

Low Range Tuba

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Perhaps an apology should be offered for the double meaning of the title. First, it is meant to help organize the resources of the tuba section for maximum effect in the concert band. Next, it is to explain how the tuba section can produce more organ-like effects:

Wonderful new dimensions to the band sound at times by utilizing the range possibilities in the lower contra and sub-contra octaves. These tones are made available in the 32-foot registrations in the largest organs for full exploitation of the tonal resources.

Pedal tones are well known in the case of the trombone, being introduced to the orchestra world by that master of orchestration, Berlioz, in his *Fantastic Symphony*. It is not too well known by composers and orchestrators that tubas have pedal tones and that the true pedals (fundamentals) can be useful in a practical manner. It can be demonstrated that the BBb tuba can descend below the piano keyboard—below the bottom range of the BBb contrabass clarinet (with extended range) and the contrabassoon.

First let us take a look at a range chart for a standard BBb tuba or sousaphone with three valves (except where the fourth is noted). Succeeding comments will explain the terms used in the illustration below. Keep in mind, however, that all notes presented are to be played 8va basso.

The following numbered notations correlate with the music example below:

1. Last note of regular register of BBb tuba or Sousaphone with 3 valves.
2. The usual frog tone on a large bore BBb tuba. If the frog tone responds closer to EE, as may occasionally occur, one half step should be added to each fingering below it.
- 2 to 3. Frog tone register. Also true pedal register on Eb tuba with same fingerings.
4. True pedal or fundamental of BBb contrabass clarinet and contrabassoon register.
- 4 to 5. Practical (or producible) range of true pedals on BBb (3 valves).
- 4 to 5A. Theoretical range with 3 valves.
- 4 to 6. Theoretical range with 4 valves.
7. Expected fingering is 1 and 4—usually very sharp. Add half step 1, 2, and 4 is usually somewhat flat but more lippable.
8. Low DD usually a trifle flat but usable.
9. Low CC definitely sharp but lippable.
10. Low BBB is not available on traditional American and other foreign noncompensating 4 valve tubas. Some tubas (rare) with extra 5th valve can obtain this.
11. The typical chromatic pattern of descent can be fingered on the Besson BBb tuba with a full compensating valve system involving double valve slides for the first, second, and third valves. Tone production is stuffy and difficult because of complicated airways.

First, let us examine the span of notes below the usual playing register down to the true pedal tones. EE is the lowest note of the normal register, obtained by causing the second mode of vibration (two waves in the pipe) to resonate in the largest pipe available by adding all three valve tubings. Remember that the fundamentals (one wave in the pipe) are not used in the normal playing register.

The use of the fourth valve (which lowers the pitch a perfect fourth) is the most obvious solution to performing in this register. With its use in conjunction with the other three valves, most of these notes can be produced in a rather faulty manner. The tone BBB immediately above the BBBb fundamental is not available.

Most low brass players that have dealt with the regular fourth valve on American baritones and tubas realize that when the fourth valve is down, the other valves added to it are just not adequate. It is like playing on a tuba in F below with a set of valve slides whose lengths are designed for a smaller instrument. The situation may be compared to constructing a BBb tuba with the valve slides that are the same length as on an Eb tuba. The valve pipe lengths are so inadequate that an extra half-step must be added to the normal chromatic sequence at some point, and even then the solution is not completely satisfactory. Observe the effect of adding other valves to the fourth in the preceding figure.

There is a solution to producing tones in this range that is possible on the three valve BBb tuba through the use of false pedals sometimes called frog tones. This mysterious phenomenon, which is better and easier to play on a larger bore tuba, usually occurs as an EE or EEb on the open pipe. It has a certain hollow "feel," but with a little nurturing can be quite suitable for adding that extra octave dimension. It can be treated like other open tones in that the regular sequence of chromatic fingering can be used to descend. These frog tones are sometimes more manageable, and easier to produce than the fourth valve tones which suffer from the stuffiness. The example compares these two methods of fingering.

A more secure means of obtaining these tones is by using the true pedal tones of the Eb tuba. If a large bore Eb tuba is available, it can serve this purpose well.

As suggested earlier, the BBb tuba is capable of producing the lowest sounds of any band or orchestral instrument. The fundamental (one wave) of the open pipe of the common BBb tuba or Sousaphone is BBBb, or the last Bb on the piano keyboard. From there we can descend chromatically by playing the fundamentals of valved notes theoretically down to EEE with three valves, and on down to CCC with the fourth valve. In practice, however, the lowest tones are too difficult to resonate due to the physical limitations of embouchure and design of standard mouthpieces. The author has used these tones as low as a GGGb for pedal effects in the United States Navy Band.

These true pedals are not difficult to produce with a one-lip embouchure, and with careful practice can be sustained a reasonable length of time in the lower dynamic levels.

Intonation is not a problem because they fit well into the "resonance grooves" of the same tones in higher octaves.

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