

How are Pans Made?

A steel pan is a true and living example of an open secret. Everything about a pan can be seen. Nothing is hidden. There is no mysterious little sealed box with indistinguishable unmarked components in it. The final result can be seen, every aspect of the process that arrives at the end result can be observed. The tricky bit is knowing what you are seeing, recognizing what you are observing. In recent years there have been a number of developments in the process of making pans. Originally a steel drum or oil drum would be turned upside down and the bottom face would be sunk. The tools used have varied from hitting this area using heavy sledgehammers 8 -12lbs in weight. Dropping and catching cannon balls, large wooden hammers and all the other things I haven't heard of so far.

For a variety of different descriptions of this process, from the vague to the detailed visit the following website pages. You will also find some historical background of the steelband and the origins and development of the steel pan.

<http://www.mynottinghill.co.uk/nottinghilltv/community-carnival2004-steel-pans-history.htm>

<http://www.panpodium.com/history.asp>

Tuning

The making and tuning of steel pans is a complex craft. It was best described to me by Leroy Thomas in 1992, "tuners are not taught, they are born, it is possible to become an excellent maker or builder of steel pans and to be able to pre-tune and in time, possibly fine tune to a reasonable standard, but to "blend", that is where the difference is."

Blending a single pan is one thing, blending double and multiple pans so that the overall sound and tonal character is that of one instrument, is a challenge, blending a six bass and achieving the same tonal character on six different drums is even more challenging. Blending all the instruments of a steelband so that there is a balance of tone from the sound of the whole band, now the skill really starts to expose itself.

Blending 120 + steel orchestra? This is the level where the unique relationship between the tuner and the arranger can be exposed for all to hear. The intricacies and combinations of a variety of elements are now involved. The choice and balance of the instrumentation, how many low tenors ("C" Sopranos), how many high tenors ("D" Sopranos), chromed pans, painted pans, the overall tone of sections, ratio of sections, playing positions of voices, etc. all of these and more will affect the overall sound and "blend" of the orchestra.

General description of tuning.

As with all musical instruments each note has to be tuned to the correct pitch, this can vary from 430Hz to 450Hz depending on the instrument and its particular use. With steel pans the most common pitch is 440Hz.

During the making process it is common practice to set up the required shape of each note before burning and in some cases, to pre-tune the notes. Pre-setting the octaves so that they are in position when the pan is burnt. Please note this is a general description, there are as many different methods as there are tuners, and they all have their secrets, just like other instrument makers. Why burn the pan? When the flat metal surface is sunk, smoothed and grooved the original molecular structure of the steel has been severely distorted. When the steel is heated to the correct temperature the molecular structure will be reconstituted in the new shape and form. For more detail ask a metallurgic scientist.

Fine tuning. Each note will have the fundamental -- the note you expect to hear, plus overtones, e.g. the octave plus the 3rd or the 5th. As a general rule all other overtones will be suppressed or eliminated. When they are not they can be very disturbing. The octave can be placed across the width of the note or down the notes length, the choice is usually determined by note size, pitch and required tonal character. As and when the 3rd or the 5th are included they will usually be placed at 90 degrees to the octave.

Once these three critical elements have been established it is then necessary to stabilize them so that they do not move when the note is played and to separate each note from the adjoining and surrounding notes so that they do not interfere with each other. Sounds simple doesn't it!

It is worth noting that all other comparable instruments such as pianos, vibraphones, marimbas, guitars, violins, can only achieve separation by having individual notes or strings. Pan is the only musical instrument to have all the notes physically connected together on one playing surface.

When you make this comparison it then becomes easier to appreciate the skills and challenges of the pan tuner's craft.

Pan tuners are not only born, they are also mad.

Having set up each note on the pan and fine-tuned them, it is then necessary to blend the notes so that the tone of each one has a compatible relationship with the preceding and following notes as well as adjusting in tone as the pitch of the notes rise. Then there is the overall tone of the pan when it is played, this also has to be controlled and blended. Once the tuner is satisfied with all of these elements and that they are stable, then a new pan is born. Then comes the playing in period. There are so many different elements that are involved during this period.

The instrument, the tuners particular technique, the sticks, the player's technique, the players personality, general handling and treatment of the instrument to name but a few. These and other factors will not only affect the playing in of the pan but can also affect the instrument for its lifetime.

How many times a pan should be serviced -- tuned -- during its first-year to 18 months can vary from pan to pan, dependent on use or abuse, but as a general guide, once every six months is not unreasonable, a bit like cars and teeth.

Maintenance – Tuning - Servicing.

Maintaining the tuning and tone of a pan. Ideally and logically, the best choice is to take your pan for servicing/tuning, to the person that made it. However this is not always practical or possible. Fortunately there are a number of tuners here in Europe who are capable of tuning -- blending -- repairing/re-tuning other tuners instruments.

Here are three different descriptions that can be used to describe the servicing/tuning work carried out on a pan.

Standard tuning/ blend.

This involves resetting, adjustment and correction of the fundamental notes and overtones and the overall blending of the tonal character of the instrument.

Back to pitch.

When presented with a pan of a poor quality, usually as a result of inadequate preparation and/or incorrect shape a wise tuner will recommend that the owner takes the pan back to who ever made it. When this is not possible, instead of expressing negative comments and criticism of the instrument the diplomatic way is often to offer to bring the notes back to pitch. This involves re-establishing the fundamentals of each note and suppressing the undesirable overtones, as and where possible. However this is work that is undertaken by tuners with great reluctance because they know the likelihood of a less than satisfactory outcome. Net result, the potential damage to the tuners reputation, and most important of all, the high likelihood of disappointment for the customer.

Repairs/re-tune.

It is possible for a tuner to be presented with a pan that is very badly damaged. The amount of work involved in repairing, or re-tuning an instrument that has been damaged can often exceed the amount of work involved in making a new pan. For many people this is difficult to understand and the choice of a new instrument is understandably an undesirable option either from a financial point of view or more importantly because of an emotional attachment. When a pan has fallen down, had an accident in transit or been abused, the rim of the pan can be out of shape or the skirt may be distorted, notes will be in need of repairing, resetting. When an enthusiastic novice thinks it is easy to tune a pan and makes an attempt, the instrument can also need repairing. When the instrument has been repaired then it is inevitable that re-tuning and blending will be necessary. When instrument needs this degree of TLC (tender loving care), it is recommended that you ask for estimate first.

Tonal character.

The tonal character of any steel pan instrument is determined by it's pitch, the layout of the notes, the quantity of notes, the length of the skirt, the thickness of the steel, the quality and particular type of steel, the finishes - paint or chrome, how it was tuned and how it is played.

Up until the mid 1970s the tonal character of the voices were more distinctive. With the development of and the demand for more "ring" in the pan it has become progressively more difficult to determine exactly which instrument is being played from middle "C" upwards. Clearly tenors and double tenors are determinable once they exceed the upper ranges of the other

voices but where instruments have notes in common “de ring is de ting”.

The tonal character of each individual note on a pan is obviously determined by all the factors mentioned above. However there are additional factors that become influential when scrutinizing a pan in this much detail. The shape and preparation of the sunk “belly” before marking off and determining the notes. Then there is the shapes and sizes of the notes. I have heard it said by a number of tuners that the space on a standard 45 gallon oil drum, when it is sunk and prepared properly, is too much space for the range of a high tenor, a “D” Soprano. If it didn’t involve so much extra work there would be enough space to double groove all the notes on the outer perimeter of the pan.

In recent times there have been developments in the making of pans using sophisticated mechanical and scientific processes. One of the potential benefits that could be derived from these developments would be the accurate uniformity of the sunken “belly”. Without sophisticated tools to measure the accuracy and uniformity of a “belly” sunk by conventional methods it is very difficult to assess these two aspects in a concave dome using just the “eye”. It is understandable and reasonable to presume that variables must occur.

At this point let us return to the method of sinking. With the exclusion of recent industrial and mechanical applications steel drums are sunk by human beings using a wide choice of hand held tools. How many thousands of blows with a hammer or a cannon ball does it take to sink a tenor pan belly? How long does this process take in the hands of the well trained and experienced? Is it reasonable to assume that a degree of inaccuracy can develop as this process follows its course as a result of physical and mental fatigue and muscular strain? Is it therefore reasonable to presume that these inaccuracies can be remedied with a smoothing hammer at a later stage but only to the degree that the eye can see and only from the top of the belly? Do you understand the point that is being demonstrated? All Pans are hand made and tuned by individual human beings. Variability is inevitable so therefore essential.

So often here in Europe tuners are faced with the question from the owner of a pan, “can you reduce the ring of this or these few notes so they sound more like the rest of the pan?”

It is most likely that this customer has taken this pan to more than one tuner in the forlorn hope that the tuner will be able to CHANGE the tonal character of their pan.

The key word here is CHANGE!

If your not happy with the pan you’ve got then CHANGE the pan for another one that makes you happy! Don’t ask the tuner to CHANGE the pan!

On a “D” tenor pan the most common notes with too much ring will be G, Ab, A, Bb with C sharp giving the opposite problem of being too dull and dumpf! On a “C” tenor pan the most common notes will be the same with B giving the opposite problem of being too dull and dumpf! Some tuners will try to a degree to resolve this, those with less experience will damage the pan trying to achieve the customers request. The whole point is that the tonal character of the notes are predetermined by the original preparation and making of the pan. When a tuner tunes a pan that has been made by a pan maker ie. sunk, smoothed, grooved, pre-tuned and burnt the tuner is presented with “**what is**”. The tuner must tune “**what is**” according to its predetermined characteristics or reject it. It’s not reasonable to ask a tuner to change it. Are there solutions to this? Of course there are! Best is to learn to develop your playing technique to handle “**what is**” rather than trying to get someone else to achieve the unreliable and the unreasonable. There is another option.

Spend 3 or more times the amount of money on what you buy and get exactly what you want! Instruments of this quality are now available.

Standardization of Pan.

For many years there has been a growing cry for the standardization of Pan. I understand and agree with the motives and reasons in principle but I hold out very little hope that it will ever happen. Having symposiums, meetings, discussions may result in agreement, but this would only be arrived at and agreed upon by those who took part. Even if a ‘world governing body’ were to endorse and publish these new standards neither they nor any one else will ever be in a position to impose or enforce them. Telling tuners what to do is extremely foolish no matter who you are or who you represent. Asking tuners to make something is a much better approach but it does involve the need to listen to the answers and ask further questions so as to arrive at a wider and

deeper understanding of what is possible, what is recommended and why.

Patterns, styles, layouts. In the very early days of pan it was common practice that when someone tuning a pan got a "sweet" note man would jump up and declare "leave that note, don't interfere with it." The distribution and positioning of notes of many steel pan instruments were determined using this criteria hence the wide variety of patterns with in a band or section. Many of the pioneering tuners are still alive today and still tuning. It's a brave or foolish person who is going to impose standardized patterns on tuners.

In my opinion the only natural way that standardization may come about one day will be when availability, reliability and affordability of a full range of instrumentation dominates the market with all the support and servicing in place as well. But this will never stop tuners making whatever they feel to make.

Standardization could also have its down side as well. If tuners are preoccupied with demand and orders for the "standardized" instruments then experimentation, development and diversity of sound and tone could be sacrificed on the alter of "market driven forces", the future could be populated by tuners who only know one way to tune and one sound to aim for – standardization could be a double edged sword.

Agreeing on the cycle of fourths and fifths for the Soprano pan as the most predominant pattern in this voice has a very strong argument because of the revolution that this instrument is. Should it go from right to left or left to right, should „C“ be at the bottom or the top? What is a demonstrated fact of life is that this layout of notes is most commonly found with „C“ at 6 o'clock and „A“ at 3 o'clock. This standard has been imposed by nothing more than common use.

For all the other voices and instruments the distribution of notes, what is next to what and where their position on the pan should be will be harder to resolve. To demonstrate this point I will just use the double second and the double guitar as examples. Take a brave leap into the world of vulnerability and assume that most tuners teachers and players agree that these instruments should be laid out in a whole tone pattern. Progressing chromatically left right or right left, oops which pan should be on which side. Should the lowest notes on each pan be at 6 o'clock or 10 o'clock left and 2 o'clock right for example? To reduce the mysterium of one voice from the other some would argue that the note placement and hanging of the whole tone double pans in these two voices should be the same

so as to allow players the opportunity to move from one voice to another and have the advantage of familiarity of same note positions. Yes the whole tone pattern makes a lot of sense in these two voices but I doubt if there will ever be agreement as to what is left or right or the distribution of the notes. The treble cello pattern is three diminished chords, one on each drum! The treble cello could therefore be referred to as standardized! But which note the instrument starts from, how many notes are on each drum, which one is left, right or middle! Forget it! Every tuner will tune it how they want and every player will set it up to their own liking, usually how they first met it.

Should the 4 pan cello follow the 4ths & 5ths pattern or the whole tone pattern or should both be included? How many notes, how are they hung up, all the previous differences touched on with double second and double guitar and treble cello will be included.

Bass! 1,2,3,4,5,6,7,8,9,12!!! Just this much diversity of permutation says it all, pattern, set up of the pan, lowest note! Take your pick and enjoy yourself. The best hope standardization has is most common use, only God has the ability to impose anything more. Whatever God is one thing is for sure, God is not a presiding executive officer of a man made organization so the imposition of standardization is not realistic as yet. **Make your pan and damn de man!**