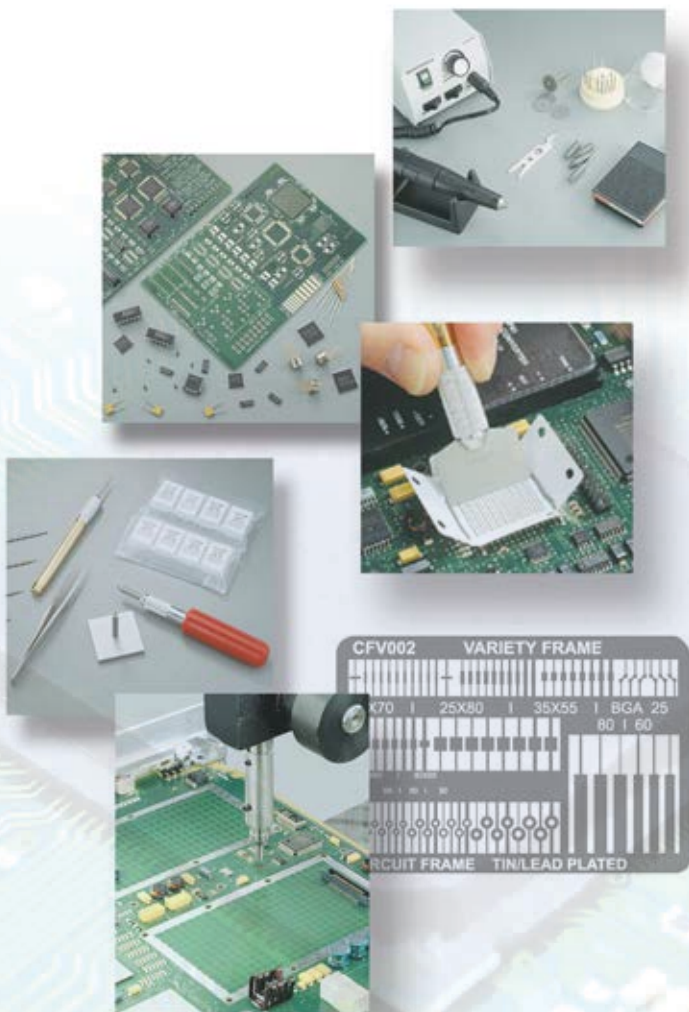


CIRCUITMEDIC⁺

First-Aid Kits for Circuit Boards[®]



Supporting electronics manufacturing companies around the world with first-aid kits, tools, materials, and illustrated guides for circuit board rework and repair for 40 years.

Circuit board repair is a challenge...

When the inevitable first-aid is needed for your rework project, provide your technicians with time-tested tools and materials designed and built to get the job done quickly and reliably. These unique tools and materials are precisely what is needed to achieve successful results and are used throughout the commercial, medical and military electronics industries.



Circuitmedic is a division of Circuit Technology Center, the country's most innovative specialists in circuit board rework and repair.



Surgeon grade rework and repair, by the book and guaranteed.®

www.circuitrework.com

CircuitMedic Repair and Rework Guides

CircuitMedic kits are specifically designed to meet the requirements outlined in IPC repair and rework specifications and include in-depth instructions that follow these same standards.

Our guidebook follows IPC 7711/7721 standards and provides step-by-step procedures, including illustrations and video for various rework and board/repair challenges you may face when working on modern, high-density circuit boards.

Guides in sections 1 through 6 detail the proper step-by-step techniques, tools and materials, and cautions needed to reliably repair and modify bare and assembled circuit boards.

Guides in sections 7 through 9 detail the proper step-by-step techniques, tools, and materials, and cautions needed to reliably rework assembled circuit boards covering soldering, desoldering and BGA rework procedures.

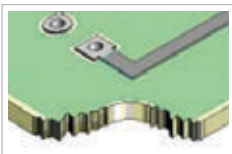
Guides in section 10 detail the requirements for replacing the solder alloy finish on electronic component leads.

Each procedure includes a "Conformance Level" indicated as high, medium, or low. The Conformance Level indicates how closely the repaired or reworked product will be to the original specifications. The Conformance Level listed for each procedure should be used as a guide only.

Each procedure also includes a "Skill Level" that provides a gauge for the requisite experience and skill needed by the operator to obtain a reliable outcome. Skill Levels are listed as intermediate, advanced, or expert. The Skill Level recommended should be used as a guide only.

Hundreds of detailed illustrations are included throughout this guidebook.

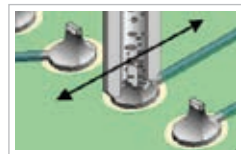
View at <https://www.circuitmedic.com/guides>



Section 3: Base board repair.



Section 4: Conductor repair.



Section 7, 8 and 9: Soldering, desoldering and BGA rework.

Professional Repair Kit

P/N 201-2100 120 VAC

P/N 201-2102 230 VAC

APPLICATIONS

- Surface Mount Pad Repair.
- Land Repair.
- Circuit Track Repair.
- Plated Hole Repair.
- Base Board Repair.

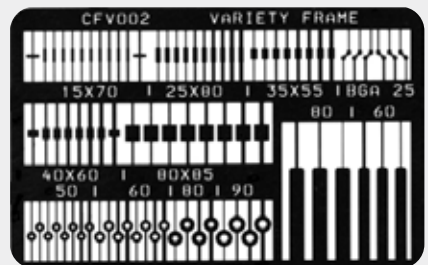
FEATURES

- Has everything you need to repair most types of circuit board damage.
- Includes dry film, epoxy-backed replacement circuits that do not use messy liquid epoxy.
- Includes eyelets and setting tools for plated through-hole repair.
- Includes Circuit Tracks to repair damaged circuits.
- Includes epoxy and color agents for solder mask or base board repair.
- All the tools and materials are neatly arranged in a conductive, ESD safe carrying case.
- Tools and materials conform to IPC guidelines.
- Every item is prime quality and time-tested to meet high standards.



Kit is shipped in a rugged, conductive plastic case safe for ESD sensitive areas.

CFV002



Professional Repair Kit

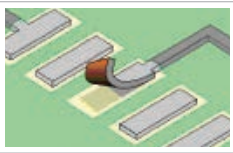
DESCRIPTION

The Professional Repair Kit is the most complete and versatile circuit board repair kit you'll find anywhere. It's the total package.

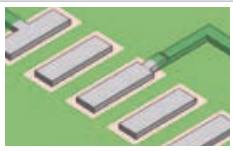
The kit includes dry film, epoxy-backed circuit frames, and unique replacement circuits that do not use messy liquid epoxy. Includes eyelets and setting tools for plated through-hole repair, Circuit Tracks to repair damaged circuits, epoxy and color agents for solder mask or base board repair, all packaged in a convenient carrying case.

If you need to repair damaged circuit boards, the all-in-one Professional Kit is what you need.

BEFORE



AFTER



Includes
replacement
surface mount
and BGA pads.

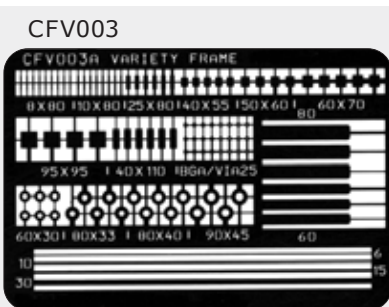
BEFORE



AFTER



Includes eyelets
and conductors
for plated hole
and circuitry repair.



Master Repair Kit

P/N 201-2400 120 VAC

P/N 201-2402 230 VAC

APPLICATIONS

- Surface Mount Pad Repair.
- Land Repair.
- Circuit Track Repair.
- Base Board Repair.

FEATURES

- Includes dry film, epoxy -backed replacement circuits that do not use messy liquid epoxy.
- Includes Circuit Tracks to repair damaged circuits.
- Includes epoxy and color agents for solder mask or base board repair.
- All the tools and materials are neatly arranged in a conductive, ESD safe carrying case.



Kit is shipped in a rugged, conductive plastic case safe for ESD sensitive areas.

- Tools and materials conform to IPC guidelines.
- Every item is prime quality and time-tested, to meet high standards.
- Does not include eyelets and setting tools for plated through hole repair.

BEFORE



AFTER

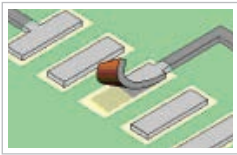


Includes replacement laminate and high strength epoxy for base board repair.

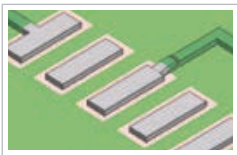
DESCRIPTION

The Master Repair Kit includes dry film, epoxy-backed circuit frames to repair lands, BGA pads and surface mount pads. The kit also includes Circuit Tracks for repairing damaged conductors, epoxy, and color agents for solder mask or base board repair. All items are packaged in a durable, ESD-safe carrying case.

BEFORE

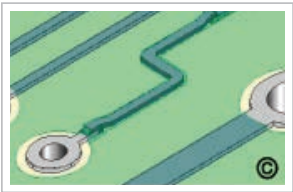
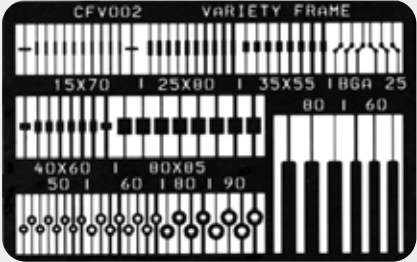


AFTER



Includes replacement surface mount and BGA pads.

CFV002



Includes replacement circuits.

Land/Pad Repair Kit

P/N 201-1400 120 VAC

P/N 201-1402 230 VAC

APPLICATIONS

- Surface Mount Pad Repair.
- Land Repair.

FEATURES

- Includes dry film, epoxy-backed replacement circuits that do not use messy liquid epoxy.
- Includes epoxy for solder mask or base board repair.
- All the tools and materials are neatly arranged in a conductive, ESD safe carrying case.
- Tools and materials conform to IPC guidelines.
- Every item is prime quality and time-tested, to meet high standards.



Kit is shipped in a rugged, conductive plastic case safe for ESD sensitive areas.

DESCRIPTION

This kit includes the tools and materials needed to reliably replace damaged lands, surface mount, and BGA pads.

Each Circuit Frame has a dry film adhesive backing. You simply select the appropriate size pad or land, trim it from the Circuit Frame, and bond it to the circuit board surface.

Included with the kit are a bonding iron and tips to match the various sizes of the lands and pads.

A multifunctional epoxy is included for over-coating the lap solder joint formed between the replacement pad and connecting circuitry.

This kit is designed to make the repair process as simple and reliable as possible. All the tools and materials are packaged in a rugged ESD safe carrying case and conform to IPC specifications.

Heat Shield Kit

P/N 201-3160

FEATURES

- Aluminized heat shield insulates the circuit board surface and components from extreme heat.
- Aluminum plates deflect excess heat.
- Quick cure high-temperature mask seals seams to block extraneous heat flow.
- Includes high-temperature tape, tools and materials.



Heat Shield Kit

DESCRIPTION

This kit includes all the tools and materials you need to protect heat sensitive areas of an assembled circuit board from excessive heat exposure during rework operations. This kit is ideal for the protection of adjacent components at risk of collateral heat damage during hot gas BGA rework.

During component rework, protection of nearby components is often mandatory to avoid collateral heat damage or inadvertent reflow.

Collateral heat damage or unintended reflow of adjacent component solder connections can result in component damage, oxidation, de-wetting, pad damage, wicking, starved joints and scorching. These issues can create new unintended rework problems. The rework technician must be constantly aware of the effect of heat on the target device or circuit, plus how it affects components near the target device on both sides of the assembly.

Measuring Microscope Pen, 25X

P/N 115-3115



DESCRIPTION

A powerful pocket pen-sized microscope with measuring reticle for precision measurements. Ideal for inspecting and measuring conductor and pad widths, plated hole diameters, and other features on circuit boards. Field of view 3.3 mm. Scale division .05mm.

Circuit Frames

Visit our website for a complete selection of Circuit Frames:
www.circuitmedic.com/products/circuitframes.html

DESCRIPTION

Imagine replacing damaged circuits without the mess of liquid epoxy, with a bond strength equal to the original, on bare or loaded circuit boards -- all in about 30 seconds. Our replacement Circuit Frames with dry-film adhesive backing make this delicate, precise procedure quick and neat. Trim out the circuit you need and bond it to the circuit board surface with a Bonding Iron.

Choose from hundreds of different shapes, plated in bright tin, tin- lead, or nickel-gold, or let us custom design and fabricate that special shape for you.

SPECIFICATIONS

Overall Size: 2.25" x 1.50" (57 x 38 mm).

Base Material: Rolled annealed copper foil .0014" (.036 mm) thick.

Adhesive Backing: B-staged modified acrylic film adhesive .002" (.051mm) thick.

Bonding Temperature: 475°F +/- 25°F (246°C +/- 14°C).

Bonding Time: 30 seconds.

Peel Strength: Minimum 8 lbs/inch (1.43 kg/cm) after cure to FR-4 material.

Shelf Life: 1 year minimum. Each Circuit Frame is stamped with the expiration date.

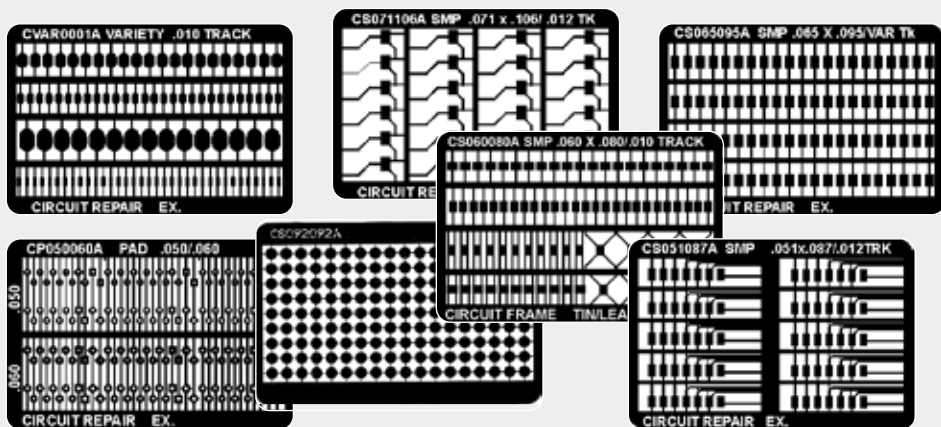
PLATING OPTIONS

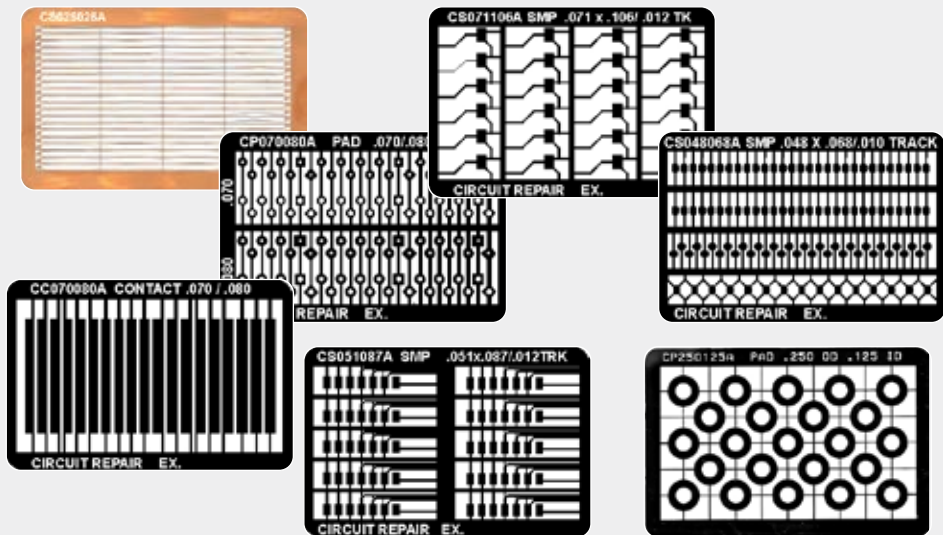
Bright Tin: .0001" (.0025 mm) Bright Tin (Lead Free).

Nickel/Gold: .000050" (.00127 mm) Gold over .000100" (.00254 mm) Nickel.

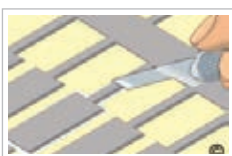
Tin/Lead: .0001" (.0025 mm) 60/40 Tin/Lead.

REACH: CircuitMedic Circuit Frames contain less than 0.1% by weight any substance listed as a very high concern in Article 59 of REACH.





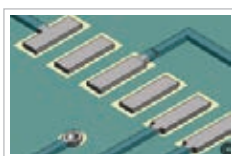
1. Remove the damaged pads and prepare the area.



2. Select a replacement pad and trim it out from the Circuit Frame.



3. Place the pad in position using tape and bond in place.

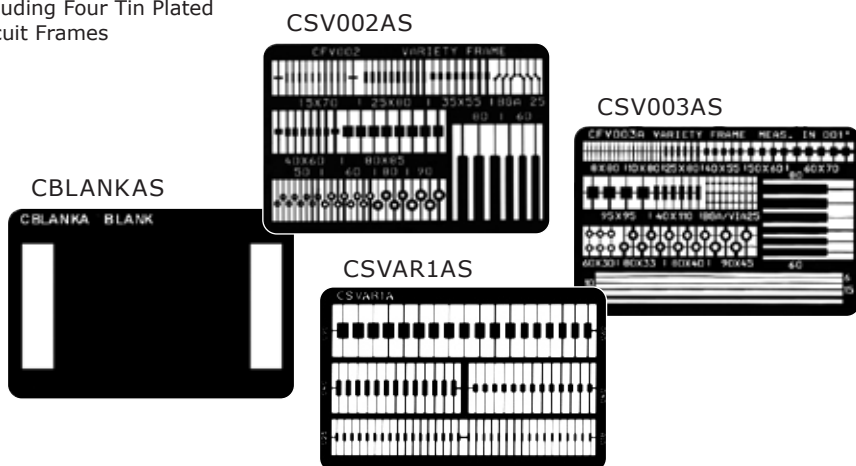


4. Complete the connection to the existing circuit.

CIRCUIT FRAME BUNDLE

P/N CBNDL-01AS

Including Four Tin Plated Circuit Frames



Circuit Track Kit

P/N 201-3130

P/N 201-3132 Refill Kit

APPLICATIONS

- Circuit Track Repair.

FEATURES

- Everything you need to repair damaged circuits and conductors.
- Circuit Tracks can form to any conductor pattern.
- Designed to meet IPC recommended guidelines.
- 19 separate items, more than 50 pieces.



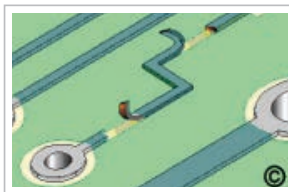
Kit is shipped in a rugged, conductive plastic case safe for ESD sensitive areas.

DESCRIPTION

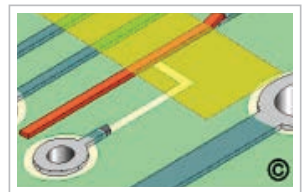
It's now easier than ever to repair damaged circuits. Circuit Tracks are rectangular-shaped conductors made of 99.9% pure CDA 11000 copper.

These rectangular ribbons closely conform to the original conductor dimensions. The replacement Circuit Track is bonded in place using prepackaged epoxy included in the kit. This kit is a great time and labor-saver and an easy solution to repairing missing or damaged circuits.

1. Remove damaged conductor.



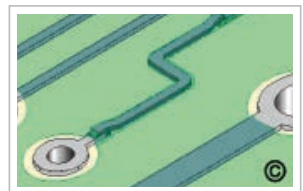
2. Solder one end.



3. Form the shape.



4. Overcoat with epoxy.



Gold Contact Plating Kit

P/N 201-6100 120 VAC

P/N 201-6102 230 VAC

FEATURES

- Specifically designed and packaged for gold edge contact plating.
- Plating probes use pre-wrapped plating anodes.
- Industry-approved and conforms to IPC guidelines.
- Variable power supply provides accurate voltage and current.



DESCRIPTION

Kit is shipped in a rugged, conductive plastic case safe for ESD sensitive areas.

Here's the perfect kit for replating solder-contaminated gold contacts or contacts that don't meet the minimum thickness specification. The kit includes a DC power supply and all the tools and materials needed for gold edge contact plating.

Plating probes use pre-wrapped, screw-on plating anodes to end the common problems associated with loosely wrapped cotton anodes.

PLATING SOLUTIONS

P/N 115-3821 Plating Solution, Gold, 1 oz (.03 liter)

P/N 115-3824 Plating Solution, Gold, 4 oz (.12 liter)

P/N 115-3831 Plating Solution, Nickel, 1 oz (.03 liter)

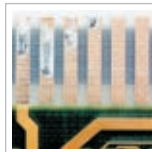
P/N 115-3834 Plating Solution, Nickel, 4 oz (.12 liter)

P/N 115-3841 Plating Solution, Electroclean, 1 oz (.03 liter)

P/N 115-3844 Plating Solution, Electroclean, 4 oz. (.12 liter)

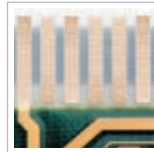


BEFORE



Gold contacts contaminated with solder.

AFTER



Gold contacts replated using the Gold Contact Plating Kit and Optional Plating Solutions.

Plated Hole Repair Kit

P/N 201-3140

P/N 201-3142 Refill Kit

APPLICATIONS

- Plated Hole Repair.

FEATURES

- Eyelets conform to IPC Guidelines.
- Versatile - has everything you need to repair plated holes in a wide variety of sizes.
- Kit contains 6 different eyelet sizes.
- Standard eyelets are RoHS compliant.



Kit contains everything you need to repair damaged plated holes.

DESCRIPTION

This kit includes all the tools and materials you need to repair damaged plated through holes in circuit boards.

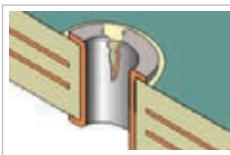
The kit includes a variety of eyelets, carbide ball mills for drilling, and setting tools to form the eyelets.

Eyelets are made of pure copper or brass and electroplated with tin.

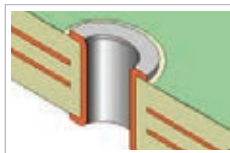


Eyelets - Eyelets are brass or copper, electroplated with tin, unless otherwise specified.

BEFORE



AFTER



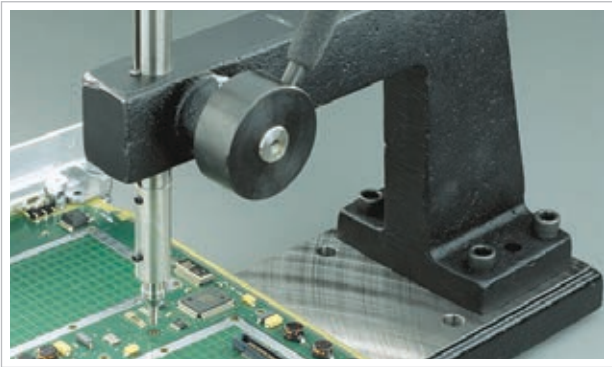
Eyelets and conductors for plated hole and circuitry repair.

Eyelet Press

P/N 110-5202

FEATURES

- Heavy-duty construction to properly form eyelets per IPC guidelines.
- Contains two small setting tools and two large setting tools.



This rugged, heavy duty press precisely forms eyelets in circuit boards for repair or assembly.

DESCRIPTION

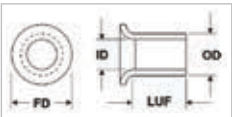
This rugged, heavy-duty press precisely forms eyelets in circuit boards for repair or assembly. The unit has a 6.50" (16.50 cm) throat depth to accommodate 12" wide circuit boards. A wide variety eyelets are available to meet most circuit board plated hole repair and rework needs.

The CircuitMedic Eyelet Press will deliver years of maintenance-free reliable production.

SPECIFICATIONS

Throat Depth: 6.50" (16.50 cm).
Minimum Throat Opening: 1.00" (2.54 cm).
Weight: 28 lbs. (13 kg.).

Flat Flange Eyelet



Funnel Flange Eyelet

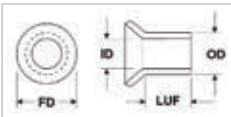


TABLE OF EYELETS

Part No.	Flange	Metal	ID	OD	LUF	FD	Setting Tool
115-7206-25	Flat	Copper	.020"	.030"	.094"	.046"	115-3120
115-7209-25	Flat	Copper	.020"	.030"	.120"	.046"	115-3120
115-7306-25	Flat	Brass	.030"	.040"	.093"	.060"	115-3120
115-7336-25	Flat	Brass	.033"	.047"	.093"	.080"	115-3120
115-7339-25	Flat	Copper	.033"	.047"	.125"	.080"	115-3120
115-7353-25	Flat	Copper	.035"	.047"	.062"	.080"	115-3120
115-7366-25	Flat	Copper	.036"	.046"	.093"	.076"	115-3120
115-7453-25	Flat	Copper	.045"	.059"	.062"	.090"	115-3120
115-7456-25	Flat	Copper	.045"	.059"	.090"	.090"	115-3120
115-7459-25	Flat	Copper	.045"	.059"	.125"	.090"	115-3120
115-7576-25	Flat	Copper	.057"	.067"	.095"	.111"	115-3126
115-7676-25	Flat	Copper	.067"	.078"	.097"	.130"	115-3126
115-8359-25	Funnel	Brass	.073"	.089"	.093"	.125"	115-3126

Base Board Repair Kit

P/N 201-3110

APPLICATIONS

- Base Board Repair.

FEATURES

- Versatile, includes everything you need for base board repair.
- Meets IPC guidelines.
- High strength, high temperature epoxy withstands demanding physical environments.
- Color agents permit matching of solder mask and base board colors.



Kit contains everything you need for base board repair.

DESCRIPTION

This versatile kit can repair many common base board material defects and damage. The kit includes Circuit Bond epoxy packs, color agents, foam swabs, mixing cups and sticks..

COLOR AGENTS

Matching epoxy to the color of the circuit board being repaired is a simple process when you use a color agent.



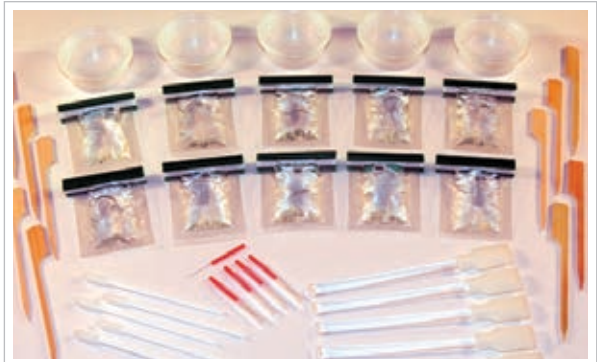
115-9102	115-9185	115-9293
115-9348	115-9358	115-9376
115-9424	115-9457	115-9560
115-9561	115-9995	115-9996

Circuit Bond Kit

P/N 115-1322

FEATURES

- Pre-measured, two-compartment packaging eliminates mixing errors.
- High strength/high temperature epoxy withstands demanding physical environments.
- Clear epoxy can be tinted with Coloring Agents.
- Includes Micro Probes, ideal for dispensing a tiny volume of epoxy.



Kit contains 10 packages of clear, low viscosity, superior strength epoxy ideal for circuit board use.

DESCRIPTION

The Circuit Bond Kit contains 10 packages of clear, low viscosity, superior strength Circuit Bond epoxy, precisely measured into two-compartment plastic packages. Circuit Bond epoxy is easy to use, and there's no measuring. Once cured, Circuit Bond epoxy makes an effective electrical insulator with excellent high-temperature, mechanical, and impact resistance properties.

The epoxy can be used to bond replacement conductors, repair burns and circuit board surface defects, and many other high-strength, high-temperature applications.

Coloring Agents are designed to mix with the epoxy to match solder mask colors commonly found on circuit boards.

EPOXY SPECIFICATIONS

Packaging: 2 gram pre-measured packages.

Mix ratio: 4 parts resin to 1 part hardener.

Color: Clear, transparent.

Pot Life: 30 minutes.

Cure cycle: 24 hours at room temperature or 4 hours @ 149°F (65°C).

Viscosity (after mixing): 2000 cps.

Operating temperature range: -67°F to 275°F (-55°C to 135°C).

Hardness: 88 Shore D

Dielectric strength: 4400 volts/mil.

Shelf Life: 6 months minimum.

Micro-Drill System

P/N 110-4105-120

P/N 110-4105-220

FEATURES

- High-quality construction for delicate work.
- Flexible telephone-style cord eliminates bothersome drive cables.
- Quick change chuck for easy bit replacement.
- Versatile forward, reverse, and variable speeds.
- Lightweight, ergonomically handpiece reduces fatigue.



The Micro-Drill System is a repair technician's dream.

DESCRIPTION

The Micro-Drill is a workhorse in a kit. This versatile powerhouse is ideal for milling, drilling, grinding, cutting, and sanding circuit boards. It removes coating, cuts circuits, cuts leads, drills holes, cuts slots, shapes FR4, and performs many other procedures using various interchangeable bits.

Unlike most hand-held tools, the Micro-Drill has a tiny, high-speed DC motor in the handpiece, eliminating bothersome drive cables and giving the technician better control. A separate power supply keeps the handpiece lightweight and reduces fatigue. Power is supplied by a panel switch or foot switch for ease of use.

Accessory Kit

P/N 110-4302

DESCRIPTION

Includes a selection of tools and bits for use with the Micro-Drill System. Includes Screw Mandrel, Threaded Mandrel, Abrading Tips, Cutoff Disks and Ball Mill Pack.

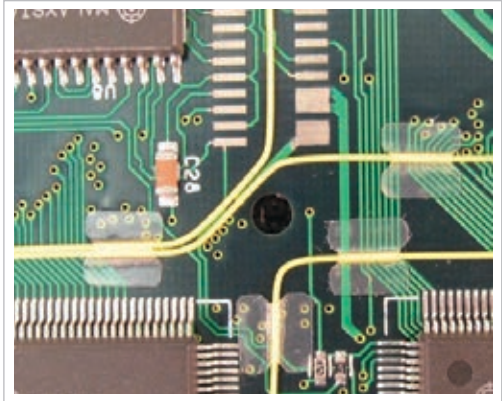


Wire Dots

See list of part numbers below.

FEATURES

- Excellent initial bond strength that increases over 72 hours to stabilize as a high strength reliable bond.
- Will hold securely after exposure to numerous chemicals, including cleaning solutions/sprays, saponifiers, mild acids, and alkalis.
- Wires will hold securely through a typical PCB hot water wash.
- Can be repositioned during and immediately after initial bonding without causing adhesive transfer or loss of bond strength.
- Retains its performance and properties for one year from date of purchase when stored at room temperature..



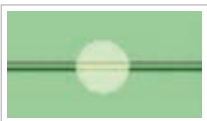
Wire Dots make the job of bonding jumper wires neat and fast.

DESCRIPTION

Wire Dots are a wire tacking system consisting of pre-cut shapes of a thin, flexible polymer film membrane coated on one side with a high-performance, electronics-grade permanent pressure-sensitive adhesive.

The result is a highly conformable, high-strength bond. The adhesive-release liner is an environmentally stable poly-coated kraft liner.

Wire Dots will perform best when applied at temperatures between 60F (15C) and 100F (38C). Do not apply below 50F (10C).



P/N 310-0651 Wire Dots,
.256" (6.5 mm) Round



P/N 310-0652 Wire Dots,
.256" (6.5 mm) Square



P/N 310-1001 Wire Dots,
.394" (10.0 mm) Round



P/N 310-1002 Wire Dots,
.394" (10.0 mm) Square

Flextac™ BGA Rework Stencils

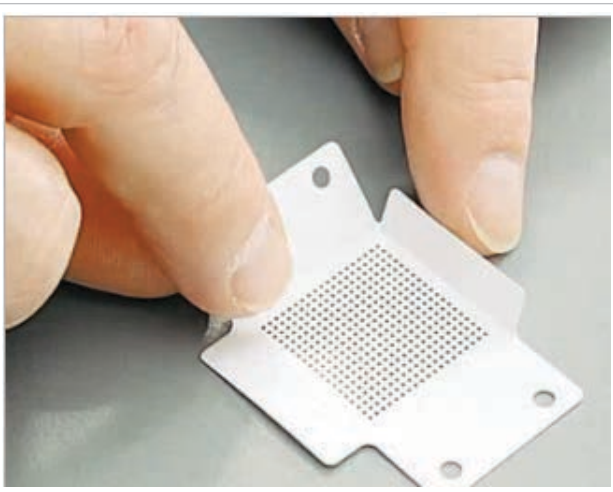
For a complete list of stencils visit:
www.circuitmedic.com/products/stencils.html

APPLICATIONS

- Applying solder paste for BGA rework.

FEATURES

- Residue-free adhesive backing seals around BGA pads to prevent solder paste bleed.
- Laser cut ensures precise aperture size.
- Disposable - eliminates tedious stencil cleaning.
- Flexible - conforms to board surface.
- Fold-up sides for easy placement and solder paste containment.



BGA rework solder paste stencils with adhesive backing. No tape or fixturing is needed.

DESCRIPTION

If you've been using metal stencils for BGA rework, we have some great news for you. Flextac BGA Rework Stencils.

These flexible solder paste stencils are laser cut from high-quality, anti-static polymer film with a residue-free adhesive backing. Because they are self-sticking, no tape or fixturing is needed. The adhesive seals around each BGA pad to prevent solder paste from bleeding under the stencil when the paste is applied. Flextac Stencils are easy to use and leave no residue on the board surface.

Typical BGA rework stencils are made from metal and require fixturing or taping to position them and hold them in place. Metal stencils warp easily, and if the circuit board has undulations in the board surface, the metal stencil will not sit flat. Since there is no gasket-like seal, solder paste can easily bleed under metal stencils when paste is applied with a squeegee. Also, solder paste can spill out over the sides of flat metal stencils contaminating the circuit board surface. Metal stencils require tedious stencil cleaning. A high level of operator skill is required to use metal stencils effectively.

Step 1. Select the proper size and fold up the side tabs.



Step 2. Peel off the cover film exposing the adhesive backing.



Step 3. Place in position using the handy side tabs.



Step 4. Apply paste using a standard metal squeegee.



Step 5. Remove the stencil and save for another reuse or dispose

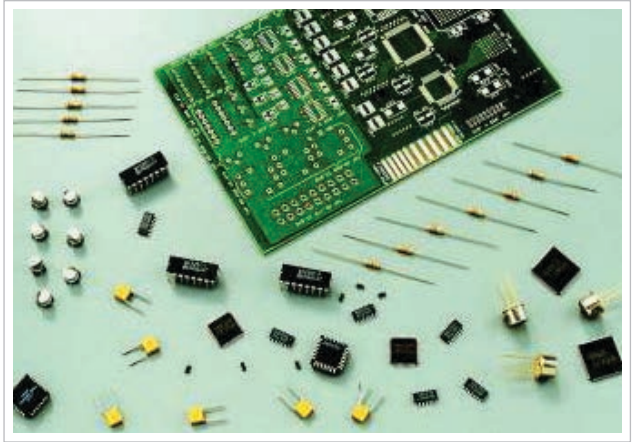


Soldering Skills Practice Kit

P/N 201-4150

FEATURES

- Includes a multi-layer PCB for realistic soldering conditions.
- Includes 15 component types required for IPC soldering skills certification.
- The perfect kit to use when obtaining IPC soldering skills certification.



Soldering Skills Practice Kit

DESCRIPTION

Are your new soldering and rework operators skilled enough to work on your valuable products? The best way to find out is to order our Solder Skills Practice Kit that allows them to work on actual projects until they develop the expertise they need.

Repair Skills Practice Kit

P/N 201-4350

DESCRIPTION

The Repair Skills Practice Kit will help operators brush up on their circuit board repair skills and give them an advantage toward becoming IPC certified. Includes a circuit board with a variety of plated holes, surface mount pads, replacement circuit tracks, eyelets, epoxies, and more.

FEATURES

- The Repair Skills Practice Kit will help operators brush up on their circuit board repair skills.
- Includes dry film, epoxy-backed replacement circuits that do not use messy liquid epoxy.
- Includes Circuit Tracks to repair damaged circuits.
- Includes epoxy and color agents for solder mask or base board repair.
- Includes eyelets for plated through-hole repair.
- Tools and materials conform to IPC guidelines.



All CircuitMedic tools and kits were developed and manufactured by Circuit Technology Center. Circuit Technology Center is recognized as the most innovative and reliable specialist in circuit board rework, repair, and component-level modification services in the world.

Rework services include removal and replacement of BGA and other bottom-terminated components, leaded surface mount components and through-hole components, BGA component re-balling services, installation of jumper wires, circuit cuts, x-ray inspection, and a wide variety of other ework and board modification services.

Component-level modification services include robotic hot solder dip services for lead tinning, solder alloy exchange and lead reconditioning services.

Circuit Board damage repair services include correcting and restoring damage to surface mount pads, though-hole pads, plated through-holes, gold edge contact repair and replating and base-board material repair.

Circuit Technology Center has been dedicated to rework and repair for 40 years; there is simply no other company with our level of knowledge and experience.



Surgeon grade rework and repair, by the book and guaranteed.®

www.circuitrework.com

Phone: 978-374-5000

Email: info@circuitrework.com

22 Parkridge Road
Haverhill, MA 01832

CIRCUITMEDIC

First-Aid Kits for Circuit Boards®



CIRCUIT 
TECHNOLOGY CENTER

Surgeon grade rework and repair, by the book and guaranteed.®

www.circuitrework.com

Haverhill, MA 01832-1293
Phone: 978.373.1600
Fax: 978.372.5700

E-Mail: info@circuitmedic.com
Web Site: www.circuitmedic.com