CS-400E
Semi-Automatic Through-Hole Assembly Machine
THE CS-400E CUT & CLINCH COMPONENT LOCATOR is a Semi-Automatic Assembly Machine for Through-Hole Electronic Assembly.

The first CS-400 Cut & Clinch Component Locator was delivered by Contact Systems in 1983. Since then hundreds of companies throughout the world have installed CS-400 Machines in their production lines and rely on them daily.

The CS-400E Machine is a PROGRAMMABLE PC BOARD ASSEMBLY MACHINE

It was designed to perform three basic functions:

- Direct the Operator to the Component Insertion Locations via the Dual Overhead Projectors.
- Prompt the Part Delivery Devices to Present Components to the Operator.
- Cut and Clinch Component Leads To The Programmed Specifications.

Cut & Clinch BENEFITS

- Simple Lead Forming
- No Component Spillage or Pop-up During Wave Soldering
- Improved Solderability
- No Post-Solder Lead Trimming

Cut & Clinch FEATURES

- Inward and Outward Lead Clinching
- CS-400E allows the user to program the ideal Lead Length and Clinch Angle for each component
- Miniature Cutter Footprint
The CS-400E Cut & Clinch Machine offers programmable Lead Length and Clinch Angle. On the illustrations below you can see the examples of Inward, Outward Clinches and different Lead Lengths for the axial resistors.

### Different Lead Lengths

Lead Lengths have 10 different settings; Clinch Angle is the same for all components.

### Inward Clinch

Inward clinch, 10 different settings for Clinch Angles starting from 20° min; Lead Lengths are the same.

### Outward Clinch

Outward clinch, 10 different settings for Clinch Angles starting from 20° min; Lead Lengths are the same.

### Multi-Leaded Components

In the case of multi-leaded components, like SIPs, DIPs, normally only two leads are clinched to secure the part. However, you have the option to clinch more or all the leads if desired.

#### 10-pin SIP

Components with the odd number of leads processed in two steps: two leads on the first step, and one lead and one phantom location for the second lead.

#### 40-pin DIP socket

The CS-400E can be programmed to clinch leads Sideways for the components with the lead spacing 0.1".

#### Transistor

#### Radial Resistor
**Rugged Construction**

The base of the Machine is made from heavy gauge welded steel. A 15° steel I-beam supports the X-Y table while heavy wall aluminum channel supports the projectors and touch screen monitor. The moving mechanical components are oversized and thus will last beyond the life of the Machine.

**Accuracy**

**Table Positioning Accuracy**

The rugged design of the X/Y table assures positioning accuracy and repeatability for years of trouble-free service. You can be assured that as you add more machines to your production floor, programs generated on one machine will work accurately on any other.

**Fixturing Accuracy**

To achieve consistently good Cut & Clinch results, the PC board must be positioned accurately above the Cutters. This often requires that the PC board be located using its tooling holes, because of the PC board edges are not accurately referenced to the component hole pattern. The board clamps use tooling balls from .078” to .156” diameter. This yields excellent PC board positioning accuracy, while facilitating quick PC board changeover.

**Reliable Operation**

CS-400E has for over 20 years an industry reputation as a “workhorse”. Many companies run these machines in excess of 80 hours / week.

**Operator Efficiency**

The machine is designed for maximum Operator comfort and efficiency.

**Ergonomic Design**

Operators will appreciate features such as:
- the Padded Armrest
- Adjustable Footrest with Recessed Footswitch
- 30° Table Angle
- Eye Level Operator Display

**The Moving Board - The Point Of Insertion Is Always The Same**

For each component, the Machine moves the PC board so that the target holes are positioned at the same location in front of the Operator, directly over the Cut & Clinch Mechanism. Thus, the Point of Insertion is always the same. With Operator’s arms comfortably supported on the Armrest, the hands posed over the target holes, making component insertion quick, searchless, and without wasted motion.

**Dual Spot Projection**

The Inserion Location is indicated by two bright light spots from the Overhead Projectors (see Operation Overview)

**Convenient Component Delivery**

All the Component Dispensing solutions are placed conveniently close to the Insertion Area, minimizing Operator fatigue while increasing productivity.
Machine Operation Overview: The Operator clamps the PC board on the Workfixture. The Overhead Projector indicates the Insertion Point by two light spots. The Rotary Bin or other Component Delivery unit presents the part to be inserted into the PC board. The Operator inserts the component into the PC board and presses the Footswitch. The Machine will cut and bend the component leads. The Cut & Clinch Mechanism will lower, and the table will then move the PC board to the next component location.

Cut & Clinch Mechanism

Illustration 1

Adjustable Workfixture

Dual Spot Projection (View A on Illustration 1)

The Adjustable Workfixture moves PC board to locate the Insertion Point above the Cut & Clinch Mechanism.
Machine Overview

1. **Take Parts from the Bin**
   - The Rotary Bin or other component delivery unit presents the part to be inserted. The Operator removes a quantity of components from the component delivery unit indicated on the display.

2. **Insert Parts**
   - While holding the components in one hand, the Operator inserts one of the components into the PC board holes, indicated by two high intensity light spots. The Operator can see on the monitor the image and description of the part to be inserted, its polarity, clinch direction, and circuit reference.

3. **Press the Footswitch**
   - After inserting the part, the Operator presses the Footswitch to activate the Cut & Clinch mechanism. The Machine moves the PC board to the next insertion location.

4. **Continue Job**
   - When the PC board assembly is completed, the Operator open the toggles and removes the PC board from the Workfixture. If the next PC board required the same program, he clamps the next PC board and presses the Footswitch to go to the next parts.

   - The Operator removes the completed PC board from the Workfixture
   - The Operator clamps the next PC board on the Workfixture
   - The Operator slides the PC board over to the Board Edge Stop
   - The message on the touchscreen prompts to press the Footswitch to start the next assembly

If the Operator set the Offset and Skew Checks ON, the Machine will set the Offset and Skew Points by moving to the locations that were set on the previous PC board, optically scanning the diameter of the holes, and calculating the center of these holes. Therefore, if the new PC board is mounted in the Workfixture in about the same position as the previous PC board, the Machine will find the Offset and Skew points automatically.
Resume Job

If the Machine is turned OFF before the job is completed, it will remember the setup information and where assembly stopped.
When the Machine is turned back ON, it will ask if the Operator wishes to continue last job. Simply pressing the “YES” box on the touch screen will cause the Machine to Home itself and optically correct the Offset and Skew Points and resume assembly at exactly the right spot you were at when the Machine last was powered down. The Parts Delivery equipment will also return to their last positions. Then the Operator has to press the Footswitch to continue assembly.

Multiple Board Assembly

The CS-400E is capable of running up to ten identical PC boards simultaneously. To optimize the efficiency of the Machine, it is necessary to assign the Offset numbers correctly.

To run the Multiple Board Assembly, the Operator has to do the next steps:
▪ Mount the PC boards on the Workfixture
▪ Power up the Machine
▪ Set the Offset Point and Skew Points for each PC board
▪ Load the Program
▪ Press the Footswitch to start

The Machine will move to Offset Board #1, run through the component locations for the first Part Group, then move to Offset Board #2 and so on, until the first Part Group is inserted in all Offset Boards. The Machine will then return to Offset Board #1 and run the second Part Group. When the first set of PC boards will be completed, the Operator will remove the assembled PC boards, mount the new PC boards and set Offset and Skew Points or utilize the Offset Ocheck and Skew Check feature.
1. **Loading PC Board on the Workfixture**

Then the Operator closes the toggles on the Board Clamps, locking the PC board securely in place.

After loosening the two Rail Adjusting Knobs, the Operator slides the rail down until the bottom edge of the PC board rests on the lip of the bottom rail. Ensure that the PC board is seated square, the Operator tightens the two Rail Adjusting Knobs.

The Operator places the PC board on the Workfixture and slides the PC board over to the Board Edge Stop.

2. **Machine Setup**

After the power is turned ON, the Operator has to set up the Machine. Pressing the boxes step by step on the touch screen will:

1. **Home the Machine** - the Machine has six X/Y axes; by two for the table, the Moveable Projector and the Cut & Clinch Mechanism. The Machine automatically moves all its mechanisms to the “Home” position.

2. **Load the Program** - the Operator selects the Program previously created and saved on the Machine hard drive.

3. **Set Offsets** for each PC board. The Offset Point is a PC board’s zero location. The Operator jogs the table using the jogstick on the front panel. After centering the crosshairs of the Scope over the Offset Point, the Operator presses the Footswitch.

4. **Set Skew Points** for each PC board. Automatic Skew correction allows the PC board to be mounted anywhere on the Workfixture without concerns for the alignment with the X- and Y-axes. The table then jogged to two predetermined target holes. The crosshairs of the Scope are centered over the Skew Point. The Operator presses the Footswitch and the Program coordinates automatically modified to match the PC board position.

The PC board is now “zeroed” for this particular setup. This procedure is required only for first PC board of a run.
CS-400E Specifications

<table>
<thead>
<tr>
<th>Insertion Area</th>
<th>Model</th>
<th>X Axis</th>
<th>Y Axis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CS-400E</td>
<td>19.75&quot; (501.7 mm)</td>
<td>14&quot; (355.6 mm)</td>
</tr>
<tr>
<td></td>
<td>CS-400EJY</td>
<td>19.75&quot; (501.7 mm)</td>
<td>18&quot; (457.2 mm)</td>
</tr>
<tr>
<td></td>
<td>CS-400EJX</td>
<td>24&quot; (609.6 mm)</td>
<td>14&quot; (355.6 mm)</td>
</tr>
<tr>
<td></td>
<td>CS-400EXY</td>
<td>24&quot; (609.6 mm)</td>
<td>18&quot; (457.2 mm)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Board Fixtures</th>
<th>Adjustable Fixture (standard)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table Angle</td>
<td>30 degrees</td>
</tr>
<tr>
<td>Projector</td>
<td>Two .090&quot; (2.29 mm) diameter spots — one fixed, one movable</td>
</tr>
<tr>
<td>Computer</td>
<td>566 MHz CPU, 8 Gb Hard Drive</td>
</tr>
<tr>
<td>Rotary Bin</td>
<td>90 compartments - sequential and random access Operator removes parts at constant height 32&quot; (812.8 mm) above floor</td>
</tr>
<tr>
<td>Cycle Control</td>
<td>Footswitch</td>
</tr>
<tr>
<td>Cycle Rate</td>
<td>1500/hr (for 3&quot; table moves)</td>
</tr>
<tr>
<td>Electrical Requirement</td>
<td>115 VAC 50/60 Hz, 10 amp, 220 VAC available</td>
</tr>
<tr>
<td>Shipping Weight</td>
<td>1000 lbs (450 kg)</td>
</tr>
</tbody>
</table>

Facility Requirements

<table>
<thead>
<tr>
<th>Dimensions (w/d/h)</th>
<th>40&quot; x 54&quot; x 59&quot; (1.63m x 1.83m x 1.52m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>1000 lbs (450 kg)</td>
</tr>
<tr>
<td>Power Requirements</td>
<td>115V @ 10A or 220V @ 8A, 60/50 Hz</td>
</tr>
</tbody>
</table>
The Cut & Clinch Mechanism Overview

The CS-400E with Ultra Clinch™ is the only Machine on the market that offers programmable Lead Length and Clinch Angle.

It employs a Cut & Clinch Mechanism consisting of two Cutter assemblies: one Fixed and one Movable. Each Cutter assembly is comprised of an Inner and Outer Cutter. The Fixed Cutter is mounted in the center, aligned with the Fixed Projector spot, while the Movable Cutter goes to the position defined by the Moveable Projector spot. The Cutters can be oriented at any angle and any lead spacing from 0.100” to 1.75”. The component leads pass through the center of the holes of the Inner Cutters. The Outer Cutters then rotate over the holes, first cutting, then bending the leads. In normal operation, both leads are cut and clinched in one operation. The CS-400E can be programmed to clinch leads Inward, Outward, or Sideways (for lead spacing 0.1”).

Cut & Clinch Mechanism Specification

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lead Spacing</strong></td>
<td>.1” - 1.75”</td>
</tr>
<tr>
<td><strong>Rotation</strong></td>
<td>360°, 0.5° resolution</td>
</tr>
<tr>
<td><strong>Lead Diameter</strong></td>
<td>up to .050”copper lead, .025” maximum steel lead</td>
</tr>
<tr>
<td><strong>Clinch Direction</strong></td>
<td>Inward / Outward programmable, Sideways on .1” lead spacing components</td>
</tr>
<tr>
<td><strong>Footprint</strong></td>
<td>.085” x .105”</td>
</tr>
</tbody>
</table>
Cut & Clinch Cutters

The Cutter Assembly can be programmed to move up or down around the Fixed Standoff Pin to achieve the ideal lead length (dimension “A”).

Lead Length

The PC board is supported by a Standoff Pin, which insures that the Cutter does not touch the PC board. This feature also guarantees accurate Lead Length, because the length of the cut lead is determined by the distance from the bottom side of the PC board to the Cutter Shearing Edge. Each Cutter can move upward or downward on the Standoff Pin. This changes the distance from the Shearing Edge to the bottom side of the PC board. This distance can be programmed to produce 10 different Lead Lengths. The CS-400E is the only machine that offers programmable Clinch Angle and Lead Length.

Clinch Angle

Each Cutter Assembly consists of a stationary Inner Cutter and rotating Outer Cutter. When a component is inserted into the PC board, the lead is also inserted into the Inner Cutter. The Outer Cutter then rotates, pushing the lead to the edge of the Inner Cutter hole, shearing it there. The Outer Cutter sweeps beyond the edge of the hole to clinch the lead. The lead Clinch Angle is determined by the distance the Outer Cutter pushes the lead beyond the hole. This distance can be programmed to produce ten different lead Clinch Angles. A minimum Clinch is typically 20°, when the Outer cutter simply shears the lead and moves no further. A small increase on the Outer Cutter will cause significant increase in the lead Clinch Angle. The maximum Clinch is virtually flat to the PC board.

Each Outer Cutter can clinch its lead to any of 10 Programmable Angles:

<table>
<thead>
<tr>
<th>SETTING</th>
<th>PIN HEIGHT</th>
<th>LEAD LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.110”</td>
<td>.020”</td>
</tr>
<tr>
<td>2</td>
<td>.116”</td>
<td>.026”</td>
</tr>
<tr>
<td>3</td>
<td>.122”</td>
<td>.032”</td>
</tr>
<tr>
<td>4</td>
<td>.128”</td>
<td>.038”</td>
</tr>
<tr>
<td>5</td>
<td>.134”</td>
<td>.044”</td>
</tr>
<tr>
<td>6</td>
<td>.140”</td>
<td>.050”</td>
</tr>
<tr>
<td>7</td>
<td>.146”</td>
<td>.056”</td>
</tr>
<tr>
<td>8</td>
<td>.152”</td>
<td>.062”</td>
</tr>
<tr>
<td>9</td>
<td>.158”</td>
<td>.068”</td>
</tr>
<tr>
<td>10</td>
<td>.164”</td>
<td>.074”</td>
</tr>
</tbody>
</table>
**Miniature Footprint**

Major concern when using the automatic Cut & Clinch is the amount of blade surface or “Footprint” that touches the bottom of the PC board, during the cutting operation. The smaller the Footprint, the less it would disturb previously clinched leads or pre-populated SMT components.

The Cutters Miniature Footprint is practically invisible to adjacent leads, even on densely populated PC boards. Two stationary pins provide support for the PC board, and are the only items to actually contact the PC board.

These are represented by the cross-hatched circles “A”. Section “B” indicates the area on each cutter that will come within .040” of the underside of the PC board during the cutting action. These areas do not contact the PC board.

“C” represents the angle between the component center line and the direction of lead clinching, either Inward or Outward. The figure below shows this angle for a one half inch part.

“D” shows an extension of the normal Footprint that would occur if the customer chose to adjust the cutters for an exaggerated lead bend. This would be necessary only for large leads (.40” copper) in oversized holes.

A matrix of holes on a .100” grid is shown in the figure below to illustrate the effect that the 400E Footprint would have on a very dense PC board.

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**Lead Stress Relief**

The CS-400E does not deform the integrity of the stress relief bend because the bending force is applied almost perpendicular to the lead.

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**Cutter Durability**

If the Cutter wears out, it can be rotated and utilize it’s Spare Cutting Edge.
Clinch Direction

Clinch direction can be either Inward or Outward.
On the Outward Clinch the Movable Cutter is positioned on the other side of the Fixed cutter.

![Inward Clinch](image1)

![Outward Clinch](image2)

Clinch Direction VS. Component Lead Spacing

<table>
<thead>
<tr>
<th>Lead Spacing</th>
<th>Clinch Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inward</td>
</tr>
<tr>
<td>.100”</td>
<td>øø</td>
</tr>
<tr>
<td>.150”</td>
<td>øø</td>
</tr>
<tr>
<td>.200”</td>
<td>ø ø</td>
</tr>
<tr>
<td>.400”</td>
<td>ø ø</td>
</tr>
<tr>
<td>1.000”</td>
<td>ø ø</td>
</tr>
<tr>
<td>1.500”</td>
<td>ø ø</td>
</tr>
</tbody>
</table>

The Cutters are able to clinch closely spaced leads (0.1”) Sideways, as you can see in the line 1 in the table above.

Outward Clinches are necessary to securely hold some components such as radial capacitors or stand-up resistors. Other components will hold better with Inward Clinch.

In the case of multi-leaded components, like SIPs, DIPs, normally only 2 leads are clinched to secure the part. However, you have the option to clinch more or all the leads if desired. With clinched leads the board can be handled without the danger of components falling out or popping up during the wave soldering process.
Inner cutters
There is only one Inner Cutter available for each
Component Locator: p/n 400-1400

Outer cutters
They are three types of Outer Cutters:

**Standard Cutters**
These Cutters were designed to handle the widest range of applications. They perform well on densely populated PC boards. They can cut copper leads .045" (1.1mm) diameter, and can achieve below-board lead protrusions as low as .035" - .040" (.89mm - 1.1mm), depending on the lead diameter.

**Minimum Bend Cutters**
These low profile Cutters are recommended only in situations where lead diameters are less than .035" copper. They perform well on densely populated PC boards, and can achieve a below-board protrusion of .030" - .035" (.76mm - .89mm), depending upon lead diameter.

**Heavy Duty Cutters**
Heavy Duty Cutters have a higher profile, and were designed for the PC boards with a significant amount of large, or steel leadeled devices (.025" maximum steel lead). These Cutters have a slightly larger Footprint than the other two Cutters, and produce a minimum lead protrusion of only .045" (1.1mm).
Display Component Properties

This feature represents to the Operator:
- Orientation
- Polarity
- Lead Spacing
- Inward or Outward Clinch Direction
- Values
  for each component.

Component Image Display

The purpose of this feature is to display to the Operator an Image that closely represents the component that is currently being inserted into the PC board. These Images are generated from a selection available to the Programmer who has control over body size, leg number, and body color.

Optically Assisted Digitizing

This feature will facilitate the Digitizing process as it eliminates the need to spend time jogging to the exact center of the hole. Also used in setting Offset and Skew Points.

Offset And Skew Checks

Offset and Skew Check feature can set these points automatically.
If this feature is ON, the Machine will set the Offset and Skew Points by moving to the locations that were set on the previous PC board, optically scanning the diameter of the holes, and calculating the center of these holes.
**Configuration Menu**

This function will allow users to tailor their machine more closely to their production environment.

**Graphical File Chooser**

- Intelligent directory search routine with continuous display updating;
- Full help support available for both general and specific functions;
- A user feedback box provides real-time status prompts to display available choices, warnings, errors, etc.;
- Prompt for overwriting of an existing program file;
- Intelligent entry into the file chooser—upon being called-up, the File Chooser will start in the path last stored in the computer;
- Configurable interface which allows a Supervisor to restrict access to certain functions within the File Chooser.

**Indication Low Quantity / Shortages for all dispensers**

If a part that is to be inserted into the PC board is not available, the Operator can put the Bin containing that part on a Bin Shortage List. If another Bin in the dispenser contains the same part it may be designated as an Alternate Bin.

**Full Resume Of Last Job**

The Resume function allows the Operator to continue an assembly program, at the point where it was stopped. After pressing the “Yes” on the touch screen, the Machine will load the Program, Home itself and optically correct the Offset and Skew Points. The Parts Delivery equipment will also return to their last positions. (see more Operation)

**Cut Clinch Counter For Maintenance Scheduling**

The Counter keeps a running total of cuts of the Machine. The Cut Clinch Counter Menu offers the options of Stopping, Resuming, Modifying, or Clearing the count.
The Programming Procedure consists of the writing the Program and Digitizing of the Component Locations.

1. Writing the Program

Program are written as a series of Sequence Lines, which are saved to an executable file. The Programmer writes the Program line by line, entering: Part Numbers (circuit references), Component Values, Polarity, Component Delivery units, Cut & Clinch parameters. Cut and Clinch parameters are determined by the PC board density, lead material, lead length, hole diameters and the location of traces on the PC board. Organizing the components insertion points order efficiently, the Programmer can minimize the production time. The components are inserted in the same order which they are programmed. The Machine automatically moves sequentially through the Program, stopping at each component insertion line.

2. Digitizing Component Locations

Digitizing is a process of entering of the component insertion location coordinates directly on the Machine or manually. Before Digitizing, the Programmer has to Home the Machine and set the Offset & Skew. Optical correction speeds up the Digitizing Process. The Programmer jogs the PC board to the Insertion Location and presses the Footswitch for each component. Each Machine movement cuts and clinches two leads at once. Each sequence line has coordinates for both leads: X/Y for the Fixed Cutter and DX/DY for the Movable Cutter.
The CS-201 Rotary Bin is a Component Delivery system that, when programmed with a Cut and Clinch Machine, will run in sequence with an Assembly Program. The Rotary Bin holds nine Component Trays. Each Tray has ten numbered compartments. The Rotary Bin can hold up to ninety different components, and presents each component as it coincides with the Assembly Program.

The Bin opening is conveniently located next to the PC board fixture. The Operator picks up a quantity of parts with one hand and inserts with the other.

**Features**

**Constant Height Pick-up Window**

The Rotary Bin has a stationary Pick-up Window which presents the correct compartment to the Operator at the same location every time. The Operator does not waste time or energy searching for, or reaching to various locations.

**Safety Light Curtain**

Whenever the operator’s hand is in the Pick-up Window, the light curtain will prevent the Bin from operating.

**Electronic Control (Smart Bin)**

The Rotary Bin utilizes a rotary encoder and a microprocessor to track each and every Bin move. The number of the compartment in position is always displayed.

**Options**

**Rotary Bin Trays CS-204-59-3**

Each tray has 10 compartments, numbered from 1 to 10. Trays made of black electrically conductive plastic 0.125” thick.

**Rotary Bin Tray Covers 204-270-3**

Covers made of black electrically conductive plastic 0.0625” thick.
JIT assembly processes demand a streamlined method of delivering parts to the factory floor at the actual point of assembly. Labor-consuming steps such as kitting and returning surplus parts to stock are eliminated. The components for all PC boards are stored next to the assembly station. Storage capacity in the CS-740BD is large enough so that typically, inventory can be maintained for running many types of PC boards without any changeover of the parts supplies.

**Storage Capacity**

The CS-740BD has 708 component Bins to store and deliver up to 708 unique components. Each Component Locator has access to 684 component Bins (up to 1416 different components with Split Bin Option).

**Minimized Setup Time**

Using the CS-740BD with the CS-400E Component Locators, the Operator can set up for a PC board run simply by mounting a PC board and loading a Program. This process requires less then two minutes. Since setup time is minimized, small lot sizes and even single PC board runs become practical and more cost-effective.

**Operation**

Parts inventories are maintained inside the CS-740BD, using plastic Bins, arranged in an X-Y grid. A Picker, programmed in conjunction with the CS-400E Component Locator, selects a Bin and moves it to one of the two Access Windows on the front of the CS-740BD.

**Minimized Waiting Time**

To minimize waiting times between one part type and the next, the CS-740BD queues two Bins at each Window. When the Program demands a new part type, the CS-740BD removes the "used" Bin and replaces it with the "standby" Bin. Then, while the Operator is inserting the parts, the CS-740BD returns the "used" Bin to its X-Y location and fetches the next Bin, placing it in the "standby" position behind the Window. Thus, the Operator will rarely have to wait for the next Bin to arrive at the Window. When inserting commonly used axial parts, operators easily achieve rates of over 800 parts per hour.
Split Bin Option

With the Split Bin Option, each Bin is divided into two sections, thereby doubling the number of components available (1416 Bins). Shutters automatically cover one section of the Bin, leaving only the desired component available.

Support for Two JIT Bins

The Software allows to support two JIT Bins. With the configuration using two Component Locators CS-400E and two JIT Bins CS-740BD, each Operator has access to 1416 (2832 with Split Bin Option) components.

Bin Loading

To initially load the CS-740BD, the Operator opens the sliding doors, gaining access to all 708 Bins in the rear. Replenishing components is normally done at one of the Access Windows on the front side of the 740BD.

When the Operator sees a Bin getting empty, he will press a “Low Quantity” button in the Window. A printer attached to the Component Locator, will immediately print out the Bin number. At the end of a work shift, the almost empty Bins may be retrieved with a simple keyboard command for reloading.

Box Specifications

Material: Electrically Conductive Polystyrene
Capacity: Approx. 3.500 ¼ Watt resistors with .400” lead length

Space Requirements

Specifications

Component boxes: 684 accessible by two Picker Arms
Access windows: two
Motor drive: closed loop DC servo
Picker positioning speed: 70” / second
Air requirements: 100 psi 8 CVM
Electrical requirements: 115 or 230V 50.60 Hz
4 AMPS at 115 Volts
2 AMPs at 230 Volts
The certain amount of Bins cannot be acquired by a Window due to the physical limitations of a Dual Picker JIT Bin. The Window #1 cannot access the Bins 685-708 (1393-1416) while the Window #2 cannot get the Bins 1-24 (709-732).

The Software allows to use all 708 (1416) Bins. If the Bin can not be reached by the Picker, the CS-740BD will re-address the request to the alternate Bin, filled with the same parts. The software allows to specify an Alternate Bin that will be used if the Primary Bin can not be reached. Each pair of the Primary and Alternate Bins has to be loaded with the same parts. This program could be run successfully from both JIT Windows.
Lighted DIP Dispenser is one of several types of Component Delivery systems, designed for CS-400 Machines. Large capacity, flexibility and ergonomical design are the features that allow to maximize production speed.

The Lighted DIP Dispenser is capable of handling a variety of components including DIP, SIP devices and DIP sockets, loaded directly from the DIP tubes. Parts stay inside of the tube, so they are preserved from the breakage. One LDD unit can hold up to 80 tubes. The Lighted DIP Dispenser can be mounted to your CS-400E with a right side arm mount or left side arm mount. For ordering please use part numbers CS-241/RH and CS-241/LH accordingly.

LDD Software is a part of the CS-400E Software, which allows to set up the Lighted DIP Dispenser as one of the Component Delivery Bins.
Large Capacity and Flexibility

Large capacity and flexibility allows to reduce or eliminate kitting. One or two Lighted DIP Dispensers can be used per CS-400E machine. The LDD contains 8 removable cartridges. Each cartridge holds 10 tubes for total of 80 different part types. The cartridges accept .300", .400", .600" DIP tubes without any adjustment.

Light Guidance

This feature is designed to increase picking speed and accuracy. Each tube has an adjacent LED to indicate its use when required.

Ergonomic Design

Ergonomic design to minimize Operator fatigue and increase Operator speed.
- The CS-241 is conveniently located at eye level.
- Adequate room is provided for fingers between each tube.

Removable Cartridges: Easy to Load

The CS-241 contains 10 removable cartridges. Each cartridge holds 8 tubes for total of 80 different part types. The cartridges are removeable for reloading and tube exchange.
The Lighted Parts Dispenser has six parts Bins per unit. Each Bin location has an LED to indicate the correct pick location. The LPD can be used alone or in conjunction with any of the other Dispensing options.

The Lighted Parts Dispenser can be mounted to your CS-400E with a Right side arm mount or Left side arm mount. For ordering please use part numbers 400LPD/RH and 400LPD/LH accordingly.

Lighted Parts Dispenser Software is a part of the CS-400E Software, which allows to set up the Lighted Parts Dispenser as one of the Component Delivery Bins.
The CS-400EV Component Verifier Option is used to test components before insertion. The unit is capable of detecting an incorrect part at the point of insertion (resistance, capacitance, inductance and diode polarity) and actually halt the Component Locator if the error occurred.

The Component Verifier consists of the tester, test pads and cable set.

RLC Accuracy: ± 0.1%
Power requirements: 90-250 VAC; 50 or 60 Hz; 60W max

**Operation**

In operation, the display on the CS-400E Component Locator will display the message “Press Footswitch for Manual Test” for each component that is to be tested. The Operator must touch the leads of the components to the test pads mounted directly above the insertion area. The Verifier will then test or “sample” the value of the component.

If the component passes, the CS-400E will turn on its Projector lights to indicate the insertion location. At the same time, the machine “beeps” once to signal the Operator that the part has passed. The component can then be inserted and subsequently cut and clinched by pressing the Footswitch again.

**Programming**

The Verifier is an add-on to CS-400E Component Locator, and designed to be programmed and operated through the use of the keyboard on the CS-400E Component Locator.

The Verifier listed as an Option in CS-400E Software and can be added during System Configuration.

The green tag on the print screen shows that the Component Verifier is ON. Orientation, polarity, lead spacing, inward or outward clinch direction for each component also are displayed on the screen.

**User Options**

The user has the option to test any or all components of a component group. With a simple keyboard command the Verifier can be turned off so that no components are tested. With this flexibility the user can do 100% inspection of applicable components, a subset of those components, or simply test the first component of each group on the first PC board to verify the correct parts are in the correct Bin locations before running a job.