

STUDYING STRING ORCHESTRATION



Thomas Goss, Orchestration 101 Master Class: The String Section • macProVideo

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A Guide to Orchestration Master Class 101: The String Section

A macProVideo Course by Thomas Goss

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Many thanks to Sam Hayman of [Tower Studios](#) for formatting this guide.

A MESSAGE FROM ORCHESTRATION TRAINER THOMAS GOSS



WELCOME!

I hope you’ve enjoyed viewing the Orchestration Master Class 101 Course. As I mentioned in the last video of the course, here’s a guide that will supplement and consolidate your training.

The first chapter will get you started with score-reading works for strings, with some basic how-to information if you’ve never looked at a score before, and a few essential insights if you already have a bit of experience.

The second chapter includes a progressive list of scores to study, which will gradually sharpen your score-reading skills while showing you the development of string technique and approach over the last three centuries. This list contains brief descriptions of each work, with tips on getting the most out of your score-reading, and a list of string techniques to watch out for. The chapter ends with an index of the different techniques as they appear in the list of scores, so that they may be singled out for individual study.

Following this is a catalogue of string techniques, with charts and diagrams of tuning, range, fingering, harmonics, and multiple stops. I’ve also included a dictionary of the many string-specific musical terms that you’ll be reading in these scores, and a glossary of typical markings.

I look forward to presenting you with the next orchestration master class soon, 102: The Wind Section. Until then, get the most out of your training, and please feel free to let me know how you liked this course.

Orchestrationally Yours,
Thomas Goss
May 2014 • Wellington, New Zealand

I. SCORE-READING THE STRING SECTION

for Orchestration Master Class 101:
The String Section

A macProVideo Course by Thomas Goss

INTRODUCTION

For a composer, a score is like a novel, with characters, scenes, and a plot - but we define these features as instruments, episodes, and structure. In studying the works of one period of music, we see how the great masters used similar strategies, and yet created works that were individual and often groundbreaking. Then when we compare periods of music we see how these strategies evolved and changed, opening up avenues for greater possibilities of personal style and freedom of imagination.

A composer who doesn't score-read is like a writer whose experience with literature is having a few books read to them aloud. Just as writers read books voraciously, composers must read scores - hundreds of scores, and eventually thousands of scores. Score-reading should be a daily fact of life, where one's sense of wonder is renewed, and one's imagination spurred to greater heights.

Mozart

Symphony No. 41

in C Major

K. 551

“Jupiter”

Allegro vivace.

Flauto.

Oboi.

Fagotti.

Corni in C.

Trombe in C.

Timpani in C.G.

Violino I.

Violino II.

Viola.

Violoncello e Basso.

INTRODUCTION (cont.)

It's very simple to begin. All you need is a score and recording of the same work. As the music plays, your eye follows the flow of music along the page, and notes the development and vertical structure. Certain factors should be focused on, with the same score being read several times in different ways. The easiest thing to focus on is the melody, following its sometimes twisty course through different settings. Then other elements may be followed, such as rhythmic patterns, harmonies, accompaniment figures, and the bass line. After taking the score apart like this, put all the pieces back together, and score-read like a conductor, seeing how all parts make a strong whole.

If you can truly dedicate yourself to this, then you'll notice your ability to absorb music growing to greater proportions. You'll be able to grasp larger and larger portions of the score as you read, perceiving all the calculations and inspirations that make a work great. And you'll also develop a stronger inner ear, that's able to make sense of a score without having to hear it first. A true professional can look through a score and know what it will sound like just by looking at the notes. This is a process called mental hearing, where you use your own imagination as the musical instrument, and feed it the information that you see on the page. It's a skill that works the other way as well, allowing you to develop large sections of orchestral music mentally. You can imagine the music instead of needing to work things out with a piano, or orchestral sound sets and notation software.

Beethoven, Symphony no. 4, movt. 1 - bars 69-76

The image displays a musical score for Beethoven's Symphony no. 4, movement 1, bars 69-76. The score is presented in a vertical layout, with each instrument part on its own staff. The staves are color-coded to highlight different musical elements. The top three staves (Fl., Ob., Cl.) are yellow and labeled 'Harmony'. The fourth staff (Fag.) is green and labeled 'Accomp. Figure'. The fifth staff (Cor.) is yellow and labeled 'Harmony'. The sixth and seventh staves (Vn., Va.) are pink and labeled 'Melody' and 'Counter-Melody' respectively. The eighth staff (Vcl.) is blue and labeled 'Rhythm/Harmony'. The bottom staff (Cb.) is purple and labeled 'Bass Line'. The score is written in G major (one sharp) and 2/2 time. The key signature is one sharp (F#). The tempo is marked 'Allegro'. The score is for the first movement, bars 69-76.

SCORE READING STRING ENSEMBLES

Most viewers of this video course will probably have skills on a musical instrument, and will already have experience reading notation. Most likely, this will be playing piano music, which has its own sets of rules and expectations. The left hand will mostly play figures, chords, octaves, and bass lines. The right hand will take many different roles, but is usually associated with the melody.

There are some parallels between piano and string scores, and some big differences as well. First the differences: there's no pedal to create a resonant wash of lingering sound. String phrasing can be much more flexible, dynamic, subtle, and timbrally varied than piano. Pianists can play any note with the same amount of force and articulation; whereas some notes are far more difficult to successfully play than others on string instruments, and these differences vary from instrument to instrument, register to register. And of course, piano scores have two staves, while string scores are generally 4-5 staves, and sometimes many many more (as you'll see in the section ahead "Scores To Study").

But then there are parallels. Cellos and double basses will generally play the bass line most of the time. Cello is great for patterns and figures, as is viola. Cello, viola, and second violin often combine to play chords, sometimes with the first violin, or sometimes supporting it as it plays the melody. And finally, first violin most often plays the melody, with a great deal of support from the second violin.

These roles often translate very well to the two hands of a pianist, which makes certain reductions of symphonic music ideal to play for rehearsals of ballet, opera, and theater. This can go the other way as well, with certain types of piano music ideally suited for transcription to string quartet or string orchestra. But often such arranging must need to be expanded in scope, to keep the strings from sounding too pianistic in character. The range of motion, spacing of harmony, and intersection of lines differ greatly between piano music and string repertoire, and must be carefully adapted.

If a score-reader is a pianist, then the best strategy is to use instincts developed during practice and apply them in a new way to viewing a score. Just as you learned to notice two staves of music at once while playing a piano score, develop your ability to absorb at least that much at first with a string composition.

The most prominent part of a score is the melody, and is easily picked out by the eye while reading along to music. As you read the melody, watch how the notes around it support it, or provide counterpoint. Then reverse it: read through the score again, paying attention to everything but the melody. Since the melody is the most obvious part, it can float on the edges of your attention, serving as a convenient place marker to keep your reading on track. That way you can put the different parts of the score into context, seeing how they all help to move the music forward. Eventually it will all fit together, and you'll see it all happening at once.

String ensembles have certain set definitions and general parameters. String duos may combine any two instruments, like violin and cello, or two violins. But a string trio is nearly always violin, viola, and cello. When a piano is added to this lineup, it's called a "piano quartet." When you take away the violist, it's called a "piano trio."

The chamber string group that's most useful to score-read for developing orchestrators is the string quartet, composed of two violins, viola, and cello. The parts are laid out exactly as they'd appear in an orchestral score, and the instrumental roles are quite similar. The main difference is that the solo tone and virtuosic individuality of quartet players ranks high above that of the orchestral string section. Quartet repertoire can be far more difficult to perform than orchestral music, and requires a level of artistic unity and trust that's difficult to find in large groups.

After you've score-read the first handful of recommended quartets, and several more if you're wise, then you're ready for string orchestra scores. Many of these have only four parts, just like a quartet, with cello and double bass sharing a staff. Orchestral scoring may often be more simple and direct in character than string quartet, and yet far greater in scope of sound. That is where the term "symphonic" originated, meaning "sounds together:" a massive unity of talent and willpower. Its possibilities have unleashed some of the highest inspirations to which humanity is capable. As you'll see in scores for full orchestra, the strings have largely retained their defining role in this exercise.

GETTING STARTED

Don't wait anymore. You've watched the course, read this PDF guide up to this page, and now you're ready to try out score-reading for yourself. The easiest thing to do is to just scroll down to the next page and click the first link on the list, the Haydn String Quartet no. 5, Op. 64. Go to the IMSLP page and download a file of the work, opening it on your computer screen. Then surf on over to YouTube and search for a video upload of the quartet. As of this writing, several different string quartet ensembles of both semipro and pro ability have uploaded their own versions of this work, and most are more than adequate to guide your score-reading. Or click on the playlist link on the right for my recommended choice for score-reading all the works I've listed below.

Make sure the score on your screen is at a comfortable reading size for you. Too small, and it's hard to process all the details as they fly by. Too large, and you may find it difficult to follow when the music gets fast. For most computer screens, two systems of music is probably the right size.

Start the music and then read through the score. Take things slowly and methodically at first. Read through the melody first, and note when it trades off from instrument to instrument. Don't be afraid to backtrack, restarting the music if you get lost. Stick to movement one at first, reading through it several times and noting all the different roles each instrument plays.

Then move on to the second movement. You'll see that the different form of this movement will dictate different roles for the

instruments, and a very different character to the music. The support of the melody may be more simple and unified in some places, more intricately contrapuntal in others. This variety is evident in each movement, and should be studied many times. If you are interested in Classical style and form, this work covers most of the basics with elegance and perfection.

This may take you a couple of hours total, or even a whole day. It all depends on how much you want to immerse yourself in your score-reading assignments, how quickly you absorb the music, and how developed your reading skills. It also depends on your memory and musical imagination, both of which play a role in your comprehension of a piece of music.

When you feel you're ready, move on to the next selection, and the next. In the following list of works, I've assembled what's at least a solid month of score-reading, if not twice or three times that much. That means that you are simply going to have to do the right thing for yourself. You want to be an orchestrator - so you must score-read constantly. Set a schedule for yourself and stick to it. Don't blast through each score once - that will get you nowhere. Rather, take a bath in each score, luxuriously getting to know everything about it, until large sections of it are stuck in your head. If you're doing it right, those memories will be not only of sounds, but of pages of score.

FURTHER RESOURCES

For more training, tips, and perspectives on orchestration and score-reading, please subscribe to my website, [Orchestration Online](#). You'll find resources listing orchestration manuals, books on music theory and film scoring, and useful websites for developing your skills. There are also detailed blog posts and videos about orchestral instruments, along with the philosophy and craft of scoring. It's also the platform for the sister courses to this series: the [Orchestration Online Scoring Series](#). The first course in this series explores scoring for the string section, and will be launched in late 2014.

On the [Orchestration Online YouTube Channel](#), I've created a [playlist](#) for each of the selected works below, so you can see which videos I recommend for listening along with your assignments. I generally favor live performances, in which you may also observe string technique in action, and see how the players realize what's in your copy of the score. My channel also contains an additional [Score-Reading Course](#), which may prove a useful supplement to the training in this guide.

Please follow on [Twitter](#) or [Google+](#), or join the thousands of composers and orchestrators who share their music and perspectives on the [Orchestration Online Facebook group](#). I hope to see you there!

Thomas Goss

II. SCORES TO STUDY

1. LIST OF SCORES TO STUDY

This supplement is intended to put the information presented in the Orchestration Master Class 101 to work for the viewer. The twenty-two assigned scores below are targeted at a notation-literate musician with beginning to intermediate score-reading skills.

The list below is divided into three categories: String Quartets; String Orchestra works; and Full Orchestra works. In each category, the music is listed in order of difficulty, with the first few scores helping to build good score-reading habits, all the way to some fairly advanced examples of the literature.

WORKS FOR STRING QUARTET

- 1. [String Quartet Op. 64 in D, no. 5 \(“The Lark”\)](#)
Haydn, Franz Joseph
- 2. [String Quartet in C, K. 465](#)
Mozart, Wolfgang A.
- 3. [String Quartet No. 1 in E-flat, Op. 12](#)
Mendelssohn, Felix
- 4. [String Quartet in D minor, D. 810](#)
Schubert, Franz

- 5. [String Quartet no. 2](#)
Borodin, Alexander
- 6. [String Quartet in G minor](#)
Debussy, Claude
- 7. [String Quartet in F](#)
Ravel, Maurice

WORKS FOR STRING ORCHESTRA

- 8. [Eine Kleine Nachtmusik, K. 525](#)
Mozart, Wolfgang A.
- 9. [String Symphony no. 11 in F](#)
Mendelssohn, Felix
- 10. [Brandenburg Concerto no. 3 in G, BWV 1048](#)
Bach, J.S.
- 11. [Serenade for Strings, Op. 22](#)
Dvořák, Antonin
- 12. [Holberg Suite](#)
Grieg, Edvard
- 13. [Serenade for Strings, Op. 48](#)
Tchaikovsky, Piotr I.

- 14. [St. Paul’s Suite](#)
Holst, Gustav
- 15. [Symphony no. 5, movement 4, Adagietto](#)
Mahler, Gustav
- 16. [Introduction and Allegro, Op. 47](#)
Elgar, Edward
- 17. [Fantasia on a Theme by Thomas Tallis](#)
Vaughn Williams, Ralph

WORKS FOR FULL ORCHESTRA

- 18. [Symphony no. 41 in C](#)
Mozart, Wolfgang A.
- 19. [Symphony no. 4 in B-flat](#)
Beethoven, Ludwig
- 20. [Symphony no. 3](#)
Brahms, Johannes
- 21. [Symphony no. 2 in B minor](#)
Borodin, Alexander
- 22. [Scheherazade, Op. 35](#)
Rimsky-Korsakov, Nikolai

2. DESCRIPTIONS OF WORKS

WORKS FOR STRING QUARTET

1. [String Quartet Op. 64 in D, no. 5 \(“The Lark”\)](#)

Haydn, Franz Joseph

This is an excellent place to start. In fact, if you really want a great introduction to string quartet writing, you couldn’t go wrong by score-reading Haydn’s entire set of six Opus 64 quartets. This is the best-known of the bunch, titled “The Lark” because of the opening phrase on the first violin.

There are many great interpretations of this quartet. The best are string quartets that play in the early Classical period style, limiting too much vibrato. The extremely clear tones lend the music a certain glowing resonance, and make the “lark” theme ring out very much like an actual bird song.

The score is simple and direct, and yet superbly well-written. The first violin dominates most of the quartet, and is easy to follow on your first read. After that, read through the score three more times, with special attention to the second violin, then the viola, and finally the cello. Then give the quartet one final reading, observing how all these parts support one another, each in their well-defined roles.

Techniques:

- detaché bowing: movement 4, bar 1 etc.
- mezzo staccato: movt. 1, bar 8 etc.
- staccato: movt. 1, bar 1 etc.

2. [String Quartet in C, K. 465](#)

Mozart, Wolfgang A.

This quartet was one of a set of six that Mozart dedicated to Haydn. It’s nicknamed “Dissonance” because of its mysterious opening section, in which the harmony goes in some unexpected directions for a Classical-period string quartet. But the rest of the first movement is bright and extroverted, with just a touch of the opening harmonic complexity here and there.

As you’ll see, Mozart has a far more sophisticated, intense approach than Haydn. Though the first violin leads as much as ever, it’s first among equals. In order to pull this off in performance, every player has to aim for absolute perfection. Pay special attention to the cello part in the first movement, and how it often plays a melodic role, imitates the first violin, and supports the second violin.

Another trademark touch you will see in the last movement of this piece and many others is the use of detaché bowing as a matter of course. Mozart combines fast, precise strokes with tiny connective slurs in places, for music that’s difficult but very rewarding for the player.

Techniques:

- detaché bowing: movement 4 throughout
- fortepiano and sforzando: movt. 1 opening section
- measured tremolo: end of movts 1 & 2
- triple-stops: end of movt. 4

3. [String Quartet No. 1 in E-flat, Op. 12](#)

Mendelssohn, Felix

Notice Mendelssohn’s careful attention to detail in his string scoring, as compared to the previous two scores. Classical composers like Haydn and Mozart used expression marks sparingly, relying on the approach of the players to realize the nuances. Romantic era composers, however, were far more specific about dynamics and expression.

This work was composed when Mendelssohn was 20 years old, and already an experienced composer of masterpieces like his Overture to a Midsummer Night’s Dream. The brilliance of this particular work is in its flexibility and adjustability to the different personalities of different quartet ensembles. I recommend listening to several different versions as you study it - there are worthy interpretations ranging from easy virtuosity to deep, soulful reaching. This is what’s called “core repertoire,” and there’s a reason for that.

As you score-read, watch for the superb handling of the lines. Mendelssohn’s part-writing is among the best, and the placement of each voice is flawless, their variety and horizontal continuity engaging and masterful.

Techniques:

- mezzo staccato: movt. 1 opening section
- staccato: movt. 2 throughout
- triple- and quadruple-stops: opening of movt. 4

WORKS FOR STRING QUARTET (cont.)

4. [String Quartet in D minor, D. 810](#)

Schubert, Franz

So far, I've listed these quartets in chronological order, as there is a certain development of complexity of approach and emotion as these works move forward in time. But I'm putting the Schubert after the Mendelssohn, even though it was written first, because it is a huge step forward in quartet composition. It's also truly huge, easily twice the length of any others on the list so far. In fact, it is considered one of the bedrock works of the genre, one that any great quartet ensemble must master to establish their credibility.

This quartet is often nicknamed "Death and the Maiden," as Schubert quotes from his own song of that title in the second movement. While the quartet certainly does deal with issues of mortality, its emotional spectrum is all-encompassing, from joyous to pessimistic, meditative to ferocious.

Note the huge difference of approach between Schubert and the other composers before him on this list. His energy is more direct and individual, and his style highly personalized, with ideas that develop over many more bars.

Techniques:

- detaché bowing, movt. 1, p.7
- forzando (sforzando), movt. 3 opening section; throughout movt. 4
- staccato, movt. 4 throughout

5. [String Quartet no. 2](#)

Borodin, Alexander

Borodin only composed two string quartets, but they're both such potent artistic statements that they're considered core repertoire, especially the second. You'll notice here as big a difference between this quartet and the Romantics (Schubert and Mendelssohn) as the Romantics differ from the Classical era composers. Borodin uses the quartet genre to explore his sense of unfettered lyricism and emotional poetry, idealizing folk melodies and rhythms.

What this means is that the music is becoming ever more a series of emotional gestures that unite to reveal the towering vision of their composers. Score-read along those lines, now that you've developed some instincts and technique. As you listen to the recording, observe how arcs of expression realize themselves in each phrase, and how the instruments involved carry that forward dynamically and technically. How do supporting instruments frame the idea? How do the melodic lines push at the music, or hold it back?

Along with this, of course, is the evolving capacity of string technique, which lays the groundwork for the modern era.

Techniques:

- mezzo staccato, movt. 3 opening
- portato, movt. 1, bar 4 cello part; movt. 3, opening cello theme
- staccato, movt. 4, bar 20 onwards

6. [String Quartet in G minor](#)

Debussy, Claude

Debussy was a keen student of Borodin and the other Russian nationalist composers. You'll hear a relationship between the previous quartet and this work, though Debussy's personality and innovations make this work all his own. This is another cornerstone work, as much as the Schubert quartet D. 810, because it liberated the string quartet from the rules of form which had dictated it for so long. For Debussy himself, it pointed a way forward in his own approach that would eventually lead to his masterpiece La Mer.

Score-read with this in mind. Think of the music as being composed in episodes rather than exposition, recapitulation, development, and so on. Watch for how the episodes work themselves out, mirror each other, even arrange themselves in mounting series of emotion. All through this, observe the technical and expressive demands Debussy makes on the players. Some passages, especially in the second movement, are fiendishly difficult to play.

Techniques:

- downbows, movt. 1, esp. opening and pp 7, 11, & 15
- mezzo staccato, movt. 3 throughout
- mutes, movt. 3 throughout
- pizzicato, movt. 2 throughout
- tenuto, movt. 1 throughout
- triple- and quadruple-stops, movt. 2, cello part

WORKS FOR STRING QUARTET (cont.)

7. [String Quartet in F](#)

Ravel, Maurice

No string quartet score-reading list would be complete without this monumental work, as groundbreaking in its own way as the Debussy and Schubert quartets. Ravel also studied Russian models like Debussy, but it's fascinating to observe that he expressed their influences in far different ways. Debussy borrows their energy and harmonic directness, but Ravel their sense of refinement and poise. One relationship you might notice between Ravel and Borodin is that both reach points of harmonic stability and emotional completion between episodes, and emphasize those points poetically. And yet Ravel uses this trick in a way that's every bit as personal as any section of Schubert.

This work is also a grab-bag of technical approaches, setting the stage for future works of many styles and nationalities to incorporate them with abandon. You'll note that the list of techniques to the right is the most extensive of any work in this catalogue. But Ravel only uses these techniques in a way that absolutely serves the musical idea - never as an end in themselves. His taste and sense of proportion are unmatched, as is his ear. Debussy was a huge fan of this work, admonishing Ravel to preserve it even though his teacher Gabriel Fauré had criticized it harshly and recommended it be drastically rewritten. What we read and hear now is an act of courage as well as a stellar piece of music.

Like Debussy, Ravel writes episodically rather than along formal lines. Watch how he seems to effortlessly set up each episode, making their sequence feel inevitable in places, startling in others. The expressive freedom and spontaneity in the third movement look ahead to Bartók, as does the ferocity and nonconformity of the fourth movement.

The score-reader should closely study the roles each instrument plays in bringing all this about, especially as Ravel shows how a huge variety of emotion and mood can be combined seamlessly. It's all in the individual parts for anyone to read. Anyone who wants to know how to score a terrific solo for cello, viola, or violin will read many perfect - and I mean "perfect" - examples here.

Techniques:

- double-stops, movt. 3 throughout
- fingered tremolo, movt. 1 figs. G & M, movt. 3 fig. D
- harmonics, movt. 4 figs. I & K
- measured tremolo, movt. 1 figs. A & E
- mutes, movt. 2 fig. H, movt. 3 throughout
- repeated tremolo, movt. 1 figs. B, H, & K; movt. 2 fig. C, H & P, movt. 3 throughout
- pizzicato, movt. 2 opening
- quadruple-stops & arpeggiando, movt. 1 fig D, H & M, vln I & II, movt. 3 figs. F & G
- sul tasto, movt. 1 fig. F, movt. 4 before fig. F
- triple- and quadruple-stops, movt. 2 fig. M and ending; movt. 4 throughout

WORKS FOR STRING ORCHESTRA

8. [Eine Kleine Nachtmusik, K. 525](#)

Mozart, Wolfgang A.

We've studied string quartets up to this point - and I hope you've actually listened and score-read several others as well by now. Now, let's cross the bridge over to string orchestration with the next three works. This first work is a little bit of both orchestral work and string quartet, and in fact it's perfectly playable by a quartet ensemble. But there's no question that the emotional scope of this work is most applicable to a larger ensemble. Keep in mind that Mozart's idea of a string orchestra was around two dozen players. In one of his letters he marvels at having heard his music played by 40 string players, which shows you that budgets have been limiting orchestras since they first started.

Apply everything you've learned up to this point, paying heed to the differences in tone and agility between quartet players and orchestral sections. Also notice the difference in the character of the techniques listed below, especially the indeterminacy of trills played by as a section rather than solo.

Techniques:

- détaché bowing, movt. 4 throughout
- double- and triple-stops, movt. 1 throughout, movt. 2 after fig. C
- staccato, movt. 4 throughout
- trills, movt. 1 throughout

WORKS FOR STRING ORCHESTRA (cont.)

9. [String Symphony no. 11 in F](#)

Mendelssohn, Felix

Mendelssohn composed a dozen symphonies for string orchestra, and they’re very much worth score-reading. Some are heavily influenced by J.S. Bach, like the String Symphony no. 4. Others, like this one, are more a product of his time and personal style.

The whole set are an excellent introduction to symphonic string scoring. These works, unlike Mozart’s “Eine Kleine Nachtmusik” above, really must be performed by a full complement of strings, not a quartet. They’re composed for a certain type of drama and scope, not to mention the sense of united purpose that underlies most great symphonies.

In this particular symphony, there’s a huge jolt of virtuosity, energy, and poetry, and how the orchestra brings forth those elements is fascinating. The most important lesson here for the score-reader is orchestral roles. Each section is clearly defined in their tasks, firsts leading the way, seconds harmonizing firsts and supporting with violas, cellos vigorously inhabiting the lower regions with a push from the double basses. There’s a lesson on every page.

Techniques:

- detaché bowing, movt. 4 throughout
- measured tremolo, movt. 1 throughout

10. [Brandenburg Concerto no. 3 in G, BWV 1048](#)

Bach, J.S.

This brief but amazingly potent and intense work is placed here as test of your score-reading capabilities. Up to now, you’ve been reading 4 to 5 staves. Bach gives you ten to read at once - a triple trio of violins, violas, and cellos, plus double bass. When you look for versions to listen to along with the score, try to pick live performances of only 11 players - one per part, plus double bass and harpsichord (continuo). They will not only convey the sheer excitement and brilliance of this work, but also show how fleet and agile the music can be, not to mention personal to each player.

Though the huge vertical mass of staves may seem confusing at first, use this opportunity to develop your sense of combining related voices and isolating important lines. Start by score-reading the first violin part, then read it again but with an eye on how the whole section of three violins interacts, doubles, harmonizes, and counterpoints. Then repeat the same procedure with the violas and cellos, reading the top part and then the section. Finally, score-read the entire work several times, watching for how the sections relate to one another. I find something new every time I look at this work - the mark of a great piece of music. Try the other Brandenburg concerti as well.

Techniques:

- detaché bowing, movt. 2 throughout

11. [Serenade for Strings, Op. 22](#)

Dvořák, Antonin

Dvořák was a master of string composition, as perfect in his way as Mozart or even Ravel. This serenade is one of his greatest works, written in a two-week roll in 1875, one his most productive and personally fulfilling years. It’s one of the best examples of its genre, with with emotional intensity that’s tempered with honesty and a terrific sense of craft. It’s the type of music that fits naturally to the instrument like a glove (but that doesn’t mean it’s necessarily easy to play).

With this piece, I recommend listening several times without reading, and imagining what exact roles each section is playing. The first violins will obviously be the top voice nearly all the time, and the cellos and basses at the bottom - but how are the middle parts being performed? Focus on that, visualizing mentally what that might look like on a score, especially sections with a danceable pulse like the second movement. Then read the score, and see if your guesses were right.

Techniques:

- martellato (marcatissimo), movt.2 bars148-158
- mezzo staccato, movt. 1 throughout
- portato, movt. 1 bars 24-25, 66; movt. 4 96-97
- staccato, movt. 5 throughout
- sul G, movt. 2 bars 88-97, 174-184
- trills, movt. 3 bars 49-56, 243-250

WORKS FOR STRING ORCHESTRA (cont.)

12. [Holberg Suite](#)

Grieg, Edvard

Before score-reading this piece in its orchestral version, have a look over the original piano version. Score-read it; or even better, download the score, print it up, and play it on the piano if you have the skill. Then score-read the version for strings.

This piece is almost a lesson on how not to score for strings, despite its brilliance and place in the repertoire. Grieg took every note that fit under his ten fingers, and realized them as double-stops and divisi in two and sometimes even three voices. The result is a texture that’s immensely rich and full in places. While this is thrilling to listen to at first, it starts to wear the ear out after a while. The truth is that very closely-spaced string harmonies in five and six parts start to sound like a church organ - and in fact, the interaction of their over-tones is operating in exactly that way. There’s a reason why most string sections are composed of only five groups of players, rather than seven or eight. And yet it’s great to hear what is possible in this work, especially with a smaller group of very enthusiastic professionals. Find a version like that to score-read along to.

Techniques:

- divisi and non divisi throughout (see comment above)
- fortepiano, movt. 1 opening
- saltando (spicc.), movt. 5 throughout
- sul C/G, movt. 1 p. 4

13. [Serenade for Strings, Op. 48](#)

Tchaikovsky, Piotr I.

Now that you’ve heard both Dvořák’s Serenade and Grieg’s Holberg Suite, have a listen to this piece. Contrast Dvořák’s luminescent, easy perfection alongside Tchaikovsky’s intense, brooding mastery of conception. The latter doesn’t strive for perfection, but ideally executed motion and emotion. Then notice how huge Tchaikovsky can make a string section sound compared to Grieg’s organ-like textures. Tchaikovsky may score sections of double-stops, but his harmonies are widely-spaced, raising the roof instead filling in the midrange.

This serenade, like so much of Tchaikovsky’s scoring, uses many different techniques. Watch for those listed below, and how well they convey the exact expression of each line. His craft is amongst the best of any composer in the standard repertoire, and musicians love to play his works.

Techniques:

- divisi and non divisi throughout
- double- and triple-stops throughout
- harmonics, movt. 3 closing
- martellato (marcatissimo), movt. 1 opening/closing
- mezzo staccato, movt. 2 throughout, movt. 3 fig. D
- mutes, movt. 4 opening
- sforzando, movt. 1 opening
- staccato, movt. 1 fig. D & K, movt. 4 throughout
- tenuto, movt. 4 opening

14. [St. Paul’s Suite](#)

Holst, Gustav

Holst is almost exclusively known for having composed “The Planets.” But his life’s work contains many works worth knowing, which have been heavily imitated by other com-posers of both film and concert music genres. Have a listen to “Egdon Heath” and “A Somerset Rhapsody” and you’ll hear sections that heavily influenced Benjamin Britten and Bernard Hermann, to name only a couple.

I’ve included this work, not because it presents any great step forward in your score-reading, but because this is what a great work of youth string composing looks like. This suite was composed for his students at St Paul’s Girl’s School, at which he worked his day job as a teacher, and weekends and nights on composing The Planets and other works. This piece does the opposite of “writing down” to fit a less capable player. Rather, it challenges the young musician in exactly the right way, daring them to rise to a level of excel-lence in both their personal technique and their skills as a corps. Watch for some clever bits of playing with meter and pulse, where the inflection of a rhythm becomes a new time signature - that type of sly innovation is always enormous fun for youth string groups to finesse.

Techniques:

- double-stops and divisi throughout (see above)
- triple- and quadruple-stops, movt. fig. 9, movt. 3 fig 3 & 6, movt. 4 fig 4

WORKS FOR STRING ORCHESTRA (cont.)

15. [Symphony no. 5, movement 4, Adagietto](#)

Mahler, Gustav

This is a section of a much more vastly-scored symphony, in which all the winds, brass, and percussion are absent. Only the harp joins in on this deep, searching meditation for strings. Though this piece is incredibly slow, with 5 pages of score lasting for 12 minutes, it's nevertheless an enormous challenge of expression and unity of purpose for both orchestra and conductor. Mahler was the epitome of the composer/conductor, and his symphonies were vehicles for a conducting career in the same way Tchaikovsky's were.

Listen to how enormously rich and full the scoring sounds, even with only five or six voices at any given moment. Mahler splits the cellos in some places, and gives the violas their share of double-stops and divisi, but essentially this is an example of how you don't need a lot of bulking-up of the harmony in order to sound full and luxurious. Have an eye out for the perfectly scored harp part, and how it adds just the right touch of embroidery and framing to the music. We'll be studying it more closely in the last course of this series.

Techniques:

- divisi (geteilt), bar 44 etc.
- glissando, bar 71
- portato, bars 2 & 72,
- sul G & D (G & D Saite)
- sul tasto (Griffbrett), bar 33
- tenuto, bars 29-71

16. [Introduction and Allegro, Op. 47](#)

Elgar, Edward

This work is really going to test your developing score-reading skills. It's scored for string quartet, plus orchestra that's essentially doubled sections divisi nearly throughout. It's also a massively grandiose work, possible Elgar's best, and it holds nothing back - huge emotional sweeps and contrasts punctuate the score. It's certainly one of the greatest string orchestra works ever composed.

The first task for the score-reader is to look for relationships between parts. Observe which instruments are soloing and carrying the melody on your first read-through. After this, break down the functions of the score by looking for doublings, of which there are many at both the unison and the octave, and also interactions between lines. Do this in both a very general way - but also study individual pages very carefully, as they've got volumes of information.

Techniques:

- accents/sforzando, opening, figs. 5 & 19
- double- triple- and quadruple stops, figs. 11, 12, 14, 26, & 27-30
- martellato, before fig. 14
- mutes, fig. 15
- sul G, fig. 17-18, 27, & 30
- sul ponticello, fig. 15
- tenuto, fig. 12 & 27
- tremolo, figs. 3, 5, & 15

17. [Fantasia on a Theme by Thomas Tallis](#)

Vaughn Williams, Ralph

Here Ralph Vaughan Williams takes Elgar's massive divisi approach and separates out the parts into three separate ensembles: a string quartet, a full-sized string orchestra, and a chamber orchestra of 9 players (1 desk of each regular group, plus one double bass). But where Elgar's music burns with energy and vitality, Vaughan Williams is ancient, mysterious, ethereal in some places, overpoweringly rich in others.

Grieg stumbled into organ-like textures because of a note-for-note arranging style. Vaughan Williams aims for this effect on purpose in places, but keeps the sound from getting old through a constant development of material and shifting of texture. In fact, it's a catalog of how many different textures and effects one might achieve from massed strings. The expressive range is phenomenal as a result. Don't miss the ending, where the strings push from a triple-pianissimo to a fortissimo, and then back down to a pppp.

Techniques:

divisi, throughout
double- and triple-stops throughout
mute, fig. E-I
non vibrato (senza espr.) fig. G
sul tasto (sur la touche), fig. U
tenuto, fig. N
tremolo, fig. U

WORKS FOR FULL ORCHESTRA

(*work excerpted in video course)

18. [Symphony no. 41 in C](#)

Mozart, Wolfgang A.

Up to now, this list has dealt with quartets, string orchestras, and even masses ensembles. At this point, most score-readers will be more than ready to step up to a full orchestral score. Once again, Mozart is a great place to start, and this is considered one of his greatest symphonies.

Use this as a chance to learn the way other sections interact with the strings. Every selection of this last category treats the strings as the fundamental orchestral color; but Mozart most of all, as the concept of the full orchestra had not even been standardized during his lifetime.

Watch for a couple intriguing approaches. In movement 2, Mozart uses the fortepiano accent on measured tremolo, making sure that the play understands that the first note of each repeated group is to be hit hard, and the rest played softly. Also watch for the fourth movement’s blinding speed - so fast that even the whole notes may be marked staccato!

Techniques:

- detaché bowing, movt. 4 throughout
- fortepiano, movt. 2, bars 19-24, 51-55 (see above)
- measured tremolo, movt. 1 bars 17-18, 47-48, etc.
- mutes, movt. 2 througout
- staccato, movt. 4 throughout (see above)
- triple-stops, movt. 1 bars 9-16, 49-55, etc.

19. [Symphony no. 4 in B-flat](#)

Beethoven, Ludwig Van

This symphony is one of Beethoven’s lighter efforts - but it’s still a major step forward compared to Mozart’s. The emotional scope is broader, the commitment more deep, the virtuosity more daring. It’s all the more amazing as this piece was written extremely quickly on the spur of the moment while Beethoven was trying to complete his monumental 5th Symphony.

As advanced as it is, the fundamental approaches are not that different from Mozart or Haydn. Brass is often used for rhythmic emphasis, and to underline a primary chord. Winds play solos, undertake certain melodic duties, and provide upper harmonies and doubling. The strings still reign supreme. They define the character of the entire piece.

As always, examine the roles of each string part. What are the cellos doing? How are the violas supporting the line, the texture, and the rhythm? When do the 2nd violins team up with the violas, and when do they join with the 1sts? And watch for the tempo of the finale, which outdoes even Mozart’s Jupiter Symphony.

Techniques:

- detaché bowing, movt. 4 throughout
- fortepiano, movt. 2 bar 18-23, 73-78
- sforzando, movt. 2 bars 17-22, 50-53, 72-76
- staccato, movt. 2 throughout

*20. [Symphony no. 3](#)

Brahms, Johannes

This symphony is one of Brahms’s best for string scoring. Many individual lines, whether melodic or support, can be taken right out of the score and used to demonstrate certain aspects of lyricism, use of registers, and flow of phrasing. And yet it’s very demanding music for the players, requiring extreme focus to execute with conviction.

Brahms has a very rich, integrated approach to scoring, the opposite of many great coloristic orchestrators of his day. His focus is firmly on the strings as the primary movers of the orchestra, and is often seen as an extension of late Classical and early Romantic-era composers, like Beethoven, Schumann, and Mendelssohn. This makes his symphonies ideal for study to a beginning score-reader. But he definitely has his own trademark sound and structure, and it can become quite complex.

Brahms neglects to mark div. and non div. in his score - but he probably intends that all intervals be played non divisi by default, as nearly all divisi are scored as two voices.

Techniques:

- divisi and double-stops throughout (see above)
- fingered tremolo, movt. 1 bars 142-143
- martellato (marcato), movt. 1 fig. L
- measured tremolo, movt. 4 fig. H
- mezzo staccato, movt. 4 fig. A

WORKS FOR FULL ORCHESTRA *(cont.)*

21. [Symphony no. 2 in B minor](#)

Borodin, Alexander

This symphony is a full two generations past Beethoven, and shows just how huge the orchestra had grown, with full brass and wind sections, heavy emphasis on percussion, and more of a wide-ranging palette of orchestral color. All the same, the music still rests largely on the presence of the strings.

This is enormously catchy, listener-friendly music, with melodies and passages that stay in one’s head for days. Use that approachability to grasp larger sections of music, taking in many details at once. Despite the sweeping scope of many of these pages, the underlying musical ideas and developments are still fairly straightforward and simple.

It’s also a great piece for score-reading string techniques. Note how the main theme is often scored as all downbows. There are also a few new notations, like the use of multiple articulation marks over measured tremolos, as in figure G in movement 3. In the same movement, Borodin freely scores tremolo as both a harmonic and melodic element.

Techniques:

- measured tremolo, movt. 3 fig. G (see above)
- quadruple-stops, movt. 1, movt. 4
- saltando (spiccato) figs. C-D, pp. 157-163
- repeated tremolo, movt. 3 figs. B-F (see above)
- trills, movt. 4 bars 8-14, closin

*22. [Scheherazade, Op. 35](#)

Rimsky-Korsakov, Nikolai

This is a sprawling orchestral tone poem in the form of a suite, with lush exoticism from an already exotic orchestrator and composer. Rimsky-Korsakov was a member of the same group of colleagues as Borodin, called “The Mighty Five,” and preserved and orchestrated many of their works in the form we hear them today. He was also Stravinsky’s only orchestration teacher, and the author of “Principles of Orchestration,” a manual that’s still used by composers today.

His approach to orchestration was far to the front of any of his day, and was inspirational to modern French composers like Ravel and Debussy. He scored highly individualized colors and daring technical episodes. His use of special effects was casual, taking for granted many different techniques - and yet it was inspired as well, laying the groundwork for what we now think of as cinematic orches-tration.

Nearly every Rimsky-Korsakov piece is a collection of great ideas. Scheherazade is spilling over with them, nearly every element illustrating a perfect bit of scoring. One great example is in the second movement, where four double basses play divisi in delicate harmony under a bassoon solo. Or even just the way that every section is introduced by a lush, dreamy violin solo, floating along over a gently strummed harp, leading to radiant, ecstatic episodes.

You’ll note that Rimsky-Korsakov really scores the full range of coloristic possibility across all sections. And yet this work is firmly based on string scoring throughout. Look for his aggressive use of lower strings, how imaginatively he puts the violas to work, and independent the upper strings are from the winds. Even if one were able to completely ignore the rest of the orchestra, there would still be huge lessons to learn in these pages for the orchestrator in strings alone.

Techniques:

- arpeggiando, movt. 3 fig. L
- divisi throughout (see above)
- non divisi, movt. 2 fig. O (p. 93 - see above)
- harmonics, movt. 2 p. 64
- l. h. pizz. p. 98
- mutes, movt. 2 opening
- pizzicato, movt. 2 fig. I
- sul D, movt. 3 opening
- sul G, movt. 2 fig P
- trills throughout
- triple- and quadruple-stops, movt. 2 fig C

3. ADDITIONAL WORKS FOR STUDY

The following list is a collection of works chosen for their variety, use of string techniques, and progressive challenges to the developing score-reader. Though space doesn’t allow for further descriptions, I’ve listed some of the techniques worth looking out for in the first two categories. Note: some works may not be public domain in some countries, but may be easily available at your public library.

WORKS FOR STRING QUARTET

23. [Trois Poèmes de Stéphane Mallarmé](#)
Ravel, Maurice

Techniques: arpeggiando (quadruple-stops), harmonics (natural and artificial), fingered tremolo, mutes, sul G (“4e corde”)

24. [String Quartet no. 3](#)
Bartók, Bela

Techniques: a punta d’arco, al tallone, double-, triple-, and quadruple-stops; col legno battuto, glissando (chromatic and portamento), martellato, measured tremolo, mutes, pizzicato, sul C, D, G, and A; sul ponticello, sul tasto, trills

25. [String Quartet no. 14 in C# minor](#)
Beethoven, Ludwig

Techniques: mezzo staccato, sul ponticello, trills

WORKS FOR STRING ORCHESTRA

26. [Music for Strings, Percussion, and Celesta](#)
Bartók, Bela

Techniques: col legno battuto, fingered tremolo, flautando, glissando, harmonics, martellato, measured tremolo, mezzo staccato, mutes, pizzicato, portato, quadruple-stops, repeated tremolo, snap pizzicato, staccatissimo, sul G, sul ponticello, trills

27. [Lyric Suite](#)
Berg, Alban

Techniques: col legno battuto, col legno tratto, fortepiano, flautando, glissando, harmonics, martellato, nonvibrato, repeated tremolo, sul G, sul ponticello, sul tasto, trills

28. [Verklärte Nacht \(Transfigured Night\)](#)
Schoenberg, Arnold

arpeggiando (triple- and quadruple-stops), fingered tremolo, harmonics, martellato, measured tremolo, mutes, repeated tremolo

29. [Metamorphosen for 23 String Instruments](#)
Strauss, Richard

(no particular emphasis on techniques, but terrifically exciting all the same!)

WORKS FOR FULL ORCHESTRA

(*work excerpted in video course)

(techniques too numerous to mention)

30. [Symphony no. 40 in G minor](#)
Mozart, Wolfgang A.

*31. [Symphony no. 9 in D minor \(“Chorale”\)](#)
Beethoven, Ludwig Van

*32. [Symphonie Fantastique](#)
Berlioz, Hector

*33. [Symphony no. 1](#)
Brahms, Johannes

*34. [Romeo and Juliet Fantasy Overture](#)
Tchaikovsky, Piotr I.

*35. [Symphony no. 6](#)
Tchaikovsky, Piotr I.

*36. [La Mer](#)
Debussy, Claude

*37. [The Planets](#)
Holst, Gustav

*38. [La Valse](#)
Ravel, Maurice

4. INDEX OF TECHNIQUES

Note: the following index catalogues either exceptional examples of each technique; or lists works in which they occur in a general way. It should not be taken as an exhaustive, bar-by-bar list of every appearance of each separate technique

Each number corresponds to the number of the work as listed on the first page of this section, and the following section. Numbers from 23 on refer to “Additional Works For Study,” and are not listed on the first page.

A punta d’arco

- 24.

Accents

- throughout, but esp:
- 16. opening, figs. 5 & 19

Al tallone & Downbows

- 6. movt. 1, esp. opening and pp 7, 11, & 15
- 24.

Col legno battuto

- 24., 26, & 27.

Col legno tratto

- 27.

Detaché bowing

- 1. movement 4, bar 1 etc.
- 2. movement 4 throughout
- 4. movt. 1, p.7
- 8. movt. 4 throughout
- 9. movt. 4 throughout
- 10. movt. 2 throughout
- 18. movt. 4 throughout
- 19. movt. 4 throughout

Divisi (geteilt)

- 12. divisi and non divisi throughout
- 13. divisi and non divisi throughout
- 14. throughout
- 15. bar 44 etc.
- 17. throughout
- 20. throughout
- 22. throughout
- 22. non divisi, movt. 2 fig. O

Double-stops

- throughout, but esp:
- 7. movt. 3 throughout
- 8. movt. 1 throughout, movt. 2 after fig. C
- 13. throughout
- 14. throughout
- 16. figs. 11, 12, 14, 26, & 27-30
- 17. throughout
- 20. throughout
- 24.

Flautando

- 26. & 27.

Fortepiano

- 2. movt. 1 opening section
- 12. movt. 1 opening
- 18. movt. 2, bars 19-24, 51-55
- 19. movt. 2 bar 18-23, 73-78
- 27.

Glissando/Portamento

- 15. bar 71
- 24. (chromatic and portamento), 26., & 27.

Harmonics

- 7. movt. 4 figs. I & K
- 13. movt. 3 closing
- 22. movt. 2 p. 64
- 23., 26., 27., & 28.

Martellato (marcatissimo)

- 11. movt.2 bars148-158
- 13. movt. 1 opening/closing
- 16. before fig. 14
- 20. movt. 1 fig. L
- 24., 26. 27. & 28.

INDEX OF TECHNIQUES *(cont.)*

Mezzo staccato

- 2. movt. 1, bar 8 etc.
- 3. movt. 1 opening section
- 5. movt. 3 opening
- 6. movt. 3 throughout
- 11. movt. 1 throughout
- 13. movt. 2 throughout, movt. 3 fig. D
- 20. movt. 4 fig. A
- 25. & 26.

Mutes

6. movt. 3 throughout
7. movt. 2 fig. H, movt. 3 throughout
13. movt. 4 opening
16. fig. 15
17. figs. E-I
18. movt. 2 throughout
22. movt. 2 opening
- 23., 24., 26., & 28.

Non vibrato

17. (senza espr.) fig. G
- 27.

Pizzicato

- throughout, but esp:
6. movt. 2 throughout
7. movt. 2 opening
22. (l. h. pizz.) p. 98, and movt. 2 fig. I
24. & 26. (pizz. & snap pizz.)

Portato

5. movt. 1, bar 4 cello part; movt. 3, opening cello theme
11. movt. 1 bars 24-25, 66; movt. 4 96-97
15. bars 2 & 72,
- 26.

Quadruple-stops

3. opening of movt. 4
6. movt. 2, cello part
7. arpeggiando: movt. 1 fig D, H & M, vln I & II, movt. 3 figs. F & G
7. movt. 2 fig. M and ending; movt. 4 throughout
14. movt. fig. 9, movt. 3 fig 3 & 6, movt. 4 fig 4
16. figs. 11, 12, 14, 26, & 27-30
21. movt. 1, movt. 4
22. movt. 2 fig C
22. arpeggiando, movt. 3 fig. L
23. & 28. arpeggiando
24. & 26.

Saltando (spiccato)

12. movt. 5 throughout
21. figs. C-D, pp. 157-163

Sforzando (forzando)

- 2. movt. 1 opening section
- 4. movt. 3 opening section; throughout movt. 4
- 13. movt. 1 opening
- 16. opening, figs. 5 & 19
- 19. movt. 2 bars 17-22, 50-53, 72-76

Staccato

- throughout, but esp:
- 1. movt. 1, bar 1 etc.
 - 3. movt. 2 throughout
 - 4. movt. 4 throughout
 - 5. movt. 4, bar 20 onwards
 - 8. movt. 4 throughout
 - 11. movt. 5 throughout
 - 13. movt. 1 fig. D & K, movt. 4 throughout
 - 18. movt. 4 throughout (see above)
 - 19. movt. 2 throughout
 - 26. (staccatissimo)

Sul C, G, D, etc.

- 11. sul G, movt. 2 bars 88-97, 174-184
- 12. sul C/G, movt. 1 p. 4
- 15. sul G & D (G & D Saite)
- 16. sul G, fig. 17-18, 27, & 30
- 22. sul D, movt. 3 opening
- 22. sul G, movt. 2 fig P
- 23. sul G (“4e corde”)
- 24. sul C, D, G, and A
- 26. sul G
- 27. sul G

Sul ponticello

16. fig. 15
- 24., 25., 26., & 27.

INDEX OF TECHNIQUES *(cont.)*

Sul tasto (Griffbrett)

- 7. movt. 1 fig. F, movt. 4 before fig. F
- 15. bar 33
- 17. (sur la touche), fig. U
- 24. & 27.

Tenuto

- 6. movt. 1 throughout
- 13. movt. 4 opening
- 15. bars 29-71
- 16. fig. 12 & 27
- 17. fig. N

Tremolo, Fingered

- 7. movt. 1 figs. G & M, movt. 3 fig. D
- 17. fig. U
- 20. movt. 1 bars 142-143
- 23., 26., & 28

Tremolo, Measured

- 2. end of movts 1 & 2
- 7. movt. 1 figs. A & E
- 9. movt. 1 throughout
- 18. movt. 1 bars 17-18, 47-48, etc.
- 20. movt. 4 fig. H
- 21. movt. 3 fig. G (see above)
- 24., 26. & 28.

Tremolo, Repeating

- 7. movt. 1 figs. B, H, & K; movt. 2 fig. C, H & P, movt. 3 throughout
- 16. figs. 3, 5, & 15
- 21. movt. 3 figs. B-F (see above)
- 26., 27., & 28.

Trills

- throughout, but esp:
- 8. movt. 1 throughout
 - 11. movt. 3 bars 49-56, 243-250
 - 21. movt. 4 bars 8-14, closing
 - 22. throughout
 - 24., 25., 26., & 27.

Triple-stops

- 2. end of movt. 4
- 3. opening of movt. 4
- 6. movt. 2, cello part
- 7. movt. 2 fig. M and ending; movt. 4 throughout
- 8. movt. 1 throughout, movt. 2 after fig. C
- 13. throughout
- 14. movt. fig. 9, movt. 3 fig 3 & 6, movt. 4 fig 4
- 16. figs. 11, 12, 14, 26, & 27-30
- 17. throughout
- 18. movt. 1 bars 9-16, 49-55, etc.
- 22. movt. 2 fig C
- 24.

III. CATALOG OF STRINGS TECHNIQUES

III. CATALOG OF STRING TECHNIQUES

Part 1:Tuning and Range

Violin Tuning

Range

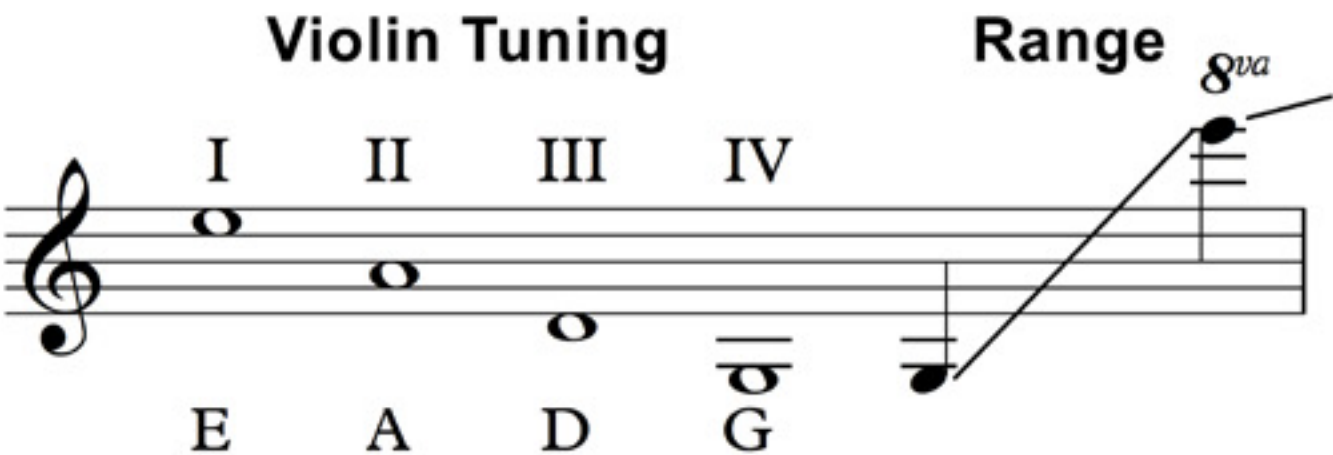


Diagram showing Violin Tuning (I, II, III, IV) and Range (8va) on a staff. The tuning notes are E, A, D, G. The range is indicated by an arrow pointing to the 8va position.

Viola Tuning

Range

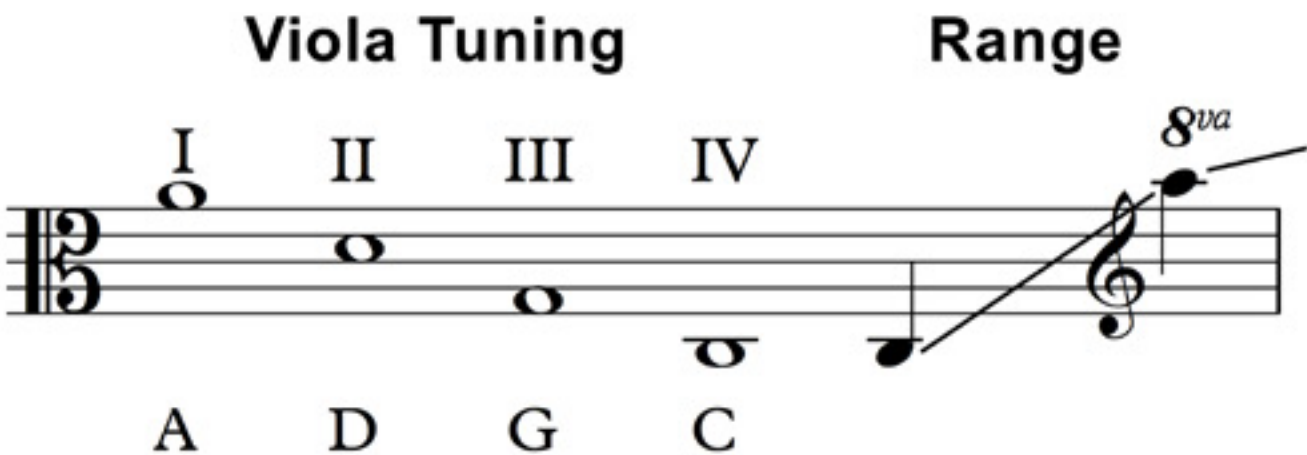


Diagram showing Viola Tuning (I, II, III, IV) and Range (8va) on a staff. The tuning notes are A, D, G, C. The range is indicated by an arrow pointing to the 8va position.

Cello Tuning

Range

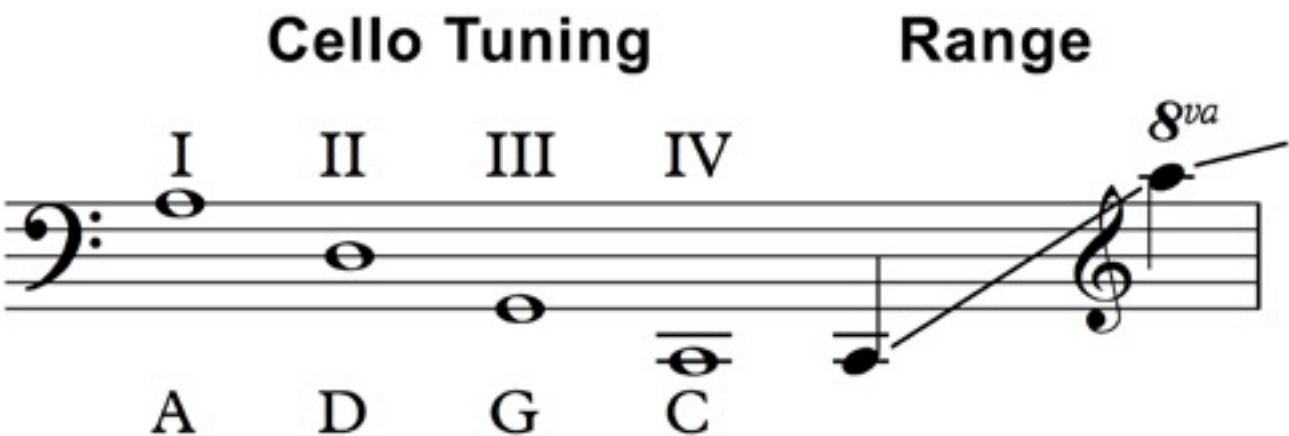


Diagram showing Cello Tuning (I, II, III, IV) and Range (8va) on a staff. The tuning notes are A, D, G, C. The range is indicated by an arrow pointing to the 8va position.

Double Bass Tuning

Range

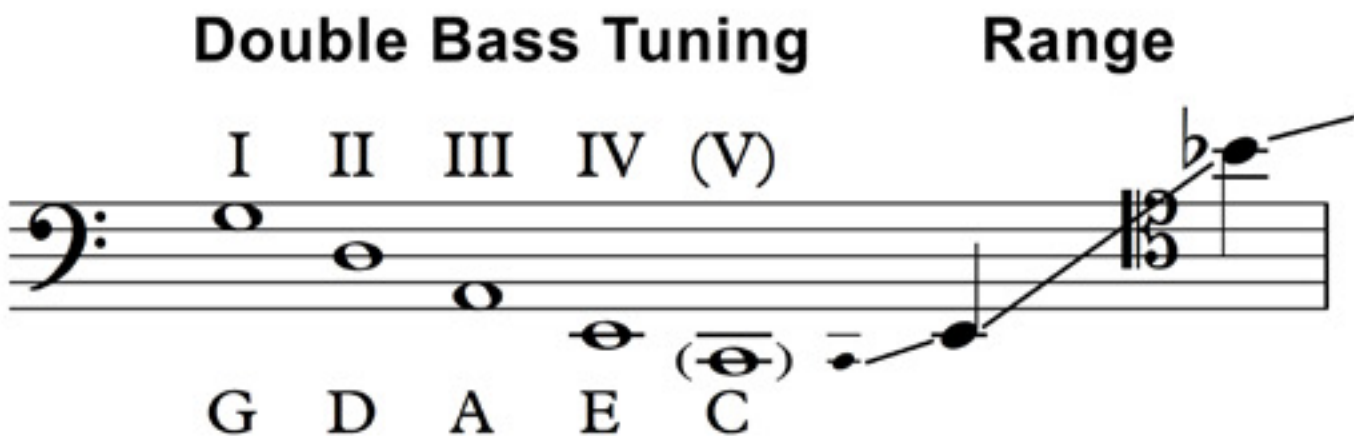


Diagram showing Double Bass Tuning (I, II, III, IV (V)) and Range on a staff. The tuning notes are G, D, A, E, C. The range is indicated by an arrow pointing to the 8va position.

Part 2: Fingering Positions

VIOLIN FINGERING

Note vertical continuity of positions across strings in violin and viola

The diagram illustrates the vertical continuity of fingering positions across the four strings of a violin. It consists of four staves, each representing a string. The positions are labeled above the staves: open string, 1st position, 2nd position, 3rd position, 4th position, 5th position, 6th position, and 7th position. Each position shows the fingering (1-4) for the notes in that position. The notes are written on the staves, showing the vertical alignment of the same finger across different strings. For example, the first finger (1) plays the same pitch on the open string, 1st position (F), 2nd position (C), 3rd position (G), 4th position (D), 5th position (A), 6th position (E), and 7th position (B).

Position	1st String (G)	2nd String (D)	3rd String (A)	4th String (E)
open string	0			
1st position	1	1	1	1
2nd position	2	2	2	2
3rd position	3	3	3	3
4th position	4	4	4	4
5th position	1	1	1	1
6th position	2	2	2	2
7th position	3	3	3	3

VIOLA FINGERING

open string

1st position

2nd position

3rd position

4th position

5th position

6th position

7th position

The image displays four staves of musical notation for viola fingering, each in 3/4 time. The first staff includes a treble clef for the 6th and 7th positions. The notation shows the following patterns:

- Staff 1:** open string (0), 1st position (1-4), 2nd position (1-4), 3rd position (1-4), 4th position (1-4), 5th position (1-4), 6th position (1-4), 7th position (1-4).
- Staff 2:** 0, 1-4, 1-4, 1-4, 1-4, 1-4, 1-4, 1-4.
- Staff 3:** 0, 1-4, 1-4, 1-4, 1-4, 1-4, 1-4, 1-4.
- Staff 4:** 0, 1-4, 1-4, 1-4, 1-4, 1-4, 1-4, 1-4.

CELLO FINGERING

Note that fingering becomes diatonic from 5th position

open string1st position2nd position3rd position4th position5th position6th position7th position

The image displays four staves of musical notation for cello fingering exercises. Each staff represents a different register of the cello, with a bass clef on the left. The notation is organized into columns corresponding to positions: open string, 1st position, 2nd position, 3rd position, 4th position, 5th position, 6th position, and 7th position. Fingerings are indicated by numbers 0 through 4 above the notes. The exercises show chromatic and diatonic scales, with a key signature change to one flat (F major/D minor) starting at the 5th position. The 5th position exercises include a double bar line and a key signature change symbol (one flat).

DOUBLE BASS FINGERING

Note that positions are completely chromatic throughout the range

open string 1/2 pos. 1st pos. 2nd pos. 2 1/2 pos. 3rd pos. 3 1/2 pos. 4th pos. 5th pos. 5 1/2 pos. 6th pos. 6 1/2 pos. 7th pos.

G

D

A

E

C

Part 3: Harmonics

Violin

Artificial ^{8va}

written sounding

Natural ^{8va}

E

2 3 4 5

A

2 3 4 5

D

2 3 4 5

G

2 3 4 5

Viola

Artificial ^{8va}

written sounding

Natural ^{8va}

A

2 3 4 5

D

2 3 4 5

G

2 3 4 5

C

2 3 4 5

Cello

Artificial ^{8va}

written sounding

Natural ^{8va}

A

2 3 4 5

D

2 3 4 5

G

2 3 4 5

C

2 3 4 5

Double Bass

Natural Harmonics Only (*sounding one octave lower*) ^{8va}

G

2 3 4 5 6 7 8 9 10 11 12

D

2 3 4 5 6 7 8 9 10

A

2 3 4 5 6 7 8 9 10

E

2 3 4 5 6

C

2 3 4

Part 4: Double, Triple, and Quadruple Stops

Violin Double Stops

ONE STRING OPEN, ONE STRING FINGERED (the first notes of each range below may contain additional open strings)

G string open, D string fingered D open, G fingered D open, A fingered A open, D fingered A open, E fingered E open, A fingered

INTERVALS

minor 2nd (intonation difficult) major 2nd minor 2nd major 3rd perfect 4th augmented 4th/diminished 5th

perfect 5th minor 6th major 6th minor 7th major 7th octave

Violin Triple Stops

TWO STRINGS OPEN, ONE STRING FINGERED

D/A open, G fingered G/A open, D fingered G/D open, A fingered A/E open, D fingered D/E open, A fingered D/A open, E fingered

Violin Triple Stops (cont.)

LOWER STRING OPEN, UPPER TWO STRINGS FINGERED

G open, plus:

m2 M2 m3 M3 P4 aug4/dim5 P5 m6 M6 m7 M7 Octave

D open, plus:

m2 M2 m3 M3 P4 aug4/dim5 P5 m6 M6 m7 M7 Octave

UPPER STRING OPEN, LOWER TWO STRINGS FINGERED

A open, plus:

m2 M2 m3 M3 P4 aug4/dim5 P5

E open, plus:

m2 M2 m3 M3 P4 aug4/dim5 P5 m6 M6

INNER STRING OPEN, OUTER STRINGS FINGERED THREE STRINGS FINGERED (many varieties of chords possible)

D open, plus:

m10 m10 m10 m10 major chord augmented minor dominant 7th major/V forms of 11th chord

A open, plus:

m10 m10 m10 m10 major chord augmented minor dominant 7th major/V forms of 11th chord

Violin Quadruple Stops

LOWER TWO STRINGS OPEN, UPPER TWO STRINGS FINGERED

G/D open, plus:

m2 M2 m3 M3 P4 aug4/dim5 P5 m6 M6 m7 M7 Octave

OUTER TWO STRINGS OPEN, INNER TWO STRINGS FINGERED

G/E open, plus:

m2 M2 m3 M3 P4 aug4/dim5 P5 m6 M6

UPPER STRING OPEN, LOWER TWO STRINGS FINGERED

A/E open, plus:

m2 M2 m3 M3 P4 aug4/dim5 P5

FOUR STRINGS FINGERED *(many varieties of chords possible)*

m2 M2 m3 M3 P4 aug4/dim5 P5 m6 M6 m7 M7 Octave

Viola Double Stops

ONE STRING OPEN, ONE STRING FINGERED (the first notes of each range below may contain additional open strings)



C string open, G string fingered



G open, C fingered



G open, D fingered



D open, G fingered

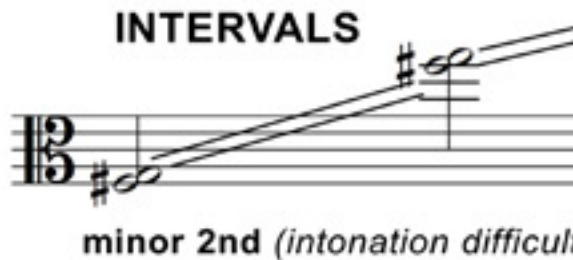


D open, A fingered

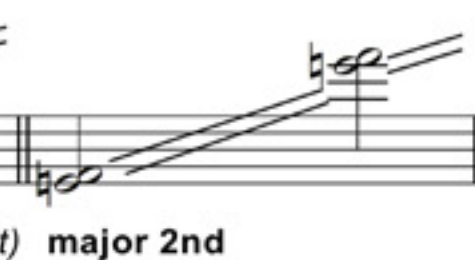


A open, D fingered

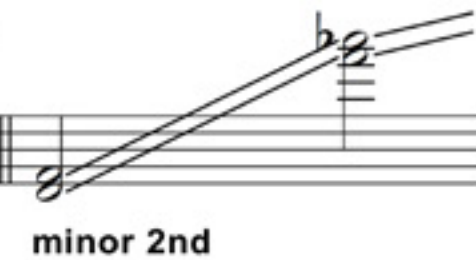
INTERVALS



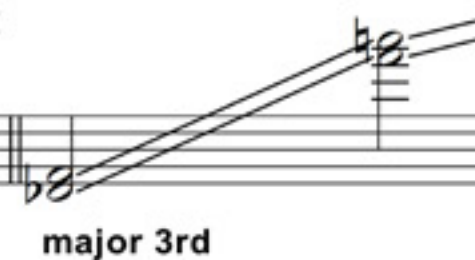
minor 2nd (*intonation difficult*)



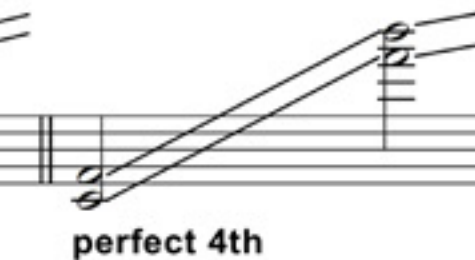
major 2nd




minor 2nd




major 3rd




perfect 4th




augmented 4th/diminished 5th



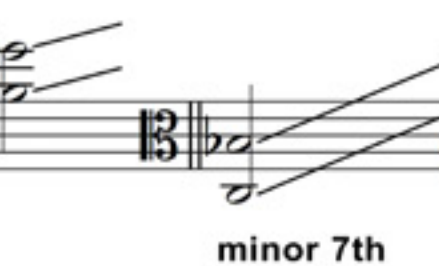
perfect 5th



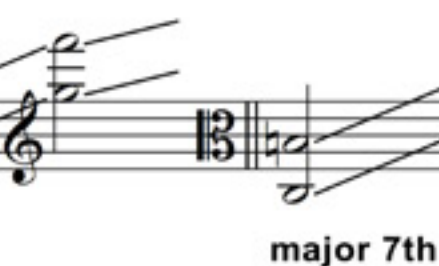
minor 6th



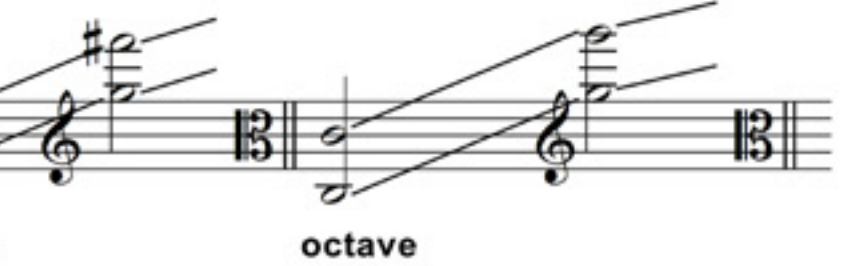
major 6th



minor 7th



major 7th



octave

(Large intervals more difficult in lower positions)

Viola Triple Stops

TWO STRINGS OPEN, ONE STRING FINGERED



G/D open, C fingered



C/D open, G fingered



C/G open, D fingered



D/A open, G fingered



G/A open, D fingered



G/D open, A fingered

Viola Triple Stops (cont.)

LOWER STRING OPEN, UPPER TWO STRINGS FINGERED

C open, plus:

m2 M2 m3 M3 P4 aug4/dim5 P5 m6 M6 m7 M7 Octave

G open, plus:

m2 M2 m3 M3 P4 aug4/dim5 P5 m6 M6 m7 M7 Octave

UPPER STRING OPEN, LOWER TWO STRINGS FINGERED

D open, plus:

m2 M2 m3 M3 P4 aug4/dim5

A open, plus:

m2 M2 m3 M3 P4 aug4/dim5 P5 m6 M6

INNER STRING OPEN, OUTER STRINGS FINGERED THREE STRINGS FINGERED (many varieties of chords possible)

G open, plus:

m10 m10 m10 m10 major chord augmented minor dominant 7th major/V forms of 11th chord

D open, plus:

m10 m10 m10 m10 major chord augmented minor dominant 7th major/V forms of 11th chord

Viola Quadruple Stops

LOWER TWO STRINGS OPEN, UPPER TWO STRINGS FINGERED

C/G open, plus:

m2 M2 m3 M3 P4 aug4/dim5 P5 m6 M6 m7 M7 Octave

OUTER TWO STRINGS OPEN, INNER TWO STRINGS FINGERED

C/A open, plus:

m2 M2 m3 M3 P4 aug4/dim5 P5 m6 M6

UPPER STRING OPEN, LOWER TWO STRINGS FINGERED

D/A open, plus:

m2 M2 m3 M3 P4 aug4/dim5 P5

FOUR STRINGS FINGERED *(many varieties of chords possible)*

Cello Double Stops

ONE STRING OPEN, ONE STRING FINGERED (the first notes of each range below may contain additional open strings)

Diagram showing Cello Double Stops (ONE STRING OPEN, ONE STRING FINGERED) on a single staff. The first range (C string open, G string fingered) includes notes: C2, G2, C3, G3, C4, G4, C5, G5. The second range (G open, C fingered) includes notes: G2, C3, G3, C4, G4, C5, G5, C6. The third range (G open, D fingered) includes notes: G2, D3, G3, D4, G4, D5, G5, D6. The fourth range (D open, G fingered) includes notes: D2, G3, D3, G4, D4, G5, D5, G6. The fifth range (D open, A fingered) includes notes: D2, A3, D3, A4, D4, A5, D5, A6. The sixth range (A open, D fingered) includes notes: A2, D3, A3, D4, A4, D5, A5, D6.

INTERVALS

Diagram showing Cello Double Stops (INTERVALS) on a single staff. The intervals are: minor 2nd (intonation difficult), major 2nd, minor 2nd, major 3rd, perfect 4th, augmented 4th/diminished 5th, perfect 5th, minor 6th, major 6th, minor 7th, major 7th, and octave. A note: (Large intervals more difficult in lower positions).

Cello Triple Stops

TWO STRINGS OPEN, ONE STRING FINGERED

Diagram showing Cello Triple Stops (TWO STRINGS OPEN, ONE STRING FINGERED) on a single staff. The first range (G/D open, C fingered) includes notes: G2, D2, C3, G3, D3, C4, G4, D4, C5, G5, D5, C6. The second range (C/D open, G fingered) includes notes: C3, D3, G3, C4, D4, G4, C5, D5, G5, C6, D6, G6. The third range (C/G open, D fingered) includes notes: C3, G3, D3, C4, G4, D4, C5, G5, D5, C6, G6, D6. The fourth range (D/A open, G fingered) includes notes: D3, A3, G3, D4, A4, G4, D5, A5, G5, D6, A6, G6. The fifth range (G/A open, D fingered) includes notes: G3, A3, D3, G4, A4, D4, G5, A5, D5, G6, A6, D6. The sixth range (G/D open, A fingered) includes notes: G2, D2, A3, G3, D3, A4, G4, D4, A5, G5, D5, A6, G6, D6, A7.

Cello Triple Stops (cont.)

LOWER STRING OPEN, UPPER TWO STRINGS FINGERED

C open, plus:

m2 M2 m3 M3 P4 aug4/dim5 P5 m6 M6 m7 M7 Octave

G open, plus:

m2 M2 m3 M3 P4 aug4/dim5 P5 m6 M6 m7 M7 Octave

UPPER STRING OPEN, LOWER TWO STRINGS FINGERED

D open, plus:

m2 M2 m3 M3 P4 aug4/dim5

A open, plus:

m2 M2 m3 M3 P4 aug4/dim5 P5 m6 M6

INNER STRING OPEN, OUTER STRINGS FINGERED THREE STRINGS FINGERED (many varieties of chords possible)

G open, plus:

m10 m10 m10 m10 major chord augmented minor dominant 7th major/V forms of 11th chord

D open, plus:

m10 m10 m10 m10 major chord augmented minor dominant 7th major/V forms of 11th chord

Cello Quadruple Stops

LOWER TWO STRINGS OPEN, UPPER TWO STRINGS FINGERED

C/G open, plus:

m2 M2 m3 M3 P4 aug4/dim5 P5 m6 M6 m7 M7 Octave

OUTER TWO STRINGS OPEN, INNER TWO STRINGS FINGERED

C/A open, plus:

m2 M2 m3 M3 P4 aug4/dim5 P5 m6 M6

UPPER STRING OPEN, LOWER TWO STRINGS FINGERED

D/A open, plus:

m2 M2 m3 M3 P4 aug4/dim5 P5

FOUR STRINGS FINGERED *(many varieties of chords possible)*

IV. DICTIONARY OF MUSICAL TERMS

A

à la pointe - see *a punta d’arco*

a punta d’arco (It) - playing at the tip, or point of the bow.
(Fr) *à la pointe*; (Ger) *an der Spitze*

accent - to emphasize the dynamic intensity of a note

ad libitum (Lat.) - “at one’s pleasure,” to play according to the personal desire and expression of the performer

al tallone (It) - playing at the frog, or heel of the bow.
(Fr) *au talon*; (Ger) *am Frosch*

alto - the lower vocal range of the female voice; also, see *viola*

am Frosch - see *al tallone*

an der Spitze - see *a punta d’arco*

arco - to return to using the bow, marked after pizzicato; sometimes after col legno.

arpeggiando (It) - an arpeggiated bow-stroke that lifts off the string

arpeggio - a series of notes, typically a broken chord played from high to low or vice versa, often repeated as part of a pattern.

articulation - the manner in which a note is attacked, which can have a bearing on its tone quality and expressive and dynamic character.

ausdrucksvoll - see *espressivo*

avec le bois - see *col legno*

au talon - see *al tallone*

B

Baroque period - a historical period in Western culture dating from the start of the 17th century to the mid-18th century, in which forms tended to be elaborate in execution and intellectual in structure.

Bartók pizzicato - see *pizzicato, snap*

bass, bass viol - see *double bass*

body (instrument part) - the resonating cavity of any string instrument. It is usually of a size that captures a specific range of notes, reflecting them back through one or two tone-holes.

bow - a long, slightly curved stick strung with horsehair, used for producing sounds on a stringed instrument by drawing across the string.

(It) *arco*, (Ger) *Bogen*

bow stick (instrument part) - the wooden part of a bow.

bowing - the act of using a bow; also, the different ways in which a bow may be applied.

bridge (instrument part) - a small saddle that sits under the strings, raising them above the body and fingerboard, and spreading them into an ideal configuration for bowing.

C

cantando (It) - in a singing style
(Fr) *chanté*

capriccioso (It) - free, lively, whimsical

cello - the lower-register member of the violin family, tuned down an octave and a 5th from the violin. Cellos cover many roles: melodies, accompaniment, and bass lines.

C (cont.)

chinrest (instrument part) - a small support device, clamped onto the body of a violin or viola, which supports the player’s chin. Many players avoid them.

Classical period - a historical period in Western culture dating from the mid-18th century to the early 19th century, in which directness and clarity of form was the ideal.

col legno (It) - “with the wood,” using the bow stick rather than horsehair to produce sounds. Important: note varieties below!
(Fr) **avec le bois** (Ger) **mit Holz**

col legno battuto (It) striking the bow stick on the strings;
col legno tratto - drawing the bow stick across the strings.
(Ger) **geschlagen/ gestrichen**

colla parte (It) - “with the part,” to follow the tempo and rhythm of a featured section or soloist
(Fr) **suivez**

concerto - a work for solo instrument and orchestra, usually in contrasting movements.

con sordini - “with mutes” - see **mutes**
con vibrato - to restore vibrato after nonvibrato

continuo - the bass part of a baroque score; the instruments that interpret this bass part

contrabass - see **double bass**

D

Dämpfer - see **mutes**

desk - two string players who share a music stand, and read from the same sheet of music.

detaché (Fr) - detached, separated; play without slurring.
(It) **nonlegato**

divisi (It) - “divided,” to divide simultaneous notes between string players rather than playing double-stops. This can be simple harmonic intervals and chords, or passages of two or more voices on a single or separate staves.
(Ger) **geteilt**

dolce (It) - “sweetly,” to play in an extremely expressive style
(Fr) **doux**

double bass - the lowest-register member of the string section, the sole surviving member of the viol family in the orchestra. It is tuned in 4ths like a guitar or bass guitar, and mostly plays the bass line, very often supporting the cellos.

double-stop - to play two strings with one bow stroke.

downbow - to draw the bow across the strings to the player’s right side. This stroke may often start at the frog or heel of the bow.

E

en dehors (Fr) - prominently, strongly

espressivo (It) - expressively; abbr. **espress.**

expressif - see **espressivo**

F

flautando (It) - “like a flute,” light bowing near to or over the fingerboard; almost *sul tasto*

fingerboard (instrument part) - a long, curved piece of wood rising out of the body, running under the strings and ending at the nut, upon which the player fixes pitches with the fingers of the left hand. Also see **neck**

fingering - the arrangement and sequence of left-hand fingers used in fixing pitches upon the fingerboard. These are reliant on a set group of finger positions.

fortepiano - to immediately reduce the dynamic level after an attack

frog (instrument part) - the heel of the bow, which fixes the horsehair in place, may be tightened or loosened, and gives a bit of weight to the bow.

G

geteilt see *divisi*

geschlagen/gestrichen see *col legno battuto/tratto*

glissando - to glide or slide from pitch to pitch; specifically, the musical effect itself.

H

harmonic series - the natural tendency of vibrations to increase in frequency or resonate over a given fundamental tone.

harmonics, artificial - harmonic nodes, usually of an interval of a fourth, which are touched ahead of a stopped tone.

harmonics, natural - notes in the harmonic series which are played by lightly touching naturally-occurring nodes on an open string.

harmonic nodes - points along a vibrating string which may be lightly touched to isolate a given frequency in the harmonic series.

I

in modo ordinario (It) - “in the ordinary manner,” to return to normal bowing
(Fr) *jeu ordinaire*

intonation - the relationship between tones developed by a player that allows them to play in tune.

J

jeté (Fr) tossing the upper part of the bow onto the string for a bouncing down-stroke; also know as *ricochet bowing*

jeu ordinaire - see *in modo ordinario*

L

legato - the quality of bowing in a smoothly connected way.

leggiero - “lightly,” with a delicate touch
(Fr) *léger*

louré - see *portato*

lunga (It) - “long,” to greatly increase the length of a note; usually applied to a fermata

M

mano sinistro (It) - “left hand,” usually to indicate a left-hand pizzicato

marcato (It) - “marked,” to play forcefully

martellato (It) - “to hammer,” or vigorously emphasize the notes.

mettez les sourdines see *con sordini*

mit Holz - see *col legno*

Modern period - a historical period in Western culture dating from the early 20th century to the present, in which many stylistic and cultural barriers have been erased, approaches have enormous freedom, and often the context of a work is key to understanding its content.

molto vibrato - to play with an exaggerated amount of vibrato - see also *espressivo*

mutes - devices placed on a musical instrument that limit a part of its resonance, resulting an different tone. This may aid in playing extremely quietly, or simply provide a different textural element at any dynamic volume.
(Fr.) *sourdines*, (Ger) *Dämpfer*

N

naturale (It) - “natural,” to return to normal bowing or playing

neck (instrument part) - a piece of wood that supports the fingerboard, rising out of the body at one end and ending in a scroll and pegbox at the other.

non divisi - the instruction to a player that a passage is not to be played divisi, but with double-, triple-, or quadruple-stops.

nonlegato - see *detaché*

nonvibrato - to play without vibrato, often as an indication of an older approach

normal (Eng, Sp, Fr), *normale* (It, Ger) - to return to normal bowing or playing; usually abbreviated universally as “norm.”

nut - the small protrusion at the end of a fingerboard that elevates the strings, and provides a saddle that fixes the strings in place between the fingerboard and the pegbox.

O

off-the-string bowing - a group of bowing styles that involve a lifting and/or bouncing of the bow across the strings.

on-the-string bowing - a group of bowing styles that leave the bow resting on the strings while playing. The great majority of bowing styles are on-the-string.

orchestra - a combined group of musicians usually founded upon the string section, including regular players of wind, brass, percussion, harp, and keyboard instruments.

orchestration - the process of bringing separate elements together to create one work, most commonly referring to arranging an idea for an orchestra.

ôtez les sourdines see **senza sordini**

P

pegbox (instrument part) - the section between the nut and scroll that fixes the strings to the neck of the instrument with tuning pegs.

phrase - a musical idea that is thematically and/or expressively cohesive. It may be a small building block of a longer passage or series of patterns. Or it may describe an extended idea.

pizzicato - to pluck the strings instead of bowing

pizzicato, snap - to pinch the string and pull away so that it snaps against the fingerboard when released; also known as **Bartók pizzicato**

point (instrument part) - the tip of the bow into which the end of the horsehair is fixed.

portamento - to glide or slide from pitch to pitch; specifically, the necessity to change finger position due to musical demands.

portato - individually articulated notes, played with very legato bowing.
(Fr) **louré**

position - the placement of the fingers on the fingerboard

punta d’arco - to play near the point of the bow

Q

quadruple-stop - to play all four strings in one bow stroke, usually as a rolled chord or arpeggiando.

R

rebec - an ancient type of bowed string instrument, whose design influenced the violin family. It was very flat, much shallower than a viol, and usually played under the chin.

recitando - in a reciting, declamatory style

ricochet bowing - see **jeté**

ripieno - tutti; those who do not play a solo part

Romantic period - a historical period in Western culture dating from 1820 to

rosin - hardened, processed tree sap that is produced in cakes, which are rubbed into a bow’s horsehair to increase friction against the string.

S

saltando (It) - “leaping,” with the bow-stroke bouncing or jumping off the strings; also know as **spiccato** and **saltato**.
(Fr) **sautillé**, (Ger) **Springbogen**

scherzando - in a comical or playful style

scordatura (It) - “mistuning,” to alter the tuning of a string or strings from their normal pitch.
(Ger) **Skordatur**

scroll (instrument part) - the stylistic carving at the end of the neck, which also provides balance.

sempre (It) - “always,” continue to perform with the marking indicated

senza sordini (It) - “without mutes” - see mutes

senza vibrato (It) - “without vibrato” see **nonvibrato**

sforzando - an accent, sometimes played with extra emphasis.

skips - the distance between notes which require a player to immediately adjust their finger position. Wider skips may involve changing from one string to another, or even crossing unplayed strings.

slur - a curved line that covers a group of notes indicating that a player should play them within the span of one bow stroke.

solì - indicating a section of music in which a group of players perform a featured part, rather than one player

solo, soloist - a part or player of a single featured instrument, usually within a work of combined parts and players

S (cont.)

sostenuto (It) - in a sustained style
(Fr) **souteno**

sourdine - see **mutes**

spiccato - see **saltando**

staccatissimo - a very short, separated staccato, with a touch of emphasis

staccato - short, abruptly articulated notes with a sense of separation

staccato, accented - short notes, played with special emphasis

staccato, mezzo/slurred - individually articulated notes, connected by a single bow-stroke

string, open - a string that is played without stopping pitches by the left hand. Open strings are used when playing natural harmonics.

string orchestra - an orchestra composed solely of string instruments, usually in the same numbers and groups as the string section.

strings, string section - a section of the orchestra composed of two groups of strings, and one group each of violas, cellos, and double basses.

sul (It) - “on,” usually indicating a particular string to be played during a passage, like “sul A” or “sul G.”

sul ponticello (It) - to bow very close to the bridge.
(Fr) **au chevalet**, (Ger) **am Steg**

sul tasto, sul tastiere (It) to bow over the fingerboard (or close to it).
(Fr) **sur la touche**, (Ger) **am Griffbrett**

T

tenuto (It) - to emphasize the length and fullness of a note

transposition - the notation of a musical part using different notes than those played. In the string section, the double-bassist transposes written notes down an octave while playing.

tremolo (It) - “trembling,” usually defined as an extremely rapid repetition of a note, also known as an **unmeasured tremolo**. See other types below.

tremolo, fingered - to rapidly alternate between two pitches, usually a third or more apart. May be measured or unmeasured.

tremolo, measured - repeating one note, or alternating two note, with defined time values.

tremolo, undulating - to alternate two notes on different strings, requiring the bow to undulate up and down between them

trill - to rapidly alternate between two adjacent pitches

triple-stop - to play three strings in one bow stroke, usually as a rolled chord.

tutti (It) - “all,” signifiying the end of a solo

U

unison - a marking ending a divisi passage

upbow - to push the bow across the strings to the player’s left side. This stroke may often start at the tip or point of the bow.

V

vibrato - the quality of vibration and modulation of pitch created by rocking the fingertip on the string; to restore vibrato after nonvibrato, also written as **con vibrato**

viol, viola da gamba - an ancient type of bowed string instrument, whose design influenced the violin family. It was generally larger and deeper in frame than the rebec, and most often played in an upright position like a cello.

viola - the middle-register member of the violin family, tuned down a 5th from a violin. Violas mainly fill in the middle of the sound picture in a string texture.
(Fr) **alto**, (Ger) **Bratsche**

violin family - the modern group of instruments that comprise an orchestral string section, with the exception of the double bass.

violin - the highest-register member of a standard string section, upon which all other members of its family are based. Violins comprise two orchestral sections: the firsts, who most often play the highest notes and take the lead thematically; and the seconds, who support the firsts and play more accompanying roles.

violoncello - see **cello**

Glossary of Markings

downbow upbow tenuto accent sforzando marcato fortepiano staccato staccatissimo

mezzo staccato portato or loured harmonics artificial harmonics pizzicato cancel pizzicato snap/Bartók pizzicato

non divisi divisi cancel divisi portamento & glissando trill measured tremolo (repeated) unmeasured tremolo

fingered tremolo (measured) fingered tremolo (unmeasured)

The image displays musical notation for various string markings across four staves. The first staff shows: downbow (square bow flag), upbow (inverted V bow flag), tenuto (horizontal bar), accent (>), sforzando (sf), marcato (^), fortepiano (fp), staccato (dot), and staccatissimo (inverted triangle). The second staff shows: mezzo staccato (dotted notes with slur), portato or loured (horizontal bar with slur), harmonics (circle on stem), artificial harmonics (diamond on stem), pizzicato (pizz.), cancel pizzicato (arco), and snap/Bartók pizzicato (circle with cross). The third staff shows: non divisi (non div.), divisi (div.), cancel divisi (unis.), portamento & glissando (slanted line), trill (trill symbol), measured tremolo (repeated) (bracketed equals), and unmeasured tremolo (unbracketed equals). The fourth staff shows: fingered tremolo (measured) (bracketed equals) and fingered tremolo (unmeasured) (unbracketed equals).