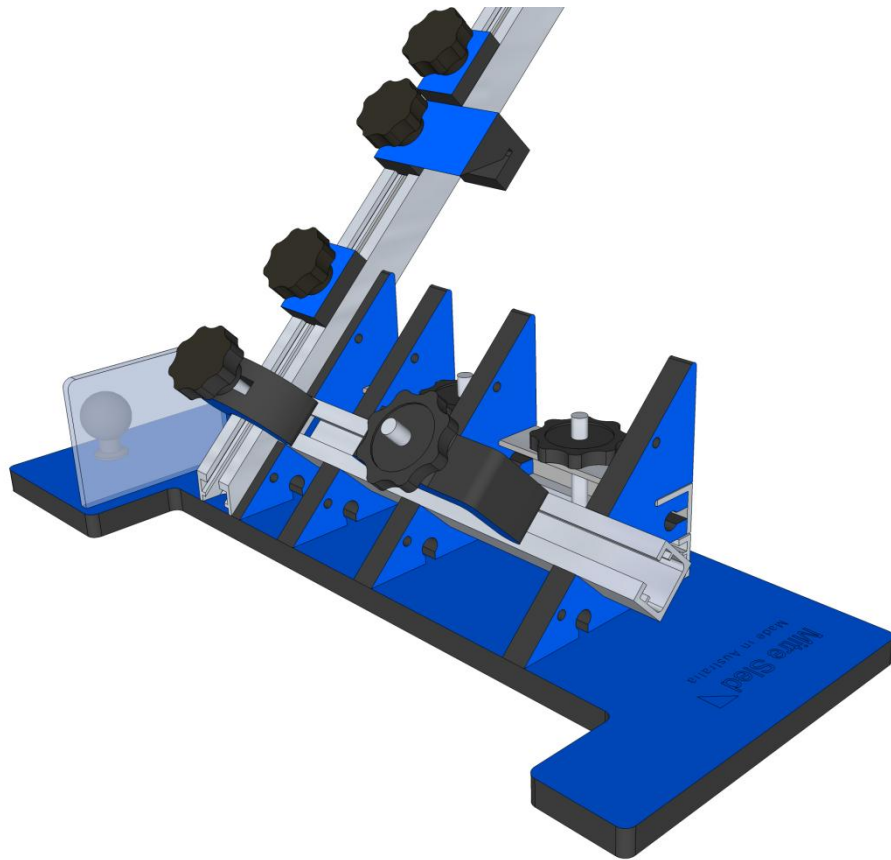


Mitre Maker



Mitre Sled Owner's Manual

www.mitremaker.com.au

First Edition
December 2014

DOCUMENT CONTROL

DOCUMENT DETAILS

<p>Title: Mitre Sled Owner's Manual. First Edition</p> <p>Author: Joel Stewart</p> <p>Document Reference: Mitre_Sled_Owner's_Manual_FIRST_EDITION.docx</p> <p>Synopsis: This is the First Edition owner's manual for the Mitre Sled. It covers the main components of the Mitre Sled, setup, recommended use, care and maintenance.</p>

REVISION HISTORY

REVISION NUMBER	DATE	PREPARED BY	CHECKED BY
0	08/12/2014	Joel Stewart	JS

DISTRIBUTION

REVISION NUMBER	ISSUE DATE	DESTINATION
0	08/12/2014	PDF (Web) + Print

SAFETY FIRST

Woodworking and working with a table-mounted router is potentially dangerous. Please read and follow the instructions in this Manual before using the Mitre Sled for the first time, and ensure that you have appropriate safety equipment including:

- Ear protection;
- Eye protection (safety glasses); and
- Dust extraction or dust mask.

When using the Mitre Sled:

- Always push the Mitre Sled away from you when cutting your workpieces;
- Keep a firm grip on the Mitre Sled handle and keep your hand behind the safety guard when cutting your workpieces. Your left hand should be braced against the left side of the Mitre Sled, be well away from the cutting blade and behind the upright supports;
- Always ensure your workpiece is securely clamped before cutting, that the clamps are away from the Mitre Sled cutting edge, and your cutters are sharp;
- Always move the Mitre Sled and workpiece away from the router after completing a cut;
- Switch off your router before removing the workpiece and clamping down the next part; and
- Always unplug your router before changing cutters.

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1 THE MITRE SLED

1.1 Introduction

Congratulations and thank you for choosing a Mitre Sled. The Mitre Sled will have you cutting accurate mitres for boxes using your table-mounted router in no time. No more calibrating your drop saw or changing your table saw blades every time you want to cut a sharp, accurate mitre. You can now make mitres for boxes using your table-mounted router.

The Mitre Sled consists of:

1. A baseplate and integrated support structure to hold boards at 45 degrees to the table surface;
2. A fence oriented at 90 degrees to the cutting surface with an assortment of clamps and sliding stops to fasten and accurately position the workpiece on the Mitre Sled; and
3. A handle and guard to provide the woodworker with a firm and safe grip on the Mitre Sled; and

The Mitre Sled is operated by moving it across a router table by hand, causing the mitre cutting edge to run along the bearing of a router bit. Moving slowly, but carefully, the cutting blade neatly and safely trims the workpiece forming a 45 degree angle between the edge placed against the support structure and that placed along the mitre cutting edge.

Key features of the Mitre Sled include:

1. A sliding stop, operating between two positioning stops, to create a solid and reliable reference point to locate a workpiece for cutting. This ensures multiple workpieces can be cut to the same size, time and time again;
2. Two positioning stops to allow the sliding stop to be accurately located for two workpiece lengths, meaning that positioning the jig for rectangular boxes is just as easy and accurate as for square boxes; and
3. The Mitre Sled's solid baseplate and hard surface finish ensure the tool is durable, it slides easily over the router table surface.

The remainder of this chapter provides more detail on the key features and components of your Mitre Sled. Chapter 2 describes the proper and recommended setup of the Mitre Sled. Chapter 3 describes the correct operation of the Mitre Sled followed by Chapter 4 describing care and maintenance, optional additions and frequently asked questions.

Our website, www.mitremaker.com.au, features more information on the Mitre Sled, including videos and free downloads.

1.2 Mitre Sled Component Overview

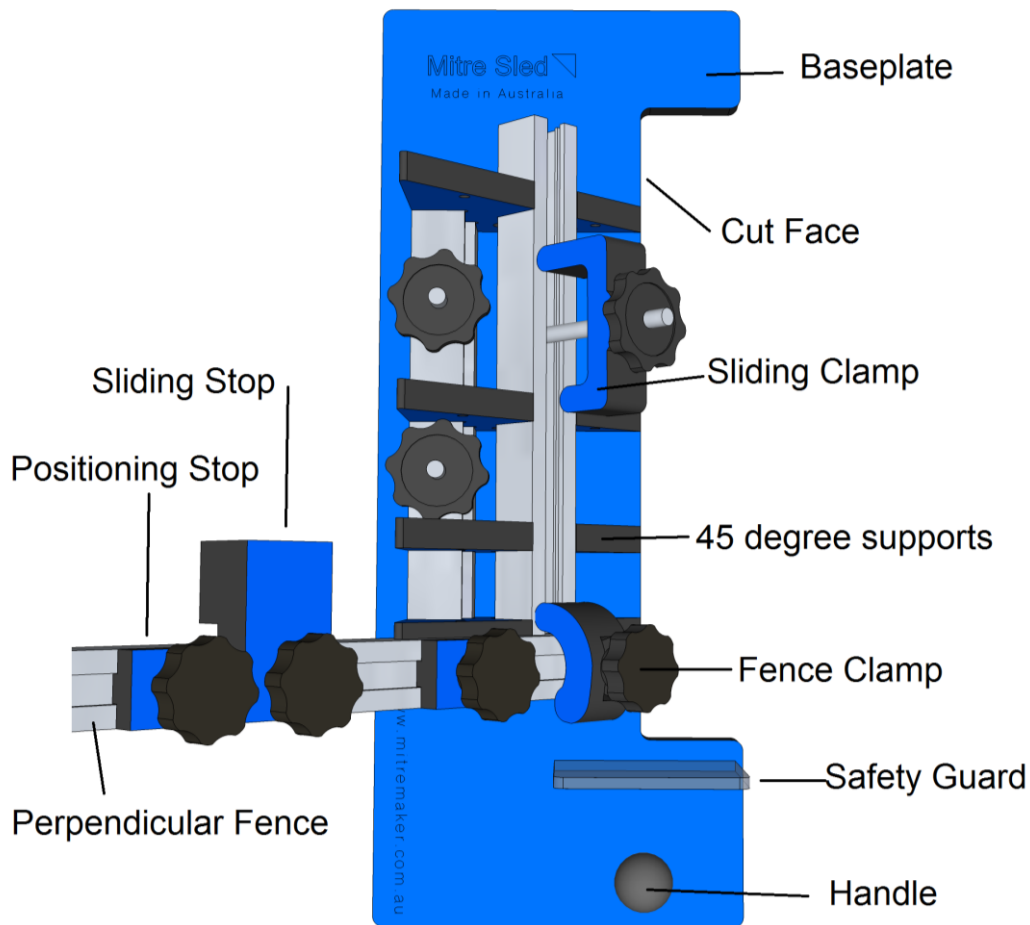


Figure 1-1. Key Components of the Mitre Sled

1.3 Baseplate

The Mitre Sled baseplate has the following overall dimensions:

- 455mm length;
- 180mm width; and
- 13mm thick.

The baseplate features a recessed cutting face. This configuration allows the woodworker to run the the Mitre Sled against a fence to cut slots for splines or hidden spline slots in mitred faces using a range of cutters and fence setups on the router table.

The baseplate is CNC machined from a compact laminate with hard, scratch resistant surfaces on the top and bottom. The core material of the baseplate is dark grey to black and a bearing mounted on your router bit is designed to run smoothly on this material.

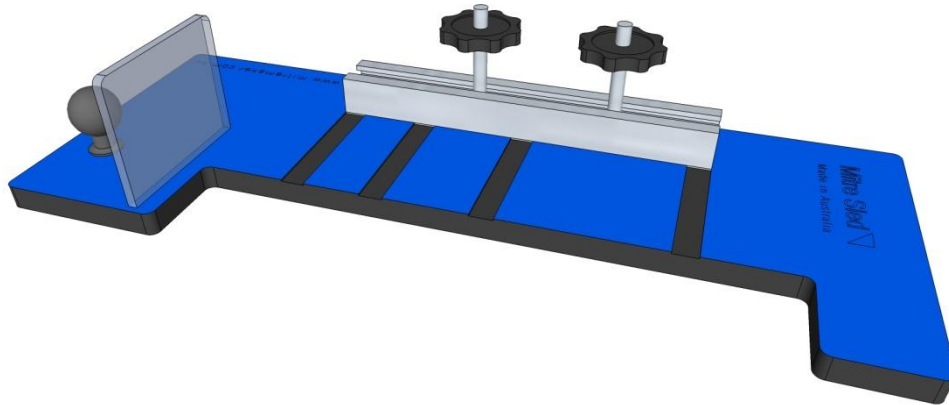


Figure 1-2. Mitre Sled Baseplate

The baseplate features:

- An inset fence with two mounting bolts for the 45 degree support structure;
- A knob behind a safety shield for secure handling of the jig; and
- Recessed slots at 90 degrees to the cutting surface for accurate alignment of the 45 degree support structure

The core material along the mitre cutting edge may experience build up of dust after frequent use which may impact on the smoothness of your mitres. This may be cleaned by gently scraping with the end of a steel ruler to remove the dust, and/or polishing with an old toothbrush to return the edge to a smooth surface.

We do not recommend re-machining of the mitre cutting edge as a cleaning option. If the cutting edge of the baseplate is damaged by a router bit, then we recommend replacement of the baseplate.

1.4 The 45 Degree Support Structure

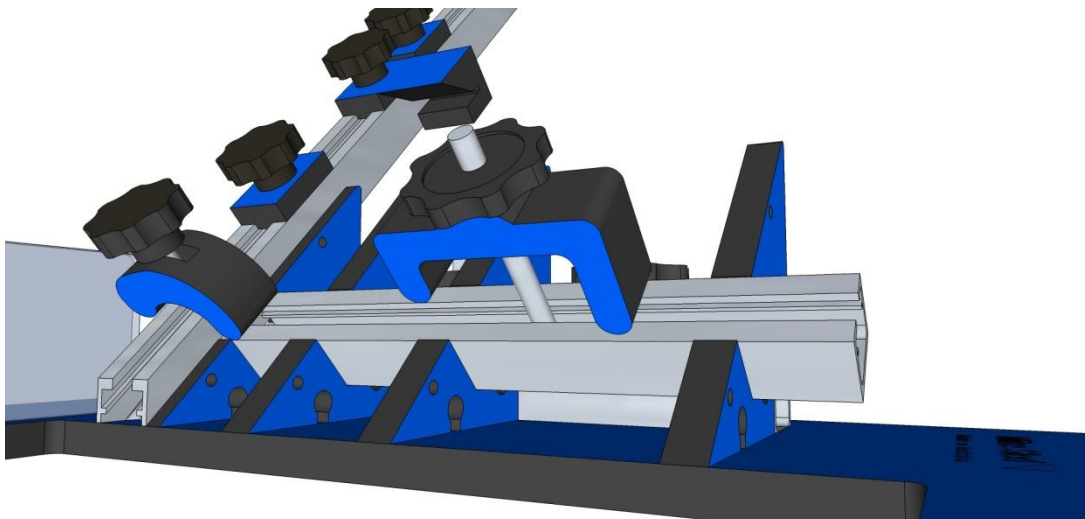


Figure 1-3. Mitre Sled 45 Degree Support Structure

The Mitre Sled 45 degree support structure and clamp fence is also made from compact laminate and extruded aluminium. There are 2 inset fences containing slots for clamps and stops. Features include:

- The 45 degree support structure is recessed into the baseplate by approximately 1mm for accurate alignment at 90 degrees with the mitre cutting edge and is attached to the baseplate using 4x M6 screws and barrel nuts directly into the 45 degree frame pieces.
- The 45 degree support structure sits against the inset baseplate fence and is fixed to this fence with two hold down bolts that can be loosened and tightened by hand when making micro adjustments to the jig.
- The clamp fence inset into the 45 degree support structure is inset slightly below the plate of the supports so as not to interfere with the angle of the jig. This fence is fixed to the supports with M6 bolts and barrel nuts and is supplied with 1 spring loaded clamp
- The fence perpendicular to the cut face requires assembly after shipping. this fence houses a semi 'trapped' fence clamp and stop hardware.

All fixings of the 45 degree support structure are designed to allow for micro adjustment to allow the woodworker to calibrate their jig.

1.5 Material Sizes

- The maximum ***length*** of material that can be mitre cut using the Mitre Sled is not determined by the size of the baseplate, however timber stock over 500-600mm length the Mitre Sled may become unbalanced and tip backwards. We recommend keeping material length less than 600mm.
- The maximum ***width*** of material that the Mitre Sled baseplate can accommodate is approximately 220mm for mitre cuts.
- The maximum ***thickness*** of material that the Mitre Sled can accommodate is determined by the cutter height.

1.6 Stops and Clamps

The Mitre Sled is supplied with the following stops and clamps:

- 2 x positioning stops;
- 1 x sliding stop to move between the two positioning stops; and
- 1 x large hold down clamp and 1 x small semi 'trapped' hold down clamp

1.7 Cutters

The Mitre Sled is not supplied with any cutters, however the 1/2 inch shank 38.1mm carbide tipped inverted flush trim bit with down shear used with the Mitre Maker is a good starting point. Some spiral cutters with mounted bearing may also be used, however if the bearing is not flush mounted, additional spoil boards may be required to reduce tearout.

Cutters must be securely mounted in an appropriate table-mounted router with adjustable cutter height.

2 MITRE SLED SETUP AND CALIBRATION

2.1 Introduction

The Mitre Sled requires some assembly to attach the 45 degree perpendicular fence and perform a calibration test. The following sections describe assembly and calibration of the Mitre Sled

2.2 Assembly and Calibration

The Mitre Sled is provided partially assembled. Please follow the 4 steps below to complete the assembly.

For the first time use and setup, we recommend that the 45 degree perpendicular fence is attached to the Mitre Sled after the Sled had undergone the initial 2 steps of the setup process.

2.2.1 Step 1: Fine tune the 45 degree supports

Prior to installing 45 degree perpendicular fence, place or clamp the Mitre Sled to your router table and measure the angle of each of the 45 degree supports relative to the table. They should be 45 ± 0.3 degrees to the router table surface.

You can adjust this angle by:

1. Loosening the hold down bolts underneath your Mitre Sled and the hold down knobs attached to the baseplate fence; and
2. Slipping a small piece of paper either at the front or back of the 45 degree support; then
3. Retightening and re-measuring the angle.
4. Ensure all fixtures are tight

Generally, 1 thickness of paper will be equivalent to 0.05-0.1 degree adjustment.

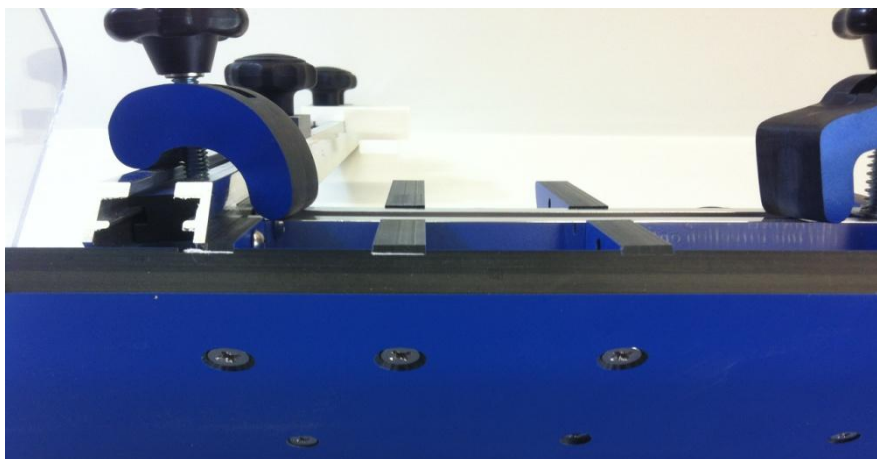


Figure 2-1. loosen the fixing bolts underneath the jig to insert paper shims under the 45 degree supports

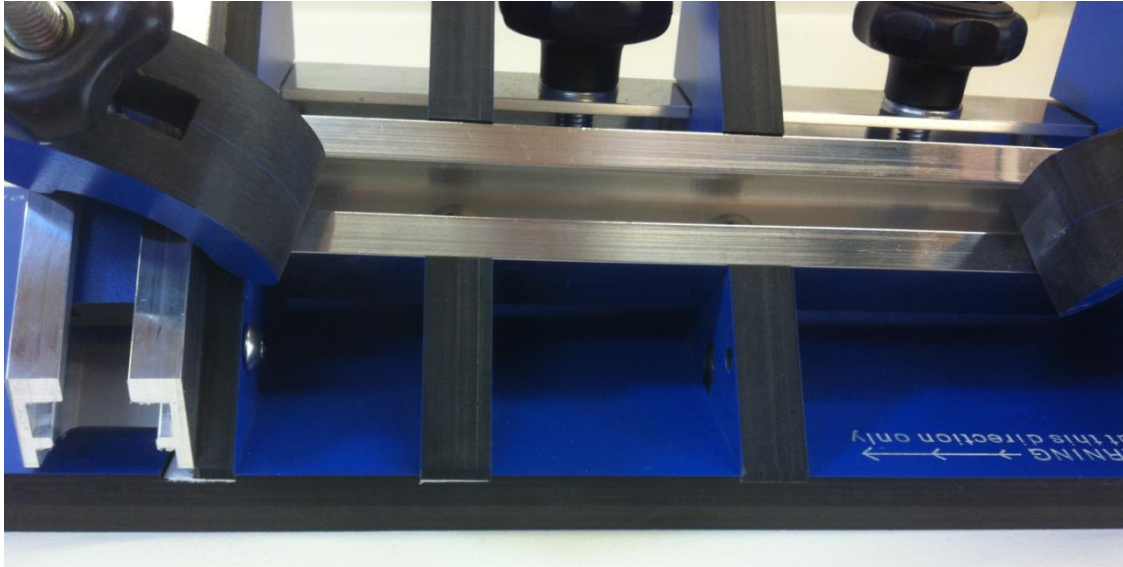


Figure 2-2. Paper shims can be placed underneath the 45 degree supports to make micro-adjustment to the Mitre Sled angle

2.2.2 Step 2: Fine tune the vertical angle of the first 45 degree support

The vertical angle of the first 45 degree support can be fine tuned by first measuring the 90 degree angle of this support relative to the jig base plate and making any adjustments as described below. This step assists with the final calibration step.

You can adjust this angle by:

1. Loosening the bolt on the first angled bracket at the rear of the jig and the bolt in the inset fence;
2. Adjusting the vertical angle of the first 45 degree support; and
3. Retightening all fixtures and re-measuring the angle.

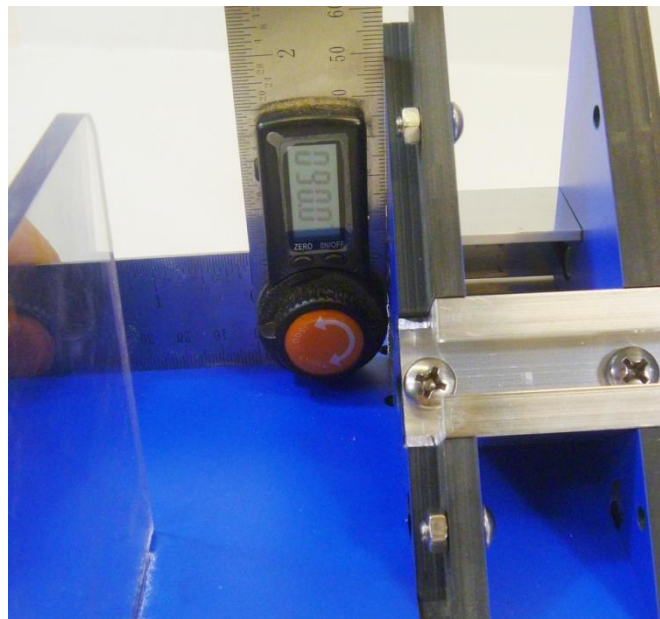


Figure 2-3. Measure the angle of the first 45 degree support

2.2.3 Step 3: Install the fence.

The fence is installed using 2 M5 bolts that require a 3mm Allen key. Some double sided tape attached to a screwdriver head can be used to hold the nut in place.

It is important to ensure that the fence clamp is installed between these two fence attachment nuts to ensure the clamp does not slide down the fence. The photos below describe the fixture of the fence to the Mitre Sled.

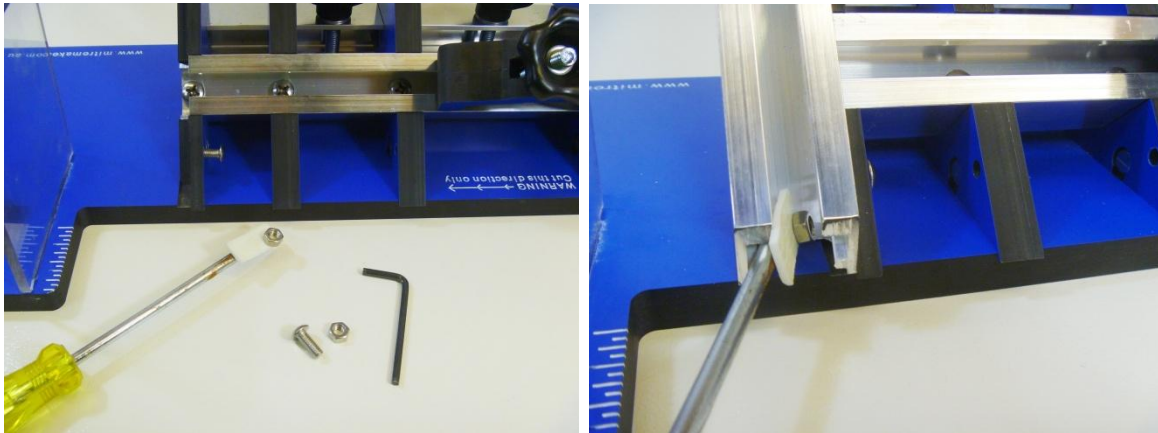


Figure 2-4. Use double sided tape to assist in positioning the nut for the lower M5 fence bolt.

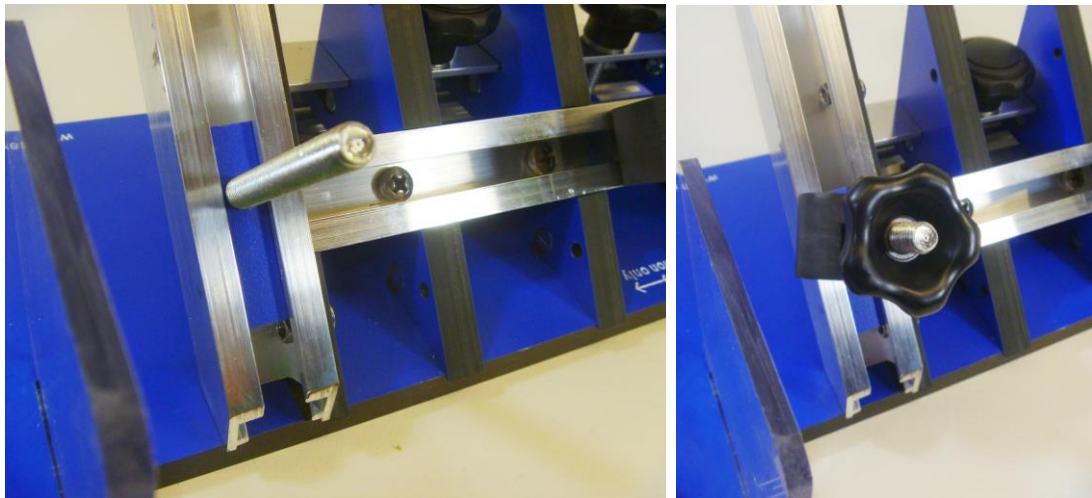


Figure 2-5. (a) Insert the clamp bolt. Slide the fence clamp bolt into the fence and down to the first bolt. **Ensure that the longer end of the slider is pointing downward.** (b) install the second m5 bolt and nut to 'trap' the fence bolt

2.2.4 Step 4: Align the fence.

Fence alignment must be 'spot-on' for this jig to work well. It must be exactly 90 degrees to the cutting face.

You can adjust this angle by:

1. Taking the small fence clamp and installing it on the inset parallel fence
2. Using the small fence clamp to clamp an accurate square to the jig. Ensure that an edge of the square is running along the top of the cut face;

3. Loosening (slightly) the bolt on the first angled bracket at the rear of the jig and the bolt in the inset fence. This bracket is the one you are attaching the fence to.
4. Adjust the angle of the fence; and
5. Retighten the fixing bolts and remeasure the angle

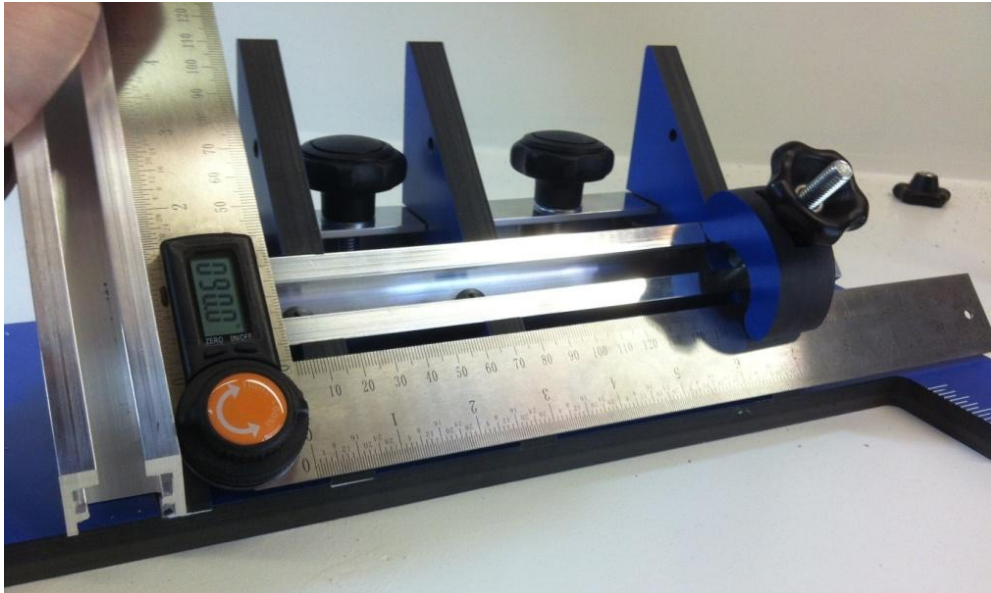


Figure 2-6. Clamp a square to the jig for fence alignment

2.2.4.1 Alternate method of fence micro adjustment

If the fence is close to 90 degrees, but you are finding it difficult to adjust it by the final 0.1-0.2 degrees, then try this method:

1. With the fence already attached to the Mitre Sled, loosen the upper or lower fixing bolt and slip a paper shim between the fence and the bracket support and retighten
2. Trim off any paper sticking above the bracket with a sharp knife.

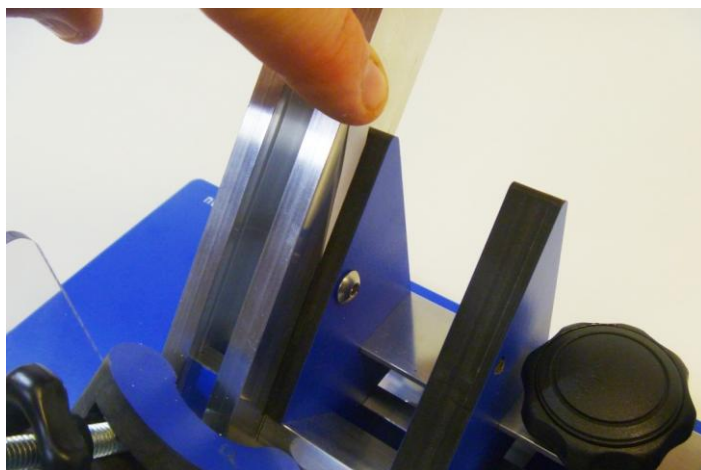


Figure 2-7. Adding a paper shim for angle adjustment

The fence alignment step is perhaps the most important calibration step for this jig and should be considered routine prior to starting a new project or re-installing the fence.

3 USING THE MITRE SLED

3.1 Introduction

The basics of using the Mitre Sled are as follows:

- The Mitre Sled should be used with an inverted flush trim router bit mounted in table mounted router. Boards are loaded into the Mitre Sled and firmly clamped before turning on the router.
- A cut is made by pushing the jig **away** from the woodworker. The router bit should travel along the cut face of the jig in the direction shown on the jig (Figure 3-1).
- The positioning stops and sliding stops are used as per the Mitre Maker to accurately position the workpiece and trim work pieces to length.
- Your boards will be rotated in the jig to cut mitres on each end, not flipped over. This means that your boards should have parallel edges to achieve very neat mitres because each edge will be placed against the perpendicular fence.
- Keep a hand on the Mitre Maker knob, behind the safety screen, your left hand can be placed on the jig behind the Mitre Sled
- Always push the jig away from you when cutting and ensure that bearing on the router bit runs unimpeded along the cutting face
- Clamp your work piece firmly. The rotation of the cutter and the orientation of the work piece will result in the board slipping downward into the cutter if it is not clamped firmly.
- Make 2 or more passes when trimming stock, particularly for thick boards.

3.2 First time use

- The first time the Mitre Sled is used, the woodworker will need to trim off the ends of the 45 degree upright supports, and possibly some of the upright aluminium fence.
- The cutter should have no trouble cutting the aluminium, however please take a very slow and deliberate cut when doing this



Figure 3-1. The 45 degree supports and the aluminium fence will be trimmed in the first use

loading and unloading boards

- Turn off your router.
- Boards are easily loaded and unloaded from the jig by tilting the jig backwards and resting the 45 degree upright fence on your router table.
- Loosen the clamps;
- Slide the board out from underneath the clamps
- Turn the board around or insert a new board under the clamps and clamp tightly
- Tilt the router back up and make the next cut.

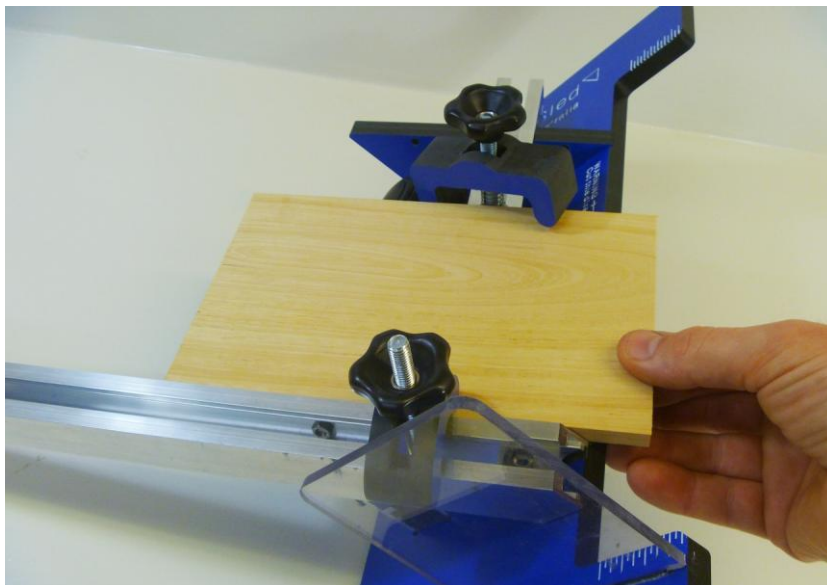


Figure 3-2. Tilt the jig back to easily load and unload boards.

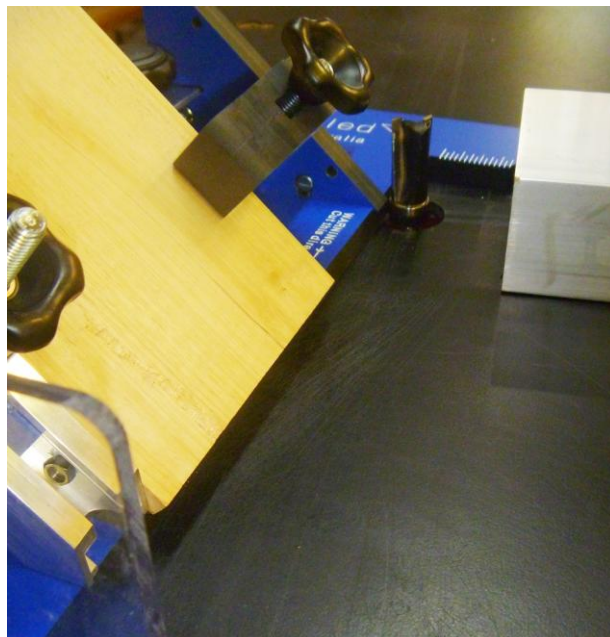


Figure 3-3. Ready to make the next cut.

4 CARE AND MAINTENANCE

4.1 Mitre Sled Baseplate and Fence

The Mitre Sled baseplate core material may experience build up of dust after frequent use and particularly after cutting timber with high resin content.

The mitre cutting edge may be cleaned using the end of a steel ruler using a scraping motion and/or polishing with an old toothbrush to return the edge to a smooth surface.

We *never* recommend re-machining of the mitre cutting edge as a cleaning option. If the cutting edge of the baseplate is damaged by a router bit, then we recommend replacement of the baseplate.

If the fence has been damaged by excess clamping force, abrasion or by a cutting blade, then we recommend replacing it with a new fence. This can be fitted, if required, by removing the fixing bolts.

4.2 Cutters

Sharp, precise mitres need sharp cutting blades. It is possible to sharpen the blades of your cutters, however after sharpening, the cutting blades will be slightly smaller in diameter than the bearing and therefore the workpiece will slightly overhang the baseplate and fence after cutting. This may mean that spoil boards, or a replacement fence are required. A new fence can always be fit to the Mitre Sled and trimmed to the exact size if the cutter diameter is significantly less than the diameter of the bearing on the shank.

Alternatively, new suitable cutters can be purchased direct from our website (www.mitremaker.com.au).

