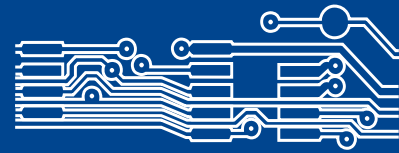


Rapid PCB Prototyping Newsletter



Wilsonville, OR

October 2003

Introducing the LPKF ProtoMat® H100. The Fastest and Most Comfortable Prototyping System Yet

Does this scenario sound familiar? You need a moderate-size prototype board fabricated in one day, but most of the day is consumed with the board's plating and laminating time that can't be shortened. So how do you get it done comfortably in one day, and with the quality that you need? You use the LPKF ProtoMat H100 to greatly reduce the board milling time.

The ProtoMat H100 achieves this goal by providing a rich set of automated tool adjustment, calibration, and board alignment features. Accompanying all of this is a powerful 100,000 rpm milling motor, which complements the plotter's advanced board positioning system and precise X-Y motion controller. The benefits of using the ProtoMat H100 are evident when you realize that your board prototyping turnaround time and quality rate will significantly increase because of these new capabilities:

- Greater speed
- Automatic front-to-back and multilayer alignment
- Automatic tool calibration
- Integrated vacuum table top

The top speed for the H100 is two to four times greater than the top speed for other ProtoMat machines. As a result, the milling speed for the H100 can reach up to 4 inches (100 mm) per second. The typical average speed is two times greater.

Front-to-back and multilayer board alignment is completely automated, due to a camera vision system attached to the milling head. The camera recognizes alignment fiducials embedded in the board layers, so once they're located you can remove, remount, or flip the board and it's always properly aligned. Fiducial recognition ensures accurate through-hole drilling and artwork alignment for multilayer boards, and it prevents errors like milling the wrong side of the board stack after placing the board back on the machine upside down, or misaligning the board by 180°.

Calibration for changed milling tools is also completely automated. The H100 uses a sensor located in the plotter's table top to automatically set the bit milling depth, and the software-controlled adjustment has an accuracy of 5 µm (0.2 mils). The automation of these alignment and calibration tasks eliminates frequent operator interaction, so you can run the board milling operation unattended for long periods.

The H100 includes an integrated vacuum table top, so you can securely mount thin and flexible substrates on the plotter and be assured that the material stays perfectly flat. This eliminates any milling depth deviations that might occur due to substrate unevenness.

In conclusion, the LPKF ProtoMat H100 possesses many new features found only in high-volume production systems. These features further improve the capabilities of in-house PCB prototyping equipment.



LPKF ProtoMat H100

Introducing the LPKF MiniContac III. A Reverse Pulse Plating System at a Special Introductory Price

The LPKF MiniContac III is a compact through-hole electroplating tank that can be placed on a table top, providing the best possible in-house through-hole plating for double-sided and multilayer prototype PCBs. The plating process is quick and easy, saving your company countless man-hours and eliminating the need for outside suppliers. This is the simplest system known on the market to use for galvanic through-hole plating in terms of the number of baths and production steps.

The LPKF MiniContac III plating system benefits from state-of-the-art chemicals, so the process requires no specialized knowledge of chemistry or galvanizing. The system also takes advantage of the latest plating technology, called reverse pulse plating. This new process provides uniform copper plating that allows plating of more difficult aspect ratios and smaller holes. It avoids the "bone effect" (thicker copper growth at the hole entrance) that can clog up small via holes entirely before they are completely plated. It also improves production reliability during soldering. Reverse pulse plating is achieved by using special LPKF control electronics, which monitor the entire through-hole plating process and remove excess material by the precise setting of reverse pulses (positive polarization of the board).

The machine itself is virtually maintenance-free. One complete set of chemicals is used for one year in a clean environment, and the chemicals used in the electroplating systems do not require analysis during use. The cleaning baths are completely replaced every three months, while the activator and copper plater are replenished once a year.

LPKF provides a complete disposal solution for the plating chemicals in cooperation with the Univar nationwide disposal service company. We keep the procedure as simple and as easy as possible so you can concentrate on the system's operation and not the worry of disposal.

For a limited time until December 31, 2003, LPKF is offering the MiniContac III at a special introductory price of US\$9,500. The price includes a free one year supply of chemicals and their disposal.



MiniContac III Reverse Pulse Plating System

LPKF®
Laser & Electronics

LPKF Laser & Electronics
North American Headquarters
28220 SW Boberg Rd.
Wilsonville, OR 97070

Tel: 1-503-454-4200 main
Fax: 1-503-682-7151

www.lpkfusa.com
info@lpkfusa.com

Tech Support Group:
1-503-454-4229
8am-5pm (Pacific)
support@lpkfusa.com

System Sales:
1-503-454-4219
or toll free 1-800-345-LPKF
sales@lpkfusa.com

Tool & Material Sales:
1-503-454-4242
or toll free 1-800-345-LPKF
tools@lpkfusa.com

Use www.lpkfusa.com for online technical support and access to LPKF's problem solution database 24 hours a day

Do you have a question about using your LPKF equipment or software, or do you need to resolve a problem? You can call or e-mail us and receive a prompt answer from an LPKF Technical Support technician, but you can probably find the answer yourself just as quickly if you log on to the Support section of LPKF's web site at www.lpkfusa.com. If you're a first-time visitor to the Support section, complete the free registration form and then create a login user name and password to gain access.

Click these links, depending on the kind of information you're seeking:

[Search the Knowledge Base](#) Enter one or more search keywords to display a list of problem descriptions that contain your keywords. If a problem description matches what you're seeking, click it to view the solution.

[FAQ's](#) This section contains Frequently Asked Questions and their solutions for customer issues. The FAQ section is updated frequently.

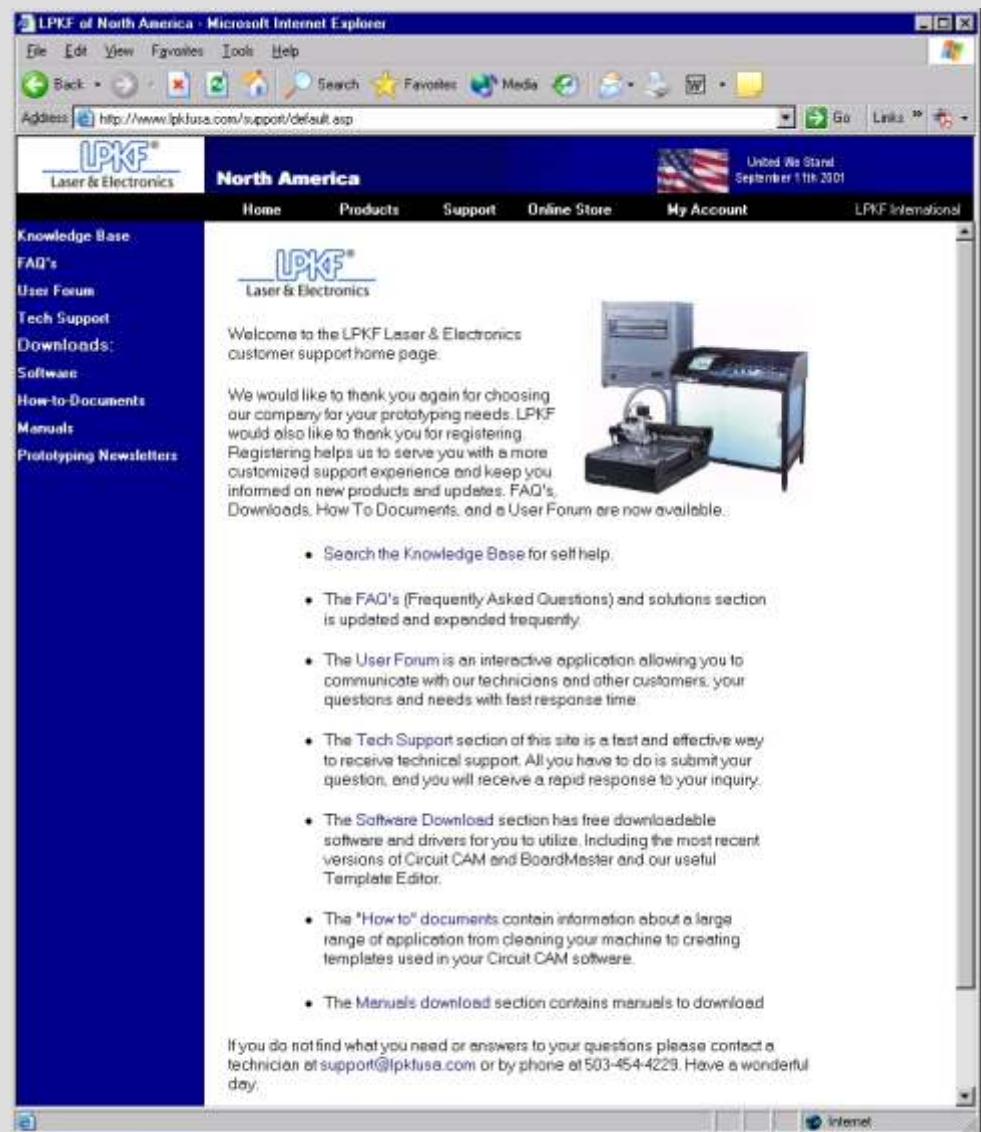
[User Forum](#) This section is an interactive message board where you can communicate with LPKF technicians, or with other customers who share your same interests. You can search for an existing message that may describe a solution to your problem, then reply to the author with your own comments. If you can't find what you're looking for, you can post a new message and receive responses to your posting.

[Tech Support](#) Submit an inquiry directly to an LPKF technician. You'll receive a case number and a prompt response to your inquiry. If you need to check on the status of your inquiry, click this link and supply your case number. The technicians will review your case and respond with an update or an answer.

[Software Download](#) This section contains the latest versions of the BoardMaster and CircuitCAM applications, as well as related accessories and drivers. You can also download the most recent Aperture Template Editor.

["How to" documents](#) View PDF versions of documents that cover a wide range of subjects, from machine cleaning techniques to CircuitCAM template generation.

[Manuals download](#) This section contains PDF versions of operation and maintenance manuals for LPKF products and accessories.



Option: Micrometer Screw Retrofit

The optional micrometer screw (part # 109688) provides infinite adjustment of the plotter milling depth when operating on materials without a milling depth limiter. Available for all LPKF circuit board plotters, this device works off of a backstop to control the milling depth.

You can retrofit the micrometer screw onto your plotter in a few easy steps. Instructions are provided when you order the micrometer screw option, or you can contact an LPKF Technical Support technician for retrofit information.



Micrometer Screw

Customer Testimonials Get a Free LPKF Polo Shirt

Do you have a success story that you would like to relate to everyone about using your LPKF equipment, or about receiving superior service from LPKF? Download our testimonial form from the LPKF web site at www.lpkfusa.com/testimonial.pdf, then FAX the completed form to us at (503) 682-7151 and we'll send you a free LPKF polo shirt. Sizes are available for both men and women.

With your signed permission, we may quote all or part of your testimonial in future LPKF advertising or publications.



Dust Extraction System with Integrated Autoswitch

LPKF offers a new heavy-duty, variable speed, fully automatic dust extraction system. This industrial-quality vacuum unit is equipped with HEPA (High Efficiency Particulate Air) filtration and it's fully able to handle all milling and drilling dust, including glass fiber-reinforced substrates. The LPKF dust extraction unit can be directly connected with any LPKF ProtoMat and most older plotter systems, and the integrated autoswitch synchronously turns the vacuum unit on and off with the milling motor. This system is capable of continuous operation, and it guarantees 100% absorption of the milling dust, minimum operating noise, and maximum life of the vacuum system.

The new LPKF dust extraction system (part # 050114) operates at 115V and it is available to order for US\$680.00 from the LPKF web site Online Store (www.lpkfusa.com/store), or by conventional order.



Dust Extraction System

LPKF Laser Services

LPKF's Laser Services positions itself on the development leading edge of precision laser cutting and etching technology. Using the LPKF MicroLine Drill 600, the group researches and tests microvia (50 to 100 microns; 2 to 4 mils) drill speed and production quality on a variety of new and standard materials, and also advances flex circuit production technology. Laser Services compiles data on optimum fabrication techniques, so contact them if you're looking for advice related to laser drilling or etching issues.

Laser Services also provides a valuable benefit to customers by assisting them with their board prototyping tasks. Do you need microvias placed on your board, a special flex circuit produced, or experimental production performed on special material? Send your request to LPKF (e-mail: whfner@lpkfusa.com) and Laser Services will review it and send you a quote for producing what you need. They'll even generate production samples, so you can see how well the LPKF MicroLine Drill 600 can work for you. We think you'll conclude that LPKF's Laser Services can ably assist you with your prototyping projects, and for an economical cost.



LPKF MicroLine Drill 600

EasyContac Manual Through-Hole Plating Solution

The LPKF EasyContac Kit is developed for prototype circuit board production and PCB repairs with less than 50 through-plated holes. The kit contains the following parts conveniently packed in a handy boxed set, so it can also be used by service engineers:

- One automatic punch tool with stamp tip A for 0.6 mm (24 mil) and 0.8 mm (32 mil) (inner diameter) rivets
- One stamp tip B for 1.0 mm (40 mil) and 1.2 mm (48 mil) (inner diameter) rivets
- One pair of tweezers
- One anvil plate
- 1,000 rivets each for the four different sizes

The key components of the LPKF EasyContac Kit are rivets made out of a special copper alloy. These rivets are available with external diameters of 0.8mm (31mil), 1.0mm (39mil), 1.4mm (55mil) and 1.6mm (63mil). The inner diameter is 0.2mm (8mil) or 0.4mm (16mil) smaller. They are placed in the hole by hand and riveted with the help of a punch tool. The hole can still be populated with a component lead if required before soldering. The LPKF EasyContac Kit (part # 110914) is available to order for US\$225.00 from the LPKF web site Online Store (www.lpkfusa.com/store), or by conventional order.



EasyContac Kit

Limited Extended Warranty Includes On-site Maintenance

Purchasing an extended warranty for your LPKF system buys you peace of mind, knowing that you're covered for most repairs and that you have yearly scheduled maintenance. The maintenance is performed on-site at your location by an LPKF technician. While on-site, the technician can provide any additional system training you might need.

The extended warranty program covers the repair of system components for a period of one year, and it's renewable on a yearly basis. On-site scheduled maintenance is performed once a year, and it involves a complete system alignment, lubrication, and calibration. Cost for the extended warranty is US\$2,000 to \$3,000, depending on the system. Airfare for the LPKF technician is included in the cost.

On-site Maintenance Program for Systems with Expired Warranty

LPKF offers a comprehensive maintenance program for systems with expired warranties. The maintenance is recommended once a year, and it's performed on-site at your location by an LPKF technician. This maintenance is valuable preventive care for your system, and it involves a complete system alignment, lubrication, and calibration. The only requirement is that LPKF establishes the time for the scheduled maintenance. Any repairs or other services are an additional charge. The cost for this maintenance program is US\$1,200.

Tips from Technical Support

Back up your CircuitCAM and BoardMaster Configuration Files

We recommend that you back up your CircuitCAM and BoardMaster configuration files so you won't risk losing your custom settings. Follow these steps:

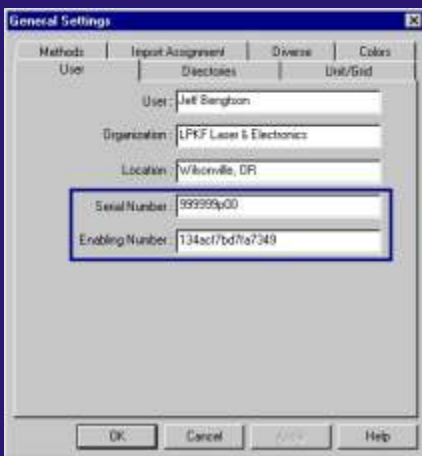
1. Open the C:\LPKF3x directory (for 3.x users), or the C:\LPKF4x directory (for 4.x users).
2. Copy the Ape_Templates and New_Templates folders to a network drive or to a floppy diskette.
3. Open the Bmaster folder and copy all files with a .TOL, .INI, .MCH, .PHS, .DIS, .VAC, and .TLS extension to a network drive or to a floppy diskette.

These files occupy approximately 1.0MB of disk space, so they should all fit onto the same floppy diskette.

Save Your CircuitCAM Serial Number and Enabling Number

A computer hard disk crash or a lost CircuitCAM software license card could cause you to lose your CircuitCAM product serial number and enabling number. Follow these steps to make a backup of this important information:

1. Open CircuitCAM, then click the Config menu and click General Settings. The General Settings dialog box appears.
2. Click the User tab. Note the values in the Serial Number and Enabling Number fields.



3. Copy an image of the dialog box to the Windows Clipboard by holding down the Alt key and then pressing the Print Screen key.
4. Paste the image into a word processor or graphics application, then save the file.

FAQs



Q Why does this error message appear each time BoardMaster 4.0 (Build 172) starts in Windows 95, 98, NT 4.0, Windows 2000 or Windows XP, even if the Use FIFO buffers option was previously disabled?



A Click OK to dismiss the error message. BoardMaster and your plotter will operate properly. To eliminate this message, log on to the Support area of the LPKF web site at www.lpkfusa.com. Click the Software Download section, then click the Download link for the item titled "BoardMaster 4.0 (build 172a) EXE replacement file" to download [bm40-172a_exe_only.zip](#).

Extract [bmaster.exe](#) from the ZIP file. This is the build 172a version of just the BoardMaster executable file. Replace the version of [bmaster.exe](#) in your LPKF40\BMaster directory with this downloaded version.

When you start BoardMaster 4.0 (Build 172a), a similar FIFO error message appears with an additional "Don't show this message again!" Checkbox option in the lower left corner. Check this option and click OK to prevent the FIFO message from reappearing.

Q How do I set the proper milling tool depth for my ProtoMat Plotter?

A The LPKF web site (www.lpkfusa.com) has a document in PDF format that provides detailed procedures on how to set the milling tool depth. To view the PDF file, log on to the Support area of the web site and click the "How to" documents section. Next, click the Download link for the document titled "How to set the milling tool depth (Except Protomat® 95s, 95sII)" to open the PDF file.

Buy tools and accessories on LPKF's secure web site before 12:00 noon (PST) and your order ships the same day

Easy, fast, and secure purchases are only a few mouse clicks away when you use LPKF's Online Store at www.lpkfusa.com/store. As an added bonus, your order ships to you the same day you make the purchase if your order is completed before 12:00 noon USA Pacific Standard time (PST). When it ships, LPKF promptly sends you an e-mail notification that contains order shipping and tracking information.

You can easily find what you're looking for by using our versatile Online Store search engine. Check out the different ways you can locate the items you need:

- Search by entering a product name (partial names are accepted)
- Browse by selecting a product category
- Search by entering a product part number

Purchase online with peace of mind, knowing that the LPKF Online Store uses the most advanced SSL (Secure Socket Layer) certificate authentication and data encryption techniques. In addition to choosing from several credit card purchasing options (Visa, MasterCard, American Express), you can also choose to have LPKF send you an invoice when you provide a purchase order number.

