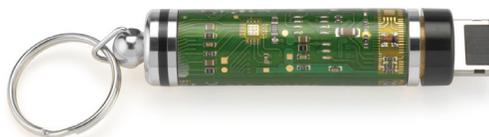
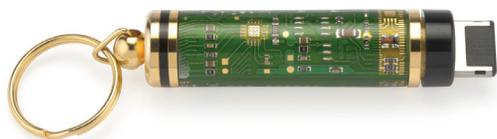




## Circuit Board USB 2Gb Key Chain Kit

Product #150291, 150292



### General Instructions

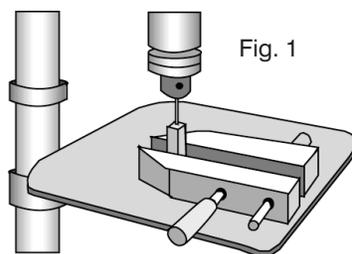
Whether you're a novice turner or a pro, you'll find these projects are all quick and easy to make. Using cut-offs and shorts, the type everyone saves but doesn't know what to do with, you'll find yourself making handsome, custom woodturning projects which are great for gifts or for sale. The following is general in nature, please refer to the instruction sheet on the opposite side for specific dimensions and sizes for your project.

#### 1. Cutting Blanks

Cut wooden blanks to the size specified in the enclosed instructions. For your safety, be sure that the blanks are solid and have no holes, checks or other defects.

#### 2. Drilling Blanks

Center and bore a hole through your stock as specified in the Project Instructions on the opposite side. The center of the blank can be located at the intersection of diagonal lines, drawn from opposite corners. All holes are easily drilled using a clamp and a drill press (**FIG. 1**). Before you start to drill be sure that your blank is at 90° to the drill press table. You may also chuck and drill the stock on your lathe.



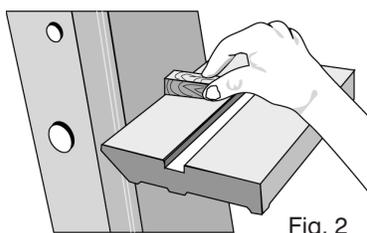
#### 3. Gluing Blanks to Tubes

Rough the brass tube's surface with a fine grit sandpaper and use a quick drying CA type glue to secure the brass tubes into the blanks. Rotate the tube as you insert it to ensure maximum surface coverage of glue. If you find that CA glue is not providing adequate bonding, an alternative is any two part epoxy type glue.

#### 4. Sanding Blanks to Length

Using a belt or disc sander, square the ends of the brass tube/wood blank. The blank should be flush with the brass tube on both ends. Care should be taken to not sand into the tubes (**FIG. 2**). If any excess glue remains inside the tubes it should be gently scraped out.

*Tip: Excess glue can be scraped out using the threaded end of the mandrel when mounting the blanks for turning.*



#### 5. Mandrel Preparation

Woodcraft's new Pen and Pencil Maker's Mandrel system allows you to turn a variety of small projects without requiring the purchase of a unique, special mandrel each time. The only item you will need to purchase to turn new projects is the specially designed bushing set for the project of your choice. The mandrel is provided with either a #1 Morse Taper (141468) or a #2 Morse Taper (141469). If you prefer to use the mandrel in a three jaw chuck, simply loosen the Morse Taper set screw and slide the Morse Taper off of the shaft. Now the mandrel shaft may be mounted directly in your three jaw chuck. With the bushing sets specified on the project instruction sheet, mount your wood blanks and bushings as depicted for each project. With the mandrel mounted in your lathe, slide a bushing onto the mandrel, followed by a wood blank and a second bushing or spacer as required, followed by the second wood blank if required. With the wood blanks installed on the mandrel, secure the wood blank/bushing assembly using the washer and retaining nut provided. Bring up a live center in the tailstock to support the threaded end of the mandrel. Do not over tighten the tailstock or the mandrel will flex and bend causing oval shaped turnings.

#### 6. Turning Blanks

Place your tool rest parallel and as close as possible to the blank. Rotate the blank by hand to ensure it will not touch the tool rest when the lathe is turned on. Using a turning speed of approximately 1,000 RPM begin turning the blank to a diameter slightly larger than the bushings. You can work the stock down to just short of the desired design or diameter by carefully scraping or sanding.

#### 7. Finishing the Blanks

Blanks can be finished like any other wood project. Using a fine grit sandpaper, sand the blank until it is flush with the bushing for parallel sided projects or until the desired profile is obtained for custom projects. Use a wood filler, if desired, to fill any grain openings in the blank. Final sanding with a wet/dry paper will create a blank which is glass smooth. *Tip: We have found that use of Micro Mesh sanding paper (11L61) after wet/dry sanding creates a perfect, glass smooth finish.*

#### 8. Assembly

All parts should fit together as depicted in the parts diagram for each project. In some cases a pen press or machinists vise will be needed to completely press the parts together. Protect all plated parts from scratching by covering them with a cloth or thin pad before placing them in a vise. Proceed carefully, many of the kit components are delicate and uneven or excessive pressure will cause permanent damage.



# Circuit Board USB 2Gb Key Chain Kit

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## 1. Cutting Blanks

Not required for this kit.

## 2. Drilling Blanks

Not required for this kit.

## 3. Gluing Blanks to Tubes

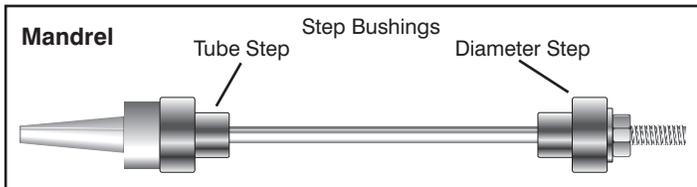
Not required for this kit.

## 4. Sanding Blanks to Length

See General Instructions for details.

## 5. Mandrel Preparation

This kit requires only two bushings (150293). The bushings are identical. Slide one of the bushings to the headstock side of the mandrel with the lip of the bushing facing the tailstock, followed by the blank/tube assembly. Make sure the lip of the bushing seats inside the brass tube. Place the other bushing on the mandrel, ensuring that the lip of the bushing seats inside of the brass tube. If you are not using the Woodcraft Professional Mandrel you may have to make a wooden spacer to fill any gap on your mandrel between the bushings and blank assembly and threaded portion of your mandrel. Secure the bushings and blank assembly (and spacer if necessary) with the mandrel washer and nut.



## 6. Turning the Blanks

Turn the blank to match the outside diameters of the bushings. Now you will need to part off material for a tenon. You will notice that on one end of the blank it has a gold or brass colored section; this is the end that will need to be parted off to create your tenon. You will need to measure back approximately  $2\frac{1}{64}$ " and make a mark on the blank, using your parting tool remove all of the material to the brass tube, ensuring to not puncture the tube. When completed the tenon should begin at the green portion of the blank.

## 7. Finishing the Barrels

See General Instructions for details.

## 8. Assembly

Begin by assembling the twist coupling. Place black accent ring (C) onto ring holder (B) followed by trim ring (D) tenon side facing the black accent ring and press together. Once completed press the twist coupling onto the transmission (A) and extend the barrel completely out. Loosen the set screw with the provided allen wrench and insert the USB 2GB drive (F) into the slot and secure with the screw. Slide the finished blank (E) over the transmission followed by trim ring (G) then the black end cap (H). Apply a small drop of thick CA or Epoxy on the brass tube before securing the black end cap. You will need a pair of pliers to finish the last step. Clamp the locking ring (I) in the jaws of your pliers and insert the key ring (J) onto the locking ring, secure them by squeezing the ring together through the holes at the end of the twist coupling. The use of masking tape or a rag will help prevent scratching the plating on the locking ring.

