DIY Guitar Kits

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VB Style DIY Bass Kit

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Please read these instructions carefully before beginning in order to have a complete overview of the project. There are six steps that you will follow to complete your Electric Guitar Kit.

FINISHING THE BODY AND NECK

Although the overall tone and playing characteristics of the instrument will not be affected, a high-quality finish is a real source of pride to the builder.
Both the neck and body of your Electric Guitar Kit will have to be sanded with 180 / 240 and 320 grit sandpaper to prepare for finishing.

FINISHING

First you will need to decide whether you would like a natural finish or a coloured finish on the body. For a natural finish or stain, go directly to "Clear Coat".

NECK

Before application of finish, the fingerboard should be masked off to prevent finish from adhering to the fretted surface.
- Spray all exposed surfaces evenly. The neck of your Guitar has been sanded level so it should not be necessary to sand between coats unless runs, orange peel or drips appear. Use the same procedure that you followed on the body – again, two or three coats should do the job. The final cut and polish take place about one week later when the lacquer has cured.

COLOR COAT

The **acrylic lacquer** made by the automotive industry is particularly well suited to your needs. In addition to providing a full range of colour choices, acrylic lacquer is extremely durable and resistant to cracking. Choose your colour from the many available shades (including metallic options) used for automobile touch up work. A spray can will make your job much easier and will produce great results.
Begin each spray stroke in the air on one side of the body and continue until you reach the air on the other side.
Overlap each stroke by one half, and every other stroke spray crosswise, then length wise. This technique will provide an even colour distribution. Although lacquer dries quickly, and successive coats may be sprayed in a short period of time, attempts to spray too much in one coat can result in runs or bubbles in the finish. Spraying should not be attempted on excessively humid or rainy days.
- One or two coats of colour should be enough. It should not be necessary to sand between coats unless there are drips or runs to be levelled.
All exposed surfaces should be dead level and have a nice satin gloss.

CLEAR COAT

The clear lacquer topcoat is also available at most hardware stores. If you have applied a stain coat, it is advisable to select the same brand of clear lacquer to assure compatibility.
- The clear coat is applied to the body using the same technique as described for the colour coat. Two or three coats of clear should be adequate. For best

results the body finish should be allowed to harden for one week before the polish.
To avoid runs and drips, hold the spray can 6-10 inches from surface. For best results follow directions on spray can.
Caution: Remember that spray paint is extremely flammable. Do not spray near open flames, heat or sparks. The area where you spray must be well ventilated while spraying and until all vapour is gone. Do not smoke! Do not breathe the vapour and keep doors and windows open during application and drying.

FINAL RUBBING AND POLISHING

After allowing the clear lacquered surfaces to dry and harden for at least one week, sand lightly with non-loading 400 grit sandpaper (commonly known as “wet and dry”). During sanding be sure to place a firm material behind the sandpaper. A large rubber eraser works fine. The eraser is flexible enough to sand the gradual curves but is stiff enough to prevent the sharper edges (of the headstock, for example) from being rounded off. Be sure to sand with the grain of the wood.

- All sanded surfaces should now be a bit dull, indicating that the finish is flat and level. Now repeat the sanding process with very fine 600 grit sandpaper using water and a small amount of dishwashing detergent as a lubricant. This will remove any sanding marks left by the previous step and leave all surfaces a dull gloss.
- The finish may now be rubbed out using a medium grade automotive rubbing compound (DuPont White Polishing Compound for example). The compound should be used sparingly with fairly good pressure at first — as a high gloss develops, pressure should be diminished. An extra fine grade of polishing compound may be used to get that final bit of gloss. If instructions have been followed you should now have a professional quality finish. You can protect your work with a light wax — Guitar Polish is a good choice.
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CHECKLIST

Before you start working on your DIY guitar project, please check all the parts received in this kit using the materials list above.

TOOLS AND MATERIALS NEEDED

You will need the following tools and materials:

1. Sand Paper (180, 240 and 320 grit)
2. Sanding Block
3. Soldering Iron & Solder
4. Masking Tape
5. Finishing Supplies
6. Screwdrivers
7. Power Drill

SAFETY MEASURES

Some woodworking skills are required to complete this project. Always be aware of the necessary safety precautions and follow them – be sure to use safety glasses and a dust mask when you are working with any tools. If you are a novice, you should look for help and guidance of a more experienced friend. And never forget that it's always better safe than sorry.

FINISHING THE BODY AND NECK

Before you start finishing the neck, please inspect the frets and the fingerboard. Even though all wood is kilndried it may still shrink a little so you may get sharp fret edges. In this case you need to use a fine needle file (Emory boards for finger nails can be used instead) to remove all sharp edges: first make all fret edges flat with the fretboard edges on both sides, than use masking tape on the top of the fretboard to protect it, and work on each fret's edge to smooth it by slightly rounding it. Before removing the masking tape, consider polishing the frets with fine steel wool.

STEP 1 – The body and neck have been coated with a poly resin sealant. They need to be sanded before finishing. DO NOT SAND THE FINGERBOARD.
For sanding both neck and body, use a flat sanding block for all flat surfaces and by hand for edges and rounded/curved surfaces. Start with 180 grit sandpaper, continue with 240 and finish with 320, always moving along the grain only. Before the final sanding, wipe the wood with a damp cloth and let it dry to raise the wood grain.

STEP 2 – There are many different ways to apply finish to your guitar. Do a little research to decide which type of finish you want to use. One good starting point is to review tutorials at the Project Guitar website:
http://www.projectguitar.com/tut/tutorial5.htm

STEP 3 - For any type of spraying finish (lacquer or paint) you will need to mask three areas with masking tape: neck pocket on the body, neck's fingerboard and truss rod nut.

Press the tape tightly to the wood, not allowing any gaps at the edges, to completely prevent the finish leaking to these areas.

STEP 4 - You will also need to make hangers for both the body and neck (if you want to apply any spraying finish). Make them from a strong metal wire (wire dress/coat hanger can be used for it).

STEP 5 – Apply the finish by following the manufacturer instructions. Remember that spraying the finish is not an easy process as it requires certain skill and experience – you might want to practice first on some scrap wood. Always remember your safety – work only in a well ventilated area, away from any open fire and wear a respirator mask and safety glasses.

STEP 6 – Final polishing for high gloss finishes can be done manually or using a power drill with a foam polishing pad. The finishing tools and materials are readily available in many automotive/hardware supplies stores.

TIP: Consider an oil rubbed finish (sometimes called “wipe-on oil finish”) as a good and safe alternative. Tru-Oil® (known as a “Gun Stock Finish”, based on Linseed Oil) or Waterlox® (Processed Tung Oil) is highly recommended. Oil finishing takes longer, but it is very safe and easy to apply and a high quality finish can be achieved, even by a novice.

ASSEMBLY

Notes: The VBK 1 is a more advanced kit, and requires skills and techniques that are more specialized than on other kits. Be sure to read through the assembly process, cross-reference to your websites on guitar building, and please consult a skilled friend or guitar tech for more detailed tips! You can elect to glue the neck before or after finishing, however, you must tape the areas that will be glued to ensure a proper bond if you decide to finish the body and neck separately. We suggest; however, that you attach the neck first and complete your finishing before proceeding with the assembly.

STEP 1 – Gluing the Neck. The VBK 1 is a hollow body bass guitar and has a glued in neck (no screws). This design is known as a set-neck. Assuming your guitar body and neck have been prepared for finishing (or are finished), and that all surfaces have been cleaned up, you can 'dry-fit' the neck to the body (just hold it in place to see how tight or loose it fits). Remember that the gluing surfaces must be clean of oils and any finishing material you are using. It is very important to create register marks so the neck can be glued in the correct location with regards to the pickups. You can use a clamp to lightly hold the neck in place while you take 2 straight edged rulers and hold them against the sides of the neck (remember that the neck should be flat to the bottom of the neck cavity and pushed into the neck cavity as far as possible)...align the neck (keeping it tightly in

the neck pocket) so that the edges of the neck align equally to the cut-outs for the pickups. (Tip : use a piece of painters tape or masking tape across the body right behind the bridge pick-up opening to make a couple pencil marks for aligning the neck). You will want to extend these guide-lines to the end of the guitar body so you can determine (by finding the mid-point between your two lines on the rim of the bass) where you will attach the trapeze tail-piece. The tail-piece will determine how the strings align with the neck (if you like, you can wait until everything is attached except for the trapeze tail-piece and use the E and G strings to align the location of the trapeze. The VBK 1 has a floating bridge, so it will not be able to correct any mistake you make here! When you are comfortable with the neck location, you will want to create gluing cauls for the back of the body and the top of the neck. These are soft-wood scraps that will prevent the clamps from making marks in your guitar body, or damaging your frets. You will need a piece of wood that you can slot to avoid the frets, or have a piece of closed cell foam to sit between the gluing caul and the fret-board. Using a good quality carpenters glue, make sure you spread a thin coating of glue on both surfaces, assemble the neck to the body and clamp lightly....ensure the neck registers properly with the alignment marks you made earlier...tighten the clamps and re-check the alignment. When you are satisfied, clean up the excess glue with a damp cloth, making sure you wipe away all traces of exposed glue. You will want to leave the clamps on for 24 hours to ensure proper bonding and curing.

At this point, please refer to the section on finishing your guitar, before proceeding with the rest of the assembly.

STEP 2 - Installing the Tuner. Organize all the parts for the tuners, in the order in which they will be installed.

You will have 2 per side, and the small flange with the screw-hole should point toward the body of the guitar. There will be 4 tuners, 4 washers, 4 hex barrel nuts and 4 small screws. Once arranged, take the tuner and install through the headstock from the back, placing the washer over the post, and threading the hex barrel nut so that it is finger tight. Install all 4 tuners in the same fashion. Now flip the guitar over and align all the tuners so they are properly aligned. If the screws are pre-drilled, you can align each tuner to its respective hole, but if not...align all the tuners to your satisfaction and make a mark on the back of the headstock with a pencil or awl. Drill pilot holes for all the screws (approximately 1/16" diameter), install the screws and then tighten the hex barrel nuts with a wrench or socket.

STEP 3 – Installing the Nut and Bridge. The VBK-1 comes with a floating bridge and an un-installed nut. Take a moment to ensure the nut will fit onto the neck properly....this means the bottom of the nut should sit flat against the flat surface under it and at the same time, should sit flat against the end of the fretboard. (If you find the two surfaces do not align properly with the nut, you may have to adjust the surface that sits against the end of the fret-board....adjusting the bottom will affect the height of the nut and could complicate your set-up afterwards. Lay a sheet of sand-paper on a flat surface and gently rub the surface that requires adjusting back and forth, holding the nut in a way which will adjust the angle properly.... do a bit at a time and check often until you are satisfied with the fit. The top of the nut should be slanted in the same direction as

the headstock. You can use any of the 'super-glues' on the market or a multi-surface glue like Weldbond. Place a thin surface of glue on both surfaces that need to be glued and place the nut in its correct location, making sure both sides are flush with the sides of the neck. A few minutes of finger pressure should be enough to hold it in place, but leave at least an hour or two before you continue to work on the guitar so that the glue can properly set. Once you have the guitar assembled and the strings basically installed (but not up to tension), you can place the floating bridge under the 4 strings, and move it into the position that will allow for proper intonation. This guitar has a scale length of 30", so you can measure from the nut to the centre of the bridge (at 30") and you will be close enough to start your set-up. Double check that the bottom of the bridge sits flush to the top of the guitar in its approximate position, and that the top of the bridge is parallel to the top of the guitar body....if it doesn't you may have to adjust the bottom surface of the bridge. The easiest way to do this, would be to place your sheet of sand-paper on the surface of the guitar where the bridge will be placed, and move the bridge back and forth (in the same direction as the neck) until the two surfaces are as close to being perfectly matched as possible.

STEP 4 – Wiring. Starting with the neck pickup (see wiring diagram), insert the pickup wire through the pickup cavity and into the hollow body, making sure (with a piece of tape) that the wire will be accessible through the control cut-out. Take note of the wire color as well, so you are aware of neck and bridge pick-ups. Align the pickup with the end of the neck making sure that it is parallel to the neck and centered between the edges of the neck. If there are pre-drilled holes for the pickup rings, install the screws now making sure not to over-tighten, as this may break the plastic rings. If there are no predrilled holes, you will have to mark the hole locations through the pickup ring, and pre-drill the pilot holes yourself. Repeat this process for the bridge pickup (you can use your neck alignment marks to properly position this pickup as well!). Now, following the wiring diagram supplied, solder the ground and hot wires from the pickups to the appropriate spots on the bottom of the circuit board control unit. Insert and install the input jack through the hole in the rim of the bass (If there is no hole, drill a 3/8" hole through the rim in a convenient spot near the control cavity...be sure to centre the hole between the front and back) and install the washer and nut to fasten it. Check your wiring and make sure your pickups and controls are functioning properly, and then install the control panel with the 4 supplied screws. (Use the pre-drilled holes, or arrange the control panel yourself, mark the 4 holes and drill the appropriate pilot holes...using a 1/16" drill bit)

STEP 5 – Extras. Take a moment to ensure there are pilot holes for the strap pins. If not, locate and mark these screw locations and pre-drill as necessary. The strap pins can be installed now

STEP 6 – Installing the Strings. You are now ready to install your strings. Just before you start, it is a good idea to treat the fret-board with a light oil. This keeps the fret-board from shrinking and cracking, plus reduces discoloration and dirt from entering the pores

in the wood. You can purchase fret-board oil, or you can use any light non-food oils, like tung oil, walnut oil, or lemon oil.
The strings are numbered from the thinnest to the thickest from 1-4. (This means the top string when you are playing the guitar is the thickest and is number 4) In standard tuning the open notes are 1-G, 2-D, 3-A, 4E. If you have already installed your trapeze tail-piece using the guidelines from the sides of the neck, go ahead and install all 4 strings. If you waited with the tail-piece, install the E and G strings loosely, with just enough tension that you can hold the trapeze tail-piece in it's place. Move it back and forth along the rim of the guitar until the strings line up evenly over the neck and pickups. When you are satisfied, mark and predrill the 3 screws that hold the trapeze in place. Install the screws and finish stringing the bass. Winding the string onto the tuning post can be accomplished in various ways....you may already have your own preferred method, or you may defer to a friend or expert to show you the correct method. Remember, the diameter of a bass string is much larger than a guitar string, so you won't have as much space on the tuner for as many winds as you would on a guitar. Having the proper number of winds on the tuning post helps to keep your strings from slipping and/or stretching, and therefore keeps your instrument in tune. Repeat this process for all four strings. You will adjust the height of the bridge in the 'Set Up' section in the same way you would adjust a Tune-o-matic bridge.

STEP 7 – Locating the Floating Bridge. As mentioned in an earlier chapter, the floating bridge does not have any indicators for its location. The VBK 1 bass, has a 30" scale, so the distance from the edge of the nut, to the centre of the bridge will be close to 30". In conjunction with your set-up chapter, you will have to roughly place your floating bridge at that mark and proceed with intonating the bass. After determining the string height, use a good quality tuner to make sure each string is intonated, by moving the bridge either toward the neck, or toward the tail-piece. Take care that you do not scratch the surface of the guitar during this process...you can use a piece of wax paper under the bridge until you determine the location to avoid scratches, and once you have the perfect location, remove the wax paper.

Once all the strings are installed and brought up to pitch using a tuner, and you have properly located the floating bridge position, you are ready to move on to 'Setting Up the Guitar'.

TUNING AND SETUP

Tuning a 4-string bass guitar:

The open strings of a regular bass guitar, from the thickest to thinnest, in standard tuning are:

- E (1st octave) – the thickest (or lowest sounding) string - is the 4th string
- A (1st octave) – is the 3rd

- D (2nd octave) – is the 2nd
- G (2nd octave) – the thinnest (or highest sounding) is the 1st string.

There are different methods to tune a guitar. Using a digital tuner is the easiest way. However, it is good to learn tuning (and checking the accuracy of tuning) by ear with natural harmonics, unisons, octaves etc.

Guitar playability and intonation depends on its setup, so you may want to spend some time mastering the necessary skills – be persistent in finding the optimal action (string height), neck relief and intonation throughout the entire neck.

Adjusting Strings Height:

String height is adjusted by the bridge saddle screws (use included Allen key). Since the fretboard has a radius, the heights of all strings should also match it. Thicker strings need more room for vibration without "buzzing" (touching frets) and must be set up higher than thinner strings. Low action allows easier fretting and faster playing. Recommended measurements for electric bass guitar with low action:

> For the 1st String (the thinnest) – height at the 1st fret: 0.020" – 0.024" (0.5 – 0.6mm); at the 12th fret: .094" – .1" (2.4 – 2.6mm).
> For the4th String (the thickest) – height at the 1st fret: 0.022" – 0.025" (0.55 – 0.64mm); at the 12th fret: .094" – .0110" (2.6 – 2.8mm).

The height at the first fret can be adjusted by cutting deeper slots for strings at the nut. However, it needs a very precise job not to spoil the nut. If you are not sure that you can do it properly, stay with a factory pre-cut nut. A higher string action makes the guitar harder to play, yet some musicians may prefer it.

Adjusting Neck Relief:

The truss rod compensates for string tension and allows adjusting the neck relief. You may need such adjustment due to changes of humidity and temperature (or if you switch strings to a different gauge). Lay a straight edge on the frets of a properly tuned guitar and measure the clearance at the 8th fret (alternatively you can put a capo on the first fret and press down 6th string at 16th fret – then the height of the string at the 8th fret will show you the clearance). Optimal relief for an electric guitar neck must be very small – around .014"- 024" (0.35 - 0.6mm). Turning the truss rod nut (with the included Allen key) clockwise will reduce neck relief and turning it counterclockwise will increase the relief. Be very careful with truss rod adjustments and never turn the nut more than ¼ of a turn at a time.

Adjusting Intonation:

The “speaking length” (or “working length”) of each string can be adjusted by turning the saddle position adjustment screw. The best intonation can be achieved when the string fretted at the 12 fret sounds precisely an octave higher than the open string. If the fretted string sounds sharper you need to increase the working length of the string by moving the saddle away from the neck. If it sounds flat, you need to shorten the working length of the string by moving the saddle towards the neck. The alternative way to intonate your guitar is to compare a natural octave harmonic of the open string (you can get it by touching the string exactly above the 12th and picking it) to the pitch of the string fretted at the 12th fret and adjusting the saddle position so that they sound the same. This method is less accurate because the fretted string sounds a bit sharper due to the height of the string, and the higher the action, the sharper it gets.

Adjusting Pickup Height:

Before adjusting the pickup height, make sure that both the volume and tone controls on your bass are set to the full (“10”) position. Get your amp set to a medium/low volume and all tone controls to the middle. You will get a better picture of the pickup’s tone change during its height adjustment with a clear sound.

There is no universal “optimal” pickup height position in a setup – it depends on playing style and personal preferences of a bass player. Remember: bringing a pickup closer to the strings makes it sound brighter, but bringing it too close will make the magnetic field of the pickup interfere with the vibration of a string which will, not only result in reduced sustain, but may also cause complex harmonics sound rather unpleasant. Moving a pickup too far from the strings will result in loss of its output signal and some higher frequencies. It’s not necessary to maintain an even height of the pickup – you may find it more satisfactory sounding by setting it somewhat angled, depending on what you are looking for in the output sound.

There are a few mm of real usable range where you can find the pickup tone that you’ll like the best.

VBK-1 Wiring Diagram