

## Preface

When I first started to write this book three years ago, my intention was to update Peter Seegers book about steel pan making from 1964. I was trying to understand and learn how to tune steel pans as a part of my research in the acoustics of the steel pan, and it seemed suitable to document what I was learning. But, during my research project I realized that the art of steel pan tuning has now reached a degree of crafting refinement that makes it impossible to teach a novice how to do it properly from a reading book only – if it ever was. In fact, I believe that it would be easier to make a working violin from just reading a handbook than to make a steel pan. Still, as a scientist I wanted to document what I was learning and felt that a building description could serve as a written guidance to the basics of steel pan making.

The main purpose of this handbook is thus *notto* teach novices how to tune steel pans. The making and tuning of good steel pans is a crafting art that must and should be taught practically by a skilled panmaker. But the methods have hitherto been passed on completely through oral tradition. Therefore, a handbook like this one can, seen as a complementary aid, facilitate the teaching of pan making. The documentation is also intended to serve as a basis for a discussion of existing and emerging new tuning techniques.

The aim of this book is *not* to promote a standardization of the crafting process. It is rather to present major steps of the process and gather the tricks, specialities and results of some different methods so we can have an open discussion of their usefulness. In this way the community of panmakers can join the information society and start to develop the steel pan instrument through the same methods as used by manufacturers of high-tech instruments, such as pianos, violins, saxophones, etc.

As a researcher in acoustics I want to bring my measurements and theories to the skilled tuners to see if the marriage of practical crafting knowledge and scientific theory can bring the steel pan further in its evolution towards a matured instrument. The aim is to promote a fruitful feedback between theory and practice – to try to make a "reference work" both for skilled panmakers and newcomers in the field.

You may argue that the panmakers have managed very well without any theory or written documentation through the first fifty years of the steel pan history. This is perfectly true, but the future development of the instrument can be facilitated and speeded up by providing

written documentation and theories. This has been realised by individuals and organisations in Trinidad. A paper from Pan Trinbago (the national organisation for steel pan music in Trinidad & Tobago) from 1980 states the following about the need for technical research: "To-day, however, there is a need to carry this development to a higher plane and to marry the rich practical experience of the individual panmaker with the theory of engineering science".

I do not claim to be anyone who knows very much about steel pan making and tuning. I don't even know how to keep my own tenor pan in tune, when it comes to practice. But, as I am eager to learn the practical methods and have access to tools for measurements and theoretical models, this book can be seen as a first step towards a thorough documentation of the instrument and the tuning techniques.

The book is divided into four main parts:

- I – a practical section with a brief description of the crafting method.
- II – a documentation of various inventions and trends for the future development of pan.
- III – a theoretical section with a discussion of the acoustical aspects of the steel pan and a documentation of research results, gained in projects during the years 1989 and 1990.
- IV – appendices with data and measurements on some common steel pan models and tools.

This handbook is intended to be published in a step-wise refined procedure. This means that the first edition is to be revised when a sufficient amount of new findings and data are at hand. Therefore, if you find something that seems faulty or poorly described, please report it to me to have it altered in the next edition. In this way the handbook can serve as an evolving reference work for the art of steel pan making and tuning in the future.

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I also want to thank the crew who has helped me with the production of the book: Bob McAllister for proof-reading, Elisabeth Gunnarsdotter, Linus Torell and Johan Larsson for helping me with the pictures, and Lars Lundbom for layout, typography and cover design.

## Steel pan history

The steel pan, the tuned steel drum, is one of the few genuinely novel acoustic instruments invented in the twentieth century. Its origin is believed to be dustbins, used as rhythm instruments by the traditional Carnival bands of Trinidad & Tobago in the 1930's. During its 50-year history the steel pan has evolved from a multi-pitched percussion instrument to the mellow-sounding melodic-harmonic instrument of today.

The history of the steel pan is a story of prohibitions and compulsion. Its invention was in fact induced by the ruling colonialists trying to suppress the strong rhythmic heritage of the black Africans. Here are some milestones in the history of the pan:

- 1883                    The use of drums in street parades was outlawed since the colonialists feared that passing of secret messages by means of drumming might become the impetus for social unity and revolt among the black. Riots and conflict between the natives and the authorities led to the banning of drum processions after the carnival this year.
- 1900 - 1934        The ban of drums led to the use of tuned bamboo sticks in street parades. During the 1930's biscuit tins were included as rhythm instruments in the Tamboo Bamboo bands.
- 1934                    Tamboo Bamboo bands were forbidden due to street clashes among rival groups.
- 1935 - 1938        A gradual change to steel instruments in street bands.
- 1938 - 1939        Are considered to be the "birth" years of the steel drum. Tamboo Bamboo bands finally switching over to steel. Alexander's Ragtime Band, led by pioneer Carlton Forde, is said to have been the first known band with an ensemble exclusively consisting of steel instruments.
- 1942                    Carnivals forbidden during World War II for "security reasons", which gave people more time for acoustic experiments with the emerging "steel drum".
- 1939 - 1945        The first melody pans with three to eight tones was introduced. The pan crafting process was improved by sinking, grooving and tempering. Sticks damped with rubber tubing were starting to be used. The

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- instruments were grouped into categories as iron, boom, dudup, ping-pong.
- 1945 In a spontaneous Carnival at the end of the war there were several bands consisting of only steel pans – the first real steelbands.
- 1946 The Invaders steelband, led by Elliot "Ellie" Manette, was reported to be the first steelband to participate in organised "mas".
- 1947 - 1949 The last years of the small melodic steel pan; in 1948 the 55 gallon oil drum finally replaced the biscuit tin as main raw material. The first fourteen-note steel drum with chromatic tones was developed.

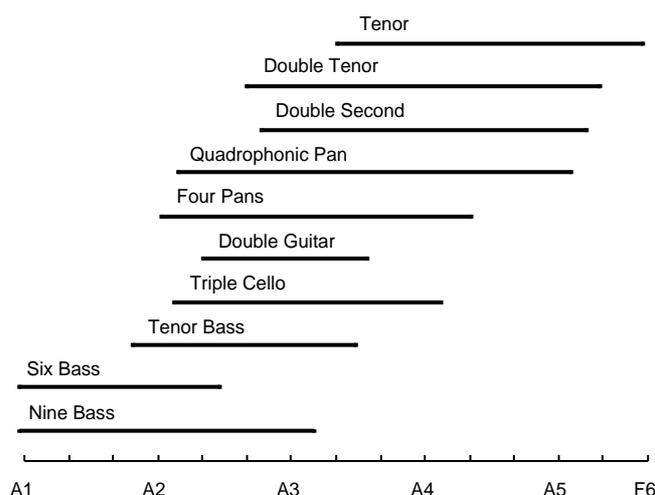
The early rhythm steel drums were usually made from paint tins or biscuit tins, one foot in diameter and two feet long. It was discovered that bulges of different sizes in the bottom of a tin could produce sounds of various pitches. Some of the more inventive players started to tune the tins and play melodies on them. Several sources point out Winston "Spree" Simon as the inventor of the first melodic steel pan.

An oil industry as well as an U.S. naval base had been established on the island of Trinidad. Leftover oil drums were often cut in two and used as dustbins. These dustbins successively replaced the biscuit tin as the raw material for pan making. The bottom of the dustbin was hammered outwards to a convex shape (i.e., the opposite to a modern steel pan) and then small dents for the different notes were made in it. In the later part of the 1940's, pan tuner and arranger Elliot "Ellie" Manette changed the design to concave with convex note-dents and increased the number of notes in the pan.

Through the fifty years following the second world war, the steel pan has been further developed by panmakers through sophisticated experimentation with the physical parameters of the metal, using intuition, trial and error experiments and a good musical ear. The development is still in progress; refinements are made and new crafting techniques and constructions are tested. A number of pan types with different layouts have evolved from this experimentation. Some problems that have not yet been finally resolved are the standardization of the note layout on the various pan types and the evaluation of the effectiveness of the different existing crafting techniques.

## The steelband

In the traditional Trinidad carnival steelband all the melodic and harmonic functions are held by steel pans – the only other instruments that participate are percussion instruments. A steelband can consist of up to 100 players, forming about ten to twelve different instrument groups, ranging from bass to soprano line, together covering a tonal range almost equal to a grand piano.



Graph of tonal ranges for the most common steel pan models. Total range of scale corresponding to that of a grand piano, less one octave at the bottom and 1.5 octave at the top.

The following is a list of the most common steel pan models, together with their usual tonal range and a suggestion for a "tonal

Trinidad name	"Range" name	Tonal range	No. of drums
Tenor	Soprano	D4 - F6	1
Double tenor	Alto	F3 - C6	2
Double second	Tenor	F#3 - B5	2
Quadrophonic pan		B2 - Bb5	4
Four pan		Bb2 - C#4	4
Guitar pan		D3 - F4	2
Cello pan	Baritone	B2 - Bb4	3
Tenor bass		G2 - D4	4
Six bass		A1 - D3	6
Nine bass		A1 - B3	9

range" name:

The rhythm section of the steelband is usually comprised of a regular drum-kit, a pair of congas (usually played with rubber-tipped sticks) and the important "iron" – several people playing with metal rods on brake drums from old cars.

## Methods for steel pan making

Nowadays, steel pans are mostly made by a team, consisting of specialized "sinkers", doing the tough sinking and crafting work, and the expert tuner, doing the intricate tuning of the pan. Almost every pan tuning team has its own method for making and tuning steel pans, using special, sometimes secret, tricks and handicraft methods to get a good result.

The techniques described and discussed here are based on the methods used by the tuners Lawrence "Egar" Mayers and Rudy Smith and their respective crafting teams. Data for the description of the methods has been gathered by the author during tuning sessions, research projects and discussions with the tuners in Sweden from April to June 1989. The manuscript was revised after a visit to Trinidad in the spring of 1990. The pictures were taken in Trinidad 1990 and in Sweden 1991.

The documentation of the crafting method is fully the responsibility of the author, and none of the involved tuners should be held responsible for any faulty statements made here, due to possible misconceptions. However, the functionality of the described methods is fully credited to the tuners.