

# GCC LaserPro Spirit GX

*Over the years,* I have used and written about several of the GCC LaserPro laser engravers. Each one comes with new features and improvements over previous models, and each time I have been thoroughly impressed with the construction and engineering of the equipment. This time was no exception.

As you may know, GCC has become a major player in the laser engraving field. They make an extensive line of equipment at their factory in Taipei, Taiwan, and support this with offices and distribution facilities in California, Europe, Asia and elsewhere.

The GCC system I reviewed here is their model GX. This is a 60 watt system with a large work area and full pass-through engraving capabilities. With a suggested U.S. price of \$36,700, this system will be of particular interest to the serious business owner who wants to maximize production using a very fast and robust machine.

After the machine had arrived and was unpacked and removed from the crate, I began to contemplate my options since I knew this monster was not going into my shop unless I planned on removing the entire side of the building. At 54" x 34.6" and weighing 528 pounds, this laser was clearly one of the big boys. Unlike some lasers that come in two parts (laser cabinet and stand), the GCC laser comes as one complete unit which, in itself, speaks volumes about the



strength and durability of the cabinet. And since the laser tube is located in the back and beneath the work area, it allows for a very large work area compared to the overall size of the machine. The price we pay for this large work area, however, is that unless you have a doorway at least 36" wide, this system just won't fit into your shop. And if you have any stairs leading to your work area, you may as well forget it.

Clearly, this machine isn't intended for cramped quarters like mine, but for anyone with enough room and the need for speed and large work areas, the GCC LaserPro Spirit GX laser would be a tremendous asset. This engraving machine offers a huge work area and high

speeds for those who need to cut or engrave large items such as cabinet doors, acrylic panels and 3-D architectural models. It also produces large orders of things like name badges, plastic signs, etc. in a snap.

Of all the things on this machine that I like, my favorite attribute has to be the new gantry mechanics. Unlike earlier models that used exposed bearings to move the carriage from left to right, this new model sports a fully enclosed roller bearing mechanism that goes a long way in protecting itself from dust, grit and other debris that can cause excessive wear to the bearings. This is especially important when working with materials such as rubber stamp material, IKONMetal or marble—all of which produce a very fine powder that seems to find its way into every crook and crevice of a laser's motion system and can quickly cause excessive wear.

## LASERPRO SPIRIT GX SPECIFICATIONS

**Company Name:** GCC America, Inc.

**System Name:** LaserPro Spirit GX

**Price:** Starts at \$21,995

**Standard Warranty:** 2 year

**Laser Type:** Carbon dioxide laser (CO<sub>2</sub>)

**Laser Beam Power:** 30, 40, 60, 100 watts

**Work Table Size:** 40.3" W x 27.7" L

**Maximum Engraving Speed:** 80 IPS

**Major Applications:** General engraving and cutting; Industrial engraving and cutting

**Layout Software:** Third-party software

**Compatible Third-Party Software:** CoreIDRAW, AutoCAD, Illustrator, Photoshop

**Power Requirements:** 100-240 volts, 50/60 Hz, Max. 20 amps

**Laser Class:** 3A

**New Features/Capabilities:** SmartCENTER—enables users to position the laser carriage to the center point of working objects within seconds, even on polygonal or circular objects; Drag and Engrave—assures user effortless and speedy setup while reducing operation time.



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I also like the fact that the fire sensor (Fig 1) on this machine is built right into the work area of the laser. This is not exclusive to GCC machines as this feature is being offered as an option on more and more lasers. I happen to be a big fan of such safety devices since I almost destroyed a laser once when it caught on fire due to a careless mistake. GCC offers the patented SmartGuard Fire Alarm device as an option on the LaserPro Spirit GX.

One of the nice features about this device is that it can be turned off altogether or set at one of three different sensitivity levels depending on what material you're using. For example: if you're cutting or engraving IKONMetal, which tends to put on a "light show" with all of the sparks it produces, you can lower the sensitivity to avoid having the machine shut down in the middle of a job.

Decreasing the sensitivity was also necessary when engraving acrylic, thick plastics and when cutting some types of wood. For other materials, the sensitivity could be left high, especially if the air assist is being used to help hold down flame-ups. To invest in a laser like this one without opting for the fire sensor seems a little short-sighted to me. Personally, I think it should become a standard safety feature. It's very easy to disable the device by going into the software setup or, for even faster results, by putting a piece of masking tape over the sensor tube. This is only recommended, however, for very aggressive cutting that might cause the sensor to shut down the machine during operation.

The cabinet on the GX is very large, housing the air pump (air as-



**Figure 2: The steel cabinet on the GX leaves plenty of accessory storage room.**



**Figure 1: This sensor is part of the SmartGuard Fire Alarm that detects.**

sist comes standard but an optional pump is required to make it work) and electrical connections. It also has a large storage area (Fig. 2) for laser accessories such as a cylindrical attachment (Fig. 3). While it may not be a revolutionary advancement, the GX features a closed cabinet to keep lenses, cleaning supplies and attachments safe and clean while providing easy accessibility. It also includes a specially designed electrical panel (Fig. 4) to allow the switching of some devices to be done automatically.

More and more laser manufacturers have added lamps to the engraving area of the machines, allowing users to see what's happening without opening the cabinet door. In earlier versions of the Spirit, small fluorescent tubes were used to illuminate the laser's interior. This test model, however, was upgraded with high-output white LEDs (Fig. 5). This is a significant upgrade as the white light provides a true perception of the color of the material being engraved and it produces very little heat and virtually no chance of accidental breakage.

A switch is available on the outside of the cabinet to turn the light off and on without having to use the driver software. Under most circumstances, these lights were more than adequate, although there were times I wished they had been a little brighter. GCC has also added an emergency stop switch on the top of the cabinet, which comes in very handy and is something I used on several occasions.

Like most lasers on the market today, the GX is fast. At 80 IPS, the lens assembly moves fast enough to impress even the most seasoned engraver. What's more important, however, is the fact that users can control the "ramping" of the laser to maxi-

mize the speed for jobs that don't require extended ramping and to extend the ramping when necessary.

It's impossible to explain the idea of ramping without giving a quick lesson in physics, so bear with me here. A moving object such as a laser lens assembly that's moving at 80 IPS has to maintain the exact same speed from one edge of the engraved surface to the other in order to engrave evenly across the entire surface. Variations in speed cause variations in cutting depth, which are clearly visible in some finished products. When the lens assembly reaches the farthest point in one direction, it must slow down, come to a complete stop, reverse direction and then "ramp" up to the prescribed speed before it reaches the edge of the engraving surface. Because of inertia, it takes time (and therefore distance) for this to occur, adding as much as three inches to the length of the pass on each side.

When engraving some materials such as wood and plastic, it is imperative that this take place. If the ramp time is shortened, then the engraving will be visibly deeper on the edges of the material than in the middle—a problem that plagued the earliest models of high-speed lasers.

When engraving materials such as coated metals, however, the absence of this extended ramping doesn't show up in the finished product. This is mainly due to the fact that a CO<sub>2</sub> laser doesn't affect metal, therefore, once the coating on the metal is removed, the speed or power of the laser has minimal effect. This means that when marking this type of material, much of the distance needed



**Figure 3: The GX offers a cylindrical attachment as one of its standard accessories.**

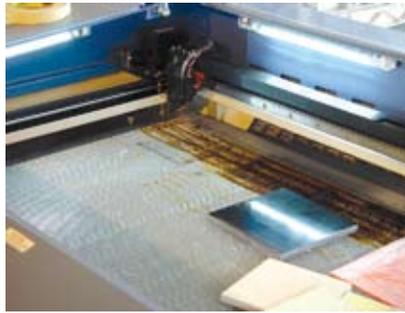


**Figure 4:** The specially designed electrical panel is housed in the steel cabinet.

for ramping and the time it takes to accomplish the process can be greatly reduced. While the actual cutting time may be the same for all 80 IPS lasers, reducing the ramping time can reduce the time required to do the overall job by 20 percent or more. This is especially true for cutting or engraving areas that are very small. As the size of the engraving area lengthens, the advantage decreases, although there is always some advantage.

Another change that was made to the GX model involves the air assist feature. I have always liked GCC's air assist system because it puts the air right where it's needed without having to add an adapter. The new design still accomplishes this while also allowing the lens assembly to pass over raised areas, such as the edge of a bowl or silver tray, without touching them.

GCC was instrumental in introducing the pass-through cabinet and, like its previous models, the GX allows for large items to pass through the cabinet during engraving. The only difference is that this process now requires a screwdriver to open the panels. This is a wise adjustment in my opinion since engraving with a cabinet that isn't fully enclosed should not be done without taking special precautions—for safety reasons. The primary danger in using a pass-through cabinet is to the eyes of the operator. Should the laser beam reflect off of a shiny surface and strike the user in the eye it could cause severe damage, which is why anyone using a laser engraver should wear special safety glasses as recommended by all laser manufacturers.



**Figure 5:** LED lights mounted on three sides of the machine provide a well-illuminated work area.

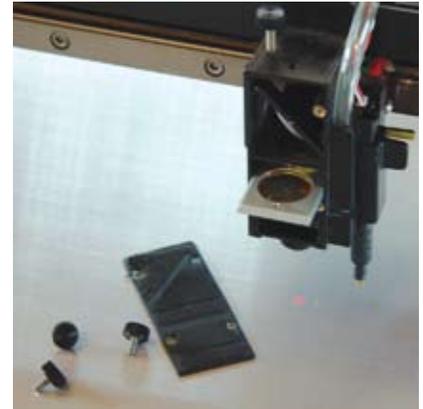
Again, the pass-through cabinet is a great feature to have as long as users take the necessary safety precautions.

The lens and mirrors are conveniently located, making them easily removable for cleaning and/or replacement when necessary (Fig. 6). Several focal lengths are available for the GX, but the typical lens is a 2" lens that, in my opinion, is adequate for about 99 percent of the jobs your laser might be called upon to produce. However, the longer 4" lens is a nice accessory to have when using the cylindrical attachment. It allows the lens assembly to pass over items such as beer steins with large handles.

When testing the GX, I cut or engraved nearly every substrate I could get my hands on including marble, various types of wood and plastic (both those considered laserable and those not), glass, mirrors, coated metals (IKONMetal, stainless



**Figure 7:** The GX did a very nice job cutting a 3-D image into IKONMetal.



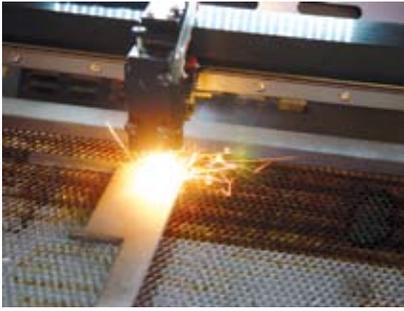
**Figure 6:** The lens is very easy to clean and replace. A 2" lens comes standard but a 4" lens is optionally available.

steel coated with CerMark and anodized aluminum), rubber stamp materials, acrylic, ABS and polystyrene plastics, Formica® and various laminates including Unisub materials, fiberglass and ceramics. I also experimented with 3-D engraving on wood and IKONMetal. Wood has been known to perform well, but I didn't know what to expect with IKONMetal. As it turned out, IKONMetal performed quite well (Fig. 7) and had I spent a little more time with it, I may have gotten results similar to that of wood.

Cutting with the GX was a dream. In addition to the manufacturer providing a very nice cutting grid, this powerful laser made short work of IKONMetal, acrylic (up to about 1/2" thick) and wood (up to 3/8"). Cutting IKONMetal created quite a light show (Fig. 8), but other than sparks and a significant amount of metal dust, it caused no damage to the machine.

Deep cuts in wood involved finding a tricky balance where the wood could be cut without scorching it (Fig. 9). I settled on limiting the wood thickness to about 3/8". The laser could easily cut thicker pieces of wood, but the damage caused to the surface of the wood in the process would require some pretty serious sanding.

The print driver that comes with the GX is powerful and versatile and, in my opinion, very user-friendly. While testing this machine, I used



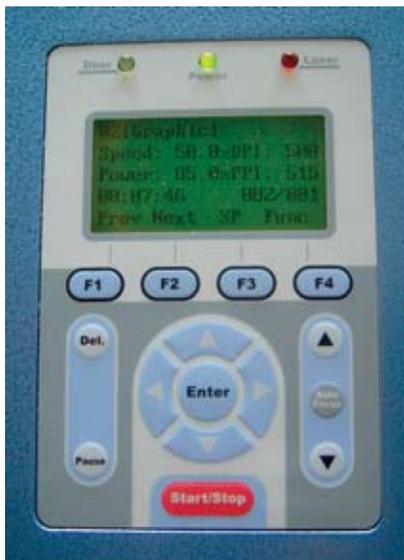
**Figure 8: Cutting materials like IKON-Metal can produce quite a light show.**

Windows XP Professional and CorelDRAW X3, both of which worked flawlessly. For those of you using Windows Vista, a driver is already available for the GX that will accommodate this software.

Although I had access to a standard printer port on the laser (Fig. 10), I opted to use the USB port. I ran the laser on 220 volts AC which drew about 2000 watts. All models of the GX over 40 watts require a 220-240 volt power source. Smaller models can run on either 110 or 220 volts.

As mentioned earlier, the work area on the LaserPro Spirit GX laser is quite large, measuring 34" x 24" with the cutting table in place. The work area can be expanded to 38" by simply removing the cutting table and enabling the SmartACT feature.

The drive mechanism for the GX uses a DC Servo motor, which provides very smooth operation. In ad-



**Figure 11: The control panel has many program levels, but is very user friendly.**

dition, most of its parts, including belts, motors and control boards, appear to be easily replaceable by anyone who is reasonably adept with a screwdriver and who can contact a service technician by telephone.

The LaserPro machines, like so many of the lasers on the market today, are built overseas. This particular model is made in Taiwan. However, when talking with Jeff Lee, the GCC representative who trained me on how to use the GX, I learned that some of the major components used in the LaserPro machines are actually American made, most notably the Synrad laser tube.

Like many of the features on the GX, the control panel (Fig. 11) is very easy to use. At first glance it may look a bit daunting with all of its program levels, but the LCD display walks you through each process making it easy even for a beginner to operate.

GCC features its Auto Focus device (Fig. 12) as a standard item on all of its LaserPro laser engravers that makes focusing a one-touch process. The Spirit GX model uses SmartPIN Auto Focus—a plug-and-play probe design that can be removed when not in use (Fig. 13). If there's anything on the GX that's susceptible to damage, I believe this mechanism is it. Here's why: The plastic "pen" has a metal plunger on the end that tells a sensor inside the pen when the lens is properly focused. When I first saw this plunger, I admit my first concern was that it might leave tiny scratches wherever it touched the material, especially when using materials like black brass or acrylic, but using the machine quite extensively with various types of materials helped to alleviate this concern. It became evident that this mechanism could touch the surface of the material without leaving any telltale marks.

The problem with this auto-focus pen, however, can occur if it's left on the lens assembly when cutting



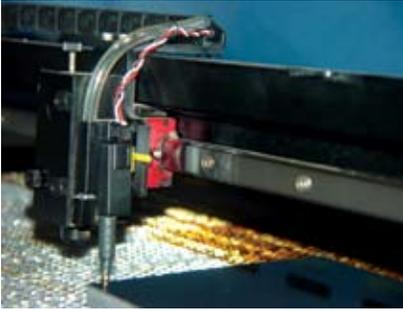
**Figure 9: This first attempt at 3-D engraving wood is a reminder that 60 watts is a powerful laser.**

or engraving materials that tend to flame-up. It would not be difficult for a flame up to melt the end of the plastic housing unit that holds the plunger. Although this unit was tolerant of my repeated mistakes and continued to perform throughout the trial, I would definitely recommend keeping a spare around just in case, especially since they are not that expensive and they are user replaceable. The GX also provides a manual-focusing tool for emergencies, but once you get used to the auto-focus feature you'll never want to use a manual-focusing tool again!

While we're considering focusing, let's discuss the ability of the GX to both focus and begin engraving from anywhere on the table. This allows users to set the X-Y axis at any point on the table rather than just the upper left-hand corner, which is not commonly seen on laser engraving machines. I find it to be very useful, especially when working with items such as silver trays and glass bowls or when working with odd-shaped items. This SmartCENTER feature (Fig. 14) can also be used to engrave items such as plaques by setting the upper left-hand corner of the object and the lower right-hand corner of the object. This eliminates any



**Figure 10: The GX can be driven using a traditional parallel port printer cable or a USB cable.**



**Figure 12 (top) and 13 (bottom): The SmartPIN Auto Focus device can be removed when it's not in use.**

measuring by the user and calls on the laser to determine size and adjust itself accordingly. This makes short work of engraving those one-of-a-kind jobs.

Although I've discussed the GX's sturdy steel cabinet, one thing I haven't mentioned yet is the SmartLID design (Fig. 15). This feature comes in very handy as it allows full access to the inside of the cabinet by opening the entire top portion of the cabinet. This is accomplished by using a pair of front-mounted hinges and internal locking support arms.

The panel on top of the SmartLID is made of Lexan, a highly durable polycarbonate resin thermoplastic. While similar to acrylic in appear-



**Figure 15: LaserPro's SmartLID design allows for loading extra large or heavy materials.**

ance, Lexan is far more durable and scratch resistant than acrylic and can block and absorb the laser's harmful rays.

Finally, it's time to discuss this laser's ability to create halftones (photographs). Most engravers use special software, such as PhotoGrav, to accomplish this, but the Spirit GX has an automatic halftone feature in its driver software. This means the system will automatically assign a halftone screen or dithering pattern to grayscale images without the need for additional third-party software. Of course, the more time given to the engraving, the better the results will be, but an image that's enhanced using 8x8 dithering with a corner dot pattern is nothing short of excellent as far as laser images go (Fig. 16).

In my testing, the three types of diffusion that could be added to the image didn't seem to make a huge difference in the finished product, but then my testing was limited and my eye isn't the best for such things. It took some trial and error for me to get good images using the Spirit GX driver, but once I got the hang of it, it was quite simple. I would recommend running a test or two before you try to engrave a photograph on an irreplaceable substrate.

The GCC LaserPro Spirit GX laser I tested was a 60-watt CO<sub>2</sub> laser that ran at 80 IPS. It was screaming fast and powerful enough in wattage to make use of this speed. With a suggested list price at about \$36,700, it's reasonably priced for a laser in this class.

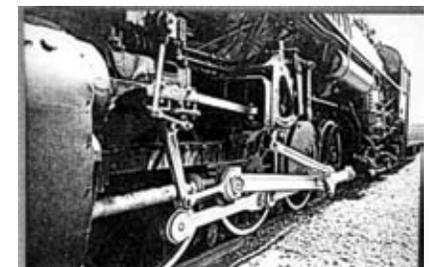
Like other laser manufacturers, GCC offers a wide variety of laser engraving units designed to meet both general applications, such as those used in the award industry, as well as some highly specific applications. To be sure, the GX is intended for a specific niche in the laser market. With its large table, it falls into the category of a high production machine for highly specialized applications such as engraving large items like cabinet doors or the 3-D architectural modeling market. Few award dealers need all of this system's capabilities, but if you have these capabilities, you're likely to enjoy them. It is through reaching out to fill the



**Figure 14: The SmartCENTER feature automatically determines the material size and the center of the job.**

broader needs of other industries like the airline industry, military/government applications or unique users' needs such as the architectural market that the industry matures as a whole. It's through these efforts to fill the needs of others that laser manufacturers better fill our needs both in design and in the ability to reduce cost.

The GX is a wonderful laser to work with and although it may not be the exact model I would recommend for an entry-level shop, it is certainly well-suited for a sign shop that wants to cut acrylic letter faces or an operation where a large number of items are duplicated over and over. For example, it would be an ideal machine for a commercial name badge maker that produces thousands upon thousands of plastic badges, or a picture framer who wants to laser-cut mats for pictures. Working with the GX was both fun and educational. I appreciated and enjoyed the opportunity few are given without first having to spend a lot of money to purchase such a machine! 



**Figure 16: The GX driver has its own dithering capabilities for lasering halftones like this one.**