A GUIDE TO PITCH TENDENCIES FOR BAND

OBOE

Woodwind Pitch Tendencies

By Abigail Koehler

APPLIED ANALYSIS AND APPLICATION PROJECT - PA2
MUSIC 618.001
AMERICAN BAND COLLEGE & CENTRAL WASHINGTON UNIVERSITY

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ABOUT THIS BOOK

The purpose of this book is to introduce students to the pitch tendencies on their individual instrument. First, this book provides resources for the student to develop their understanding of pitch. It will include tools to help students work on their pitch. Then, students will be presented with a fingering/slide position chart that explains the pitch tendencies on their instrument. There will be accompanying exercises that walk students through adjusting appropriately when they encounter notes with a sharp/flat pitch tendency. Finally, the book will include chamber music with which students can play together to work on adjusting for pitch tendencies in the context of music making. These chamber music pieces can also be used as chorales in a full band ensemble rehearsal. Students should progress chronologically through this book when reading it the first time. Then they can revisit topics as needed while they continue working on pitch individually or with their peers.

ABOUT THE AUTHOR

Ms. Abigail Koehler is the band director at Mead High School in Longmont, Colorado. This will be Ms. Koehler's 6th year teaching at MHS and her 3rd year as the head band director. Ms. Koehler teaches Marching Band, Advanced Jazz Band, Symphonic Band, Unified Percussion Ensemble, and AP Music Theory. Prior to her position at MHS, Ms. Koehler taught elementary band in Pennsylvania. Ms. Koehler earned a Bachelors in Music Education from Penn State University, and she attended Penn State for one year after her graduation to complete a performance certificate in trombone performance. While at Penn State, Mark Lusk was her primary trombone instructor. Other notable teachers include Marko Marcinko (jazz) and Velvet Brown (tuba/euphonium). Ms.Koehler also played under the baton of Dennis Glocke and Gerardo Edelstein. In addition to performing with the bands and orchestras at Penn State, Ms. Koehler also performed in the treble choir, Orianna Singers, directed by Jayne Glocke. Ms. Koehler is a graduate of the Schreyer Honors College and completed her senior thesis titled "High School Music Theory: Perceptions of the AP Music Theory Exam's Influence on Teaching and Learning." She had the opportunity to present her thesis at the 2017 PMEA conference in Erie, PA.

When not teaching or playing trombone, Ms. Koehler likes to read, run, and spend time in the great outdoors in her current home state of Colorado.

CHAPTER 1 - BASICS

What impacts intonation?

There are many factors that impact intonation on your instrument! Here are the aspects of playing that you should consider before you begin working through this book:

1. **Air** - Air is the fuel for our instruments. As a result, if our air suffers, our pitch will also suffer. When playing your instrument, always make sure to take a deep, relaxed breath. Then, breathe out with cold, focused air while maintaining a relaxed feeling in the abdomen. Never let your air supply get lower than 15-25% in order to maintain enough air to operate the instrument properly.
2. **Posture** - Posture directly impacts our air and the way that we hold our instrument. If we are not sitting properly, we will not be able to breathe properly. When sitting to play your instrument, take a moment to lean forward until you feel tension in your back. Next, lean backward until you feel tension in your abdomen. Finally, find the balance point between those two extremes at which you feel balanced and relaxed in your chair. You should not feel any tension.
3. **Embouchure** - The embouchure impacts the air stream, which impacts intonation. Take the opportunity to form your embouchure in front of a mirror to assess whether or not it is formed correctly. Ask your teacher to take a look at your embouchure as well!
4. **Reeds** - Reeds have a large impact on the pitch of woodwind instruments (with the exception of flutes). The thickness or strength of the reed can impact the pitch, so you should always try to play on the appropriate reed strength for you. As reeds get older and more worn, their pitch and tone can change. Make sure to replace reeds regularly to ensure the best quality reed. Make sure to store your reeds properly when not playing.
5. **Instrument Design** - Musical instruments are not designed perfectly in tune due to the physics of sound. Depending on your instrument, certain notes will be out of tune due to the way that the instrument is made. Because of these imperfections in instrument design, we are aware of the notes that have intonation issues, which you will learn more about in this book!

CHAPTER 1 - BASICS

How to play in tune.

TONE

Before a musician can focus on playing in tune, he/she must play “in tone.” It’s a common saying in the music education world that we must play “in tone, in tune, and in time.” In tune and in time can be self explanatory. But what does it mean to play “in tone?” It means to play your instrument with the best and most characteristic tone possible. Specifics about tone production go beyond the scope of this project, but talk to your band director/private lesson teacher about the following to ensure that you’re playing your instrument with the best tone possible.

- Breathing exercises to ensure efficient breathing
- Tone production fundamentals exercises for your instrument (ex. Long tones, flow studies, lip slurs, register/harmonic exercises, etc.)
- A list of professional musicians who play your instrument so that you can listen to their tone.

SINGING & AUDIATING

One of the best ways to improve intonation on your instrument is to train your ear! Singing is one of the best ways to train your ear because it requires you to produce a pitch without the help of keys/valves/a slide. Throughout this book, you will be encouraged to sing the exercises and your part in the chamber music pieces. Don’t skip this step! Use your instrument or a piano to give yourself a starting pitch, then do your best to sing it accurately. The expectation is NOT that the singing will be perfect. It’s simply a tool to help your inner ear develop, and you’ll improve the more you do it. Audiating means that you can hear music in your head. Try it now! Can you sing a nursery rhyme in your head without humming it? That’s audiating! The more you can audiate before you sing/play, the more in tune your singing/playing will be. When working through the exercises in this book, don’t forget to audiate!

Hear the note before you play it!

CHAPTER 1 - BASICS

INTONATION

Intonation is the accuracy of a given pitch while you are playing your instrument. Your intonation can go three different ways:

Sharp (higher than the target pitch), flat (lower than the target pitch), and in tune (right on target)

We measure intonation using **cents.** A cent is the unit of measure used for musical intervals. In equal temperament, there are 100 cents between each half step, and 12 half steps create an octave. Your tuner will show how many cents sharp or flat you are from the target pitch. The greater the number, the farther you are from the target pitch.

Beats are the "waves" that we hear when a pitch is out of tune. You can't see beats, but when you hear them, they indicate that you are playing out of tune. The slower the waves, the farther you are from the target pitch. The waves will get faster as you approach the target pitch. The closer you get to the target pitch, the worse the interval will sound. It's important that you remember that sometimes your pitch has to get "worse" in comparison to the target pitch before it can get better! Listen to the examples below that demonstrate the beats/waves that we hear when a note is out of tune.

TUNERS

Tuners are a great tool to help us work on intonation, but they should be used sparingly. Ultimately, we want to adjust our intonation based on what we hear, not what we see. A tuner can help us train our ears by helping us visualize what we hear, which is a great place to start. However, the more comfortable you can get with hearing your intonation, the better. General recommendations for using a tuner:

When a Tuner IS Helpful	When a Tuner is NOT Helpful
After your instrument has been physically warmed up.	When your instrument is cold.
When initially tuning your instrument at the beginning of a rehearsal/practice session.	The entire time that you are practicing.
If you can hear that you're out of tune, but you're struggling to correct it by ear.	Throughout an entire rehearsal. Do NOT put your tuner on your stand and leave it there!

CHAPTER 1 - BASICS

TUNERS

Tuners can come in the forms of tuning forks, an individual tuner, or an app for your electronic device.

Remember that tuning your tuning note to the tuner does NOT mean that your instrument will always be in tune. Intonation changes constantly due to the air temperature, the temperature of your instrument, the key you're playing in, and the pitch tendencies on your instrument. It's good to tune your instrument shortly after you begin to play, but remember to keep your ears turned on so that you can adjust to what you hear.

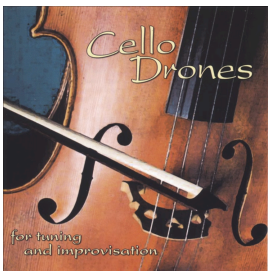
Tuning Fork

Tuner

Tuning App
(Tonal Energy)

DRONES

A drone is a sustained note or chord. Drones are frequently used as tools for intonation similar to a tuner. The difference between a tuner and a drone is that the tuner shows you your intonation visually, whereas a drone requires you to listen for intonation. Drones are extremely helpful when you're working on hearing intonation instead of simply seeing it on your tuner. Hearing intonation is a valuable and necessary skill for all situations in which you play with other people.
Recommendation: Cello drones that can be found on Youtube and Spotify. By Marcia Sloane and provided by Musician's Practice Partner.



CHAPTER 1 - BASICS

WHAT IS JUST INTONATION?

There are two primary types of tuning systems that we encounter regularly when making music.

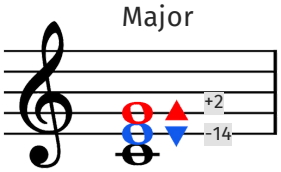
Equal Temperament: The idea that each half step is exactly the same distance apart (100 cents between each half step). *Example: An electronic keyboard is tuned using equal temperament.*

Just Intonation: The idea that intervals sound more in tune, and we achieve a more "pure" sound when intervals adjusted slightly from 100 cents between each half step. *Example: How we tune in a band ensemble.*

JUST INTONATION IN ENSEMBLES

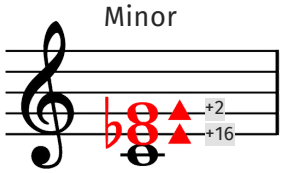
When playing in an ensemble, we must make adjustments to the harmony to make them sound "more in tune." If we were to play the following chords using equal temperament, all notes would be at the "0" cents position. However, we must make the following adjustments in order for the harmony to sound correct to the ear.

Major



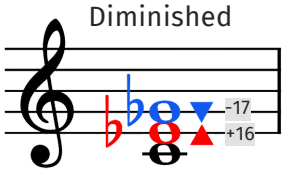
In order for a major triad to sound in tune, the third must be lowered by 14 cents, and the fifth must be raised by 2 cents.

Minor



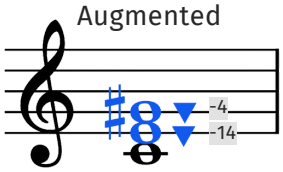
In order for a minor triad to sound in tune, the third must be raised by 16 cents, and the fifth must be raised by 2 cents.

Diminished



In order for a diminished triad to sound in tune, the third must be raised by 16 cents, and the fifth must be lowered by 17 cents.

Augmented

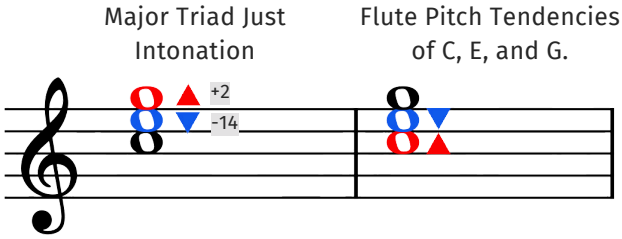


In order for an augmented triad to sound in tune, the third must be lowered by 14 cents, and the fifth must be lowered by 4 cents.

CHAPTER 1 - BASICS

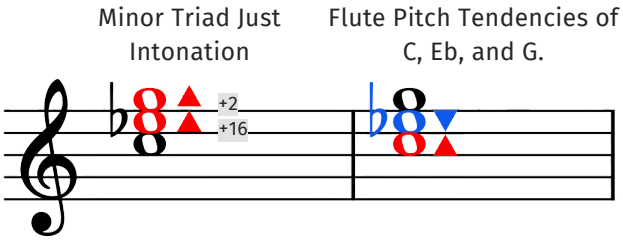
HOW DO PITCH TENDENCIES IMPACT JUST INTONATION?

In short, if you know the requirements of just intonation, and you know the pitch tendencies on your instrument, you'll be able to play better in tune. Imagine you're a flautist, and you're playing the chords below. The measure on the left shows the adjustments that need to made for just intonation. The measure on the right shows the pitch tendencies of those notes on the flute.



When playing these chord members on your flute, you'll need to be aware of the following pitch needs and issues:

Chord function and note name:	The chord requires this note to be:	The pitch tendency of the instrument is:	The player must know:
Root: C	In tune	Sharp	This note will sound sharp, so the player must lower the pitch in order for it to sound in tune.
Third: E	Flat	Flat	The pitch tendency on the flute will help the chord sound more in tune.
Fifth: G	Slightly sharp	In tune	The player should very slightly raise the G in order for it to sound in tune.



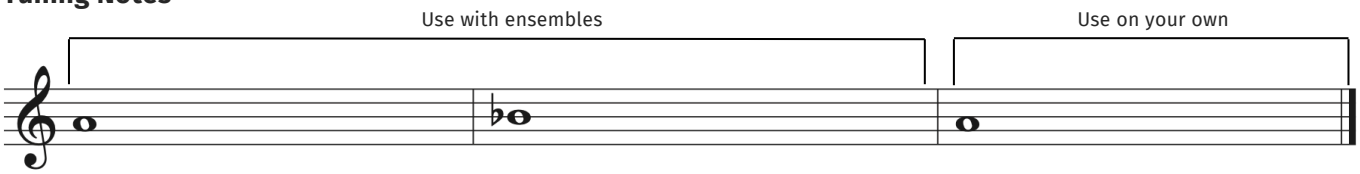
When playing these chord members on your flute, you'll need to be aware of the following pitch needs and issues:

Chord function and note name:	The chord requires this note to be:	The pitch tendency of the instrument is:	The player must know:
Root: C	In tune	Sharp	This note will sound sharp, so the player must lower the pitch in order for it to sound in tune.
Third: Eb	Sharp	Flat	Since the pitch tendency of Eb is on flat on the flute, and this chord calls for this note to be raised, the flautist will have to raise the pitch quite a bit for it to sound in tune.
Fifth: G	Slightly sharp	In tune	The player should very slightly raise the G in order for it to sound in tune.

CHAPTER 2 - INTONATION ON YOUR INSTRUMENT

OBOE

Tuning Notes



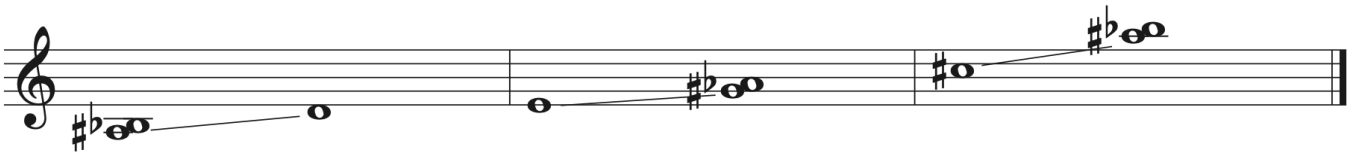
How to Tune

1. Play the tuning notes above with a tuner.

If flat:	If sharp:
More embouchure support, faster air, reduce the angle of the oboe.	Decrease embouchure pressure.
Check the length/width of the reed (it may be too long/wide)	Check the thickness of reed and balance of cain.
Take in more reed.	Take in less reed.

Range Tendencies

Though there will always be exceptions, you can expect notes within the following ranges to follow the pitch tendencies indicated below.



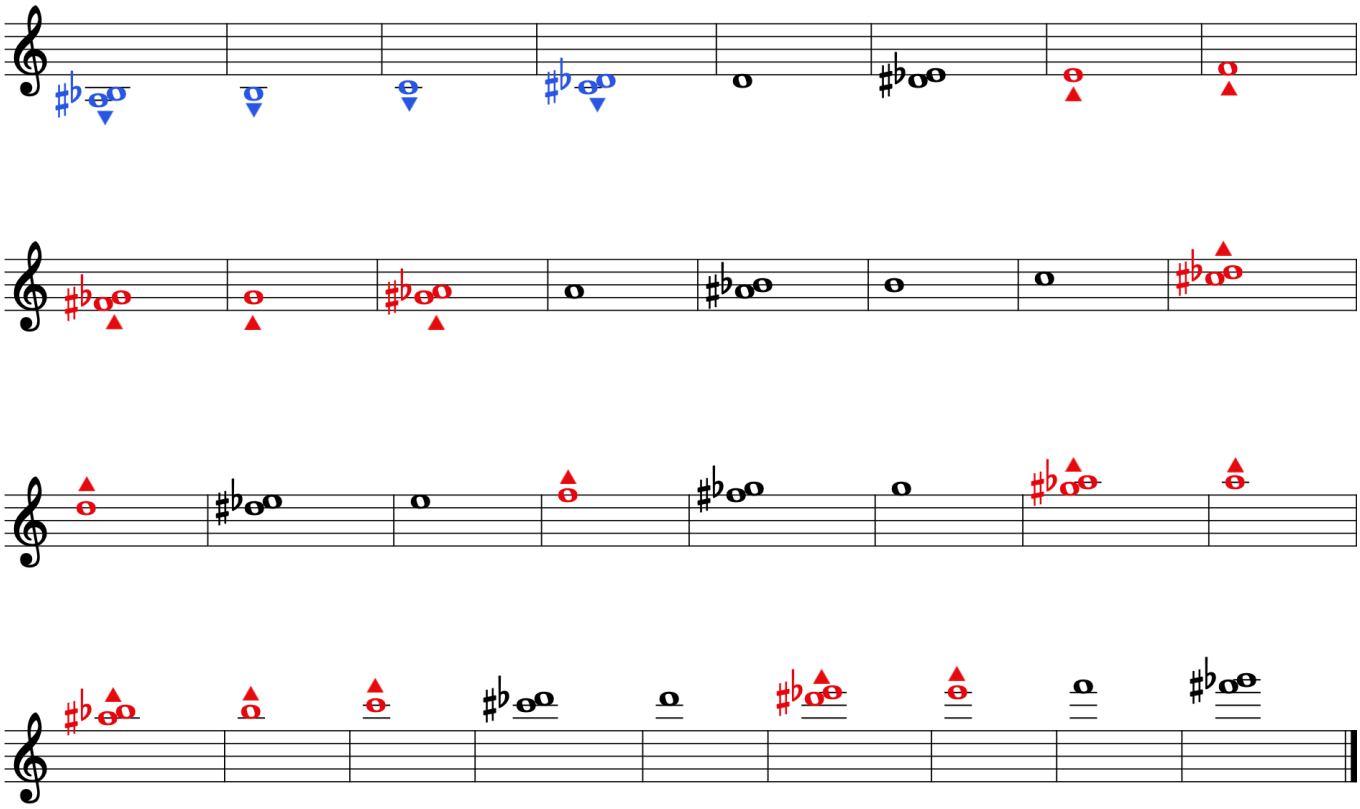
Flat. Increase embouchure pressure.

Sharp. Decrease embouchure pressure.

Sharp. Decrease embouchure pressure.

CHAPTER 2 - INTONATION ON YOUR INSTRUMENT

Oboe Pitch Tendencies

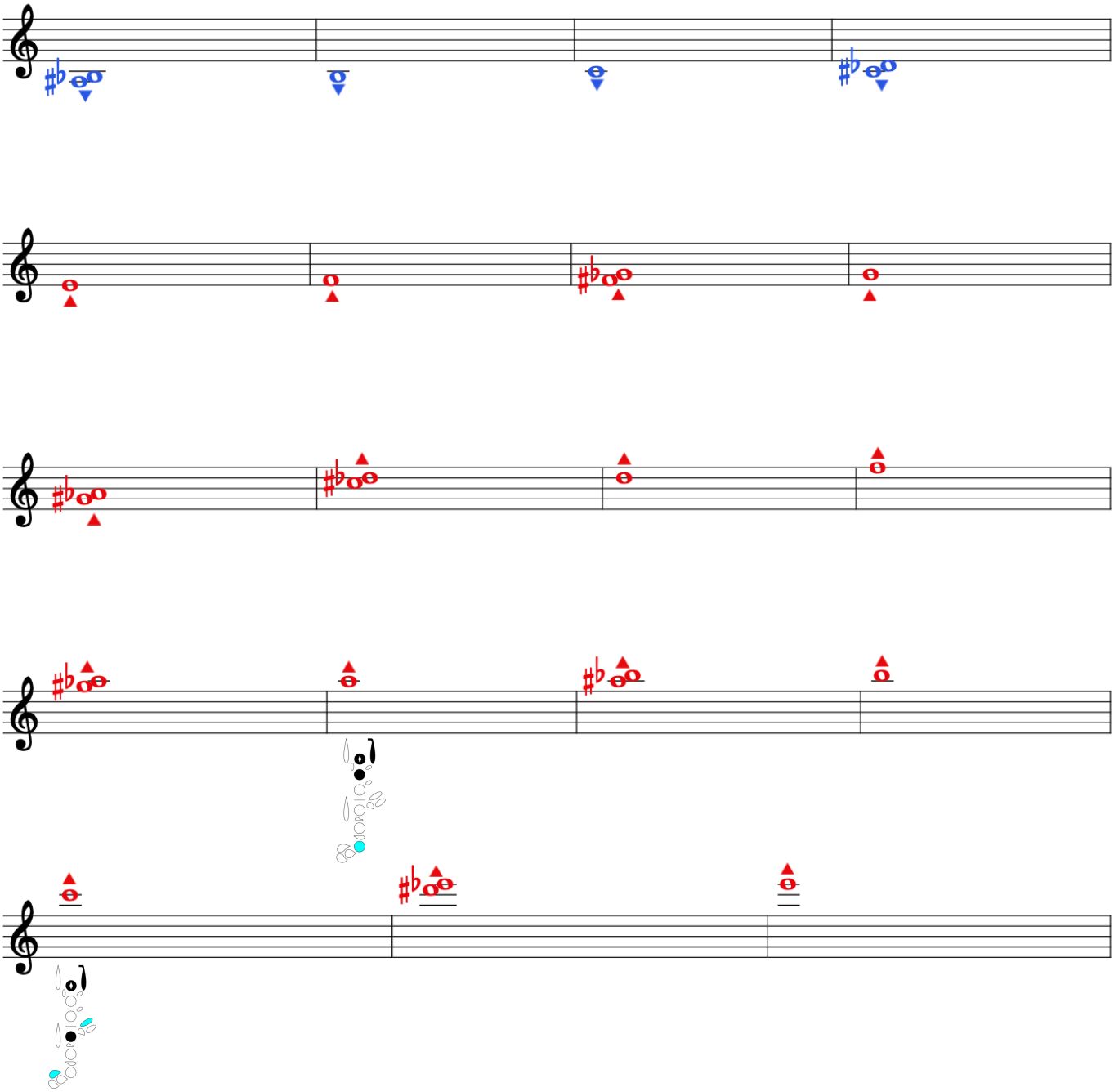


CHAPTER 2 - INTONATION ON YOUR INSTRUMENT

Oboe Alternate Fingerings

For some pitches, you can use alternate fingerings to raise or lower the pitch to improve its intonation. Below you will see the standard fingerings in **black**. Fingers that you can add to help improve the pitch are in **light blue**. Fingers that you can remove to help the pitch are in **red**.

On oboe, the solution to fixing pitch is often changing the embouchure pressure. As a result, you will not see many alternate fingerings below.



CHAPTER 3 - PITCH TENDENCY EXERCISES

The **exercises** on the next pages are intended to help you adjust pitch on your instrument according to your instrument's pitch tendencies. Notes with a specific tendency are highlighted in blue if they are flat and red if they are sharp.

Symbol	Pitch Tendency	The player should:
Blue with "down" arrow 	Flat	Raise the pitch
Red with "up" arrow 	Sharp	Lower the pitch

All exercises should be played with a **drone** that sustains the tonic (scale degree 1) pitch of the key of the exercise. Some exercises also have a drone part written as a duet in the event that you are able to play with a peer. Use the chart below to help you determine the correct drone pitch.

Exercise	Drone Pitch
Intervals of the Major Scale and Dominant 7th Chord	The drone pitch on the bottom stave of the exercise.
Arpeggios	The drone pitch on the bottom stave of the exercise.
Major Scales	The first note of the scale.
Melodies	The drone pitch on the bottom stave of the exercise.

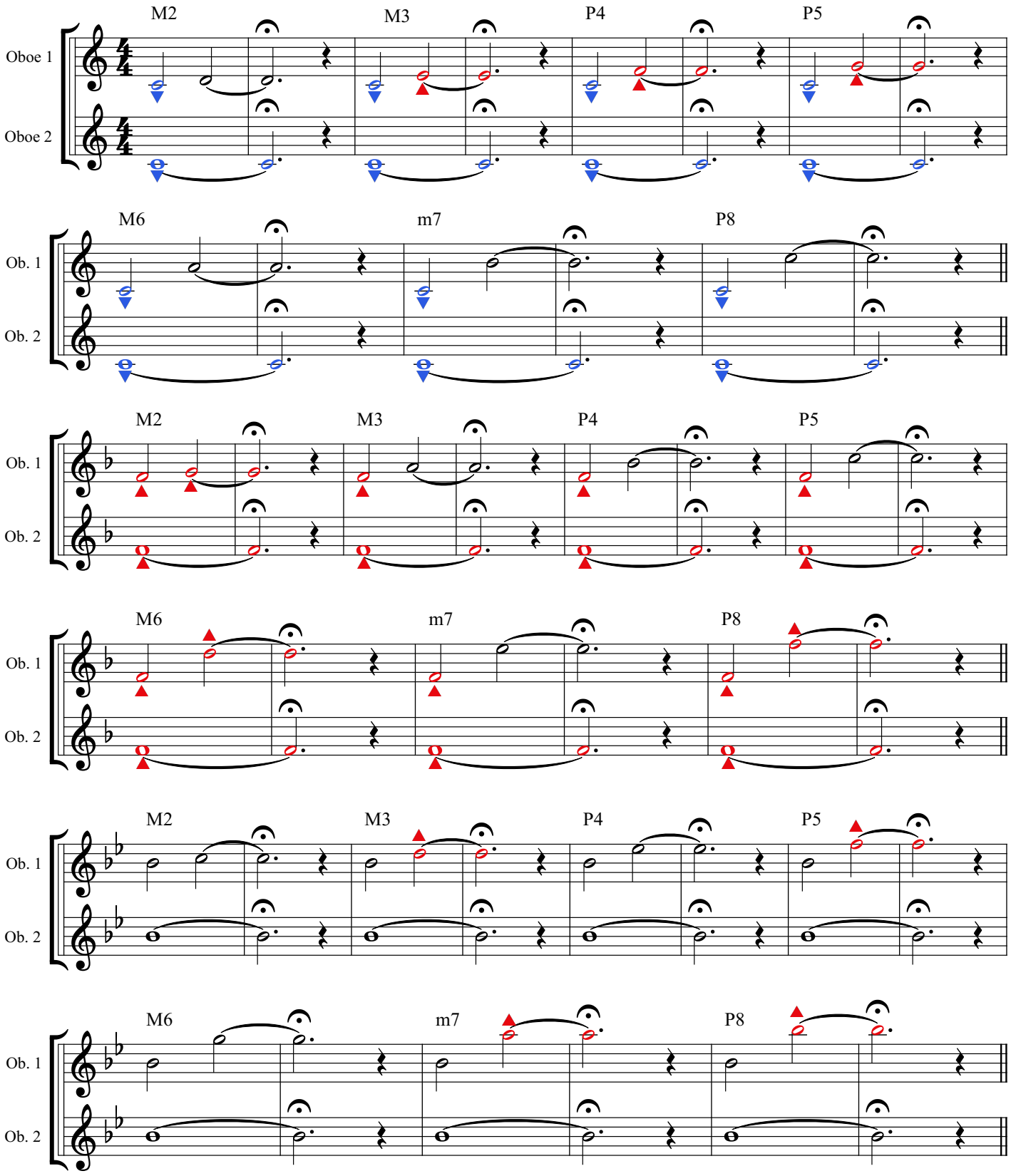
If you play a transposing instrument, remember that the **written drone pitch is your written pitch**, and you must transpose it to concert pitch in order to choose the correct drone to play. **All drones are in concert pitch.**

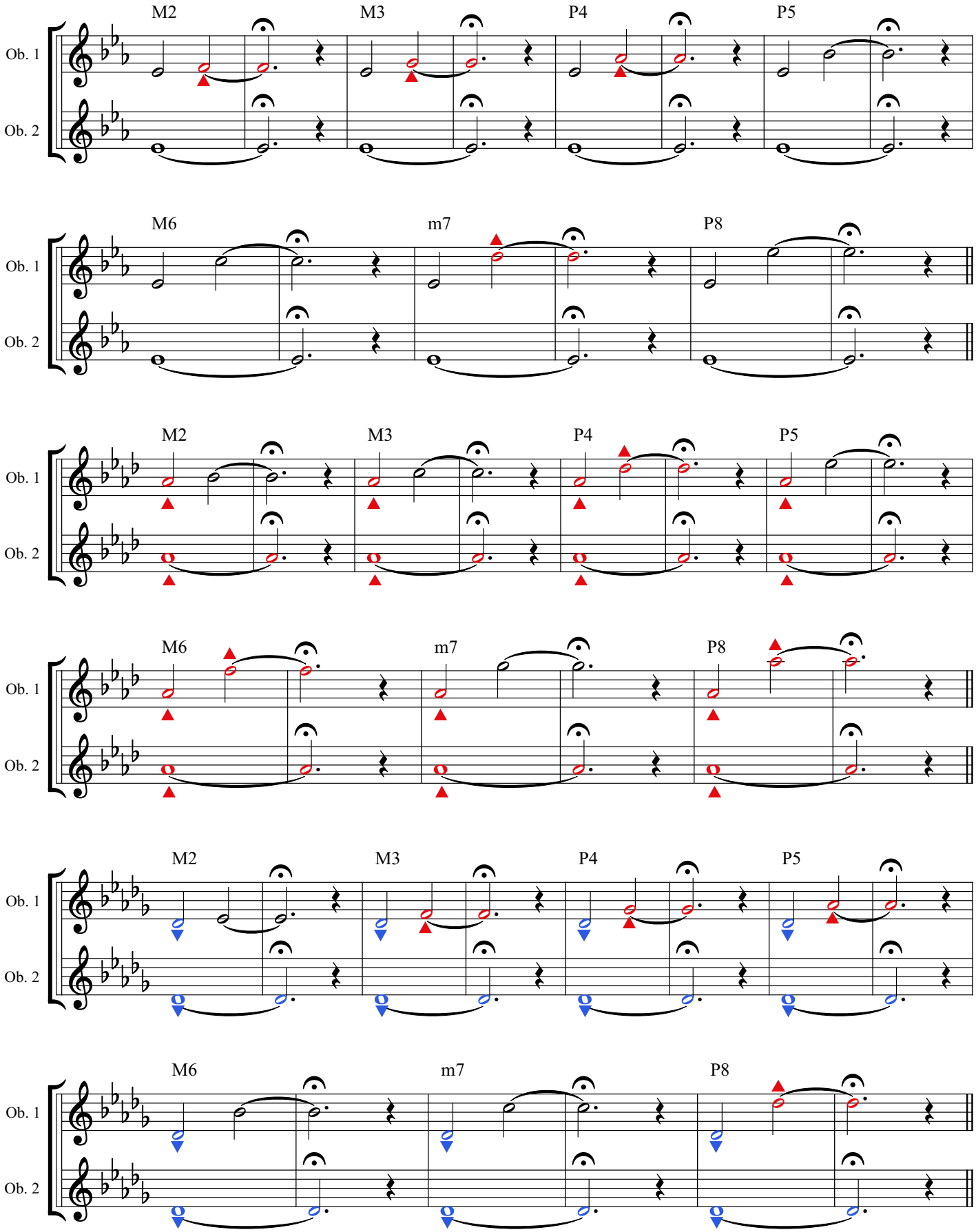
Instrument	Transposition
Flute, Oboe, & Bassoon	Written in concert pitch - no transposition.
Clarinet & Tenor Sax	Concert pitch is a **MAJOR SECOND*** lower than your written pitch.
Alto & Baritone Sax	Concert pitch is a **MAJOR SIXTH*** lower than your written pitch.

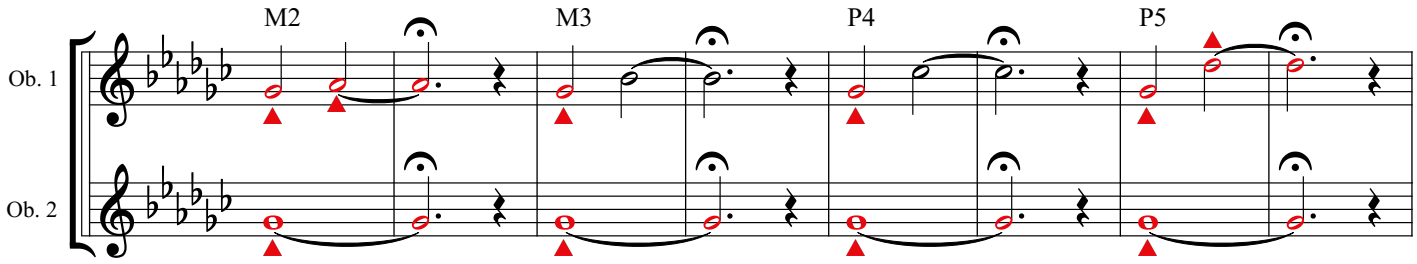
*For more information on intervals, see the music theory appendix at the back of this book.

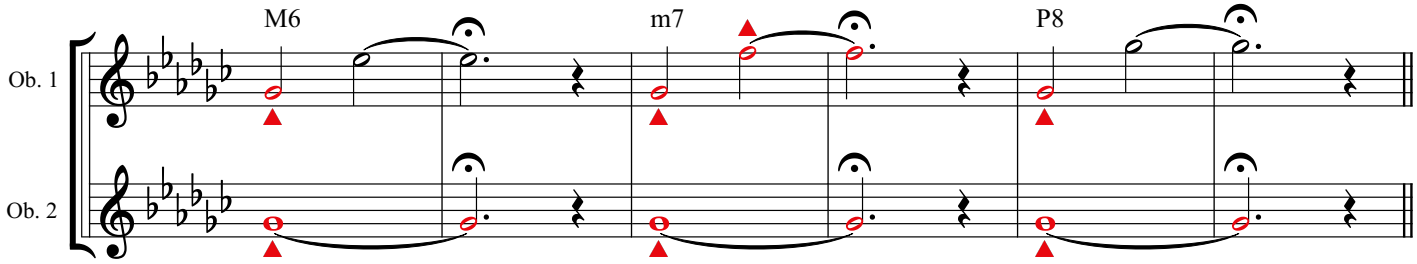
Woodwind Pitch Exercises

Intervals of the Major Scale

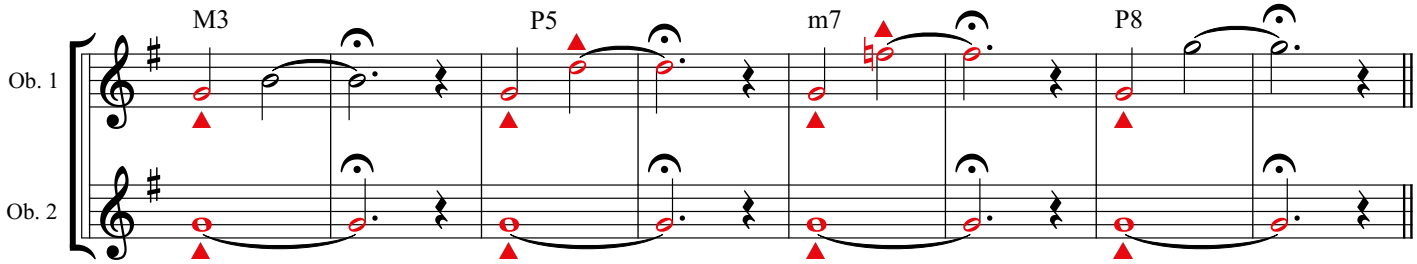


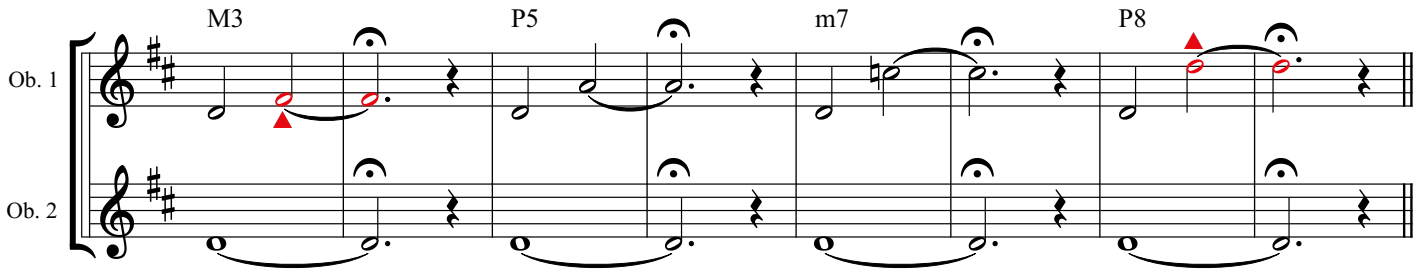

M2
M3
P4
P5
Ob. 1
Ob. 2
M6
m7
P8
Ob. 1
Ob. 2
M2
M3
P4
P5
Ob. 1
Ob. 2
M6
m7
P8
Ob. 1
Ob. 2
M2
M3
P4
P5
Ob. 1
Ob. 2
M6
m7
P8
Ob. 1
Ob. 2

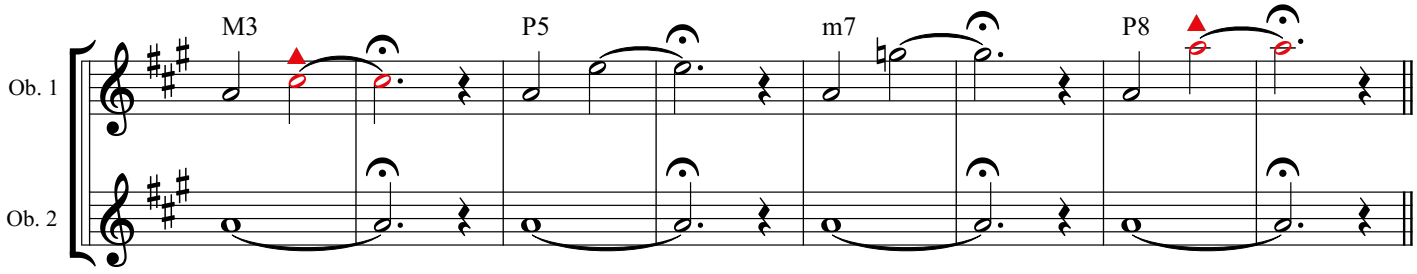


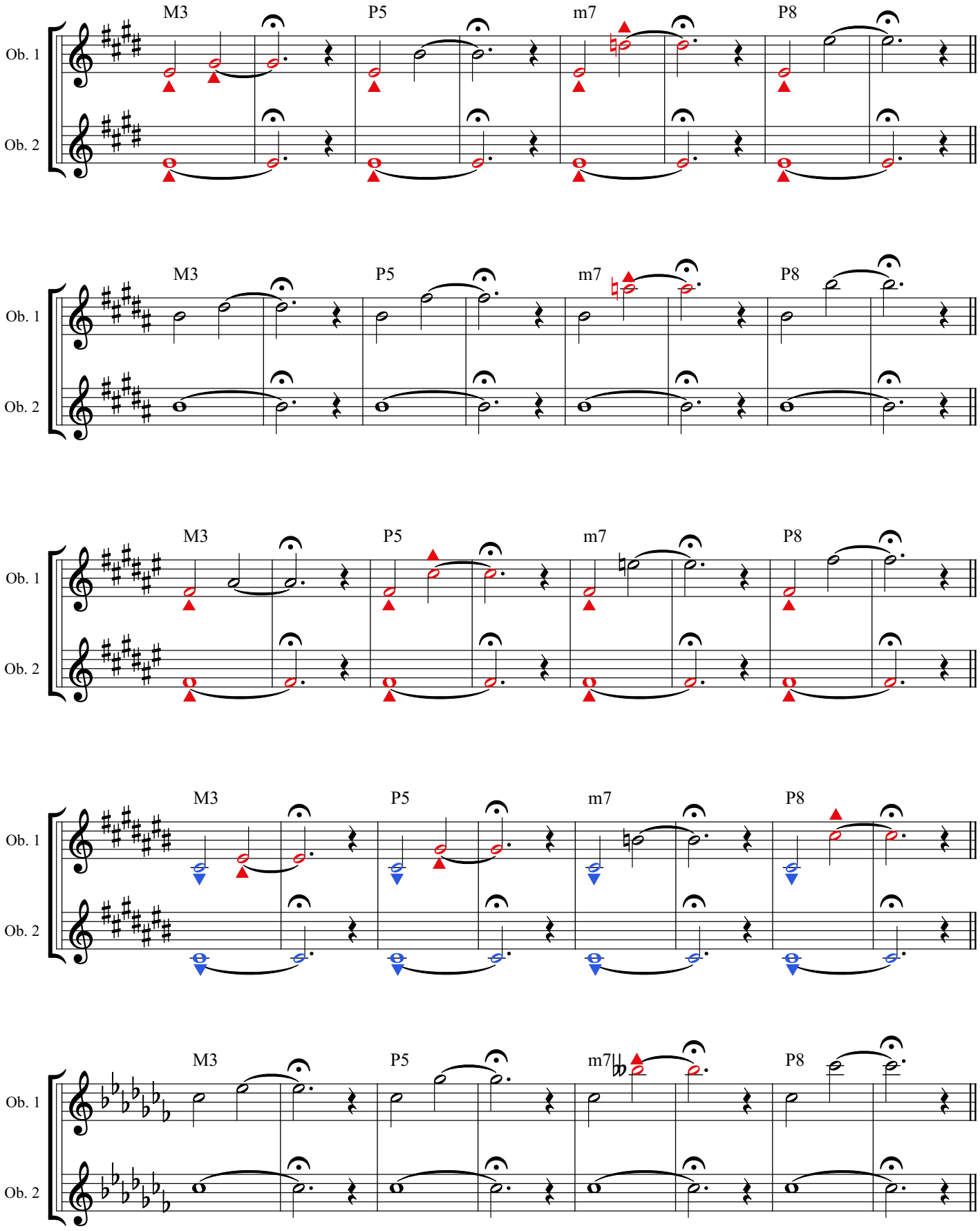


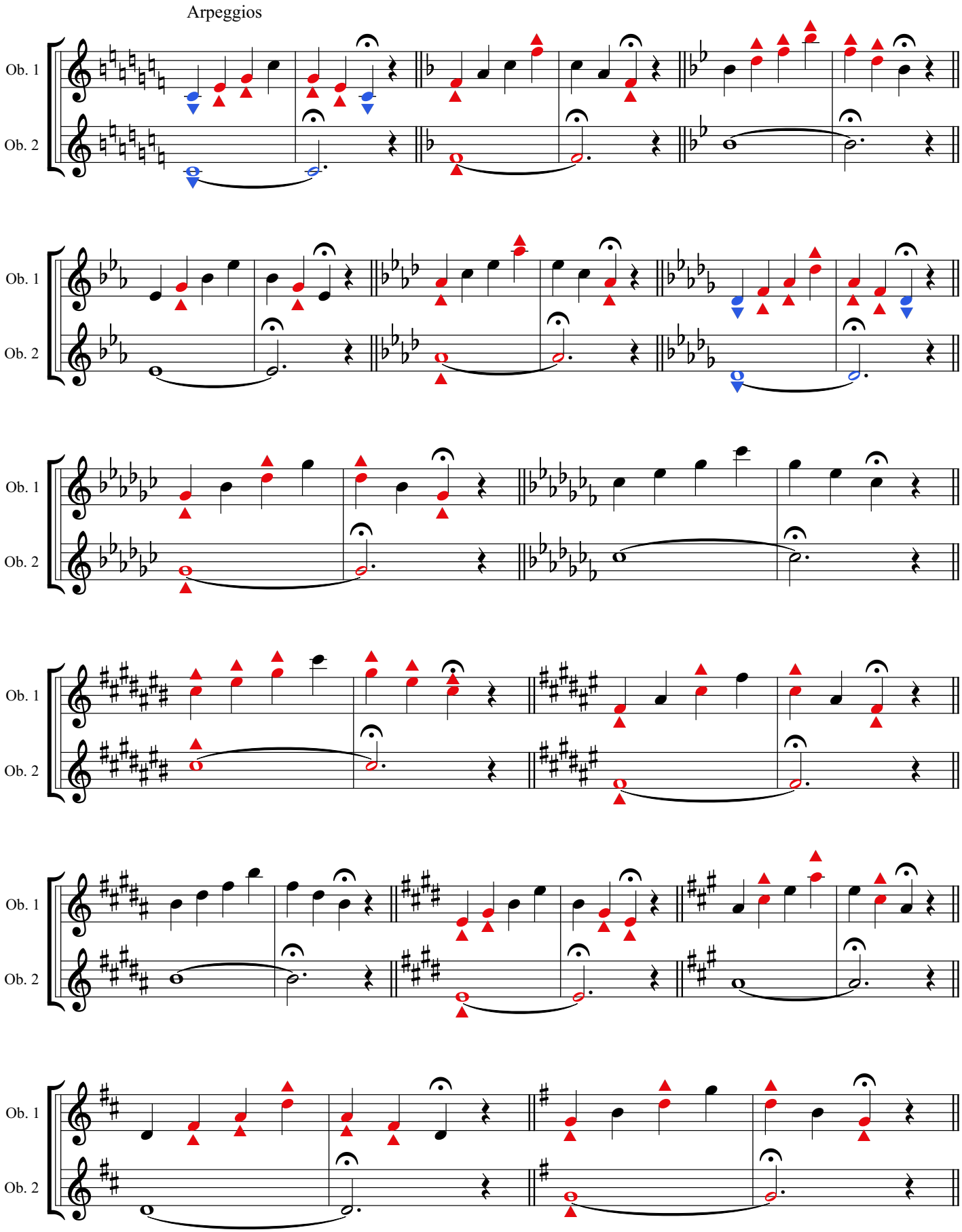
Intervals of the Dominant 7th Chord

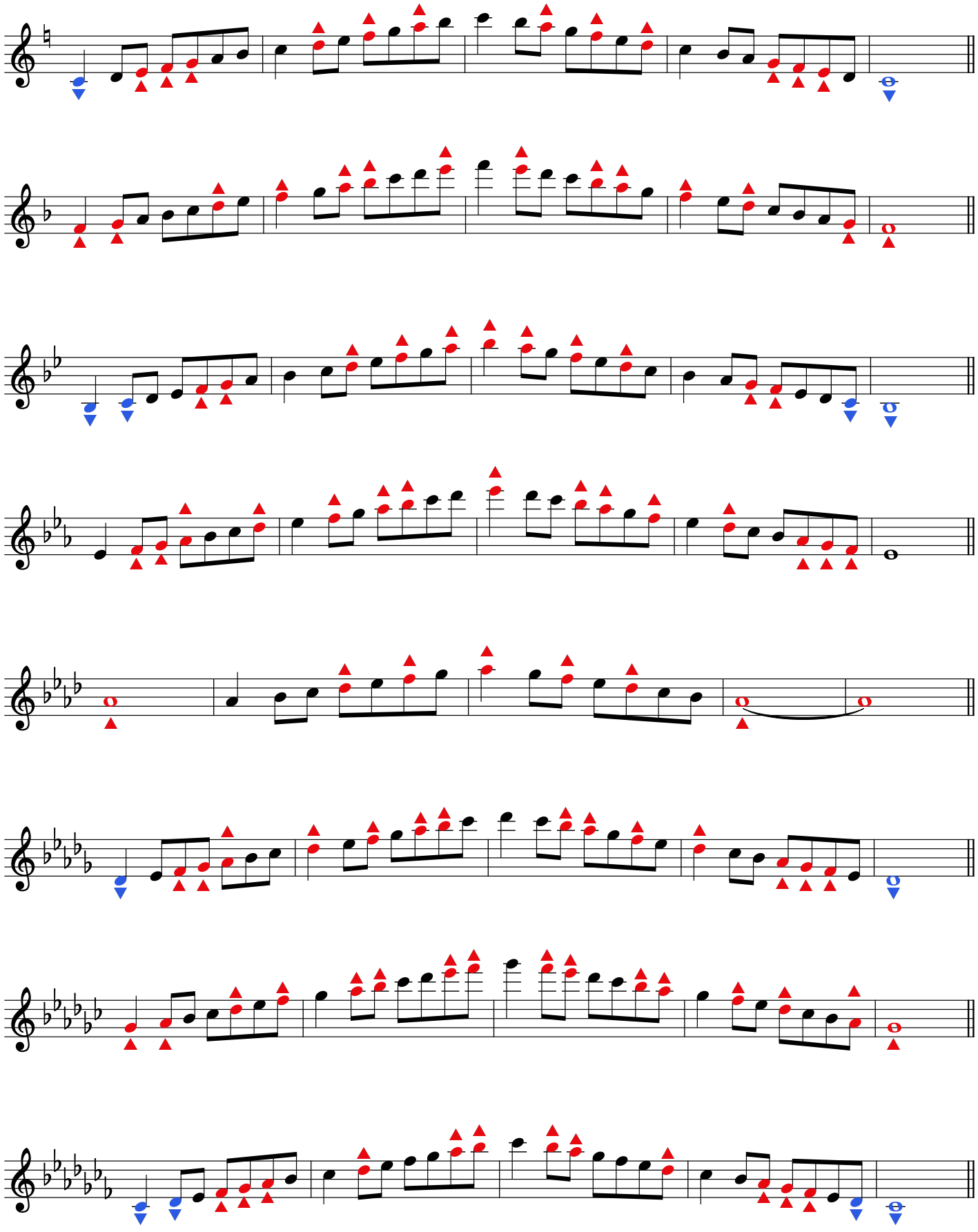


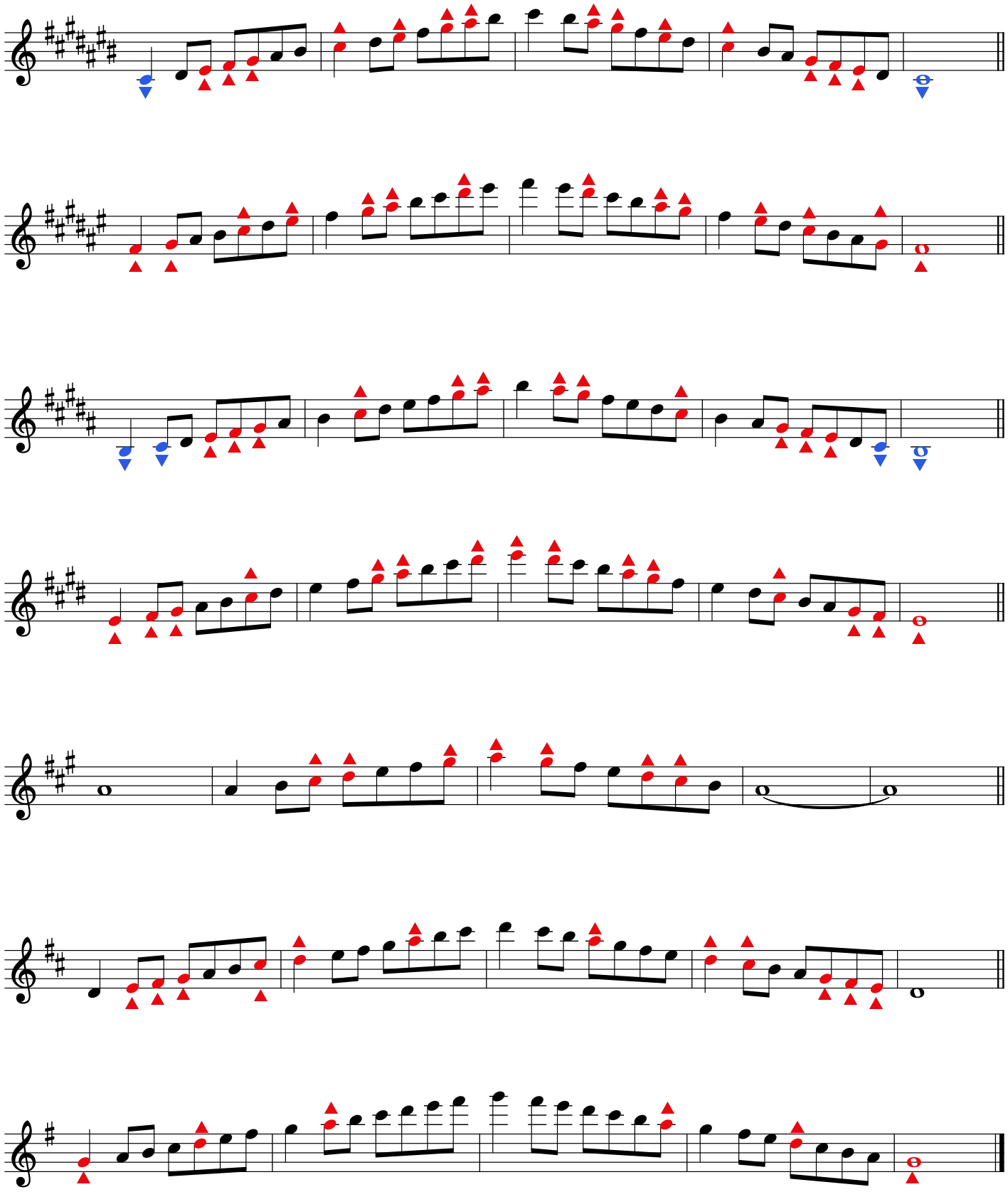





M3
P5
m7
P8
Ob. 1
Ob. 2


Arpeggios
Ob. 1
Ob. 2
Ob. 1
Ob. 2
Ob. 1
Ob. 2
Ob. 1
Ob. 2
Ob. 1
Ob. 2
Ob. 1
Ob. 2

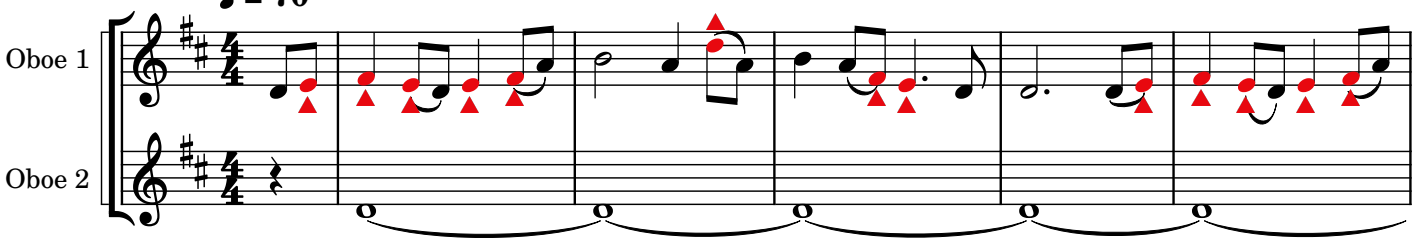


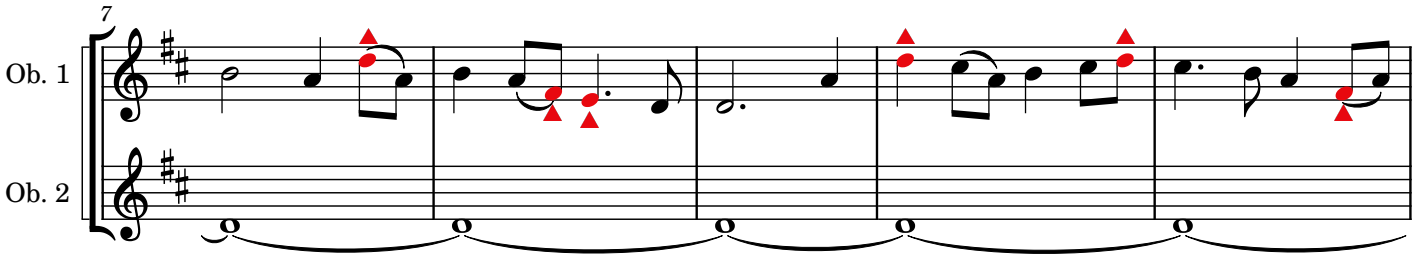


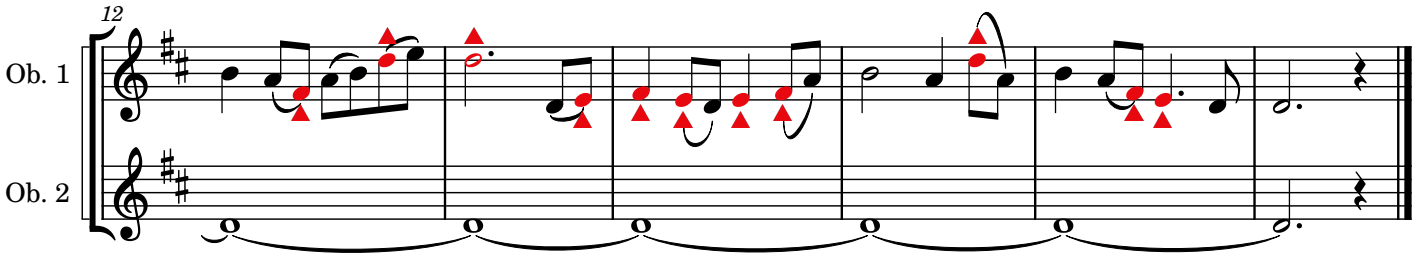
Melodies

Down by the Salley Gardens

♩ = 70

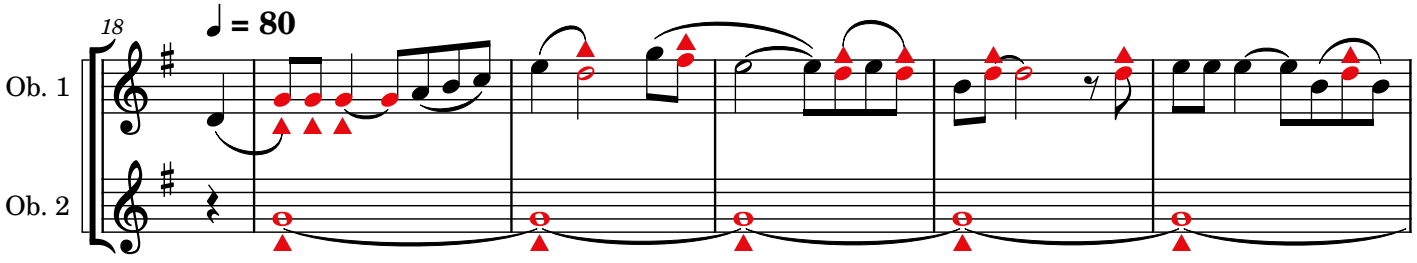


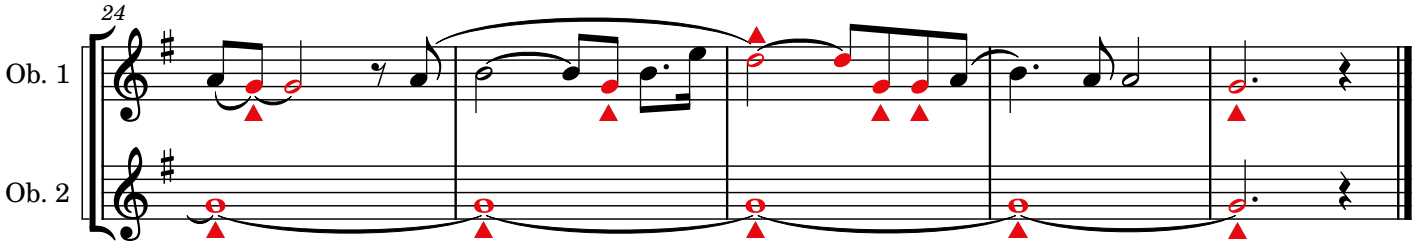




Shenandoah

♩ = 80





America the Beautiful

♩ = 100

29

Ob. 1

Ob. 2

36

Ob. 1

Ob. 2

43

Ob. 1

Ob. 2

It is Well with my Soul

♩ = 90

46

Ob. 1

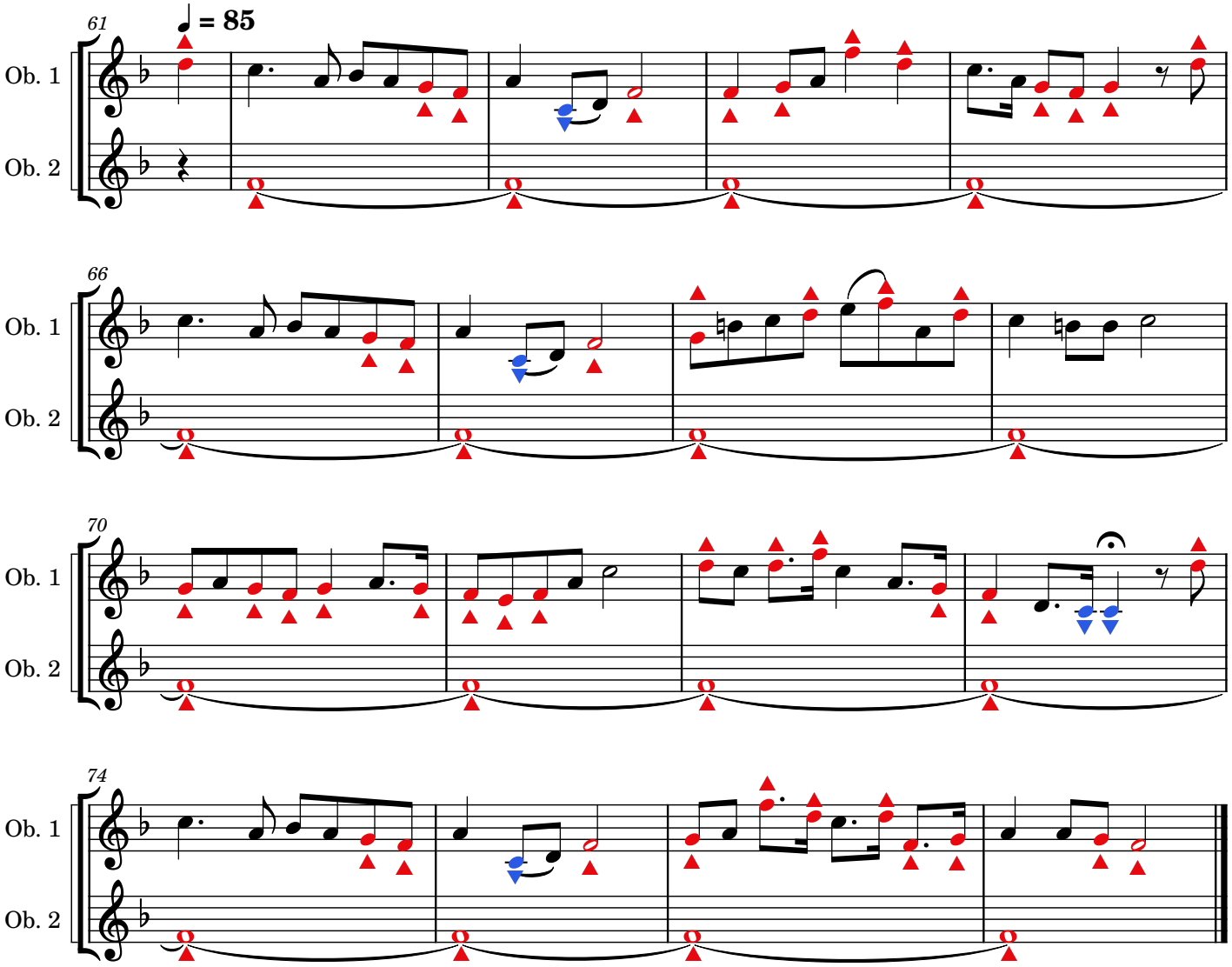
Ob. 2

55

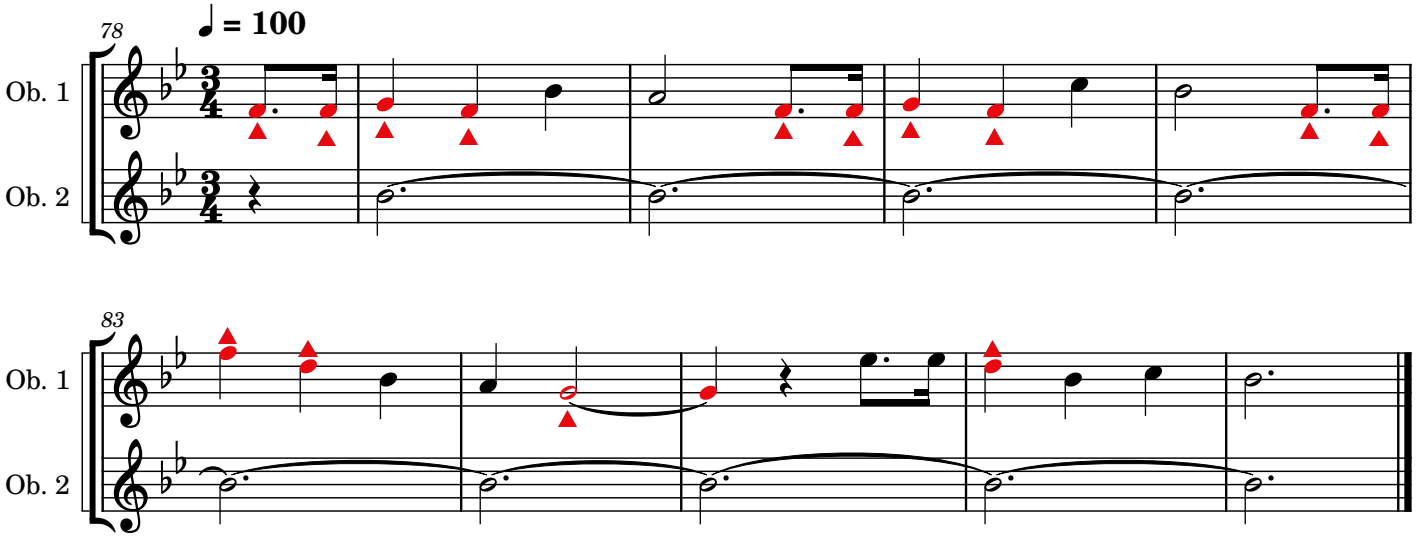
Ob. 1

Ob. 2

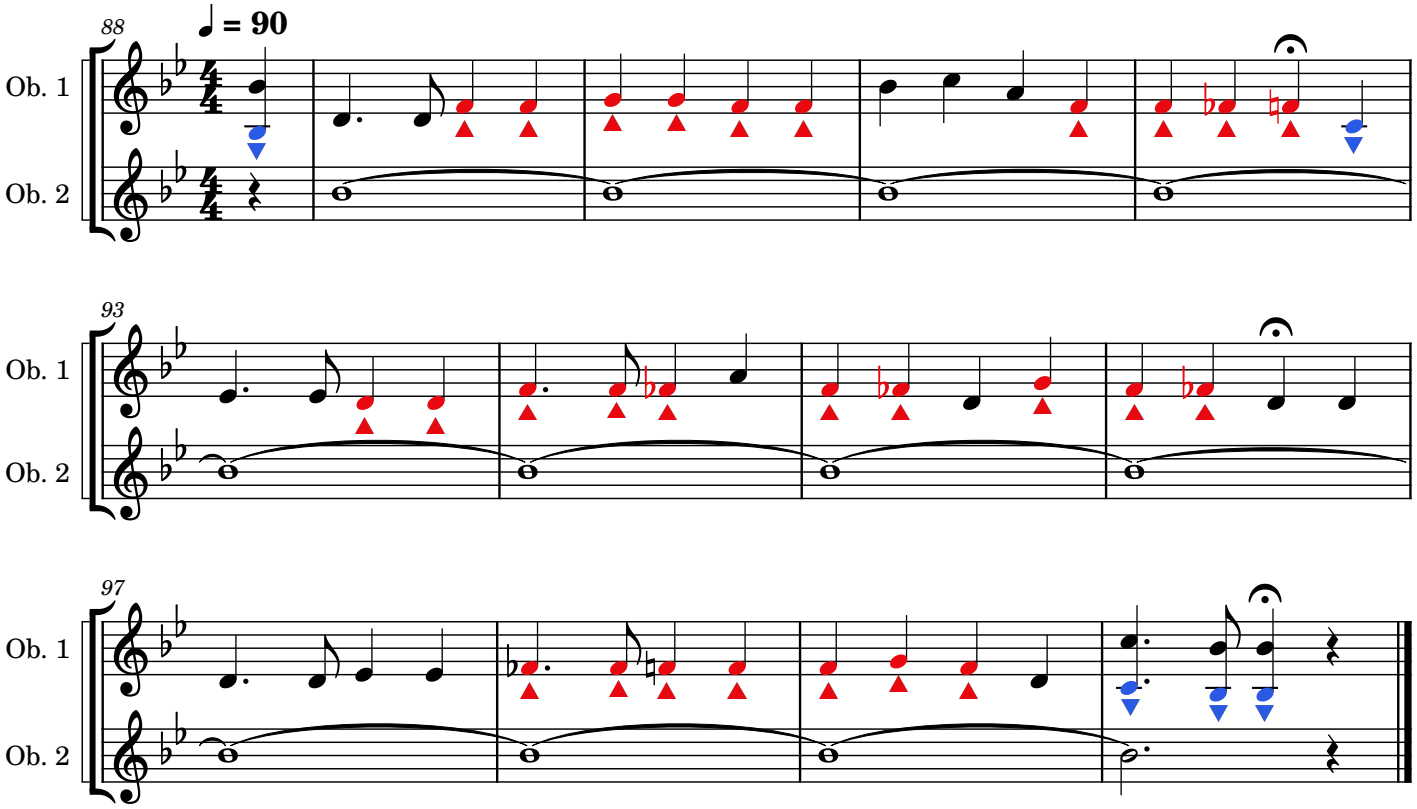
Jeanie with the Light Brown Hair



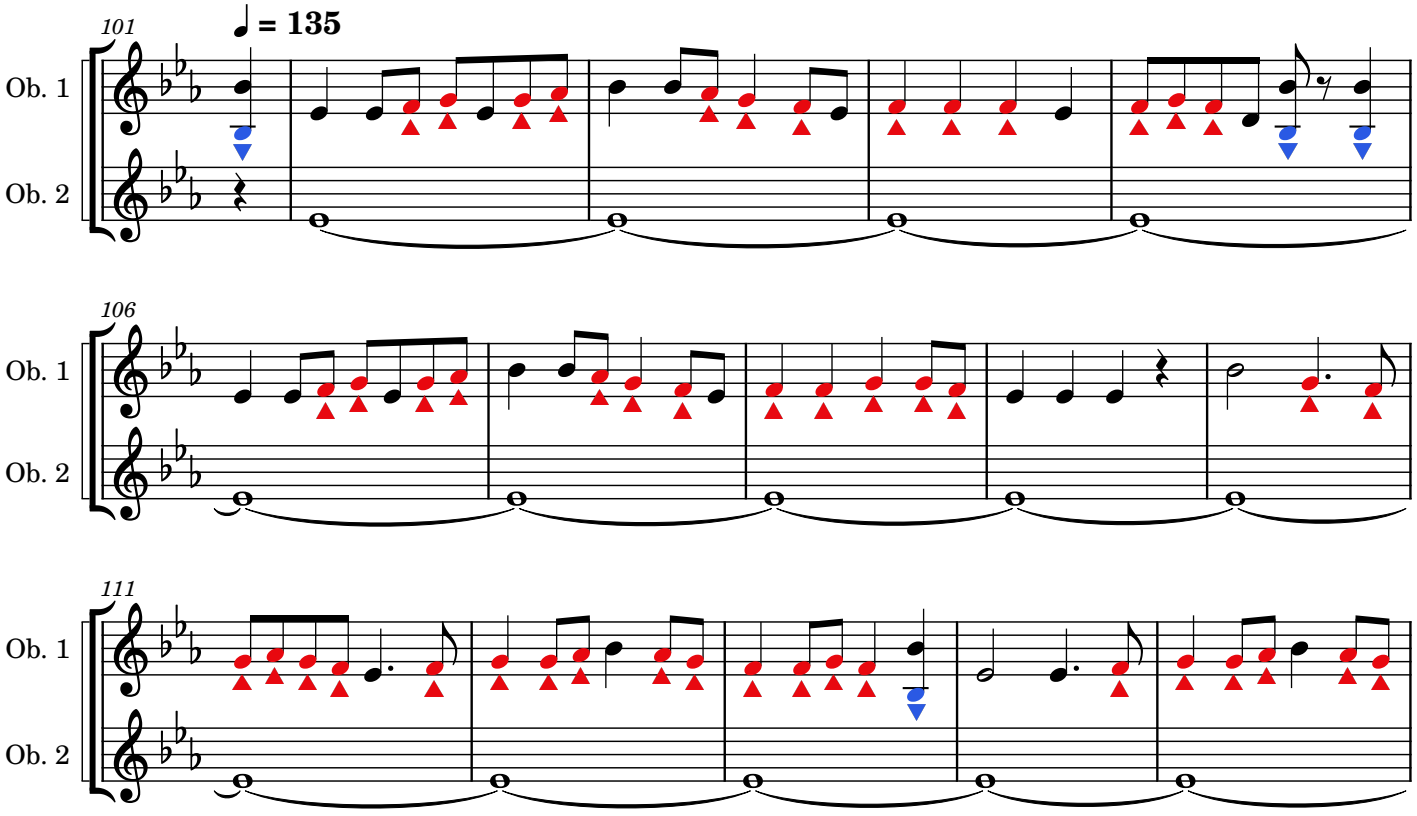
Happy Birthday

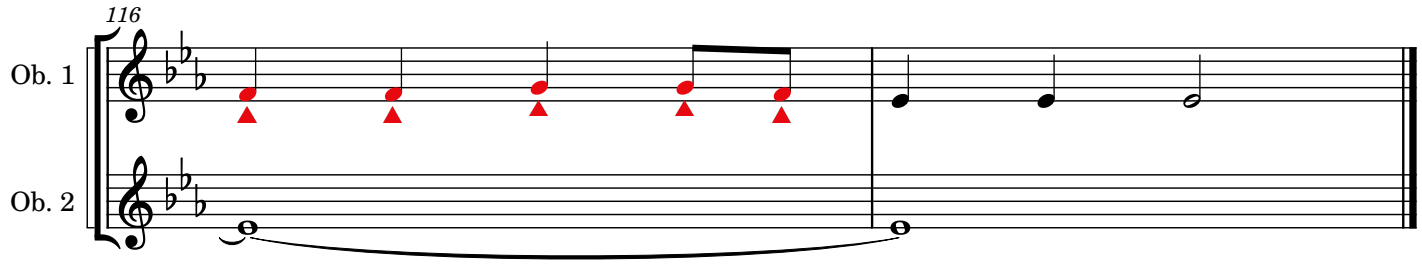


Eternal Father Strong to Save

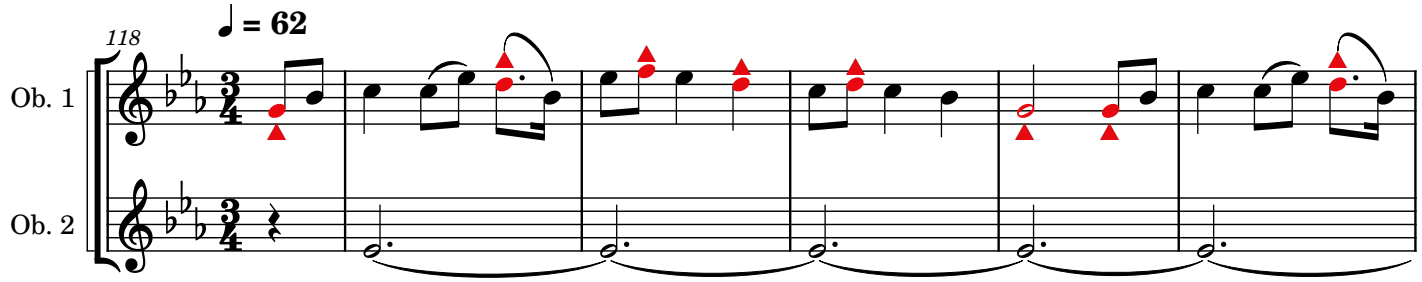


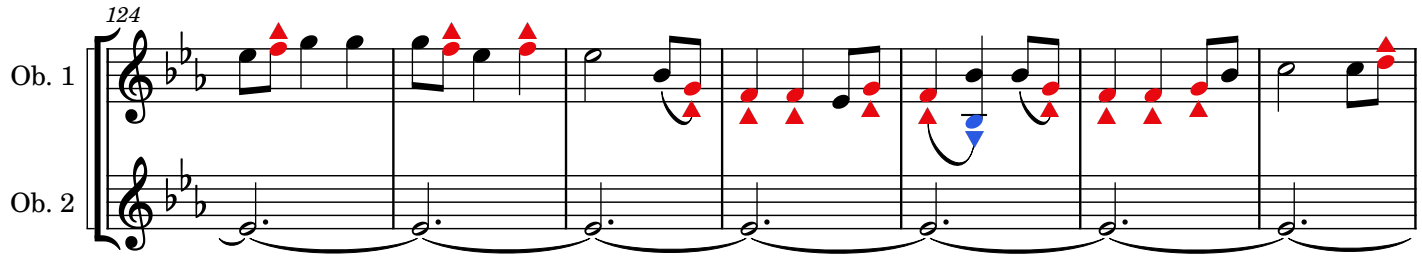
Simple Gifts

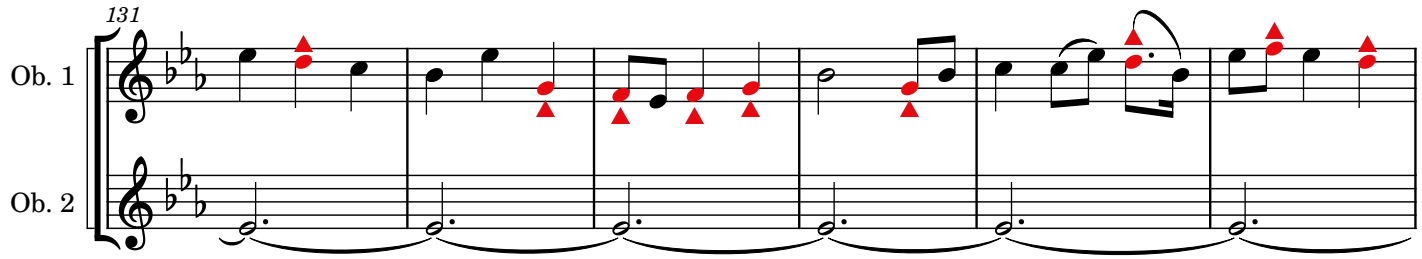


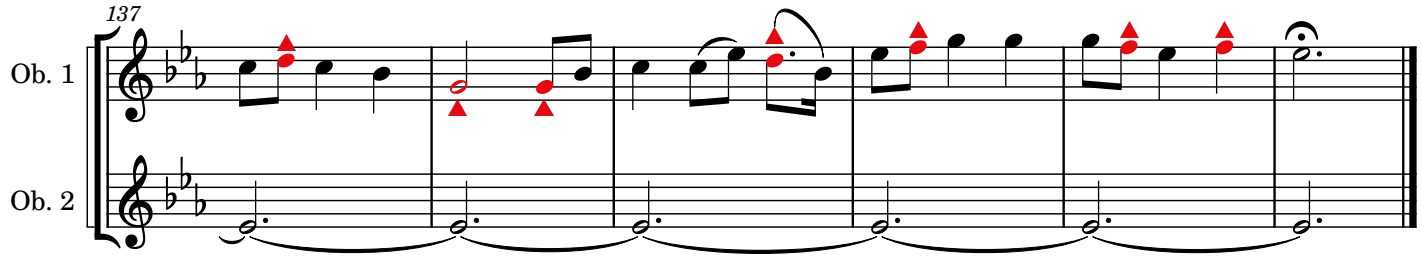


Chorale from Jupiter

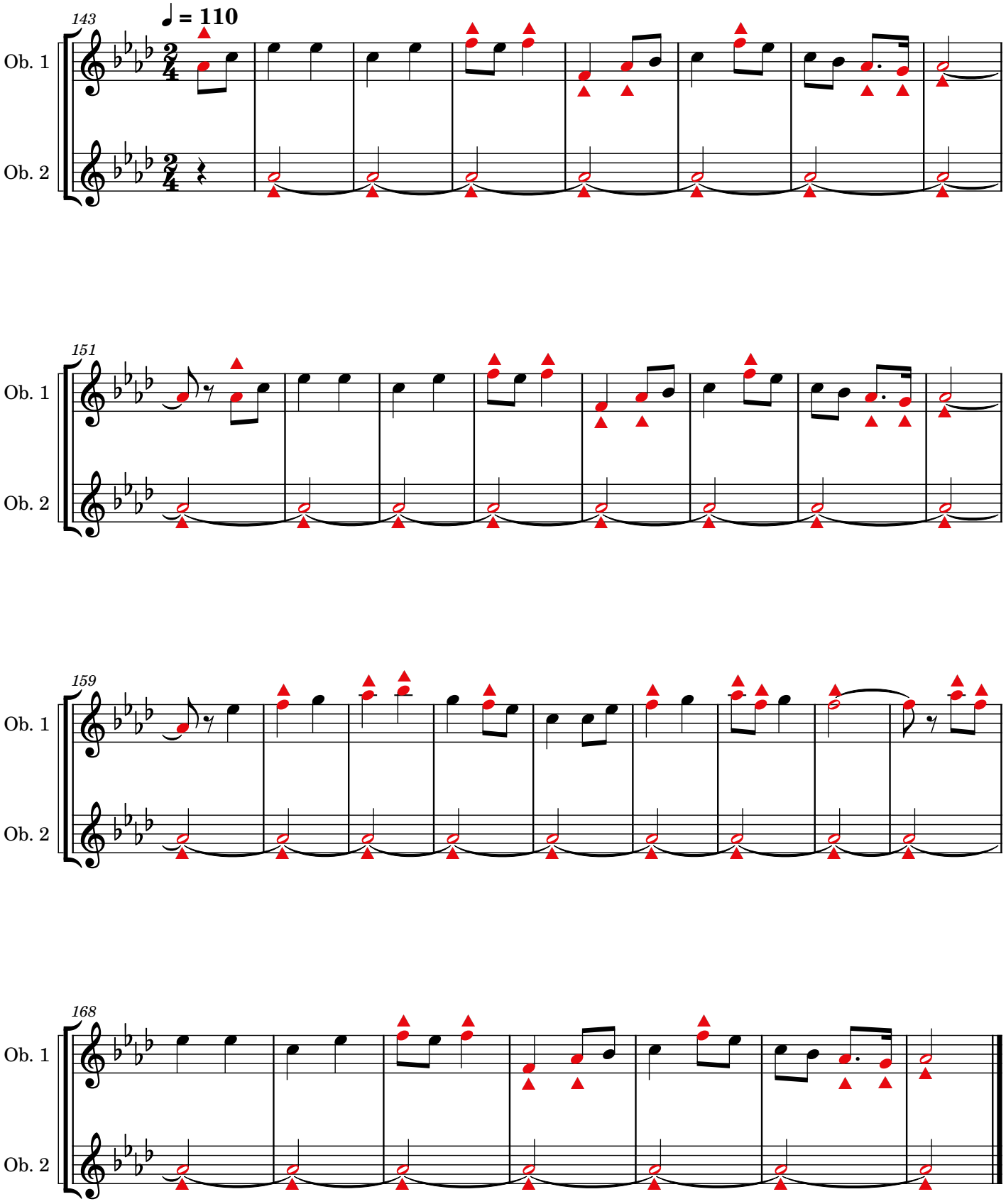








Seventeen Come Sunday



CHAPTER 4 - CHORALES FOR PITCH TENDENCY

On the following pages you will find **4-part chorales** for your instrument. These chorales can be played with a drone on the tonic (scale degree 1) pitch of each exercise. (See the introduction page to Chapter 3 for more information about identifying the proper drone for each exercise).

These chorales can be played by **four players on the same instrument or four players of differing instruments.** All of the parts of the same number are the same across all instrument parts. (For example, the Flute 1 part is the same as Clarinet 1, Oboe 1, etc.). If the band director wishes, these chorales can also be used by the full band.

Notes with pitch tendencies are highlighted in red or blue throughout the chorales. Use the **key** below to help adjust the pitch accordingly.

Symbol	Pitch Tendency	The player should:
Blue with "down" arrow 	Flat	Raise the pitch
Red with "up" arrow 	Sharp	Lower the pitch

Following the chorales in which the pitch tendencies are marked, you will find **copies of the chorales without any pitch tendency indicators.** Use these copies to practice adjusting for the pitch tendency on your instrument by using your ear and without a visual cue. Ultimately, you want to have the pitch tendencies on your instrument memorized.

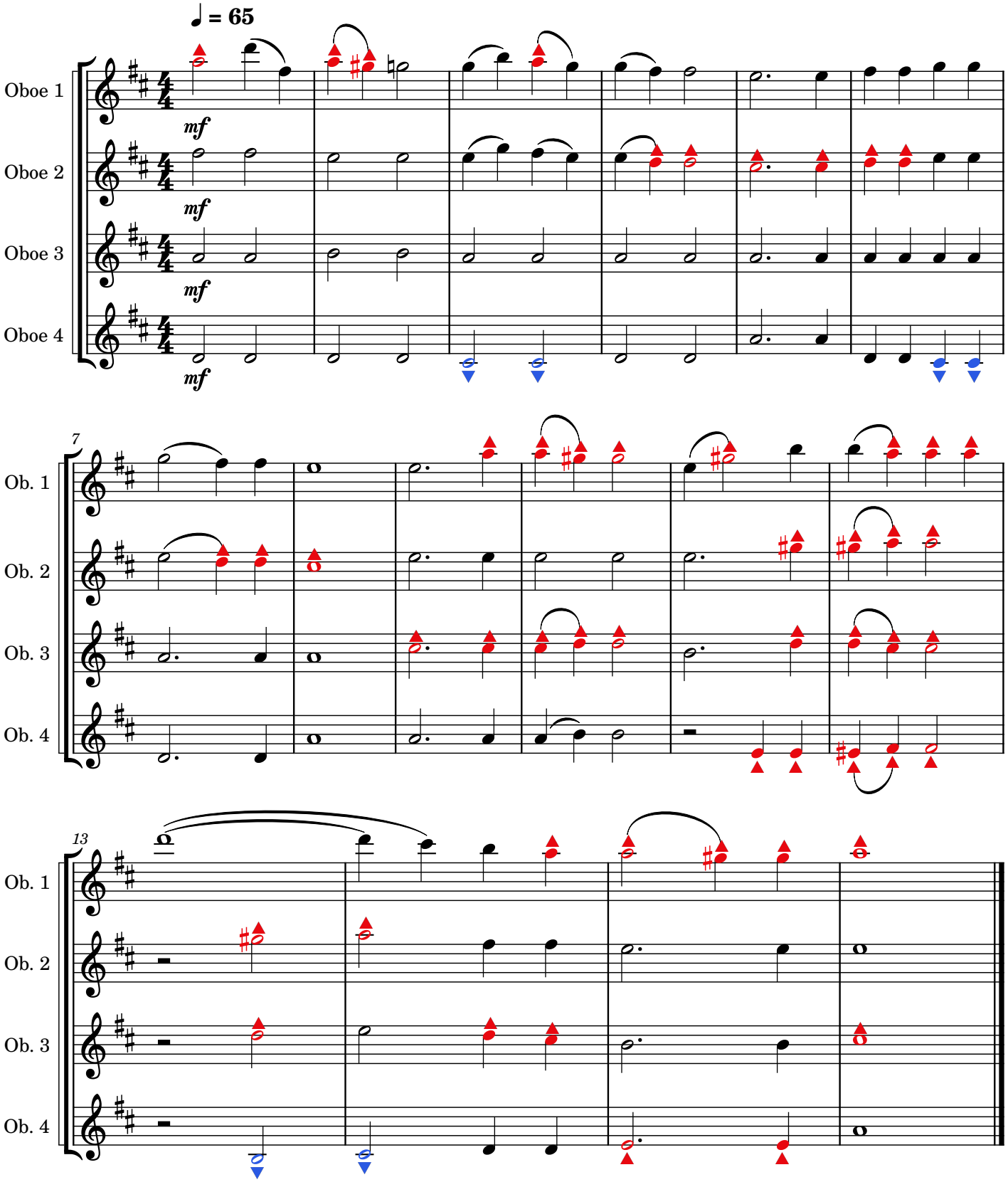
Chorales:

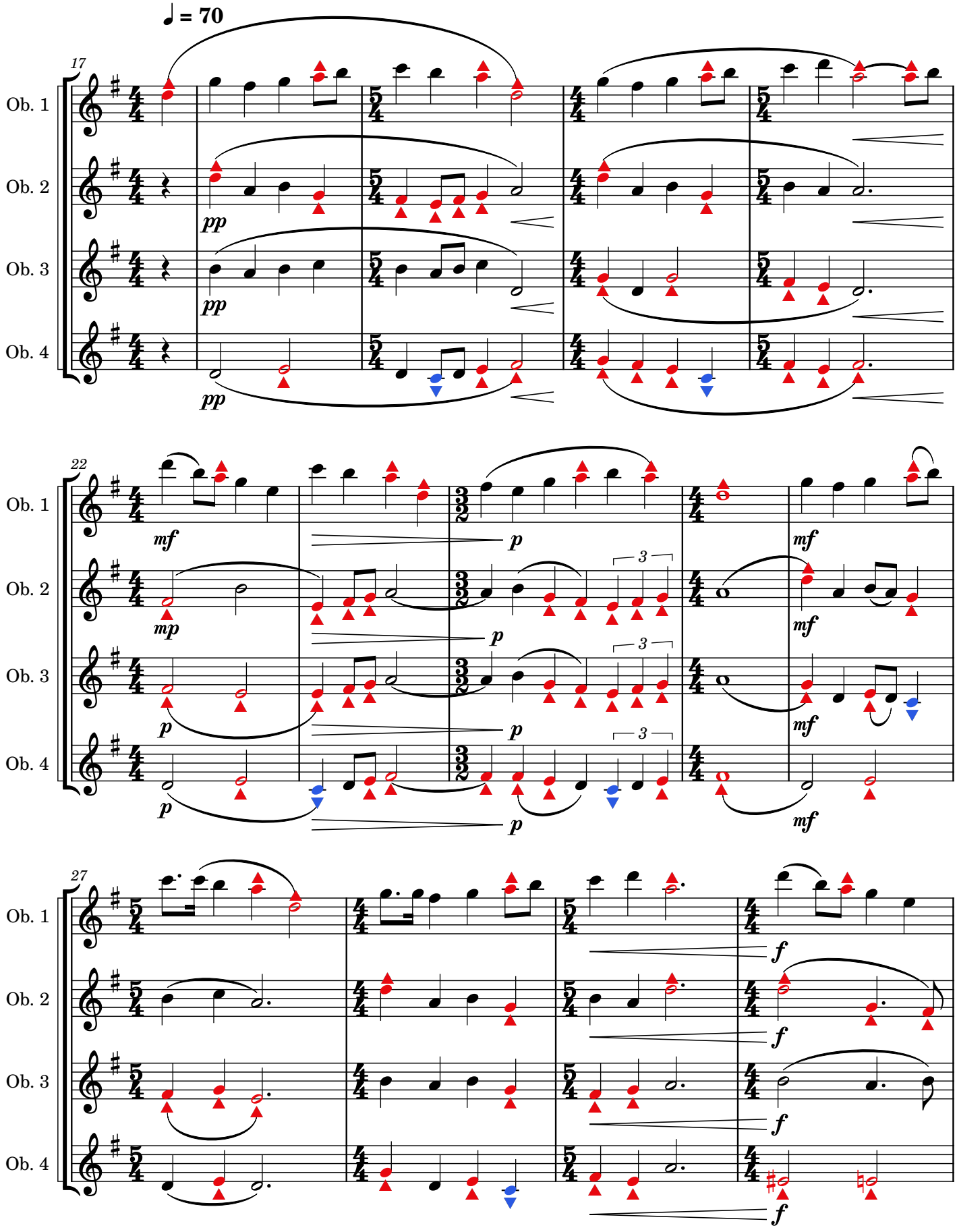
1. *Ave Verum Corpus* - Wolfgang Amadeus Mozart
2. *Horkstow Grange* - Percy Grainger
3. *In the Bleak Midwinter* - Gustav Holst
4. *Danny Boy* - Traditional
5. *Come Sweet Death* - J.S. Bach
6. *Be Still My Soul* - Jean Sibelius
7. *Salvation is Created* - Pavel Chesnokov
8. *Nimrod* - Edward Elgar
9. *Song Without Words* - Gustav Holst
10. *School Spirit* - Arr. Kessler/Judy

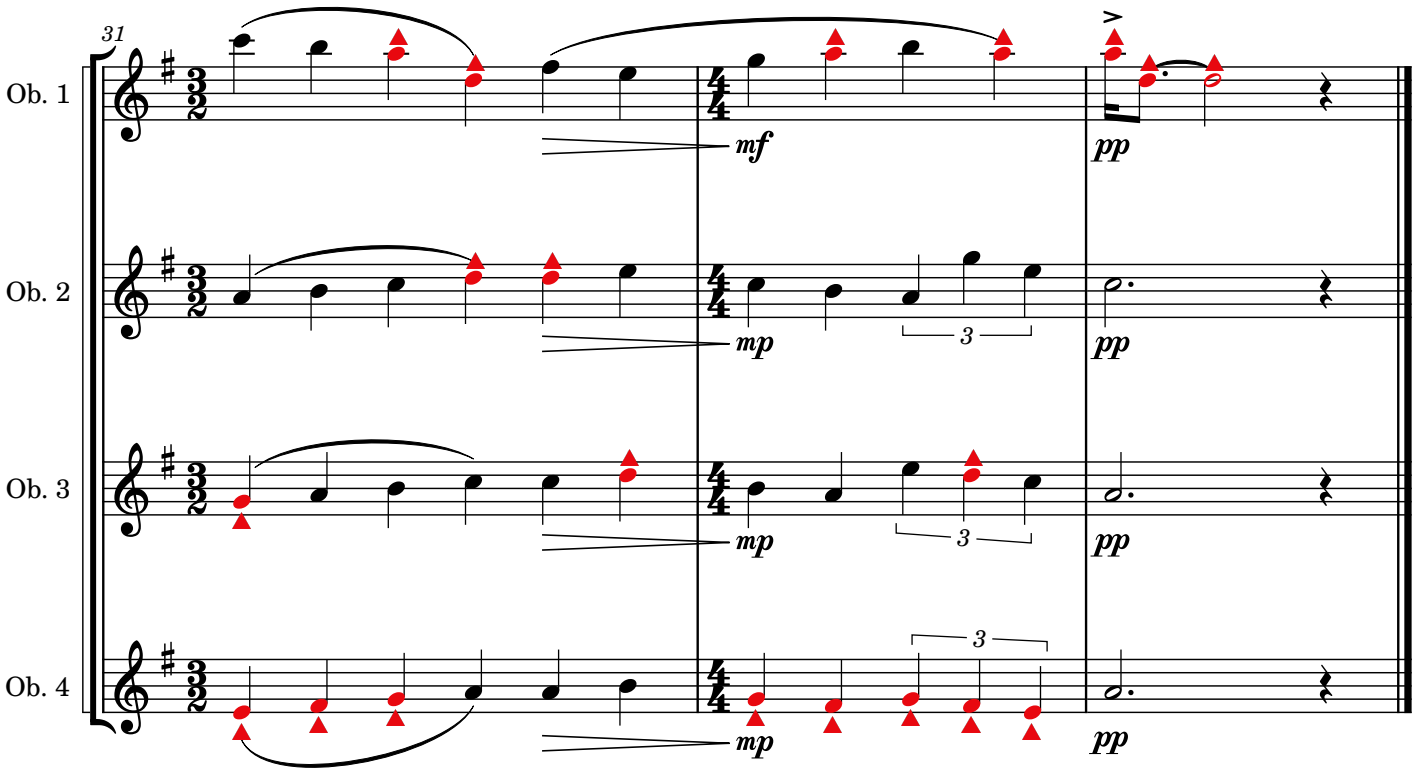
Oboe Chorales

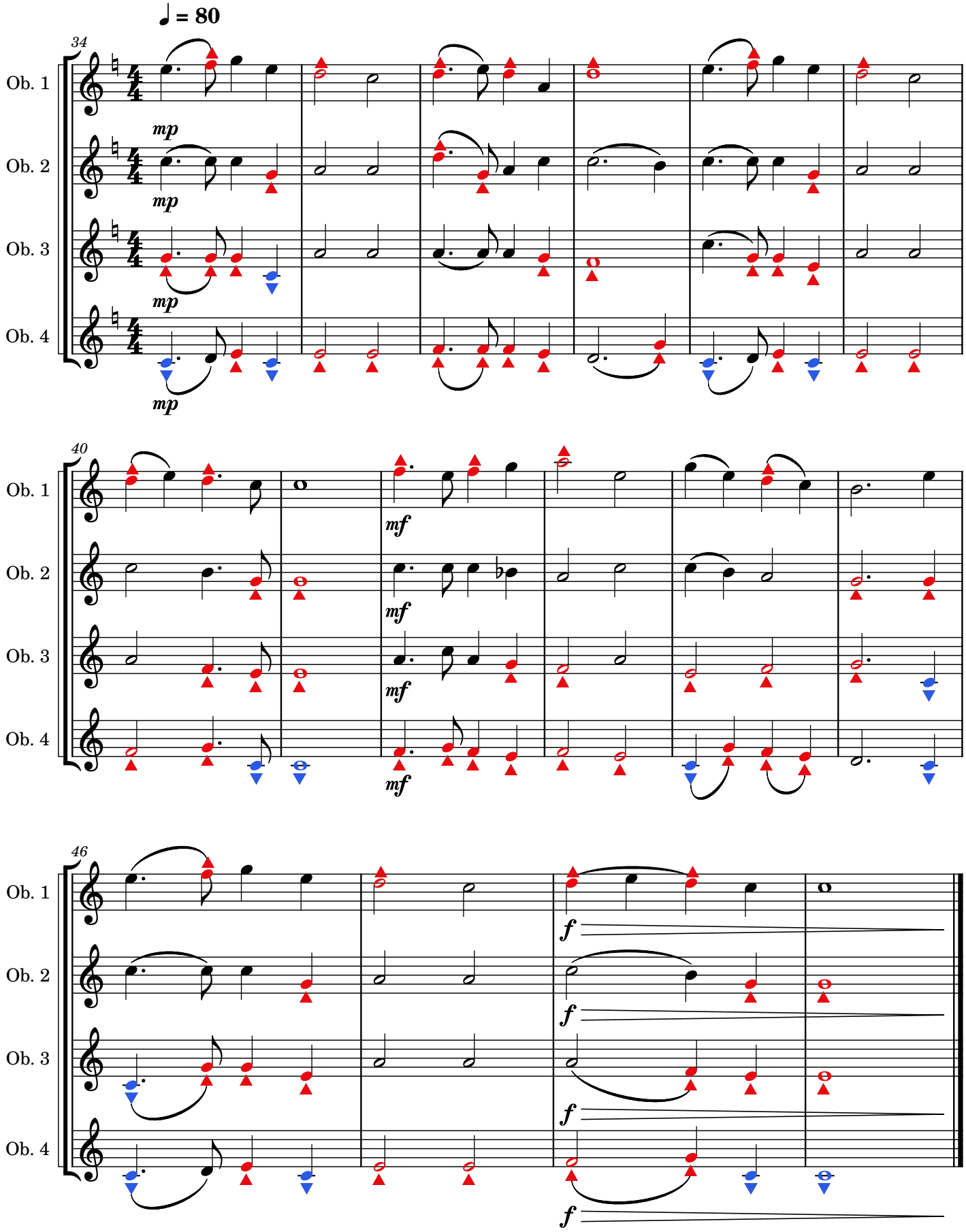
Ave Verum Corpus

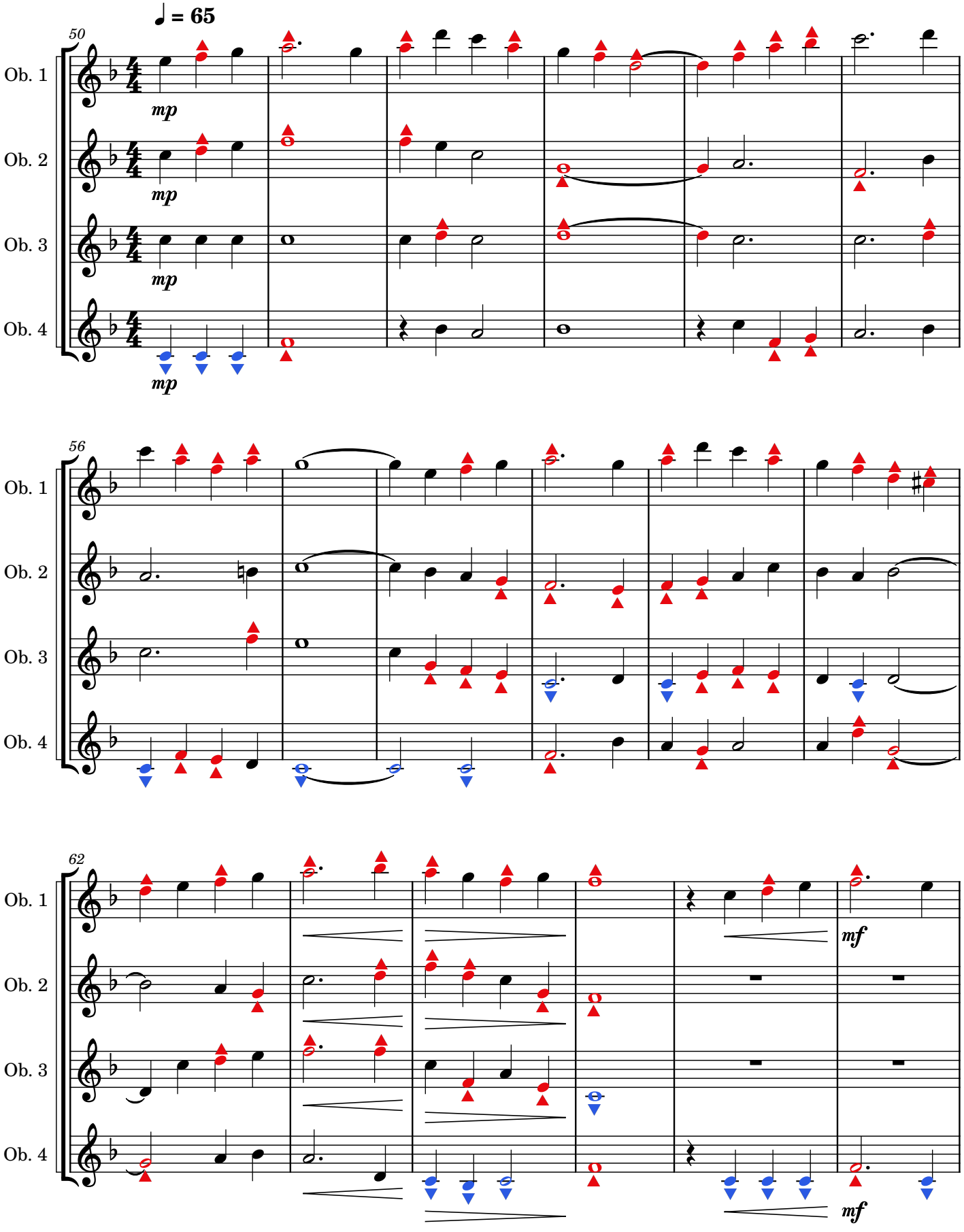
Wolfgang Amadeus Mozart

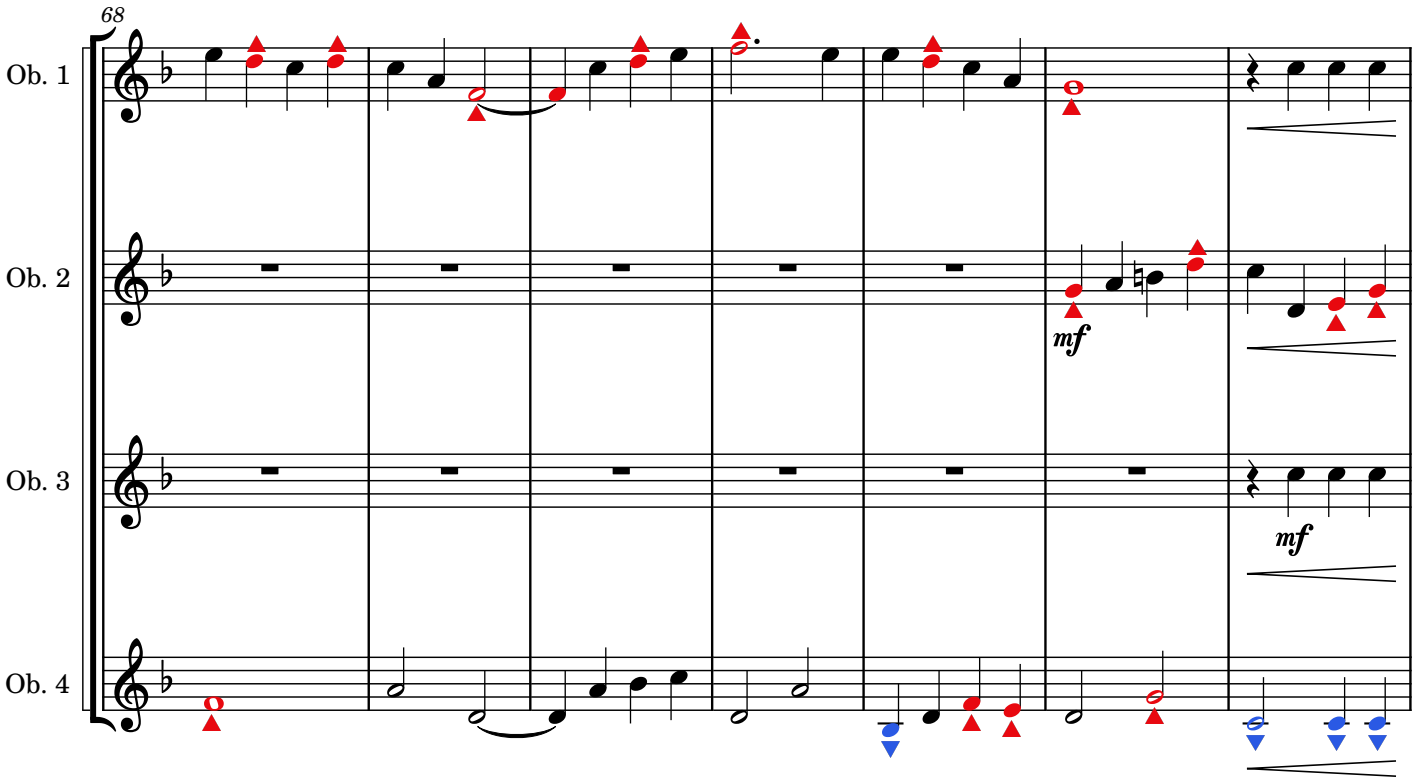


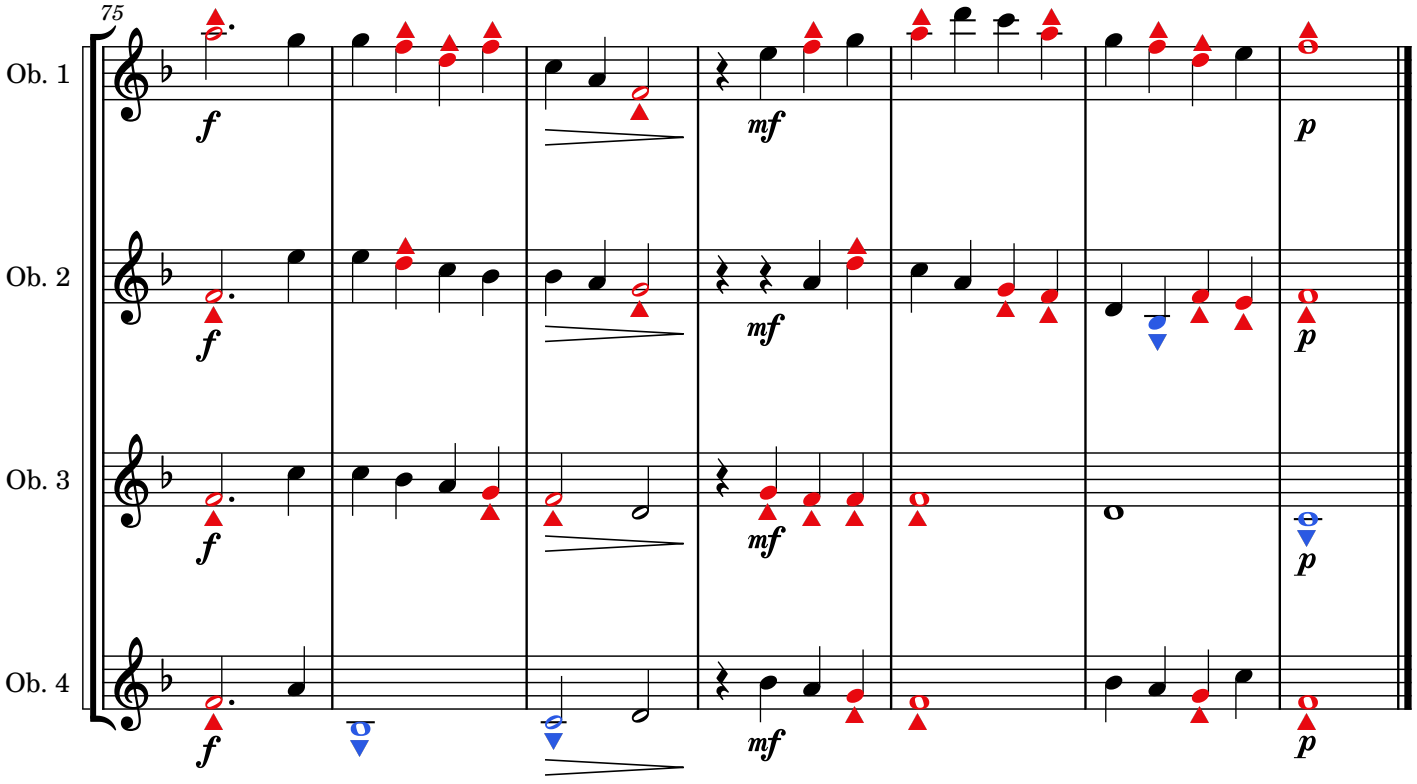

♩ = 70
17
Ob. 1
Ob. 2
Ob. 3
Ob. 4
pp
22
mf
mp
p
3
27
f

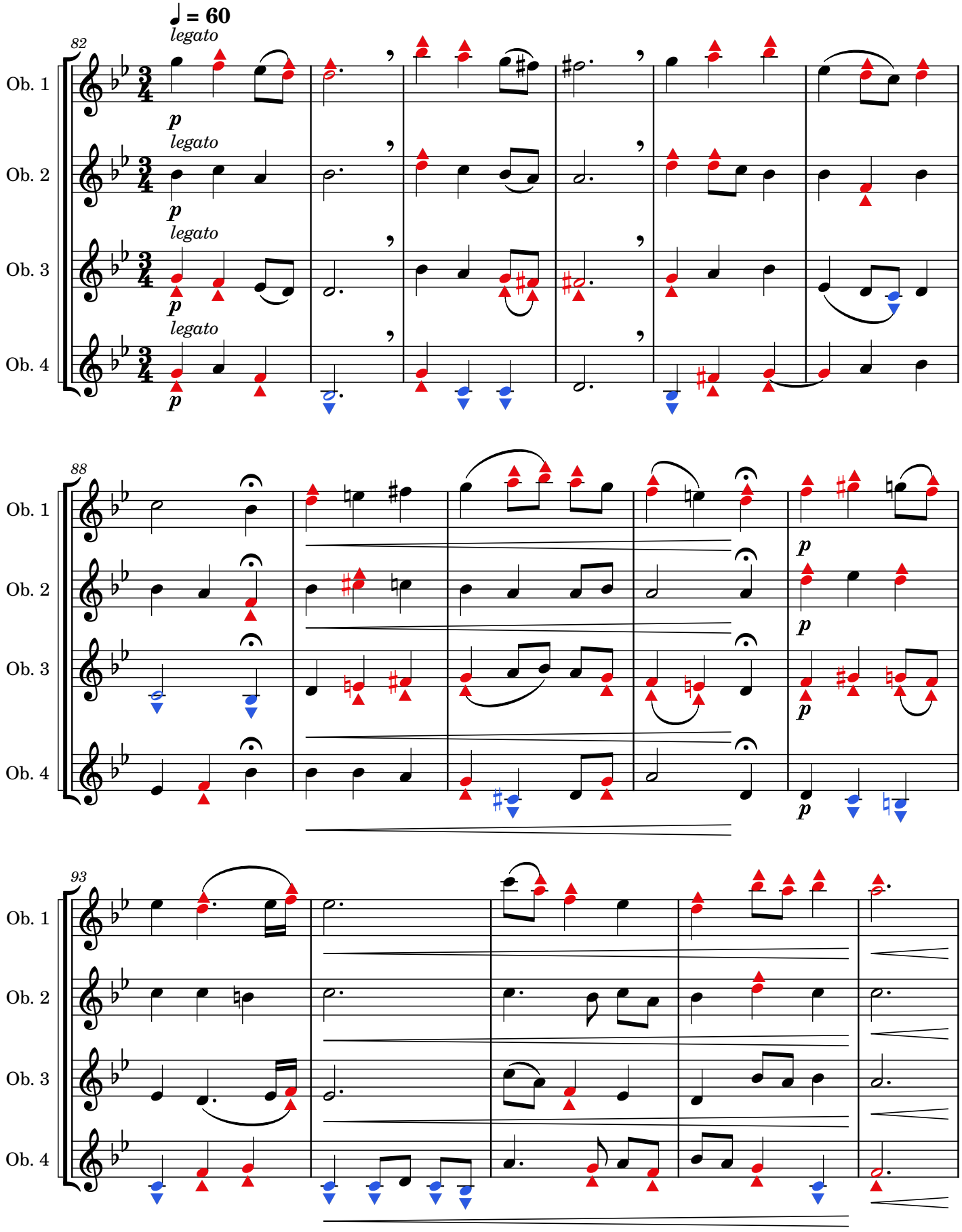

31
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mf
mp
mp
mp
3
3
3
pp
pp
pp
pp

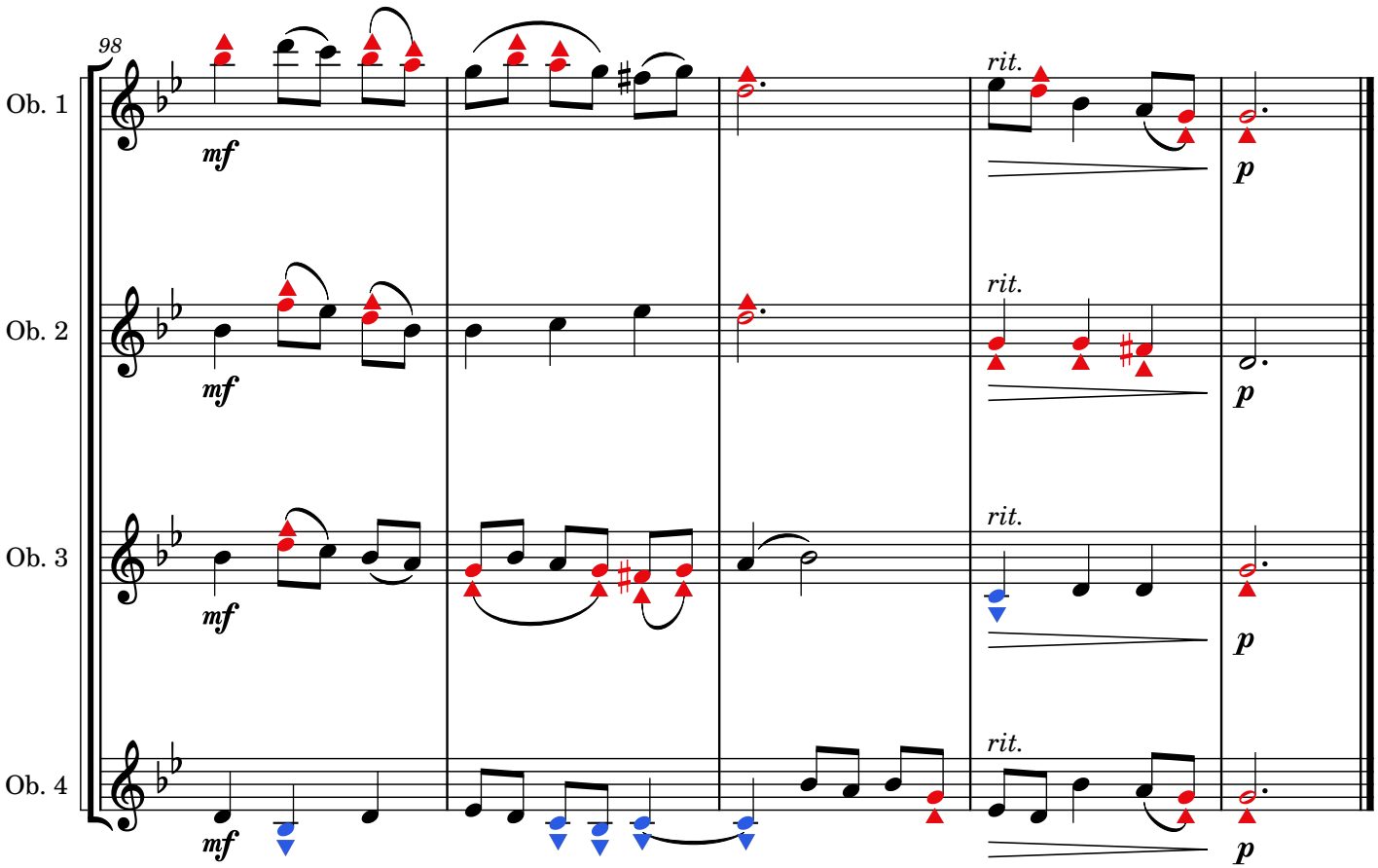

♩ = 80
34
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mp
40
mf
46
f

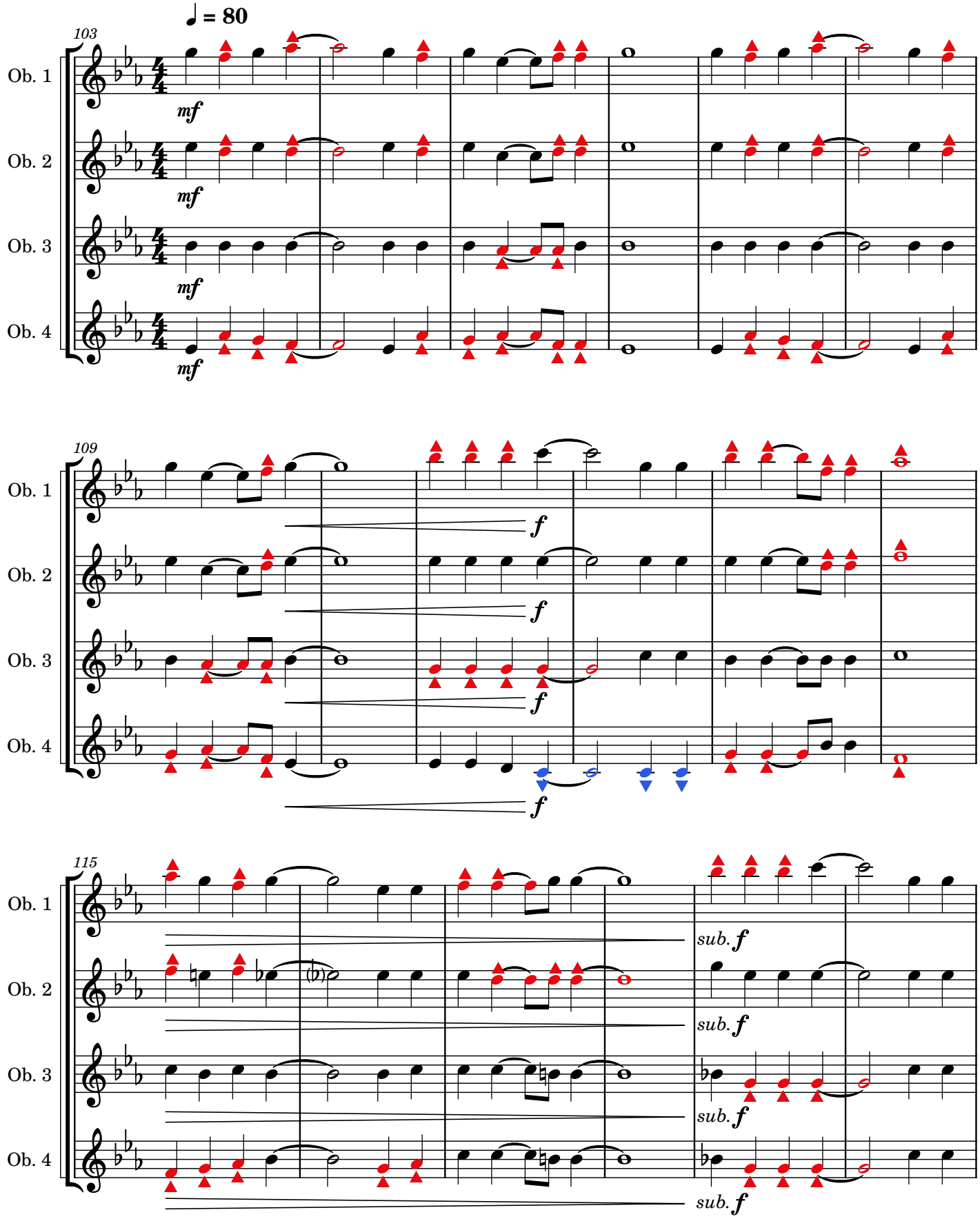

♩ = 65
50
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mp
56
62
mf

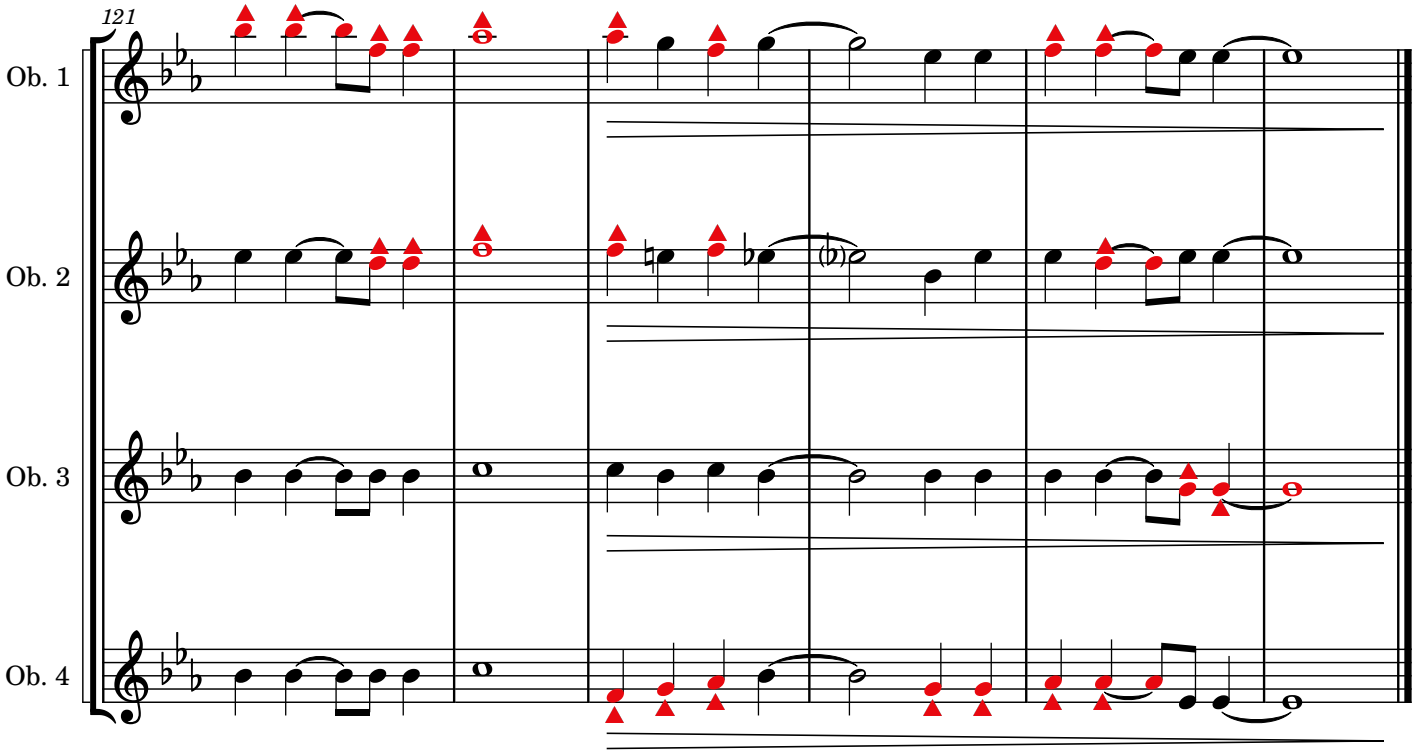

68
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mf
mf

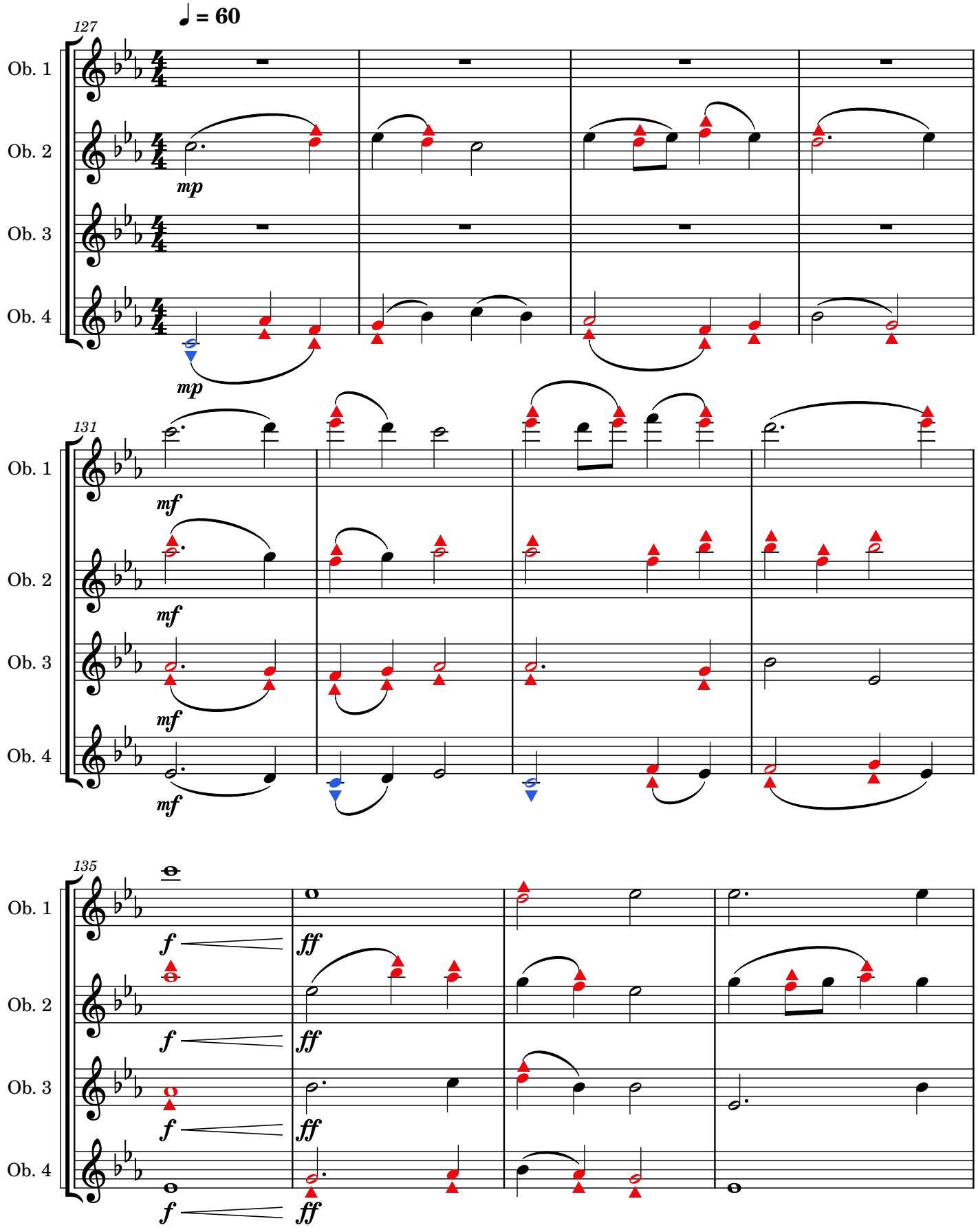

75
Ob. 1
Ob. 2
Ob. 3
Ob. 4
f
f
f
f
mf
mf
mf
mf
p
p
p
p

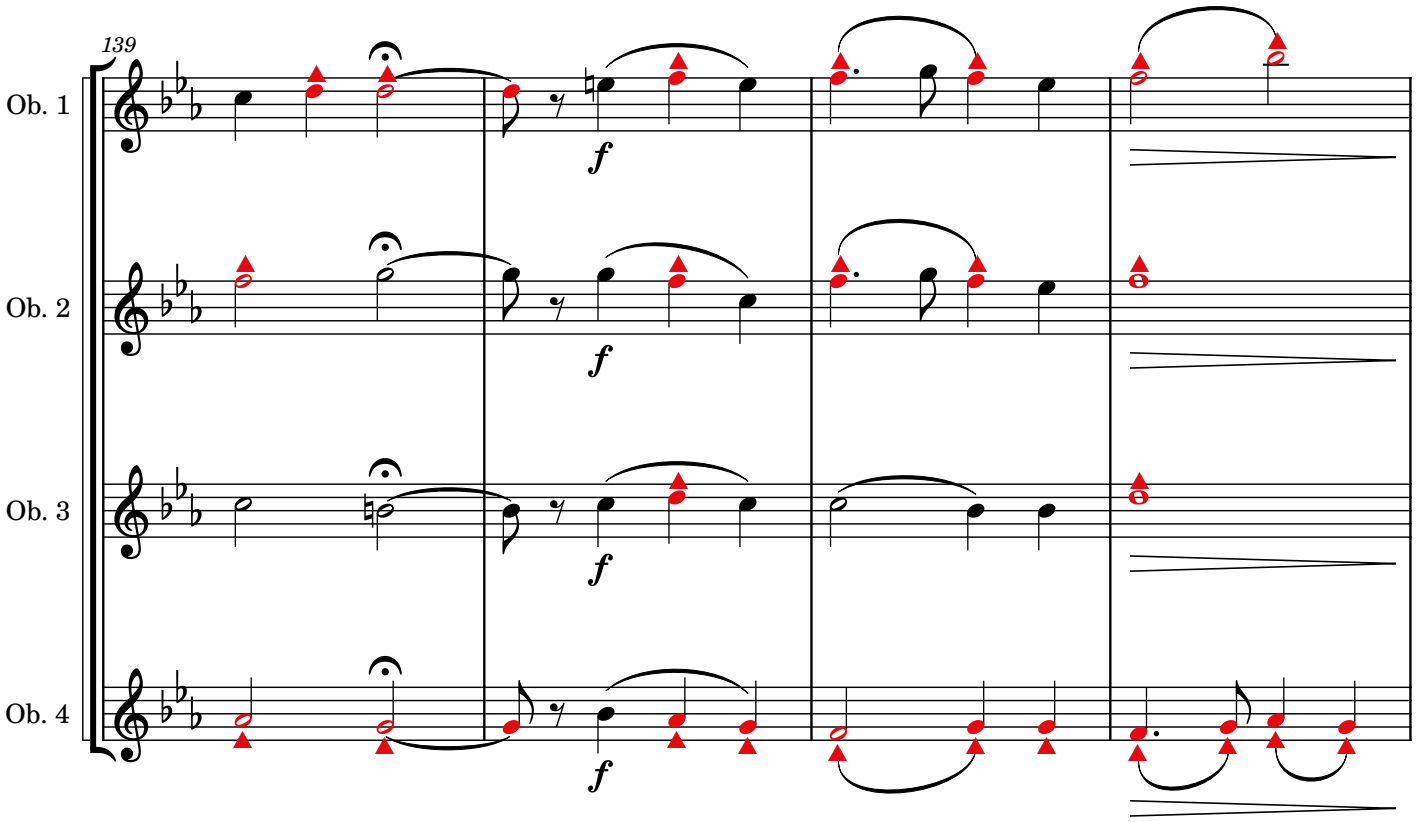

♩ = 60
82
legato
Ob. 1
Ob. 2
Ob. 3
Ob. 4
p
88
93

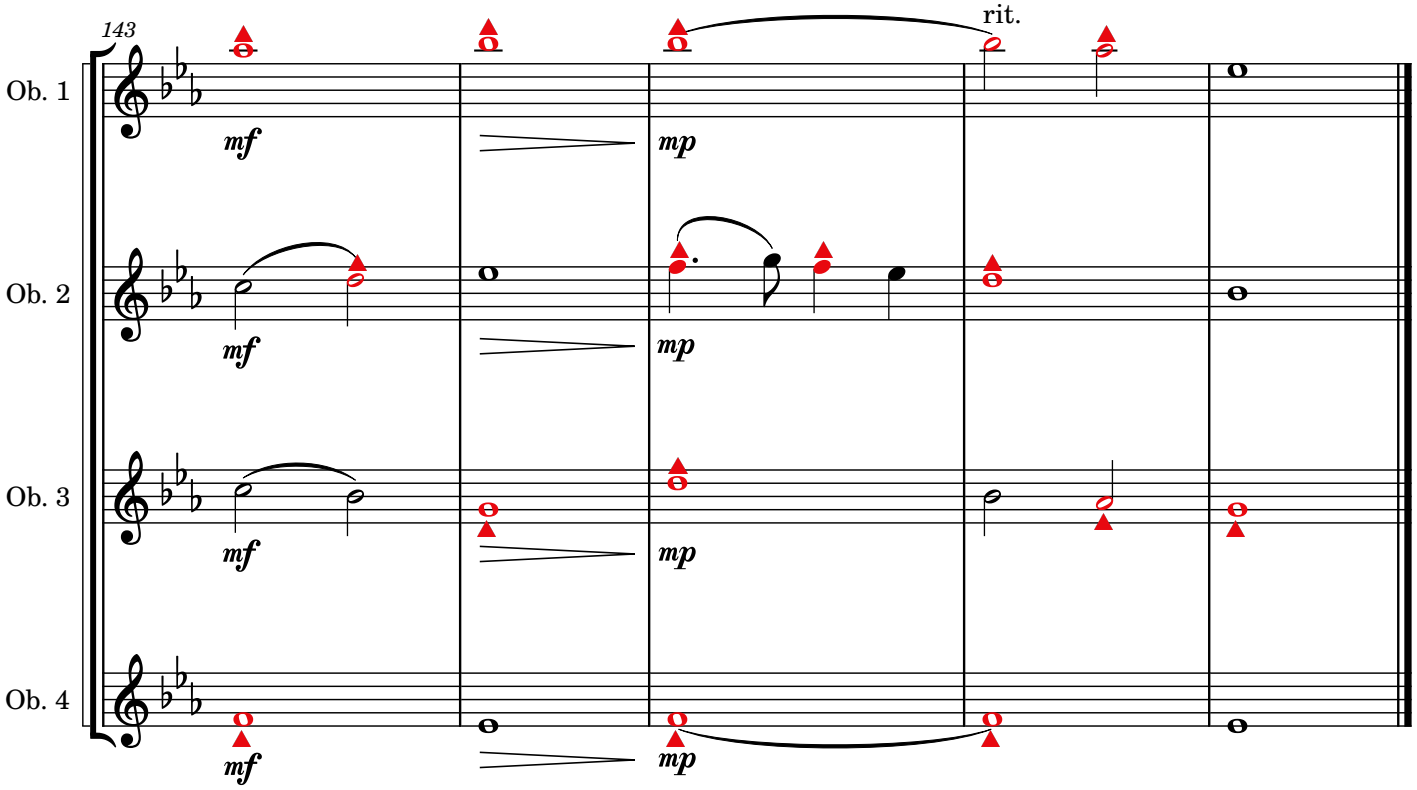

98
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mf
rit.
p

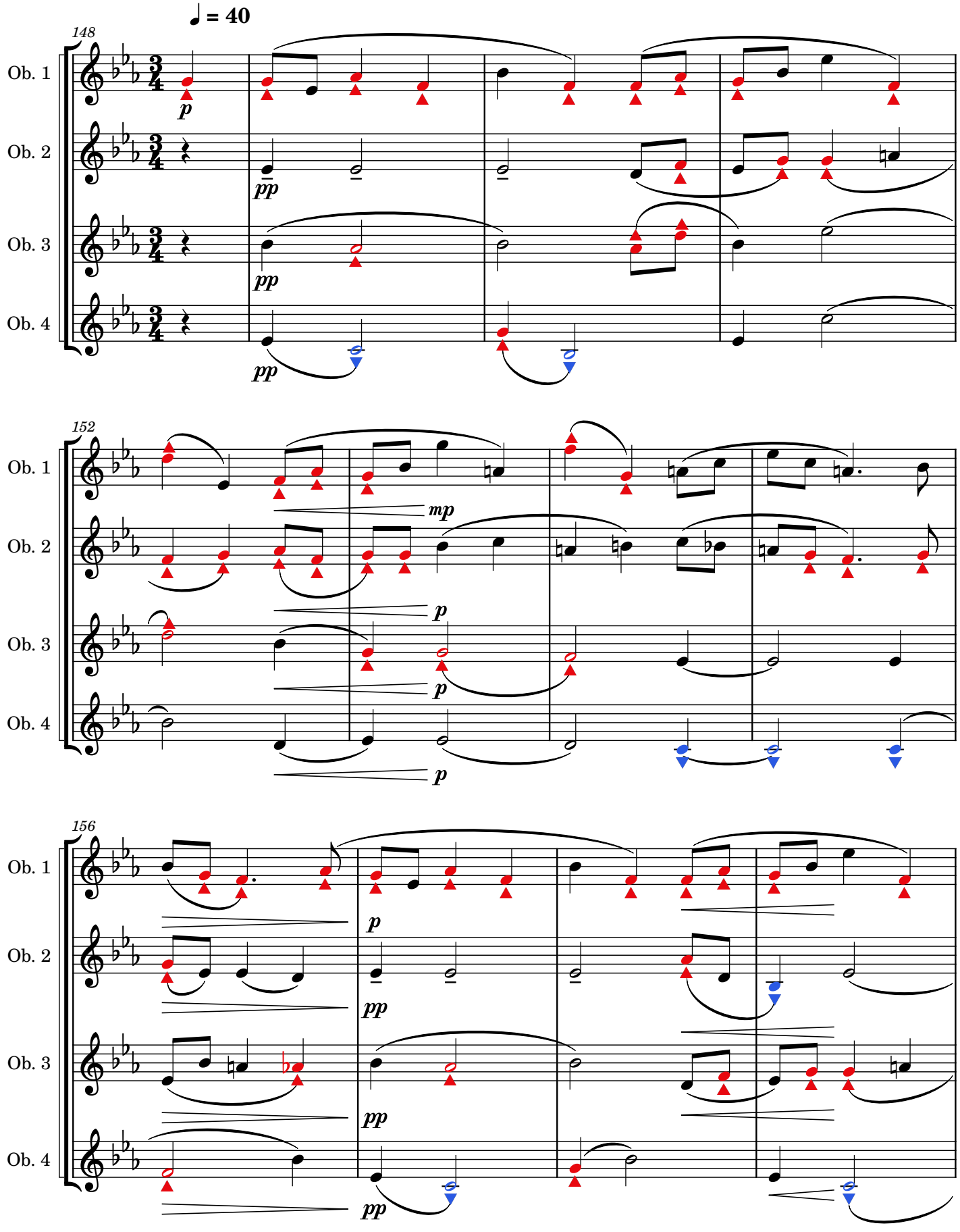

♩ = 80
103
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mf
109
f
115
sub. f

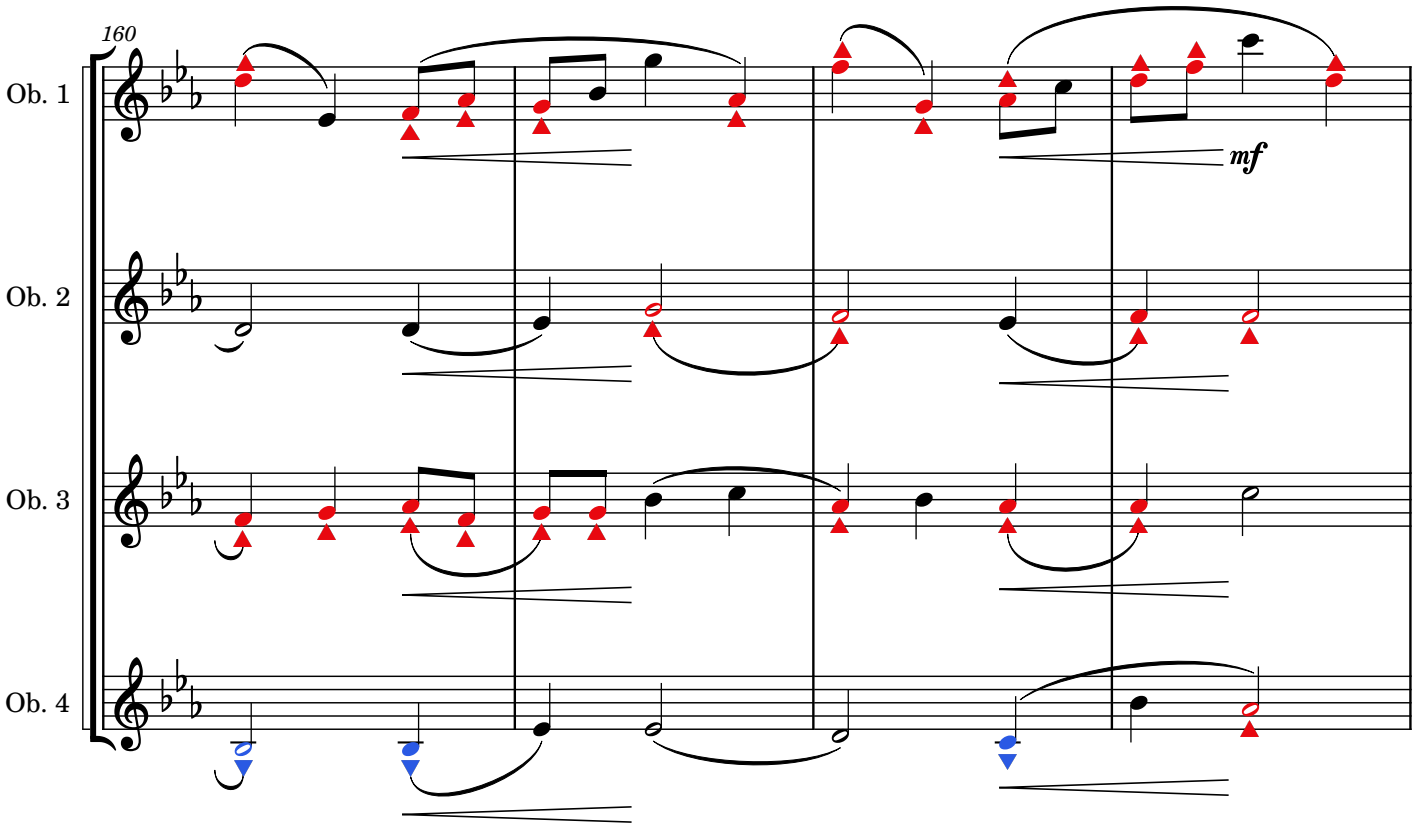

121
Ob. 1
Ob. 2
Ob. 3
Ob. 4

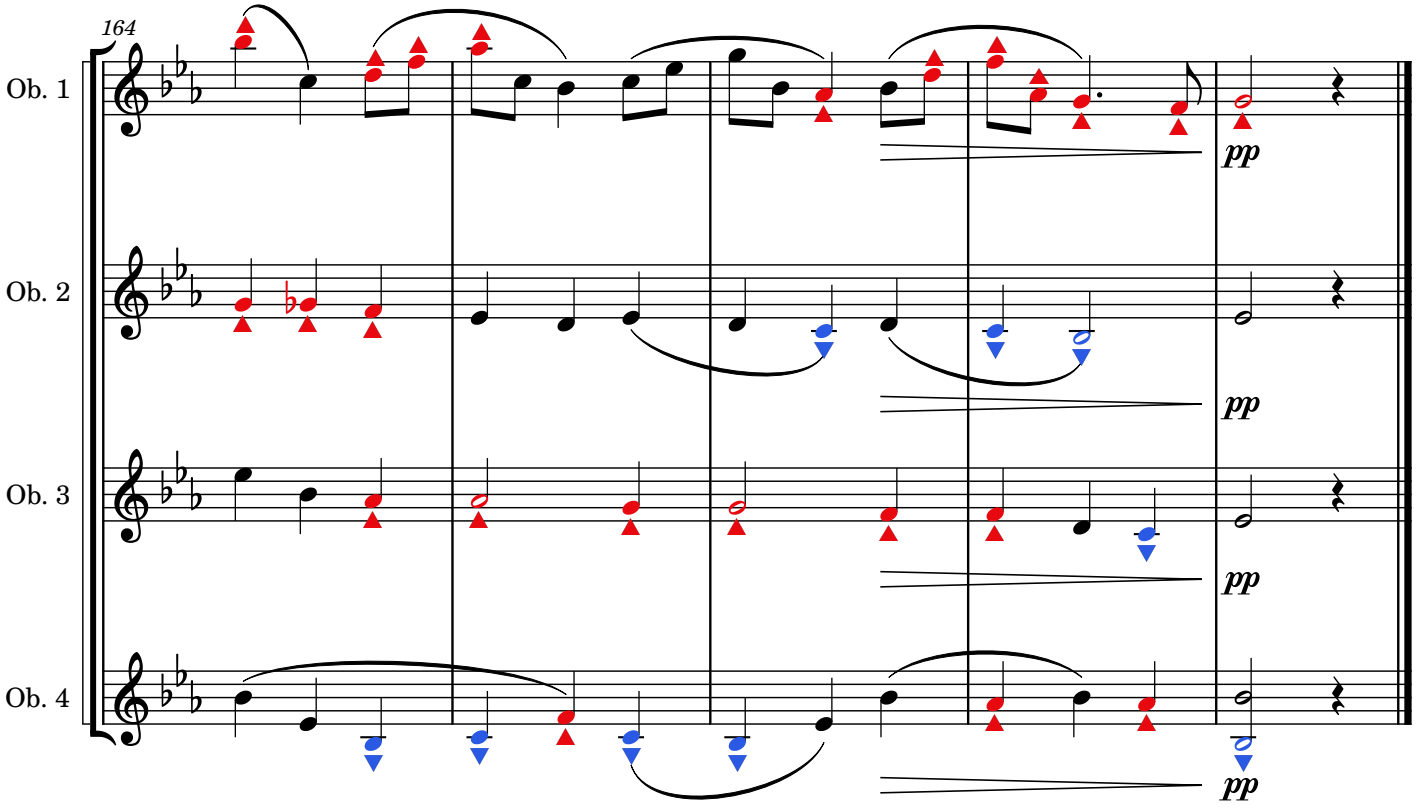

♩ = 60
127
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mp
mp
131
mf
mf
mf
mf
135
f
ff
f
ff
f
ff
f
ff

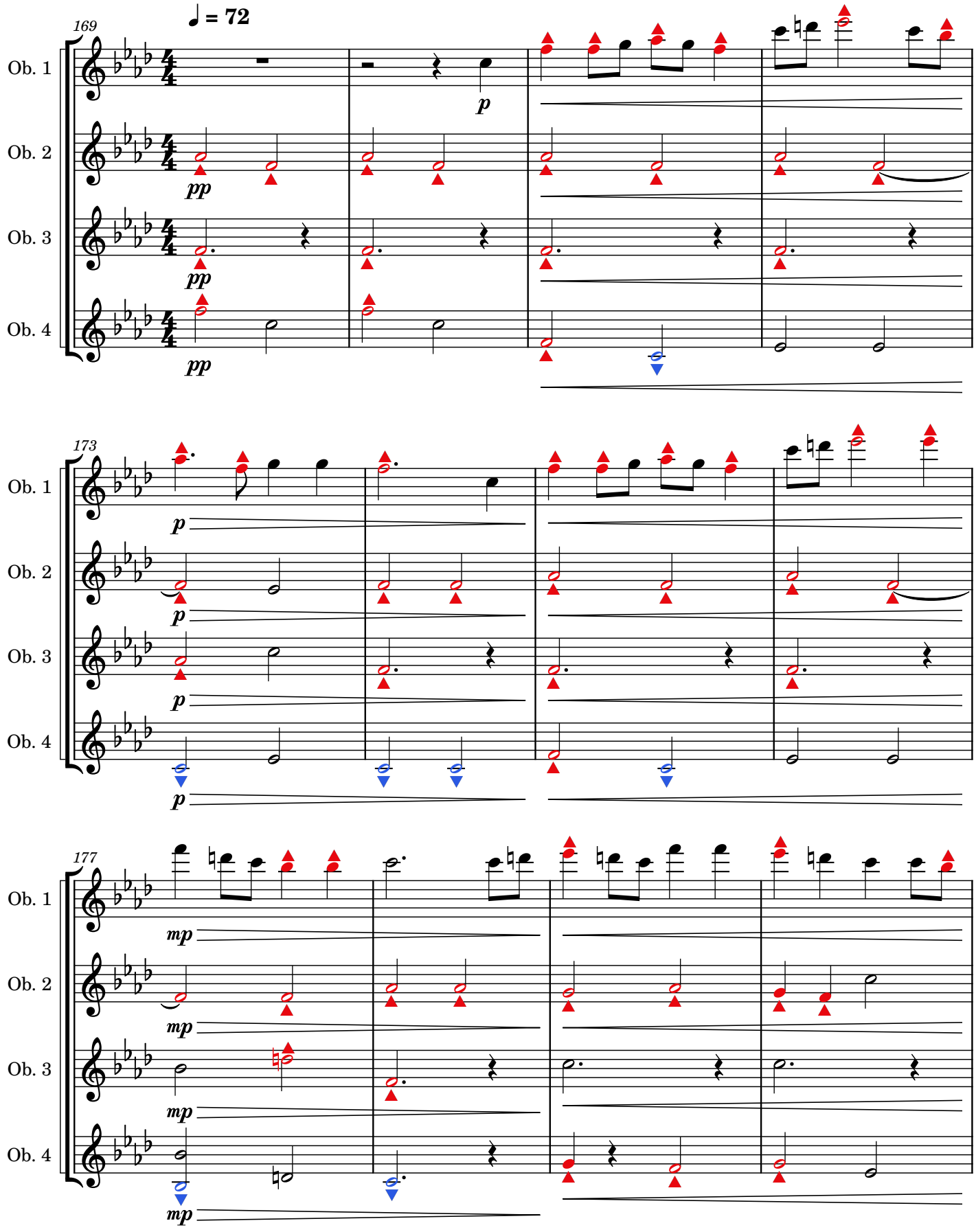

139
Ob. 1
Ob. 2
Ob. 3
Ob. 4
f

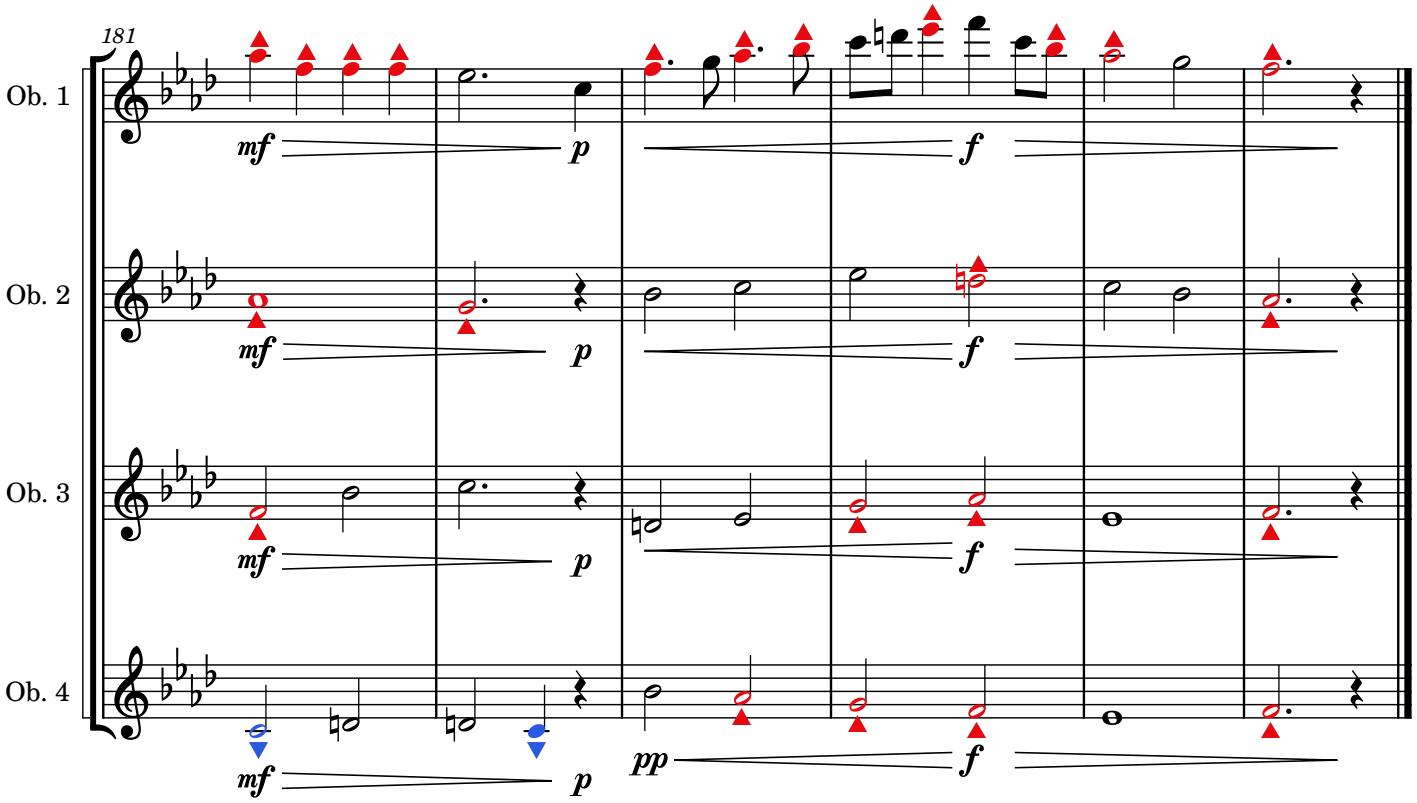

143
rit.
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mf
mp

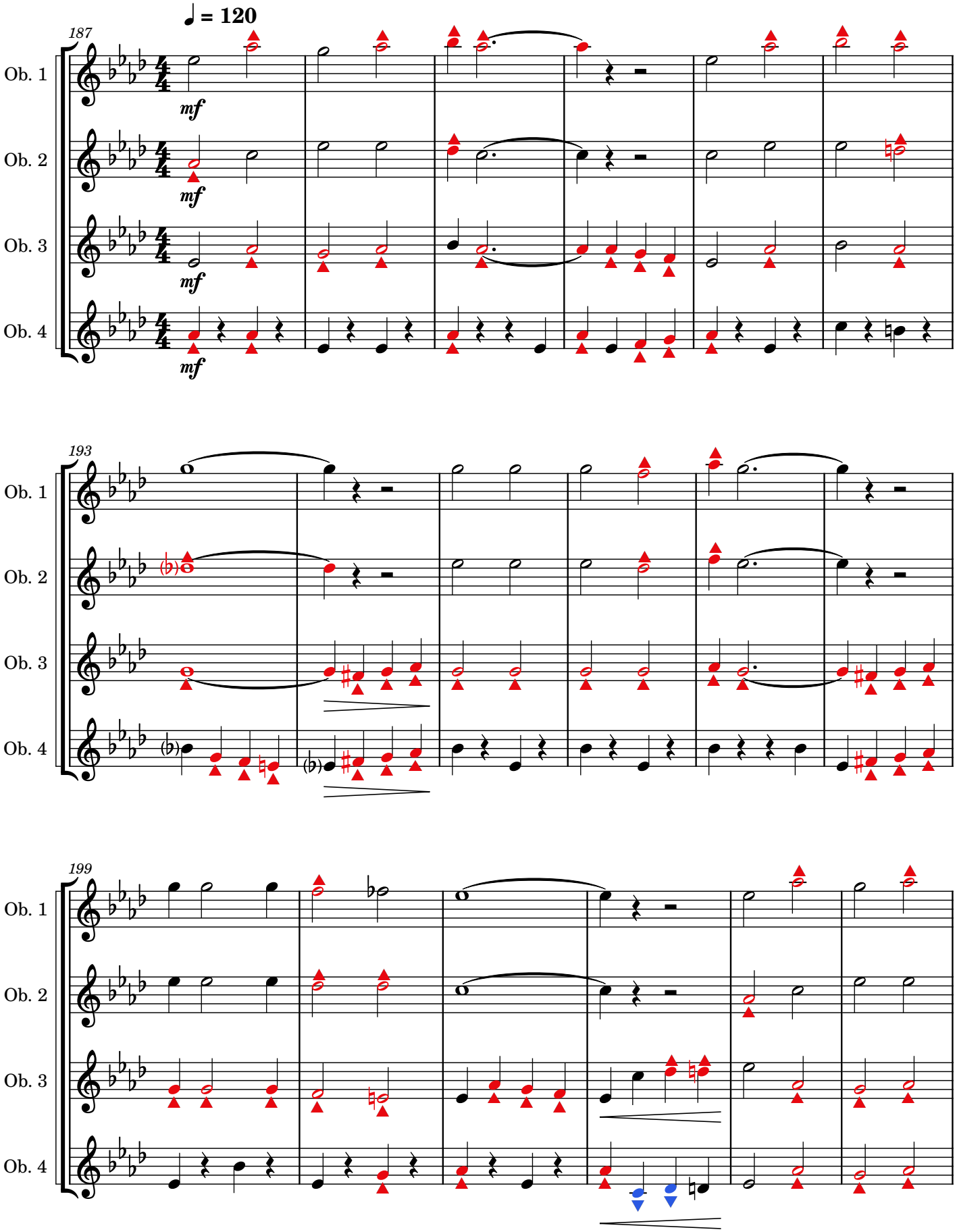

♩ = 40
148
Ob. 1
Ob. 2
Ob. 3
Ob. 4
p
pp
pp
pp
152
mp
p
p
p
156
p
pp
pp
pp

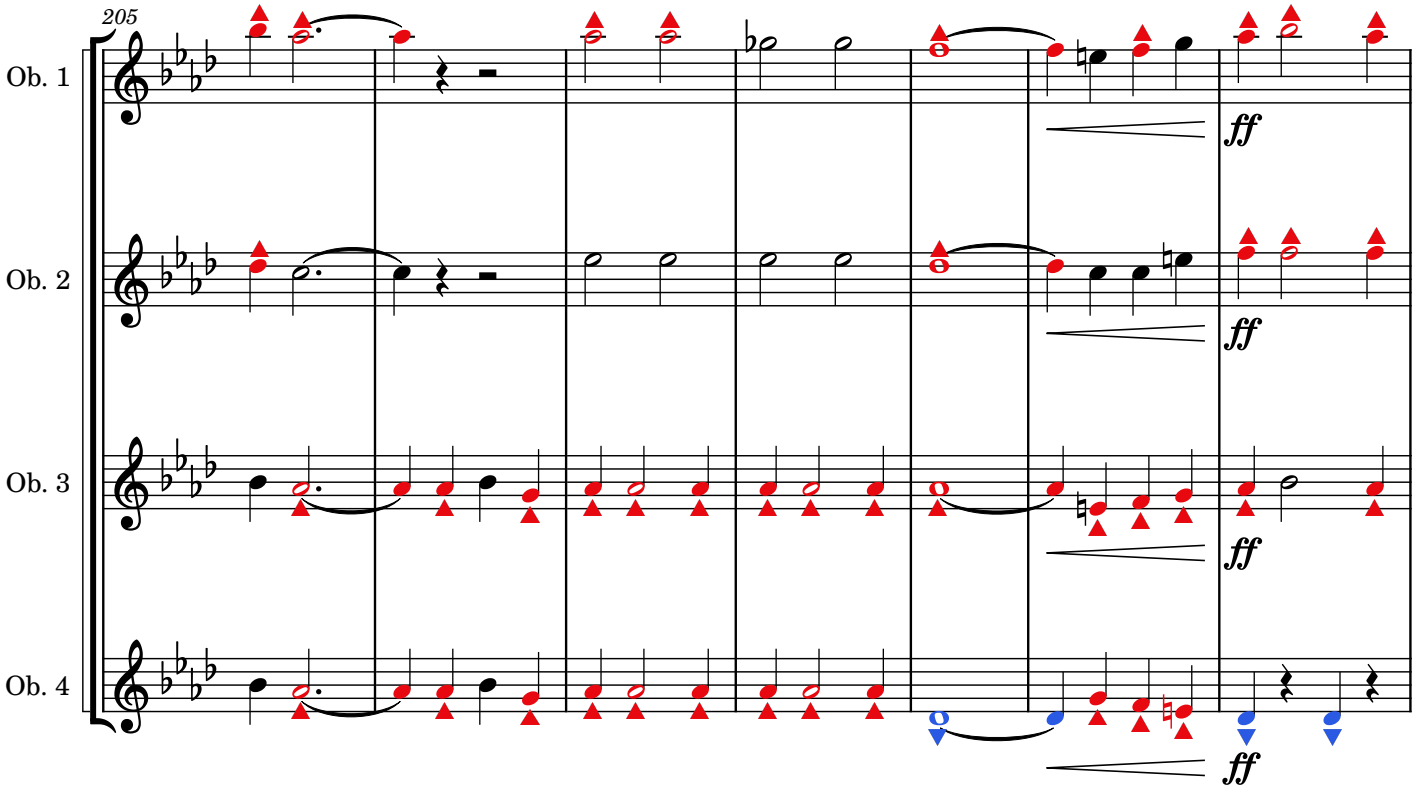

160
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mf

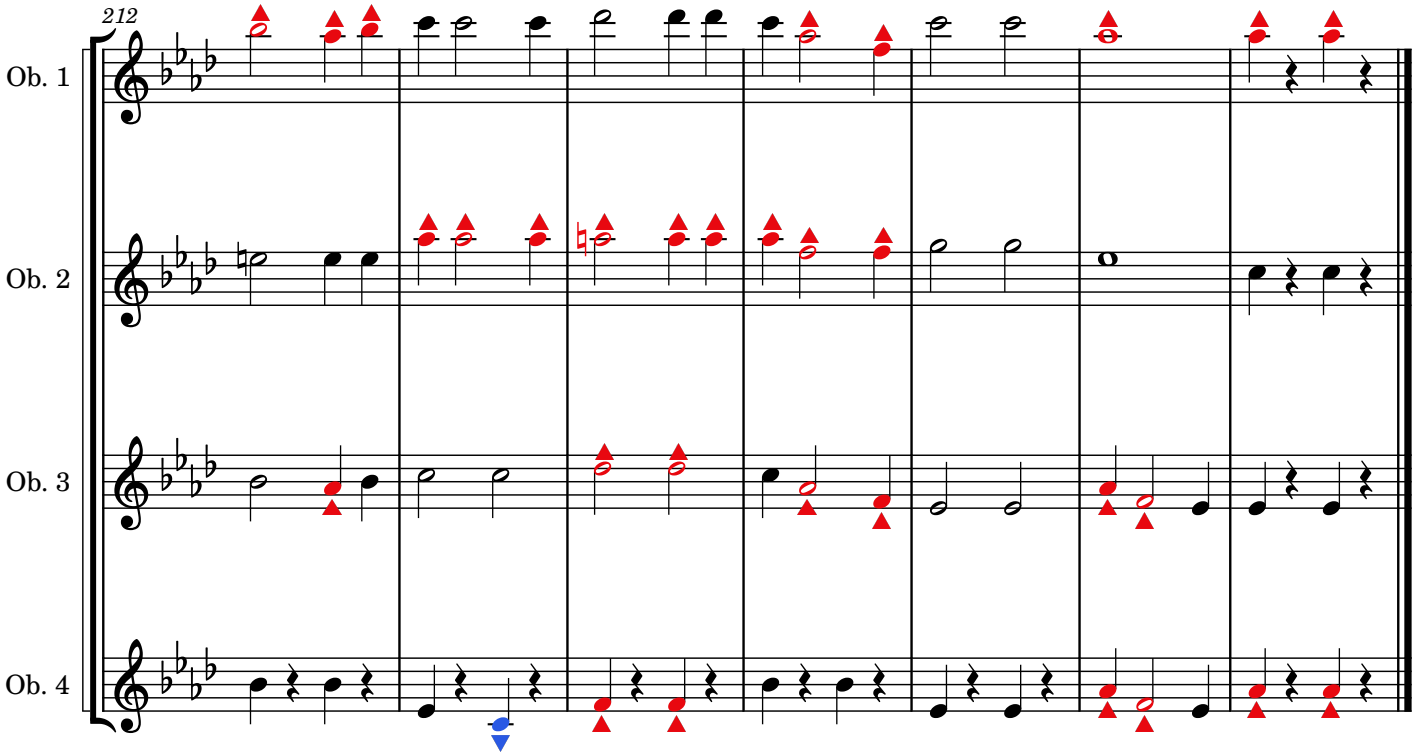

164
Ob. 1
Ob. 2
Ob. 3
Ob. 4
pp
pp
pp
pp


169
♩ = 72
Ob. 1
Ob. 2
Ob. 3
Ob. 4
p
pp
173
177
mp


181
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mf
p
f
pp


♩ = 120
187
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mf
193
199

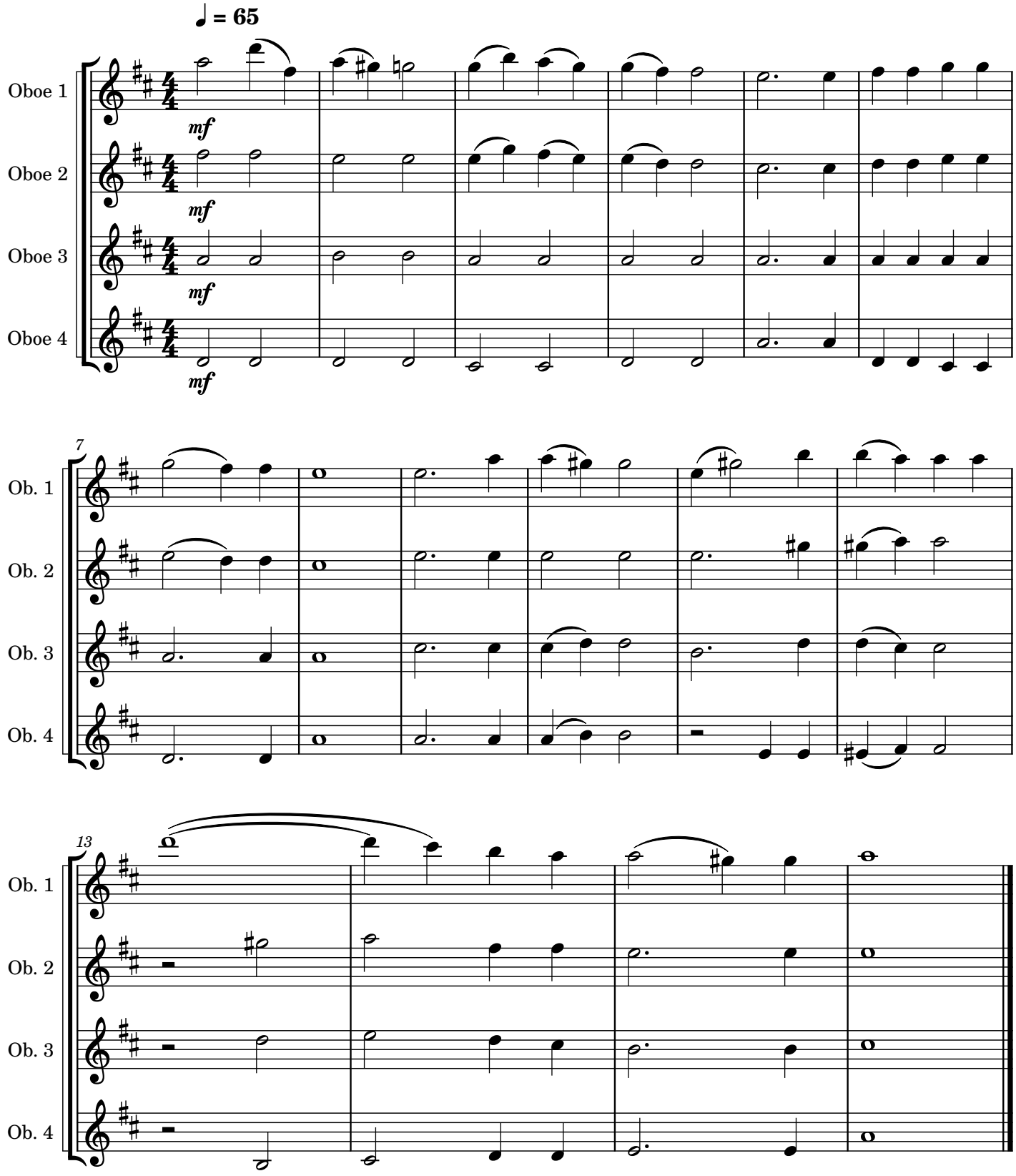

205
Ob. 1
Ob. 2
Ob. 3
Ob. 4
ff
ff
ff
ff

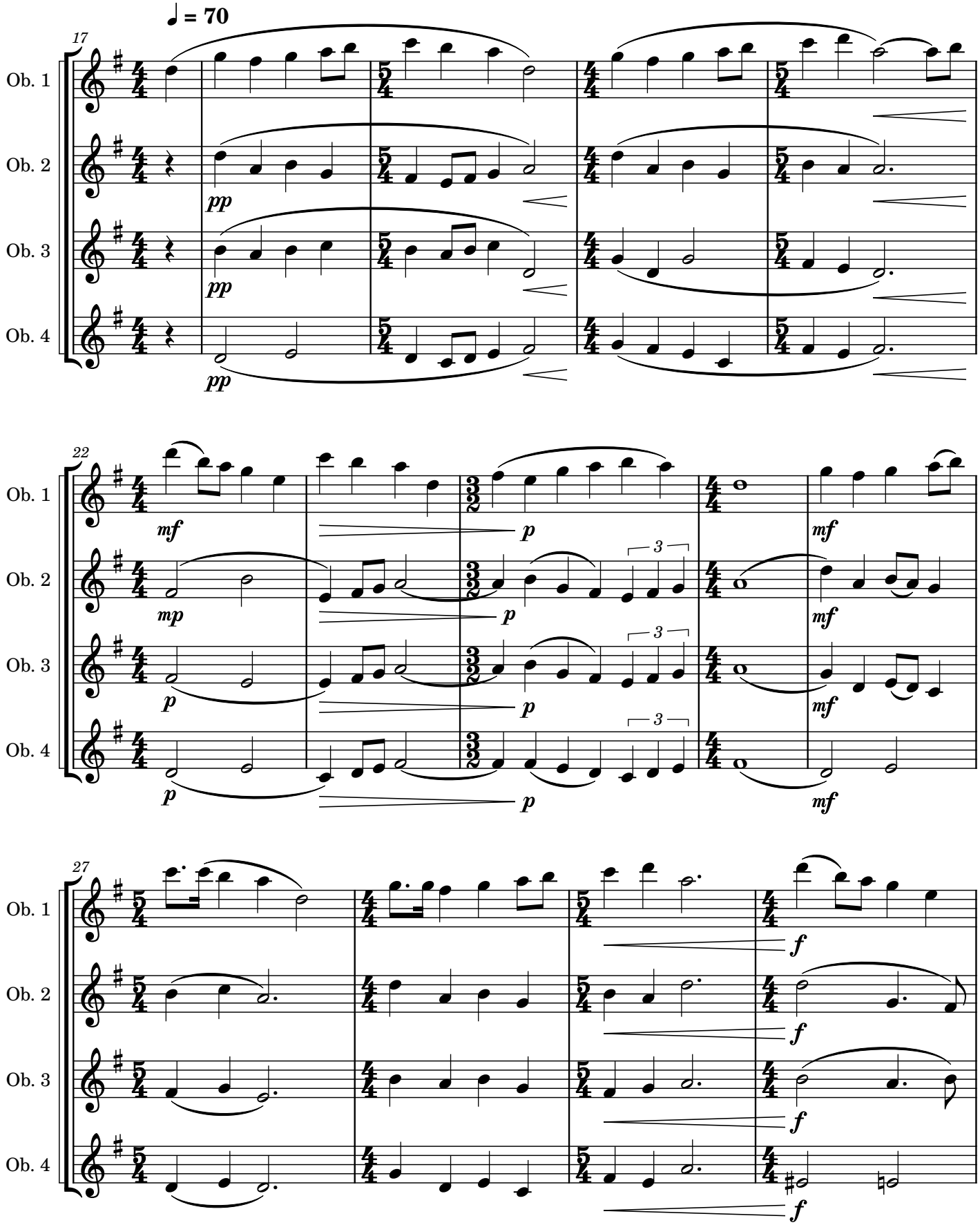

212
Ob. 1
Ob. 2
Ob. 3
Ob. 4

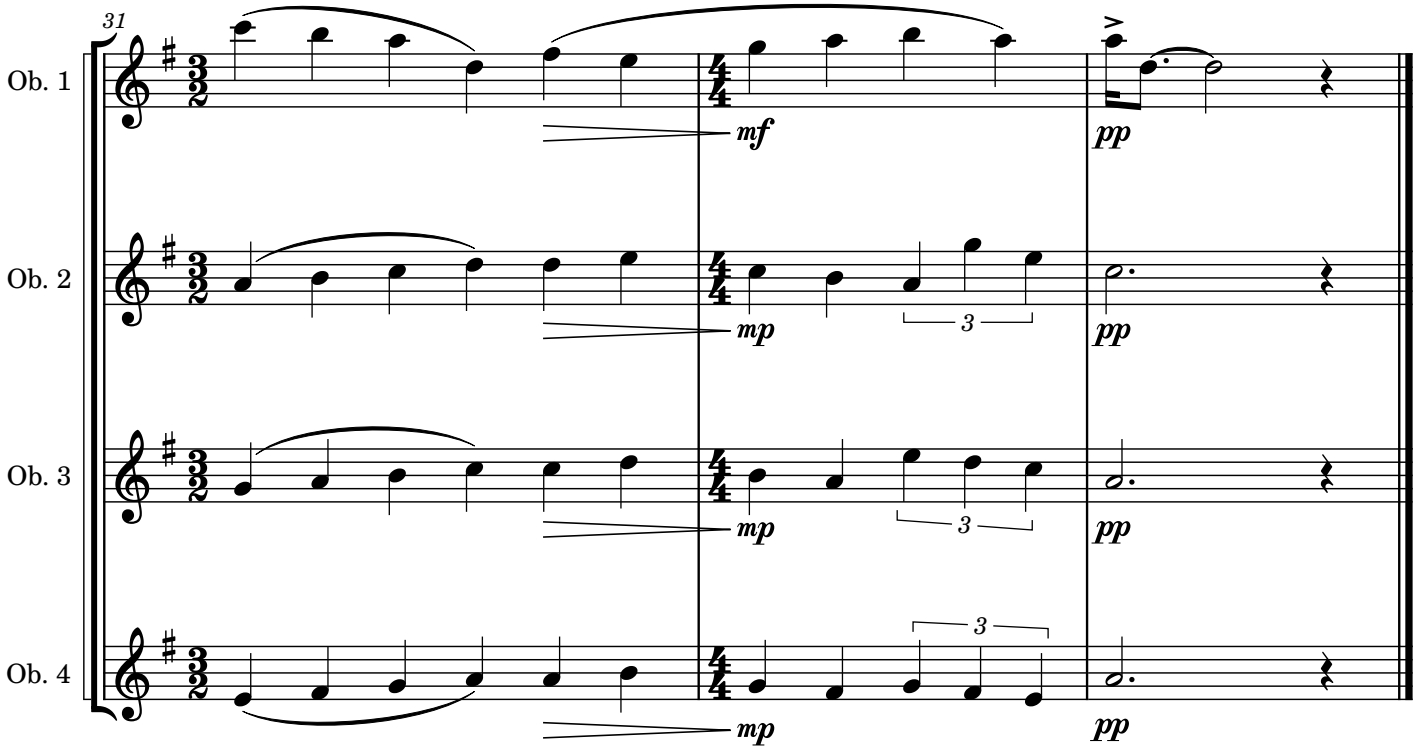
Oboe Chorales

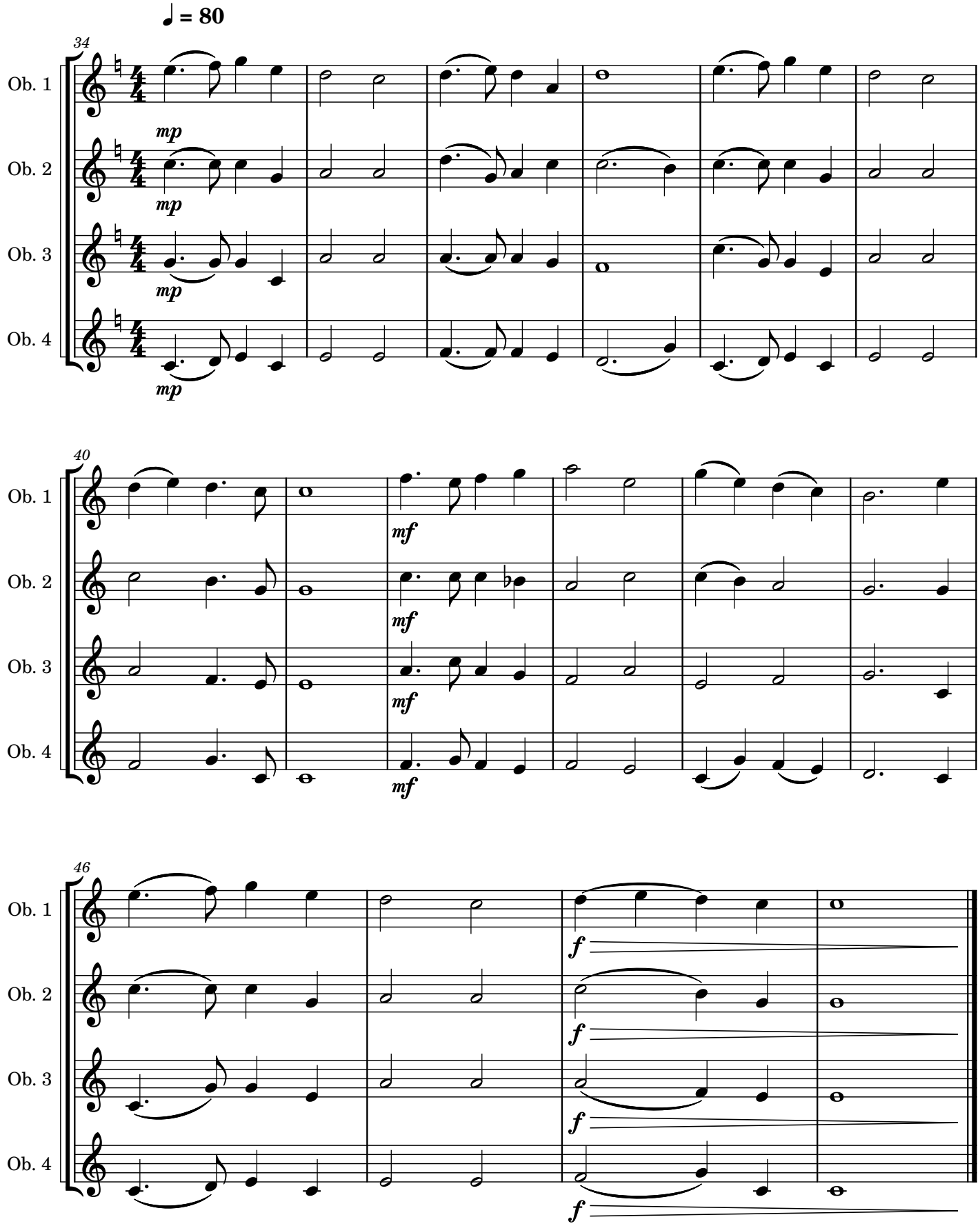
Ave Verum Corpus

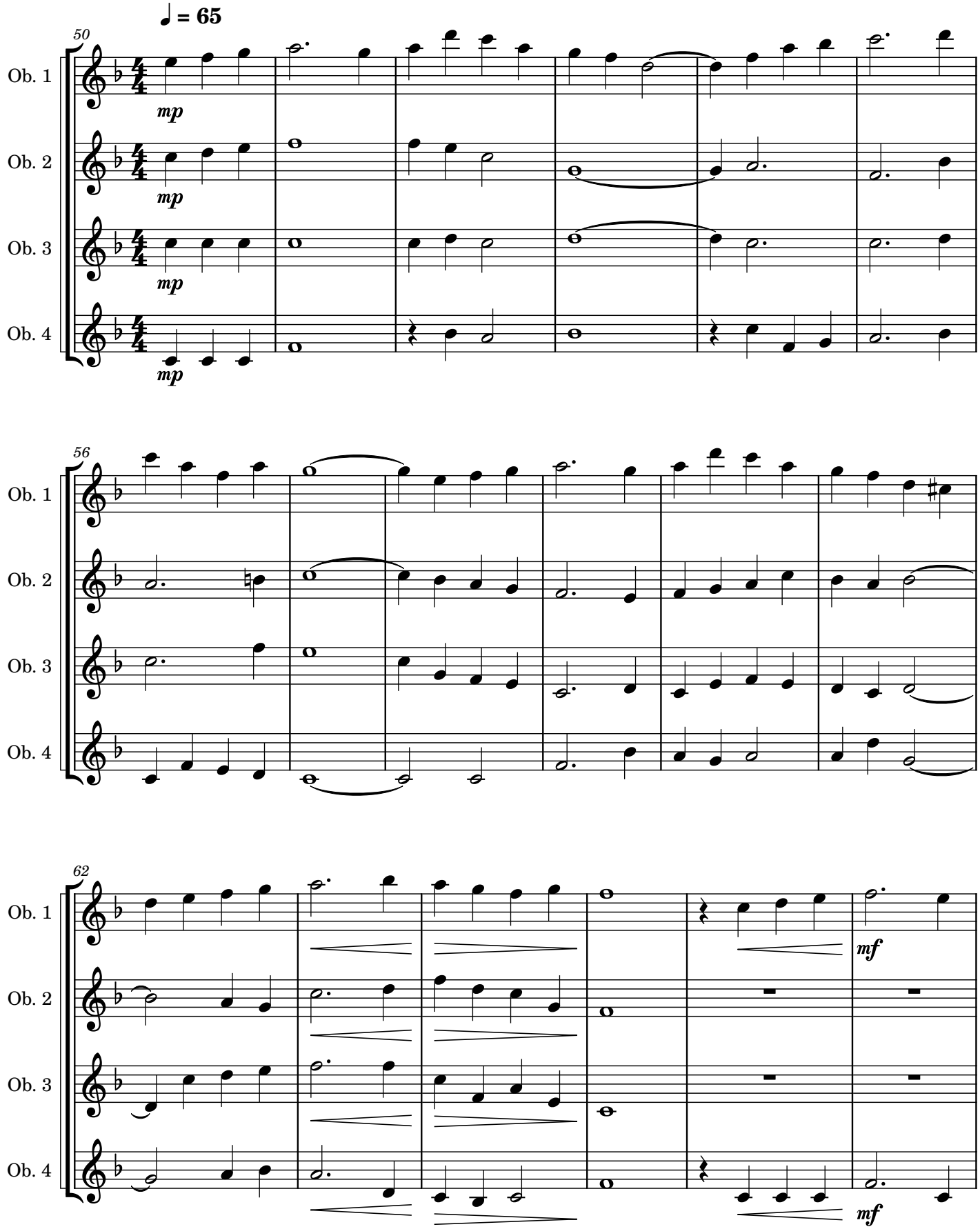
Wolfgang Amadeus Mozart

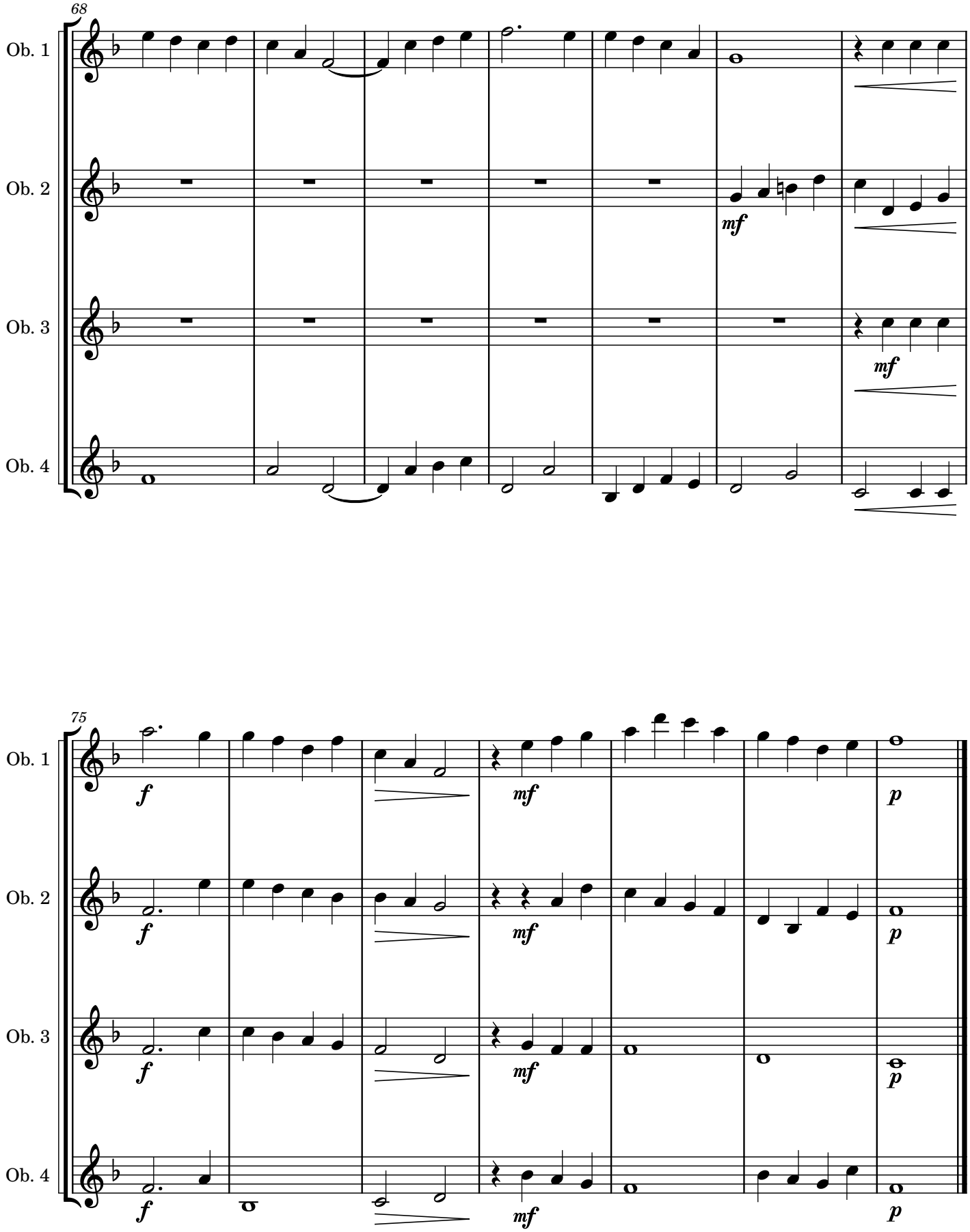


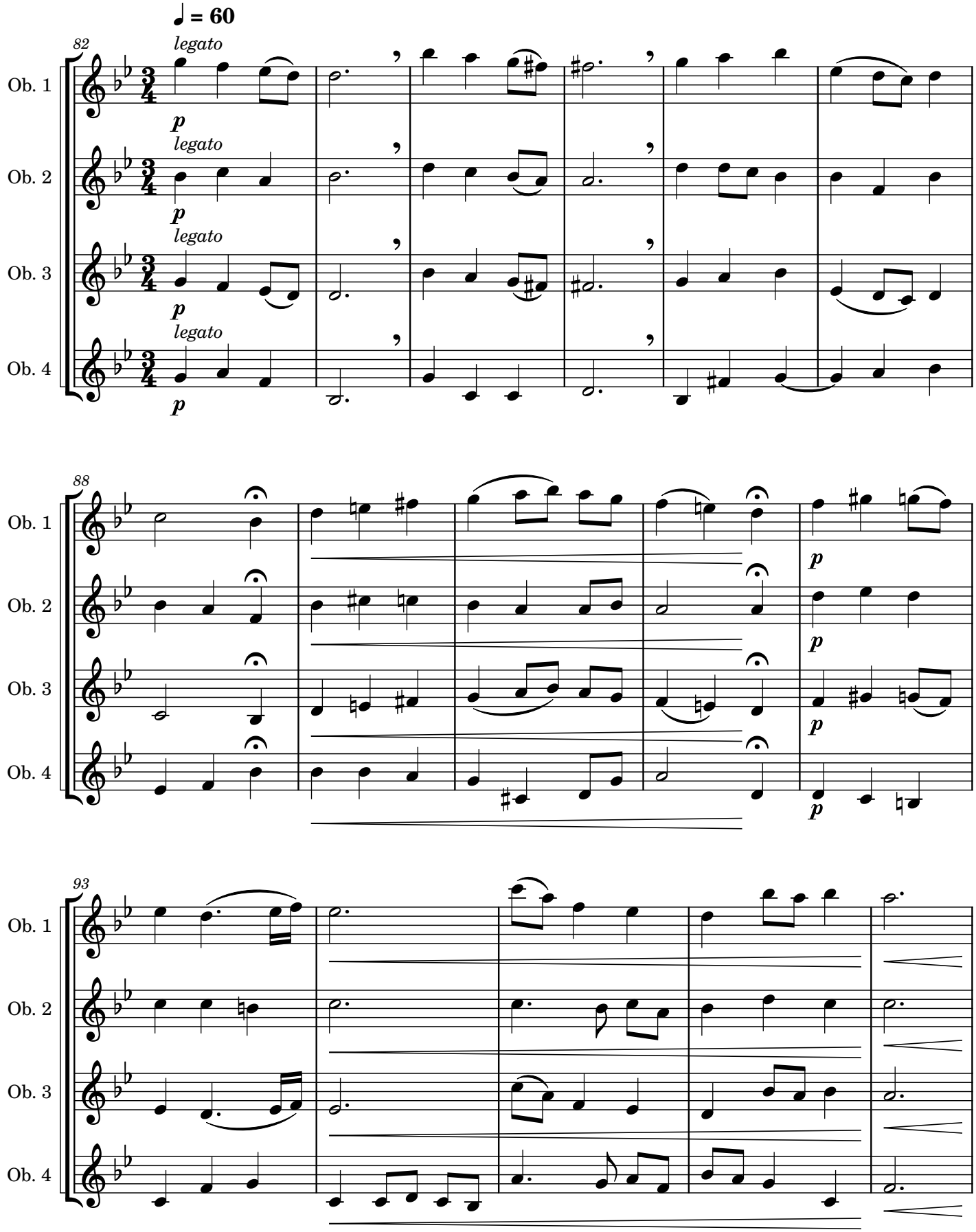

♩ = 70
17
Ob. 1
Ob. 2
Ob. 3
Ob. 4
pp
22
mf
mp
p
3
27
f

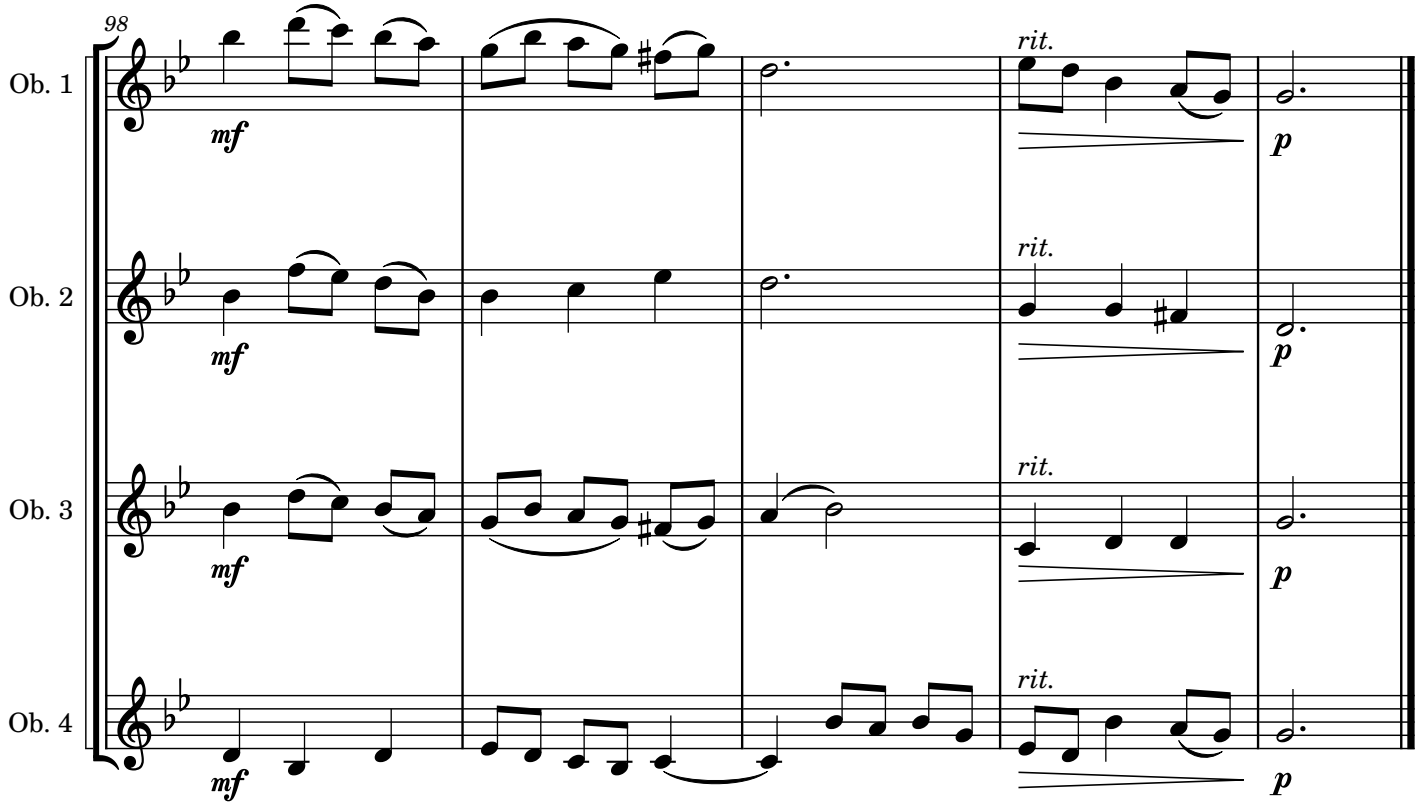

31
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mf
mp
mp
mp
3
3
3
pp
pp
pp
pp

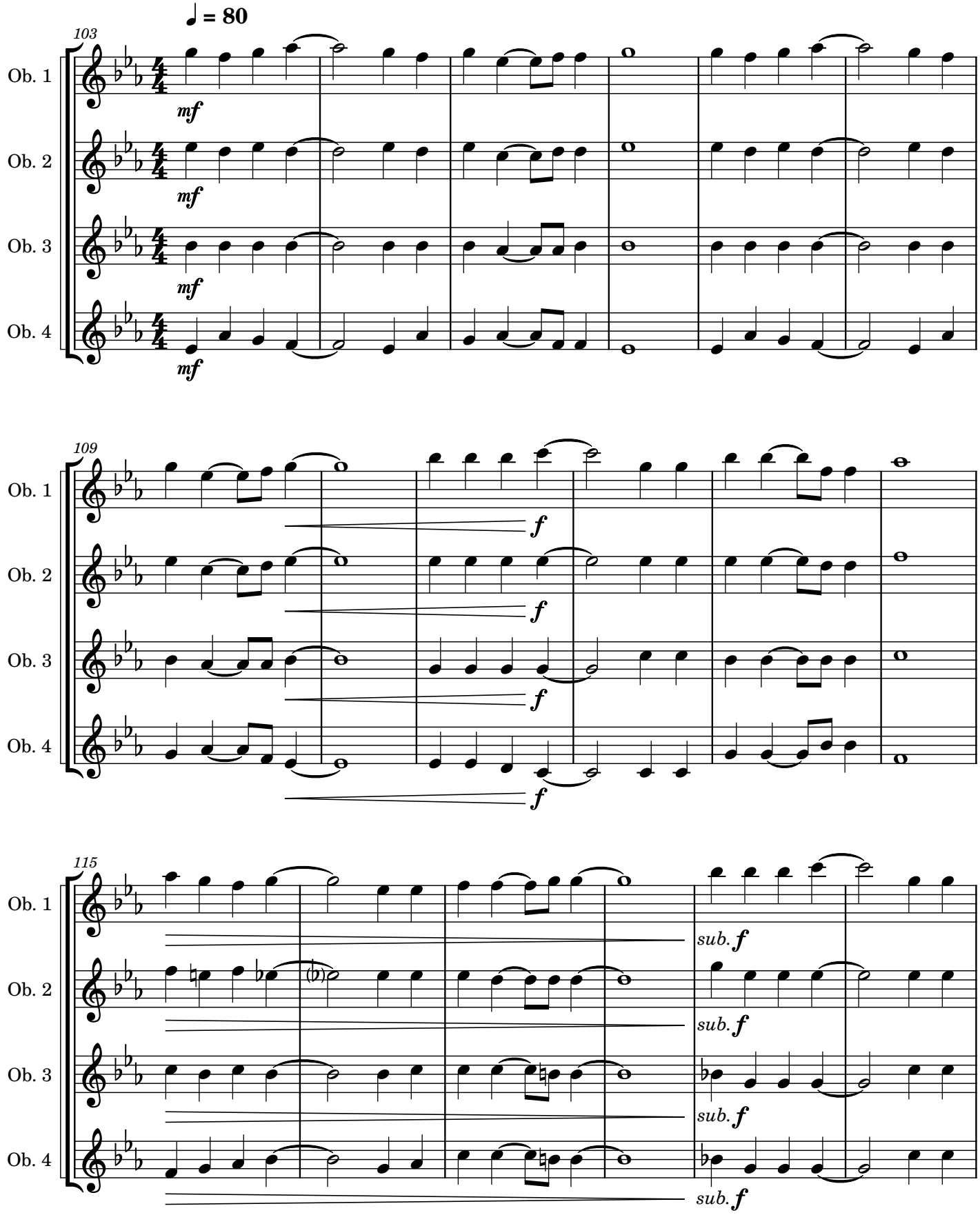

♩ = 80
34
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mp
40
mf
46
f

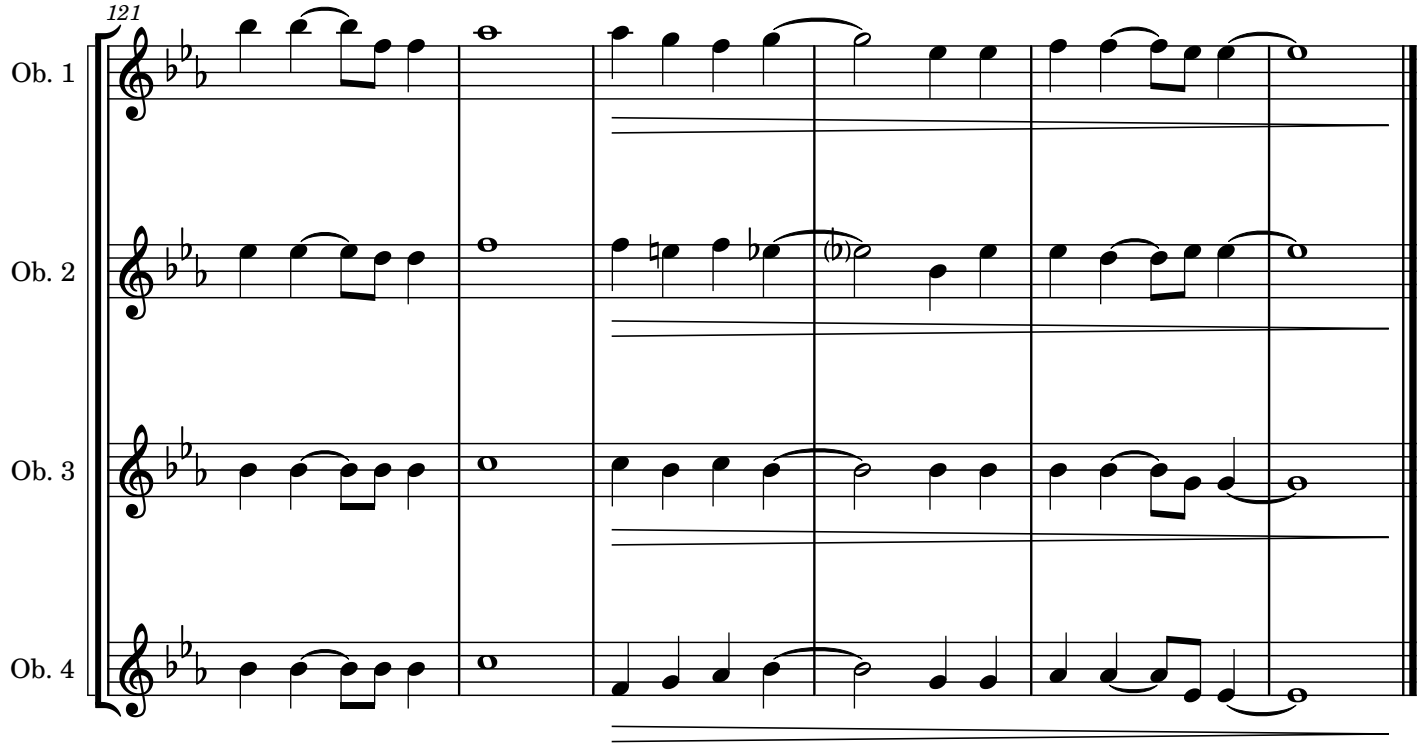

♩ = 65
50
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mp
56
62
mf

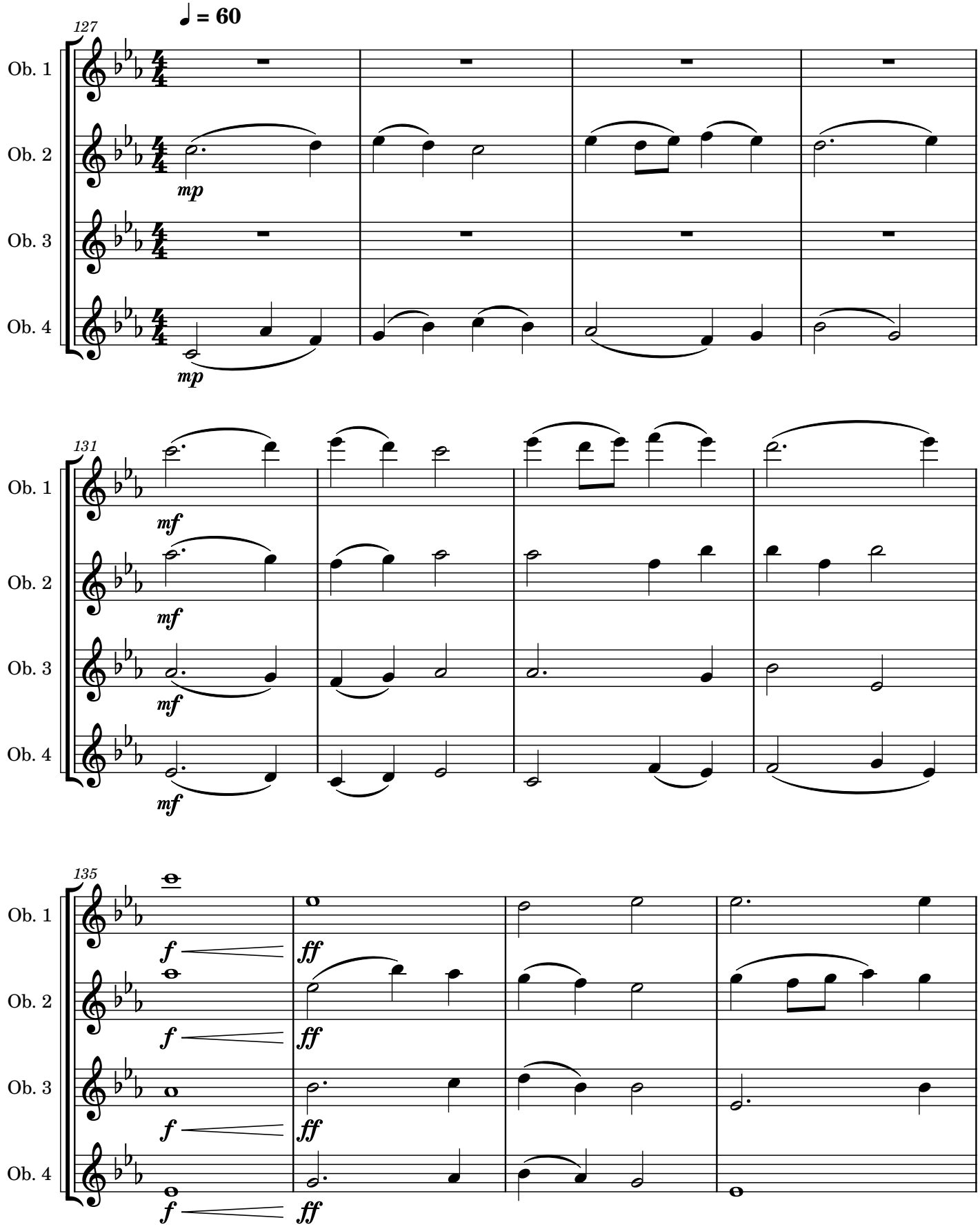

68
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mf
mf
75
Ob. 1
Ob. 2
Ob. 3
Ob. 4
f
mf
p

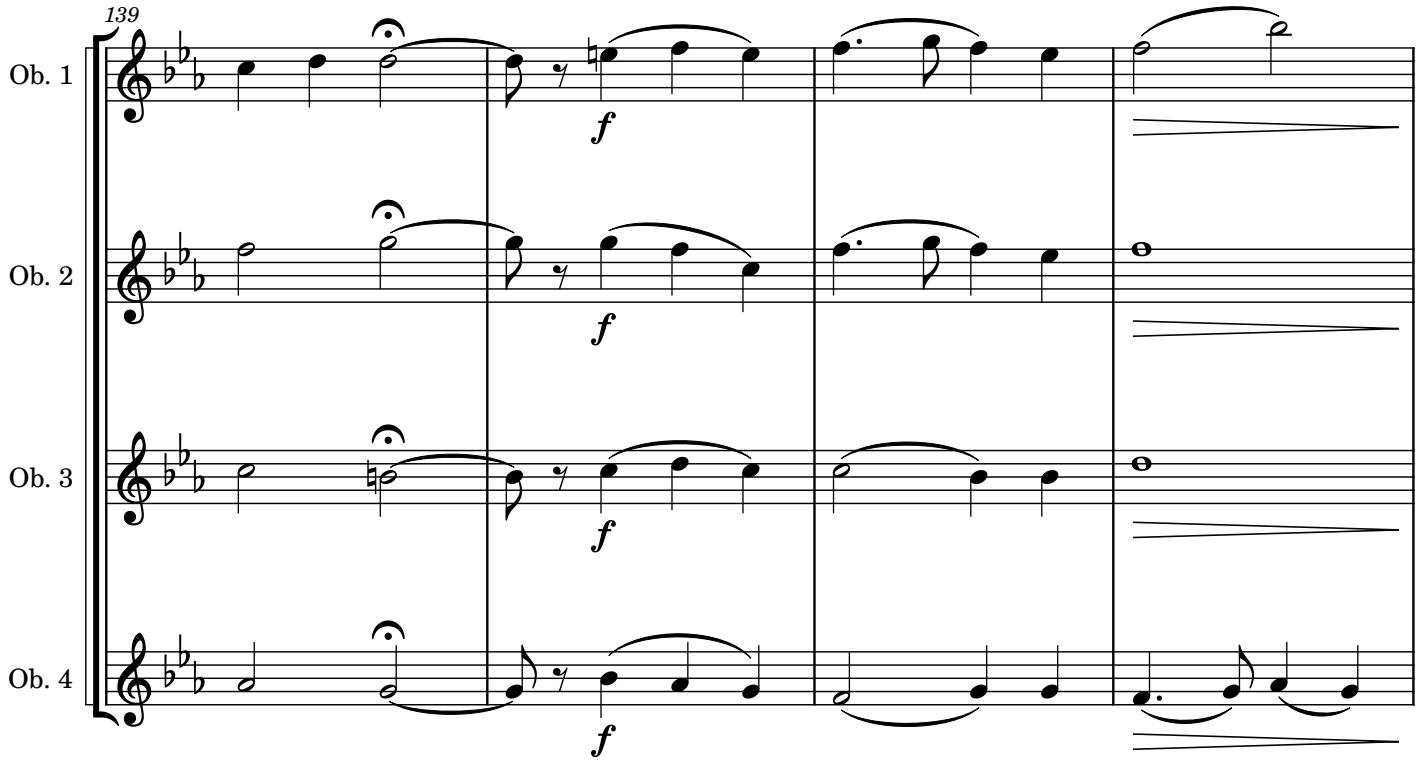

♩ = 60
82
legato
p
Ob. 1
Ob. 2
Ob. 3
Ob. 4
88
93

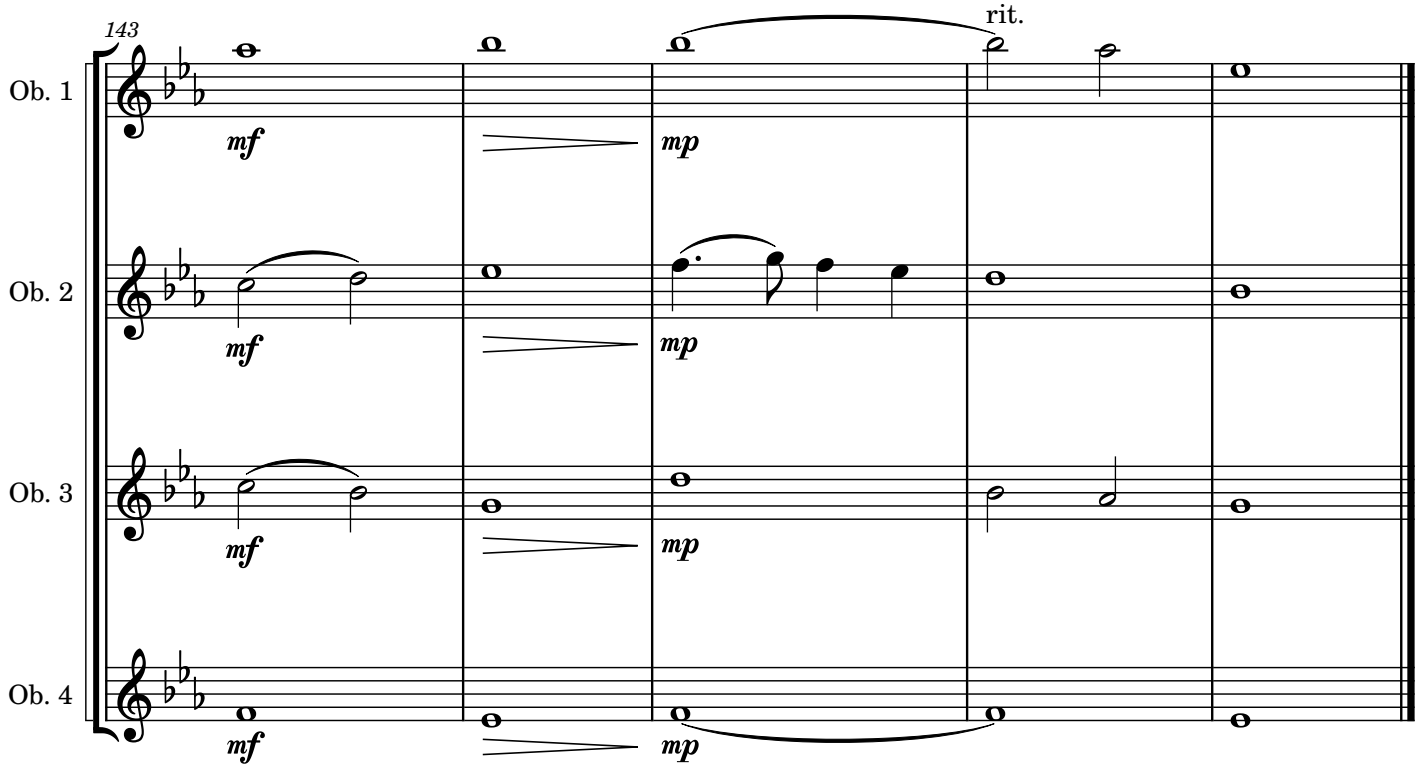

98
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mf
rit.
p

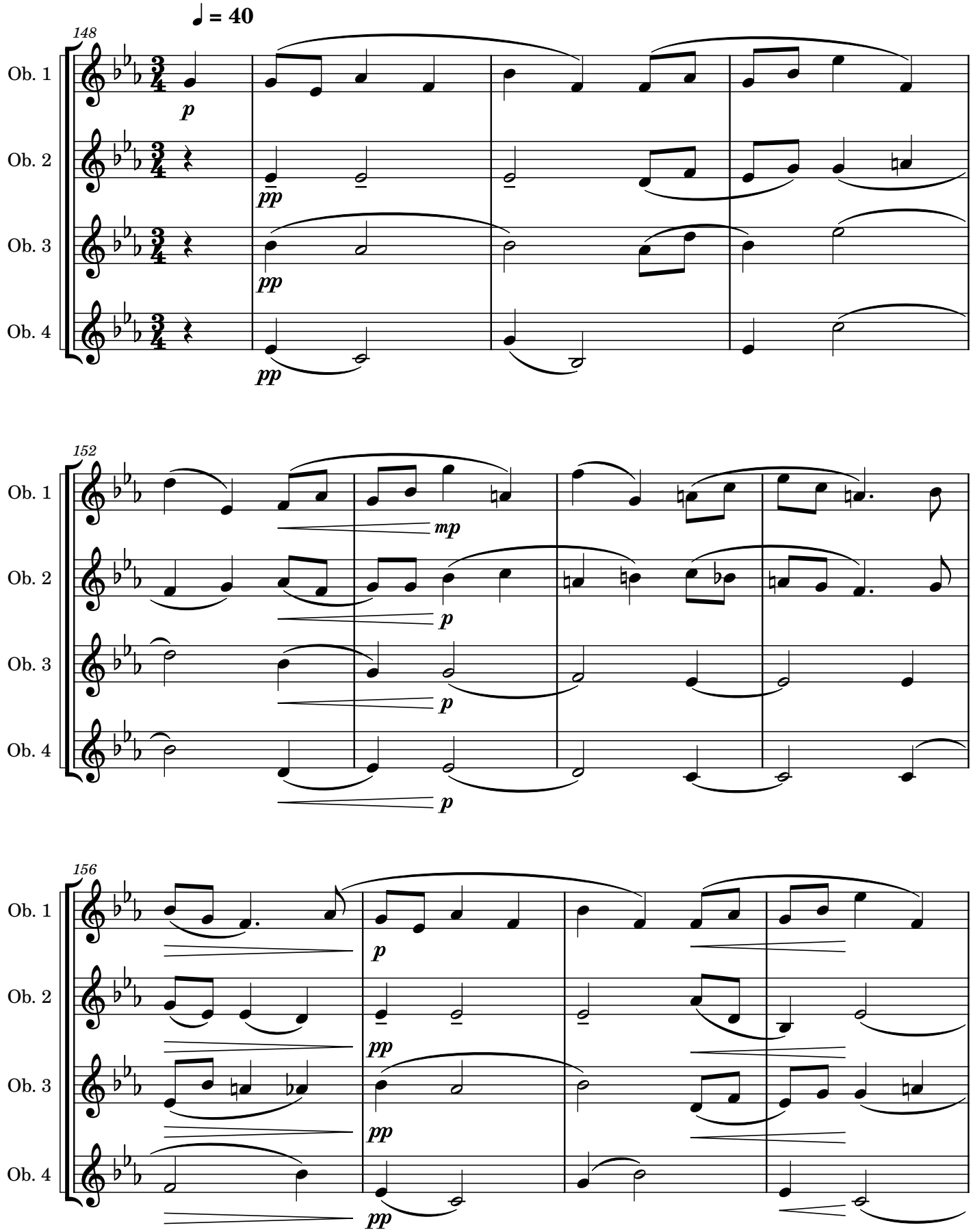

♩ = 80
103
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mf
109
f
115
sub. f

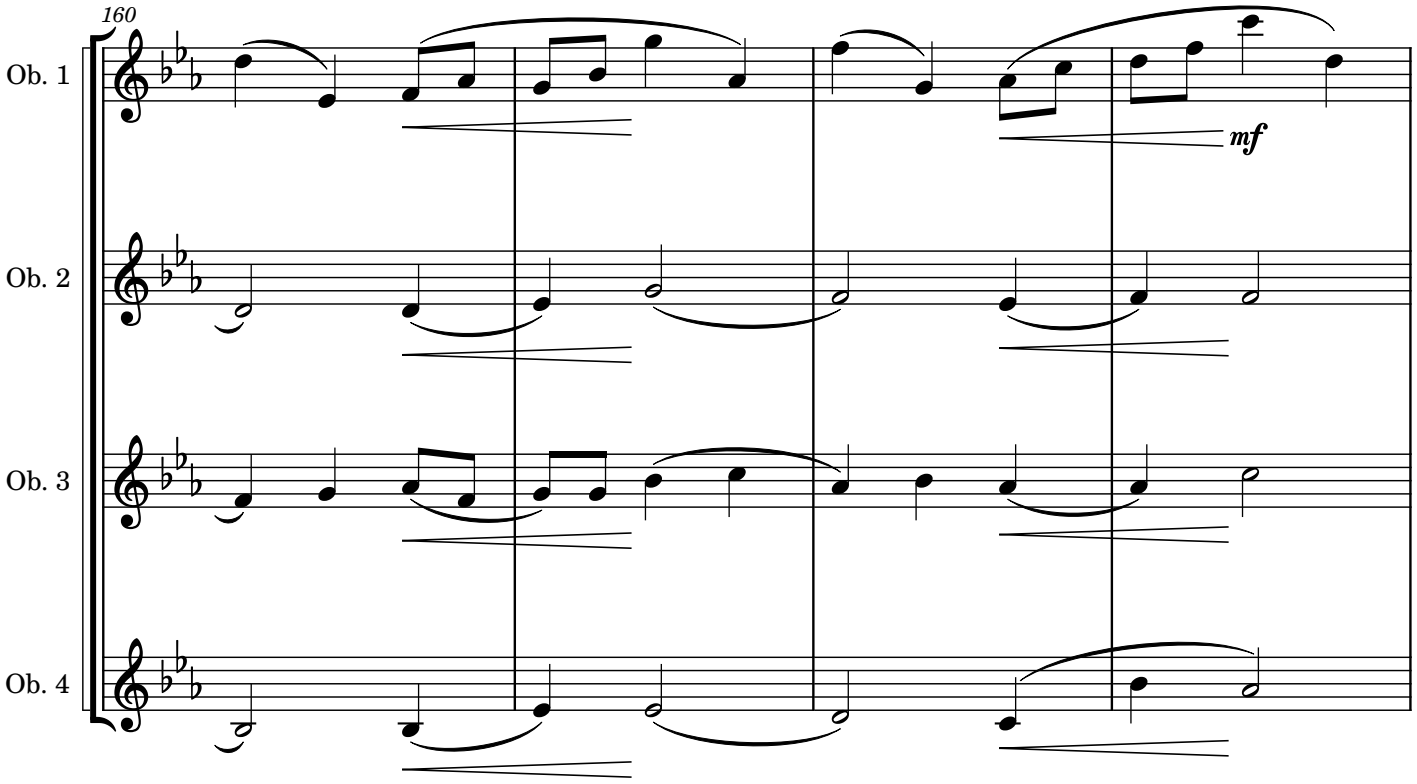

121
Ob. 1
Ob. 2
Ob. 3
Ob. 4

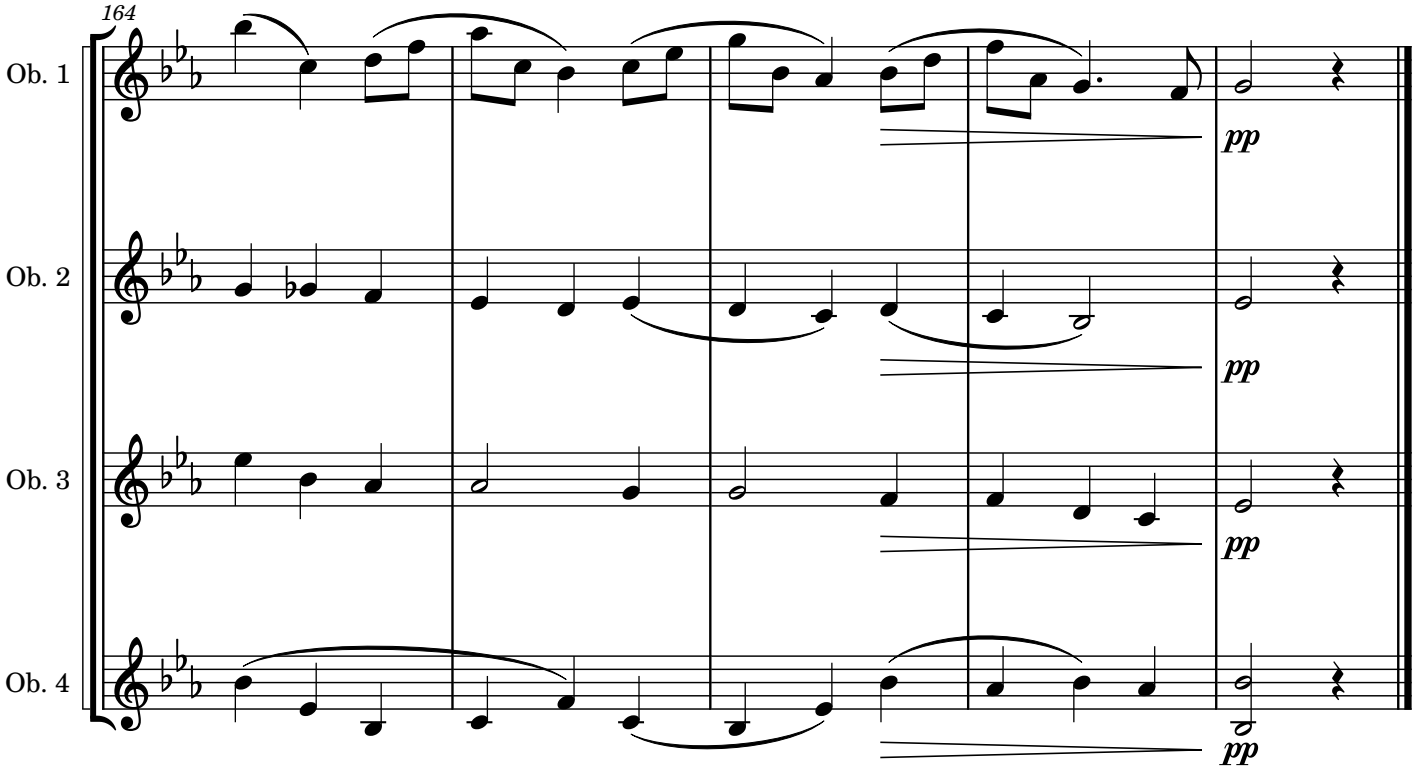

127
♩ = 60
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mp
131
mf
135
f
ff

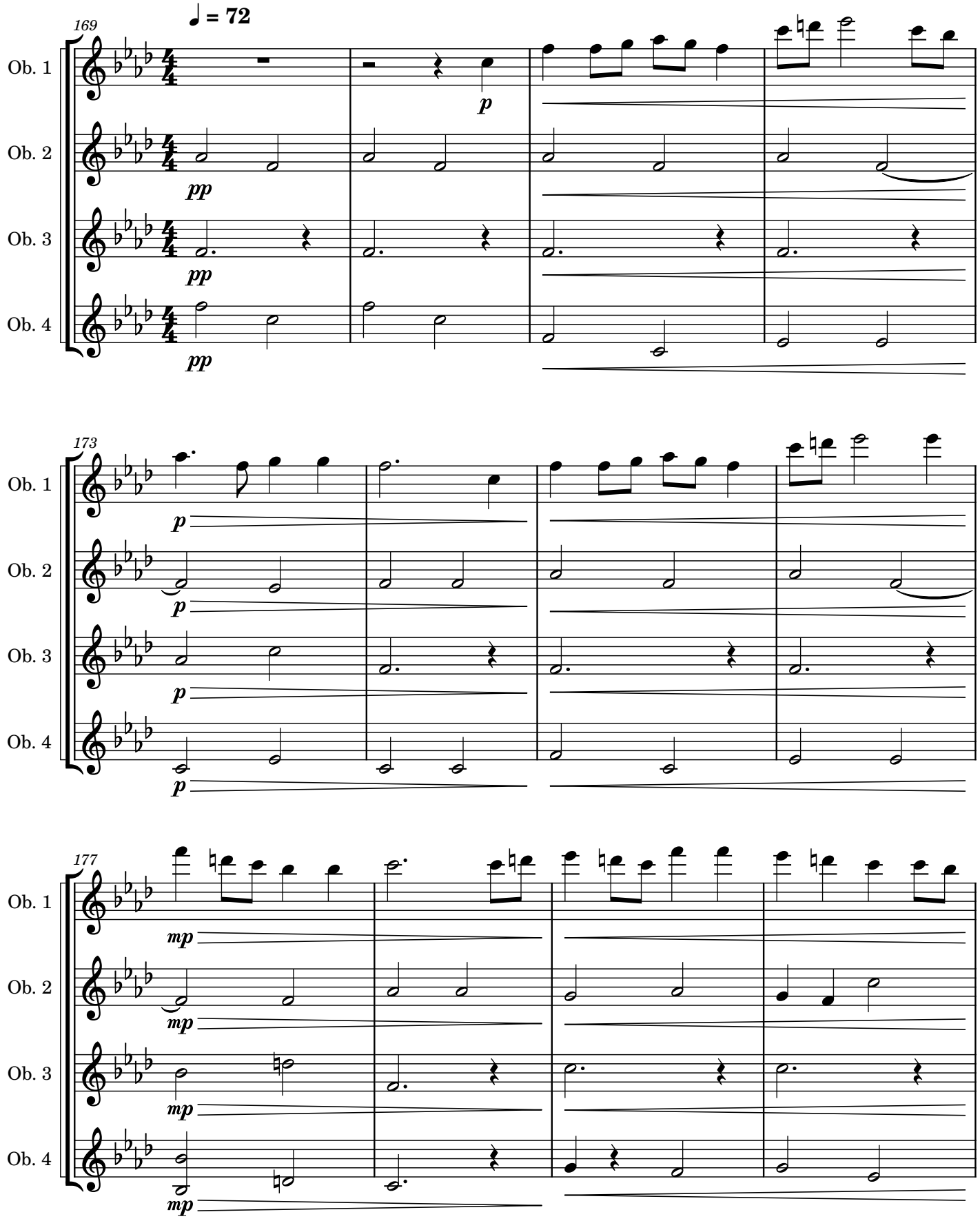

139
Ob. 1
Ob. 2
Ob. 3
Ob. 4
f

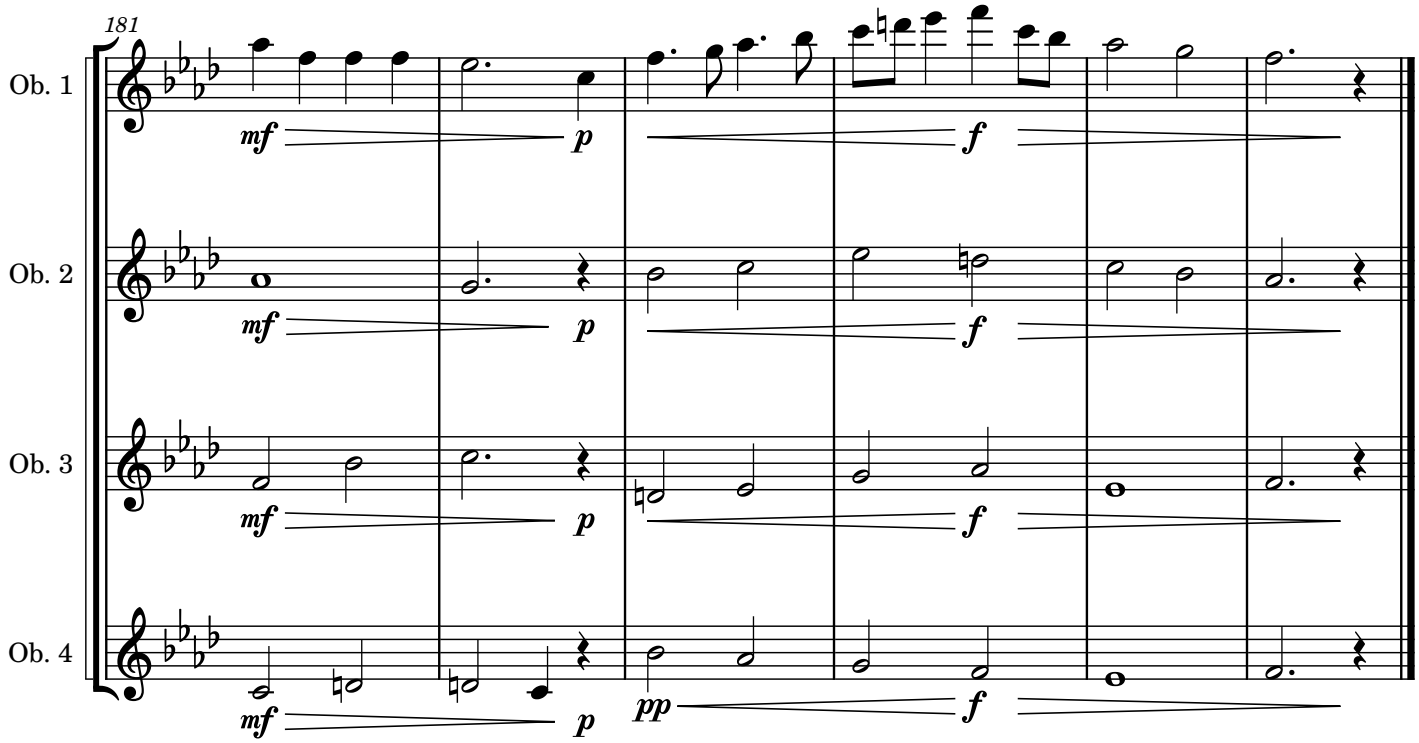

143
rit.
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mf
mp

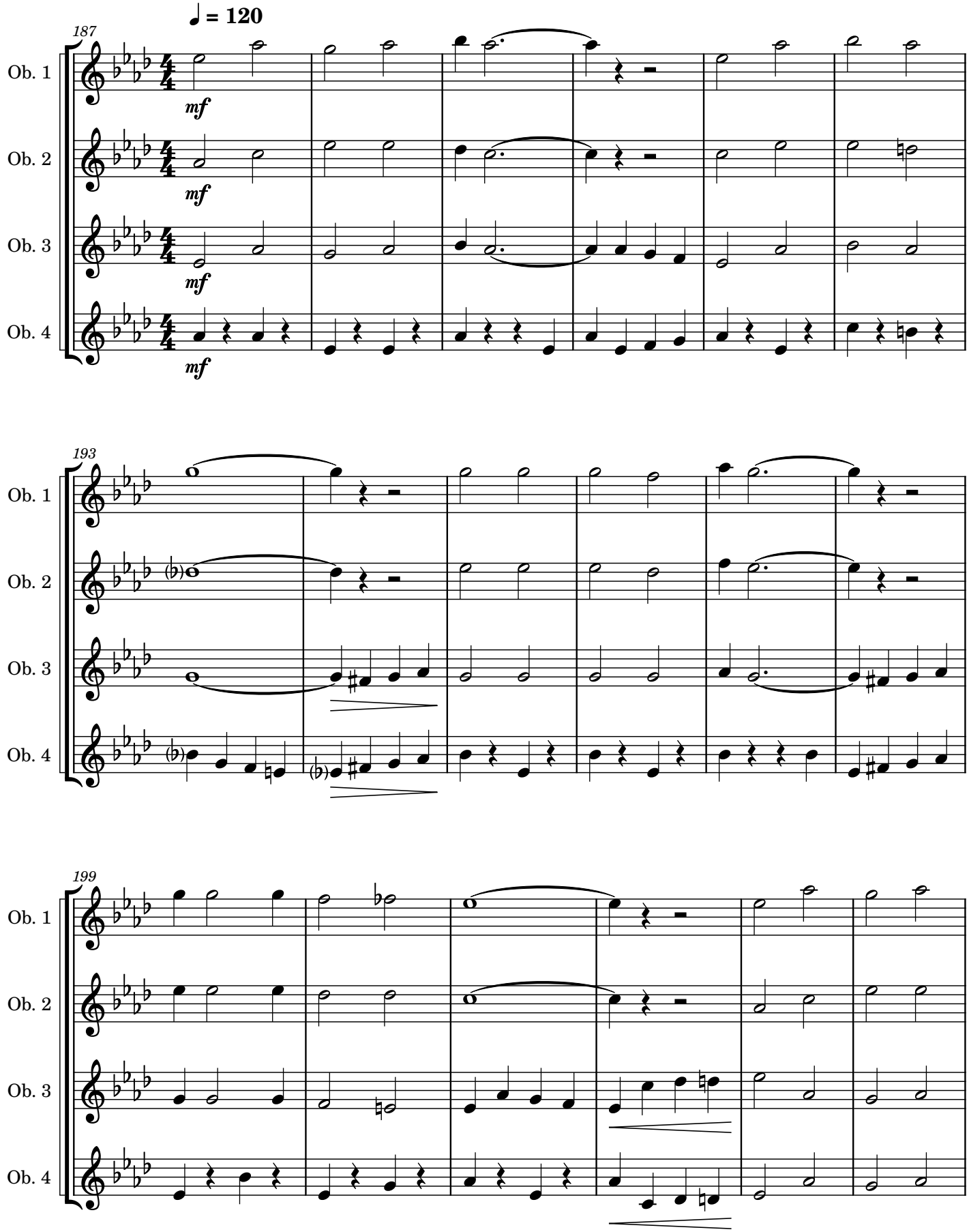

♩ = 40
148
Ob. 1
Ob. 2
Ob. 3
Ob. 4
p
pp
152
mp
156

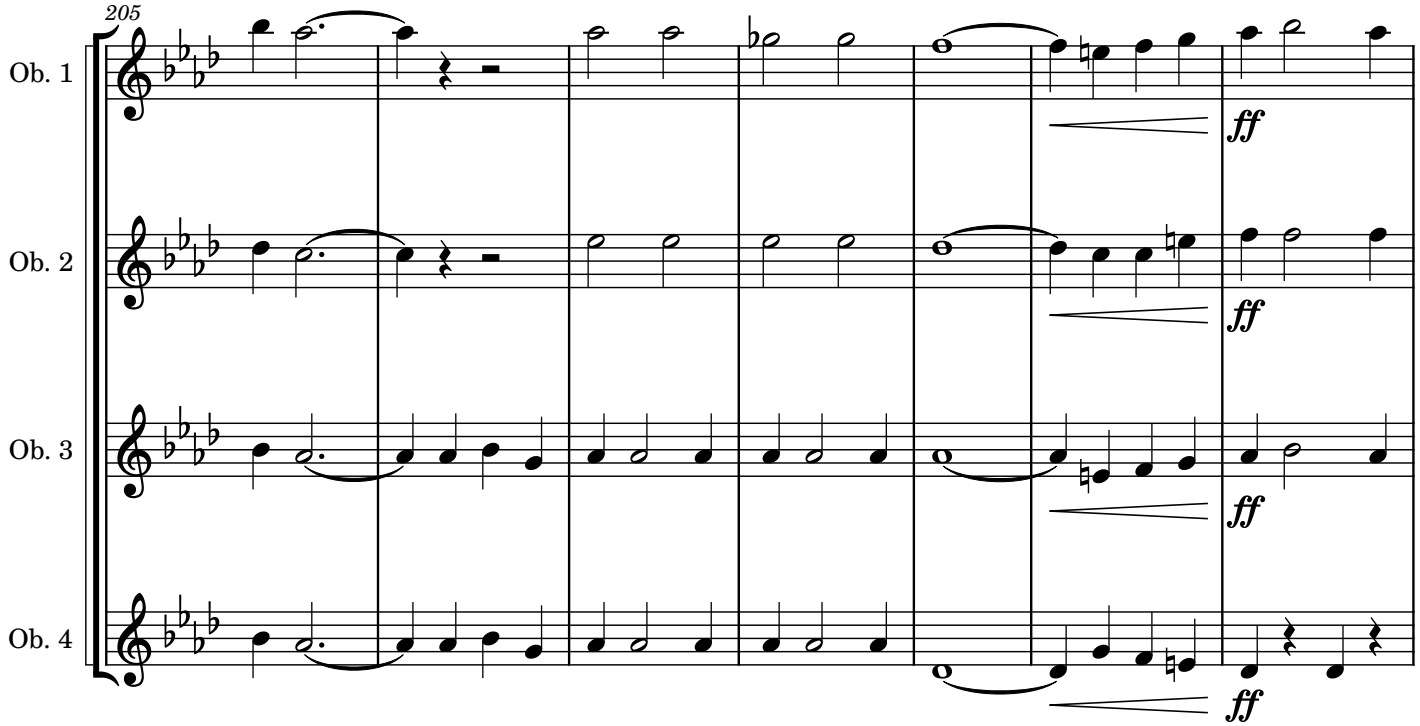

160
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mf

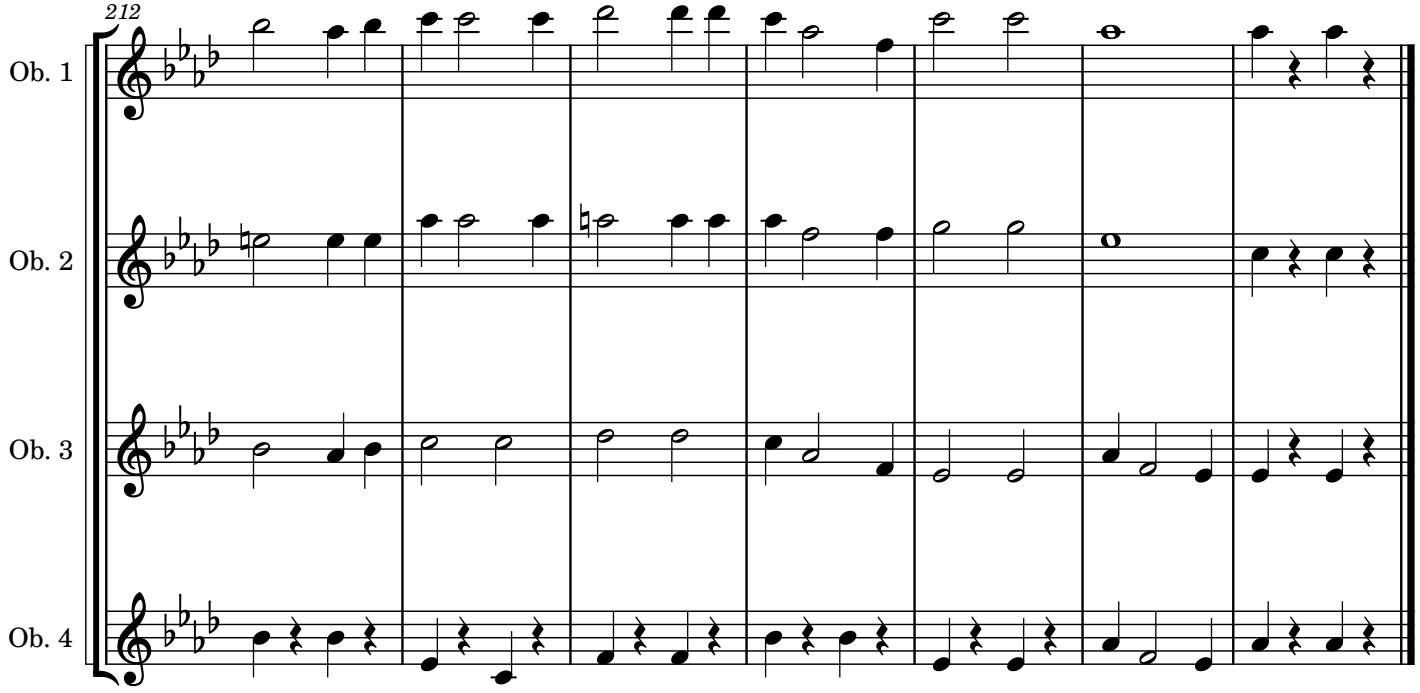

164
Ob. 1
Ob. 2
Ob. 3
Ob. 4
pp
pp
pp
pp


169
♩ = 72
Ob. 1
Ob. 2
Ob. 3
Ob. 4
pp
p
173
mp
177


181
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mf
p
f
pp


♩ = 120
187
Ob. 1
Ob. 2
Ob. 3
Ob. 4
mf
193
199


205
Ob. 1
Ob. 2
Ob. 3
Ob. 4
ff
ff
ff
ff

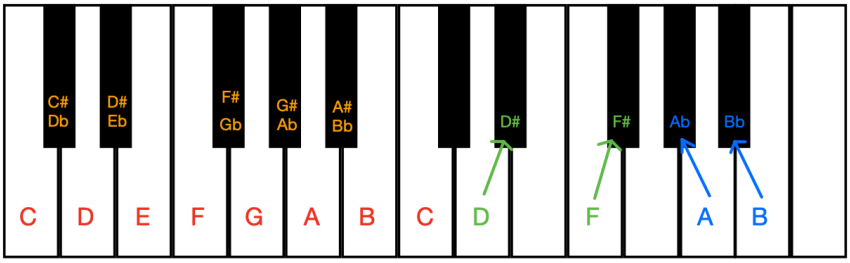

212
Ob. 1
Ob. 2
Ob. 3
Ob. 4

BASICS OF MUSIC THEORY

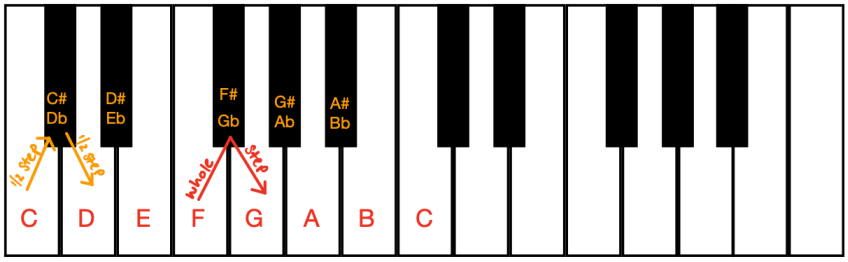
As you begin understand musical intervals, you'll need a basic understanding of how to use a piano, and how to visually and aurally identify musical intervals.

HOW TO USE A PIANO

- The white keys of the piano are for the natural notes.
- The black keys of the piano are for sharp and flat notes.
  - When you go from a white key to the black key above it, keep the note name and add a sharp.
  - When you go from a white key to the black key below it, keep the note name and add a flat



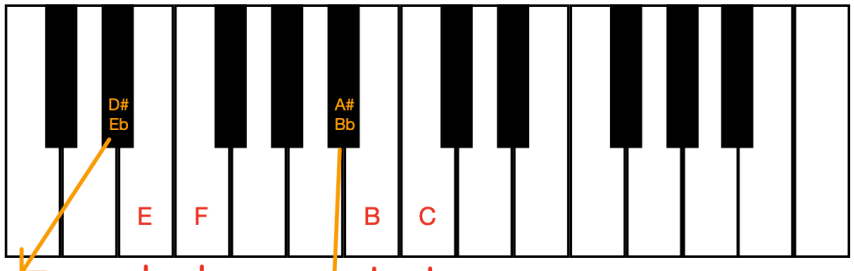
- Half steps: Half steps occur between every note on the piano (like in a chromatic scales).
- Whole steps: Whole steps occur every two keys on the piano (think: "key - skip a key - key")



C - C# is one half step
C# - D is one half step

F - G is 2 half steps, AKA one whole step

- The distance between B-C and E-F is a half step. (There are no black keys between these notes).
- Enharmonic: two notes that have the same sound, but different names.



D# is enharmonic to Eb. They sound the same but have two different names.

1/2 Step

1/2 Step

A# is enharmonic to Bb. They sound the same but have two different names.

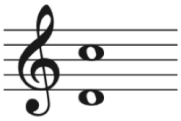
MUSICAL INTERVALS

Interval: The distance between two notes, which is measured in **quantity** and **quality**.

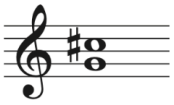
Quantity: The number of notes in the musical alphabet between the low note and high note in an interval. How to identify the **quantity** of an interval:

1. Label the low note of the interval as "1" (the low note may not always be the first note)
2. Count the following notes in the musical alphabet until you get to the high note in the interval
3. The number assigned to the high note in the interval is the **quantity** of that interval.
   *When identifying **quantity**, ignore all accidentals.

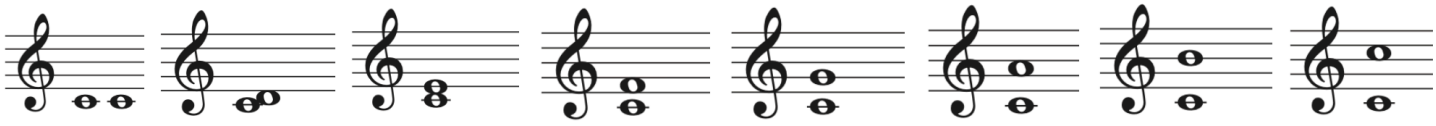
Example:



1. D = 1
2. D E F G A B C D
   1 2 3 4 5 6 7 8
3. This interval is a 7th.

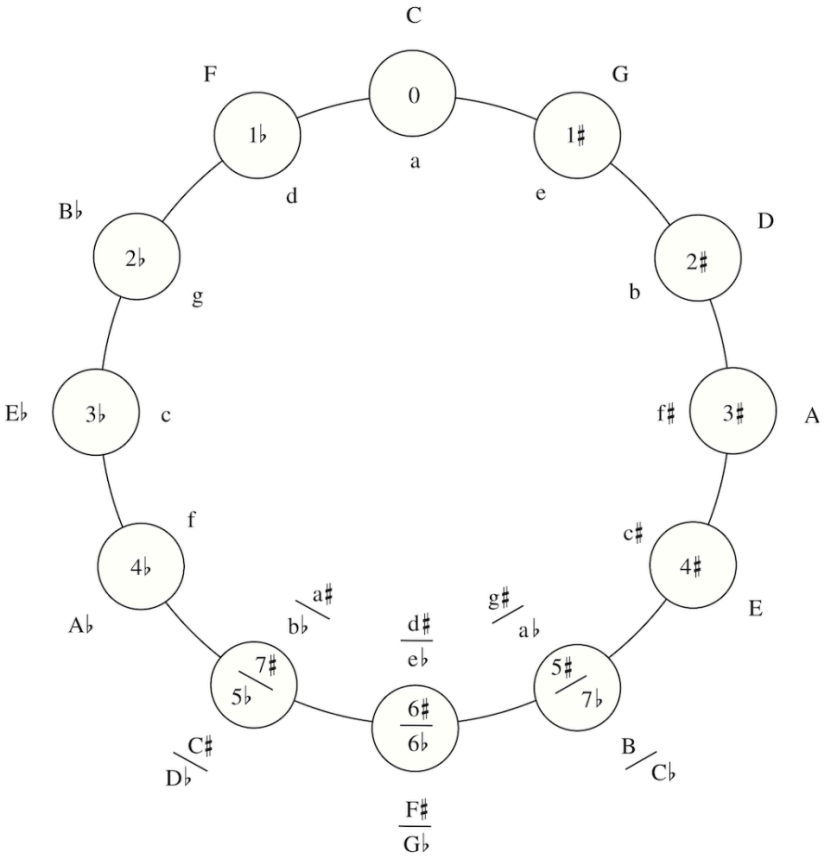


1. G = 1
2. G A B C D E F G
   1 2 3 4 5 6 7 8
3. This interval is a 4th.



Unison (1) | 2nd | 3rd | 4th | 5th | 6th | 7th | Octave (8)

CIRCLE OF 5THS



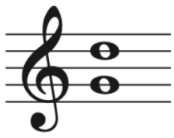
MUSICAL INTERVALS

Quality: The type of interval based on the key signature. How to identify the **quality** of an interval:

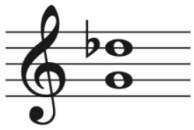
For unisons (1), 4ths, 5ths, and octaves (8ths)

1. Use the Circle of 5ths to identify the number of sharps and flats in the key of the low note of the interval. (Remember that the low note may not always be the first note).
2. Identify the quantity of that interval.
3. Ask: Is the high note in the key that you identified in step 1?
    1. If yes: The interval is a **perfect** interval.
    2. If no: And the the note is lowered by a half step from the key signature, it is a **diminished** interval.
    3. If no: And the note is raised by a half step from the key signature, it is an **augmented** interval.

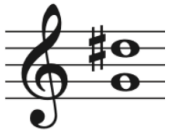
Example:



1. G has 1 F#
2. G A B C D E F#
   1 2 3 4 5 6 7
   This interval is a 5th
3. Is the top note (D) in the key above? Yes.
   This interval is a
   perfect 5th.



1. G has 1 F#
2. G A B C D E F#
   1 2 3 4 5 6 7
   This interval is a 5th
3. Is the top note (Db) in
   the key above? No. It's lowered by a half step.
   This interval is a
   diminished 5th.

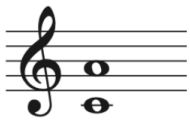


1. G has 1 F#
2. G A B C D E F#
   1 2 3 4 5 6 7
   This interval is a 5th
3. Is the top note (D#) in the key above? No. It's raised by a half step.
   This interval is an
   augmented 5th.

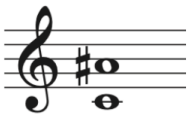
For 2nds, 3rds, 6ths, and 7ths

1. Use the Circle of 5ths to identify the number of sharps and flats in the key of the low note of the interval. (Remember that the low note may not always be the first note).
2. Identify the quantity of that interval.
3. Ask: Is the high note in the key that you identified in step 1?
    1. If yes: The interval is a major interval.
    2. If no: And the note is raised by a half step, it is an augmented interval.
    3. If no: And the note is lowered by a half step, it is a minor interval.
    4. If no: And the note is lowered by a whole step (or 2 half steps), it is a diminished interval.

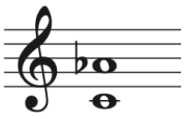
Example



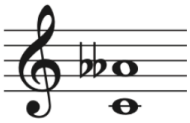
1. C has no accidentals
2. C D E F G A B
   1 2 3 4 5 6 7
   This interval is a 6th
3. Is the top note (A) in the key above? Yes.
   This interval is a
   major 6th.



1. C has no accidentals
2. C D E F G A B
   1 2 3 4 5 6 7
   This interval is a 6th
3. Is the top note (A#) in the key above? No. It's raised by a half step.
   This interval is an
   augmented 6th.



1. C has no accidentals
2. C D E F G A B
   1 2 3 4 5 6 7
   This interval is a 6th
3. Is the top note (Ab) in the key above? No. It's lowered by a half step.
   This interval is a
   minor 6th.



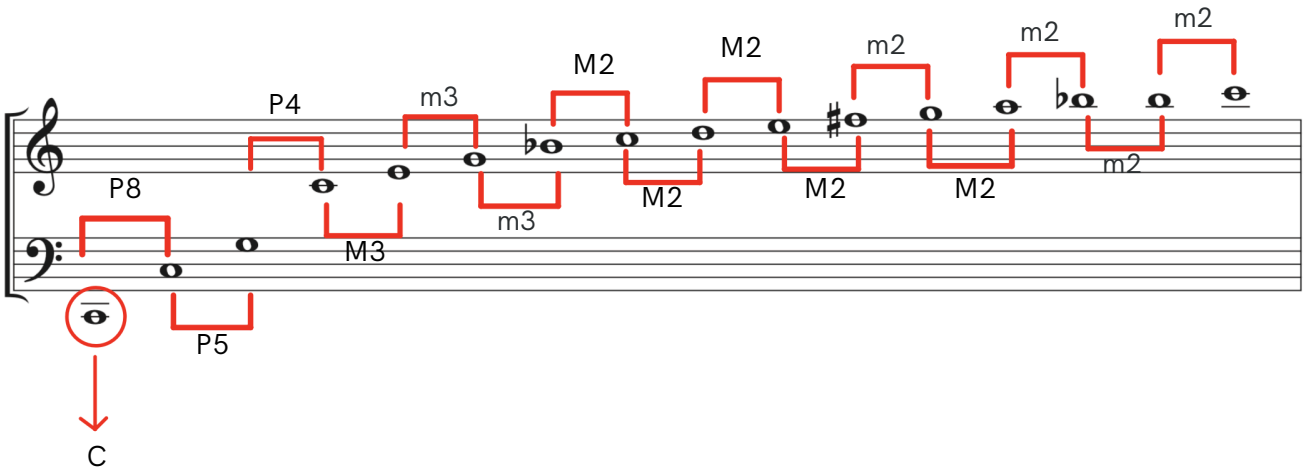
1. C has no accidentals
2. C D E F G A B
   1 2 3 4 5 6 7
   This interval is a 6th
3. Is the top note (Abb) in the key above? No. It's lowered by two half steps.
   This interval is a
   diminished 6th.

Songs that Use Each Interval (Typically in the opening two notes of the song) Look up a recording online to hear the interval associated with each song.	
Interval	**Songs**
Unison (P1)	Jingle Bells - James Lord Pierpont
Minor 2nd	Jaws Theme - John Williams White Christmas - Irving Berlin Fly Me to the Moon - Frank Sinatra
Major 2nd	Happy Birthday to You - Mildred Hill Silent Night - Franz Xaver Gruber Frere Jacques - Traditional Mary Had a Little Lamb - Traditional
Minor 3rd	Greensleeves - Traditional O Canada - Caliza Lavallee The Star Spangled Banner - Francis Key
Major 3rd	Oh, When the Saints - Traditional What a Wonderful World - George Douglas Swing Low, Sweet Chariot - Traditional
Perfect 4th	We Wish You a Merry Christmas - Traditional Bridal Chorus ("Here Comes the Bride") - Richard Wagner Amazing Grace - John Newton I've Been Working on the Railroad - Traditional
Tritone (A4 or D5)	Maria (from West Side Story) - Leonard Bernstein The Simpsons Theme - Danny Elfman Blue 7 - Sonny Rollins
Perfect 5th	Star Wars Theme - John Williams Scarborough Fair - Traditional Top Gun Anthem - Harold Faltermeyer Flinstones Theme - Hoyt Curtin
Minor 6th	In my Life (Intro) - Beatles Close Every Door (Joseph and the Amazing Technicolor Dream Coat) - Andrew Lloyd Webber You're Everything - Chick Corea
Major 6th	My Bonny Lies Over the Ocean - Traditional NBC Chimes - from 1927 The Music of the Night (Phantom of the Opera) - Andrew Lloyd Webber
Minor 7th	Somewhere (West Side Story) - Leonard Bernstein Theme from Star Trek - Alexander Courage An American in Paris - George Gershwin
Major 7th	Take on Me (chorus) - A-ha I Love You - Cole Porter
Octave (P8)	Over the Rainbow - Harold Arlen The Christmas Song - Robert Wells Singin' in the Rain - Nacio Brown Willow Weep for Me - Ann Ronell

THE OVERTONE SERIES

The overtone (or harmonic) series is the sequence of pitches whose frequency is an integer multiple of a fundamental frequency. In other words, each fingering on the horn has a fundamental pitch. The notes that can be played above the fundamental pitch (using the same fingering) ascend in the same pattern for each fingering. The pattern of the harmonic series is the same for all brass instruments, but each instrument's fundamental pitches are different depending on the length of tubing.

This stave shows the harmonic series for the open fingering on the F horn. The fundamental pitch is "C." The rest of the harmonic series follows, and the intervals from one note to the next are noted. The same intervals are used to create the harmonic series above the fundamental pitch on each fingering of the horn.



Horn players need to understand the harmonic series because they need to know which notes exist on each partial. Horn partials are notoriously challenging to settle into because they are close together, but the more a player knows about the series, the easier it will be to play the notes with accuracy.

Horn players also need to understand the harmonic series in order to play in tune. Certain partials tend to be sharp or flat. In addition, certain valve combinations tend to be sharp or flat. When the player is aware of these tendencies, he/she is able to correct the pitch either with the embouchure or the right hand in the bell.

The following chart shows horn fingerings along the Y axis, and partial numbers along the X axis. The pitch tendencies of each fingering and partial are color coded. Some notes have a pitch tendency that is exaggerated by the fingering and the partial both having the same pitch tendency. These notes need to be corrected more than the others.

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