PRODUCT REVIEW: GCC's

LaserPro C180 Tabletop Laser

By J. Stephen Spence

It seems that today, there are more applications for smaller, less expensive lasers than ever before—and that trend is growing. Book stores, gift shops, hobby shops and hobbyists alike are looking more and more seriously at lasers. Add to this the "newbie" engravers, who are buying their first laser, and we suddenly have a viable and rather large market for small, inexpensive lasers like the GCC LaserPro C180 from GCC, Walnut, CA.

The relatively new GCC LaserPro C180 CO_2 laser is designed to meet specific needs, including those who have very limited space for a laser, those who don't need a really large engraving table and those who want good performance with minimal investment.

The overall machine measures approximately 25"x28" and stands just under 15" high. The under-40 watt models of this system require 100-240 volts (auto switching). Larger models are rated at 200-240 volts.

The power rating (laser wattage) of the GCC LaserPro C180 is in line with many other lasers, including both tabletop and full-size models. The model I tested was a 30 watt machine but it is also available in 12 and 40 watt versions. Thirty watts is more than adequate for many, if not most, laser applications, especially in these smaller markets. It will easily engrave the same materials as the larger machines, even the more powerful ones—although it may take a bit longer to get the job done.

For instance, the GCC LaserPro C180 can engrave all laserable plastics that I know of, cast acrylic and coated metals like black brass-plated steel and anodized aluminum. It can be used with laser-markable coatings to mark stainless steel and ceramic tile. It can also engrave wood, although it cannot engrave as deeply in one pass as a 50 or 100 watt machine. It can, however, certainly produce a clean, salable product. It can also cut $3/8$" acrylic or $1/8$" wood, such as that used to make ornaments, with ease.

GCC has packed just about every feature one could desire into this little package and, except for the cylindrical engraving attachment, most of the accessories come standard. The only thing you need to add to the GCC LaserPro C180 is a computer, a small compressor for air assist and an exhaust system to evacuate smoke.

Unlike other lasers I have reviewed, this laser was not only tested by an experienced laser user (me) but also by a complete novice. After all, many of those who purchase this laser will probably be new to the technology. The novice found the system easy to learn and forgiving of the initial mistakes made by most people just learning about lasers.

Let's start with the cabinet. Although GCC could have used a plastic cabinet to reduce weight and cost, they chose to use a steel cabinet. This is significant for several reasons: First, the rigidity of the machine. If the laser machine isn't rigid, all kinds of problems can result—mechanical parts can jam, distortions in the engraving can occur, etc. It is imperative that the "foundation" of a laser engraver be

GCC LaserPro C180 CO_2 Laser

Suggested Retail Price (U.S.):
12 watt $8,995; 30 watt $11,995; 40 watt $13,995

Engraving Unit Size:
28.3" w x 25.2" d x 14.8" h

Worktable Size: 12"x18"

Maximum Part Size:
18" w x 12.1" l x 6" h

Maximum Engraving Speed: 40 ips

Standard System Features: metal frame & cabinet; SmartBox aluminum table; Synrad or Coherent laser tube; auto-focus; red laser pointer; 2" focal length lens; air assist (compressor not included)

solid at all times. This requires a metal frame at the least which this laser, as well as all of the lasers I know of, has. Adding a metal cabinet to the metal frame only adds to the rigidity of the overall machine. (Most lasers I know of have a metal cabinet but I do know of one model with a plastic enclosure.)

Secondly is fire. Lasers don't often catch on fire but it can happen (almost always due to operator error). A metal cabinet may make the difference between a damaged laser and a damaged building. The only "plastic" used in this laser is the Plexiglas access door which is designed to allow you to look inside the laser while it's engraving. The internal lamp greatly helps make the work visible.

The beam motion mechanism is similar to many other lasers. The lens assembly motion is controlled by DC servo motors and the Z-axis (up and down movement) is also motorized.

The system includes an auto-focus feature which utilizes the same surface sensor method used on other GCC lasers. This focusing tool features a small plunger inside a plastic cylinder that moves up and down. When the lens assembly is lowered toward the material, it pushes the plunger up into the cylinder and a switch is closed telling the laser that the lens is in focus.

The plunger, or focusing tool, is a unique design only used on GCC lasers and is an excellent design, especially due to the fact that it can be easily removed and replaced as desired. For instance, the plunger (Figs. 1 and 2) should be removed when engraving materials that tend to flame up or
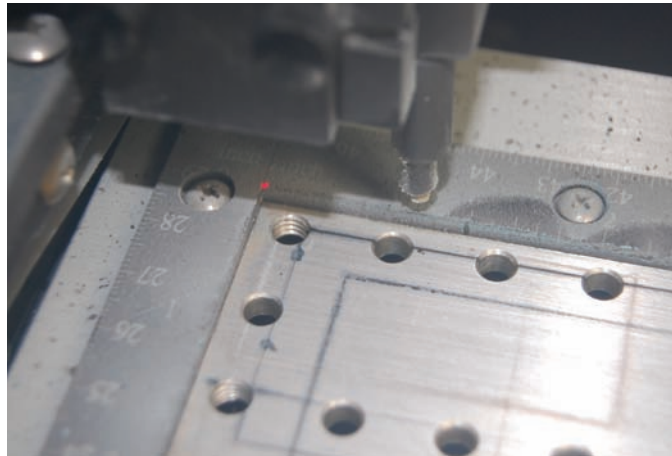

Figure 1: The "plunger," or focusing tool, is a unique design only used on GCC lasers.

anything that might emit a lot of tar such as cutting wood, acrylic or rubber stamps. The plunger can also be removed to position the lens assembly inside an object, such as a shallow bowl or silver tray, when it would otherwise bang into the edge of the object. Once the lens assembly is positioned inside the object, the plunger can be attached, the laser focused and then the plunger removed again to give the lens assembly free access over the lip of the object. Of course, the laser can also be focused manually or it can be set deliberately "out of focus" for specialized work. This is done on the control panel using a digital readout.

A red laser pointer is standard on the GCC LaserPro C180. This is incredibly helpful when working with odd-shaped items as it allows you to see where the engraving will take

place before actually engraving.

The table size is 12"x18" with a maximum part size of 12"x18"x6". This is certainly large enough for many jobs including plaques, signs and other engravables. With the standard tabletop in place, the laser can only engrave items up to 4" thick. However, by removing the table, you can engrave an item such as the inside of a bowl up to 6" deep using a 2" lens. Removing or installing the table takes about one minute.

The standard table is perforated with a series of holes and is part of what GCC calls a "SmartBox." The SmartBox works in conjunction with

Figure 2: The focusing plunger, called a SmartPIN, is designed to plug into the side of the lens assembly and can be installed or removed at any time in a matter of seconds.
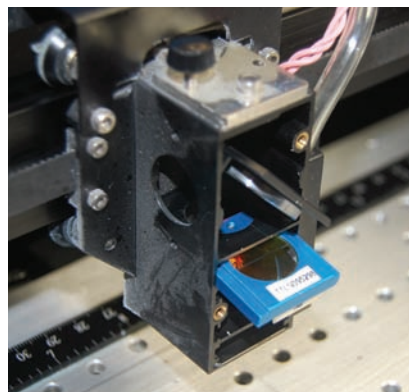

Figure 3: The lens and upper mirror can be easily removed for cleaning.
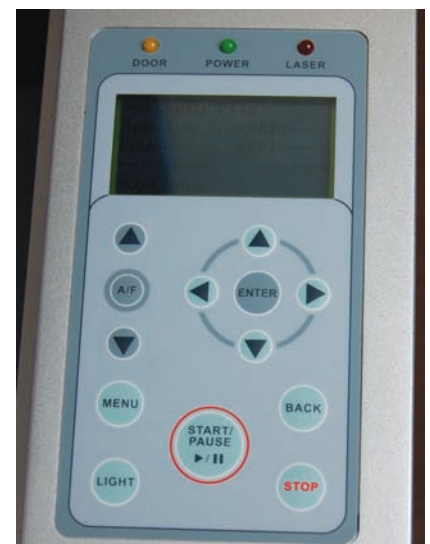

Figure 4: The control panel is located on the top-right side of the cabinet and is easy to learn and use.

Figure 5: The LaserPro C180 is unusual in that it uses a 2" exhaust. Since all blowers I know of are either 3" or 4", the hose has to be converted.

the exhaust fan to create a vacuum which pulls down the material being engraved and holds it snugly against the table. In essence, the table looks and performs exactly like a vacuum table. This is a unique feature and is very helpful when engraving paper, foils, films or fabrics that tend to ripple, curl or move around during the engraving process.

To make it easy to remove, the SmartBox table sits on a set of four pins and can be bolted in place with four small screws. We found ourselves foregoing the screws and letting the table just sit on the four guide pins. I expect this will be a common practice. Note, however, the toler-ance around these pins can allow the table to shift just slightly (about .003") on either the X- or Y-axis. This could cause some problems when doing multiple passes on extremely fine engravings if the table is touched or moved between passes.

The standard lens has a 2" focal length and a 1.5" focal length lens is available as an option. Like all GCC lasers (and some other brands), the lens and upper mirror can be easily removed for cleaning (Fig. 3). The lens is designed so that it cannot be installed incorrectly. However, some care must be taken with the upper mirror to insure it is seated properly and locked into place with a thumbscrew located on the top of the lens assembly.

The 30 watt laser tube in my test machine was made by Synrad which is a highly respected U.S.-based manufacturer in the industry. Some wattages are made by Coherent Deos, another commonly used manufacturer in our industry.

Most any computer will run the
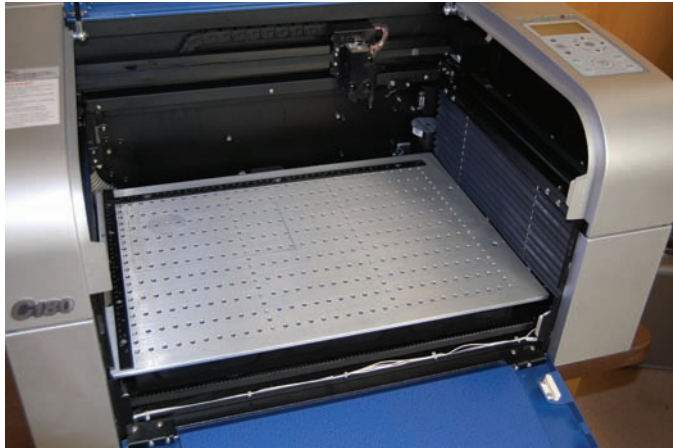
Figure 6: The upper exhaust inlets consist of a series of holes located just under the "X" rail. These holes tend to clog up with debris and must be cleaned regularly.

Figure 7: The table most commonly used is the perforated table as shown here. This table can take advantage of either exhaust method (upper or lower).

GCC LaserPro C180, including a MAC (requires an additional piece of software). The driver is simple and easy to use, doesn't take much memory and allows for up to 16 color mapping power settings per job. This means the user can control the order of various sections in a job, change focus and speed settings, and make second passes when necessary. Mirror images and rubber stamp settings are built in and downloading even very large files is fast since the GCC LaserPro C180 holds 32MB of data. The laser can be connected using either a standard parallel printer cable or a USB connector (our testing used only the USB option).

One very nice feature that is available on all GCC lasers is the ability to program new origins using the software as well as by physically moving the engraving head (called "Drag-N-Engrave"). I find this feature especially helpful when working with jigs that position the item in various positions on the table. Once the center point of a jig is determined, the jig can be removed and replaced multiple times without having to do more than enter a couple of numbers into the software. This is an excellent feature. You can also use a feature known as Smart-CENTER which allows you to set the upper-left and lower-right corners of an object to be engraved and then the laser determines where the center point of the object is. The ability to manually drag the engraving head to the starting point of an engraving

or use SmartCENTER makes it simple to engrave almost anything, even those odd-shaped items that usually take forever to set up.

Air assist comes standard on the GCC LaserPro C180 although you will need to purchase a small compressor either from GCC or from an outside source. Since only about 5 psi is required, even a hobby compressor is suitable.

The control panel (Fig. 4) is mounted on the top-right side of the cabinet with the on/off switch mounted on the lower-right side. This keeps the operator from accidentally turning off the laser in the middle of a job. The control panel has a four-line LCD readout for

simple operation and offers many of the same features as GCC's very large Spirit GX laser engraving system.

As mentioned earlier, the cabinet also features internal lighting. There is a bar of high-output LEDs mounted on the top-left side of the engraving cavity. A matching set on the other side might be a nice addition but the lights that are there do an adequate job of illuminating the work area. Internal lighting is like power windows on a car—once you have them, you never want to be without them again.

One oddity about this laser I have never seen anywhere else is the exhaust outlet. I have seen 3" and 4" outlets but never a 2" which is what this
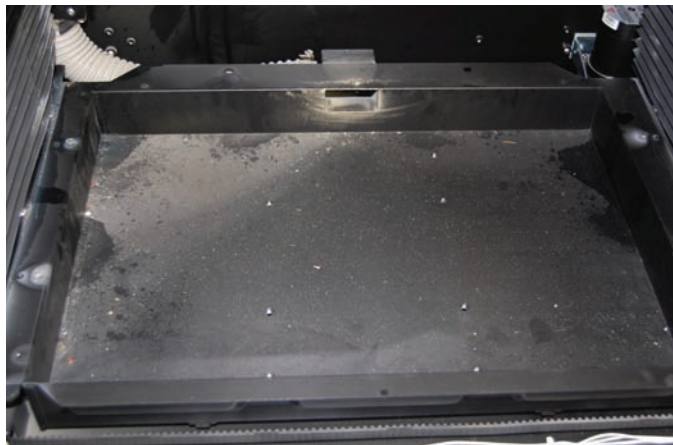
Figure 8: The "tray," or SmartBox, located under the perforated table affords additional engraving depth when needed. Here, a well-used laser shows the exhaust port (back center) that pulls air through the holes in the perforated table when it is installed.
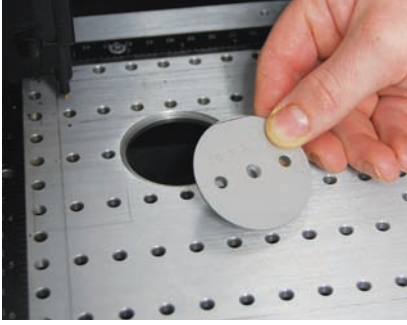
Figure 9: A removable disk in the upper-left corner of the perforated table can be used for engraving embossing dies.

laser has (Fig. 5). Since I have no scientific method for testing the efficiency of the 2" port over a 3" or 4", I can only report my observations and suggestions.

As for observations, I found that the exhaust system evacuated smoke reasonably fast provided the exhaust ports in the laser itself were clean and the selector switch was in the proper position (more about this later). I do feel that this laser's exhaust should not be ganged with other lasers, meaning this laser should have its own exhaust blower. In my own shop, I normally run two lasers off the same exhaust system (600 cfm) but with this laser, I found it far more effective to have a dedicated blower motor (in my case, 600 cfm). This should not be of concern to single laser owners since most blowers commonly used for exhausting a laser are in the 400-600 cfm range.

There are actually two exhaust designs built into the GCC LaserPro C180. One is used in conjunction with the standard table to create a vacuum that holds materials down and functions as the exhaust as mentioned earlier. The other exhaust system can be used either with or without the table. If you use this exhaust system with the table, the vacuum feature is turned off. You can switch between the two options using a damper switch located in the back of the cabinet.

The exhaust pickup is made up of a series of small holes in the back panel behind and above the engraving table. I found that, because of their size, they have a tendency to clog up with debris from engraving materials. A Q-Tip corrects this condition quickly but does require vigilance to prevent

the holes from clogging and losing exhaust (Fig. 6). During heavy usage, you might have to clean them once per day. I'm sure a lot of science went into this design for both the number and positioning of the holes, but I would like to see larger holes that might be less likely to collect debris.

Although laser salespeople stress the importance of the maximum rated speed of lasers, in my opinion this is more of a sales gimmick than a huge advantage since the speed can never exceed a certain point which is dictated by the wattage of the laser. In this case, the 40 ips speed rating is about half the speed of the more expensive lasers. This easily allows engraving to be done at full speed when engraving most plastics, coated and anodized metals, leather, cork and a host of other "soft" materials. It still must be slowed to obtain a deep engraving in wood and, as in all lasers of this size, for cutting wood, acrylic and other materials.

In short, I found it to take slightly longer to engrave various power-intensive materials compared to other 35-50 watt lasers that run at 80 ips, but this did not seem to be a problem for most materials. This is probably because of the smaller table size and because the 40 ips speed greatly reduces the amount of time required for the lens assembly to ramp down, reverse and then ramp back up again at each side of the engraving.

Although faster lasers can engrave some materials in less time, this seems of little consequence since anyone interested in that much speed should probably invest in a more powerful laser, not just a faster one. The speed of this laser is certainly acceptable for an average engraving shop.

As mentioned, the GCC LaserPro C180 actually comes with two engraving tables—the standard table, discussed earlier, works like a vacuum table (Fig. 7) to help hold down light materials and to assist when cutting materials. The second is used only when engraving thick items that need more than the normal 4" Z clearance provided by the standard table. Three additional inches are obtained by removing the standard table and using the "exhaust tray" located under the table as an engraving table (Fig. 8). It is very interesting how GCC designed both tables into such a small footprint (28.3"x25.2"x14.8" high).

One interesting feature of the GCC LaserPro C180 is a removable disk in the upper-left corner of the table (Fig. 9) that is designed for engraving embossing seal dies. In the U.S., the material used for embossing seal dies is normally purchased in sheets and is engraved and cut by placing the sheet on the flat table. In Europe, however, the material is apparently purchased already cut into circles with a lip on them so they fit in the die blank. To engrave these on the GCC LaserPro C180, you simply remove the disk on the table and place the blank die in the opening.

One of the options we considered in our test was the cylindrical engraving device (Fig. 10). This brought
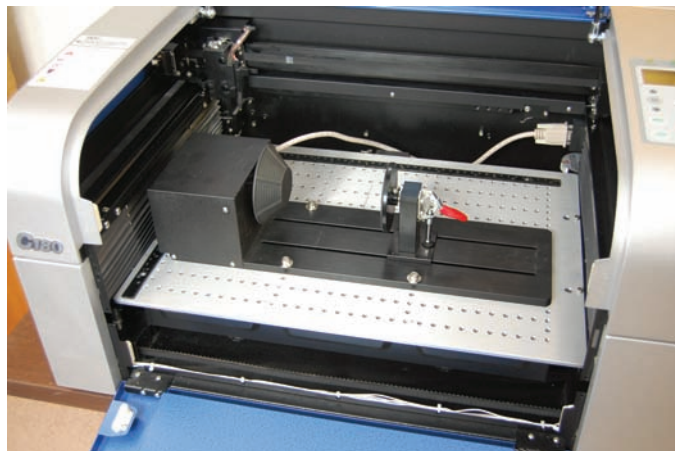
Figure 10: The cylindrical device is easy to install and use and accommodates most wine glasses.

Figure 11: The honeycomb cutting tray can be installed by lowering the engraving table and jogging the grid table into place. It can also be bolted in place for very precise, multiple pass engraving.

mixed reviews based on what could actually be engraved with it. For small diameter items such as wine glasses, it worked quite well. It was fast and simple to install and the driver software made for an easy setup. We tested it with a 4" diameter coffee cup and it worked fine, although GCC says it will accommodate items up to 5" in diameter. For those who want to engrave large items such as beer steins, the device is very limiting.

The cylindrical device comes with several rubber-coated cones to hold items. The one thing I would change about the rotary fixture would be to add a locking chuck on one end so you can hold items that can't be held with the cones. You can, however, add this after-market for only a few dollars. Locking chucks or "lathe chucks" are not offered by GCC but there are a number of Internet sources that offer them as do tool stores like Harbor Freight or supply houses that sell parts for lathes.

Another option we tested was the honeycomb table (Fig. 11). This is used for vector cutting and can be used in conjunction with the standard table to take advantage of the downdraft capabilities of the laser. The only negative to the honeycomb table is that it does consume approximately 1" of the available depth, or Z-axis, leaving a final depth of only 3". Since this option is used exclusively for cutting, the loss of depth shouldn't be a problem. Other options available include:

Air extraction systems—for use in locations where the unit cannot be filtered to the outside. These devices are also available from a number of other sources.

SmartGUARD—a sensing device that shuts down the laser when it senses an open flame in the engraving cavity.

SmartMEMORY—this is an interesting addition for those who do the same jobs over and over. This memory card, which attaches to the motherboard of the laser, will store jobs for immediate access and can even eliminate the need for a computer except when adding additional jobs to the memory.

The rivalry between manufacturers to offer a quality desktop laser for a low price continues. It's tough since the cost of the laser tube alone often equals one-third the cost of the machine and built in there somewhere has to be some cost for warranty service, training, phone support and, of course, a commission for the sales rep.

Now, with the introduction of glass laser tubes into our industry, this becomes even more interesting. Although less expensive than the tubes we are currently using, glass tubes carry a much shorter and much more unpredictable life span, and they are also currently incapable of producing anything close to the quality of engraving when being used in the raster format.

With the GCC LaserPro C180, GCC has introduced a "quality" laser that features metal construction and a traditional (metal) laser tube in the low-end $10,000 price range. Understand, however, that when you consider a laser in this price range, there have to be some compromises. The GCC LaserPro C180 designers tried to cope with those compromises in a way that would most benefit the user and they have done a very good job. In my opinion, if they could squeeze a 3" or 4" exhaust into it, I would feel a lot better about its exhaust capabilities but when connected to a 600 cfm blower, it did very well. A little more light inside the cabinet to see what's being engraved would be nice but other than those two things, I can't think of anything to even wish for in a machine of this size and price range. I like the metal cabinet, the extra-large door, easy access to the lens and mirrors and the simplicity of the driver software. Even my newbie engraver was using the driver software within a few minutes (CorelDRAW is taking a little longer).

Small and large engraving shops, hobby shops, stamp makers, scrapbook shops, gift shops and a host of other locations that have limited space could certainly benefit from a system like the GCC LaserPro C180. Larger shops that have bigger lasers might consider the GCC LaserPro C180 for specialized work such as "rubber stamps while you wait" or engraving jewelry, small gift items, etc., without tying up a larger, more expensive machine.

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