

## BRIDGES.

### Introduction.

If you Google images for guitar bridges, you will find an amazing assortment of structures; leave aside those for amplified guitars and you will still find some very modern approaches to guitar bridges. It is all very well having the pretty, using nice woods, bone, ivory, tortoiseshell and whatever, they must also be functional. From my previous articles you will see that I find it difficult, if not impossible, to correlate the guitar sound boards with those of the CBG. Not because it does not have the same function (it does) but because of the small surface area, the doubtful value of traditional bracing if applied to a CBG, and the small volume of air in the CB that it has to create the sound with.

### Bridges

The soundboard is configured by the bars and braces affixed to their under side. Various configurations are used depending upon the primary use for the guitar e.g. Classical, Flamenco, or say general use. I could go on, but one of the key differences you will immediately define is the material from which strings are made. What is not quite so obvious (and I have generalize here) is that in some music styles the strings are mainly plucked thus transferring an “up and down” motion to the bridge, and in other music styles the strings are struck “sideways”. Then add to this that some are nylon/gut and others are steel. This gives the bridges used in the various styles a different main function.

In simple terms the plucked has to handle the up and down movement of the strings and the struck has to deal with the sound board wanting to twist because of the predominate force placed upon the strings. [Like I have said, I have to generalize here as the strict physics of the movement might well favour the sideways being the predominant actual movement in all styles.]

Tail pieces (Tail stocks, by whatever name you use) now enter the equation. For the classical genre there is often no tail stock as such, the strings end just behind the bridge, in a position that usually requires no notch and on a structure that is basically part of the bridge itself. On the other hand most steel strung guitars have some form of tail stock and string anchor that takes the strings from the bridge to the bottom of the guitar. These two differing design functions place different stress functions on the bridge and thus to the sound board.

It is not by accident that these two designs have been adopted for their respective styles. You are builders and players and you will know that the strings that go over the bridge to a tailpiece that anchors to the bottom of the sound board, is much loved by those who want to emphasize a bat to their playing; swing, jazz, rock and roll etc. Those wanting a smoother sound choose a bridge that is an “all in one” bridge and string anchor.



*Classical bridge*



*Jazz bridge*

If I am right (and I could well be wrong as I have not done any measurements) the steel strung guitar with a tail piece brings more downward pressure on the bridge. Quite a lot in fact, such that once the guitar is strung up and the bridge is in place it needs no glue. That also means it is pressing down on the sound board significantly and spoiling the productions of good vibrations.

On the other hand the classical bridge has to be glued (indeed often fixed from below too) but it has less downward pressure on the sound board thus enabling it to function more effectively in the production of pleasant smooth sounds. It does have the twisting to cope with, but the Luthier sorts that out with his bars and braces.

Other than the obviously different sorts of sound each style brings there are two other factors which come into play. The sound board of the steel strung with a tail piece has a corridor of movement that is longer and narrower than the classical bridge. Its core is a narrow corridor (about the width of the bridge) that starts at the bottom of the sound board and ends near the bottom of the fret board. The fixed bridge (classical) is coping with the twisting and struggling to convert the string vibration into sound board vibrations that move the sound up and down within the body of the guitar. This is where the sound hole of this guitar is so valuable.

It is just in front of the bridge and the bracing for that style of sound hole is structure to avoid the phase “cancelling out” of vibrations (see my other discussions about this). The “swing” guitar can have “f” holes either side of the core vibration corridor on their sound board; or as we can observe in CBGs, pretty well anywhere on the top of the box! Possibly even in the side of the CB? (Again, see my other discussions on this aspect of sound holes)

Conclusion.

I find it hard to succinctly state a conclusion regarding this discussion in relation to CBGs. I will say that I am impressed by some of the pictures of “avant garde” luthiers bridges and will give some of them a try. They seem to be trying to spread out the downward pressure on the sound board, which would certainly be the right thing to do. The issue of “f” holes seems to have been given a valid function in CBG design. The “large” round sound hole in front of a bridge that has a tail piece seems not to be a valid design feature; and I have yet to see a picture of a fixed (classical style) bridge on a CBG.

I still think that my proposal to have no sound hole in the top of the box but rather have it in the side of the box, has some merit.



*I think this is a brilliant design.*



*Look at this, just one "f" hole and spread tension from the strings*

Thanks for reading this.