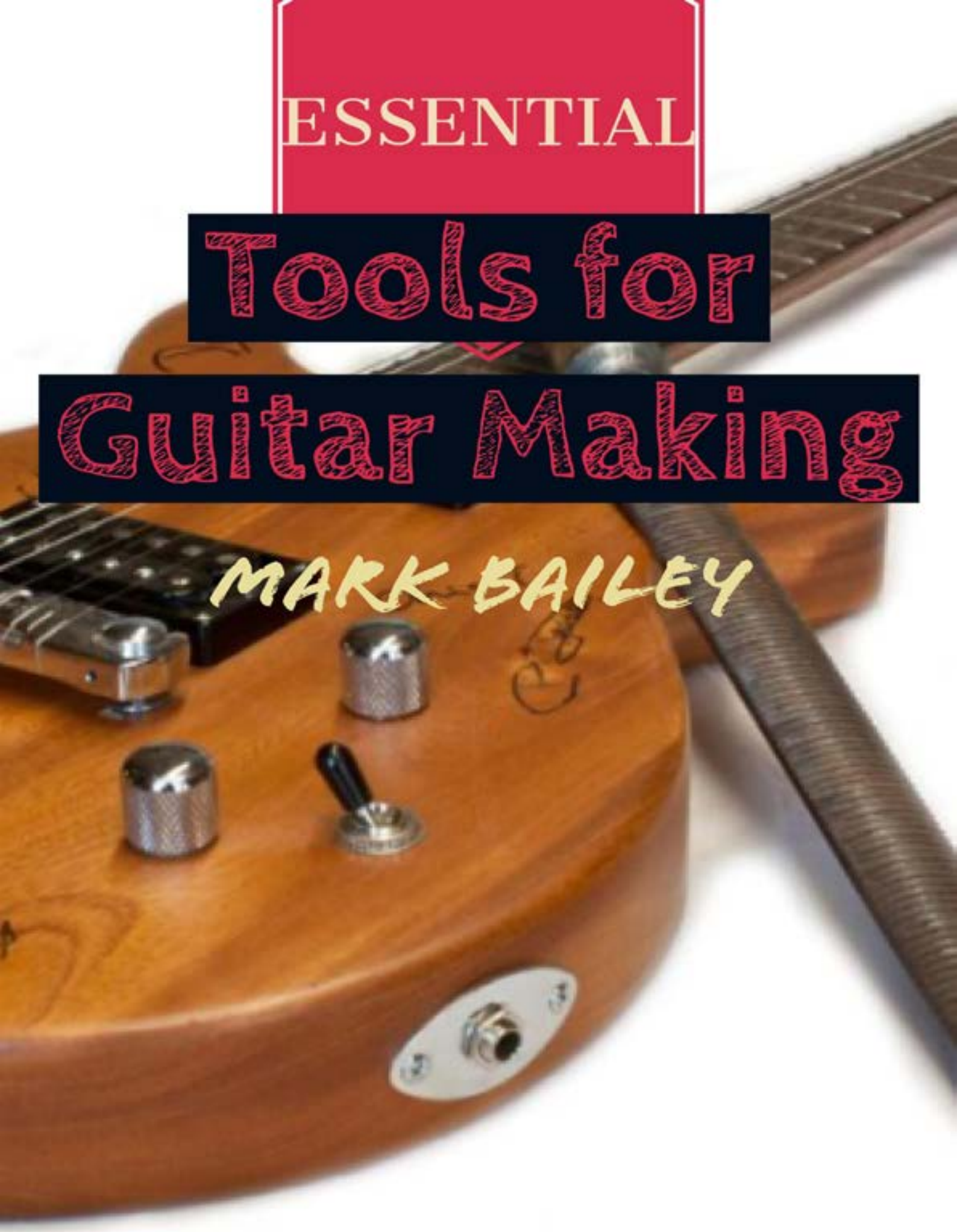
ESSENTIAL

Tools for Guitar Making



MARK BAILEY

WHAT YOU NEED AND WHERE TO GET IT

Essential Guitar Making Tools

What you need and where to get it

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Contents

Dedicated to my partner and soul mate
Carol who is my Rock (and Roll)

Introduction

One of the most frequent questions I am asked is, “What tools do I need and where do I get them?”

This manual is my ***definitive*** answer to that question.

Buying the wrong tools can be a *very* costly mistake. There are some essential tools and some that are not necessary but save time - others are to be avoided.

It has taken me 16 years to build up my workshop and I have tried just about every guitar making widget know to man - some I wish I hadn’t - others I now couldn’t live without.

My aim is to show you that you **don’t** need to spend a fortune on tools to build a guitar (or ten!).

In fact you can do it with very little outlay.

Before you go and buy some shiny new tools (tempting and satisfying though that may be) - check though the list at the end of the book.

You may just find you have most of these tools already lurking in your garage or shed.

‘Welcome to the pleasures and frustrations of guitar making’ - Mark Bailey

Summary

This manual outlines the **ALL the basic guitar making tools** used on our workshop and online courses.

Who is this manual for?

- Anyone interested in guitarmaking...even if you only want to make one guitar
- Anyone who's ever wanted to make their own guitar but doesn't know where to start
- Anyone trying to build at home
- Those who have tried and got stuck
- You, if you have already made a guitar but wasn't happy with it
- Schools and colleges
- All levels of guitar maker - from complete novice to the advanced woodworker
- Anyone wanting to make a living from guitar making...that could be you!

What will I find in this manual?

- A full list of essential tools, optional tools, and some you can make yourself
- List of Suppliers - where to get stuff from
- Advice on the important features to look out for when choosing your tools

What will I learn?

- What to features to look for when sourcing and using tools
- Which tool to use for each job

By the end of the manual what will I know?

- What tools you need
- What they are used for
- where to get them

Workshop space

Most independant guitar makers work from home in their garage or shed.

Making a guitar can be a *messy* business and whilst it would be ideal to have a dedicated space in which to work, somewhere we could shut the door and leave set up, the truth is very few of us have that luxury.

However, fear not… ***It is possible to build a guitar on a kitchen table!*** But remember… it will make a mess and whoever you share the kitchen with may not be happy.

If you do not have a dedicated space to set up your guitar making workshop… and using the kitchen has been banned, there are alternatives:

Investigate the possibility of hiring workshop space.

Why not **try your local school or community centre**? We ran our first 'Build Your Own' courses in a hired community workshop at a local school. They had all the essentials we needed except for a few of the specialist tools which you will have to find yourself.

If you are *really* serious about starting your own guitarmaking business **small industrial units can be found cheaply in any town or rural setting**. If you get good at what you do customers will beat a path to your door *wherever* you are.

Better still, why not get a group of like minded souls, **create a guitar making group and share the cost** - Even better if one of those individuals has a workshop/garage/shed you can use.

If you are *truly* interested in building a guitar you *will* find a space. My first workshop was a double decker bus, so that gives you an idea.

At the very least your workshop will need:

- **Reasonable lighting** - Overhead flourescent strip lights are best as they cast least shadows. You could use a head mounted torch to help visibilty if the light is not so good.
- **Power socket** - A four way extension cable is useful so you can have a power tool and extractor plugged in at the same time
- **Sweep-able floor** - A concrete floor is not ideal - wood is better. Dig out that old broom. You'll need a soft brush for hard floors.
- **Sturdy bench** - Any wood working bench will do, even a normal table as long as it is fairly solid. Attach a piece 18 mm MDF or plywood to protect the surface. It is useful to leave an overhang round the edge for clamping. Make sure the bench doesn't move around while you are working. It's good but not essential to have it screwed to the wall for extra stability.
- **Some tools** - Keep reading...

Before You Start!

About this book

Essential tools

Not all the tools listed here are essential; those that are will be appear with Underlined Headings (see above) and in the ‘Quickstart List’ (See below).

Optional tools

Optional tools will appear with an italic heading (see above).

Quickstart Lists

A full list of essential tools us included at the end of this manual along with a list of suppliers. I will continue to keep the lists updated - please let me know if there is anything missing.

(email: mark@baileyguitars.co.uk)

Measurements used in this manual

Wherever possible *both* **imperial** (**“**) and **metric** (**mm**) are used. Sometimes it makes more sense to favour one in which case only that will be shown.

Note:

If you are using your own choice of hardware then *drill and cutter sizes may vary from those specified* **- check to make sure you have the right ones for the job.**

What tools to buy?

Before undertaking any project it is important to make sure you have access to all the key tools and equipment.

This is just a *very basic* list of tools - enough to build a basic guitar. I have included a few extra useful ‘specialist’ tools and a glimpse at some ‘dream machines’ found in larger workshops.

Most of the tools itemised here are general purpose, standard issue and can be found in any hardware store - but there are a few things to be aware of. This manual will advise you on what important features you need to look for to ensure you get the right tool for the job.

As I have intentionally not recommended a specific brand (it may not be available in your country) I cannot, unfortunately, give you the exact part numbers of each tool. However, I am confident you will find all the tools and accessories you will need! You may just have to spend time looking.

It is best to **buy quality tools** if you can afford it – they are usually more reliable and longer lasting.

What to do if you can’t find the tools

If you are struggling to find or afford some of the tools here are some suggestions that have worked for me.

1. **befriend** someone with a workshop
2. **borrow** them from someone else
3. **rent** the larger ones
4. **beg** but don’t steal

Keep Asking

Trust me there are *piles* of unused tools in every man’s garage. Whatever it is you need *just ask all your friends* if they have one you can borrow, or if they know someone who could help. They might just say “keep it...I wasn’t using anyway...” - and that means...

FREE STUFF!

You would be *amazed* how many of the tools in my workshop I have aquired for **free**. *People are very generous if you are true in your heart.* Tell them what it is for and you might find things magically arriving as if the universe sent them to you. Say *yes* to everything (within reason). You can always pass it on to someone else who needs it.

So which Tools Should I buy?

Just the ones you need...

I built my first 60 guitars with just one small bandsaw and router (plus some regular hand tools). I made a contact at a local workshop where they made fencing and they planed up my wood for me so it was ready to work on.

As I began to make and sell more instruments, and run the courses, I started adding extra routers and other machines when the budget allowed. The list is *never ending* so you have to balance whether it is worth spending the money on something that is not used constantly.

Get a small Bandsaw and Router!

In my opinion, ***the only essential machines are the Bandsaw and Router*** - no self respecting guitar maker should be without them. They make cutting out the shapes and making patterns a breeze.

Note: An alternative to the bandsaw would be a handheld power jigsaw but I **do not** like these as the blade tends to bend when cutting hard tonewoods leaving a *very* rough and uneven edge which takes *ages* to clean up - **don't waste your time**.

Treat them with respect

It is good to have a healthy respect of what can happen when using *any* machine (or sharp tool).

Some guitar makers refuse to use any machines or power tools at all in their workshop - that is fine. But we live in an age with modern tools and it seems crazy to me not to use them.

Just make sure you read the manual that comes with your equipment and understand what you are doing before switching it on.

If things go wrong when you are using a power tool the results can often be quite spectacular and not in the way that was intended.

Please be careful - my highly paid team of lawyers have placed many layers of legal protection between us - you are on your own - so look after yourself.

Remember...

- ***Never*** do anything you are not 100% sure of
- ***Never*** use a machine if you have been drinking alcohol or taking any medication that may cause drowsiness
- ***Always*** read the manual that comes with any tool before using it
- ***Always*** practice on scrap
- ***Always*** count your fingers before and after using any sharp tool!

Get some help!

If you are *at all* unsure of what you are doing at any time **please get some professional supervision** - there are many great woodworking courses (aside from our own) where you can learn to *safely* use your tools.

Machines

This section explains all about the machines used for making guitars but to summarise (and save yourself some reading):

You don't need them all - just get a bandsaw and a router. However, if you're *determined* to get some new gear, please read on…

The machines in this section are mainly used to prepare the blanks and make the fretboard.

If you follow my advice by purchasing a pre-made fretboard, and neck and body blanks that are ready to work, you don't need any of these.

Failing that *make friends* with someone who does have these machines and *ask them nicely* if they will put your pieces through their thicknesser for you.

"Before I got my thicknesser I used to visit a nearby workshop where the guy was happy to plane up my wood for me for the price of a beer!"

Machine v hand-made

When I refer to *Machines* I am normally talking about large floor mounted things, or things that are bolted down, as opposed to hand held *power tools*.

Machines will not make the guitar for you - even if you had the money to invest thousands in a CNC machine or have your guitar '3D printed' there is still some '***guitar making***' skill needed to actually finish it and make it *play* like it should. For our purposes (making just one guitar) it is often just as easy to do the whole thing by hand.

Machines will only get you so far - depending on how much you spend on them. The machines I use in my workshop and on our courses are all easily available from any good woodworkers suppliers - none of them are industrial grade. They get me 70-80% where I want to be and then everything is finished by hand.

'By hand' nowadays has a very blurry meaning - my definition is simple: In our case I mean that whatever tool is used, whether it has power or not, as long as it is held and/or guided by a hand attached to a real person. We can use power drills, routers, bandsaws etc. and still say the guitar is hand-made.

Why we use machines

The main advantages are saving time and energy but it also *cuts down the amount of mistakes.*

When a job is hard work and is taking a long time there is a tendency to rush to get it finished. Instead of working in a controlled fashion it is possible to get 'a bit carried away' and that is when things go wonky.

We use our machines to take some of the sweat out of it and then refine everything by hand afterwards - hopefully achieving the best of both worlds. This allows us to do much more in the time available and cuts down the amount of mistakes.

Quality, accuracy, and consistancy

Anything that can help create repeatable quality is very useful in the workshop - machines not only save time and make things easier but they also do the same thing everytime increasing consistancy and accuracy.

Machines for Guitar making

Power sanders

These can take a lot of the pain out of the sanding process but are non essential and do not necessarily add any quality. Powered sanders come in various forms:

Electric Palm Sander

Useful for fine sanding and polishing but tend to either lack power, be heavy and unwieldy, or very expensive.

Air Powered Sander

Very powerful and lightweight as there is no motor but you need a big air compressor to run one. Great for sanding necks as it is so manoeuvrable.

Small Belt/Disc sander

Handy surface for shaping small things like nuts and saddles very quickly - similar to the larger version used as the basis for the fretboard radius machine.

Bobbin sander

Excellent for sanding round the edges of electric guitar bodies it also has various other uses around the workshop. A great time saver if you are making lots of guitars - but on the pricey side and nothing a bit of elbow grease wouldn’t replace.

Bench Grinder

A multitude of uses - for example grinding down screws so they are the right length and sharpening tools.

Compressor

Compressed air can have many uses around the workshop but ours is mainly for spraying. Compressors are expensive and you also need a lot of other equipment; spraygun, masks, lacquer etc. Instrument quality spray finishing is one of the most challenging aspects of our job and deserves a book to itself. Take my advice and stick to an oiled finish if you want to make things easy for yourself and save a fortune.

Dupli-carver

Copies 3D shapes - used for routing carved top guitars and archtops.

This just scratches the surface...there are always more goodies on the list – see the next section!

Dream Machines for Guitarmaking

Here is a list of other machines I have in my workshop:

If you intend to prepare your own blanks the following tools are very useful:

Planer/Surfacer

Used to plane a flat surface. **NOT RECOMMENDED FOR THE BEGINNER!**

Planer/Thicknesser

Used to plane the blanks to the correct thickness.

Sander/Thicknesser

Takes off very small amounts to clean up the surface.

Time saving devices used to prepare the fretboard:

Power Fret slot saw

This is a cheap table saw converted for cutting fret slots by the addition of a table which slides on drawer runners. The Fretboard is fixed to a pattern with double sided tape. The pattern has notches cut in it for every fret position which locates onto a pin in the table. The table with the pattern and Fretboard attached is then passed over a **.024”** wide blade which cuts the slots.

Fretboard radius machine

A large belt sander with a swinging arm attached to hold the fretboard above the sanding surface. The distance between the pivot point and the sanding surface is set to form a chosen radius.

Machine Madness

To sum up:

If I just get *one* more machine my life will be complete!

The truth is you don't *need* any of these machines to build guitars, but they do have their advantages.

It is unlikely, but not impossible, that you'll have any of the monsters mentioned in the previous pages kicking about in your garage at home.

This is fine as you don't need them.

Except of course… *all together now…* **The BANDSAW!**

Bandsaw

Last but not least… Maybe I haven't mentioned this yet…

An essential tool in the workshop and top of the list.

The Bandsaw is indespensible in any guitar workshop. We use it to make the patterns and jigs as well as cutting out the body and neck for our guitars.

The most important thing to consider when buying a Bandsaw is its 'Depth of Cut'.

You will need to make sure it is big enough to cut the full width of the neck blank for cutting the head stock angle.

B**uy the best one you can afford with at least 100 mm (4") depth of cut.**

Bandsaw - min 100mm (4") Depth of cut

The motor drives a blade (metal band with teeth) around two wheels with guides and a table is set to 90 degrees to the blade. Bandsaws are great for cutting curves and straight lines. If yours refuses to cut straight it probably needs a new blade or the guides need adjusting. Read the manual that comes with it to set it up correctly. If you are cutting small pieces use a push stick to avoid your hands getting too close to the blade.

Bandsaw Blades (6 skip 3/8” blades)

The blade supplied on your brand new bandsaw will probably not be very good so order a couple of spares.

There are 3 important things to know about Bandsaw blades to make sure you get the right ones.

- Length - Bandsaws come in many sizes so check your manual to make sure you order the right length.
- TPI or ‘Skip’ - This refers to the number of teeth per inch. Blades with higher numbers are used for cutting metal.
- Width of blade - Wider blades are great for cutting straight lines. The narrower the blade the tighter the curve.

Power Tools

After the Bandsaw the Router is the next most important tool on my list - you can make virtually anything with one of these and for us it will be one of the main pieces of equipment.

If you have not used one before you might like to get some training from a professional first.

ALWAYS practice on scrap by making patterns until you are well versed with your own router.

Router 6.3mm (1/4”)

A router is like a drill that cuts sideways using special cutters. It spins very fast and goes up and down. It has the ability to raise or lower the cutter and lock the position. It is also possible to set a maximum depth stop.

Routers are usually rated in ‘power’ and ‘collet’ size. The collet is the part that holds the cutter, a bit like a chuck. You must use the right size cutter for the collet.

You can do all the necessary jobs with 6.3mm (1/4”) “Router cutters”.

Any router over about 500 watts will do but it is recommended to buy the best router you can afford as it will get a lot of use.

Look for one with at least 50mm maximum plunge depth.

You will need the right spanners to change the cutter but these are normally supplied with the router.

Having more than one router can be useful as it saves time changing the cutters.

Router edge guide

All new routers come supplied with one of these. It is used to make a straight slot for fitting the truss rod.

Router base

For surfacing with the router we need a larger baseplate - this can be easily made or bought.

Router cutters

A router on its own is totally useless without a cutter - Most routers will come with a 6.3mm (1/4”) cutter supplied but for our purposes this has very limited use.

You will have to invest in some special cutters - these come in various shapes and sizes for different jobs.

As with most things in life you get what you pay for. Get the best you can afford for the main jobs and cheaper cutters for ‘once only per guitar’ use.

I don’t advise buying a set of cutters as most of them will never be used.

Remember - the ‘shank’ size of the cutter must match the collet of your router!

These cutters all fit a 6.3mm (1/4”) router: **12.7x12.7mm (1/2x1/2”) top bearing**

For the main routing jobs: Pocket Routing and Profiling

12.7x25.4mm (1/2 x1”) top bearing

For deep pocket routing

12.7x25.4mm (1/2x1”) bottom bearing

For profiling

11x19mm (7/16x3/4”) straight cutter

For the truss rod slot

6 to 12mm (1/4 to 1/2”) rounding over bit

To radius the body edges (optional)

Drills

*A drill with a 12.7mm (1/2”) chuck is preferable to drill the bridge mounting holes. If your drill has a smaller chuck you will need to find a drill bit with a shank that is narrower than the cutter.

Cordless Power Drill

Any powered drill should be sufficient for our purposes but a cordless one is more versatile and a spare battery is always worthwhile.

Pedestal Drill

The best thing about these is that they drill accurately at 90 degrees to the surface which is especially great for *drilling bridge mounting holes.

The problem is that most don’t have the ‘throat depth’ to reach far enough into the body.

Still, even a small one would make a great improvement for any workshop and soon become indespensible for a multitude of tasks - they are so cheap nowadays.

Get a small one as soon as you can - it will do everything except bridge mount holes and you can do that by hand. Then save for the big one - Why have one when you can have two!

Hand Drill

An good old fashioned hand powered drill is sometimes easier for the fiddly stuff like drilling the 2mm holes for the inlays in the side of the fretboard.

Drill Bits

Different types of drill bits are available for particular jobs.

Standard bits:

These are the ordinary twist drill bits you see everywhere.

1.5mm (1/16”) Standard bit

Location holes for the pins when gluing the fret board.

2mm (5/64”) Standard bit

Mounting screw holes and the Side Dots. Check your dots to make sure you get the right size drill.

2.5mm (3/32”) Standard bit

Strap Stud mounting holes.

4mm (5/32”) x 150mm (6”) Long Standard Drill

Earth Link Hole – awkward - extra long bit. The extra length helps to clear the face of the body.

Brad Point:

Sometimes called woodworking bits these have a point at the end to make drilling more accurate and cleaner holes.

3mm (1/8”) Brad Point

Front dots. Use 3mm (1/8”) dots to make it easy. Check yours to make sure you have the right size drill. For inlays we use ‘size for size’ - for example 5mm dots = 5mm drill

10mm (3/8”) Brad Point

Tuner holes. Check your tuners to make sure they fit into a 10mm hole. If not you will have to find out the correct size and acquire the appropriate bit.

v11mm (7/16”) Brad Point

Bridge mount holes. If you are using another bridge from the one specified in this book then you will have to find out the correct size and acquire the appropriate bit for your bridge.

22mm (7/8”) Flat bit or Auger

Jack Socket Hole. Most jacks fit this size but check to be sure.

Flat Bit:

Flat bits are an inexpensive way to drill large holes

or Auger:

Augers are easier to use but more pricey - either will do.

10mm (3/8”) Auger - Extra Long

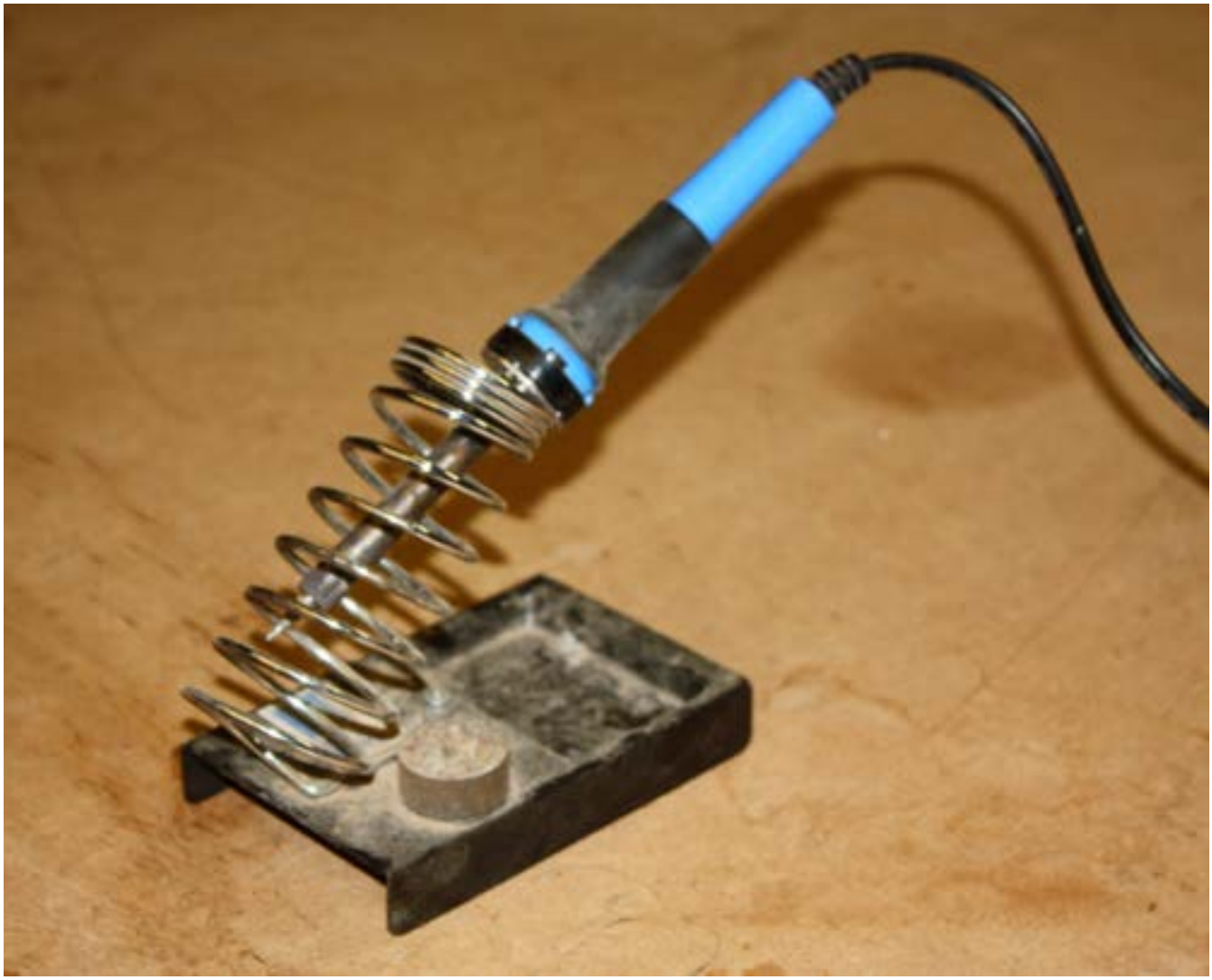
Pickup link holes

10mm (3/8”) diameter 300mm (12”) long

Wiring

You will need some tools for wiring up your guitar

Soldering Iron (25 to 40 watts)



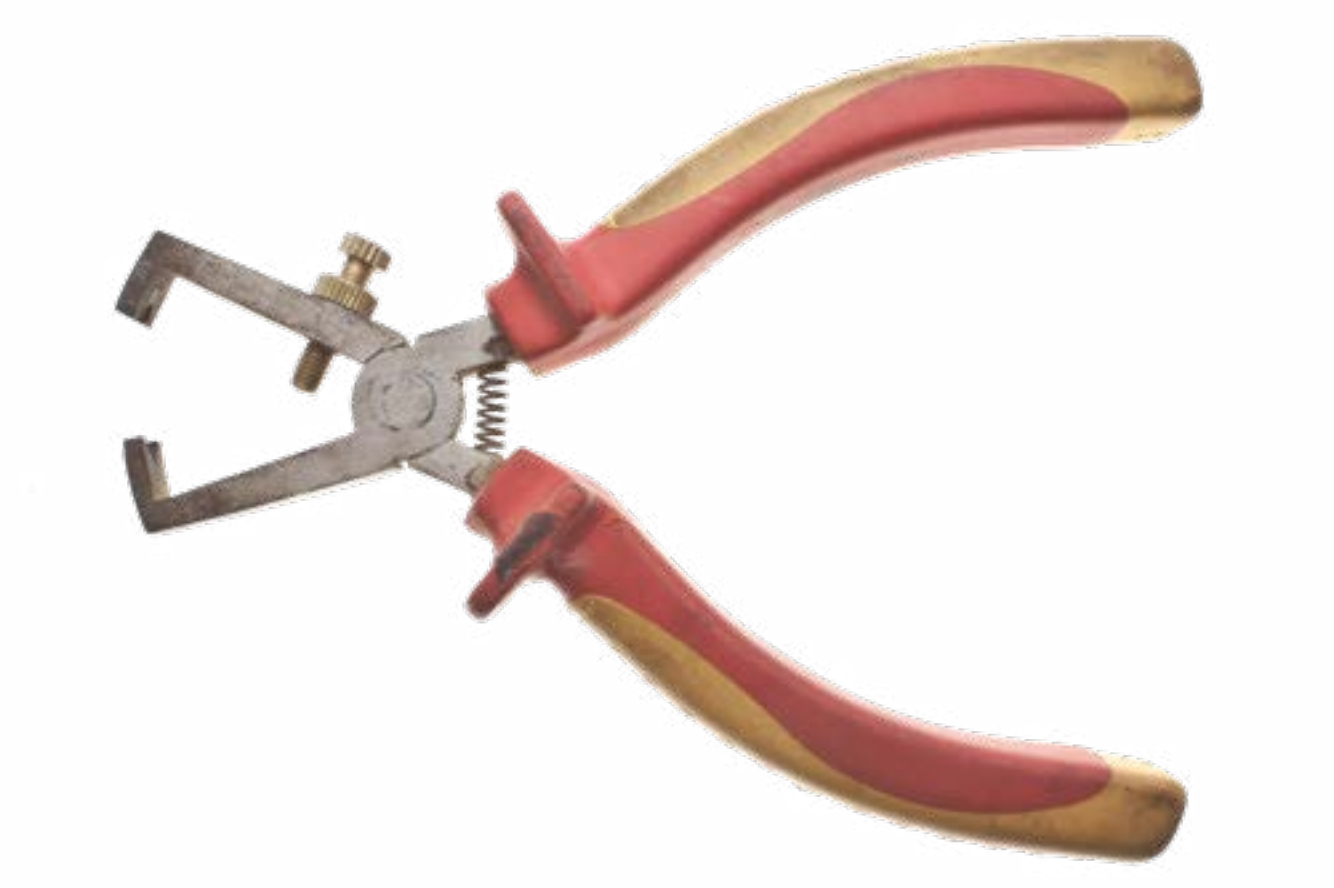
I have tried cheap ones, expensive ones, and none of them lasted very long - I have burnt out more than I care to remember - except this little beauty from Stewart MacDonald.

Any normal 25 - 40 watt iron will do, but you need one that doesn't mind being left on for long periods of time - those guys at Stew Mac have got it sussed.

Wire Cutters

You can use the “End Nippers” from the fretting section to cut your wires.

Wire Strippers



If you intend to do a lot of wiring some wire strippers will save you time - You could just use "Stanley blades". *Never* use your teeth to strip wires!

Hand Tools

You probably already have most of these kicking about - if not you don’t have to spend a fortune.

You could just buy the ones you need but sometimes it is better to buy a cheap set to start with. The quality will not be as good but if you have to put your money where it matters buy a set of cheap screwdrivers, spanners, and allen keys but spend the money on one good chisel, it will be your friend forever.

Fingers

Never underestimate the power of your fingers - personally I don’t know what I would do without mine - Always count your fingers before **and** after using any sharp tool.

Thumbs

A fatter variation of the finger - this is what really sets the guitar maker apart from all the other wildlife on the planet - and they are opposable- great for gripping things! Most people have two already but get a spare just in case.

Small Chisel

For cleaning up the nut slot and the end of the fret board.

Any good sharp chisel will do for a standard build but:

If you are putting on a headstock veneer you will need a 3mm (1/8”)

If you are cutting a 3mm (1/8”) nut slot you will need a slightly smaller chisel to prevent it getting jammed.

A 2.5mm (3/32”) chisel can be made by grinding down a 3mm (1/8”) to size with a sharpening stone or grinding wheel.

While using your chisel please keep your fingers, thumbs, and any other extremities, behind the blade at all times.

Allen keys

You will need a 5mm Allen key to adjust the truss rod. A ball ended one allows better access to the truss rod nut.

You may need others depending on your choice of hardware but these usually come with the parts so you shouldn’t have to buy any more.

Spanners

Buy a cheap set of spanners or buy separately 10,11,12,13mm. These are for the tuners, pots, and jack socket.

Screwdrivers

Which ones you need depends on your hardware. Buy a cheap set of standard sizes.

Plane

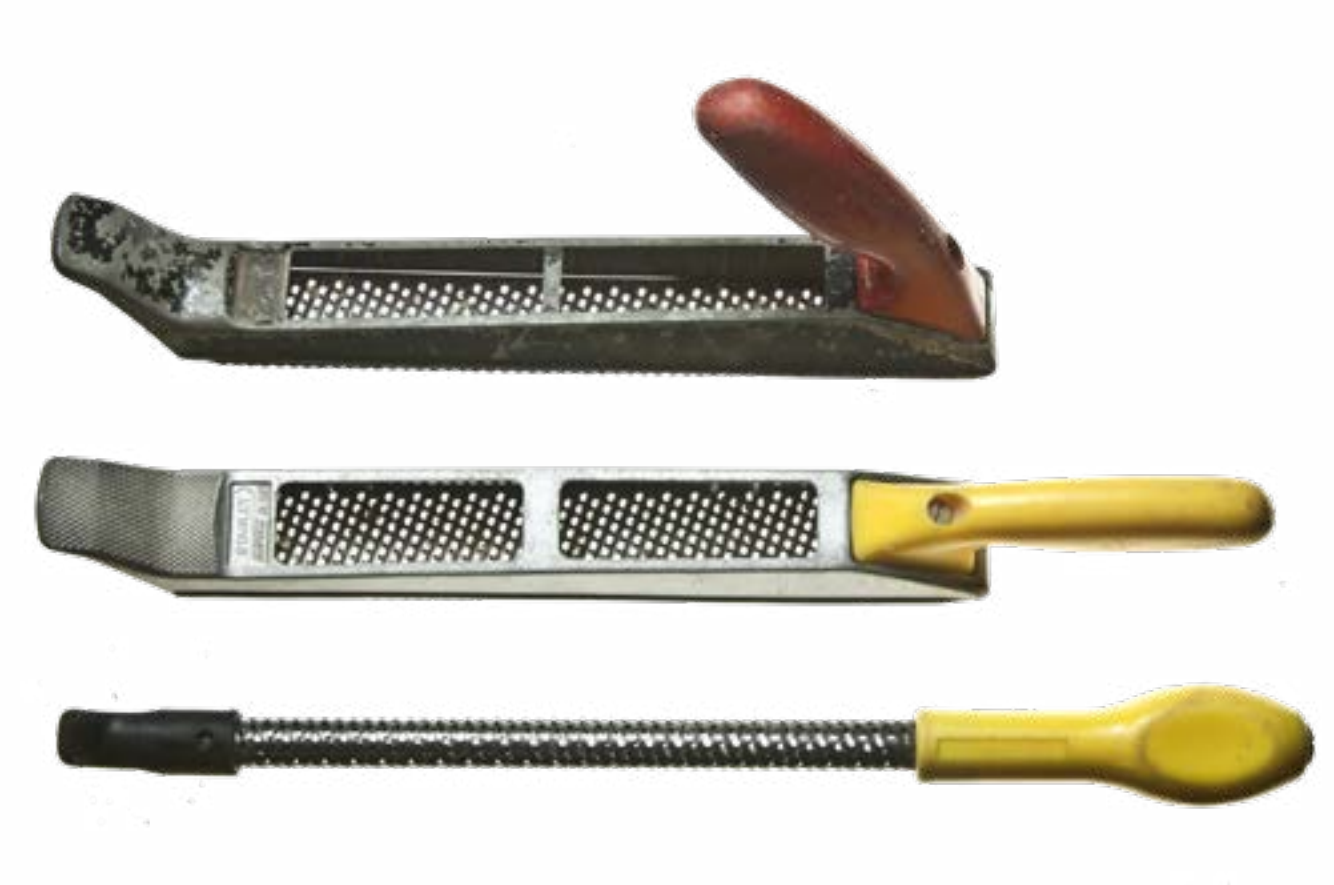
A small Jack plane is useful for trimming the fillet back. If you don’t have one you will have to use sandpaper for this which takes longer.

Carving

You will need to obtain one or more of the following tools to carve the neck and the belly carve on the back of the body. A lot of books seem to recommend a spoke shave but most beginners struggle with one of these and find a rasp or surform much easier to use.

I use rasps, surforms, and scrapers... I only get the spokeshave out if I want to show off.

Surform



The recommended carving tool for the beginner because of its ease of use and cheap availability from most hardware stores. The common version is about 10 to 12” long with a curved bottom. Available in many shapes and forms it consists of a replacable metal plate containg many tiny micro plane blades. You can also get a 12mm (1/2”) round version which is ideal for tidying up the heel and headstock ends of the neck.

Rasp

Harder to find but possibly better than the surform - it works the same way it is just made differently. Rasps tend to be harder wearing and last longer than surforms but the blade is not replacable.

Cabinetmakers Scraper

An excellent tool for removing small humps, rasp marks etc. It is a thin sheet of tool steel with a burr along the edge which works like a mini plane.

Spoke-shave

Great for pro wood workers but tricky to use for a beginner.

Installing the Frets

For me, the fretboard and frets are the most important part of the guitar - if it doesn't play well then it doesn't matter how great the pickups are or how beautiful it looks, so I prefer to use professional fretting tools and advise you to do the same.

There are many jobs to complete when installing the frets all requiring a different tool. You can buy specialist tools for each of these or make your own.

Proper fretting tools really help speed up what is a very painstaking process but as long as you have something for each job then you have it covered.

Fretslot Saw

To cut fret slots and trim the ends of the Fretboard. Most fret slot saws come with a depth stop - this should be set about 25% deeper than the tang on the fret.

If you have a slotted board then you do not need this but I would advise that you buy one anyway - a small saw like this has many other uses around the workshop - mine is in constant use.

Fretting Hammer

Special fret hammers have a hard leather or plastic face so they don't dent the frets and are also good for tapping in bridge posts or similar jobs without damaging the parts. Any normal hammer will be ok.

Small Triangular File 150mm (6”)

This is used to file a ‘V’ along the top of the fret slots before installing the frets. It can also be used along with a small triangular needle file to dress the fret ends if you grind the three sharp edges off to avoid damaging the fret board.

Fret Slot Cleaner

A hook shaped blade used to remove dust from the fret slots. You could make one by grinding down a scalpel blade. You could use a Fret slot saw for this or any small saw that freely runs through the slot.

Fret Slot Depth Gauge

You can buy one of these or make one - Take a small length of fret wire and file the ‘nibs’ off the tang to create a ‘blank fret’ which is ideal for checking the depth of the fret slots.

End Nippers

For cutting fret wire. The end nippers are ground flush to cut closer to the fret board. You could do this yourself if you have a bench grinder or buy them ready made from a guitar maker supplier.

File 150-200mm x 25mm (6-8” x 1”)

For filing the fret ends flush after installation this can also be used for levelling the frets. If you cannot find a good file then you could use a sanding block for this but the sharp fret ends will quickly ruin the paper - just replace it as necessary.

Fret Dress

After the frets are installed there is still work to be done to make your guitar play as it should

Levelling tool

A few different tools can be used to level the frets. If you can find a nice flat file you can use that. Some makers use a sharpening stone. Special Fret Levelling Files can be obtained from guitar maker suppliers. Even sandpaper stuck to a flat block will do at a push.

Re-crowning file

There will be flat spots on the top of the frets after they have been filed level. This file is used to restore the round shape to the fret. They are available from guitar maker suppliers but can be expensive. You can use the Small Triangular File for this but it takes a lot of skill and practice.

My advise is to buy a real fret recrowning file and add it to your collection of faithful friends.

Fret end dressing file

After filing, the fret ends are very sharp. A small file is used to take the edge off before final polishing. There are quite a few different versions available but I prefer the one form StewMac.

If you don’t want to buy a specialist version you can use the Small Triangular File along with a triangular needle file.

Measuring and Marking out

As a maker you can only be as good as your marking out. If you have designed your guitar already you will have some of these but there are a few extra tools needed.

Pencil and sharpener

A very sharp good quality pencil is essential for accurate marking out. Always keep a sharpener handy. Retractable pencils are even better as you always know the width of the line - it's written on the pencil.

Short Ruler: 150 or 300mm (6 or 12")

This is the one you will use most of the time so get a good one with clearly visible markings so you don't have to squint at it all the time - you don't look good when you are squinting - nobody wants to see that.

Long Ruler: 1 meter (39”)

For marking the centerline and checking alignment of the neck.

Straight Edge

A straight edge is like a ruler without any markings on it. They are machined ‘straight’ more accurately and are usually thicker for more durability. They are great for checking the frets are level but you could use a ruler instead at a push.

Set Square

A wood-workers style set square is for marking at 90 degrees across a surface or checking a surface is at 90 degrees to another.

Radius Gauge (12”)

Used for checking the radius across the width of the fretboard. You can buy one or make your own.

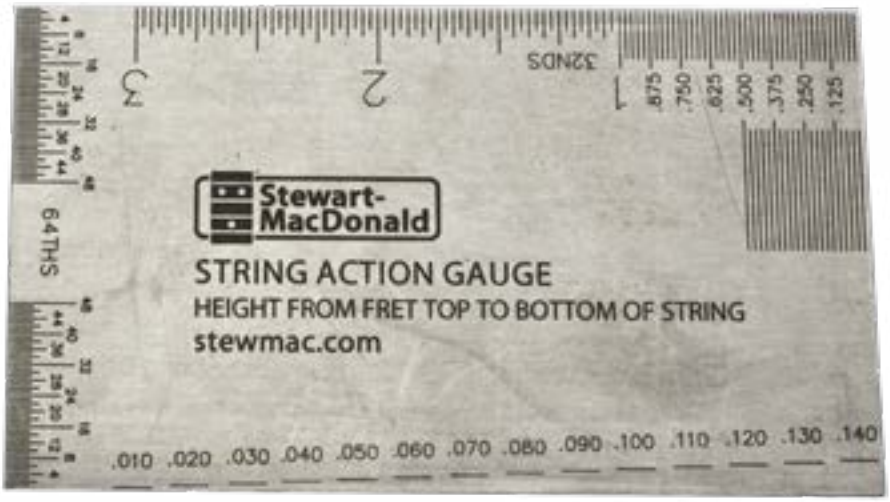
Centre punch

A small punch is used for marking all the holes to be drilled.You do not need to hit it with a hammer, just press gently to leave a little indent for the drill to locate into. If your mark is not in exactly the right place you can move it slightly by tipping the punch and pressing toward the direction you want to go.

Pokey Thing

Sometimes the centre punch is just too big to fit through and mark the holes, for instance while marking the humbucker surrounds. This tool has a fine point for these tasks. If you cannot find a pokey thing then a bradawl will suffice.

String Action gauge



This is a very small and accurate ruler with various markings on it for checking the ‘action’. You can just use a normal ruler for this.

Digital callipers (sometimes called a ‘vernier gauge’)

Capable of making very accurate measurements and reasonably cheap. The easiest way to measure the thickness of the neck during carving is with one of these.

Clamping and Holding

You can never have too many clamps!

They come in all sorts of shapes and sizes - by all means try any that you can get your hands on but buy only what you need and wait until they are on special offer, then buy loads.

Metal Clamps 100mm (4”)

You need at least two of these.

Two 10mm location pins

Most hardware stores will supply 10mm round aluminium bar. Cut two lengths about 25mm (1”) to be used for ‘location pins’.

Two small nails

Used to pin the fret board during the gluing process to stop it sliding around when clamps are applied. Any nail or panel pin about 1.5mm (1/6”) will do. Just make sure you have the right size drill bit to go with it. Drill a test hole in a piece of scrap and tap the pin into it. It should be tight in the hole.

Neck rest

A bean bag or similar device is needed to keep the neck from bending while levelling the frets or otherwise working on the neck.

Very quick to use if you don’t need a lot of clamping pressure.

Spring Clips

Very fast to use but not very strong they can be used for ‘quick holding’ while other stronger clamps are applied.

Sash Clamp

Used for joining two piece bodies and caps.

Bench Vise

This can be built in to the bench or a clamp on version. Every workshop should have one but you don’t need it to build a guitar.

String Tension Simulator

Put the strings on and tune to pitch. Then set the truss rod. Using this device it is possible to clamp the guitar and measure where the neck is. Then after removing the strings clamps are used to bend the neck back into position as if the strings were still on so that the frets can be levelled more accurately.

Sundries

On the next few pages you will find a list of all those little things that often get overlooked but are still essential to the build.

Abrasives

Nobody wants to spend money on sandpaper - it has to be one of the least exciting purchases a person can make but high quality abrasives can really save you a lot of time.

I use 3M Gold paper because it doesn't clog like most others and lasts a lot longer. It has a self adhesive backing which is great for making custom sanding blocks.

Sandpaper

Any good quality sandpaper made for sanding woods will do.

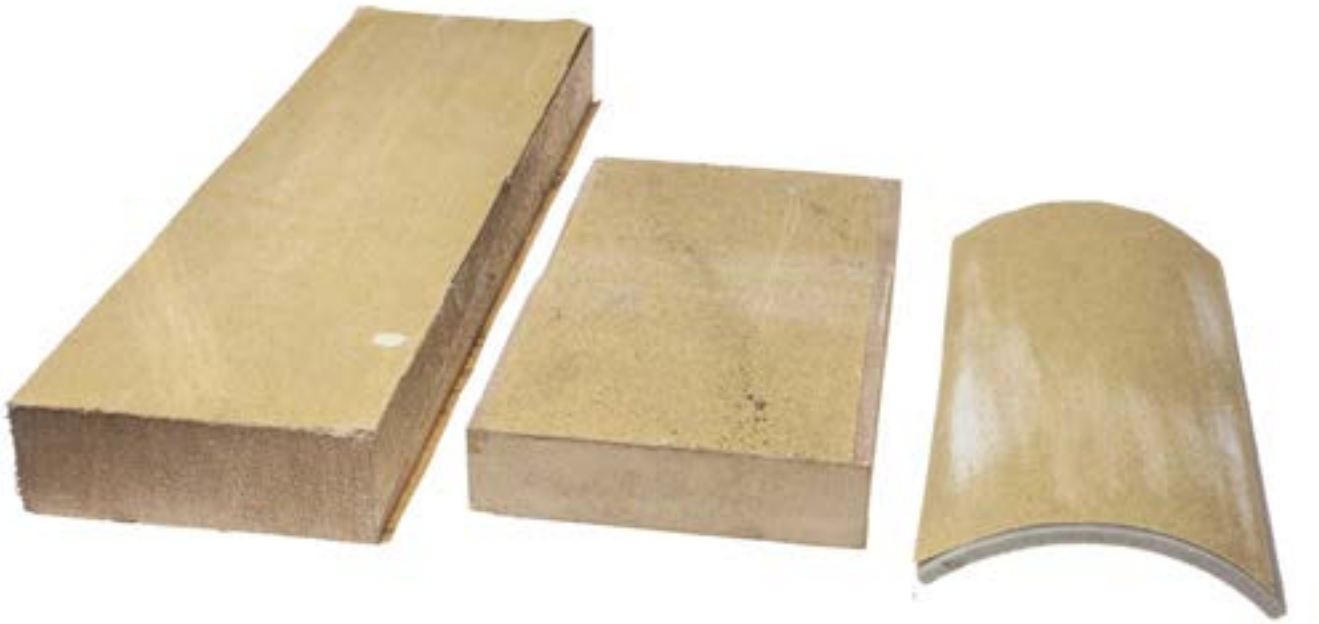
You will need a couple of sheets of each P60, P80, P120, P240, P320g.

This 'P' number is always written on the back of the paper and refers to the number of particles per unit area:

- 40g would be really rough
- 4000g would be super smooth

You will also need a sheet of 320 or 400g 'wet and dry' for sanding the frets.

Assorted Sanding Blocks



Any old piece of scrap wood can be used to make a sanding block. If you don’t have the self adhesive variety then you can fix the sandpaper to the block using wood glue, sprayfix, or double sided tape.

Radius block

A specialized sanding block used to radius the fretboard is available from guitar makers suppliers. Highly recommended if you are making a lot of instruments but if you buy a pre radiused fret board then you won’t need this.

Magic Rubber

An abrasive belt cleaner. It is great for cleaning sandpaper. Most of the time sandpaper doesn’t wear out but gets clogged up with dust and resin from the wood. Rubbing with the magic rubber makes it almost brand new again thus saving a fortune.

Wirewool

Wirewool is graded in ‘O’s; the more O’s the finer it is. Try to get ‘OOOOO’ grade wool or the finest available for polishing the frets.

Artificial wire wool made from plastic is better for polishing light coloured wood as sometimes the real stuff breaks up and works its way into the grain leaving grey marks.

Sharpening stone

When your chisels get dull you will need to sharpen them with one of these - diamond coated are the best - can also be used for Levelling the Frets

Adhesives

Stick with it... nearly there.

‘Yellow’ Wood glue

Normal white PVA wood glue is fine for making guitars but is usually reserved for joints which you may want to take apart at some point in the future - like the neck on an acoustic guitar for instance.

Yellow AR ‘Aliphatic Resin’ glue is better as it dries quicker and harder but it is more difficult to disassemble if anything goes wrong.

Medium Super glue

‘Cyanoacrylate’ glues are available in different thickness or ‘viscosity’.

- A very thin version is runnier than water and great for running into cracks and splits.
- A thick ‘gel’ version is good for filling large holes.
- The medium version is widely available, general purpose, and will suffice for most jobs

Super glue accelerator

Viagra for super glue. Makes it go hard instantly. This saves time but is not essential.

Super glue de-bonder

Super glue was invented to glue skin. De-bonder was invented to unglue it.

Get some - it could save you a very embarrassing trip to casualty with a guitar stuck to your face.

Roll of Double Sided Tape

We use quite a lot of this in the workshop - it is invaluable for holding patterns in place when a clamp would interfere with the router. You can also use it to stick sandpaper to pieces of scrap wood to make sanding blocks.

Most types will work but look out for ‘Exhibition’ tape. This is the best as it is easily removed after use.

Bits and Bobs

Here is a list of a few other bits and bobs that you will need - make sure you have all of them.

Roll of Masking Tape 25mm (1”)

One roll should last for several guitars. Too many uses to list here!

Stanley blades

Multi purpose blades for trimming sandpaper etc. You will need a couple of these per guitar - I buy them in packets of 100 to save money but if you are just making one get a pack of 5.

Wood filler

The most common are ‘Natural’ and ‘Mahogany’. Just use the ordinary ones off the shelf - You can usually make do with these or mix them to match whatever wood you are using.

Liberon finishing oil

A very simple wipe on/wipe off style finishing oil specially blended for wood. Many other brands are available. ‘Danish’ oil is okay but can feel a little sticky

Rags

Old white T shirt or sheet material is fine for applying the finish and buffing.

Blanky

You need something soft to rest the guitar onto during final assembly and set up.

Solder

Buy a small roll - it will last for several guitars

Tuner, lead and amp

You will also need these to test your finished guitar.

Health and Safety Equipment

Last but not least - Please read the section on “Workshop Health & Safety” !

Overalls or old clothes

Don’t wear your best clothes for guitarmaking - it will only get us both into a lot of trouble. Wear something comfortable - old jeans and a t-shirt or sweatshirt are perfect.

Dust masks

Some of the tonewoods used for making guitars are quite nasty - always wear a mask for sanding or any other activity that creates dust.

Safety goggles

Routing can sometimes cause chips of wood to fly off at high speed - not good for your guitar but less good if it hits you in the eye. Going blind while you have the cutter spinning is inadvisable so put your googles on.

Sometimes sharp bits can ‘ping’ off when snipping the fretwire so wear the goggles for that.

Ear protectors

If you value your ears (and you should if you want to actually hear what your guitar sounds like) get some of these and wear them for the noisier jobs.

Latex gloves

Keep your hands from getting sticky while applying the finishing oil.

Safety Boots

Steel toe-capped boots will save your feet from injury if you drop a lump of wood on them - if you can play sitting down then you might not mind but your feet will thank you for wearing them

List of Essential Tools

Machines

Bandsaw

- Bandsaw - min 100mm (4”) Depth of cut
- Bandsaw Blades (6 skip 3/8” blades)

Power Tools

Router

- Router 6.3mm (1/4”)
- Router edge guide
- Router base
- 12.7x12.7mm (1/2x1/2”) top bearing
- 12.7x25.4mm (1/2 x1”) top bearing
- 12.7x25.4mm (1/2x1”) bottom bearing
- 11x19mm (7/16x3/4”) straight cutter

Drills

- Cordless Power Drill
- 1.5mm (1/16”) Standard bit
- 2mm (5/64”) Standard bit
- 2.5mm (3/32”) Standard bit
- 4mm (5/32”) x 150mm (6”) Long Standard Drill
- 3mm (1/8”) Brad Point
- 10mm (3/8”) Brad Point
- 11mm (7/16”) Brad Point
- 22mm (7/8”) Flat bit or Auger
- 10mm (3/8”) Auger - Extra Long

Wiring

- Soldering Iron (25 to 40 watts)

Hand Tools

- Fingers
- Thumbs
- Small Chisel
- Allen keys
- Spanners
- Screwdrivers

Carving

- Surform

Installing the Frets

- Fretslot Saw
- Fretting Hammer
- Small Triangular File 150mm (6”)
- Fret Slot Cleaner
- Fret Slot Depth Gauge
- End Nippers
- File 150-200mm x 25mm (6-8” x 1”)

Fret Dress

- Levelling tool
- Re-crowning file
- Fret end dressing file

Measuring and Marking out

- Pencil and sharpener
- Short Ruler: 150 or 300mm (6 or 12”)
- Long Ruler: 1 meter (39”)
- Set Square
- Radius Gauge (12”)
- Centre punch
- Pokey Thing

Clamping and Holding

- Metal Clamps 100mm (4”)
- Two 10mm location pins
- Two small nails
- Neck rest

Sundries

Abrasives

- Sandpaper
- Assorted Sanding Blocks
- Wirewool

Adhesives

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- Medium Super glue
- Roll of Double Sided Tape

Bits and Bobs

- Roll of Masking Tape 25mm (1”)
- Stanley blades
- Wood filler
- Liberon finishing oil
- Rags
- Blanky
- Solder
- Tuner, lead and amp

Health and Safety Equipment

- Overalls or old clothes
- Dust masks
- Safety goggles
- Ear protectors

List of Suppliers

Our Main Suppliers

This is a list of our main suppliers

Allied Luthiery - Mainly Wood
Allparts - Parts
Axminster Power Tools - Tools, Sundries
Bareknuckle Pickups - Pickups, Electrics
CureUV - Uv Cure finishes
Gotoh - Parts
Graphtec - Nuts and Saddles
Luthier Supplies - Wood, Specialist Tools
Mylands - Lacquer
Northridge Hardwoods - Wood
Prosono Int. - Wood
Rothko and Frost - Parts, Wood, Decals
Small Wonder - Inlays
Stewmac - Parts, wood, specialist tools
Tonetech Luthier Supplies - Parts, wood, specialist tools
Touchstone Tonewoods - Parts, wood, specialist tools
WD Music - Parts

What Next?

So, you know what tools you need and where to get them from - but what now?

Here are some further resources from to help you in your quest.

Online Courses

[Online Courses]

Workshop Courses

Since **1998** we have enabled ***over 400*** students from ***ages 11 to 70***, with ***no previous build experience*** to **build their own guitars.**

Bailey Workshop Courses

More from Bailey Guitars

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The Bailey Blog
Bailey Guitars facebook
Bailey Guitars Google+
Bailey Guitars Twitter
Bailey Guitars YouTube Channel

Final Word

Don’t just take my word for it!

Another guitar maker friend of mine once said, “*You could build a guitar just using a screwdiver*”. I am sure that is possible but there are tools available to make each job easier if you have the money to spend.

If you *really* want to be successful in your first build, or improve your skills if you have already made one before, then *the more information you can gather the better*.

Read as much as you can on the subject and learn from as many sources as possible.

Every guitar maker has his or her own take on the process depending on what tools or resources they have available at the time.

I hope you found this little book useful and wish you the best of luck on your guitar making adventures - Mark Bailey

www.baileyguitars.co.uk