# BUYING AN ACOUSTIC GUITAR

(Musician - Jan 1990 pg 79) Alan di Perna

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Buying an acoustic guitar is a lot like choosing a spouse. Select wisely and you'll have a partner for life - one that will mellow and improve with age. It's a far cry from the "one-night-stand" mindset of high-tech purchasing, where you're out shopping for your next synth or stereo component before you've barely learned the name of the one you've got. This makes the job of choosing an acoustic all the more demanding. You may find a beauty. But how can you tell if it's built to last as long as you - through sickness and health, its tone growing richer rather than poorer down through the years?

Well, the acoustic guitar market breaks down much like the marriage market. Up on top, say in the over-$l500 price range, you've got your centuries-old aristocratic families: Martin, Gibson, and (since the '50s, at least) Guild. It's pretty hard to go wrong if you buy into one of these clans. But are these the only top-quality guitars out there? By no means. Taylor guitars of California, for example, has been around since about 1975 and already has become a major contender in the high-end market.

At lower price points you'll fInd manufacturers implementing many of the same ideas in more affordable ways. And doing a good job of it, for the most part. The acoustic guitar market has become intensely competitive in recent years. Manufacturing standards are high, both in the US and in Japan and Korea, where some 90 percent of the world's acoustic guitars are made today. This means there are plenty of respectable guitars in both the mid-price range ($500-$1500) and the affordable (under $500) zone . Whatever you've got to spend, you can take your choice from among a bevy of fine acoustics from companies like Yamaha, Ovation, Takamine, Washburn, Alvarez and others.

What is it about a good acoustic guitar that gives it that unmistakable sonic depth and character? The wood, for one. The wood for fine guitars is cut from logs using a process called quarter-sawing, which yields the straightest wood grains. It's then kiln-dried and aged, sometimes for years, to help keep it from warping. And of all the wood on an acoustic guitar, the most important piece is the soundboard or top. (That's the piece with the big round hole, or small f-holes, in it) Often compared with a speaker cone, the soundboard is what resonates in direct response to the vibrating strings, producing much of the guitar's tone. The rest of the guitar body, sides and back is analogous to a speaker enclosure, then. They're important too, but since they're not in direct contact with the bridge and strings, they're not nearly as critical as the top.

Although you'll find some tops made of cedar, pine and even Hawaiian koa, they're most commonly made out of spruce, an easily identifiable, light-colored wood. Sitka and Engelmann are generally regarded as the best varieties of spruce. As for the rest of the body, rosewood, maple and mahogany are all common, rosewood generally enjoying the highest status. A mahogany-like wood called nato is sometimes used as a more affordable substitute for mahogany.

"Mahogany generally has a more mellow tone than the other common types of body wood," advises Guild plant manager William Fritscher. "If you want more of a treble tone, I would say go with maple or rosewood."

But now we come to an important distinction. No matter what type of wood they're made of, better guitars use solid pieces of it for the top, back and sides. Less expensive guitars use laminated wood, i.e., plywood: many thin layers instead of one solid piece. It's why cheaper guitars tend to sound bright and brittle, while better guitars have a more evenly balanced tone. Often, only the outermost layer, or veneer, will be the "prestige wood"; spruce, rosewood or whatever. All the other plies may come from some less noble denizen of the forest.

You can sometimes see if the soundboard of a guitar is solid or laminated by taking a sideways peek at it, through the soundhole, looking toward the neck or the bridge. You're now looking at a cross section of the soundboard. If the wood grain on the soundboard's top surface continues all the way down through the wood vertically, then you're looking at a solid piece of wood. If, on the other hand, you see a lot of horizontal layers running round and round the side surfaces of the soundhole, you're peering at plywood, mercy. Careful, though: The soundholes on some guitars are cleverly beveled to conceal the laminations. Spotting a laminated back or sides can be even tougher.

But then, lamination isn't entirely evil. Laminated wood has the advantage of being stronger than solid wood (which is precisely why it's less responsive). Moral: Suit your purchase to your purpose. You may need ruggedness more than subtle tonal nuances. In short, don't be unduly intimidated by wood snobbery. Consider the case of Ovation acoustics. The company struck off in a whole new direction during the mid-'60s, constructing guitar bodies out of bowl-shaped pieces of space-age plastic called Lyrachord. The guitars sound swell and have become a perennial favorite, particularly with rockers. They may not have that much harmonic complexity but their more neutral, even tone makes them easier to mike up onstage.

Then there's the case of the lute-style back and sides used on some mid-market Alvarez Yairis. A solid piece is sliced into three layers,

the grain of the centerpiece is placed at a 45 degree angle to the grains of the other two pieces and the three of them are bonded together without using glue. "The process gives the back and sides a little faster response," says Alvarez product manager Tom Presley. "They're more reflective than solid mahogany backs and sides."

Let's get back to the soundboard, though. Since it is so important, what should you be looking for when you check one out? When you're examining a flat-top acoustic, Yamaha guitar product manager Ken Dapron recommends that you make sure the top really is perfectly flat. "A common problem is that humidity factors, and/or stress on the bridge, will warp the top. If you see waves in the top, any kind of areas that are higher and lower, say within eight inches of the perimeter of the bridge, that's a sign that there's something wrong structurally. Any unevenness in the height of the wood should be taken as a warning sign."

Chris Martin, head of Martin Guitars and scion of America's foremost luthier family, suggests that you examine the soundboard's wood grain when selecting a premium quality acoustic. "The top of a guitar should be straight-grained. If you look across it, the grain lines should run straight across the face." When looking at the sound board in "cross-section", through the soundhole (as described above), "the grains should run perfectly straight from top to bottom. The more perpendicular they are to the plane of the face, the better the guitar top. Those little grain lines are like steel I-beams. The straighter they are, the more uniformly the top is going to vibrate. You don't want a top where the grain is too tight, because that will inhibit vibration. But if the grain is too wide, it becomes a structural problem."

Resonance vs. strength. That's also the question when it comes to bracing; the wooden beams inside the guitar that support the body, particularly the top. If they're too heavy they'll inhibit vibration and compromise the sound. If they're too light they won't do their job, which is to keep the top, back and sides from "pulling up" off the guitar due to string pressure or the wood's settling in. The most widely accepted solution to this bracing conundrum was invented by Chris Martin's great-great-great-grandfather C.R Martin, Sr. It's called X or cross bracing, since its main feature is two lengthy braces that run diagonally underneath the top, crossing right beneath the soundhole on the bridge side of the guitar. If you peer through the soundhole of a crossbraced guitar, looking in the direction of the bridge, you can usually spy a v-shaped joint on the underside of the sound board. That's one of the angles of the cross brace.

Scalloped bracing is a refinement of cross bracing that involves

shaving away portions of the wood braces, which makes them lighter, thus allowing the top to "vibrate more". Scalloped bracing is another one of those little amenities that start turning up after you pass the $500-$600 price point.

While cross and scalloped bracing are in the overwhelming majority, you may also run into one of several types of fan bracing (including kasha bracing), in which several braces radiate, or "fan out," from a central point somewhere beneath the bridge. This type of bracing, sometimes found on expensive handmade guitars, often requires the luthier to carefully "tune" the top in tandem with the bracing. Again, things like scalloped and fan bracing can sometimes be detected by having a peek through the sound hole, or reaching your hand inside the body and feeling around. (Obviously, you can feel a lot more with the strings loosened or removed. You can also use a flashlight and an angled dental mirror.) The main thing to beware of is loose bracing, especially if you hear any untoward rattling from the body.

In addition to wood type and bracing, the finish of an acoustic guitar affects its tonality. Thick, shiny polyurethane finishes provide excellent protection against nicks and scratches, but they actually inhibit the wood from vibrating. Thin, hand-rubbed lacquer finishes, on the other hand, allow the wood to "breathe." This, in turn, affects the way the guitar ages and mellows. "When you seal a wood in polyurethane, there are no pores in it," Yamaha's Ken Dapron explains. "It doesn't breathe and it doesn't respond to the climate, so it doesn't age at the same rate as a lacquer finish. The wood on the inside of the guitar still breathes, because that's not painted. But the exposure is mostly on the outside of the instrument"

So much for the body. Now we come to the part of the guitar that calls for the closest examination before you buy: the neck. Look at it carefully. Play it even more carefully. You most emphatically don't want to get stuck with a bum neck.

Necks are generally made of either mahogany or maple, with either rosewood or ebony fingerboards. Ebony is harder than rosewood, so it tends to last longer, but it can also crack. Ebony is darker in color, and some guitar makers paint their rosewood fingerboards to look like ebony. You can still tell the difference, though: rosewood is visibly more porous. As for the neck itself, maple is more prone to warp than mahogany, which is why better maple necks are usually made of two separate pieces, often with a thin strip of mahogany in the middle. As the wood settles in, the two pieces of maple "work against" each other and the neck won't warp.

Warpage is the bete noire of any neck. Again, temperature and humidity really wreak havoc with wood; and even the finest guitar can have a

warped neck if it has been improperly stored or handled. The traditional way to check for warpage is "sighting down the neck," where you tuck the body under your chin like a violin, hold the guitar horizontally and look across the top of the neck to make sure it's straight. It's the equivalent of kicking car tires, but can be misleading, as Yamaha's Ken Dapron cautions:

"Between shadows and the kind of lighting you have, you can start seeing things that aren't there. The manicure of fret edges, for example, is not always done perfectly. And when the lengths of fret edges vary, it can make the neck look warped. So a minor problem can look like a major one."

Many experts prefer the following method for checking the straightness of the neck. Just press down the low E string between the nut and first fret. With your other hand, press the string down again at the fret where the neck joins the body. Then look at the space between the bottom of the string and the tops of the frets all along the neck. Basically what you're doing is using the string as a straight edge. The neck should run along at a fairly uniform distance from the string.

The experts also tend to agree that the neck should ideally have a very slight convex (<--should this say concave ??) warp-it should bend inward a little. Perfectly straight necks, or necks with a concave (<--should this say convex ??) warp, will create problems with buzzing strings unless you keep the action very high.

Ah, the action. . . a very important consideration. Even if the neck isn't undesirably warped, you may find that the strings are uncomfortably high off the fretboard as you play up the neck. If that's so, there could be a problem with the way the neck is set. And this is what you should check for next. All acoustic guitar necks, from the cheapest to the most expensive, are set by hand, by sliding a "male" groove at the end of the neck into a "female" slot on a part of the body called the top block. This interface, known as a dovetail joint, is glued in, usually with the kind of animal glue violin makers have used for hundreds of years. (Some manufacturers add screws as well.) The dovetail joint is a time-honored and reliable method for setting the neck in place. But between human error and the natural propensity of wood to stretch and settle as time goes on, the neck could end up in a less-than-ideal position. If the neck is set too low in relation to the bridge, the action may be irreparably high.

The deuce of it all is that acoustic guitars, unlike their electric counterparts, usually don't have adjustable bridges. So the only real way to lower the action is to shave off some of the saddle, that off-white strip of bone or plastic that sits on the bridge right in

front of the string pegs, and over which the strings are stretched. But sometimes there isn't enough saddle there to shave. Ken Dapron explains how to tell if there isn't:

"Look at the angle of the string as it bends over the saddle. If you've got a nice sharp angle, this tells you that you can bring the saddle down. If there's no angle, and the string action is real high, then the saddle can't be brought down."

Other things to check for? Examine the heel of the neck; that block of wood that extends down from the neck and adjoins the side of the body. If there's any kind of gap between the heel and body, or if the finish is cracked, bubbled or milky in color, the position of the neck has probably shifted: perhaps enough to be a problem. Similarly, check the area where the bridge joins the soundboard. Any gaps or weirdness in the finish may indicate that the bridge has shifted or is being pulled up. Makers of inexpensive guitars sometimes finish the entire sound board and then glue the bridge right onto the finish. This is a definite no-no. The bridge should be affixed to the raw, unfinished wood. Otherwise there'll be trouble when the strings are tuned up.

"A bridge that's glued to the finish is only going to stay on the guitar as tightly as the finish bonds to the top," cautions Alvarez's Tom Presley. "The way a person should check for pulling up is to take a business card or a small piece of paper and slide it around the outer edge of the bridge. If the card doesn't slip under the bridge at any point, you should have a good bond there."

Also check the nut: that slotted piece up at the top of the fretboard that guides the strings over the fretboard as they come down from the tuning machines. The slots should be uniformly spaced and of uniform depth. See if the frets and tuning pegs are in good shape. The most desirable tuning machines are the closed-back or self-lubricating kind, where the gears aren't visible. Schaller, Grover and Gotoh are all good brands.

Whew, quite a lot to keep in mind, eh? Not to worry, though. Just remember that the process starts and ends with a very simple, fundamental attraction, just like marriage. The first thing you have to do is fall in love with the sound of a guitar.