

Introduction

Tonality is a natural force, like gravity.-Paul Hindemith

This is the most profound statement about music that I have ever read. In essence, this whole book is about that one idea. A brass instrument can be thought of as a kind of divining rod in the eternal quest to uncover the secrets of tonality. It is built upon the absolute, irreducible prime principle of that tonality, the harmonic series, and it is the simplest, clearest, least cluttered expression of that principle among all of the musical instruments known to man.

I am sure that you have some questions about the title of this book...Time, Balance and Connections-A Universal Theory Of Brass Relativity...however, before we go any further in our quest for knowledge about how to play a brass instrument let us examine this harmonic series in greater detail.

Now I am willing to bet that you think you understand the harmonic series. For about 20 years into my career as a professional musician I thought that I understood it as well. After all, we pick up our instruments and navigate through the various partials of that harmonic series every day and have been doing so fairly successfully for however many years that we have been brass players.

But I learned otherwise. Let me expand your knowledge somewhat on this subject.

First I want to ask you a magic question.

Ready? OK. Here goes.

What is the difference between a note (a musical tone) and a tempo? I have asked this question of literally hundreds of people, and I have never yet gotten an entirely correct answer. Here it is:

A note is just a very fast tempo. Or...a tempo is just a very slow note.

The usual response to this idea is a puzzled "What?" I will explain.

Both are measurements of vibrations per unit of time.

In the Western European musical tradition as it exists in the early 21st century, middle A on the piano is tuned to roughly 440 beats per second. (The scientific term for beats per second or frequency as measured in seconds is "hertz", which is abbreviated as "Hz". This is the term that I will use throughout the rest of this book.)

OK. The American tune "Yankee Doodle" is generally played at about 120 beats per minute. MM=120. (A quarter note equals 120 beats per minute.)

Still with me?

So in essence, the ostinato pedal tone or bass note of "Yankee Doodle" (its tempo) is a vibration...a "note", essentially, albeit a very low one...that sounds at 2 Hz. (That is, 120 beats per minute divided by the 60 seconds that are in a minute. Two beats per second. 2 Hz.)

Got it? Good.

Now do we perceive that tempo as a note? No. Of course not.

Why? We are not big enough. Not slow enough.

Think on it.

If there were a sentient being say 100 or 1000 times larger and slower than a human being, would that creature not hear the Yankee Doodle's 120 beats per minute more as a tone than as a tempo? Would a living creature the size of the moon or the earth perceive sound vibrations on the same scale as do we?

Of course not.

Conversely, would a creature as fast as a hummingbird, a fly or some entity that lives below the threshold of human visual perception not hear the note A=440 Hz as a tempo?

I believe so, myself.

Now...consider the almost superhuman musical feats of virtuosi like Charlie Parker or Jascha Heifetz, the breadth of compositional vision of such giants as Duke Ellington or Johann Sebastian Bach. Are the Charlie Parkers and Jascha Heifetzes of this world not obviously capable of living on a much faster plane than normal humans? All you have to do is listen to them play for the answer to that question. And were the Ellingtons and Bachs not equally obviously hearing on a larger, deeper plane than the rest of us? Their "tempo" might well be considered to be the length and breadth of a whole composition or movement.

From the downbeat to the final beat.

"Happy Go Lucky Local" (Never heard it? An Ellington masterwork.) or a movement from one of the Brandenburg Concerti.

One beat.

Think on it.

I will emphasize over and over again in this book the value of good internal time as a practical tool for learning how to play a brass instrument. I will give reasons for it and I will refer to my own brass teacher Carmine Caruso whose basic, root concept of teaching had to do with time. But simply stated, the tempo at which you are playing is the bass note of whatever music that you are playing. It is the pedal tone, the root. If the "pitch" of that pedal tone is not rock solid, then you cannot play in tune with it. Nothing that you play will be in tune, because the root note itself will be wavering in pitch.

Think on it.

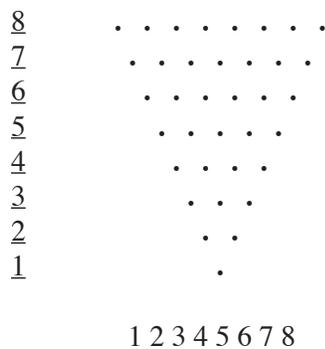
The Harmonic Series

I must ask you a seemingly simple question here...what is “the harmonic series”? You play a brass instrument that is built upon it, right? So what IS this thing? And my answer is that it is an expression of the simplest mathematical series ever recognized by mankind. One that is taught in kindergarten.

1 2 3 4 5 6 7 8 9 10 11 12 etc. on into infinity.

Another “Huh?”

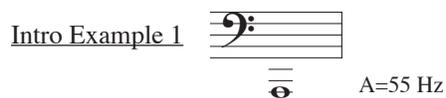
OK. Here is the harmonic series in visual form through its first four octaves.



Another “Huh?”

Let me put it in brass terms.

Let us say that the first dot on the bottom of this inverted pyramid represents the trombone pedal tone A.

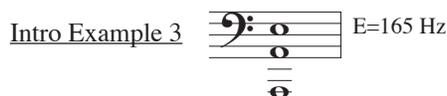


Every octave is a multiple of 2 times the frequency of the one beneath it. The A in Intro Example 1 is 3 octaves below A=440 Hz (A above middle C), therefore the note’s frequency is 55 Hz. How do I arrive at that number? $440 \text{ Hz} \div 2 = 220 \text{ Hz}$, $220 \text{ Hz} \div 2 = 110 \text{ Hz}$, and $110 \text{ Hz} \div 2 = 55 \text{ Hz}$.

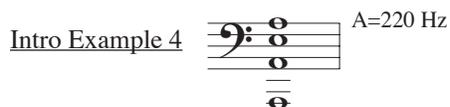
The next line of two dots on the above diagram represents a note that is twice that frequency.



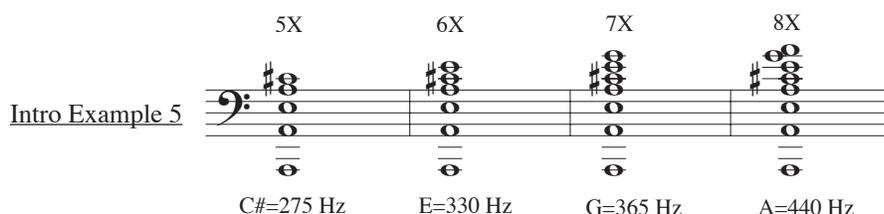
The next line? (Three dots) Three times the pedal note’s frequency.



The next...four times the pedal's frequency.



And so on right up the harmonic series.



This set of relationships continues right on up into the highest reaches of audible hearing and/or brass playing and beyond. And right on down to the ORIGINAL frequency. The beginning of which some physicists call the Big Bang. And what will be the end of this Big Bang? Perhaps it starts all over again. “It ain’t over ‘til the fat lady sings” they say? Maybe the correct version of that saying ought to be “It ain’t over ‘til the fat lady stops singing.” Not to worry, though. She is currently in full throat and singing up a storm. Bet on it.

You will also notice that the notes in this series produces a dominant 7th chord. As it continues upwards it delineates the upper structures of that dominant 7th chord as they are used in the most advanced harmonically based tonal music, and in their untempered, unaltered state of tune many of the notes...the major 3rds, minor 7ths and diminished 5ths (the 5th, 7th and 11th partials) are flatted much as are the so-called “blue” notes of the jazz idiom. These facts have ramifications that are worth an entire book themselves, but since this is a book about brass playing, that one will have to wait for a while.

I want to emphasize here that this is the perfect, *untempered* harmonic series with which we are presently dealing. It is a mathematical construct which must be altered (as are it seems all mathematical approaches to the world in which we live) to fit our less than perfect reality. “Well tempered” is the most commonly used term for that alteration. There is plenty of information on the tempered scale available...books by the hundreds and websites galore. Feel free to explore this idea if you so choose. It is somewhat beyond the purview of a book like this to explore the concept much further. If you are a brass player, you live the idea every time you try to make music. Compared to what we do everything else is just theory.

The next question that appears in clinics or with individual students is usually something along the lines of “Yeah? So? How can this help my brass playing?”

Well, you certainly can no more make these kinds of complicated calculations while playing music than can you manage equations that involve differential calculus while holding a conversation or playing basketball. But simply knowing these facts will change your mindset in many ways as you go about the difficult act of trying to master your instrument in the practice room.

I refer to my approach to teaching brass as a method that helps the individual student create his or her OWN “method”. If you do not understand exactly what you are doing...how your instrument is built, how it operates, how music *itself* operates to some degree...then you start out at a disadvantage from the very beginning.

As we go along here and I begin to get into the ideas of playing sub-pedals and identifying positional choices and partials in the altissimo range this will all become much more clear. Meanwhile, rest assured that what you are doing when you play music is simply performing complicated aural gymnastics on the unevenly built monkey bars of the (relatively) untempered harmonic series, and the instrument that you use is a musical calculator that helps you to compute where those various bars exist in the aural world and how you can most gracefully travel from one to another.

The subtitle of this book? A Universal Theory Of Brass Relativity?

From the website Wikipedia: (<http://en.wikipedia.org/wiki/Principle_of_relativity>)

“A principle of relativity is a criterion for judging physical theories, stating that they are inadequate if they do not prescribe the exact same laws of physics in certain similar situations. These types of principles have been successfully applied throughout science, whether implicitly (as in Newtonian mechanics) or explicitly (as in Albert Einstein’s special relativity and general relativity.”

Or as the Sufis say “As above, so below”.

In a sense the idea of equal temperament itself is an attempt “prescribe the exact same laws of physics in certain similar situations.”

What I am describing here works up and down the spectrum of brass playing. It works for low notes, and it works for high notes. It works on tubas and it works on trumpets. It flat out works.

Time, Balance and Connections is the name of the book. And A Universal Theory Of Brass Relativity is its subtitle.

Think on it.

Connections.

Balance out your playing system by the application of good internal time to your practice.

And begin to make some connections.

The Six Octave Trombone
and
A Trombonist's Journal

Practice doesn't make perfect. Perfect practice makes perfect.-Vince Lombardi

Coach Lombardi knew something. Read on.

I am calling two main parts of this book The Six Octave Trombone and A Trombonist's Journal. Now if you have any sense, your first reactions to these titles should be somewhere along the lines of:

“The Six Octave Trombone? How is that possible?”

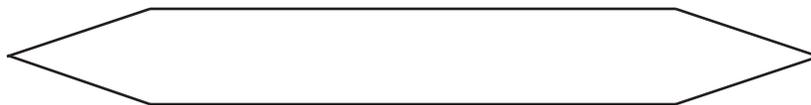
“A Trombonist's Journal? What is this, another one of those tell-all books by some so-called celebrity?”

Now that I have your attention, I will explain these titles.

First, the six octave part.

Whether you are a rank beginner or one of the greatest masters ever to play this instrument, here is a rough picture of your total range.

Intro Example 6



It makes no difference if you are a new student whose range is less than one octave or if you are one of the best trombonists on the planet with a practical, usable musical playing range of over four octaves, your total range is going to resemble this image. That is, as you approach your upper and lower range limits your sound is going to begin to tail off. Therefore, in order to achieve a large practical playing range you must extend your total POSSIBLE range beyond the boundaries of where you want to be able to play.

In both directions.

And that is the basis of this six octave idea.

I am a working freelance lower brass player in New York City, and I have been practicing through six...and even more... octaves for over 30 years on the entire range of lower brass instruments, from small bore tenor trombone right on down through bass trombone and tuba. I practice and play six main instruments at last count...500 bore tenor, .508 bore tenor, .525 bore tenor and .547 bore tenor (both of the last two with an F attachment), double independent trigger bass trombone and tuba. (All S. E. Shires instruments except the tuba.) Plus the occasional valve trombone, euphonium and also some older horns for the sake of authenticity in the playing of certain jazz styles. I play and practice through exactly the same set of octaves on all of them, using fairly mainstream mouthpiece sizes on each horn, from a large Helleberg-style tuba mouthpiece right on up to an original NY Bach 11, 11C or 12C on my smaller tenors. I use a different mouthpiece (and rim) for every horn, one that fits the job(s) that I want that horn to perform. Of course the lower octaves sound better on the larger equipment combinations; the higher octaves sound better on the smaller equipment, and the truly extreme ranges don't sound that good...are not that useful in a musical sense...on any horn. But I can play through essentially the same ranges on ALL of them. Follow the regimens that I present in this book and you will be able to develop any and all ranges in which you are interested. Once you understand how this works it is merely a matter of choosing in what ranges you most want to play and then developing and perfecting your approach and your equipment so that you can do so. Along the way, by using the exercises and concepts in this book you will also be able to ...if you thoroughly apply yourself to what is presented here...develop your mastery of scales, arpeggios, tonguing, flexibility, extended positions and slide/trigger technique beyond anything of which you have ever dreamed.

Thus the subtitle A Universal Theory Of Brass Relativity. If you wished to do so and had the requisite talents (and of course if there were time enough in any given life to master everything that might attract your interest) you could keep on expanding your ranges right on through the lowest notes ever played on a bass brass instrument and the highest ones ever played on a trumpet simply by applying these concepts to the task. This works everywhere. In every range, low to high. I have satisfied myself on this account both by having successfully taught a number of players on all brass instruments and also by having at one time applied these ideas to the playing of the trumpet. I certainly did not become a virtuoso high note trumpet player during that time, but the daily progress that I made on the instrument showed me that if I desired to pursue the effort further, I *could* do so. The doubling achievements of people like Maynard Ferguson, James Morrison, the many fine orchestral trombonists who have mastered both bass trombone and tenor trombone on a world class level (and sometimes tuba as well) and Tommy Dorsey...who was a very good trumpet player in his youth...are further proof of this idea.

Now on to the Trombonist's Journal part.

When I published my first method book The American Trombone in 2001, I had no real idea about whether there would be enough trombonists who were interested in the ideas that it contained to make publishing it a worthwhile effort. Six years later, I have had my answer. A qualified yes.

I sold a great number of books and I have met or otherwise communicated with hundreds and hundreds of trombonists in the interim. Many players have benefited from the book, but many have also found it difficult to imagine how the exercises and approaches contained within it could be put together into a useful practice routine. Plus, I myself have progressed both in my practice and in my understanding of how to use the concepts that were first presented in that book. With this in mind, I decided to write a book that better illustrates how they can be used. This is that book.

It contains more presentations of the ideas that I first offered in The American Trombone...in fact, extensions of many of them..., plus one sample practice day for an intermediate student, one for a fairly advanced student and a snapshot of three practice days in my life as a freelance 20th/21st century New York City lower brass musician who works primarily in American idioms but is quite capable of playing in Western European orchestral styles as well. That section is titled A Trombonist's Journal and within it I pulled no punches and took no liberties in communicating what I did. What you read and see in the last section of this book is exactly what I practiced. Every note.

In closing, I can only recommend that you take this method book in three doses. In keeping with the approach suggested by the great Eastern European teacher of a certain kind of human development George Gurdjieff at the beginning of his magnum opus All and Everything, Beelzebub's Tales To His Grandson, I suggest that you use this book in the following way. Pay attention to what I say in the following paragraph and then do it, because it will really help you to get the most out of this book that you can possibly acquire.

First, simply read and use it as you have read and used all of the other method books that you have ever possessed. Dip into it here and there, skip around as you wish, and make whatever value judgments that you feel necessary for your own level of understanding and achievement. To simplify this approach I have included in the Appendix a fairly compact rendering of the main concepts and exercises that are used in this book, thus saving you from having to repeatedly thumb through the book while you try to figure out how to use them. (Appendix 7- Short Descriptions of the Various Exercises and Variations Used In This Book)

Second, after you have done that for a while (if of course you feel that further pursuit will be a worthwhile effort), set aside a number of days of practice time and go through the entire book exactly as it is laid out (after warming up thoroughly, of course) with your trombone in your hand, trying to play every exercise as it is presented to the best of your ability and also trying to understand every concept as thoroughly as you can do so. Skip nothing, leave nothing unexamined or unplayed.

Then...and ONLY then, please...begin to attempt to synthesize a practice approach that is at least partially based upon the contents of this book, one that will enable you to achieve whatever it is that you wish to achieve on the trombone. Remember, this is a method book the aim of which is to teach you how to create your own method. A method that grows along with you as you progress in your musical pursuits.

As is my advice in all matters musical...try everything; use what works.

For YOU.

After you are well into this process, it is my hope that you will begin see your instrument and indeed music itself in a whole new light.

Be patient. Nothing truly new comes easily or quickly. But it is there for the taking if you have the proper aim.

I leave you with a Zen saying that encapsulates the entire learning process as it is encountered in any and all real endeavours.

Before Zen, a tree is just a tree.

During Zen, everything is confused.

After Zen, a tree is once again a tree. Only different.

Have fun during the confusing part.

I did.

In fact...I still am.

Sam Burtis, 5/17/2008