Foundations of Modern Cello Technique

Preparatory Exercises

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Table of Contents

Exercise 1: Harmonics 1-16 (upper half of the string) .............................................. 3
Exercise 2: Harmonics 1-16 (all nodes) ................................................................. 4
Exercise 3: Stopped Harmonics ................................................................................. 6
Exercise 4: Double-node Harmonics ....................................................................... 7
Exercise 5: Natural Harmonics Glissando ............................................................... 8
Exercise 6: Natural Harmonics Glissando over a Stopped Note .............................. 8
Exercise 7: Finger Dexterity in Pizzicato ................................................................. 8
Exercise 8: Overtone Exclusion ................................................................................... 9
Exercise 9: Plectrum Width ....................................................................................... 9
Exercise 10: Voicing in Pizzicato Chords ................................................................. 9
Exercise 11: Enharmonic / Timbre Trills ................................................................. 10
Exercise 12: Bi-tones vs. Strike Tones ..................................................................... 11
Exercise 13: Widening the Hammer ....................................................................... 11
Exercise 14: Strike Tones Melodic Contour ......................................................... 12
Exercise 15: Finding a Multiphonic ........................................................................ 13
Exercise 16: Turning the Peg ................................................................................. 13
Exercise 17: Quarter-tone Scale (four octaves) ..................................................... 14
Exercise 1: Harmonics 1-16 (upper half of the string)

Play all of these notes by lightly placing the left-hand second finger at the pitch indicated by the diamond note-head. Play at a *mezzo forte* dynamic, taking care that the bow moves closer to the bridge as the notes get higher in pitch. All of these harmonics sound at the same pitch as indicated by the note-head.
Exercise 2: Harmonics 1-16 (all nodes)

Play the following in two ways:

a) Begin by playing the last bar of each line – this is the last node of each harmonic, which sounds at pitch, as seen in Exercise 1. Take note of the bow placement and maintain it while playing the other nodes of the same harmonic.

b) Play the last bars of each line sequentially (upper half of the string), followed by the first bars of each line (lower half of the string), in order to feel the increasingly small distances between the nodes. This is an important aspect of understanding the geography of the harmonics on the string. The first nodes of the 10th-15th harmonics have very slight deviations in finger placement, by less than an eighth-tone. These have been indicated in cents which in this case, as with the arrows, serve only as approximate indication of finger placement. Special attention should be given to aural recognition of pitch placement when familiarizing oneself with the upper harmonic, as these will not correspond to the notes of the diatonic scale.
**Exercise 3: Stopped Harmonics**

The upper staff indicates the sounding pitch – note that the resulting sounds are the same for each of the lowest four lines below. Play the following three ways:

a) The fundamental (the lowest note in each example below) is first played with the thumb and the diamond note-head is lightly touched with the 3rd finger.

b) Repeat the exercise using the 1st finger on the fundamental and the 4th finger on the harmonic.

c) The scales can all be played either staying on one string or over two strings, as indicated on the second and third lines.
Exercise 4: Double-node Harmonics

Begin by playing the sounding pitch, notated at the beginning of the line. Use the harmonic rather than the stopped note so that the intonation is precise. Then play each double-node by lightly touching both harmonics on the same string to obtain the same pitch. Remember that finger spacing will remain constant for all the double-nodes on the same line.
**Exercise 5: Natural Harmonics Glissando**

Keeping the bow close to the bridge, glissando along the whole string from the nut to the end of the fingerboard, which will create a descending and ascending line (the 2\textsuperscript{nd} harmonic, or middle, as the lowest point in the register). The left hand should start slowly, accelerating as it reaches the middle of the string, and then slowing down again as it gets further away from the middle.

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**Exercise 6: Natural Harmonics Glissando over a Stopped Note**

Play the following several times to increase flexibility and strengthen the muscles inside the hand:

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**Exercise 7: Finger Dexterity in Pizzicato**

The use of \textit{p} (thumb), \textit{i} (1\textsuperscript{st} finger), \textit{m} (2\textsuperscript{nd} finger), and \textit{a} (3\textsuperscript{rd} finger) to label the fingers of the right hand is borrowed from the guitarist’s terminology.

\textit{Allegro non troppo}  
\textit{sempre pizz.}

\textit{Allegro}
**Exercise 8: Overtone Exclusion**

a) Find the 2\(^{nd}\) harmonic.

b) Pluck the string exactly at this point, this 2\(^{nd}\) harmonic should be completely absent from the sound but the fundamental should be very loud.

c) Pluck the string at the mid-point between this harmonic node and the bridge (or, at the 3\(^{rd}\) harmonic node), the 2\(^{nd}\) harmonic should be very prominent in the sound as the 3\(^{rd}\) harmonic is its antinode.

**Exercise 9: Plectrum Width**

Try these possible combinations, at varying distances:

a) R.H. 1\(^{st}\) and 2\(^{nd}\) fingers, in the same direction

b) R.H. thumb and 3\(^{rd}\) finger, in the opposite direction

c) L.H. 3\(^{rd}\) finger and R.H. 1\(^{st}\) finger, in the same direction

d) L.H. 3\(^{rd}\) finger and R.H. 1\(^{st}\) finger, in the opposite direction

**Exercise 10: Voicing in Pizzicato Chords**

a) Play all four notes simultaneously, using the thumb and different fingers for each note. Begin by making each red note a Bartók pizzicato, taking care that the other notes are not.

b) Then make the voicing more subtle by eliminating the snap and simply making the red notes louder than the others.
Exercise 11: Enharmonic / Timbre Trills

Play the following trills and then find more combinations elsewhere on your instrument.

a) Two nodes of the same harmonic (same string). This can be played either as a keyboard trill or a traditional trill to exploit the double-node.

b) The highest node of a harmonic and the fully stopped pitch at the same placement (same string).

c) Two natural harmonics which produce the same pitch (different strings).

d) Two stopped harmonics which produce the same pitch (different strings).

e) A natural harmonic and a stopped harmonic which produce the same pitch (different strings).
Exercise 12: Bi-tones vs. Strike Tones

a) Placing the bow firmly on the string, pluck the string on either side of the bow to hear the pitches.

b) Carefully maintaining the same point of contact, hit the string with the bow but don’t lift the bow afterwards, keep it on the string. Listen for the two notes you just plucked.

c) Now still with the same point of bow contact, hit the string but let it bounce back away from the string: you should hear the open string and the pitch of the portion of string between the bow and the bridge.

Exercise 13: Widening the Hammer

Notice the slight difference in sound between col legno at the middle of the stick, and using the flat side of the tip of the bow (the largest available surface of wood on the bow). Observe whether this produces a stronger or weaker strike tone in relation to the primary tone.

Using two bows for col legno, observe the reduction in overtone content but the increase in volume. Repeat with various distances between the two bows. If the bow closest to the bridge stays at the same point of contact, there should be no variation in the pitch of the strike tone.
Exercise 14: Strike Tones Melodic Contour

Both staves are played entirely on the A-string. The lower staff shows the fingered pitches (primary tones), and the upper staff shows the hammer’s point of contact on the string, which are also the pitches of the resulting strike tones.

a) First play the upper staff *arco* to hear the notated pitches.

b) Then, to hear the strike tones alone, place the palm of the hand over the strings to damp them and hit the string with the wood of the bow where the left hand would ordinarily be to stop the pitches.

c) Play the exercise as written.
Exercise 15: Finding a Multiphonic

a) Play the four harmonics, the resulting pitches are notated on the upper staff (these are the constituents of the multiphonic).

b) Play the highest sounding of these four harmonics, in this case the 3rd node of the 11th harmonic. Use light left-hand pressure, and a slower bow stroke with higher pressure and closer to the bridge.

c) To find the same multiphonic on the upper half of the string, first play the next four harmonics then follow the same instructions for the multiphonic.

Exercise 16: Turning the Peg

Cellists are generally less experienced at tuning with their pegs than violinists. The pegs may be stiff at first; if so ask your nearest violinist or violist for some peg paste! Always remember to push inwards while you turn.

a) First retune the string during the rest, using the left hand to turn the peg. Aim to change your playing position as little as possible.

b) Then retune while playing, focusing on maintaining a steady bow stroke.
Exercise 17: Quarter-tone Scale (four octaves)

a) Play all of the notes with a ‘big’ fingering, including the open strings. This will produce a chromatic scale with shifts in unfamiliar places.

b) Learn the following fingering pattern as you would in a chromatic scale (12-TET). Shifts are always onto a familiar note. When you shift, take note of which position you are in. At first, stop and compare familiar pitches with the open strings.

c) As you become more comfortable with finger spacing and shifting, take note of the colour and resonance of each quarter-tone.