

The Anatomy of a Precision Jig

It took five years to complete the development of the Leigh FMT! Early on it became evident that to achieve the precision required by demanding woodworkers, this new jig would be costly to produce. After numerous prototypes and test sessions, the final FMT includes 88 parts that are either extruded, die cast or injection molded, each requiring a custom die or mold. In addition, eighteen components are CNC machined to very precise tolerances. For finer detail, read the following:

- The clamp plate (1) is a rugged five hollow 6063-T5 aluminum extrusion, CNC machined flat with a special non-slip finish. Its built-in adjustment parallels the plate to the table-guide alignment and is factory set to plus or minus .0015" over 13"! The clamp plate can be angled up 30° (2) and features an adjustable stop screw for setting 90°.
- Clamping is provided by two powerful 3" capacity clamps featuring Leigh's Cam-Action Speed-Clamps and die cast ZA12 alloy rocking arms (3). Multiple clamping positions are machined into the clamp plate for all mortise and tenon work pieces.
- The die-cast aluminum tenon side stop fence (4) can be angled up to 45° left or right, or preset square as required.
- The die-cast aluminum vacuum box has a 1 1/2" O.D. dust removal port (5).
- The table (6) is made of 1/2" Mic 6 plate, a special proprietary brand of continuously-cast aluminum plate that is rigid, flat and stress free. It comes from the foundry milled flat both sides to a tolerance of +.005 thickness and .015 flatness over a 12-foot span! (The FMT table is only 16 1/2"!) The table is then CNC machined both sides with the channels, recesses and openings required for the FMT.
- The table moves front to back and left to right and locks in any position by a flip of the table clamp lever (7). This lever operates a sophisticated clamp system incorporating five more CNC turned brass and steel parts making it highly efficient, convenient and easy to use (8).
- Under the table are two more CNC milled 6005A-T5 aluminum extrusions (9) which provide both jig structure and table movement. UHMW strips act as slide bearings between these components and to the underside of the table. Delrin (Acetal) V-blocks on ground steel pins in machined V-grooves ensures true table alignment in both x and y axes.
- A retractable sight (10) made of Fortron PPS, a high-tech ultra rigid filled resin, is used to perfectly centre the table opening (11) over the pre-marked joint positions. Table limit stops (12) are adjustable for precisely controlled positioning of the table in both directions when needed.
- Each joint guide (13) snaps into the table guide recess which perfectly aligns with the cutter opening (11) and the right side pin track (14). Guides and pin track are injection molded from Delrin for durable and smooth operation.
- The router sub-base (15) is CNC machined from 6061-T6 tempered aluminum. The two tapered stainless steel guide pins (16) threaded through brass bushes (with neoprene bearings) are precision CNC machined to match. These pins ride in the pin track on the right (14) and against the joint guides on the left (13) and provide the fine adjustment for perfect joint fit.
- Teflon pads (17) on the table and on the router sub-base make routing very stable and smooth.
- The Leigh universal router sub-base mounting system (18) works with virtually any plunge router, but the router in most instances can be removed and refitted to the sub-base in under two minutes. A dedicated router is not necessary for this jig.

"Leigh's new Frame Mortise and Tenon Jig is a tour de force of design." –Ernie Conover, Conover Workshops

