The British Bass Trombone in G

Arnold Myers

The origins of the G bass trombone and the reasons for its prevalence in Britain are not well documented. The trombone had become extinct in Britain in the eighteenth century, so when it was re-introduced at the end of the eighteenth and beginning of the nineteenth century there was no established tradition to be continued. Players and makers of brass instruments came to Britain mostly from Germany[1] and so may have been familiar with bass trombones in F, E♭ or G. Players and bandmasters could choose whatever best suited their technique and their repertoire. Local instrument makers were ready to supply trombones in a range of pitches. The records of the Royal Society of Musicians give the names of trombonist members from 1773, but only in 1821 is there mention of a bass trombone, and its pitch is not specified. There are records of the trombonists engaged by the Philharmonic Society from 1813, for each season generally three musicians are named: we can assume that the third played bass trombone parts, but again no pitches are stated.

In France, a similar situation gave rise to a tradition of employing a section of three B♭ trombones. Hector Berlioz, in the 1855 edition of his Orchestration Treatise, regarded the "true" bass trombone as the E♭ bass, which he only scored for (*ad lib.*) in his *Symphonie Funèbre et Triomphale*; he added that the bass trombone in G is "sometimes found in England."[2] Practice in Britain was less straightforward than in France. Iconographic identification of early bass trombones is problematic since a trombone in G is only 11% shorter than one in F, so even if a depicted trombone can be identified as a bass, one cannot be sure if it is in G or F. The painting from the 1830s by A. Archer, *Arrival of William IV and Queen Adelaide at 'The Friars,' Lewes,*[3] shows a large trombone, its slide extended by a handle to an impressive length, but the proportions do not look right for either G or F. The well-known image of Besses o' th' Barn Band in 1860[4] clearly shows a bass trombone with proudly extended slide. While being evidence for the use of a bass trombone, it cannot be reliably determined if the instrument is in G or F.

The instruction book for three trombones by Giuseppe Foraboschi, published in London in 1838,[5] specified only the pitches F, C and G for alto, tenor and bass trombones, so at this time the preferred bass trombone pitch was already G. In 1839, the prominent musical instrument dealers D'Almaine & Co advertised only F, C and G trombones.[6] In 1851 the London instrument manufacturer John Augustus Köhler offered slide and valve trombones, listing the basses first; bass trombones were offered in F or G, see Table 1. B♭ trombones are not mentioned at all.[7]

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Table 1: John Augustus Köhler's price list of 1851

Valve trombone in F (3 valves) bass	£11 11s 0d
Valve trombone in G (3 valves) bass	£10 10s 0d
Valve trombone in C (3 valves) tenor	£9 9s 0d
Trombone in F made in the usual way	£9 9s 0d
Trombone in G do	£8 8s 0d
Trombone in C or Tenor do	£6 6s 0d
Trombone in F or Alto do	£5 5s 0d

The 1850s were a period of great expansion in British brass and military bands, accompanied by an increased choice of instruments offered by manufacturers and dealers. In his 1857 *Complete Catalogue of Military Musical Instruments*, Henry Distin offered alto trombones in F and E♭, tenors in C and B♭, and basses in G and F, each as a slide trombone, a bell-forward valve trombone and a bell-upward valve trombone (see Figure 1).

The 1850s also saw the beginnings of published repertoire for brass bands. In William Childe's arrangements, *The Amateurs' Brass Band Quartetts*, published by Wessel & Co, London, in 1852,[8] the bass part is given in transpositions for valve tenor trombone in B♭ and A♭, also untransposed for ophicleide or bass trombone. The bass trombone part is carefully taken down to D♭, the lowest note apart from pedals on the G bass trombone, but no lower.

Further evidence for the pre-1860 British bass trombone is provided by the extant early bass trombones, all of which are in G, none is in F, see Table 2.

Table 2: Extant pre-1860 British bass trombones

John Green [dealer], London, ca. 1820	Author's loan to Edinburgh University Collection of Historic Musical Instruments, inventory 3026
George Smith, Birmingham, 1830-46	Bernoulli Collection, Historical Museum, Basel, inventory 1980.2928
Frederick Pace, London, 1831-49	Bernoulli Collection, Historical Museum, Basel, inventory 1980.2908
anonymous, probably ca. 1840	Private collection, England
D'Almaine & Co [dealers], 1834 or later	Galpin Society *Made for Music* Exhibition, 1986, item 158

anonymous, probably ca. 1850	Author's loan to Edinburgh University Collection of Historic Musical Instruments, inventory 901
anonymous, probably mid-19th century	Francis Galpin Collection, Boston Museum of Fine Arts, inventory 2009

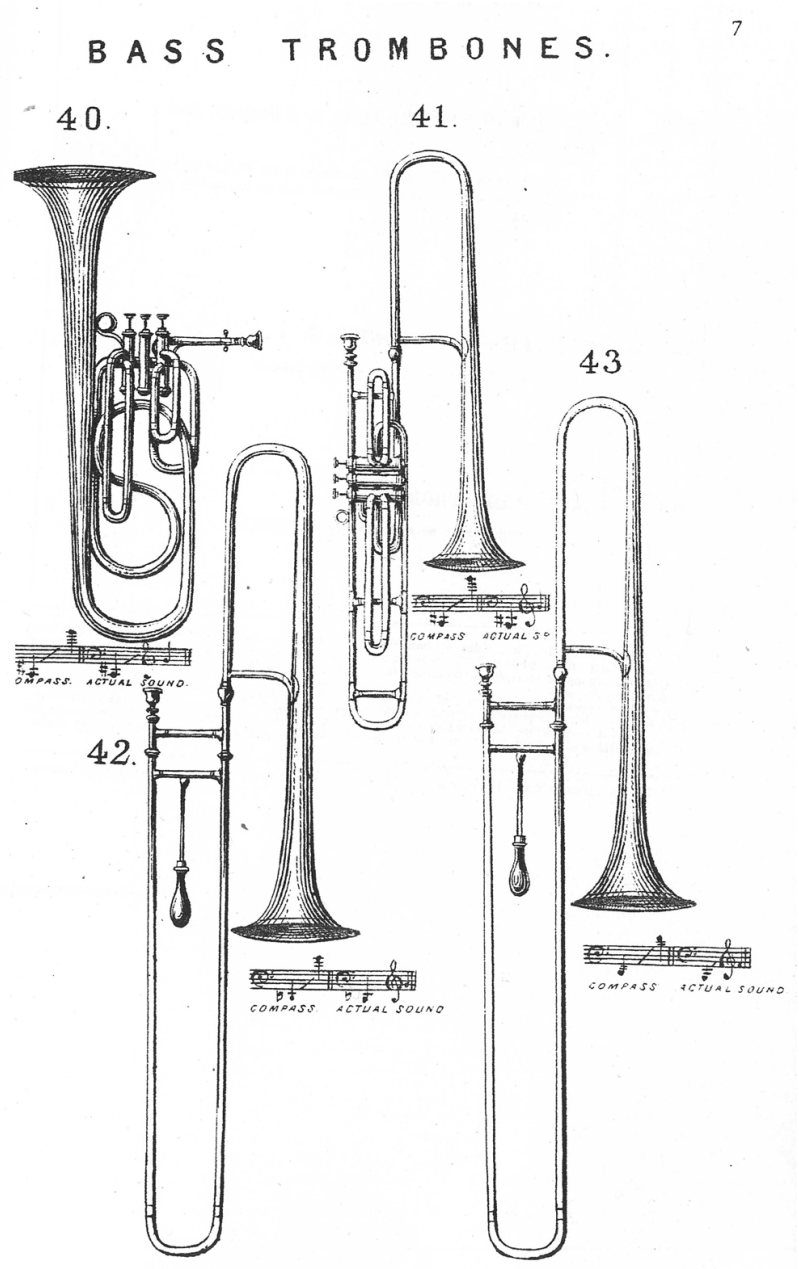
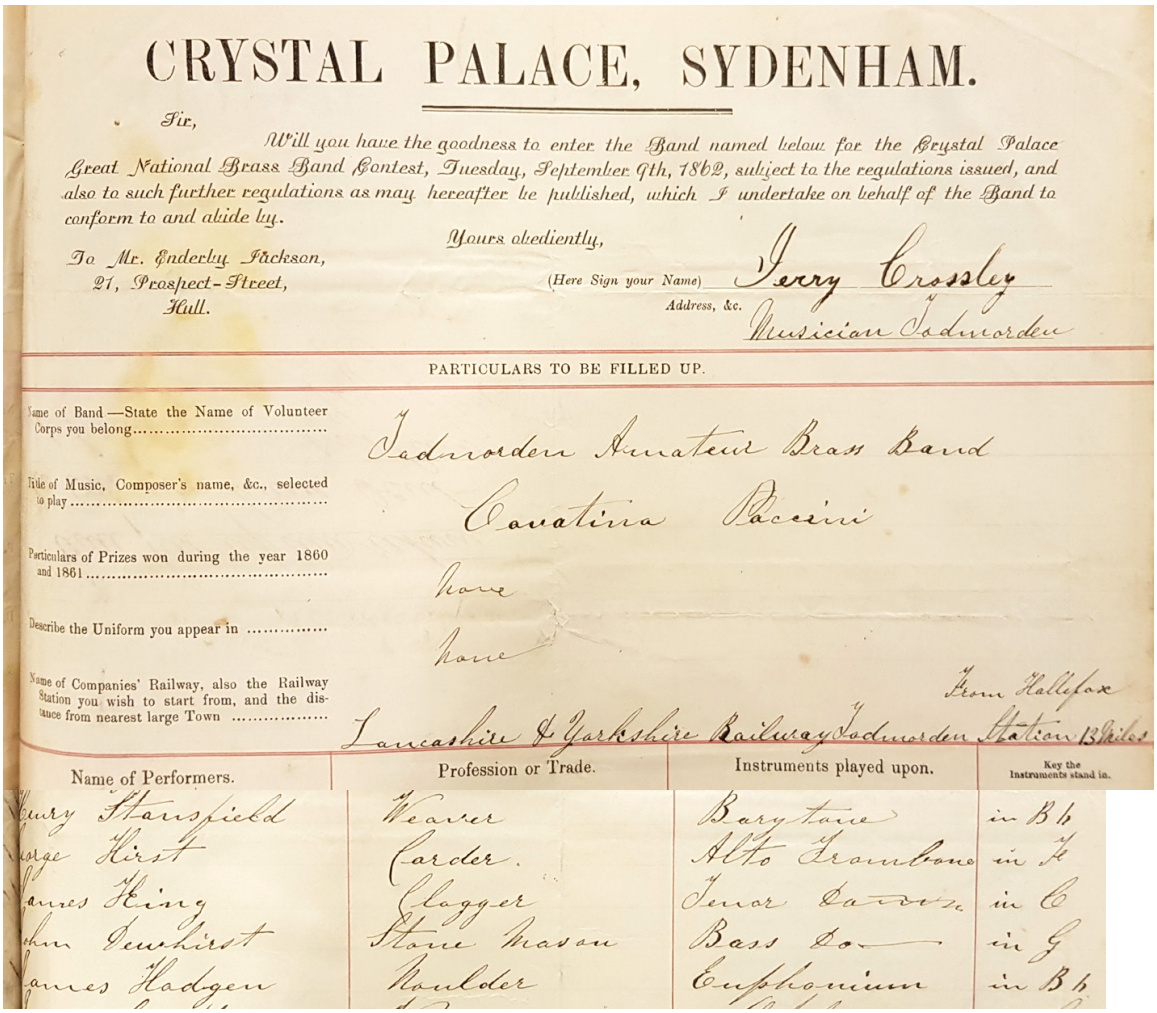


Figure 1: Bass trombones in Henry Distin, *Complete Catalogue of Military Musical Instruments* (1857). 40: bass trombone tuba in G, 3 pistons, bell upward; 40a [not illustrated]: bass trombone tuba in F, 3 pistons, bell upward; 41: bass piston trombone in G, 3 pistons, bell forward; 42: bass slide trombone in G; 43: bass slide trombone in F. ("Tuba" was Distin's term at this time for a brass instrument of any size with an upright bell.)

Finally, in the 1860s, a fuller picture of the trombones in widespread use was presented by the Crystal Palace brass band contests of 1860, 1861, 1862, and 1863. Their organizer, Enderby Jackson, required bands entering these contests to complete a form giving the kinds of instrument played and their pitches.[9] The largest collection of these forms was donated by the present author to the Royal Conservatoire of Scotland.[10] The ninety-two contest entry forms from the Crystal Palace contests in London and from an 1863 contest in Leeds, similarly organized, detail the instrumentation of seventy-five bands. Figure 2 shows an example from the 1862 contest: Todmorden Amateur Brass Band entered with F alto trombone, C tenor and G bass. They also still used an ophicleide, already rather old-fashioned. Bands entering these contests were a self-selected sample of a large population of brass bands—they would have entered only if they were up to strength and of above-average competence. The general practice at this time was for brass bands to play from arrangements by their conductors for their



CRYSTAL PALACE, SYDENHAM.

Sir,

Will you have the goodness to enter the Band named below for the Crystal Palace Great National Brass Band Contest, Tuesday, September 9th, 1862, subject to the regulations issued, and also to such further regulations as may hereafter be published, which I undertake on behalf of the Band to conform to and abide by.

Yours obediently,

(Here Sign your Name) Jerry Crossley

Address, &c. Musician Todmorden

To Mr. Enderby Jackson,
21, Prospect-Street,
Hull.

PARTICULARS TO BE FILLED UP.

Name of Band—State the Name of Volunteer Corps you belong..... Todmorden Amateur Brass Band

Title of Music, Composer's name, &c., selected to play..... Cavatina Paccini

Particulars of Prizes won during the year 1860 and 1861..... None

Describe the Uniform you appear in ..... None

Name of Companies' Railway, also the Railway Station you wish to start from, and the distance from nearest large Town ..... From Halifax Lancashire & Yorkshire Railway Todmorden Station 13 Miles

Name of Performers.	Profession or Trade.	Instruments played upon.	Key the Instruments stand in.
Henry Thornfield	Weaver	Baritone	in B♭
George Hirst	Carder	Alto Trombone	in F
James King	Clogger	Tenor Do	in C
John Dewhirst	Stone Mason	Bass Do	in G
James Hodgen	Moulder	Euphonium	in B♭

Figure 2: Trombone section entered by Todmorden Amateur Brass Band in the 1862 Crystal Palace brass band contest in London.

bands' particular players and instruments—there was little printed music and as yet no standardized instrumentation. The kinds of trombone that brass bands were using are shown in Table 3.

Table 3: Pitches of trombones in bands from their 1860s contest entry forms.

Alto trombones in F	3
Alto trombones in E♭	3
Tenor trombones in D♭	2
Tenor valve trombones in D♭	2
Tenor trombones in C	26
Tenor trombones in B♭	18
Bass trombones in C	2
Bass trombones in A♭	2
Bass trombones in G	47
Bass trombones in G♭	3
Plus 1 each: valve trombone in E♭, alto trombone in D, tenor trombone in E♭, tenor valve trombone in C, tenor valve trombone in B♭, bass valve trombone in A, bass valve trombone in A♭, valve trombone in F, contra trombone in B♭, unspecified trombone; also fifteen unspecified tenor trombones and eleven unspecified bass trombones	

There were nearly equal numbers of bass trombones and tenors. G was by far the most popular pitch for trombones, followed by C tenors. (The bass trombones in A♭ and G♭ may have been G trombones built to a different pitch standard.)

All this changed in the 1870s when bands increasingly adopted published compositions and arrangements that, together with stricter contest rules, led to a standardized instrumentation. Orchestral practice already dictated a section of three trombones, two tenors and a bass; this may have led to bands adopting the same configuration. In part, the makeup of the standardized brass band was due to the influence of band trainer John Gladney (1839–1911), a clarinetist in the Hallé Orchestra, as bands tried to emulate the success of the bands he conducted. From the late nineteenth century until after 1950, practically all British full-strength orchestras, military bands, contesting brass bands,

and Salvation Army bands fielded two B♭ tenors and a G bass trombone. Repertoire came to be written for this combination. This was the case not only in the British Isles, but throughout the British Empire, and through the Salvation Army in places such as Switzerland where the local traditions were very different. (The G trombone in France is briefly discussed in Appendix 1.) At the same time, however, there were numerous ensembles that lacked a bass trombone: smaller theater[11] and resort orchestras, brass bands not up to contesting strength, and smaller Salvation Army bands[12] employed only tenor trombones or none at all.

The firmly established position of the G bass trombone is confirmed by the factory records of the principal London manufacturers of brass instruments, Boosey & Co., F. Besson (later Besson & Co), and Rudall Carte.[13] Complete records survive of all the brass instruments made by Boosey & Co (later Boosey & Hawkes) from 1868 when they bought Henry Distin's business.[14] In the 1870s, production of valve trombones outnumbered slide trombones; by 1887–88, numbers were nearly equal, and by 1897–98 slide trombones were in the majority. Production of G bass trombones was on average about one third of the production of B♭ tenors. Bass slide trombones in F continued to be made, but probably only to special order: seven were made from 1868 until the last in 1935.

The bass valve trombone in G with three valves was widely used in bands in the decades before and just after 1900. Without the design constraints imposed by the slide mechanism, some valve instruments marketed or used as trombones departed from the bore profile of the slide trombones, which was necessarily close to cylindrical for a high proportion of the sounding length. In some valve trombones, there was greater expansion in the bore diameter in the region around the mid-point of the sounding length that differentiates their character from that of the slide trombone.

While military bands formed a large part of Boosey's market, amateur brass bands were the larger part of Besson's market. Complete records survive of the production of Besson slide trombones from 1875 to 1895 in the form of stock books.[15] In this period they made on average 145 slide trombones annually of which thirty-one were basses in G. This may seem like a low proportion of basses, but it should be noted that a proportion of the production was exported (to the U.S.A., Egypt, and elsewhere), while G trombones were primarily for domestic use. Only one F bass trombone was made: a special order for the prominent orchestral bass trombonist, Alfred Phasey Jr.[16]

An incomplete set of stock books survive from the firm of Rudall Carte. Although better known for woodwinds, they produced a range of brass instruments from 1855, when they took over the business of Thomas Key, up to World War II. In the period 1895 to 1914 they made 180 slide trombones of which forty-three were basses in G; the others were nearly all B♭ tenors with a few examples of an E♭ bass with a double slide.

As with the tenor trombone, the British bass trombone evolved over its principal period of use. The biggest change took place around 1860 when the French style of trombone was adopted in Britain.[17] This was partly a result of Henry Distin's appropriation of large-scale French manufacturing practices[18] and of Gustave Besson's opening a

London factory in 1858 using Paris designs,[19] also of the import to London of excellent brasswinds by Antoine Courtois of Paris from the 1850s, well evidenced by numerous surviving examples. While the French influence on the tenor trombone was shown by the adoption in Britain of the narrow-bore instrument already well established in France, with the bass trombone it was more a re-modelling of the G trombone commonly used in Britain to match the French model tenors.

The extant early G basses listed in Table 2, as with other British brasswind of the early nineteenth century, show a strong German influence. The trombone sold by John Green, London around 1820,[20] shown in Figure 3, is of brass with a wide bell garland, the slides are without stockings, and there is no tuning-slide or water-key. The French influence is embodied in the trombone by Antoine Courtois from around 1860 shown in Figure 4. As with many other Courtois instruments, the bell inscription includes details of the maker and of the London agent in uniform style, confirming that it was made for the British market and imported by Chappell. It has a wired bell rim; there is a tuning-slide, the slide has stockings, and there is a water-key. The ferrules and stay ends are ornamented. The majority of subsequent British bass trombones followed this model.

Figure 3: G bass trombone by John Green, ca. 1820 (author's loan to Edinburgh University Collection of Historic Musical Instruments, inventory 3026). The instrument lacks its handle, but is accompanied by a contemporary ivory and brass mouthpiece (not shown).

Figure 4: G bass trombone made by Antoine Courtois, Paris and imported by Chappell & Hammond, 1858–62 (author's loan to Edinburgh University Collection of Historic Musical Instruments, inventory 6672). The instrument has its heavy wooden fitted case.

More important than external detail is the bore profile, generally summarized by players in a single parameter, the slide-bore diameter.[21] Figure 5 shows the bore diameter for a large sample of G bass trombones. The German-influenced instruments made before 1860 mostly have a wider bore (average 13mm) than the later instruments. For a few decades from 1860 purchasers could choose from a range of bore sizes which narrowed as preferences converged and as smaller manufacturers went out of business. The later instruments have an average bore of 12.35mm, which was also the bore of the last G trombones, all made by Boosey & Hawkes, at the far right of this plot. Although Boosey & Hawkes phased out production of narrow-bore B♭ tenor trombones in the period 1946–50, the G trombones that had been the accustomed partners of narrow-bore tenors were kept in production, both in the professional range (Imperial) and student models (Regent).[22] A slightly wider-bore G latterly made by Besson (12.8mm) was discontinued when the B&H and Besson product lines were integrated in 1954.[23] A list of makers and bore sizes is given in Appendix 2.

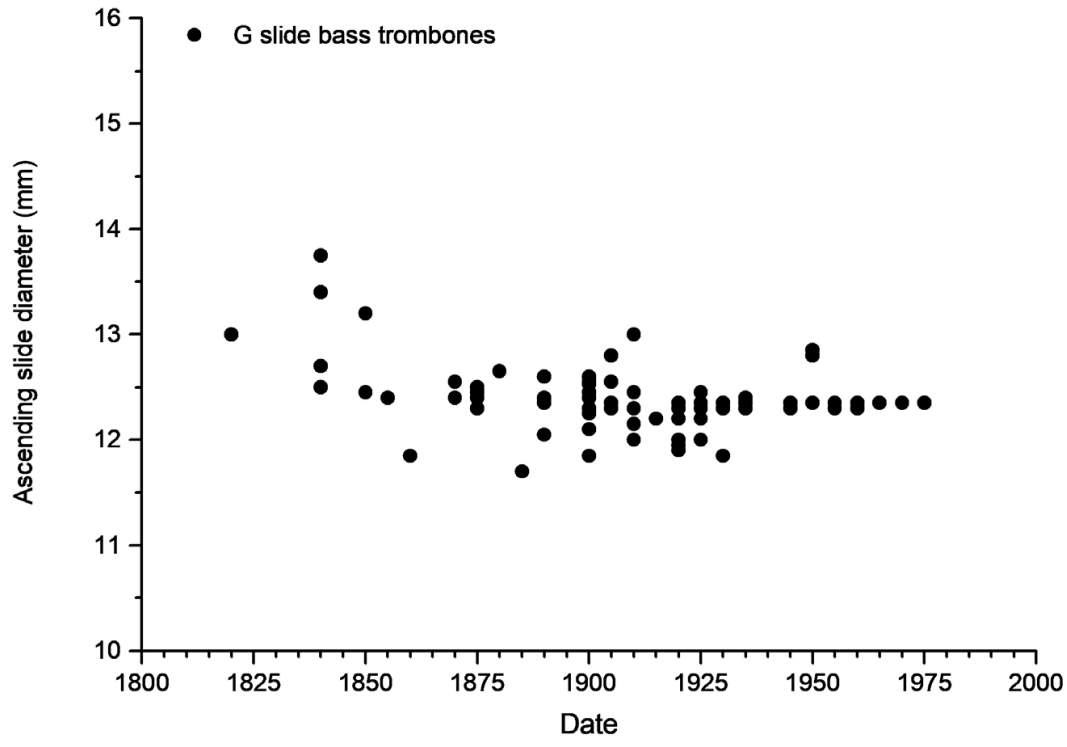


Figure 5: Plot of bore diameter in the ascending slide against date (rounded to nearest five years) for eighty-seven ordinary G bass trombones. The 1860 Courtois trombone shown in Figure 4 has one of the narrowest bores at 11.85mm.

In the Salvation Army, and no doubt in many amateur brass bands, the G bass trombone was seen as a challenging instrument for the average bandsman.[24] One reason for this is that in the British brass band (including the Salvation Army's bands), the bass trombone was the only brass instrument playing from an untransposed part, in bass clef. Whereas tenor trombones could easily transition from tenor clef to treble clef transposed (only the key signature needed to be changed), there was no comparable easy transition for the bass trombone, and to this day bass trombone parts in brass bands are in bass clef, the only such brass instruments.

The bass trombone in G is a compromise. It foregoes the very long slide of the F and E♭ bass trombones, so it is more agile. On the other hand, its compass stops short of the lowest two notes of the F bass trombone. British composers from 1850 to 1950 wrote in the expectation that bass trombone parts would be played on the G, so they avoided writing below D♭. Orchestral repertoire from continental Europe, however, sometimes posed problems for players. This topic came up for discussion at the meeting of the Musical Association in 1886 following David James Blaikley's paper on "The Development of Modern Wind Instruments."[25] The limitations of the G trombone in executing parts written for an F or E♭ bass were exemplified by a passage in Weber's overture to *Der Freischütz* (Figure 6), a popular item in the orchestral repertoire.

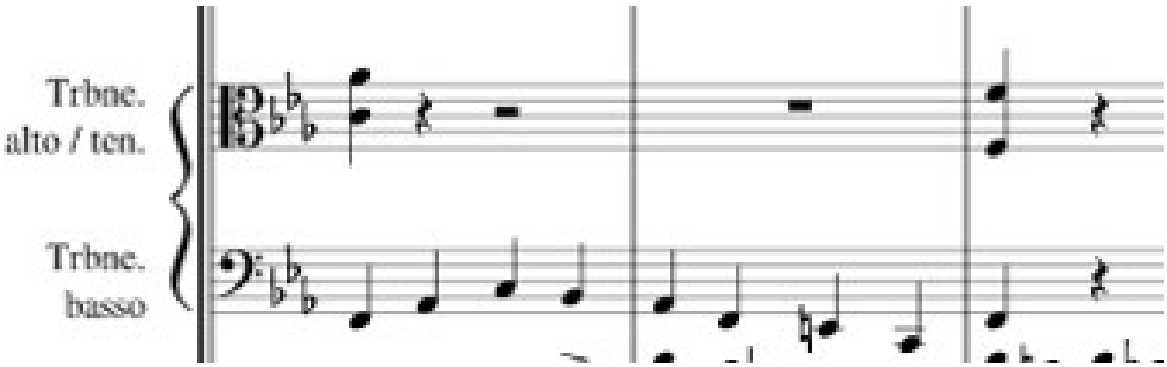


Figure 6: Excerpt from trombone parts in Weber's overture to *Der Freischütz*

Some musicians may have resorted to an F bass, while others will have played some notes an octave higher. Indeed, a complaint made in the same discussion was that even a G trombone was not always used as some players cut corners by using a tenor in its place.[26]

The solution eventually reached in British professional orchestras was the G trombone equipped with a thumb valve for D. The B♭ trombone with a thumb valve for F was hardly used in Britain until the 1930s (and then very little), but the same principle applied to the G bass trombone gave the advantages of an extended compass and more alternative positions. The first documented use of a G+D bass trombone was in 1914 when Cecil Forsyth's *Orchestration* treatise recorded that Mr. Gutteridge (recte: Guttridge) of Sir Henry J. Wood's Queen's Hall orchestra used such an instrument.[27] T. H. Guttridge (Figure 7) had been engaged by Hawkes & Son to test and tune their

bass trombones.[28] The first G+D trombones were probably adapted from plain Gs by the addition of the thumb valve. Forsyth mentions that the valve was operated by a thumb-ring as in Figure 8.

Figure 7: Photograph of T. H. Guttridge, from Hawkes & Son, *The Hawkes Band Instruments and Band Music* (ca. 1908).

Figure 8: Bass trombone in G made for the British market by Antoine Courtois, Paris, 1867–71, with added valve for D operated by a thumb-ring (author's loan to Edinburgh University Collection of Historic Musical Instruments, inventory 581). This instrument was used in the Irish Guards Band during World War II by professional orchestral bass trombonist Godfrey F. Kneller; it may have previously been Guttridge's instrument.

The regular production of G+D trombones started in July 1932 in the Boosey & Hawkes factory at Edgware.[29] The instrument shown in Figure 9 was the fifth, made in 1933 for Frank Taylor, professor at the Royal Military School of Music, Kneller Hall, bass trombonist with the BBC Symphony Orchestra, also teaching at the Royal College of Music.[30] The Boosey & Hawkes G+D was often supplied with an alternative long valve tuning-slide to give a trombone in G+C, required only when a low A♭ was scored. In the factory records of Boosey & Hawkes the G+D was not named after Guttridge, but was termed the "Betty model trombone" after the Bournemouth Symphony Orchestra's bass trombonist William Betty.[31]

Figure 9: Bass trombone in G+D made for Frank Taylor by Boosey & Hawkes, London (1933) (author's loan to Edinburgh University Collection of Historic Musical Instruments, inventory 6605). This instrument was later used orchestrally by Godfrey F. Kneller. The water-key on the valve loop proved unnecessary and was not provided on subsequent instruments.

The earliest known photograph showing a G+D trombone is of the London Philharmonic Orchestra at a rehearsal in London in October 1933.[32] The Boosey & Hawkes G+D became the accepted bass trombone in British professional orchestras and conservatoires until the 1950s. It was produced later, but the final purchasers were brass bands, who had continued with the straight G until the 1970s. The bore of the G+D was distinctly wider than that of the straight G, 13.35mm rather than 12.35mm. This led to its being favorably compared to the plain G by Denis Wick, who wrote of it as "majestic sounding" and as "an asset to any band, as it has been to many orchestras."[33] Interestingly, Boosey & Hawkes never made a straight G with the wider bore. Figure 10 shows that the G+D model remained distinct from the plain G trombone with a wider bore than had been made since before 1860.

There were, however, two attempts to produce a distinctly wide-bore G trombone, the large-bore outliers in Figure 10. The nationalized GDR makers VEB Blechblas- und Signalinstrumentenfabrik of Markneukirchen and Klingenthal produced student-quality brass instruments with the trade name "Weltklang" from 1953 until 1990.[34] From around 1970 Boosey & Hawkes imported a range of these, which were sold under their Rudall Carte brand. The imports included a small number of G bass trombones. This was evidently unknown territory for the East German makers, who

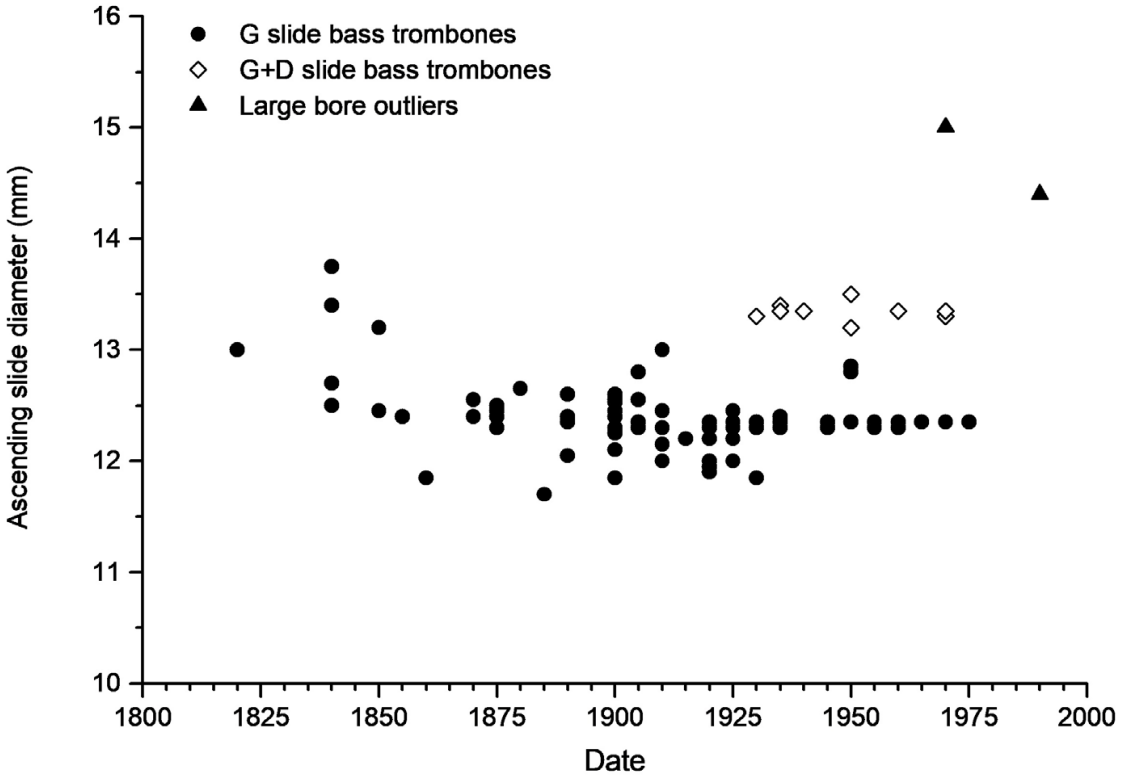


Figure 10: Plot of bore diameter in the ascending slide against date (rounded to nearest five years) for ordinary G bass trombones (solid circles), G+D trombones (open diamonds), and for large bore outliers (solid up triangles).

Figure 11: Bass trombone in G made for the British market by VEB Blechblas- und Signalinstrumentenfabrik, Klingenthal, 1972 (author's loan to Edinburgh University Collection of Historic Musical Instruments, inventory 2706).

adapted the traditional design of the obsolete German F bass trombone. The result was a G bass with dual bore of 14 and 15 millimetres (see Figure 11). This was not a commercial success since use of the G was already in decline and the few remaining customers wanted a traditional instrument of better than student quality.

The final initiative came from the collector and instrument maker John Webb, who in the early 1990s embarked on a project of updating some traditional British instruments. These included a new English slide trumpet[35] and a long F valve trumpet. His modernized G bass trombone has a bore of 14.4 millimeters. The sole example is now in the Royal Conservatoire of Scotland (inventory 552); unfortunately, the whole bell section is missing and indeed was probably never completed.

This article does not address the fall from favor of the G trombone since that has been covered by Gavin Dixon in his excellent article in the 2010 *Historic Brass Society Journal*.[36]

The characteristic timbre of the bass trombone in G is a matter of personal experience for those of us old enough to remember it in regular use. It can be heard in period recordings of British orchestras and bands, or in more recent historical performance instrumentation.[37] The literature and personal communications are also unanimous on its distinctive sound, which was most extremely expressed by the editor of *Brass Band News*, who wrote "Its tone is to a superlative degree majestic, dignified, stately and impressive, and we think it so much the noblest voice that, were we limited to one trombone we should unhesitatingly plump for the bass trombone."[38] Understanding its history is important simply because it was the bass trombone written for by all British composers from 1850 to 1950, including Elgar, Holst, Vaughan Williams, and Walton. It was the instrument they expected to hear. Any performance of their music making the slightest gesture towards period instrumentation needs to employ two French model tenors and a G bass. This is also true for brass band music of the same period. The sound of the G trombone is part of our intangible cultural heritage.

Appendix 1: The G trombone in France and the "trombone basse nouveau système"

Five of the six extant G bass trombones made by Antoine Courtois and his successors (in 1858–62, 1867–70, 1870–71, 1880–89, and 1905–10) were made for the British market and are inscribed with details of the London distributor. The sixth (1872–78) which is in the Musée de la Musique, Paris (inventory E.630), appears to be built at diapason normal pitch (A4=435Hz) suggesting that it was made for use in France. The provenance of the other G trombone in the Musée de la Musique (by Thibouville, inventory E.0863) strongly suggests that is was used in France.[39]

By 1925 there was evidently some limited uptake of the G bass trombone in France. M. G. Flandrin, writing in the Lavignac *Encyclopédie* in 1925,[40] discusses bass trombones in G and F and their limitations; he illustrates and gives slide positions for the G bass. He also describes a "trombone basse nouveau système" which is in G with

a valve lowering the pitch to E (not D); the slide is long enough to give low B in sixth position when the valve is operated, so its range matches that of the F bass. He wrote:

> The old masters wrote a lot for this instrument unique to the orchestra by its timbre and its breadth of sound; current composers are deprived of it, and entrust its part to a third tenor trombone which has neither the range nor the desirable sonority. Many attempts have been made to remedy these disadvantages of the bass trombone; they led to the establishment of an instrument combining the qualities of power, and above all of noble timbre, of the bass trombones abandoned in France …. The mechanism of the new instrument is very simple and its dimensions are reduced to almost that of the tenor trombone, its virtuosity is the same … and it benefits from the removal of the handle.[41]

No example of this "modern bass trombone" has come to light.

Appendix 2: Makers of G bass trombones and bore sizes

Maker	number of bass trombones examined by the author	range of ascending bore diameters
Besson pre-1954	15	12.3–12.8
Boosey & Co	9	12.2–12.35
Boosey & Hawkes and Besson post-1954	17	12.3–12.35
Brown & Sons	1	12.35
Couesnon & Cie	1	11.85
Courtois, Antoine	6	11.7–12.4
De Lacy	1	12.55
Gisborne	2	12.15–12.6
Green, John (dealer)	1	13.0
Hawkes & Son *	12	12.05–12.8
Higham	5	11.95–12.65
Lee, Frederick J.	1	11.9
Metzler (dealer)	1	12.55
Millereau	1	12.3

Pace, Frederick	2	12.7–13.2
Rudall Carte	2	12.0–12.6
Salvation Army	3	12.4–12.45
Smith, George	1	13.4
Thibouville-Lamy	1	13.0
Ward, R.J.	1	(incomplete)
anonymous	9	11.85–13.75

* Includes Hawkes models made by Boosey & Hawkes, 1930–45

Acknowledgements

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Notes

[1] Trevor Herbert, *The Trombone* (New Haven and London: Yale, 2006), 124.

[2] Hugh Macdonald, *Berlioz's Orchestration Treatise: A Translation and Commentary* (Cambridge: Cambridge University Press, 2002), 211, 214.

[3] Reproduced in Trevor Herbert (ed.), *The British Brass Band: a Musical and Social History* (Oxford: Oxford University Press, 2000), 142; the original hangs in Lewes Town Hall.

[4] Reproduced in Anthony Baines, *Brass Instruments: Their History and Development* (London: Faber, 1976, rpt. Dover, 1993) Plate XIV(1); also online at https://www.mdmarchive.co.uk/artefact/13946/BESSES_O'_TH'_BARN_BAND_PHOTOGRAPH_1860

[5] Giuseppe Foraboschi, *A New and Complete Iinstruction Book for the Three Trombones* (London, 1838). British Library Music Collections h.1180.(2.) UIN: BLL01004340791.

[6] H. Edmund Poole and David Halton, "A Catalogue of Musical Instruments Offered for Sale in 1839 by D'Almaine & Co., 20 Soho Square," *Galpin Society Journal* 35 (1982): 2–36.

[7] Peter Mactaggart and Ann Mactaggart, (eds.) *Musical Instruments in the 1851 Exhibition* (Welwyn: Mac & Me, 1986), 68.

[8] William Childe, *The Amateurs' Brass Band Quartetts* (London: Wessel & Co, [1852]). British Library Music Collections h.2807, UIN: BLL01004266441.

[9] Trevor Herbert and Arnold Myers, "Music for the multitude: accounts of brass Bands entering Enderby Jackson's Crystal Palace contests in the 1860s," *Early Music* 38/4 (November 2010): 571–84.

[10] Enderby Jackson Collection box, Royal Conservatoire of Scotland Archives & Collections.

[11] Most of the canon of Gilbert and Sullivan operettas for the Savoy Theatre were scored by Sir Arthur Sullivan for two tenor trombones; only in *The Yeomen of the Guard* and *The Gondoliers* is there also a bass trombone.

[12] The Salvation Army produced compositions and arrangements in various series for different sizes of band: those for the smallest bands omitted the bass trombone.

[13] The factory records discussed here are in the Boosey & Hawkes Archive held by the Horniman Museum, London.

[14] The Boosey & Co and Boosey & Hawkes factory records are discussed in Arnold Myers, "Brasswind Innovation and Output of Boosey & Co in the Blaikley Era," *Historic Brass Society Journal* 14 (2002): 391–423; and Arnold Myers, "Brasswind Manufacturing at Boosey & Hawkes 1930–1959," *Historic Brass Society Journal* 15 (2003): 55–72 .

[15] The Besson factory records are discussed in Arnold Myers and Niles Eldredge, "The Brasswind Production of Madame Besson's London Factory," *Galpin Society Journal* 59 (2006): 43–76.

[16] Alfred John Hall Phasey (1856–1917) was the son of the prominent ophicleide and euphonium player Alfred James Phasey (1834–88). Alfred Junior succeeded his father as bass trombonist with the Crystal Palace orchestra in October 1888, having previously played euphonium with Patrick Gilmore's band.

[17] Arnold Myers, "The French Trombone's Conquest of Britain," in Yves Balmer, Alban Framboisier, Fabien Guilloux, and Catherine Massip (eds.), *Musiques. Images. Instruments. Mélanges en l'honneur de Florence Gétrea* (Turnhout: Brepols, 2019), 567–79.

[18] Eugenia Mitroulia and Arnold Myers, "The Distin Family as Instrument Makers and Dealers," *Scottish Music Review* 2, (1), posted 21.1.11, www.scottishmusicreview.org/index.php/SMR/article/view/20

[19] Myers and Eldredge, "The Brasswind Production," 43–76.

[20] For John Green's dealing in brasswind, see David Lasocki, "New Light on the Early History of the Keyed Bugle, Part I: The Astor Advertisement and Collins v. Green," *Historic Brass Society Journal* 21 (2009): 28.

[21] There is a strong negative correlation between ascending bore size and spectral enrichment, meaning that for a given power output (dynamic level) a narrow-bore trombone sounds brighter than a wide-bore trombone; conversely, when producing a similarly bright timbre a wide-bore trombone is louder than a narrow-bore trombone (other things being equal).

[22] The corresponding Besson names for the same models were "New Standard" (professional) and "Westminster" (student).

[23] Jocelyn Howell, *Boosey & Hawkes: The rise and fall of a wind instrument manufacturing empire.* (Ph.D. thesis, City, University of London, 2016), https://openaccess.city.ac.uk/id/eprint/16081/

[24] Archie Chittle, "To the G Trombone Player," *The Bandsman, Local Officer and Songster* (11 December 1930): 231.

[25] David James Blaikley, "The Development of Modern Wind Instruments," *Proceedings of the Musical Association* 12 (1885): 125–38.

[26] A similar cavalier attitude to composers' orchestration was evident in the widespread use of cornets to play trumpet parts at the end of the nineteenth century.

[27] Cecil Forsyth, *Orchestration*, 1st edn. (London: Macmillan, 1914), 140–41. The Editor of *Brass Band News* described the G trombone with rotary valve for D and its capability of coping with Wagner›s contrabass trombone parts in "The Easy Way to Play Brass Instruments" (April 1918 issue, p. 5); this was reprinted later in 1918 in a booklet *The Easy Way to Play Brass Instruments* (Liverpool: Wright and Round, 1918), which additionally mentions on p. 24 that "Mr. R. Evans, the fine bass trombonist of the Royal Opera, Covent Garden, London, uses a valve tube which puts his G-trombone into C, and thus, as only four slide shifts are needed to connect with the open G pedal, the slide is more than sufficient to complete the chromatic scale."

[28] Hawkes & Son, *The Hawkes Band Instruments and Band Music* (ca. l908), 31.

[29] The first of this model is in the Horniman Museum (inventory 2004.1171); it was formerly in the Boosey & Hawkes Museum (inventory 638).

[30] Tony Evans, "The Decline of the G Trombone," *British Bandsman* (6 February 1999): 8–9.

[31] Howell, *Boosey & Hawkes*, 107.

[32] Sir Thomas Beecham conducting the London Philharmonic Orchestra at a final dress rehearsal at the Scala Theatre, Charlotte Street, London, prior to its provincial tour, 3 October 1933. Topical Press collective K6391/M, now Getty Images Hulton Archive 87894141.

[33] Denis Wick, *Trombone Technique* (London: Oxford University Press, 1971), 9. Wick is disparaging of the "most readily available 'G' trombone," which gives a "most unpleasant ripping sound when overblown; it simply cannot provide the volume, richness, or brilliance of the larger-bore bass trombone."

[34] Mario Weller, personal communication, 2008.

[35] John Webb, "The English Slide Trumpet," *Historic Brass Society Journal* 5 (1993): 276.

[36] Gavin Dixon, "Farewell to the Kidshifter: The Decline of the G Bass Trombone in the UK 1950–1980," *Historic Brass Society Journal* 22 (2010): 75–89.

[37] The G trombone was admirably played by Ronald Bryans in the landmark period-instrument recording *The Origin of the Species*, by The Wallace Collection (Nimbus Records N15470, recorded 20–22 March 1995). The 1870–71 Courtois G trombone, ex-Royal Italian Opera, Covent Garden (now Royal Conservatoire of Scotland, inventory 542) was used. Decisive *forte* playing is frequently evident; a telling piano can be heard in bar 4 of *The Lost Chord*.

[38] Editor of *Brass Band News, Amateur Band Teacher's Guide and Bandsman's Advisor* (Liverpool: Wright and Round, 1896).

[39] E.0863 came into the Paris Conservatoire collection from Geneviève Thibault, Madame H. de Chambure, in 1980; she had acquired it from Madame Le Cerf in 1930; from its inscription, it was made in 1900 or later.

[40] M. G. Flandrin, "Le Trombone" in Albert Lavignac, *Encyclopédie de la Musique* (Paris: Delagrave, 1925), p. 1653.

[41] "Les maîtres anciens ont beaucoup écrit pour cet instrument unique à l'orchestre par son timbre et son ampleur de son; les compositeurs actuels en sont privés, et confient sa partie à un troisième trombone ténor qui ne possède ni l'étendu ni la sonorité désirables. De nombreux essais ont été tentés pour remédier à ces inconvénients du trombone basse; ils ont abouti à l'établissement d'un instrument réunissant les qualités de puissance, et surtout de timbre noble des trombonnes basses abandonnés en France .... Le mécanisme du nouvel instrument est très simple et ses dimensions sont ramenées à peu de chose près a celle du trombone ténor, sa virtuosité est la même…. et il bénéficie de la suppression du manche."