Transposition for brass

VMT

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Introduction

It always comes as a surprise to non–musicians – and, indeed, to many musicians – when they're told that approximately 90% of the time, orchestral trumpeters are not actually playing the notes written in front of them. No, they're not being wildly inaccurate (though many of them have their moments) or improvising their parts. Instead, they're practising the art of transposition. Transposing is not only an essential skill for trumpet and horn players, but is also extremely useful for all musicians.

> Here's a little activity to get us started. Sing 'Twinkle, Twinkle, Little Star' starting on a C. Now sing the same tune starting on F sharp. Congratulations. You've just transposed it up an augmented 4th (or down a diminished 5th). That wasn't so hard, was it?

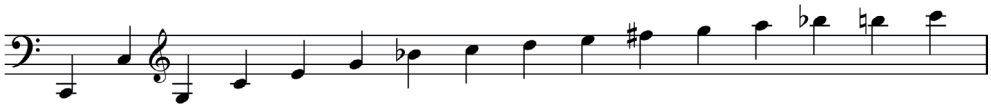
In this resource, I'll look at why transposition is so important, and suggest strategies for how to teach it. As a trumpet player myself, I'll be drawing on personal experience as a performer, teacher and youth orchestra coach. But if you're not a trumpet player, please read on and don't think it won't be relevant – these skills are universally beneficial and help to develop many important areas of musicianship.

Why do trumpet players transpose?

A brief history

(Note: everything in this section also applies to the horn.)

Before the invention of the valve, trumpets consisted of a single length of tubing, which enabled them to play the harmonic series – a sequence of notes dictated by the laws of physics (shown below). Essentially, this is an arpeggio followed by a scale, with some of the notes being slightly 'out of tune', or, at least, out of alignment with equal temperament (the history of pitch is a fascinating subject, and it could be argued that equal temperament is actually the one that's out of tune. But that's a debate for another day). Today we call this instrument a 'natural' trumpet, to distinguish it from the modern valved trumpet. Of course, in the old days it was just known as a 'trumpet'.



The instrument could therefore only play in one key, and if a different key was required, different crooks were added to shorten or lengthen the instrument and therefore produce a harmonic series in a different key.

The valve, which allows the instrument to play chromatically, was invented in 1814, and valved instruments went through multiple modifications before being gradually accepted in mainstream music during the course of the 19th century. Some composers were resistant to change, and even towards the end of the century, composers such as Brahms (who played the horn in his youth) continued to prefer the sound of the natural horn. He referred to the valved horn as the 'tin viola' (the viola joke clearly has a long and distinguished provenance). Other composers, such as Tchaikovsky and Berlioz, combined natural and valved instruments within their orchestras.

The 19th century was an exciting melting pot for brass (literally and metaphorically) that spawned assorted new instruments, with Adolph Sax being at the forefront of innovation. Despite being most famous for developing the saxophone, he also invented the saxhorn family, which was the forerunner of many of the brass band family of instruments we see today.

How music is notated

Music written for the natural trumpet is always *notated* in C major. The appropriate crooks then 'correct' the pitch to that of the particular piece.

This system is very efficient – as a player, you get attuned to both the harmonic series of the instrument and the key of the piece. We always *call* the tonic C and the dominant G. This follows the same principles as solfa, where there is a moveable tonic that's always called 'do' regardless of which pitch actually sounds.

Instruments in different keys

Modern trumpets come in a variety of different keys. In the UK, the B flat is the standard instrument, but advanced players will often have trumpets in C, D and E flat, along with a piccolo trumpet in A and B flat (and sometimes G or F). This selection of instruments is invaluable for playing different types of repertoire in different ranges, keys and timbres.

Unlike the natural trumpet, modern trumpets are fully chromatic, but, like their ancestor, the length of tubing of the body of the instrument dictates its inherent key. The lowest open (all valves up) note is still always *called* C, but *sounds* the pitch-name of the instrument. So, for example, the lowest open note (C) of a D trumpet sounds a D. The fingering patterns going up from C are identical regardless of the pitch of the instrument – D is always 1&3, E is 1&2, F is 1 and G is the next open harmonic. It doesn't matter if you're playing a B flat or D trumpet or a piccolo trumpet in A: the fingerings follow the same patterns.

Other instruments that follow this model include clarinets and saxophones, which always have the same set of fingerings allocated to the same note-names, even though the sounding pitch varies, as dictated by the size of the body of the instrument. Likewise, the cor anglais has the same fingerings as an oboe, but sounds a 5th lower because it's a bigger instrument.

Tubas also come in different keys: the most popular is the E flat tuba, but you can also find tubas pitched in F, C and B flat. However, tuba parts are written at concert pitch, so you essentially learn a different set of fingerings when you play on a tuba in a different key (the majority of players stick with one tuba, so this isn't normally a problem). E flat is open on an E flat tuba; F is open on an F tuba; and C is open on a C tuba.

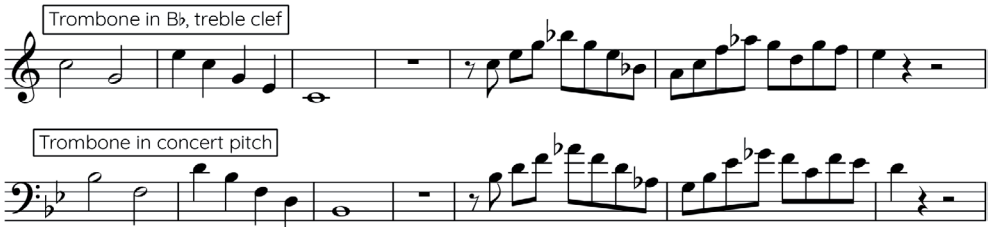
While a trumpet player is mentally adjusting a varied pitch to a rigid fingering system, the tuba player is adjusting the fingering of different instruments to a fixed pitch.

A horn player learns two different sets of fingerings depending on whether they are playing an F or B flat horn. Like the tuba, B flat horn fingerings do not match the pitch of the instrument, but essentially make it continue to *sound* in F. (See the previous Music Teacher resource *Teaching Across Different Brass Instruments*, May 2023, for more information).

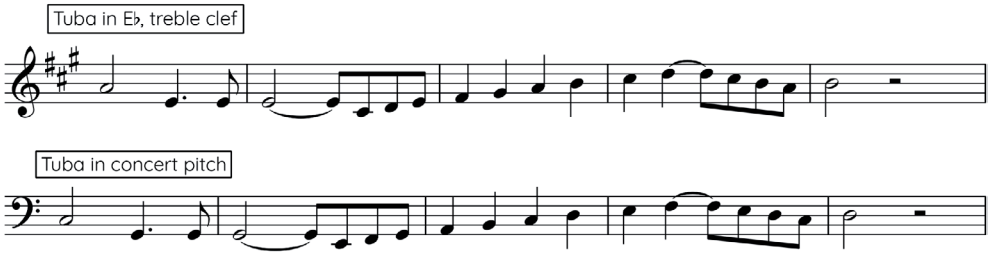
Brass band instruments

Brass band music is always transposed into the appropriate key, so players do not need to make any adjustments. All parts, *including for bass instruments*, are written out in treble clef. There is a logic to this system – all instruments have the same fingering patterns regardless of the pitch: low C is *always* open (or in first position – slide all the way in – for trombone). As with trumpets, a notated C sounds the key of the instrument: for example, C on E flat soprano cornet or tenor horn *sounds* E flat.

If a trombonist brought up playing B flat treble clef parts (the trombone is actually pitched in B flat) wants to play in an orchestra, they will need to learn to read in bass clef at concert pitch:



An E flat tuba player who reads treble clef has an easier job reading orchestral bass clef parts, because the notes are in the same position on the stave, but key signatures and accidentals need to be adjusted.



Why not just write out all trumpet music in B flat?

At one memorable performance of Handel's *Messiah*, a well-meaning but misguided music librarian excitedly told me that she had gone to great lengths to find a B flat trumpet part for me and was rather affronted when I said I wanted the original. I explained: 'The original trumpet part, written in C major, can be played down a 5th in F major on an A piccolo trumpet so it sounds in D major. The B flat part throws this lovely balance into confusion and is *so* much harder to read.' She was thoroughly bemused.

I am often asked this question. There are several answers:

- There are tens, probably hundreds, of thousands of transposing trumpet parts out there. Who's going to take the trouble to write them all out?
- Original parts are often cleaner to read once you get used to it. It's actually *easier* to transpose patterns of notes written in C major down a semitone, for example, rather than being confronted with a frenzy of sharps on the page.
- As mentioned above, trumpets come in different keys. Different players have different preferences of instrument for different pieces. A trumpet in D part helpfully transposed into B flat will be rather irritating for the player who is intending to use a D trumpet for the performance – they'll have to transpose it back again. It's much better to give an original part and leave the choice of instrument (and consequent transposition) to the discretion of the player.
- Let's enjoy our superpower. If you can transpose, you'll be more in demand.

What about using a C trumpet for parts in C, a D trumpet for parts in D, an F trumpet (good luck finding one of them) for parts in F... and pull your tuning slide out a semitone for trumpet in A?

Firstly, that's a lot of expense, and a lot of kit to carry around for every concert. Many students and amateur musicians only possess a B flat trumpet. But, more importantly, your choice of instrument should be dictated by the musical context and the sound you want to produce. For something high, light and delicate in a chamber music setting, a smaller trumpet might be more appropriate. For a large symphonic work, though, you'll probably want the power and projection of a B flat trumpet. I've frequently played a part written for B flat on an E flat trumpet (down a 4th) because the range or fingering patterns are easier. Conversely, I've played E flat parts on my B flat (you've guessed it, up a 4th) because a richer, darker sound is required. And to address the final question, please don't pull out your tuning slide for trumpet in A parts. The instrument is built in B flat, not A, which means that if you pull the tuning slide out substantially, the trumpet won't be in tune with itself any more – the valve slides will be ever so slightly the wrong length and the tuning will sound horrible.

What's the solution?

Learn to transpose! It's really not that hard.

So, how do we do it?

Transposition is the calculation you have to perform when the key of the instrument in your hand is different to the key of the music on the page.

First, establish:

- Where you are going FROM (the key of the instrument)?
- Where you are going TO (our target key – the key of the music on the page)? There can be some confusion between the *key signature of the music* and the *key of the part*. At the first stage, disregard the key signature. If a part says 'trumpet in C' but is written in E major, our target key is C. A part for horn in F is always in F, even if the key signature says something different.
- What is the interval between the two? If your part is marked trumpet in F, and you're playing a B flat trumpet, the interval from B flat to F is up a 5th. Therefore you will need to transpose up a 5th. But beware: as always, there is a potential complication. If you're covering an F horn part on a trumpet, you need to play down a 4th for it to sound at the correct octave. Whether you go up or down (trumpets generally go up, though trumpet in A is down a semitone) needs to be judged on a case-by-case basis.
- Only now, look at the actual music. Look at the key signature, and transpose this by the interval we've just established. If, for example, we know we need to go up a 4th, and our part is written D major, our new key will be G major.

We can now take three possible approaches:

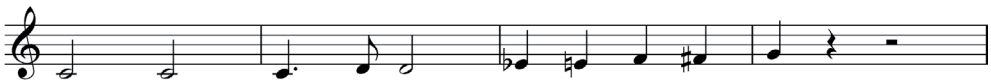
1 Transpose each note individually.
2 Transpose *patterns*, *sequences* and *phrases* of notes, identifying fragments of scales and arpeggios in the new key.
3 Read in a different clef (if you are highly musically literate).

If the music is atonal, or has jagged note-shapes that don't fit into easily identifiable patterns, you'll probably need to resort to the first approach. The danger is that the performance may become disjointed, rather like trying to translate a sentence into a different language one word at a time.

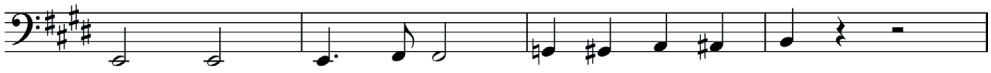
To continue the analogy, the second approach is like translating sentence by sentence. We understood the *relationships* between the notes, which flow in a logical sequence, dictated by the key of the piece. Students who have learnt solfa will normally take to transposition very quickly. A thorough knowledge of scales and arpeggios is, of course, essential: we need to build up an ability to play patterns of notes *instinctively* in different keys.

The final approach of changing the clef obviously only works if you can already read fluently in different clefs. Beware that the accidentals won't necessarily be the same, as in the example below, and octaves may need to be changed.

The following extract (from Wagner's *Rienzi* Overture) is written for trumpet in D:



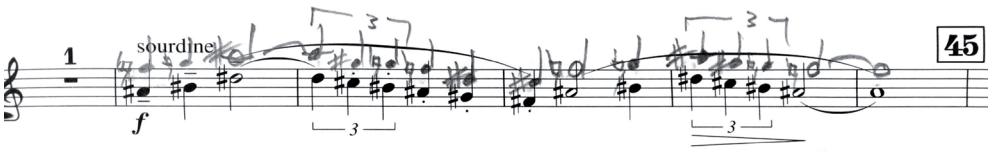
To play this on a B flat trumpet, you need to read it up a third. The notes will be in the same place on the stave if you read it in bass clef, but note the required changes in some of the accidentals. You'll also be sounding two octaves higher.



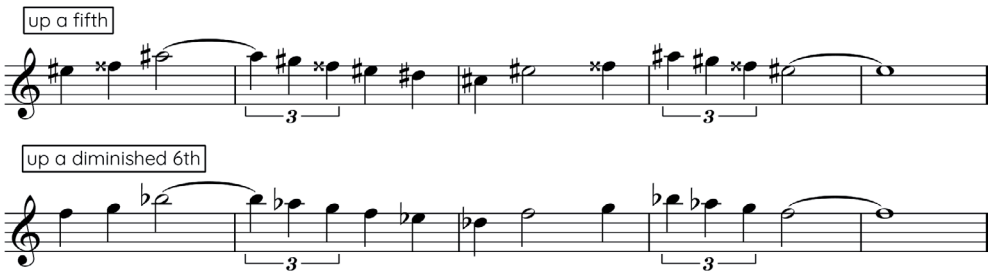
The key is... the key

We need to be intelligent and adaptable in how we approach the key. If we're in a sharp key, such as A major, and we want to transpose down a semitone, we don't need to shift the notes at all: we can just change the key signature to A flat. Again, beware of accidentals – a written D sharp becomes a D natural, and if a flat should appear, it will become a double flat. This approach won't work with a flat key, however – it's not advisable to attempt the transposition from E flat to E double flat major; D major might be a touch easier.

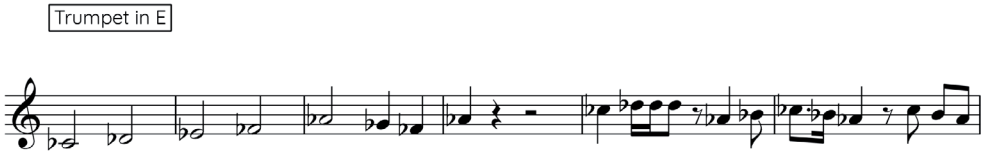
This is an extract from Debussy's *La mer*, which is for trumpet in F (as we've established, that will be up a 5th on a B flat trumpet). The pencil markings were, rather worryingly, made by a trumpet teacher.



Below is the extract transposed up a 5th, followed by a considerably easier enharmonically changed version (even if the transposition of up a diminished 6th sounds rather alarming). Either way, the sequence of notes follows a logical pattern in a discernible key rather than the jumble of naturals and sharps pencilled in above.

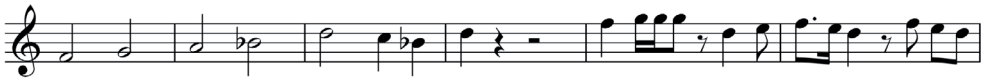


Below is one more example, where identifying the *key* makes something so much easier, when on the surface it looks fiendishly difficult. This is from Tchaikovsky's *Romeo and Juliet* for trumpet in E (up an augmented 4th/diminished 5th). This is a particularly notorious transposition sometimes faced by a trumpet player. In this extract, we're faced with the nightmare scenario of C and F flats up an augmented 4th (or should it go up a diminished 5th? Maybe avoid that... the first note would be G double flat).



Hopefully your brain will soon have stopped hurting, and in a moment of clarity you will have spotted the fact that it's in humble F major.

What *not* to do

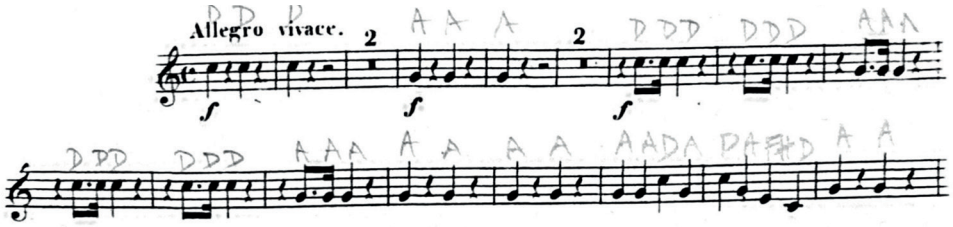


It's very common to sit down in an orchestral rehearsal and find that the parts have had the transposed notes pencilled in above the written notes (as in the *La mer* extract above). Now, musicians generally use a pencil to correct misprints in the parts. So, my natural instinct is to transpose the *pencilled* note, meaning that it gets transposed twice. Worse still is some people's tendency to pencil in an accidental over a note, meant to apply to the transposed note – e.g. a sharp pencilled in over an E when transposing up a tone, because the new note is F sharp. I will inevitably take it that the original note is E sharp and play F double sharp. (And yes, it is F double sharp, not G – we're transposing up a tone, not up a diminished 3rd.)

The first thing I do when presented with a heavily pencilled part is to grab a rubber and clean away all pencil markings. I was once hired to play along with a school orchestra. I arrived early for the rehearsal and quickly rubbed out all the pencil markings on the part. Just before the rehearsal started, a student sat down next to me, looked with horror at the clean parts and burst into tears. She could only read the pencilled notes. I hurriedly had to reinstate all the markings, while silently cursing the trumpet teacher who had not taught her to transpose.

Trumpet players always have a lot of bars' rest, so why not spend a chunk of that time thinking through the pitches of the next entry, rather than idly scrolling through your phone? We all know that music develops multi-tasking skills, so the ability to count your bars' rest while thinking through your next entry soon becomes second nature. (And if you're 100% confident with your next entry, then you probably *can* get away with scrolling through your social media accounts or checking the football scores, *as long as you're still counting your bars' rest* and it's a rehearsal and not the concert!)

It baffles me that anyone would need to pencil each individual note into, say, a Mozart symphony. In his 'Jupiter' Symphony, for example, the first trumpet uses only eight different notes, and the second trumpet six, in the entire piece, all of which are unequivocally in (sounding) C major. How can a player who is technically capable of playing this be incapable of recognising an arpeggio without needing to pencil it in?



These are my rules when tutoring in a youth orchestra:

- Always use the original parts. If alternative transposed parts are provided, don't use them.
- Don't avoid transposition but embrace it – the more we do it, the more fluent we become.
- Never pencil in notes.
- Never pencil in *all* fingerings (we don't want to end up just reading numbers rather than the notes), though my one concession is to allow the occasional fingering, if there's a particularly awkward passage.

In my school brass ensembles, for which I usually arrange parts using Sibelius, I have been known to write parts in different transpositions, just to give my more advanced students extra challenges.

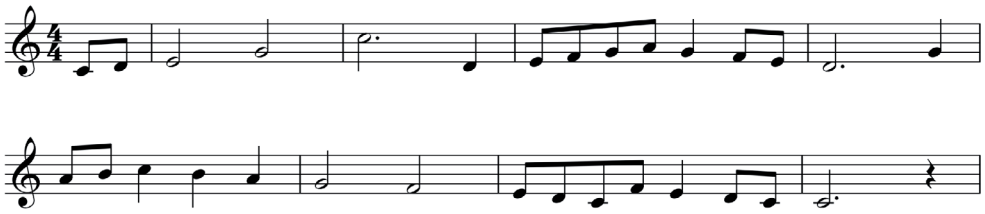
The golden rule with transposing is this: the quickest way to learn is just to do it, as often as possible.

Building early skills

Let's return to 'Twinkle, Twinkle, Little Star', mentioned in the introduction. Most toddlers can effortlessly sing it starting on different pitches, so why wouldn't an instrumentalist be able to play a piece in a different key? The answer is that they can *if they know their scales*. Encourage your students to play simple tunes *by ear* in different keys – this is a good way to consolidate scales, and to illustrate why learning a scale is an important practical skill, not just an abstract construct.

Most tunes are heavily based around scales and arpeggios – some good examples include the *Eastenders* theme, 'Hickory Dickory Dock' and 'Joy to the World'. Encourage students to play them by ear starting on different notes.

Handel's March from *Scipio* is a particularly good piece to play in different keys. When a student learns a new scale, see if they can play it in that particular key, but reading from the C major part.



Sight-singing skills are essential: musicians need to know how a piece should *sound* from how it *looks* on the page. Here are some simple exercises:

- Ask a student to sight-sing a simple tune.
- Now ask the student to sing it again, but starting on a different pitch. They should find this just as easy (unless they have perfect pitch, which might confuse them) – they're following the same interval shapes.
- Now remove the music and see if they can *play* the piece by memory.
- Now try playing it again in different keys.

Practise playing in *all* keys, not just the transpositions that are common for your instrument.

Brass players are commonly transposing lip-slur exercises, when playing them down the valve combinations or slide positions. There is no need to rewrite the same exercise for each finger change – you just follow the same pattern. This gives a student an insight into how a pattern of notated notes can *sound* a different pitch, depending on the length of tubing you're blowing down.

Advanced transposers are essentially *hearing* the music that they read in their head and then *playing* these note-shapes by ear, in the required key.

Transposition in exams

When I took my ABRSM Grade 8 trumpet exam way back in the 1980s, I had to be prepared to transpose at sight for trumpet in A, C, D, E flat, E and F, at the random choice of the examiner. Now it's just trumpet in C from Grades 6 to 8. This is a sensible compromise: the syllabus is shared between trumpet, cornet and flugelhorn players, and imposing such a burden of transposition on cornet and flugelhorn players, who do not usually need to transpose, seems harsh.

Trinity requires sightreading for trumpet in C from Grades 6 to 8 as well. You can also choose between scales and arpeggios, and transposed orchestral excerpts for trumpet (or non-transposed band excerpts for cornet and flugelhorn). On the surface, this seems something of a contradiction: a thorough knowledge of scales is a prerequisite for fluent transposition, yet you can opt out of scales and choose transposition instead.

However, an exam syllabus is *not* a curriculum, but just assesses a selection of skills. There are plenty more areas that are essential but not assessed, and some boards offer choices in order to demonstrate your strongest skills. In allowing a choice between transposition and scales, Trinity is *not* suggesting to teachers that they needn't be teaching scales. Likewise, just because trumpet in C is the only transposition required, ABRSM is *not* saying that transposition in other keys can be overlooked by teachers. We need to be intelligent and proactive, and fill in the gaps by developing our own curriculum.

Conclusion

If you're not a brass player, I hope you've still made it to the end of this resource. Transposition should not be seen as a dark art that is the preserve of the brass section in an orchestra, or the cathedral organist, many of whom have superhuman powers of transposition. It's a fun activity that turns you into a more versatile musician, and opens up a wider range of possible musical activities:

- You're playing in the band for a school show and the singer says: this song doesn't fit my vocal range – can we sing it a 3rd lower?'
- Your school orchestra doesn't have any horns. Can a trombone cover the part?
- Can an oboe cover the cor anglais solo?
- Two siblings are given a duet book, but one plays the clarinet and the other, the flute.
- A piece of music goes out of your range. Can you play it at a different octave?
- You've been invited to play your saxophone in an ad hoc village band accompanying some carol singing, but you need to read from a hymn book in concert pitch.

And, of course, if you teach your students to be proficient in the art of transposition, it'll save you a lot of time writing out transposed parts for them.