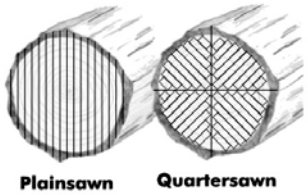
Making an Acoustic Guitar – A Simple Outline

Goal: Make an instrument that someone wants to own - looks great, sounds great, plays in tune, plays easily, and lasts a long time.

What affects the sound? – Everything, with some things more than others

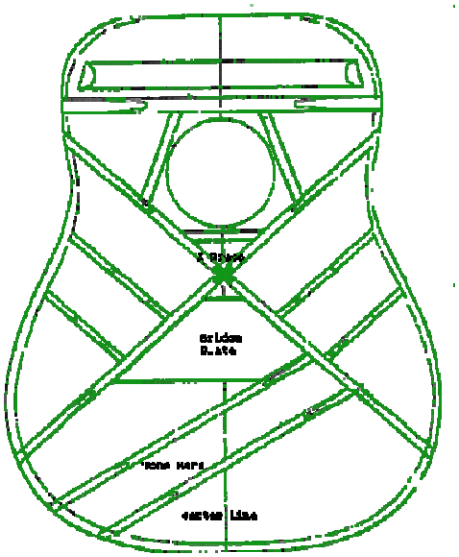
Woods (compilation of info from luthiers and tonewood suppliers – Web search for tonewoods):

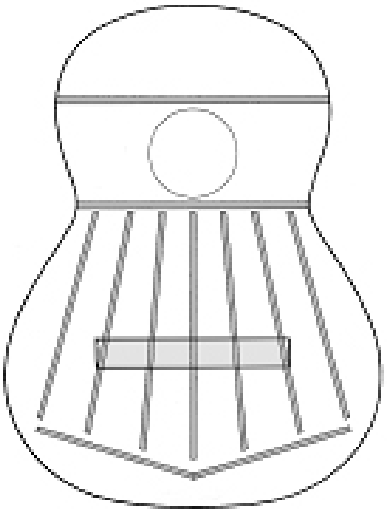
- General
  - Quartersawn – stable, even grain
  - Velocity of sound – lively and undamped transmission of sound
  - Overtones, Tapping
  - Structural integrity w/o overly dampening sound production
- Topwoods
  - Spruce – high strength to weight ratio
    - Sitka - the standard
    - Engelmann – soft, warm tone
    - Adirondack (Eastern red) – large dynamic range (headroom)
  - Cedar – quick response with a light touch, warm overtones at low volume
  - Redwood
- Back and side woods
  - Rosewoods (Brazilian, East Indian) – rich low end overtones
  - Mahogany – woody, bass and treble overtones
  - Koa – midrange overtones
  - Maple – bright, clear separation of tones
  - Walnut – woody, similar to mahogany



Bracing:

- Tops: typical steel (X-braced), nylon (fan braced), other (lattice, flying buttress…)
- Backs: typically ladder braced
- Stiffness, support vs. weight
- Arched to curvature of top and back
- Scalloping to reduce weight and adjust tap tones





Building Procedure:

- Mill wood to size
- Cut, carve neck to rough shape
- Make fretboard, attach to neck
- Carve neck to final shape
- Join top halves, back halves
- Brace top and back
- Bend sides
- Join sides to form rim with headblock and tailblock
- Attach linings to rim (top and back)
- Attach back to rim
- Attach top to rim
- Binding and purfling
- Finish – sand, fill, finish
- Make and attach bridge
- Attach strings and final set-up

Methods:

- bending – thickness, heat, moisture, - tight curves
- neck – solid, scarf Peghead, stacked heel – bolt on, flush, mortise/tenon, French dovetail
- Glues – traditional hide glue, Titebond (carpenters glue)
- Finishing – natural wood finish (no stain, paint, sunburst)
    - Prep the surface – sand, drop fill
    - Wash coat – barrier, stiffen wood fibers, adhesion of successive coats
    - Grain filler – latex, acrylic, vinyl, epoxy, super glue
    - Sealer coat - adhesion
    - Top Coats - nitrocellulose lacquer (the standard), catalyzed polyurethane, UV cured Polyester (Taylor), waterbased lacquer, French Polish (shellac, typical on classical guitars), oil
    - Sanding and buffing

Other Stuff:

- 12 fret vs. 14 fret
- Fretboard radius
- Separate neck (typical on steel string) vs integrated neck (typical on classical)
- Sustainable materials
- Composite materials