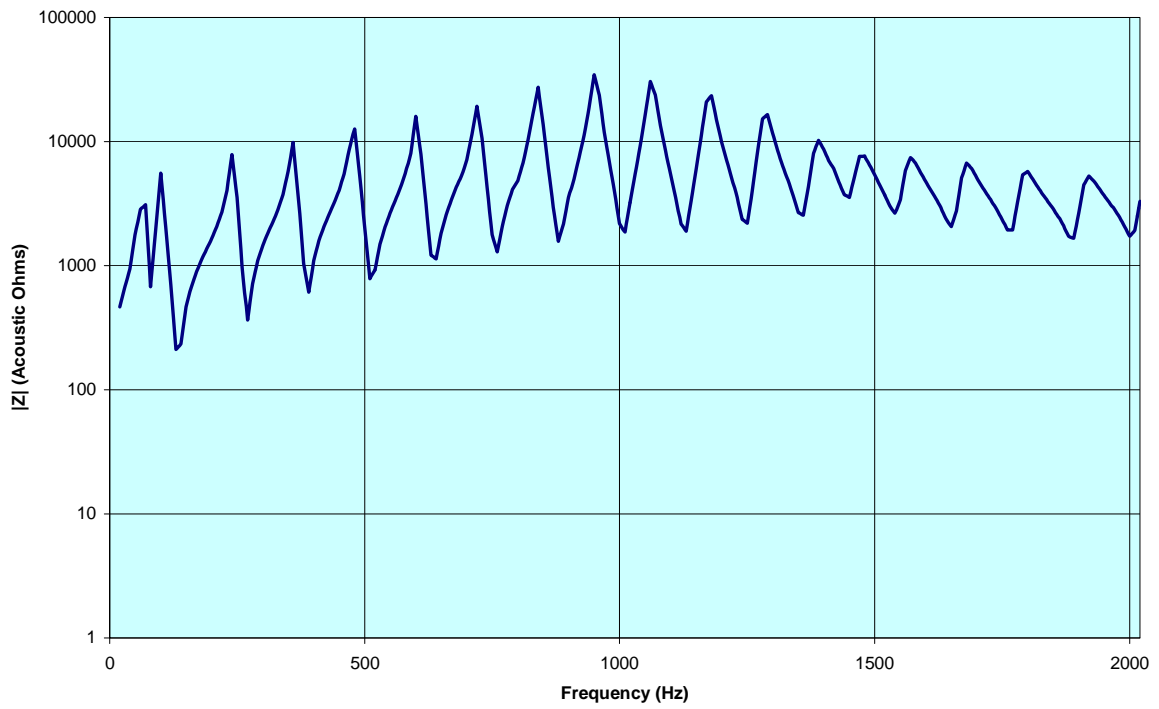
Input Impedance for Jo-Ral Harmon, no-stem



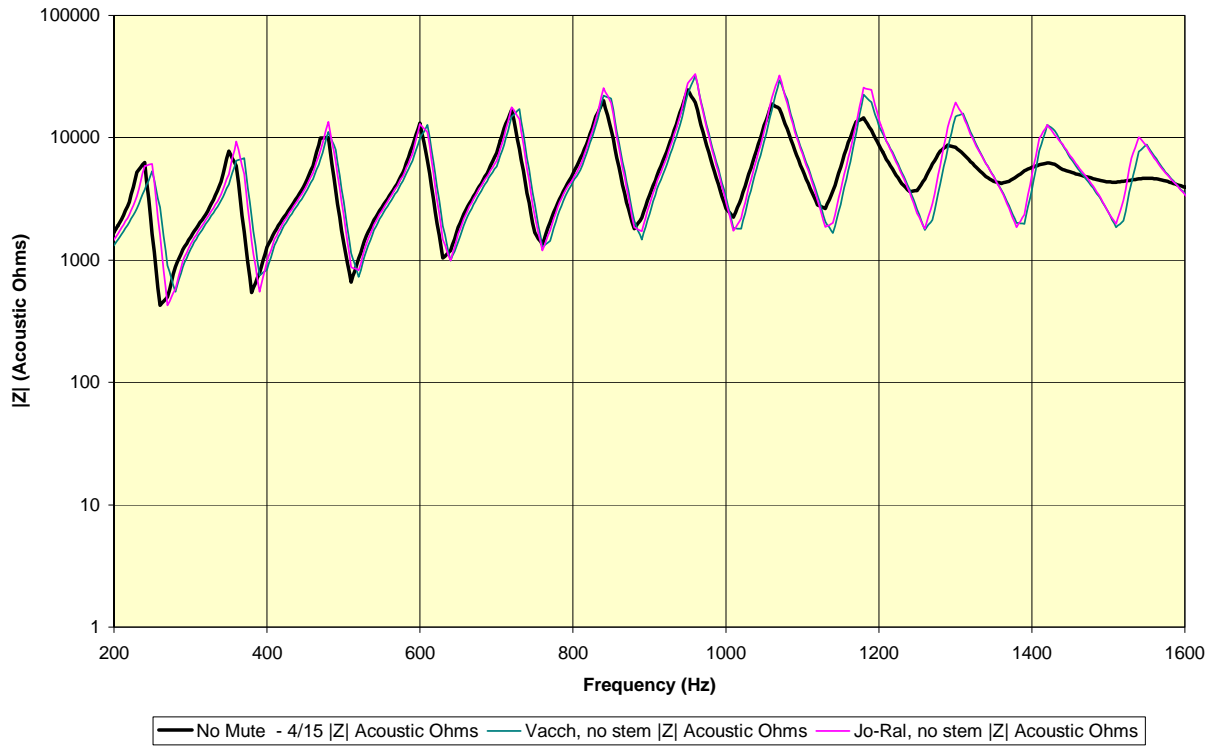
Input Impedance for Vacchiano Harmon, stem



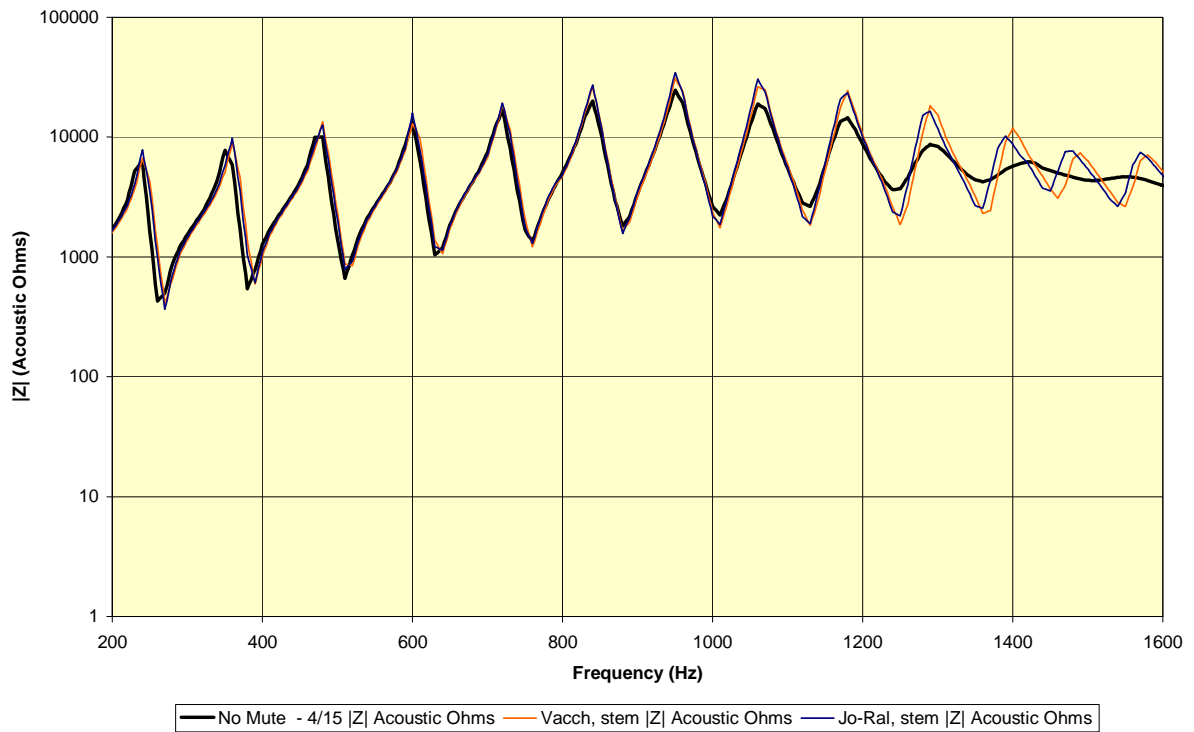
Input Impedance for Jo-Ral Harmon, stem



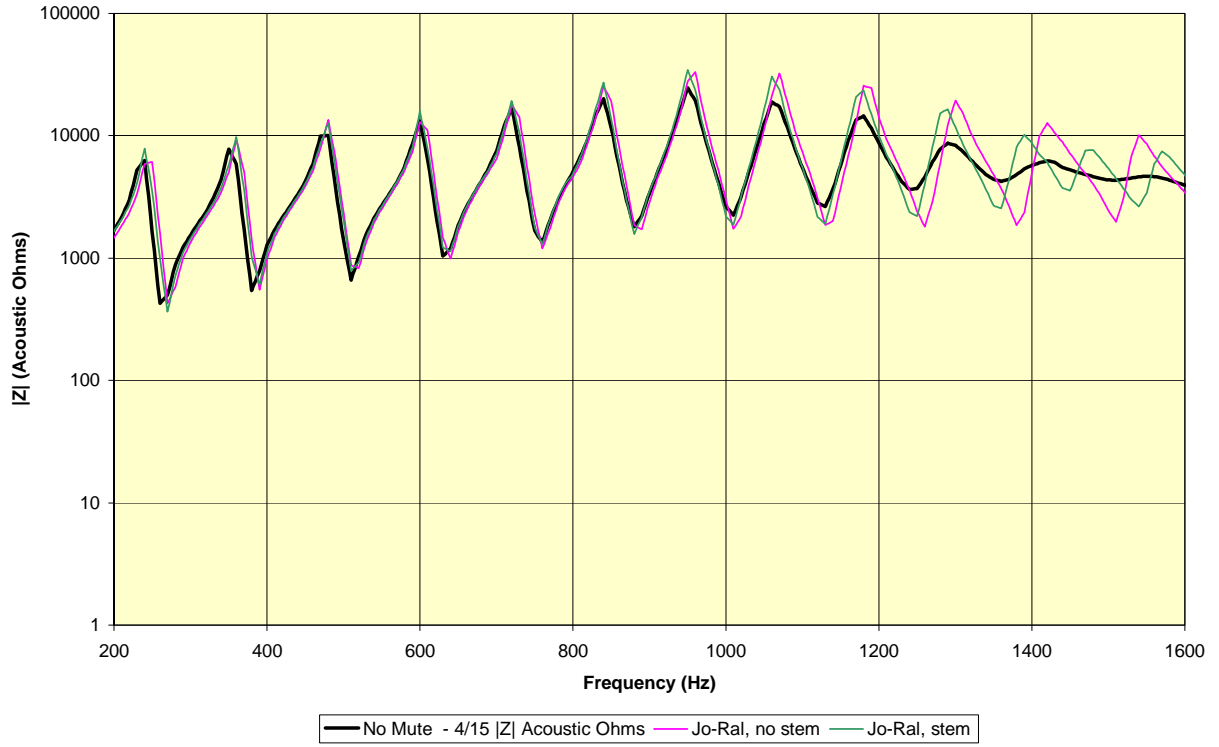
Comparing Input Impedances of Harmon Mutes, no stems



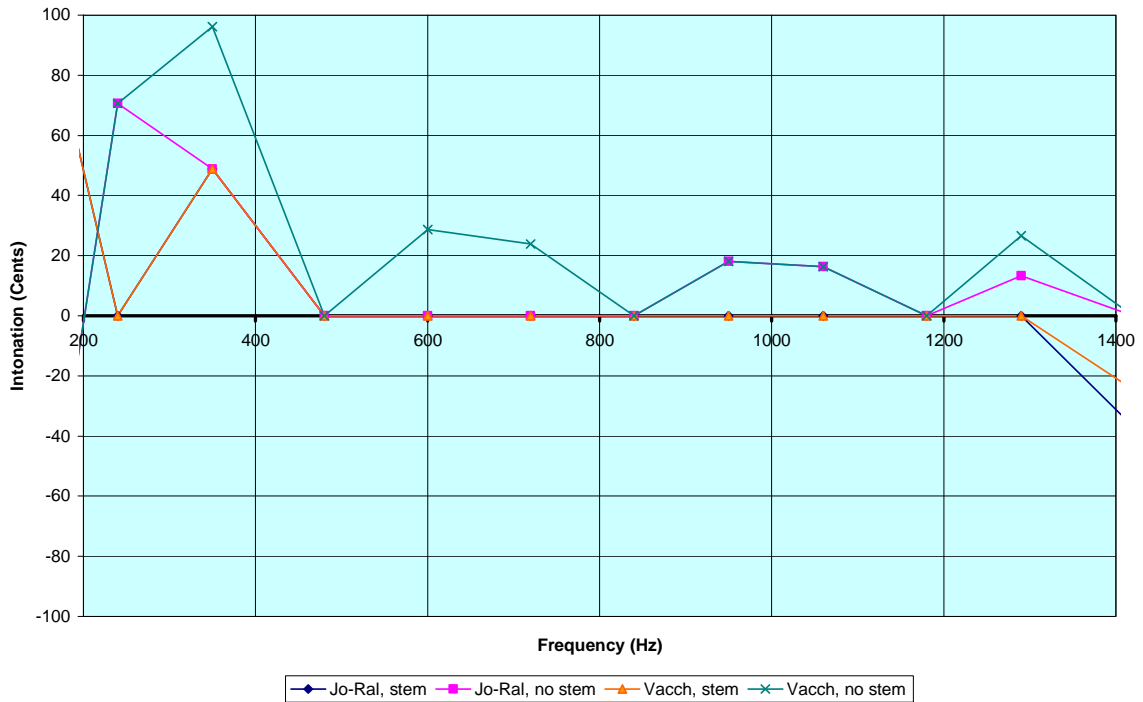
Comparing Input Impedances of Harmon Mutes, w/ stems



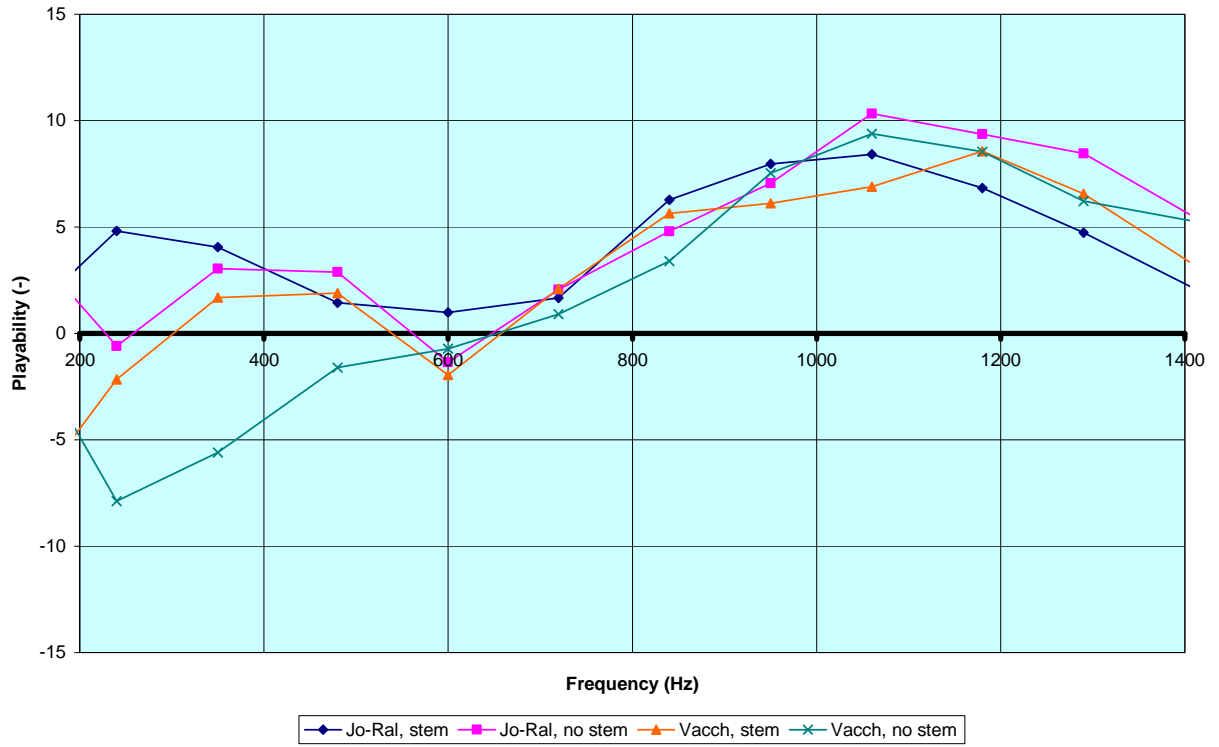
Comparing Input Impedances of Jo-Ral Harmon Mutes, w/ and w/o stems



Comparing Intonation for Harmon Mutes to No Mute



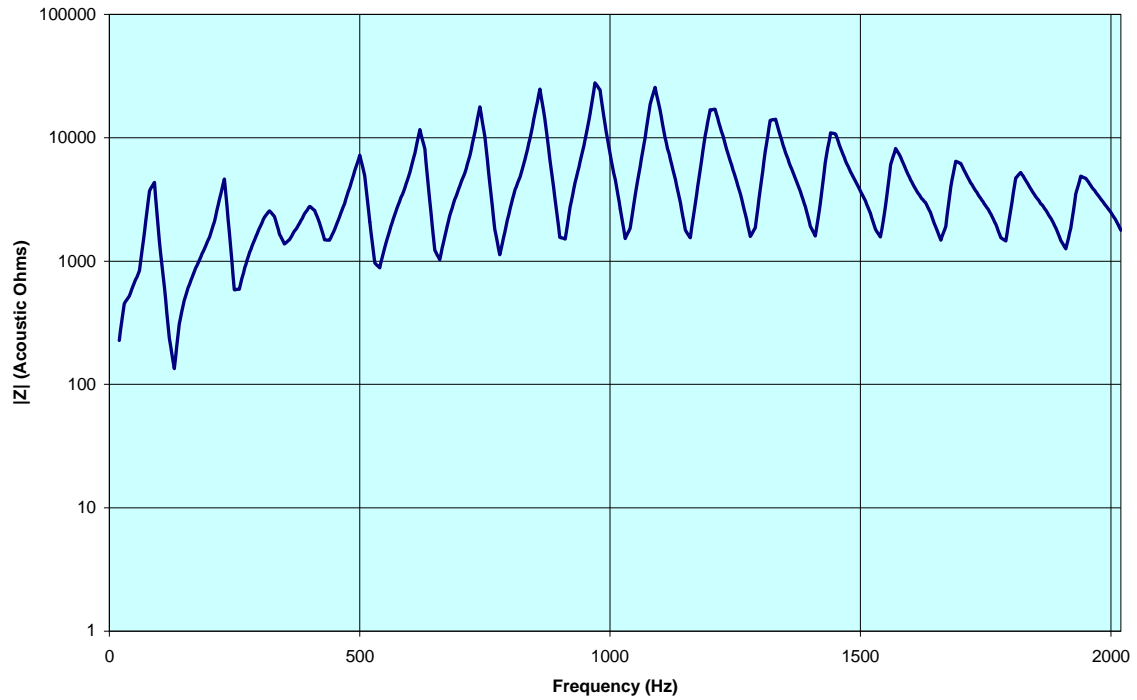
Comparing Playability for Harmon Mutes to No Mute



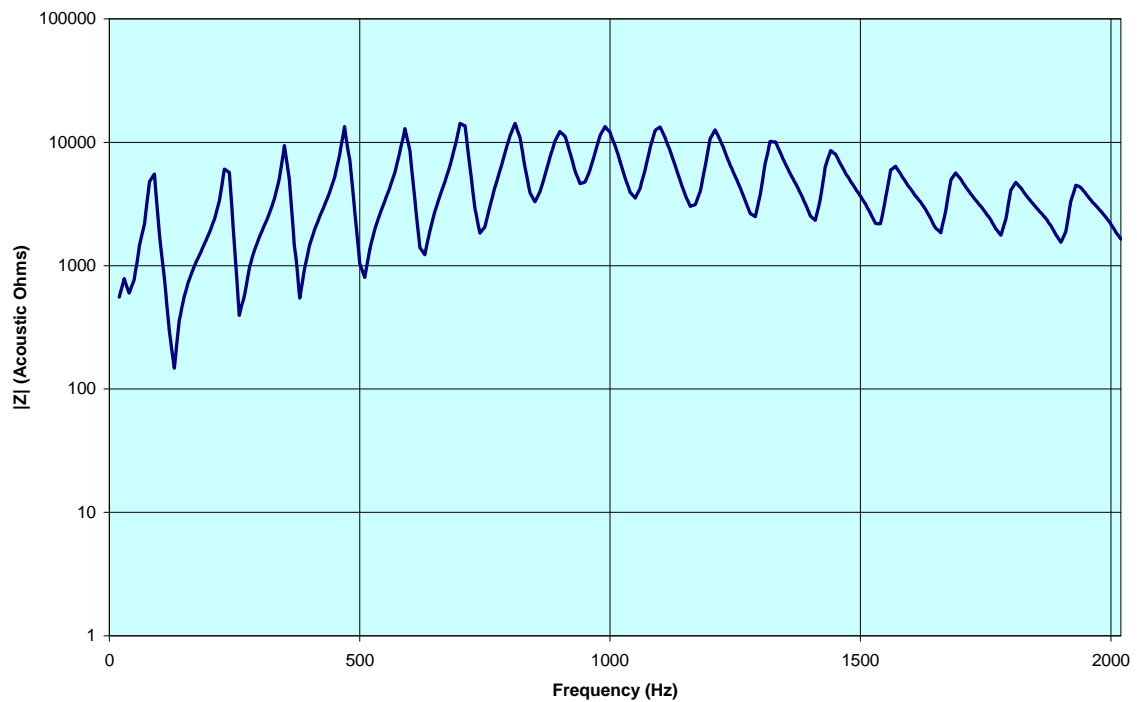


# Plunger Mutes

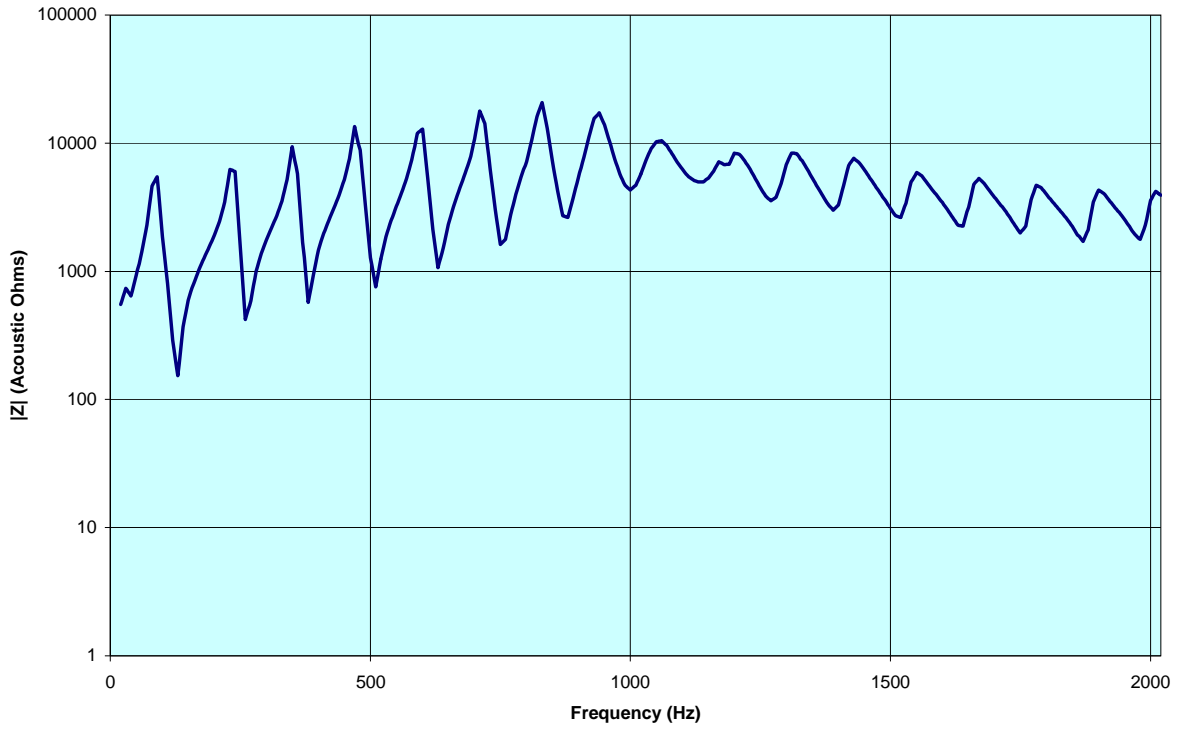
Input Impedance for Plunger, Fully Closed



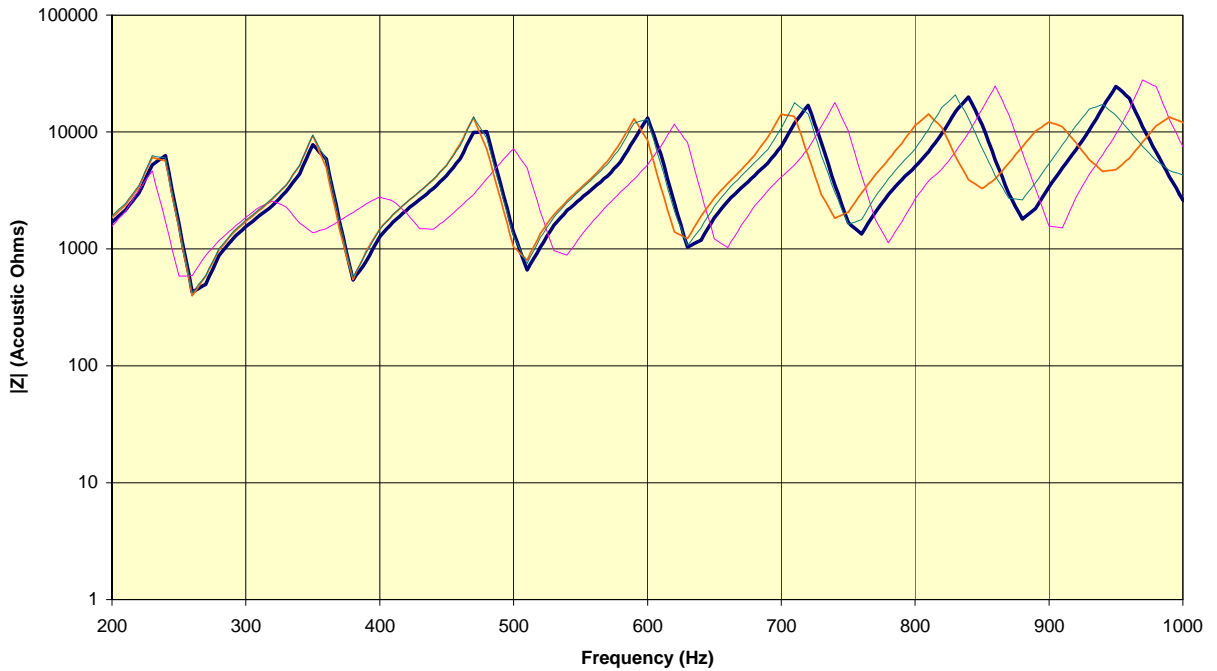
Input Impedance for Plunger, as "Played" Closed



Input Impedance for Plunger, as "Played" Open

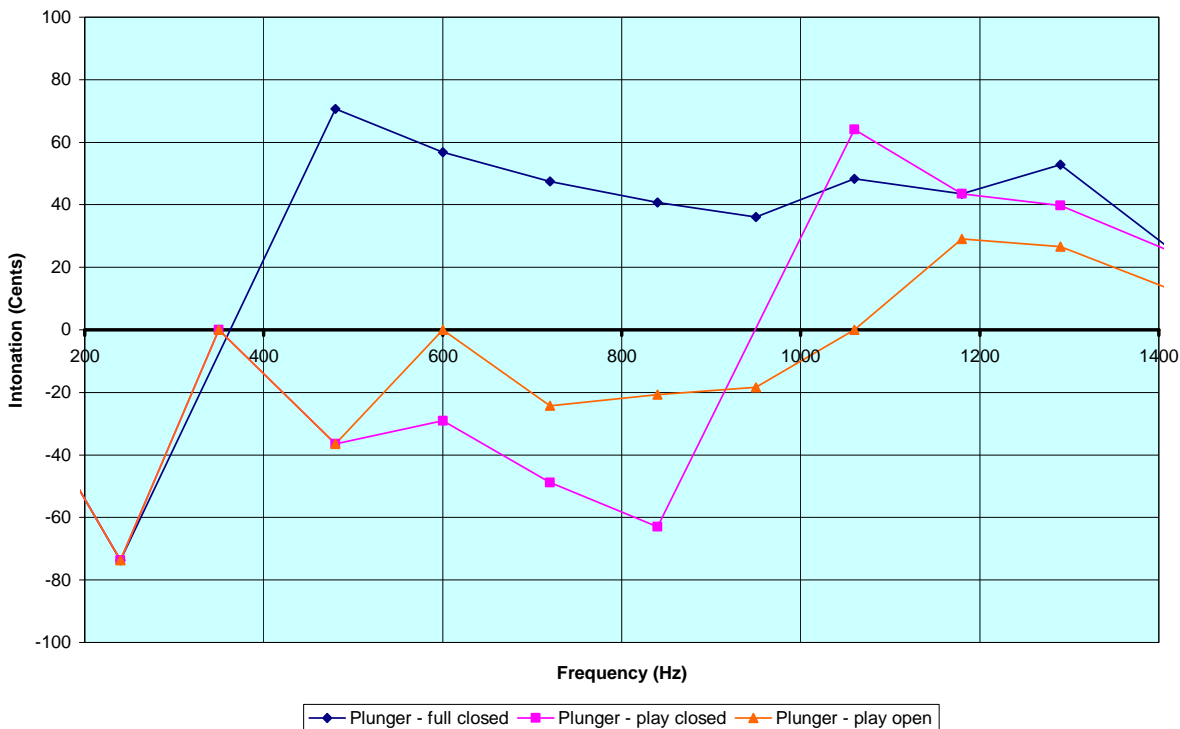


Comparing Input Impedances of Plungers styles vs. No Mute

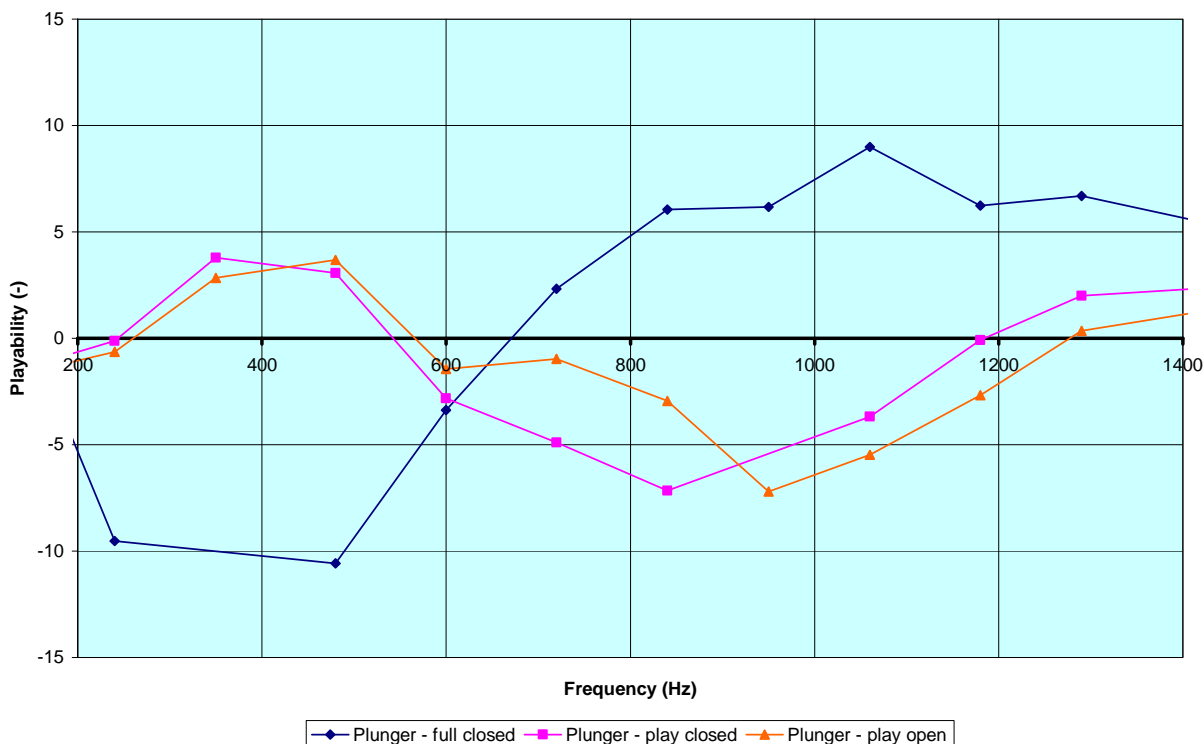


— No Mute - 4/15  Z  Acoustic Ohms	— Plunger - full closed  Z  Acoustic Ohms
— Plunger - play closed  Z  Acoustic Ohms	— Plunger - play open  Z  Acoustic Ohms

Comparing Intonation for Plunger Styles to No Mute

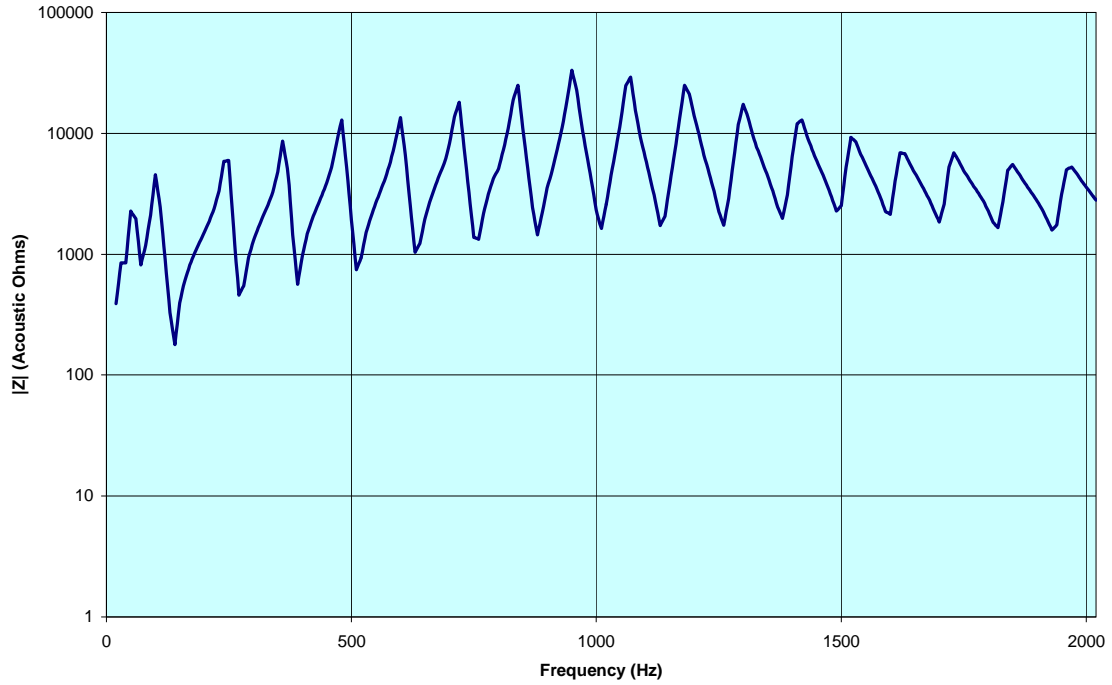


Comparing Playability for Plunger Styles to No Mute

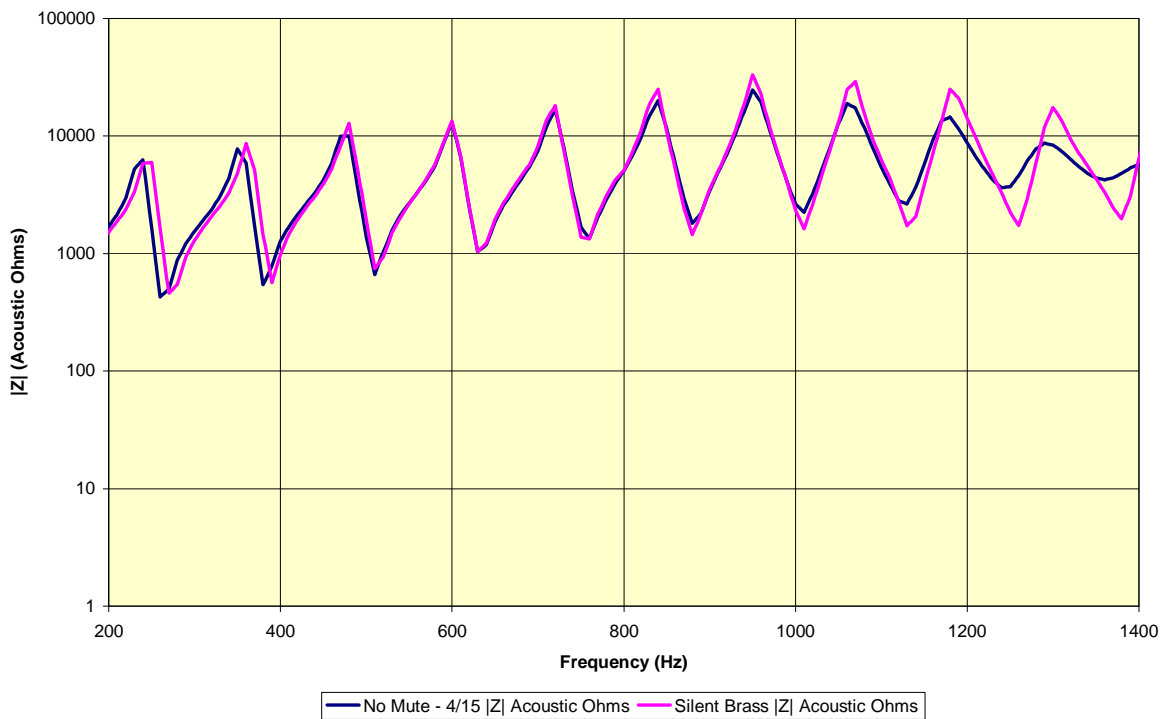


# Practice Mutes

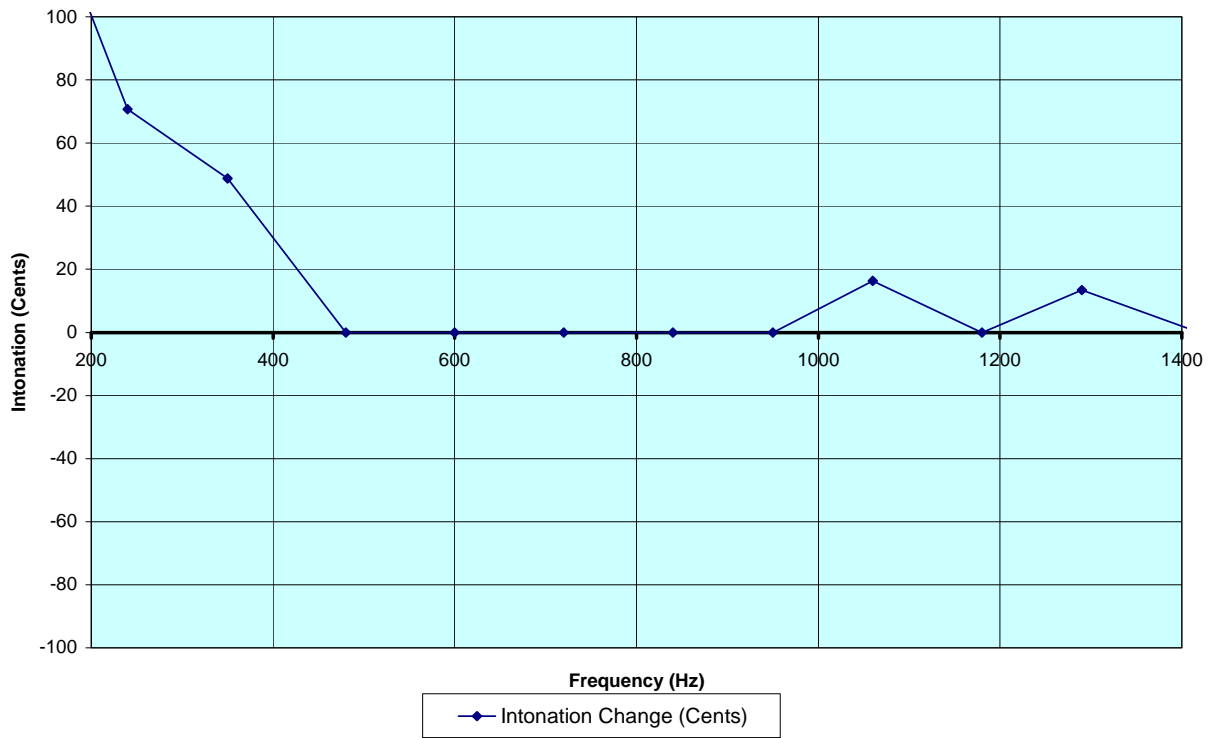
Input Impedance for Yamaha "Silent Brass"® Mute



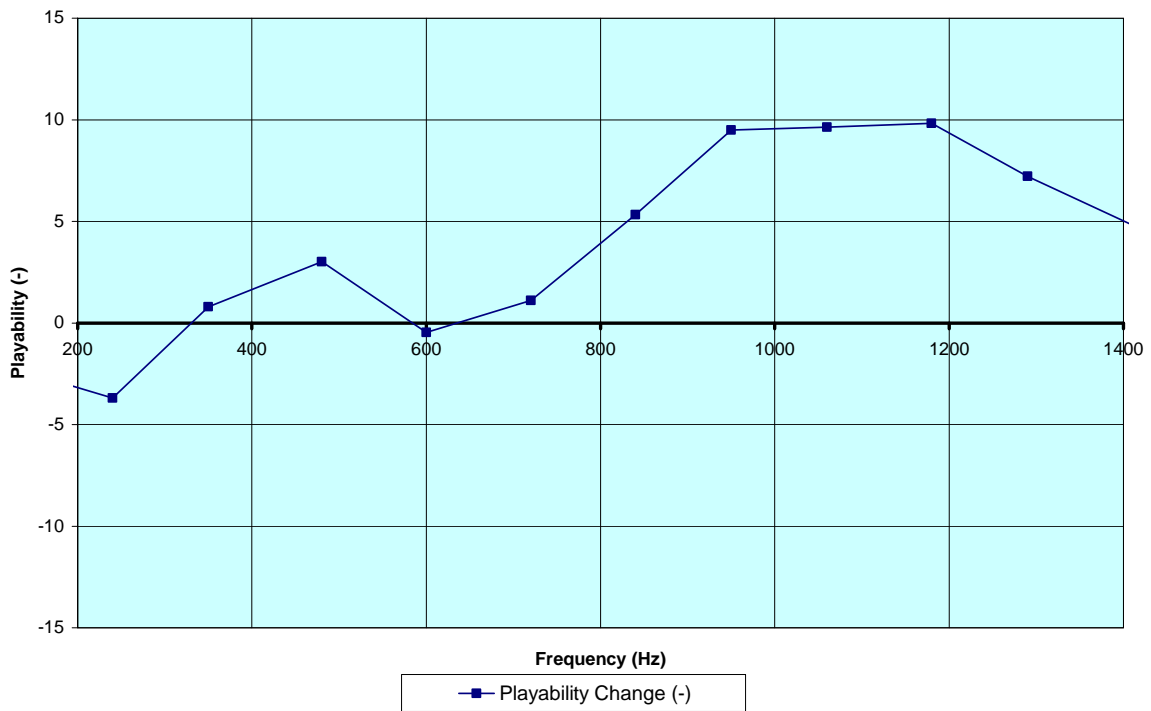
Comparing Input Impedances for Silent Mute and No Mute



### Intonation Changes w/ Silent Brass



### Playability Changes w/ Silent Brass



## More Resolute Curves

Comparing Input Impedances for No Mutes

