

# Written Vs. Sounding Pitch

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It is generally believed that converting written pitch to sounding pitch in conventional music notation is always a straightforward process. This is not true. In fact, it's sometimes barely possible to convert written pitch to sounding pitch with real confidence, at least for anyone but an expert who has examined the music closely. There are many reasons for this; a list follows. Note that the first seven or eight items are specific to various instruments, while the others are more generic. Note also that most of these items affect only the octave, so errors are easily overlooked and, as a practical matter, not that serious, though octave errors can result in mistakes in identifying the outer voices. The exceptions are timpani notation and accidental carrying, which can produce semitone errors; natural harmonics notated at fingered pitch, which can produce errors of a few large intervals; baritone horn and euphonium clef dependencies, which can produce errors of a major 9th; and scordatura and C scores, which can lead to errors of almost any amount. Obviously these are quite serious, even disastrous.

It is also generally considered that the difference between written and sounding pitch is simply a matter of transposition. Several of these cases make it obvious that that view is correct only if the "transposition" can vary from note to note, and if it can be one or more octaves, or a smaller interval plus one or more octaves.

1. In older editions, **French horn** parts in bass clef are almost always written an octave lower than their transposition would dictate. According to Read (1969), this was standard "up to the turn of the [20th] century, at least". Good examples are hard to come by because it's not often obvious to a non-horn player whether the old bass clef notation is in use. But cases where it *is* obviously used include the horn solos in Beethoven's *Fidelio* Overture (Eulenberg ed.), and in Strauss's *Till Eulenspiegel* (Boosey & Hawkes, Eulenberg, Kalmus eds.). Myron Bloom, former principal horn of the Cleveland Orchestra, says he sometimes sees cases where it's not obvious even to him whether the octave change applies (personal communication, December 2003). The article "Transposing instruments" in Sadie (2001) comments "An instruction is often printed to indicate the reformed bass-clef notation; otherwise it has to be discovered by context." Stone (1980) recommends a specific symbol for the older notation (a modified bass clef).

NB: according to the article "Transposing instruments" in Arnold (1983), this usage of bass clef in old editions applies also to basset horn and occasionally trumpet.

2. The article "Bass clarinet" in Sadie (2001) describes "several current conventions regarding notation for the **bass clarinet**." In the French system, the part is written entirely in treble clef, sounding (for the B-flat instrument, the only one really used anymore) a 9th lower than written. The German system uses both treble and bass clefs, sounding a 2nd lower than written. There is also a hybrid system: Sadie comments "In the treble clef [the German system] runs counter to the player's instincts; in an attempt to avoid confusion, some composers change to a 9th transposition when using the treble clef." But it's hard to see how this last method does anything but *increase* confusion! There's rarely if ever an explicit indication of which system is in use.

3. In older editions, **cello** parts in treble clef are sometimes written an octave higher than sounding pitch; these editions generally use only treble and bass clefs, skipping tenor. Examples: Dvorak's Piano Quartet in D, Op. 23 (International), I; his String Quartet no. 12 in F, Op.96 ("American"), I (Artia); and his \*Serenade for Strings (Kalmus). This appears to be very common in editions from certain publishers of music by Dvorak, and may also be found in Schumann, Brahms, etc. There's rarely if ever an explicit indication of when it's the case.

4. In older editions of music written roughly through the time of Beethoven, **timpani** parts are sometimes written without key signatures or accidentals. Example: Beethoven's Symphony no. 3 (Eulenberg ed.), I, III, and IV, are in E-flat major but the timpani part has no key signatures or accidentals, so B-flats and E-flats appear as B's and E's. Similar things appear in Beethoven's Symphony no. 4 (Eulenberg), Mendelssohn's Hebrides Overture (Philharmonia), Weber's Euryanthe Overture (Boosey & Hawkes), etc. But NB in most cases, the notes used in a given movement are listed at the beginning of the movement (e.g., "Timpani in B and F#"), so the sounding pitch is given that way. However, in other old editions, timpani is notated as a conventional transposing instrument, but the transposition is not explicit. For example, the Bach Gesellschaft edition of the B-minor Mass has movements in D major in which the timpani notes--obviously intended to sound as D and A--are written as C and G. The staff is labelled simply "Timpani", with no indication of the transposition and, of course, no key signature. In fact, the Gesellschaft editions seem to write timpani this way consistently.

5. In **organ** music, registration ("stops") can produce transposition down by one or two octaves and up by as much as three octaves; it can also produce doubling at any one or more of those levels, and it can be changed at any time. The notation is often explicit, but very often not. "16 ft." clearly means sounding one octave down, and "4 ft." one octave up; "with 4 ft." probably means doubling one octave up. But many scores--including most of J.S. Bach's--say nothing about registration. This ordinarily means, for pedals, 8 ft. and 16 ft. (as written, but doubled down an octave), and for manuals, 8 ft. (sounding as written). However, for manuals, the fact that no stop is indicated does not necessarily imply 8 ft.: the organist may occasionally play at 4 ft. or 16 ft. pitch, due to the character of the music or limitations of the stops available on a given instrument. Also, some scores

describe the registration, but in ambiguous terms. For example, the first page of Verdi's *Othello* says only "L'Organo sulla scena mettera il registro dei Contrabassi e Timpani, e coi Pedali suonerà contemporaneamente." Does that mean it sounds as written, an octave lower, or what? Most people seem to think it means as written, but I haven't found anyone--and among those I've asked are an opera conductor and a Verdi scholar--who's sure. (Note that mutation and mixture stops could produce transposition by other intervals, e.g., a 12th, but they are conventionally used only to affect timbre; if they were used for transposition, it would certainly need to be notated explicitly.) Similar considerations apply to the **harpsichord**, though, to my knowledge, harpsichord registration allows only one octave of transposition up or (less often) down, and even that is used much less than on the organ.

6. In band music, according to the article "Transposing instruments" in Sadie (2001), "The **B-flat baritone [horn] and euphonium**, when written in treble clef, sound a major 9<sup>th</sup> lower, but in the bass clef there is no transposition." Thus, in the former notation, they're written as B-flat instruments, but in the later case as C instruments.

7. **Tenor voice** always sounds an octave lower when written in treble clef but at sounding pitch in treble-tenor clef. This is a relatively minor problem because the clef never changes within a piece. (Of course there might be exceptions I don't know of, but it's hard to imagine why it would ever happen.)

8. **Scordatura** for string instruments usually--though not always--effectively involves different transpositions mixed within a single part, and sometimes even within a single chord. To determine sounding pitch requires the "accord" (tuning to be used) and the instrument's normal tuning. Examples: Bach's Cello Suite #5, throughout; Mozart's Sinfonia Concertante, K.364; Stravinsky's *The Firebird*, opening section; Mahler's Symphony no. 4, II; and works by Paganini, Saint-Saens, Kodaly, Bartok, etc. Scordatura is common in 17th-century violin music, especially Biber. Scordatura is also found in non-classical music: it's fairly common in Hardanger fiddle music (from Norway), and it occurs in 18th-century Scottish folk music. (Even knowing the accord and normal tuning might not suffice to determine a note's sounding pitch if it's unclear what string it should be played on, but ambiguities of this kind seem to be very rare.)

9. A great many recent orchestral works are written with "**C scores**". This usually means everything is at concert pitch except for octave-transposing instruments like piccolo (up) and contrabass (down), though a few scores (especially Berg?) have even piccolo, contrabass, etc., written in the sounding octave. Many C scores indicate that all instruments are written at concert pitch, but many don't.

10. Scope of **octave signs** isn't always clear. Where there are two voices on the staff they affect, they sometimes apply to only one voice. Examples: Debussy's *Les Collines d'Anacapri* (cf. Byrd (1984), Fig. 64); Tchaikovsky: Piano Concerto no. 1 (Eulenberg ed.), I.

11. There are instances, produced by clefs above or below the staff or by ties across clef changes, of **simultaneous notes in two clefs on one staff**. It's usually obvious which clef applies to which notes, but not always. Examples: I know of at least eight examples of this phenomenon in works, mostly for piano, of Brahms, Debussy (cf. Byrd (1984), Figs. 62 & 63), Poulenc, Puccini, Rachmaninoff, and Ravel. Also, Read (1969) comments that this device is sometimes used in late Romantic horn parts; none of the examples I've seen are in horn parts, so there are almost certainly many more cases.

12. The **rules for when accidentals carry** can be ambiguous. It's arguable that even the standard rules are ambiguous in the presence of multiple voices, clef changes, and perhaps even octave changes. In addition, many 20th-century scores contain a statement to the effect that accidentals apply only to the notes they precede--but what about immediate repetitions? Others say accidentals apply only to the note and immediate repetitions--but it may not be clear what is an "immediate repetition", e.g., what about other voices on the same staff?

13. **Harmonics** introduce a couple of problems. For natural harmonics, some composers, especially Ravel, write the fingered note (with a diamond-shaped head) rather than the sounding note (with a small circle above or below); if the note can be played on more than one string, it may be difficult to figure out which is intended, and therefore what the sounding pitch is. Also, Stone (1980) says "Double-bass harmonics are occasionally notated at sounding pitch, in G-clef".

## References

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