

## **The London Guitar Academy – Guitar club podcast 2 - program notes**

by Terry Relph-Knight, issue 1, 04/02/16

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### **The sounds of the guitar – Part 2**

A journey through the history of the guitar demonstrating the range of sounds now available to the modern guitarist.

#### **Christian Frederick Martin and the American flat-top**

After Torres the story of the guitar moves to America where highly skilled luthiers had set up shop after emigrating from Europe. Their innovations found fertile ground in a large, multicultural and growing nation. Perhaps now the most famous, C.F. Martin

[https://en.wikipedia.org/wiki/Christian\\_Frederick\\_Martin](https://en.wikipedia.org/wiki/Christian_Frederick_Martin) founder of the Martin guitar company, trained in Vienna under Johann Georg Stauffer

[https://en.wikipedia.org/wiki/Johann\\_Georg\\_Stauffer](https://en.wikipedia.org/wiki/Johann_Georg_Stauffer), but emigrated to America to escape the restrictions and inter-guild bickering of the European craft guild system. Martin trained as a cabinet maker and at the time the Cabinet Makers guild made guitars. However the Violin Makers guild argued that it is was the only guild with a royal mandate to make string musical instruments.

Stauffer invented the six-on-a-side tuner arrangement (advantages – straight string pull over the nut and easier access to all six tuners) and a neck that could be easily adjusted for its angle to the body. It seems more than likely that Paul Bigsby, later 'copied' by Leo Fender, may have seen one of Martin's guitars built to the Stauffer pattern. C.F. Martin & Company founded in 1883, quickly developed from mimicking Stauffer's designs, to introducing innovations of its own in guitar design. For example, in 1842, the X bracing pattern and later, guitars with steel stiffening beams in the neck to resist the increased tension from steel strings. The Martin guitar designs were very influential and lead to the archetypal American flat-top steel strung guitar – the dreadnoughts and jumbos such as the Martin D28 and the Gibson J200. Again, the larger bodies of these instruments attempted, and did generate more volume and bass.

It is in America that the steel strung guitar was developed. Until the development of nylon by DuPont in the 1940s, 'classical' guitars were strung with gut. Gut strings are expensive. They still are made using an ancient and unpleasant process. This takes a long time and a lot of skill is required to produce a set of gut strings. The rapid growth of industry in America lead to the widespread availability of machine made wire. It has been suggested that the American wire industry was boosted by the need for many miles of wire to fence off grazing land in the developing west. Before the availability of cheaper steel strings the expense of gut strings tended to limit interest in the guitar to the fairly well off.

Now one of the largest and most successful and most respected manufacturers of acoustic guitars, and still a family business, during the early years C.F. Martin & Co. was of course a much smaller company struggling to survive (you can follow the timeline of the Martin Co. online - <https://www.martinguitar.com/about/martin-story/martin-timeline/> ). At one point during the early 1920's Martin only survived by making large quantities of, relatively inexpensive, Ukulele's. An instrument made popular by the huge success of Hawaiian music at the time.

Originally the company built small, 12 fret to the body, gut strung guitars with a pronounced upper bout and narrow waist. Designed for restrained entertainment in intimate settings, today these would be regarded as parlour guitars. Although recognized today as a trend setter with many of its methods and designs becoming benchmark's for modern acoustic guitars, Martin was often cautious

about innovation and careful not to upset the sensibilities of its existing customers. The market for steel strung guitars was seen as distinct from the market for gut strung 'classical' guitars. An attitude that has to some extent persisted until today. Even the classical guitar was not recognised by the Royal Academy of Music as a subject for study until 1960.

### **Martin guitar models**

Over the years the C.F. Martin company has become so influential in the flat top guitar market that almost all other flat top guitars manufactured by other companies are based on, or at least influenced by, its designs.

In the early days Martin made guitars with five body sizes with a reverse number scheme following an old guild cabinet making convention – the size 5 – the Junior for small children, the 2 ½ – Child's for larger children, the size 2 Ladies, the 1 Standard guitar and the 0 Concert guitar. Even the largest, the 0 Concert, was only 13 ½ inches across the lower bout. Although Martin no longer make guitars in any of these sizes it does help to explain the 00 and 000 sizes they do still make, as the numbering follows the old convention of a smaller number for a larger guitar. Having already reached zero they kept going with the zero, zero (00) and the zero, zero, zero (000), also referred to as the double oh and triple oh.

### **The Orchestra Model**

Another Martin innovation, which would have a huge impact on the future of the acoustic guitar, was the Orchestra Model. The prime feature of the OM was the fourteen fret to the body neck join. Dance orchestras were changing from banjo to guitar and the fourteen fret to the body design of the OM catered to the banjo player. Its design wasn't due to a flash of pure inspiration, but was prompted by requests from dance orchestras. Specifically from a band leader called Perry Bechtel <http://perrybechtel.com/>.



*Martin Orchestra Model -28*

Working two jobs, by day a salesman with the Cable Piano company and by night a professional musician, early in his career Bechtel was billed as “The Boy with a Thousand Fingers” and later “The Man with 10,000 Fingers”. Unlike most banjo players Bechtel was also highly proficient on the six string guitar and before his connection with Martin, was playing a Gibson guitar. Bechtel’s Gibson was a Style O Artist model, a truly wonderful and unusual carved archtop guitar with an upper bout scroll, probably inspired by the Gibson F5 mandolin and with 15 frets to the body!! The problem with this was that Cable Piano, the company he represented as a salesman, was not a

Gibson retailer, but sold Martin guitars.



*A Gibson 1920s Style "O" Artist guitar of the type played by Perry Bechtel. Image: Elderly Instruments*

The fashion for guitar and the need for banjo players to be able to switch to something that sounded like a guitar, is the reason for the development of the four string tenor guitar. Before the OM, Martin had tried various designs of tenor guitar to satisfy demands from their dealers and from individual players. Eventually getting it right in the O-18T, which remained in production for more than 50 years. The compressed body shape and slim fourteen fret neck of this tenor fed in to the design of the six string OM for Bechtel, blended with the neck specifications from his Gibson O Artist. So if you don't like the modern narrow necks – blame the banjo players.

Before the tenors and the OM, all Martin guitars, and the majority of flat-tops from other makers, were twelve fret to the body designs, with the longer body this dictates, a bridge close to the centre of the lower bout and wide flat necks. Over the period 1934 to 35 Martin re-vamped its entire guitar catalogue converting almost all its guitars to 14 frets to the body. Today almost all acoustics follow the OM design, with a compressed upper bout and a bridge offset closer to the sound hole. Although recently there has been an increased interest in the old designs and some companies have re-introduced some of the old 12 fret to the body guitars, the fourteen fret narrow neck, adjustable truss rod, re-shaped body and X bracing defines the modern acoustic guitar.

Ironically the Martin OM guitars were never that successful with plectrum players in the dance orchestras they were designed for. In that market the by then established archtop style of guitar, eventually ruled. However the OM's, along with the Dreadnought, found a large and sustained market with country and western and finger-picking guitarists and are still very popular today.

### **Frets and truss rods**

The early guitars were fretted with bar frets. These were cut from a strip of nickel silver with a rectangular cross section and wedged and glued into slots in the fretboard that were the full width of the fret. This style of fretting is hard to execute, but results in a stiffer neck. Neck reinforcing rods became necessary for steel strung guitars partly because of the shift to T shaped fret wire, with a toothed tang that presses into a simple saw cut in the fretboard, and partly because of the slimmer, longer and more flexible, 14 fret necks. Martin started using either a T shaped steel beam or a square tube to reinforce necks before finally adopting an adjustable truss rod, a Gibson innovation, in 1985.

## The Dreadnought



*The benchmark for dreadnought's - a 14 fret to the body Martin D28. Image: C.F. Martin & Co.*

Martin made its very first large body guitar, the first dreadnought (named after a WW1 era class of British battleship), in 1916 for Oliver Ditson & Company and these were sold under the Ditson brand as the Model 111 until the late 1920s (while the accepted spelling of dreadnought today is with an 'O' some Martin promotional material of the 1930's shows it as dreadnaught). These instruments looked rather different to the modern dreadnought, having an elongated body and a 12 fret to the body neck, with a slotted peghead. They were fan braced and incredible as it might seem now, most were designed for Hawaiian slide lap style playing. With their pronounced bass, they were quite shocking to guitarists of the time.

This year - 2016, is the centenary of the dreadnought design, although the modern dreadnought has inherited the 14 fret to the body neck of the Orchestra Models, features X bracing and most have solid 'paddle' head stocks.

Although the dreadnought guitar is now regarded as a Martin innovation, the first dreadnoughts were built as part of a business deal with the music publishers, Ditson and the Martin brand did not appear on the guitars. Ditson operated two large music stores where they sold a variety of musical instruments in addition to sheet music. Martin worked with Harry Hunt, the manager of the New York Ditson store to design and build wide waisted guitars in nine models - three sizes and three styles, designs that, at the time, looked nothing like Martin guitars. The wide waist body design was dictated by Mr Hunt, although the drawings and templates for these guitars were made at the Martin factory. The square, wide waisted body design may have come about because the narrow waist of most guitars, which forms a knee rest for seated players, isn't necessary for lap steel playing. It is only when, due to the great depression, Ditson went out of business in 1931 that the most successful of these guitar models, the Dreadnought, was incorporated into the Martin catalogue and branded as a Martin product.

Before building the Model 111 guitars for Ditson, in 1915 Martin had already completed a custom order for a large body guitar, one half inch wider across the lower bout than the 000 body size, for the Hawaiian star Mekia (or Major) Kealakai <http://www.royalhawaiianband.com/the-friends-of-the-royal/projects-of-the-friends/mekia-kealakai-biography.pdf>, composer and leader of the Royal Hawaiian Band. This guitar was the inspiration for Harry Hunt and Martin to create the Dreadnought guitar.

Note that while the large bodies can be uncomfortable for 'conventional' players, the body size is less of a problem when played lap style. The Dreadnought was never an instant hit, but once the transition from a 12 fret Hawaiian lap steel instrument to a 14 fret guitar was made, with the growth in radio and film, it eventually became a must have instrument for country artists and bluegrass bands.

Martin have introduced a new centenary model for 2016, the Dreadnought Junior, which is a smaller bodied guitar (15/16ths of the full size Dreadnought) in the Dreadnought shape with a 24 inch scale length. Also marking the centenary, the company has a wonderful new documentary about the Martin Dreadnought available on its web site <https://vimeopro.com/user48581009/the-ballad-of-the-dreadnought>.

### **The smaller Martin guitars**

The smaller bodied Martin instruments, harking back to the traditions of European lutherie, were played by popular entertainers of the 1920s such as Nick Lucas <http://www.nicklucas.com/biography.html> , the original performer of 'Tiptoe through the tulips' and Roy Smeck (the Wizard of the Strings) <https://youtu.be/WwkD1vB9xo4>. These players were very much entertainers and would sing and play well known standards of the time such as 'Tiger Rag' incorporating comedy noises, sight gags and technical gimmicks. On stage Lucas would stand and sing into a microphone holding his signature model guitar by the neck vertically at his side. He would then swing the guitar up into playing position for his instrumental sections. Not a presentation style you would want to attempt with a large, heavy guitar.

### **Gibson and the archtop jazz guitar**

The Gibson company became famous in the early years of the 20<sup>th</sup> century for the archtop guitars designed by Orville Gibson (inventor of the carved top and back mandolin) and by Loyd Loar, based on the techniques of the European violin, cello and double bass makers. The very earliest carved arch top guitars made at Gibson had a central, round or oval sound hole. It is only later that the twin F holes of the violin family were adopted. These guitars became the basis of the American acoustic and electric archtop jazz guitar tradition. The model L-5 introduced in 1922, was Gibson's first carved archtop guitar with F holes.

The early acoustic archtops were not particularly responsive guitars, but they could be played hard to generate cut through and volume. The flat top guitars of the time just couldn't take that sort of pounding.

The finest of archtop guitars became the province of individual boutique builders. Archtop guitars, from makers such as John D'Angelico, Jimmy D'Aquisto [https://en.wikipedia.org/wiki/Jimmy\\_D'Aquisto](https://en.wikipedia.org/wiki/Jimmy_D'Aquisto) and Robert Benedetto <http://benedettoguitars.com/about/about-robert-benedetto/> are regarded today as the pinnacle of the guitar makers art because of the complexity of their construction and the time and skill that goes into making them. These guitars are known for their crisp bright sound with a loud, fast attack followed by a relatively short note decay.



*Gibson Hollowbody with Venetian cutaway. Image: Gibson*

Archtop guitars also appeared in the dance orchestras of the 1950's, played mostly as part of the rhythm section. One of the most famous players in this arena is Freddie Green who played rhythm guitar for the Count Basie Orchestra on his Stromberg Master 400 [https://en.wikipedia.org/wiki/Stromberg\\_Guitars](https://en.wikipedia.org/wiki/Stromberg_Guitars) .

Hand carving the top and back of an archtop requires high quality timber, great skill and takes a long time, so a technique for pressing tops and backs, often out of plywood, was developed to meet demand for a lower cost instrument. As amplification was developed often pickups were fitted to the archtops used in dance orchestras and this eventually led to the development of the semi-hollow electric guitar, such as the Gibson 335 or the Epiphone Sheraton, which greatly resemble the acoustic archtop designs.

Gibson has been making stringed musical instruments since 1894 when Orville Gibson started building mandolins in his small woodshop in Kalamazoo, Michigan. Orville went on to build the first archtop guitars. The adjustable truss rod was a Gibson innovation that was eventually adopted by every guitar maker.

### **Jazz and the European traditions**

Guitars were of course still being designed and made in Europe and one of the most famous guitars of the 1930s and perhaps the European equivalent of the carved archtop, sprung out of the cooperation between the Henri Selmer instrument manufacturing company and the guitarist and luthier Mario Maccaferri. The Grande Bouche or 'Big Mouth' guitar, so nicknamed because of its large D shaped soundhole, was later joined by the Petite Bouche or 'Small Mouth' model with its also distinctive, small oval soundhole.

The Grande Bouche guitar was Maccaferri's original design and had many unusual features. The large D shaped sound hole opened into a scoop that connected with an internal resonator, a second body inside the external guitar body. The tops were made of thin spruce pressed into a shallow dome with a fold or bend below the bridge as found in some mandolin tops. The domed shape and the use of a floating bridge with the strings anchored by a tail piece helped withstand the tension of the steel strings. The neck joined the body at the twelfth fret and was similar in width to a classical guitar. The top and back were ladder braced.

A later design variation by Selmer, the Petite Bouche, borrowed some of the styling and construction of the Grande Bouche, but had no internal resonator and had a narrower neck joining the body at the fourteenth fret. The small oval sound hole was intended to accept a clip-in Selmer pickup.

These guitars are linked with Manouche or Gypsy Jazz and were often played by the great Gypsy guitarist Django Reinhardt, who made them so famous. Although he rarely owned a guitar, Django apparently preferred to play a Petite Bouche model, while his accompanying rhythm players used Grande Bouche guitars.



*A reproduction of the Selmer Maccaferri 'Grand Bouche' made by Gitane. Image: Gitane*

Today the Maccaferri Grand Bouche is almost never played as it was designed to be heard because, in surviving guitars, the internal resonator has often been removed and many modern copies do not incorporate the resonator because it is too expensive to reproduce.

Although there is quite a difference in sound between the various models, these guitars have a dry bright sound and are often strung with 'Gypsy strings' which use silver plated copper wire on the wound strings. The manouche style is usually fast and up-tempo, with the guitar strings struck near the bridge and a distinctive vibrato in the left hand.

### **The 12 string guitar**



*A reproduction of the 12 string Oscar Schmidt Stella guitar made by Fraulini. Image: Fraulini.*

The origin of the steel strung 12 string guitar, which appeared in America in the early years of the 20<sup>th</sup> century, is something of musical mystery. It is a return to the idea of courses of strings to produce a louder sound and may have been developed by Italian luthieres, with their background in mandolin making. Or it might have migrated from Mexico, or even germinated from an instrument made in 1904 by Grunewald, a New Orleans company.

In the case of the 12 string guitar there are 6 courses of two strings each, with the string pairs in the top two courses usually tuned to unison, while the bottom four pairs are tuned in octaves. The tension of 12 steel strings at standard pitch makes the 12 string guitar quite tiring to play, so it is a very common practice among 12 string players to tune down a half or a whole step.

The 12 string guitar became associated with acoustic blues and American folk music. The great American blues and folk musician Lead Belly or Huddie William Ledbetter is famous for the unique sound of his ladder braced Stella 12 string <http://www.stellaguitars.com/> which he custom ordered from Fulvio Pardini at the Oscar Schmidt company in Jersey City. This guitar is unusually large and has a long scale length. Lead Belly tuned down from standard tuning and played with thumb and finger picks.

The Oscar Schmidt Stella guitars seem designed for heavy strings and low tuning with a 26 and ½ inch scale length. The Stella's were ladder braced and although they had a glued on rectangular wood bridge with a bone saddle, the strings were anchored by a pressed metal tail piece secured to end block of the guitar, avoiding any problems with the bridge lifting due to the extra string tension. During the period Oscar Schmidt was in business, 12 strings were avoided by other established guitar making companies and the early 12 strings were low cost instruments.

### **Nashville tuning**

Nashville tuning, also known as high-strung tuning and inspired by the 12 string guitar, was developed as a way of getting a 12 string sound in a studio when an actual 12 string wasn't available. In Nashville tuning a conventional 6 string flat-top is strung with the octave strings of a 12 string set in the low four string positions and with the normal top two strings. When played with, or tracked against, a second 6 string guitar (or even the same guitar re-strung) with a normal string set in standard tuning, a large 12 string effect is produced, without actually having to use a 12 string.

### **Slide guitar and National Resonator guitars**



*Resonator guitars - A National Reso-Phonic Tri-cone, a Scheerhorn Dobro and a National Reso-Phonic Triolian. Images: National Reso-Phonic and Scheerhorn.*

The National Stringed Instrument Corporation

[https://en.wikipedia.org/wiki/National\\_String\\_Instrument\\_Corporation](https://en.wikipedia.org/wiki/National_String_Instrument_Corporation)

was founded in 1927 by George Beauchamp, John Dopyera and his brothers. As a performer and slide guitar player Beauchamp had approached the Dopyera's about developing an acoustic guitar that used some form of mechanical amplification to compete with the volume of brass and other loud instruments.

Their, sometimes stormy, co-operation resulted in the invention of three different types of resonator guitar using different numbers and arrangements of spun aluminium cones in place of the conventional wooden guitar top or soundboard; the three cone Tri-cone, the 'biscuit bridge' single cone Triolian and the 'spider bridge' single cone Dobro.

The Tri-cone was their first design and was initially made in a square neck form, for lap steel playing in the Hawaiian style, which was hugely popular in the United States in the 1920s. The National Corporation was launched with funds obtained from a wealthy backer during a party, where the great Hawaiian steel guitarist Sol Hoopii was hired to play a prototype Tri-cone. The Tri-cone guitars, made of nickel silver were usually lavishly engraved and were expensive instruments for the time.

In the Tri-cone design three, six inch diameter cones, made of thin spun aluminium are supported in a triangular well sunk into the front face of the instrument, two cones on the bass side and one on the treble. A 'T' shaped bridge made from sand-cast aluminium rests on the points of these cones. The strings run over a notched maple saddle held in a slot cut in the arm of the aluminium bridge and the bridge and cones are all held in place by the down pressure from the strings.

The great depression that began in 1929 had many companies looking to manufacture lower cost products and NSIC were no different. Discussions over how a new, cheaper, resonator instrument might be constructed led to a huge argument, fueled by other disagreements on how the company should be run, between Beauchamp and the Dopyera's. John Dopyera wanted to retain the singing sustain of the Tri-cone with an almost equally complicated design of a cast aluminium spider bridge edge driving a large re-folded cone. George Beauchamp wanted to go with the simplest, cheapest construction possible – a single large cone with a maple biscuit bridge attached to its point. The disagreement was so acute that the Dopyera's walked away from National and formed their own new company – Dobro (a contraction of Dopyera Brothers that also means “good” in Slovak).

Back at National, Beauchamp put his ideas into practice and came up with the oddly named Triolian and later Duolian biscuit bridge, single cone guitars. While both of these designs have a single cone, it seems the Triolian may have been planned as a three cone design, although none were ever made that way, with a wood body. Painted wood, rather than plated and engraved sheet nickel silver, being another cost cutting measure. The name Duolian just follows on from the Triolian. While National never went as far as Monolian they did come up with the Collegian, a stripped back version of the Triolian. Like the sand blasted etched patterns on the nickel plated National's some of earlier wood body guitars were painted with Art Deco Hawaiian motifs.

Later, all three single cone National's were also manufactured with painted steel bodies. The secret of one spectacular paint finish, known as 'frosted duco' has almost been lost to time. A noxious combination of chemicals in the paint cause it to form crystallised patterns like the ice crystals in frost. Today a handful of people claim to know how it was done and some can even reproduce the effect.

The sounds of all three types of resonator guitar are quite distinctive. Resonator guitars are often described as having strings connected to a loudspeaker cone housed in a box, the guitar body, as

though the body has little to no effect, on the tone. In practice resonator guitar bodies have been, and are, made out of four different materials, all with their own distinct sonic character. The original National Tri-cone bodies were made from German (nickel) silver, an alloy of nickel, copper and zinc, originally used for making cutlery. While this alloy is silvery in appearance it doesn't contain silver. Tri-cones with nickel silver bodies have a complex bright and singing tone. A lower cost alternative, brass, which like nickel silver can be nickel plated, imparts a more mellow sound. These instruments are often described as being made from 'Bell' brass which is nonsense. No brass alloy has ever been known as 'Bell' brass (other than in resonator guitar advertising). Bells are cast from bronze, not brass.

Cheaper than brass, steel body resonators, usually painted, have a loud brash tone. Instruments made from perhaps the cheapest body material, plywood, can be a little restrained compared to the metal body instruments.

Resonator guitars are available with all three cone types, in all four body materials, in 6 string, 12 string and baritone configurations, providing a wide range of different models with a very broad spectrum of tones. Many of these instruments retain the 12 fret to the body, wide flat necks of the older style of guitar.

Fortunately for modern guitarists, although all resonator guitar production at the NSIC ceased in 1941 due to the United States entry into world war two, recreations of the original National resonator instruments, plus a host of new models are now made in San Luis Obispo, California by National Reso-Phonic Guitars <http://www.nationalguitars.com/>, founded by McGregor Gaines and Don Young in 1989. Both Gaines and Young are ex-employees of OMI a subsidiary of Gibson, which had bought the rights to the Dobro name and that still manufactures Dobro resonator guitars today.

### **The Weissenborn lap steel guitar**

The Weissenborn guitar is another rather esoteric type of acoustic guitar designed for lap steel playing that has been resurrected in recent years. Most Weissenborn style guitars have an elongated body that blends in to a hollow square neck, although there are some made with a solid neck that can be played bottleneck style. See <http://www.anderwoodguitars.com/>



*A modern weissenborn lap steel guitar made by UK company Anderwood Guitars.*

### **Modern acoustic finger style guitar**

Modern acoustic finger style guitar is often a bit of a misnomer because most modern acoustic players use acoustic guitars fitted with internal pickups and play through amplification, often with effects. Modern acoustic guitars are available in a wide range of body shapes and sizes, from all the

old ones through to the Taylor Grand Concert, Grand Auditorium and Grand Symphony, all with or without cutaways.

Taylor guitars are a relatively modern company that, due to its innovative ideas, such as the adjustable bolt on neck and finger jointed headstock, and the high quality of its products, has risen to a prominent position in today's guitar market. Taylor has experimented with build techniques, body shapes and sizes to create a catalogue that rivals Martin's.

The current styles of solo acoustic guitar use percussive and two handed tapping techniques, aided by amplification, to expand the range of sounds available. Some players go even further by playing two guitars at once (one supported on a stand) or by playing guitars with double necks, or with extra strings.

Many players in the 'new acoustic' style, such as Thomas Leeb, John Gomm and the late Eric Roche, favour the larger Lowden guitar models. These lend themselves well to the low alternate tunings and the large bodies produce a good bass thump for the percussive techniques.

We will continue the story of the guitar in our next podcast – “The Birth of the Electric Guitar”

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