

## Question #326

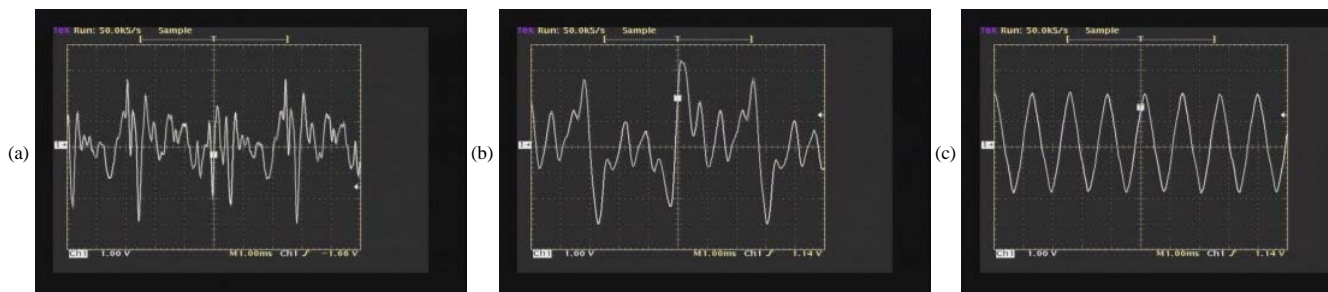
This is a follow-up to [Question # 325](#) that will extend the concepts involved to include musical instruments.



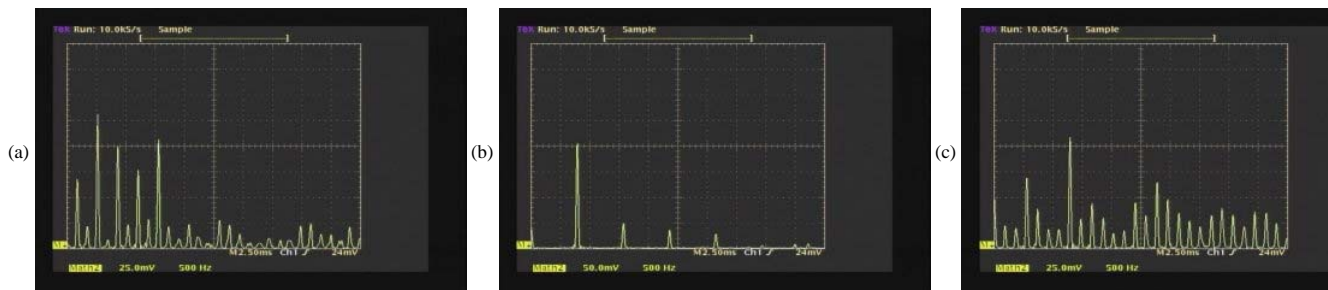
Click on the photographs above to hear the sounds of (left to right) the alto recorder, the tenor krummhorn, and the clarinet. For those of you who have never heard the sound of a krummhorn (sometimes spelled *crumhorn*) click on [Crumhorn music, please](#). (A brief discussion of the instrument and the music is included.)

Below are sets of three wave shapes and Fourier spectra belonging to these three instruments, but not necessarily in the same order.

Wave shapes (left to right) a, b, and c:



Fourier spectra (left to right) a, b, and c:



You are to determine which of the above wave shapes and spectra correlate with the sounds of each instrument:

- (a) the alto recorder.
- (b) the tenor krummhorn.
- (c) the clarinet.

Click here for [Answer #326](#) after November 3, 2008.

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For questions and comments regarding the *Question of the Week* contact [Dr. Richard E. Berg](#) by e-mail or using phone number or regular mail address given on the [Lecture-Demonstration Home Page](#).

# Example of music performed on the crumhorn

The music performed here was actually written for the viola da gamba, a family of bowed fretted string instrument with six strings (tuned in fourths with a major third in the center), including three common sizes (treble, tenor and bass), that were played holding the instrument between your legs like the modern day cello. This family of instruments was very popular throughout the Renaissance, but lost out to the violin family in the baroque due primarily to the greater expressive quality of the violin family (violin, viola, vello, and bass). (In fact, the bass violin can probably be considered more similar to the bass viol than to the other members of the violin family.)

This music originates in an instruction book by Diego Ortiz (ca. 1510?1570), a Spanish composer and musicologist, including examples used in teaching performance techniques for the viol and harpsichord, but also useful for other contemporary Renaissance instruments.

The book is commonly known as *Tratado de Glosas*, but bears the full title of: *Trattado de glossas sobre clausulas y otros generos de punctos en la musica de violones nuevamente puestos en luz*.

This particular music is a short piece based on the famous chord progression known as *el passamezzo moderno*. This short sequence is repeated six times with increasingly complex and rapid ornamentation, in a common Renaissance variation technique, often referred to as the *division*. The title for this piece of music is: *Recercada Segunda sobre el passamezzo moderno*. Adaptation of the viol music for the tenor crumhorn was done by Dick Berg ca. 1976 for a concert commemorating the music that George Washington may have known; this was an example of music that George Washington probably did not know.

The crumhorn is a capped double-reed Renaissance instrument, commonly played in a consort of four or more instruments and often including combinations of three or more soprano, alto, tenor, and bass crumhorns. Michael Praetorius (1571?1621), a contemporary German composer, organist, and musicologist, wrote that the crumhorn produced a "soft, buzzy sound." A number of capped reed instruments like the crumhorn existed in the Renaissance, but did not possess the expressive qualities necessary to adapt to Baroque performance practice. The performance here uses a tenor crumhorn.

The keyboard instrument used in the video is a Yamaha DX7s Digital Musical Synthesizer. We selected this instrument because our Physics Lecture-Demonstration Facility, like many such Facilities in other major American universities, does not own a harpsichord. To make it sound as much like a harpsichord as we could, we selected the *clavecin* voice.

Click [here](#) to view the full original score for the performance. Click [here](#) to view the music for the solo line as edited and adapted for the crumhorn.

Click [here](#) to hear the music. (This is a relatively long file, so please have patience.)

This performance took place at the University of Maryland Physics Lecture-Demonstration Facility on Tuesday, July 8, 2008. The performers were Dick Berg, tenor crumhorn, and Deni Foster, synthesizer keyboard. The video camera operator and recording engineer was Krishna Bhamidipati. Audio setup was by Krishna Bhamidipati and Dick Berg.

# Recarcada Segunda

Diego Ortiz

## RECERCADA SEGUNDA

The musical score is presented in a system of six systems. Each system contains four staves: a vocal line (Cantus) and three lute accompaniment staves (Alto, Tenor, and Bassus). The vocal line is written in a single melodic line with a treble clef and a common time signature. The lute accompaniment is written in three staves, each with a different clef (treble, alto, and bass) and a common time signature. The music is in a key with one sharp (F#) and a common time signature. The score consists of 24 measures, with each system containing four measures. The vocal line features a series of eighth and sixteenth notes, while the lute accompaniment consists of chords and single notes. The piece concludes with a double bar line and repeat dots.

The first system of musical notation consists of three staves. The top staff is a bass clef staff with a melodic line of eighth and sixteenth notes. The middle staff is a grand staff (treble and bass clefs) with piano accompaniment, featuring chords and moving lines. The bottom staff is a bass clef staff with bass piano accompaniment, primarily consisting of chords and a steady eighth-note bass line.

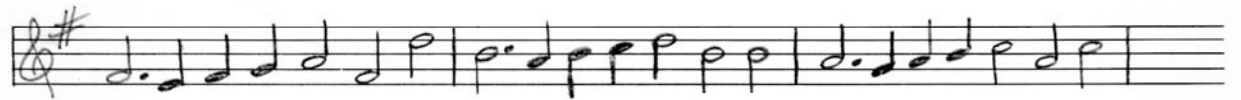
The second system of musical notation consists of three staves. The top staff continues the melodic line from the first system. The middle staff shows piano accompaniment with some rests and chordal textures. The bottom staff continues the bass piano accompaniment with a consistent rhythmic pattern.

The third system of musical notation consists of three staves. The top staff continues the melodic line, ending with a double bar line. The middle staff shows piano accompaniment with some rests and chordal textures. The bottom staff continues the bass piano accompaniment, ending with a double bar line.

Tenor Krumhorn

# Recercada Segunda

Diego Ortiz



R. Seg. - P2

