

The xTool M1 Expansion Options

The xTool M1, introduced in spring of 2022, is a self-contained laser engraver/cutter and knife cutter. It was the first to bring these two complimentary craft technologies to market in a single tabletop box, and did so at a very competitive price. The device, which can house up to a 10W laser module, for engraving and cutting; also incorporates a precision CNC knife cutter, for trimming vinyl, paper, and other soft-surface materials, such as leather and fabric.

Late in 2022, in response to its popularity, xTool introduced a number of additional-cost add-ons that expand the machine's capabilities and ease-of-use.

Air Assist

First of the improvements is an air assist system. The xTool M1 Air Assist Set consists of a small, quiet, 30L/min. pump with an independent on/off power switch, and all of the necessary hardware and components for permanent installation (FIG. 1). The air nozzle is held securely to the laser lens by a magnetic ring, and can be removed easily to accommodate the use of the knife cutter, which is also held in position by a magnet (FIG. 2). Only the laser nozzle or the knife cutter can be in position for use at any one time.



FIG. 1. The xTool M1 Air Assist Set provides a powerful stream of air through the laser nozzle to reduce discoloration and push away smoke.

The purpose of the air assist is to blow smoke and air-borne debris from under the laser head. This action

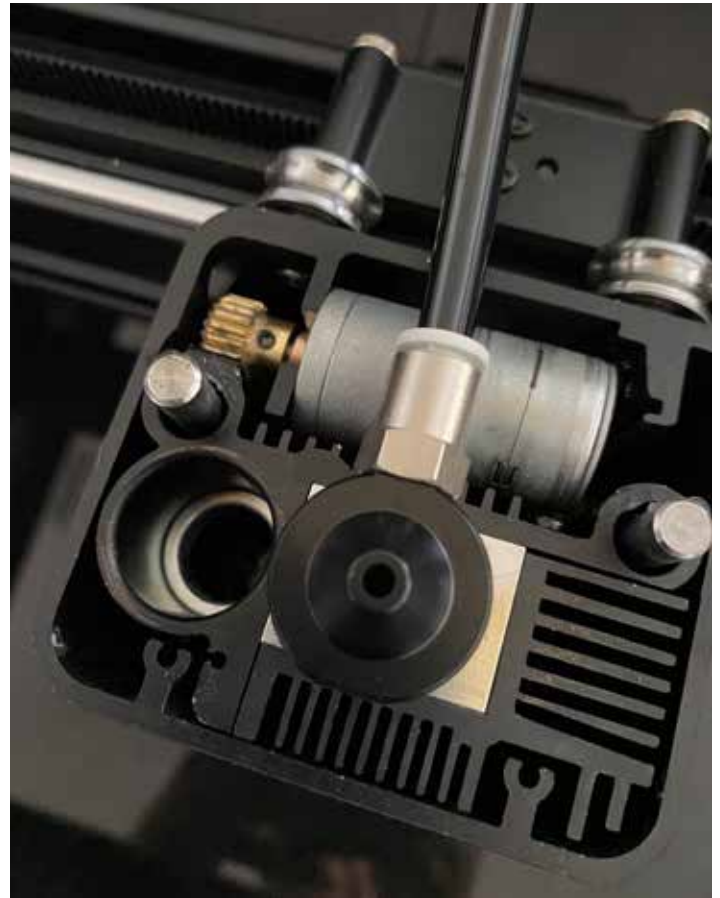


FIG. 2. The magnetically-held air assist nozzle as viewed from the underside of the laser module. The round opening to the left is for the cutter blade.

significantly reduces the amount of worksurface discoloration and charring, producing cleaner cuts, and keeping the laser lens cleaner and performing more efficiently. The result is that the user will finish workpieces without the need for sanding or other time-consuming post-production operations. The need for air assist has been proven to be essential.

The installation of the air assist requires that the original laser lens mount (FIG. 3) be replaced with one that will be receptive to the magnetic nozzle (FIG. 4). One end of the length of 2.5m black plastic tubing is connected



FIG. 3. The laser module prior to any modifications. Note that both the laser and the knife cutter are in place. As set, the knife cutter would be active.

to the nozzle, and the other end to the air pump. xTool provides a set of self-adhesive tube clamps that fit along the inner rim of the M1 window opening, and keep the tubing free of crimps, and out of the way (FIG. 5). When the nozzle is removed, it is stored along the top front opening, in a convenient nozzle holder (FIG. 6).



FIG. 4. The original laser lens mount, shown immediately to the right of the laser lens, is removed using a double-pronged tweezers provided with the air assist kit.

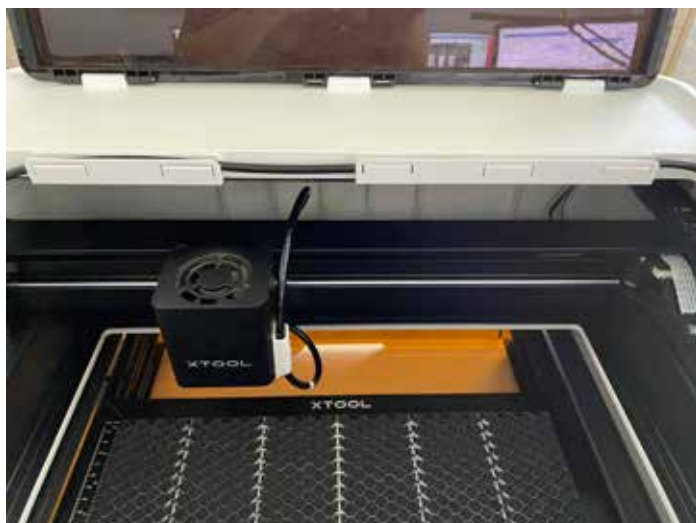


FIG. 5. A set of self-adhesive plastic clamps help to efficiently route the tubing within the confines of the M1.



FIG. 6. The air assist nozzle stored in its holder.

Riser Base with Honeycomb Panel

Designed as a self-enclosed space, the M1 has certain inherent limitations, namely the confines of its four walls. Rather than create a new form-factor, xTool has engineered a deep base foundation (FIG. 7) that provides for the accommodation of taller workpieces, up to 121mm, as well as the engraving of cylindrical objects.



FIG. 7. The Riser Base consists of four sides, two of metal, and two of acrylic, that lift the M1 to accommodate a wider range of workpiece sizes. Credit: xTool

The Riser Base maintains the safety and security of the machine by keeping all sides well-enclosed. The design ensures adequate eye protection on all viewing ports, and the air-flow design minimizes the escape of smoke and odors.

There are four main parts to the Riser Base: the sturdy metal left and right panel sides, that exactly match the color and design of the M1, and the front and back orange-tinted transparent acrylic panels. These components fit together quickly without the need for fasteners.

The M1 itself, which is a securely constructed enclosure, sits on top of the Riser Base, with its short pedestal feet fitting inside openings at the top corners of the steel sidewalls. The M1 can be lifted off of the Riser Base easily should the need arise.

The Riser Base includes a honeycomb panel, which is about 7/8" thick, with a lattice of small metal cells that allow air to circulate, as parts are cut. The air movement reduces cutting time, while making the cuts cleaner, on front and back, and ensuring more precise cutting.

The honeycomb panel, which slides into one of the three cantilever guides (FIG. 8), includes a set of four material pins, that are designed with magnetic heads that fit securely within the honeycomb cells, to hold workpieces securely in place (FIG. 9). Additional pins can be purchased to create custom jigs for complex or repetitive work. In addition, the user can use any low-profile magnet.

The RA2 Pro for M1

The xTool M1 has a specially designed rotary attachment with the most versatile set of accessories available on the market (FIG. 10). The RA2 Pro can accommodate a wide variety of drinking glasses, water bottles, and coffee mugs, as well as cylindrical objects as large as the inside width of the M1, and as small as a wedding ring. The various attachments make it possible to securely hold objects that would have previously been impossible to grip.

Before attempting to use the rotary, the user must remove the air assist nozzle and store it in its holder. Next, the height of the honeycomb panel is set according to the letter showing on the provided color-coded



FIG. 8. The Riser Base is segmented into three heights, labeled with the Greek characters alpha, beta, and gamma (A, B, and C). These characters are related to the distance of the honeycomb panel surface to the laser.



FIG. 9. The magnetic material pins shown sitting on top of the honeycomb panel. The silver protrusions fit snugly into the honeycomb cells.

tape measure, either A, B, or C (alpha, beta, or gamma). That letter is revealed when the tape measure is wrapped around the object (FIG. 11). Next, the rotary



FIG. 10. The RA2 Pro for the xTool M1 contains the most extensive and complete set of attachments for securing round or cylindrical objects for precision engraving.

rollers are configured, the object is secured in the rotary, and the unit is placed on the honeycomb, so that the red focus dot falls on the highest point of the object. The RA2 Pro cable is connected to the M1 rotary power port, and the Laser Cylindrical setting is chosen in the XCS software. Auto-measure is selected to obtain the focus. If the auto-measure fails, the distance can be manually measured using the provided ruler. The ruler is positioned at the highest point of the object, and it is read at the top of the laser module. That distance can then be entered manually. The user frames the image and then initiates processing.

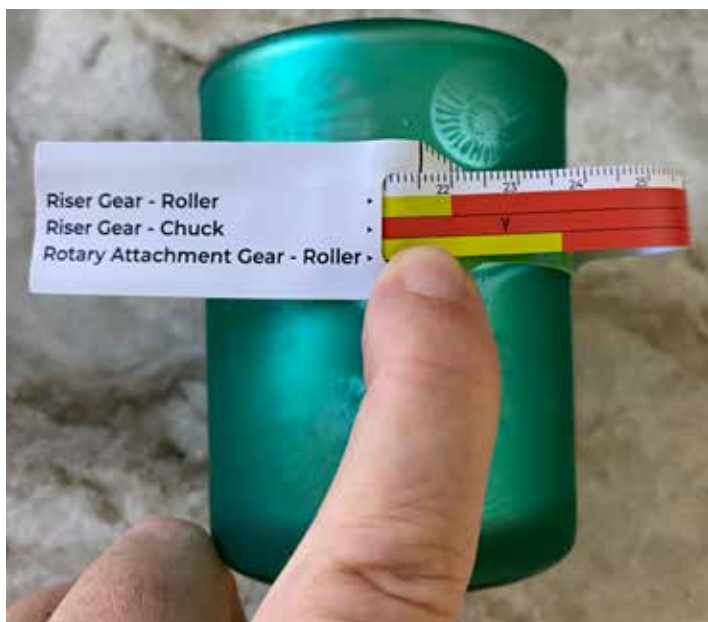


FIG. 11. The color-coded tape measure, wrapped around an object, reveals a letter code that is used for setting the rotary.

The rotary can also be used without the Riser Base. In such a case, a set of four precisely-machined wooden risers, with settings engraved on the sides are used (FIG. 12). With the alpha side facing up, the RA2 Pro can be set to process materials of a perimeter 0-88 mm. With the beta side facing up, the perimeter range extends from 0-142 mm. And, finally, with the gamma side facing up, the perimeter extends from 142-314 mm.



FIG. 12. These wooden risers are used to elevate the M1 when the Riser Base is absent.

A color-coded tape measure is provided which is used to determine the orientation of the risers. The tape is read dependent upon the mode to which the rotary has been set, namely Riser Gear – Roller; Riser Gear – Chuck; or Rotary Attachment Gear – Roller.

Thicker Materials, Taller Objects

The position of the honeycomb panel can be changed to accommodate a wide variety of material thicknesses or object heights. The panel can even be removed, if necessary, to process a particularly tall workpiece. The height of the object may require that the focus be set manually.

Blade Cutting

The blade cutting function requires that the blade cutter be re-installed (FIG. 13), and that the baseplate be mounted in its original location in the base of the M1, secured with the mounting screws. A cutting mat, with



FIG. 13. In this photo, with the M1 turned upside down, the blade cutter is being removed prior to the installation of the air assist nozzle. When the blade cutting function is to be used, this opening is where the cutter is installed. Ordinarily the blade cutter is installed with the M1 in its upright position.

material, is placed on the baseplate and secured in position. The cutting mat has an adhesive coating on both sides; the back to adhere to the baseplate, and the front to hold the material to be cut. Next, the Blade Cut option is selected in the XCS software along with the type of material in use. The material is then positioned and cut.



Further Reading

In-depth coverage of the entire laser engraving and cutting process is available in the new book, **Focusing on Laser Engraving and Decorating: Affordable, Versatile, and Creative Marking, Engraving and Cutting** (<https://tinyurl.com/2j2kmyc4>) sold exclusively on Amazon.com.

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