

ORCHESTRATION NOTES

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STRINGS

RANGES & STRINGS

(in range, lower notes are for ensemble players, higher for soloists)

Violin Range Strings Viola Range Strings Cello Range Strings Bass Range Strings

MECHANICAL MEANS OF CHANGING THE SOUND

- *Sordino* (mute)
- *Pizzicato* (plucking)
- *Tremolo* (shaking the bow rather than drawing it across the string)
- *Ponticello* (playing on the bridge)
- *Col legno* (striking the strings with the wood of the bow)

FOUR-PART HARMONY

- Bases either double cellos, or are silent.
- If an independent bass or cello part is required, split the cellos, and have the lower part double the basses.

PLAYING MORE THAN ONE NOTE SIMULTANEOUSLY

- Double-stopping:

maj/min 3rds *perf/aug 4ths* *perf/aug/dim 5ths* *maj/min 6ths* *maj/min 7ths* *8ves*

- Maj/min 2nds best avoided.
- Transpose a 5th down for viola, and an 8^{ve} + 5th down for cello. However, double bass double-stopping is not effective.
- Triple-stopping:

All are available in minor form, except:

- Transpose a 5th down for viola, and an 8^{ve} + 5th down for cello. However, double bass triple-stopping is not effective.
- Quadruple-stopping:



- Transpose a 5th down for viola, and an 8^{ve} + 5th down for cello. However, double bass quadruple-stopping is not effective.
- OWING TO THE CURVATURE OF THE BRIDGE, ONLY THE TOP TWO NOTES OF A THREE- OR FOUR-PART CHORD CAN BE SUSTAINED. ALSO, THEY ARE ONLY EFFECTIVE ABOVE *forte*.

ORCHESTRATION

- Violin I
- Violin II
- Viola
- Violoncello
- Double Bass
- All possibly *divisi*

WOODWIND AND HORNS

RANGES

Harmonic series:-
red notes are inaccurately tuned

FLUTE

- The first 6th of the flute is rich and beautiful – often resembling a distant trumpet. However, this range is quiet, and must be very lightly accompanied.
- The next 8^{ve} is particularly suited to quiet melodic work.
- Above the 2nd A above middle C, there is a clear bright tone and penetrating sound. This high register gives brilliance when doubling violins or other wind instruments at 8^{ves}.
- Trills between the following notes are impossible on the flute:-
 - Middle C and Db
 - C# above middle C and D# (i.e. C# = aug 1st above middle C)
 - Any trill above top G

OBOE

- Penetrating and nasal tone, capable of great musical expression.
- From the 2nd C above middle C, the tone becomes too thin for satisfactory playing – if a phrase is required to be orchestrated in the wind at this point, the flute is preferable.
- Essentially a melodic instrument.
- The oboe is fatiguing to play – breathing spaces are essential.

CLARINET

- Choose Bb or A clarinets as the concert pitch key requires, for example: Db concert on an A clarinet is E, and on a Bb is F, therefore the Bb clarinet is preferable for ease of reading; however, B concert on a Bb clarinet is Db, and on an A, D, so the A clarinet is preferable.
- The low range of the clarinet is the *chalumeau*, is rich, hollow, and potentially sinister, especially with *sforzando*.
- Passages for two clarinets in 3rds or 6ths are of excellent effect.
- Avoid the trills between the following notes:
 - F# below middle C and G#
 - 8^{ve} above the above
 - 2nd C# above middle C and D# (i.e. C# = aug 8^{ve} above middle C)
 - 8^{ve} above the above

BASSOON

- In scores, the bassoon is usually designated as *Fag.* or *Fagotto*.
- Music for the bassoon is written in either bass or tenor clef, depending on the register.
- The natural function of the bassoon is to provide the bass of the woodwind group, but it is frequently used as a melodic instrument, either solo or doubled at 8^{ve}.

PICCOLO

- Shrill and piercing in top register, thus requiring much support.

COR ANGLAIS

- Part of the oboe family, this instrument is particularly melancholy in tone, and is most characteristic in its bottom 12th.
- Essentially a solo instrument – is normally too obtrusive to be used as an inner voice of the woodwind.
- Doubles the following instruments with good effect:
 - Viola
 - Cello
 - Clarinets in *chalumeau*.

BASS CLARINET

- There is no bass clarinet in A – several composers have written for it, but these parts are played on a Bb today.
- The bottom octave is extremely rich.

DOUBLE BASSOON

- As with double bass, the part is written an 8^{ve} higher than it sounds.
- The double bassoon is normally used only to add weight to the bass, as it is not agile, and the high notes are of poor quality.

HORN

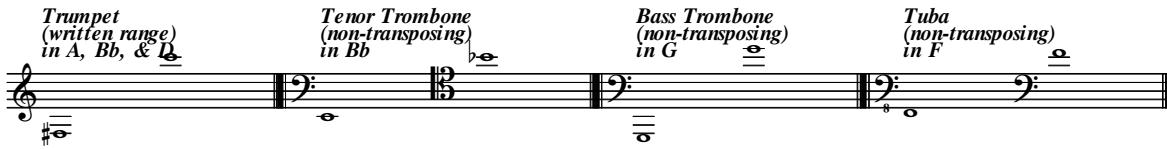
- The horn is, strictly, a brass instrument, but is often scored with the woodwind.
- A particular effect, which is produced by stopping the bell with the hand and blowing hard, is called *cuvré*, shown in the music as a + above the note.
- For very romantic distant or 'echo' effects, the muted horn blown very softly is excellent.

ORCHESTRATION

- Small orchestras might use the following combinations of wind instruments, possibly plus horn:
 - 1fl 1ob 1clar 1bsn
 - 1fl 1ob 2clar 1bsn
 - 2fl 1ob 2clar 1bsn
 - 1fl 1clar
- For small orchestras, two oboes would be too penetrating and reedy, and two bassoons too thick.
- In full orchestras, two of each of the following are normally used:
 - Flute
 - Oboe
 - Clarinet
 - BassoonThis is referred to as double woodwind.
- If triple woodwind is used, then the third player of each often swaps between instruments as follows:-
 - Flute → Piccolo
 - Oboe → Cor Anglais
 - Clarinet → Bass Clarinet
 - Bassoon → Double Bassoon
- Even in small orchestras, it is rare to find a sole horn: normally, horns are paired, so either no horns are found, or two or four. Four horns are also paired, two pairs of horns, on the score.

BRASS

RANGES



TRUMPET

- The top 4th of the instrument should be reserved for notes which need to be highlighted – they are brilliantly effective if sparingly used.
- Up to high G, any note in the compass can be produced from *ppp* to *fff* with ease and certainty.
- Considerable agility is possible, but rapid passages for it should not be of great length.

TENOR & BASS TROMBONES

- The trombone works by moving a slide into seven positions. All trombones have “pedal notes”, the fundamental of the harmonic series, which is not normally easily producible on brass instruments, but which is possible on trombone. However, its sound is not pleasant on tenor trombone. If pedal notes are essential, they must be used with care, and extend the tenor trombone’s lower limit by one 8^{ve}.
- Most bass trombones have a mechanism by which the chromatic notes between the lowest note in seventh position, bottom C#, and the lowest pedal note, bottom G, can be produced.

TUBA

- The tuba, when blown softly, combines well with the horns, and if composed for well, could act in certain passages as a “bass horn”.
- When the tuba is independent as a bass part from the trombones in held chords, the best results are when the tuba is placed low, even if this results in a large gap between the tuba and bass trombones.

ORCHESTRATION

- The normal specification for the brass department of the full orchestra is:
 - 4 horns
 - 2 trumpets
 - 3 trombones (2 tenor, 1 bass)
 - 1 tuba
- They are written in this order on a score:-
 - Horns I & II
 - Horns III & IV
 - Trumpets I & II
 - Trombones I & II
 - Trombone III & Tuba
- These numbers are exceeded in many scores. If this is the case, the parts are written in whatever way seems appropriate.
- When 4 horns are used, dovetailing should be employed thus:-



PERCUSSION

RANGES



The glockenspiel sounds TWO octaves higher than written.

HARP

RANGE



OTHER NOTES

- The harp is tuned to the DIATONIC scale of Cb.
- Each individual note of this scale can be raised by one or two semitones by means of a pedal mechanism, thus providing a non-simultaneous chromatic range. Pedal changes are written into the music.
- Accidentals in harp writing are not dictated by harmonic rules, but by pedal changes. e.g., this passage

Fnat, Cnat Bb, Db Gb Ab

Note: Bbb is impossible, and would have to be written A.

requires 6 pedal changes in 3 bars, changing thus:

C#	D	E	F#	G	A	B
C	Db	E	F	Gb	Ab	Bb

However, the same passage could be written to need only a change from A to A# and back:-

A# A nat

- If two notes are tuned to be enharmonic, then many chords of four notes can be produced, for example, E⁶:-

E, Fb	G#, Ab	B, Cb	Db
= E	= G#	= B	= C#
= E, G#, B, C#			
= E ⁶			

ANNDRA MACEANRUIG