Operating and Modification Instructions For Your GBC® brand HS100 (4”), HS200 (9”) or HS300 (12”) Pouch Laminator

Get perfect toner transfers when using our “Direct Etch” method for making instant circuit boards or chemically “milling” brass, and for creating B&W and full-color “dry rub down” decals. GBC® (General Binding Corporation) had designed a most unusual “pouch laminator”. You get the benefits of a “hot roll” laminator at a fraction of what a real one costs! They achieve this by externally heating (versus expensive internally heated rollers). This unit exerts pin-point heat and pressure to make absolutely perfect toner transfers from our “TTS” paper to brass, copper as well as to our line of specialty foils for making amazingly simple “dry transfer” run-down decals!

The first part of this instruction set covers some simple modifications you will need to make if you plan on making PCB’s thicker than .032”, (otherwise, no modifications are necessary.) If you elect to modify your unit, it will take you about 15 minutes to complete. The second part of this instruction set covers basic operation of your unit. You are responsible for any modifications you perform to this unit. Please read the Operating Instructions and warranty conditions enclosed with the unit before making any modifications to your unit if you are unsure. Keep the box, packing materials and removed parts from these modification instructions to be able to “unmodify” your unit if you need to send it back to the manufacturer for warranty repairs, etc.

**TOOLS REQUIRED:**
- Long, thin #2 Phillips screwdriver
- Needle nose pliers
- Flashlight

**MODIFYING YOUR UNIT**

**OPEN THE UNIT:**

1) Start with the unit unplugged and cold: Remove the 4 Phillips screws from the rear of the unit. Keep these screws separate from others that will be coming off.

2) Rotate the front (silver half) under the back half: This will give you ample room for these minor modifications.

3) Remove three chassis mounting screws: One is under the chassis on the right side, another is in the extreme lower left corner and may be hard to see right away because of several wires in that vicinity. A flashlight helps to spot it. The last one is in the upper left corner.

4) Pull some slack to the thermistor wires: Notice on the front right corner of the chassis, there is a wire-tie holding 4 wires; two white and two black. Pull a little bit of slack to the left of the wire-tie.

5) Remove the chassis. Grasp the assembly by the front and pull it out from the back case a few inches.
COOLER PLATE MODIFICATION:

6) Remove the two rear “guide” plates: Notice from the top side view, there are two spring-loaded “feet” that hold the plates in place. CAREFULLY push both feet back... just barely enough to get the plates “tongue” out of the slot. Do the same with the other side and the second plate. Pay particular attention to the way the two plates face each other with the bend edge away from each other. NOTE: If you press the retaining feet too far they will break.

7) Remove spacers on plates: One plate has two clear plastic squares on the end ‘tabs’ where the other plate has narrow strips of silicone rubber. Remove all four of these spacers and keep in a safe spot in case you need to “unmodify” this unit.

8) Insert the plates back to their original position: Both are identical so it doesn’t matter which ones goes in first. Insert both and snap them down under the retaining feet. Lay the chassis back into the rear case.

MOTOR MODIFICATION:

9) Offset the top motor flange on the assembly: Notice there are two screws holding the motor to a pivoting plastic assembly (pivoting on the lower screw). The motor’s top flange has a pin in one hole and a screw in the other. Remove the uppermost screw, lift the flange a 1/4” and rotate the motor forward so that the “pinned” hole is now over the “screw” hole and the original screw hole is “floating in space”. You may have to push the assembly down at the same time as pivoting the motor into its new position. Replace the screw. NOTE: The screw will have to start on a slight angle due to the flange being offset a bit and will require a bit of force to get it started. Don’t overtighten!

10) Remove the spring: Next to the top motor screw you just worked on, is a small spring. This spring keeps the motor engaged to the drive roller. Under “normal” use, (e.g. non-modified form) the tab in the back would be depressed to disengage the motor in the event you had a jammed “pouch” situation. Using needle-nose pliers, remove the spring off the top mounting post. Now remove the lower motor mounting screw.

11) Remove Motor Assembly: The pivoting motor assembly is in a “track” that you can’t see, so you must let it drop it down to the bottom of the case to allow it to escape the “track”, then wiggle it out and away from the chassis.

12) Remove “Release Lever”: The tab that sticks out the rear of the unit needs to be removed from the motor assembly. Because the motor has been re-aligned, the tab will not allow the motor to pivot enough to be able to disengage the motor in the event you had a jam. If there was a jam and a rigid board was half way through the unit, you would not be able to open the unit up! If there is a subsequent jam during use, (which is unlikely) you would reach a finger inside the rear “Release” opening and push the pivoting motor assembly far enough down to disengage the motor drive gear to be able to remove the board.

13) Exchange Gears: Swap the small and large gears and then reassemble. This will take a bit of force or tweaking to get the motor assembly to re-engage the “track”. Start from the motor assembly pivoting low. As it is raised up, pull the assembly towards the rear during the sweep back to the top. Once you have it back on track, install the screw being careful not to over tighten, then reattach the spring to the post with needle-nose pliers.

RE-ASSEMBLE:

14) Secure the chassis: Reinstall the three screws into the two lower and the top left holes. If you find the lower left hole is too difficult to get to because of the wires, you can skip this mounting point since the two opposite corners are sufficient to hold the chassis stable in the base shell.

15) Close The Unit: Look at the two “points” that are sticking out from the bottom–front edge of the back half of the shell where the two shells mate. Make sure they are both just inside the mating silver front half. It’s a very tight fit. Work the casing back together manipulating all sides. Once it’s aligned, you will have a good fit. Before inserting the four rear screws, made sure the bottom seam where the two shells come together are smooth and not overlapping. Do not overtighten!

MODIFICATIONS COMPLETED!
OPERATING INSTRUCTIONS

Side the power switch to “on” and slide the “Temp Set” to the right (for the higher of the two heat settings). Wait until the red “ready” light illuminates in the insertion slot.

NOTE: If you slide the “Temp Set” to the middle (heat off or “cold” setting), the red “ready” light will continuously be illuminated. If the “ready” light extinguishes (which won’t happen often after the unit has done its first warm-up), it means the temperature is below the proper setting and full A/C power is being put to the heaters to reestablish a “constant” temperature. If this happens when a board is going through the unit, you will want to run the board through the unit again as soon as it exits the unit.

Preparing your PCB laminate. There will undoubtedly be oxidation on the copper surfaces. Using a green & yellow “ScotchBrite” scouring pad, put a drop of dish washing soap on the green side and with water, make a nice scratch pattern all over the surface of the copper. Rinse good and dry with a paper towel. Anything else is overkill.

Align your toner image over the copper board and insert squarely into the slot. The drive rollers will take the board and paper, and process it through the unit. When it exits out the back, it will halt and stay horizontal until you pull it all the way out.

Grab the board by the edges, slide it out the back of the unit and slip the board into a tray of water. Let the board sit in the water bath for a minute or two to allow the paper to lift off on its own. There is no problem if you leave the board in the water, so don’t worry about getting out of the water after the paper floats off. Rinse the board under running water and pat dry. Apply GreenTRF as per instructions (see “About TRF Foils”).

WARNINGS & CAUTIONS:
CAUTION: Insert nothing thicker than .080”, (which would be 1 – .064” PCB plus 2 “TTS” sheets of transfer paper). The quick way to get a visual on board thickness is to compare the edge of your PCB to one or two credit cards. Credit cards are all about .032” thick. How convenient!

WARNING: Never Leave The Unit Running Unattended! This unit runs very hot and if a malfunction were to occur, it could result in a melt-down or worse... a fire! There Is No Minimum Length Of Board You Can Process, however... if it is too short (less than 3-1/2”), you’ll have difficulty pushing it in far enough to catch the transport rollers, and, when it comes out it might not be long enough for you to get a hold of it! After a board is inserted, you won’t be able to pull it back out because the rollers are under extreme spring pressure. If you insert a long board on an angle and it looks as though it is going to hit a side wall TURN THE UNIT OFF! On the back of the unit is an opening marked “RELEASE”. Insert a finger ABOVE the “boxed” molding and press down to disengage the motor to allow you to pull the board out somewhat easily.

TROUBLE SHOOTING:
If the TTS paper “pops” away from the board before it gets put in the water bath, it indicates that either the temperature applied to the paper, or the toner density printed on the transfer paper is too low. The first step is to isolate these two possibilities. Cut up some of the sample PCB “test” images that came with your unit and test them on any piece of scrap board. Ensure the board scrap is properly cleaned so you don’t go on a wild goose chase looking for the problem! If the toner still does not properly stick, it is definitely a temperature problem and the unit may be defective.

NOTE: It is easy to “bump” the temperature switch towards the center “heat off” position! Remember that the red indicator will always stay illuminated when in the “cold” position! Slide the switch far left and then back to the far right to confirm.

If that doesn’t fix it, run another test of your toner image, but this time, run the board through twice. Toners do vary a little bit in their formulations for different OEM’s where some require a higher heat range. If the problem still exists, give us a call. Your unit may need servicing. This is the only problem we’ve experienced in our extensive testing of this unit to date. If you experience any problems with this unit, call us immediately! We are very interested to know of any problems you have discovered.
ABOUT “TRF” FOILS:
 Included with your unit are five different samples of our new line of Toner Reactive Foils, each for a specific purpose. Read the information about these foils on the inside cover of the TTS instructions. For PCB fabrication and “Chemical Milling” of brass, you’ll be using GreenTRF. (WhiteTRF is for “Silk Screen” layer).

The objectives of the GreenTRF is to seal the toner from etchant getting into the toner image causing “pitting” and also to allow you to use the new technique, called “Contact Etch” without needing an etching tank (!), fully explained in our “Tips and Tricks” section on our web site at www.pulsar.gs.

To use GreenTRF, simply cut a piece large enough to cover the entire length of the board. Lay the foil “dull side down” over the toner, wrap an inch or two around the leading edge of the board and insert it into the TIA. Immediately grab the tail end and tug on the film to prevent any wrinkles of the film. When the board exits, either let the board cool to room temperature or put in a tray of water for an instant cool-down... then peel back the GreenTRF and discard.

SETTING PRINTER DENSITY:
The newest 1200dpi printers from HP have their density control hidden from easy access due to the installer putting some files in hard to find locations on your hard drive. We have not tested the following procedure on all of the HP’s, so we’d appreciate your feedback on differences you find to be more accurate. Users of other OEM brand names besides HP may also find this information useful. The print driver for Windows offers only a “Paper Selection” to choose Plain Paper, Rough Paper, Transparency, etc. A thorough review of both the printed documentation that came with the printer and the online help confirms that the DRIVER offers no direct way to set the default toner density. Changing this setting from its default value of 3 to the max value of 5 makes for good PCB transfers. However, you must remember that ANYTHING sent to the printer from ANY PROGRAM after you do this will come out at high density. It is therefore necessary to run this “config program” again after you are done printing onto our TTS paper. Many set density to “1” for lowest toner consumption and an improvement to image “crispness”. Visit our site for the latest tricks and techniques for this “direct-etch” process.

MAKING DECALS:
Your “TIA” unit is also used for making amazing full color decals! You already know about the Green and WhiteTRF, “but what are these other 3 films?” you are probably asking yourself. Refer back to the TTS instructions under “B&W and Full Color Decals” and “Imaging to Glass & Mirrors” columns. That’s where you’ll read about how they are used, however, there is one product you will need to buy called “KK-2000” in order to make use of some of these techniques. You can order direct from us at $12.95, or call your local “fabric” store to see if they have it in stock.

OTHER USES FOR YOUR “TIA”:
DRY FILM: Because your applicator uses “hot rollers”, you can apply photographic “dry film” for using the “UV” exposure system. Not bad, figuring that “real” hot roll laminators (that have their heaters INTERNAL to the rollers), sell for a minimum of $1,200!

CHEMICAL MILLING: The web site explains this in detail. Since we don’t have the room here, suffice to say, you can make “parts” out of brass sheet in much the same way we make PCB’s. A real boon to “scale” hobbyist out there.

AS A “POUCH” LAMINATOR: What a surprise! Purchase “pouches” for clear lamination purposes of photos, etc. at your local office supply store.