CONTACT

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.**
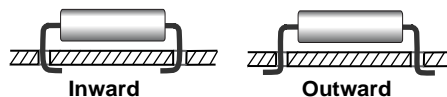
Rotary Bin CS-201 (optional) · Programming Scope · Padded Armrests with concealed Keyboard · Cut & Clinch Mechanism · Color Touch Screen Monitor · Dual Spot Projection · Adjustable Workfixture · Footrest / Footswitch
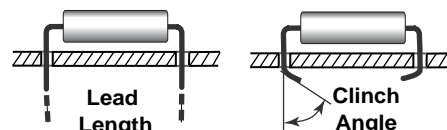
Cut & Clinch BENEFITS

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

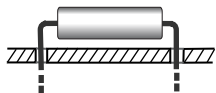## Cut & Clinch FEATURES

- **Inward and Outward Lead Clinching** — Inward / Outward
- **CS-400E allows the user to program the ideal Lead Length and Clinch Angle for each component** — Lead Length / Clinch Angle
- **Miniature Cutter Footprint**

Machine Overview

Results After Cut & Clinch Machine
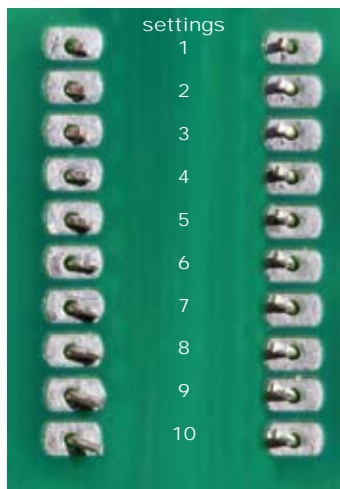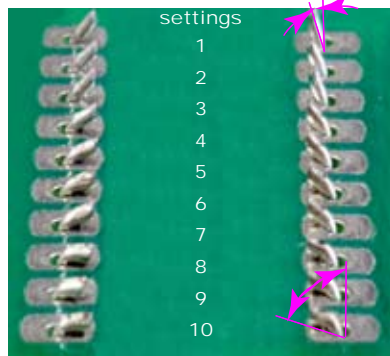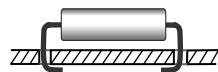
Different Lead Lengths

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.
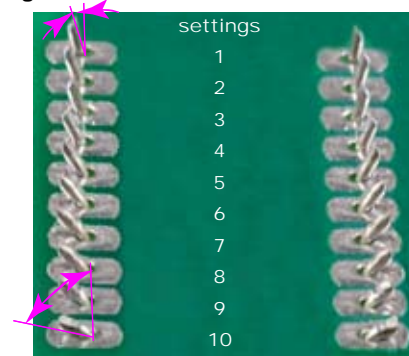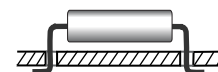

Inward Clinch

20° min Clinch Angle

settings
1
2
3
4
5
6
7
8
9
10

Outward Clinch

settings
1
2
3
4
5
6
7
8
9
10

settings
1
2
3
4
5
6
7
8
9
10

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

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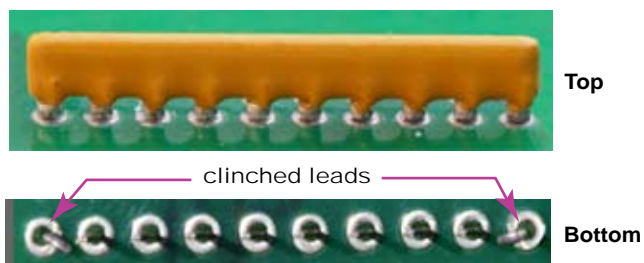
Outward clinch, 10 different settings for Clinch Angles starting from 20° min; Lead Lengths are the same

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

Top

clinched leads

Bottom

40-pin DIP socket

Top

clinched leads

Bottom

Transistor

← **Top** →

Radial Resistor

← **Bottom** →

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.

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

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 achieive 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.
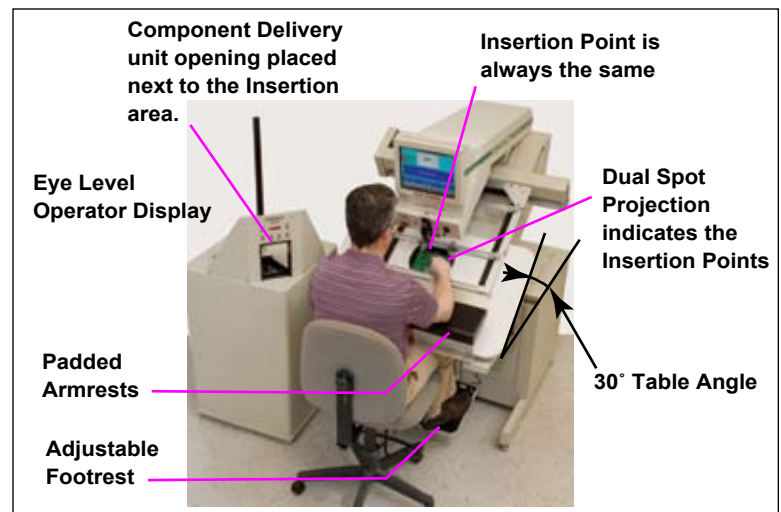
Operator Efficiency

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 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.
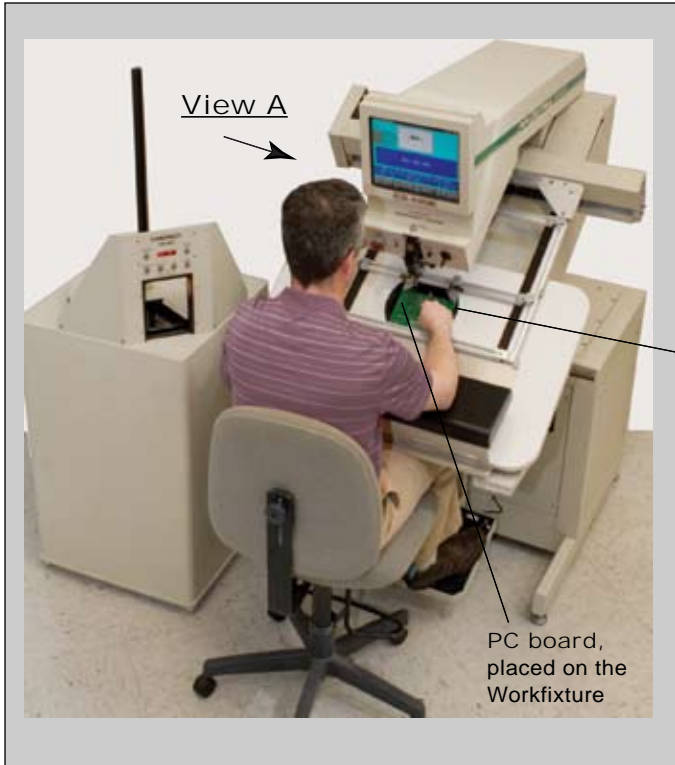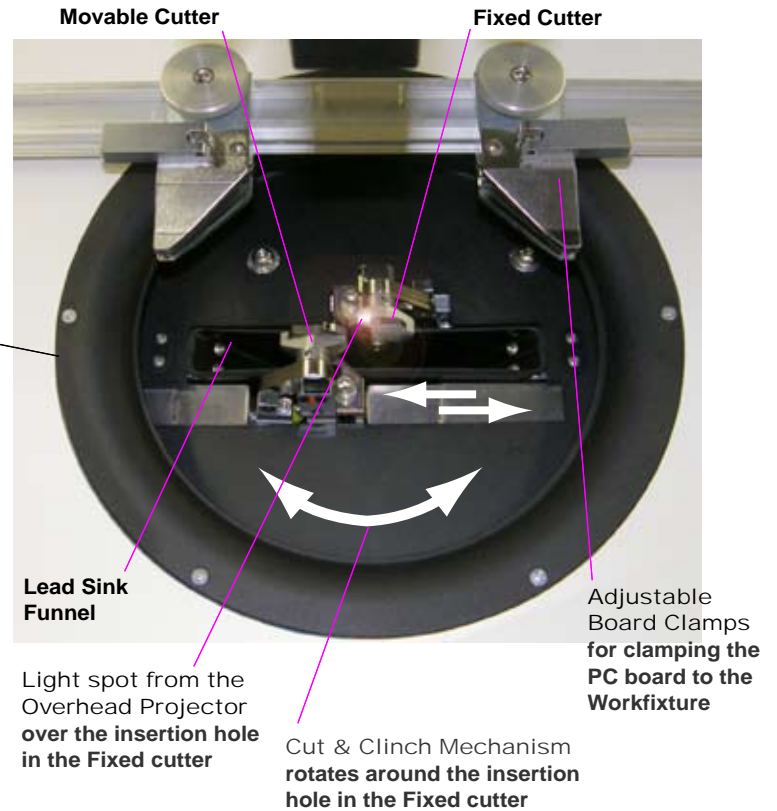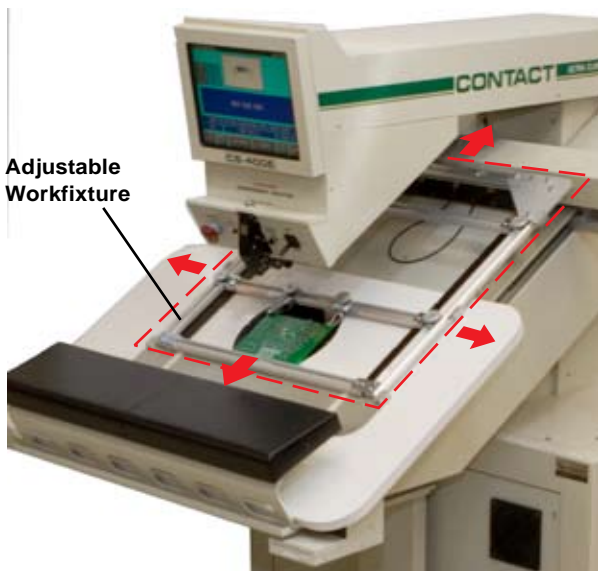
Cut & Clinch Mechanism

View A
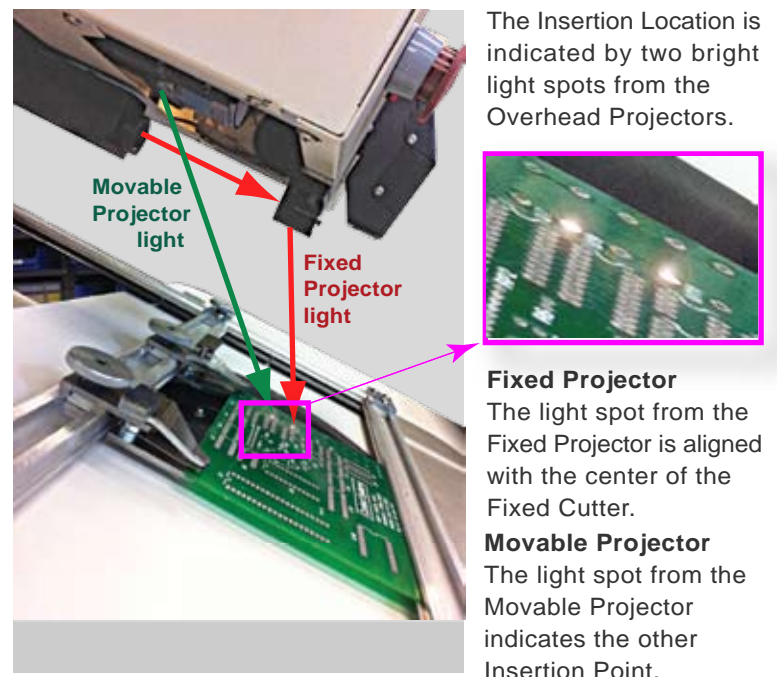
PC board, placed on the Workfixture

Illustration 1

Movable Cutter

Fixed Cutter

Lead Sink Funnel

Light spot from the Overhead Projector over the insertion hole in the Fixed cutter

Cut & Clinch Mechanism rotates around the insertion hole in the Fixed cutter

Adjustable Board Clamps for clamping the PC board to the Workfixture

Adjustable Workfixture

Adjustable Workfixture

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

Dual Spot Projection (View A on Illustration 1)

The Insertion Location is indicated by two bright light spots from the Overhead Projectors.

Movable Projector light

Fixed Projector light

Fixed Projector
The light spot from the Fixed Projector is aligned with the center of the Fixed Cutter.

Movable Projector
The light spot from the Movable Projector indicates the other Insertion Point.

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.
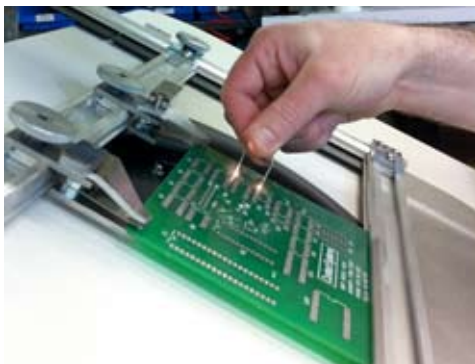
1.8K OHM, 1/4WATT, 5%

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.
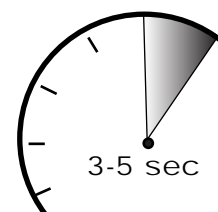
The Operator can see on the monitor the image and description of the part to be inserted, its polarity, clinch direction, and circuit reference.

③ Press the Foofswitch

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.

The Operator presses the Footswitch

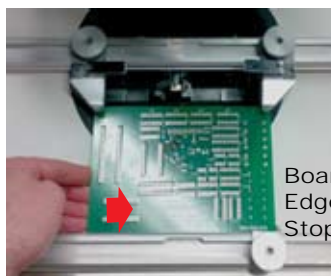**3-5 sec**

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.

Board Edge Stop

PRESS FOOTSWITCH TO START

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.
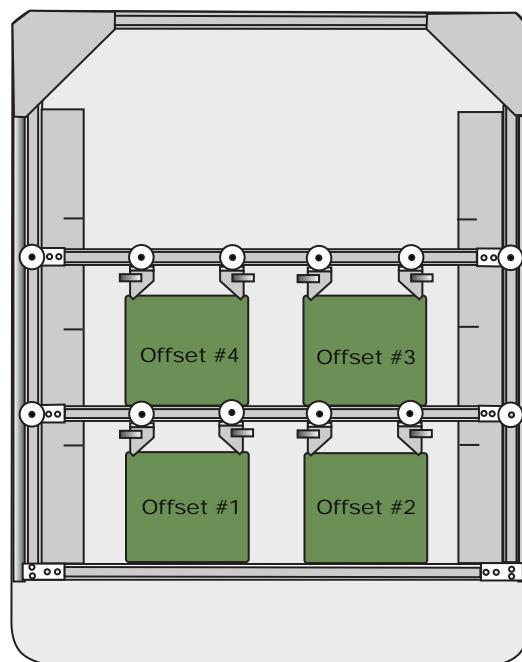
.

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 Oheck and Skew Check feature.

(1) **Loading PC Board on the Workfixture**

Board Clamps

Board Edge Stop

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

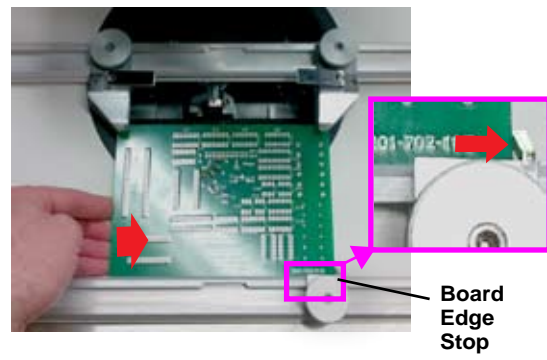After loosing the two Rail Adjusting Knobs, the Operator slides the rail down until the bottom edge of the PC board rests on the lip of the bottom rail. Ensured that the PC board is seated square, the Operator tightens the two Rail Adjusting Knobs.
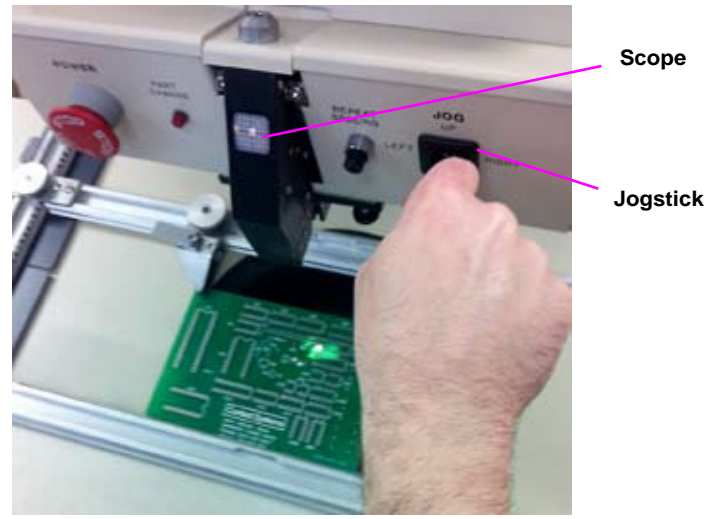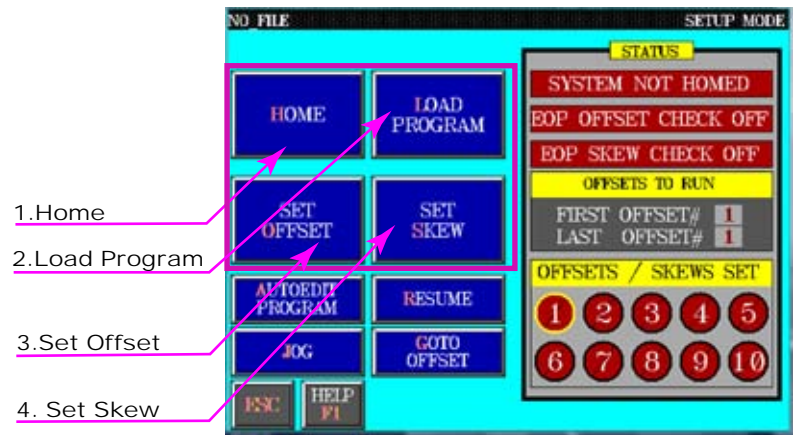
The Operator places the PC board on the Workfixture and slides the PC board over to the Board Edge Stop.

(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.

1.Home

2.Load Program

3.Set Offset

4. Set Skew

Scope

Jogstick

The PC board is now "zeroed" for this particular setup. This procedure is required only for first PC board of a run.

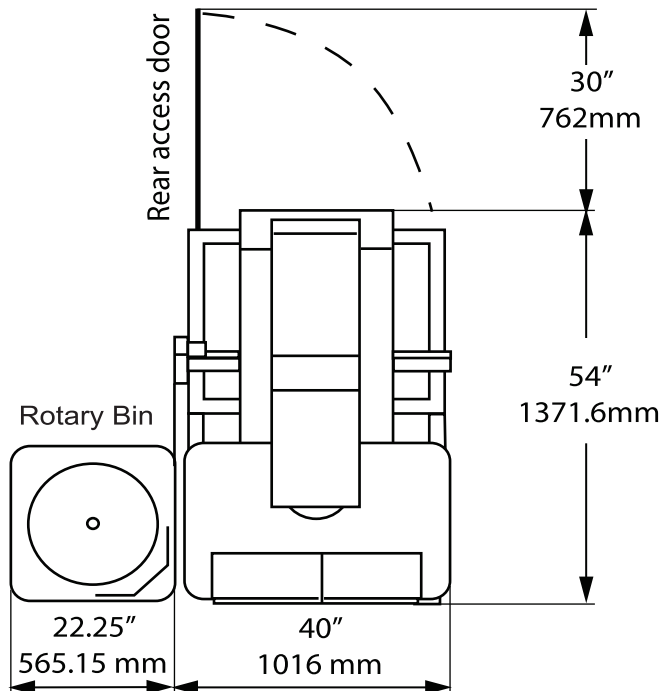## CS-400E Specifications

Model	X Axis	Y Axis
CS-400E	19.75 " (501.7 mm)	14" (355.6 mm)
CS-400EJY	19.75 " (501.7 mm)	18" (457.2 mm)
CS-400EJX	24" (609.6 mm)	14" (355.6 mm)
CS-400EXY	24" (609.6 mm)	18" (457.2 mm)

Insertion Area (applies to the Model table above)

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

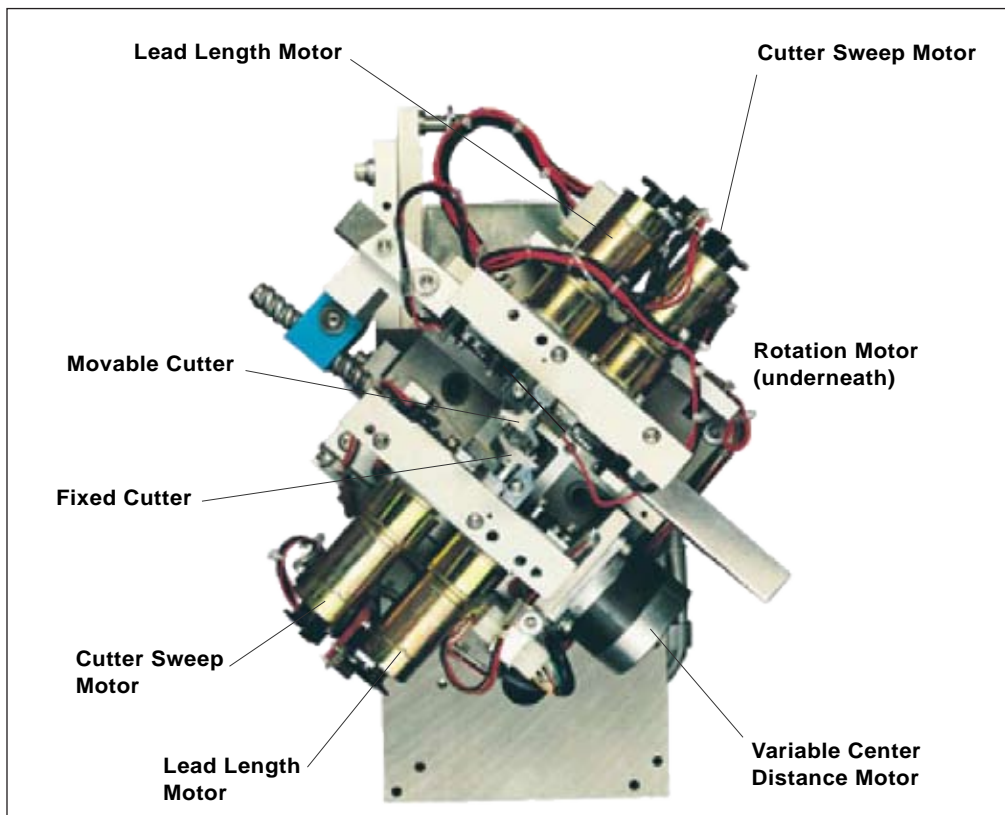## Facility Requirements

Dimensions (w/d/h)	40" x 54" x 59" (1.63m x 1.83m x 1.52m)
Weight	1000 lbs (450 kg)
Power Requirements	115V @ 10A or 220V @ 8A, 60/50 Hz

Rear access door

30"
762mm

54"
1371.6mm

Rotary Bin

22.25"
565.15 mm

40"
1016 mm

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.
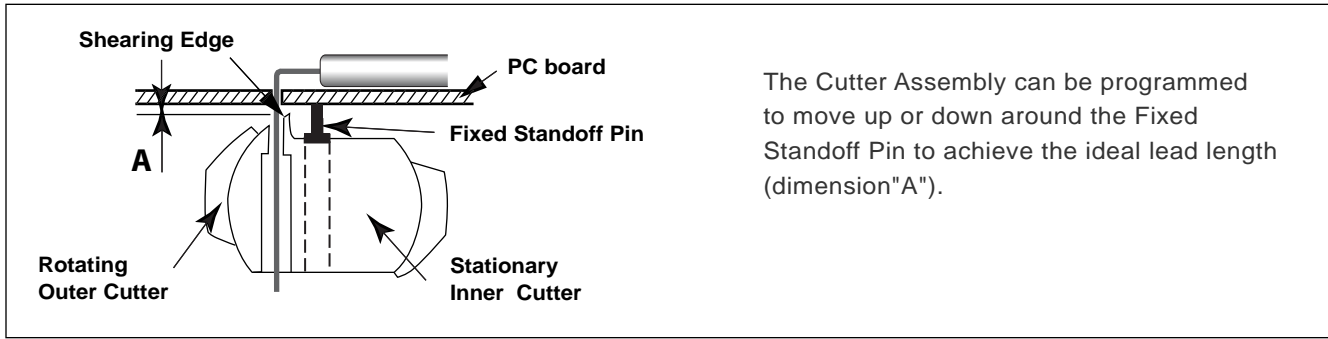
It employs a Cut & Clinch Mechanism consisting of two Cutter assemblies: one Fixed and one Movable. Each Cutter assembly is comprised of an Inner and Outer Cutter. The Fixed Cutter is mounted in the center, aligned with the Fixed Projector spot, while the Movable Cutter goes to the position defined by 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

Lead Spacing	.1" - 1.75"
Rotation	360°, 0.5° resolution
Lead Diameter	up to .050"copper lead, .025" maximum steel lead
Clinch Direction	Inward / Outward programmable, Sideways on .1" lead spacing components
Footprint	.085" x .105"

Cut & Clinch Cutters

Shearing Edge

PC board

Fixed Standoff Pin

A

Rotating
Outer Cutter

Stationary
Inner Cutter

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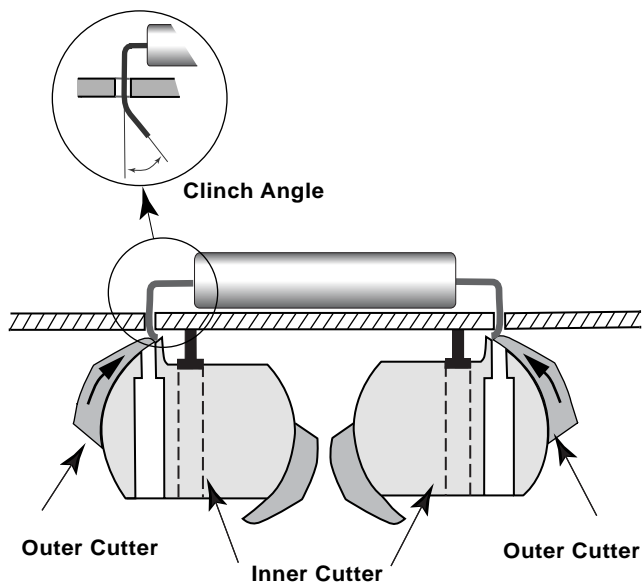
Lead Length

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.

Clinch Angle

Outer Cutter

Inner Cutter

Outer Cutter

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

SETTING	PIN HIGHT	LEAD LENGTH
1	.110"	.020"
2	.116'	.026"
3	.122"	.032"
4	.128"	.038"
5	.134"	.044"
6	.140"	.050"
7	.146"	.056"
8	.152"	.062"
9	.158"	.068"
10	.164"	074"

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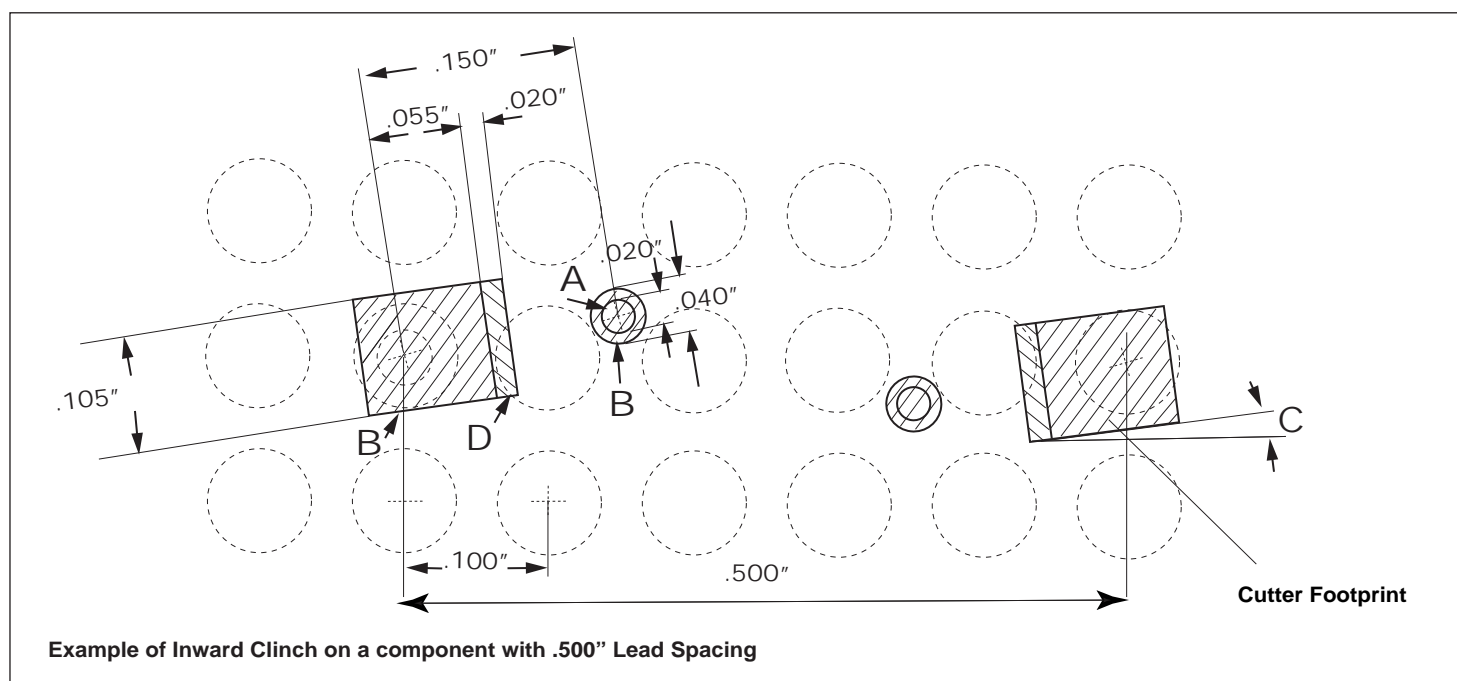
The Cutters Miniature Footprint is practically invisible to adjacent leads, even on densely populated PC boards.Two stationary pins provide support for the PC board, and are the only items to actually contact the PC board.

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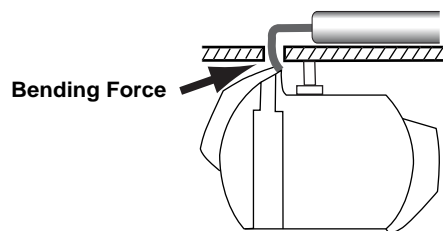
"C" represents the angle between the component center line and the direction of lead clinching, either Inward or Outward. The figure below shows this angle for a one half inch part.

"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.

Example of Inward Clinch on a component with .500" Lead Spacing

Lead Stress Relief

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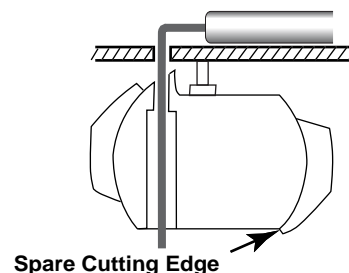
The CS-400E does not deform the integrity of the stress relief bend because the bending force is applied almost perpendicular to the lead.
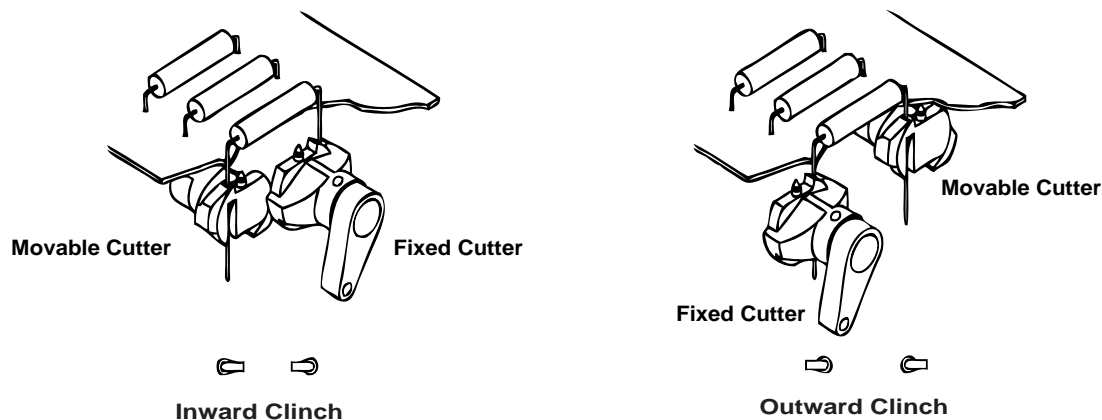
Cutter Durability

Spare Cutting Edge

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

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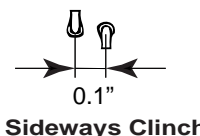
Clinch direction can be either Inward or Outward.
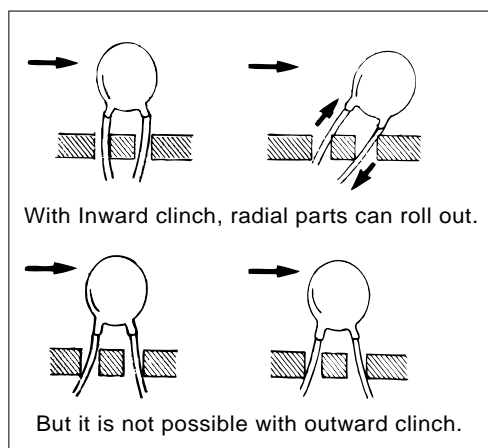On the Outward Clinch the Movable Cutter is positioned on the other side of the Fixed cutter.

Movable Cutter   **Fixed Cutter**

Inward Clinch

Movable Cutter

Fixed Cutter

Outward Clinch

Clinch Direction VS. Component Lead Spacing

Lead Spacing	Clinch Direction	
	Inward	Outward
.100"		
.150"		
.200"		
.400"		
1.000"		
1.500"		

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

0.1"

Sideways Clinch

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.

With Inward clinch, radial parts can roll out.

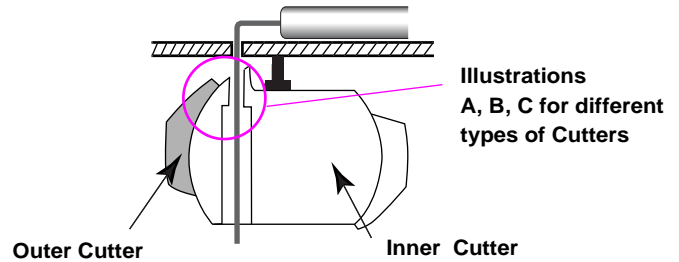But it is not possible with outward clinch.

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

Illustrations A, B, C for different types of Cutters

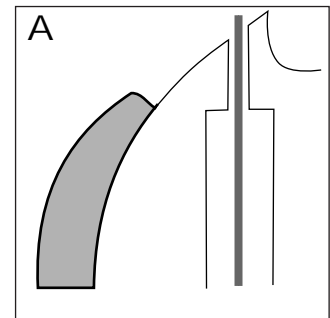**Outer Cutter**   **Inner Cutter**

Outer cutters
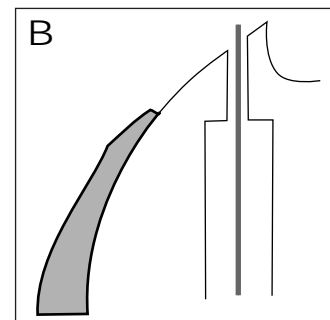
They are three types of Outer Cutters:

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.

A

Minimum Bend Cutters

These low profile Cutters are recommended only in situatons 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.

B

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 leaded 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).

C

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

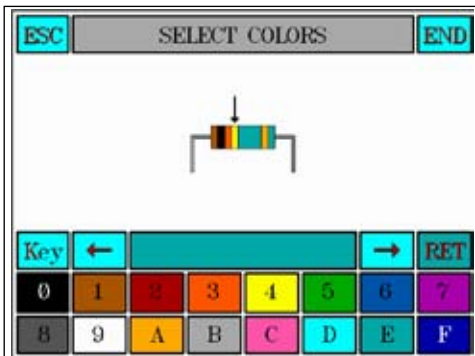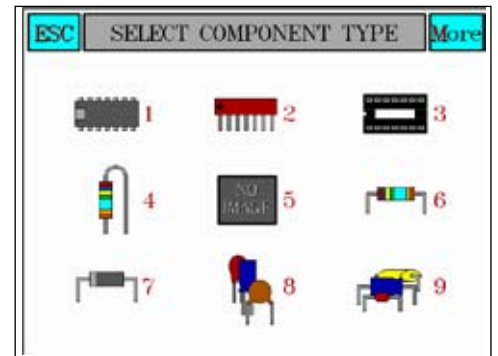The purpose of this feature is to display to the Operator an Image that closely represents the component that is currently being inserted into the PC board. These Images are generated from a selection available to the Programmer who has control over body size, leg number, and body color.

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.

The image of the hole on the Scope

The Operator needs to jog the crosshairs of the Scope anywhere inside the hole.

The Machine scans the hole and finds its center.

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.

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.

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.

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.
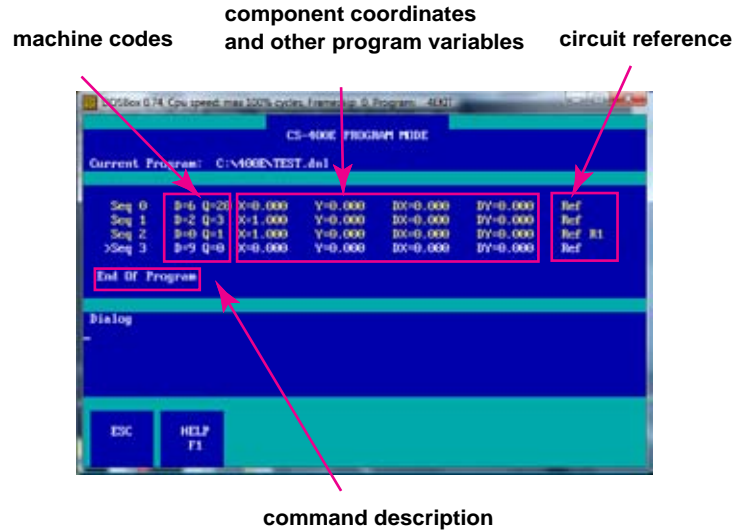
The Programming Procedure consists of the writing the Program and Digitizing of the Component Locations.

1. Writing the Program

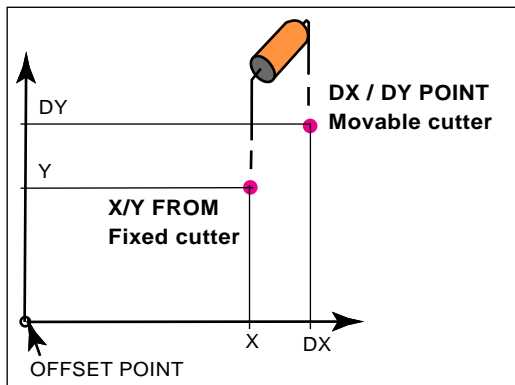Program are written as a series of Sequence Lines, which are saved to an executable file.
The Programmer writes the Program line by line, entering: Part Numbers (circuit references), Component Values, Polarity, Component Delivery units, Cut & Clinch parameters. Cut and Clinch parameters are determined 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.

component coordinates
and other program variables

machine codes

circuit reference

command description

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.

DX / DY POINT
Movable cutter

X/Y FROM
Fixed cutter

OFFSET POINT

component coordinates

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.

Dialog box guides the Programmer step by step

through the Digitizing Process

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.

Operator Display Panel

Nine Component Trays

Pick-up Window

Options

Rotary Bin Trays CS-204-59-3

18" diameter

4.5"

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).

Access Windows

Front View   **Back View**
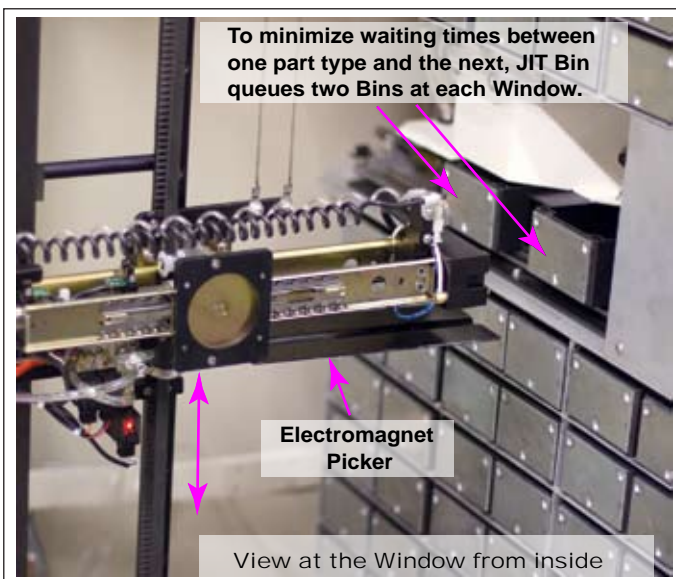
Minimized Setup Time

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.
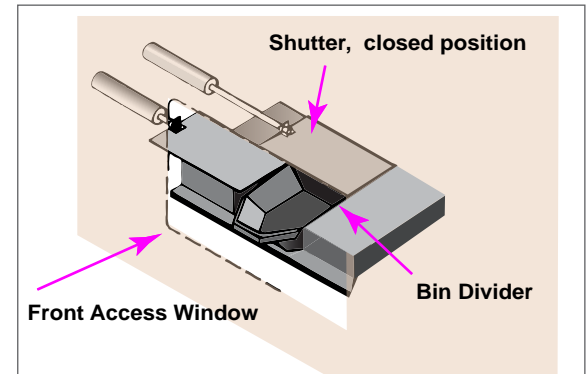
Minimized Waiting Time

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.

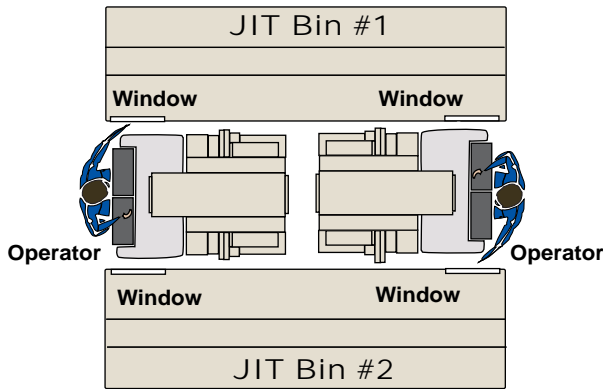**To minimize waiting times between one part type and the next, JIT Bin queues two Bins at each Window.**

Electromagnet Picker

View at the Window from inside

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.

Optional Bin Divider

Shutter, closed position

Front Access Window

Bin Divider

Support for Two JIT Bins

JIT Bin #1

Window   Window

Operator   Operator

Window   Window

JIT Bin #2

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.
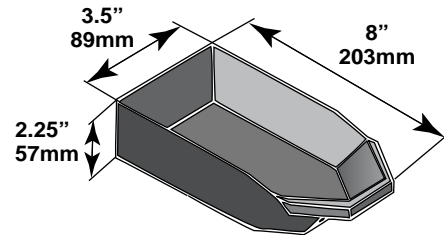
Bin Loading

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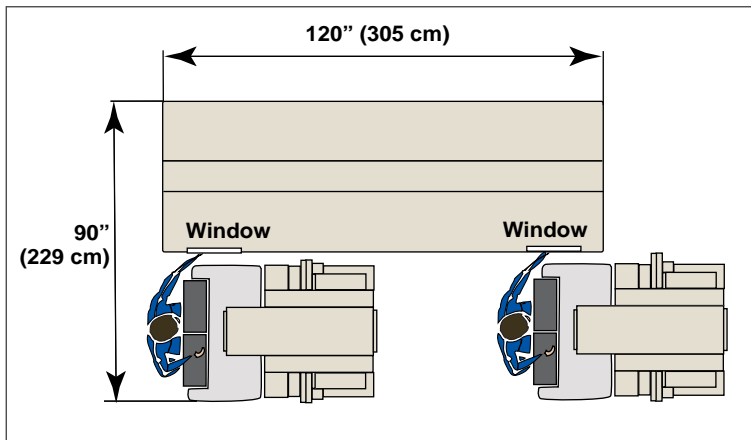
When the Operator sees a Bin getting empty, he will press a "Low Quantity" button in the Window. A printer attached to the Component Locator, will immediately print out the Bin number. At the end of a work shift, the almost empty Bins may be retrieved with a simple keyboard command for reloading.

Box Specifications

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

3.5"
89mm

8"
203mm

2.25"
57mm

Space Requirements

120" (305 cm)

90"
(229 cm)

Window   Window
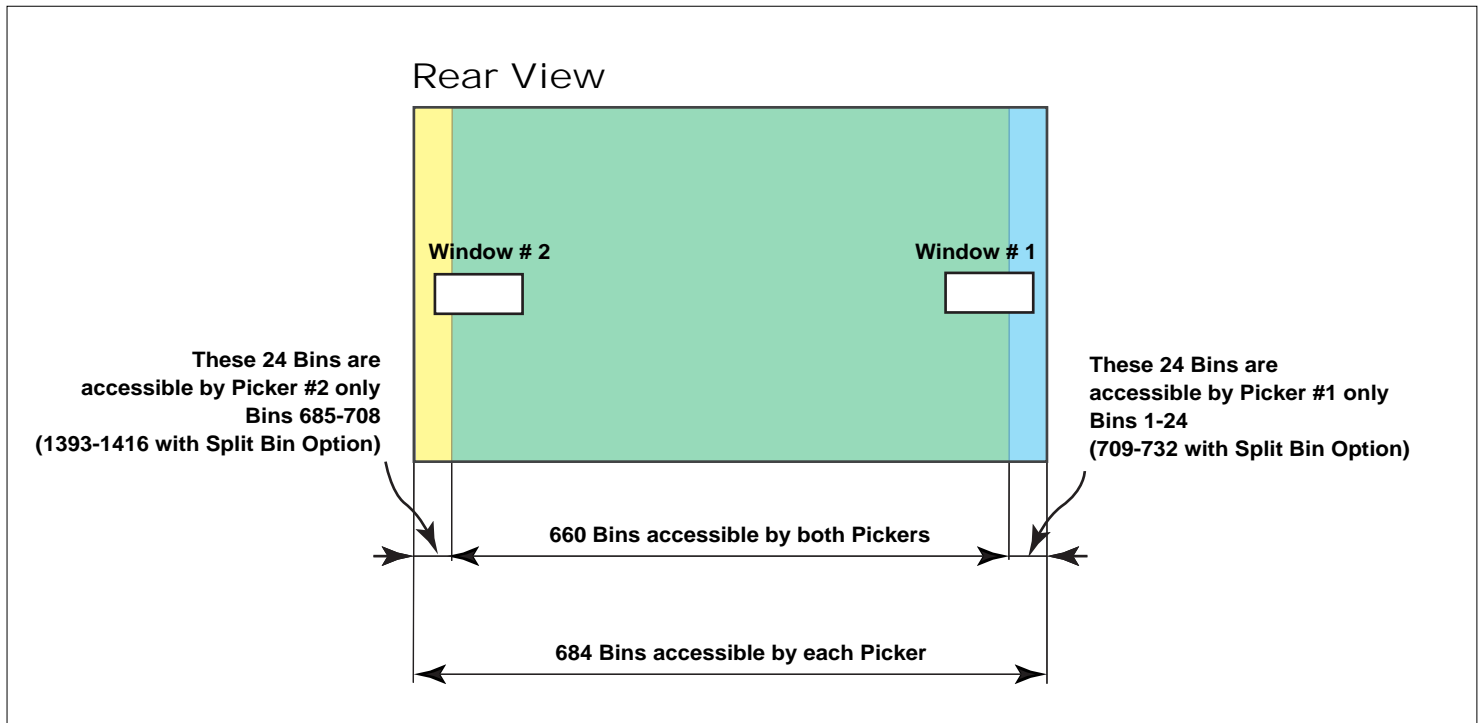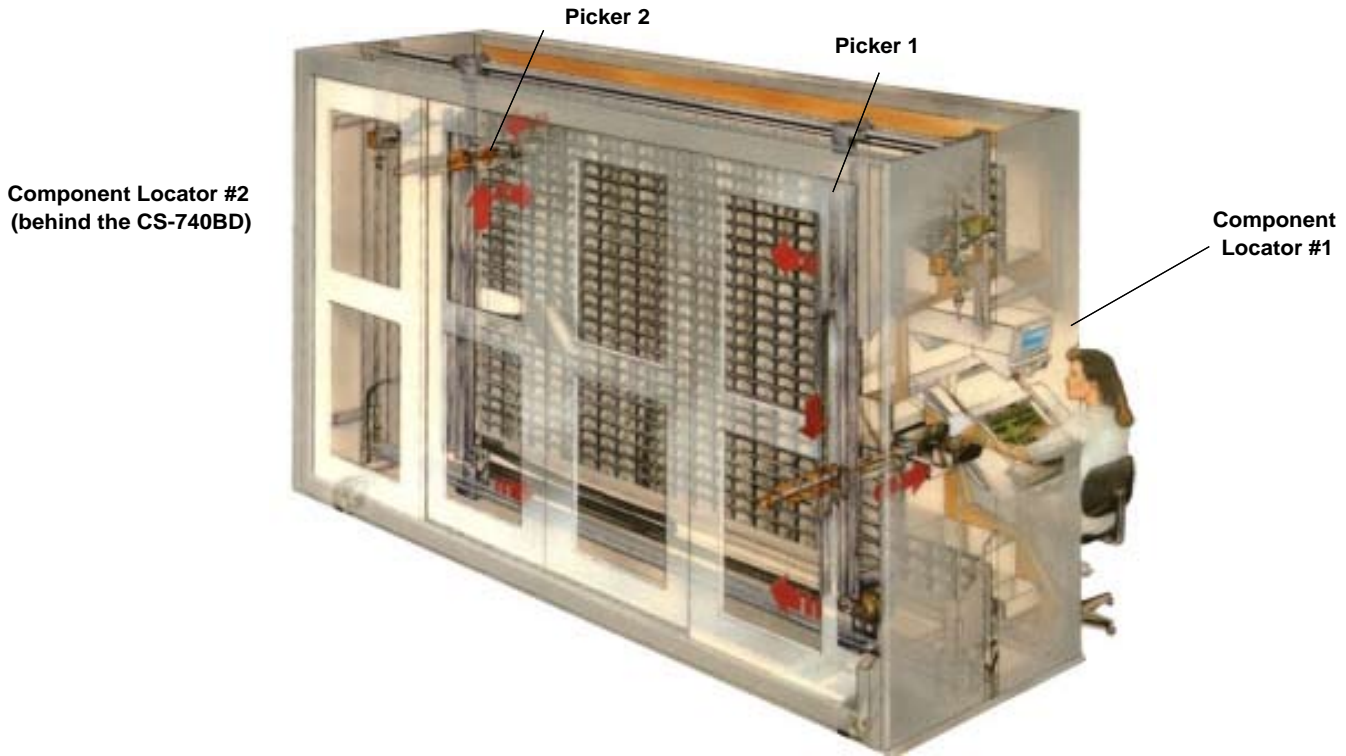
Specifications

Component boxes: 684 accessable 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

Component Delivery Options   Dual Picker JIT Bin CS-740BD

Picker 2

Picker 1

Component Locator #2
(behind the CS-740BD)

Component
Locator #1

Rear View

Window # 2   **Window # 1**

These 24 Bins are
accessible by Picker #2 only
Bins 685-708
(1393-1416 with Split Bin Option)

These 24 Bins are
accessible by Picker #1 only
Bins 1-24
(709-732 with Split Bin Option)

660 Bins accessible by both Pickers

684 Bins accessible by each Picker

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).
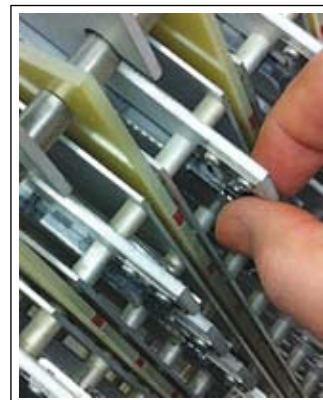
The Software allows to use all 708 (1416) Bins.
If the Bin can not be reached by the Picker, the CS-740BD will re-address the request to the alternate Bin, filled with the same parts. The software allows to specify an Alternate Bin that will be used if the Primary Bin can not be reached. Each pair of 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.

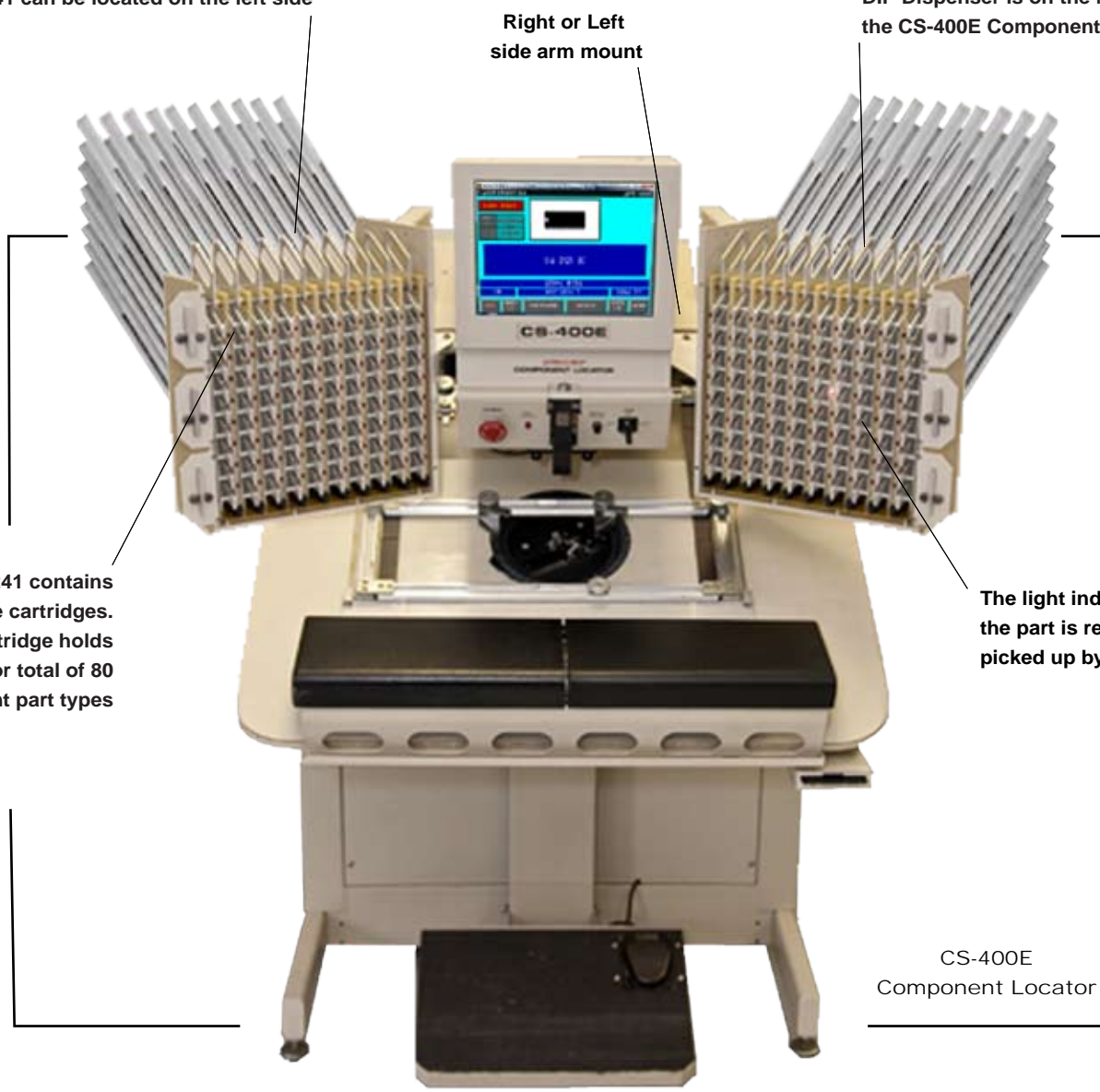**For additional capacity a second CS-241 can be located on the left side**

Right or Left side arm mount

Standard location of the Lighted DIP Dispenser is on the right side of the CS-400E Component Locator

The CS-241 contains 10 removable cartridges. Each cartridge holds 8 tubes for total of 80 different part types

The light indicates that the part is required to be picked up by the Operator

CS-400E Component Locator
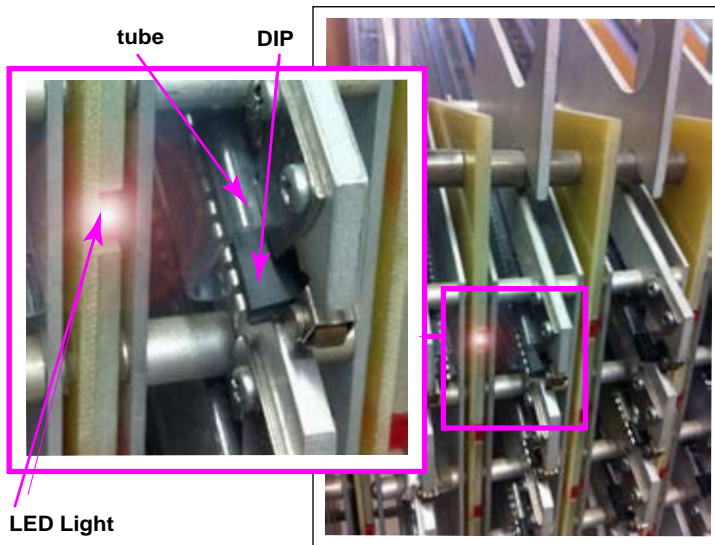
Large Capacity and Flexibility

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 holds10 tubes for total of 80 different part types.
The cartridges accept .300", .400", .600" DIP tubes without any adjustment.

Light Guidance

tube   DIP

LED Light

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
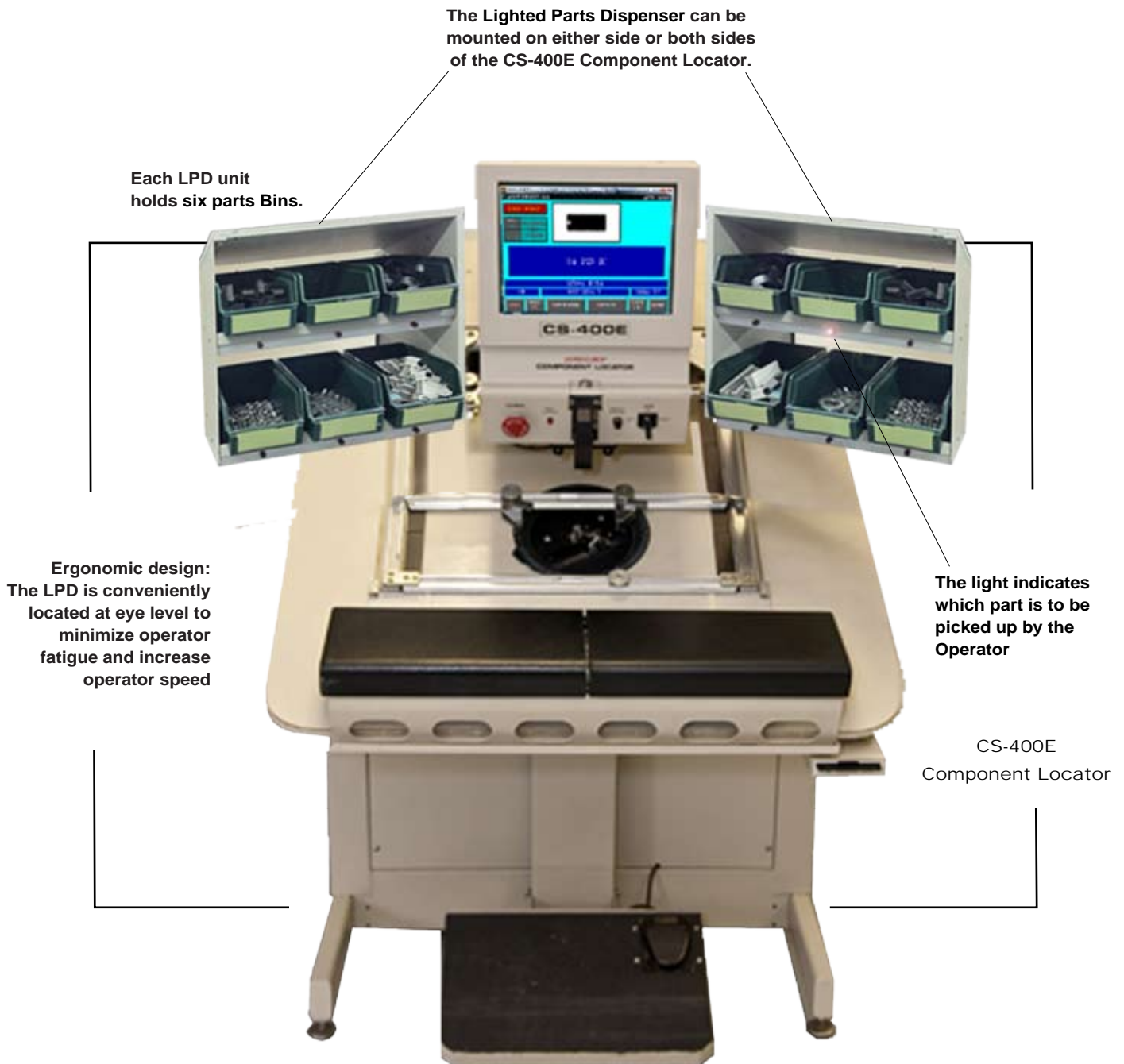
The CS-241 contains 10 removable cartridges.
Each cartridge holds 8 tubes for total of 80 different part types.
The cartridges are removeable for reloading and tube exchange.

DIP tubes

Removable cartridge

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 **Lighted Parts Dispenser** can be mounted on either side or both sides of the CS-400E Component Locator.

Each LPD unit holds six parts Bins.

Ergonomic design: The LPD is conveniently located at eye level to minimize operator fatigue and increase operator speed

The light indicates which part is to be picked up by the Operator

CS-400E Component Locator

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 occured.

The Component Verifier consists of the tester, test pads and cable set.
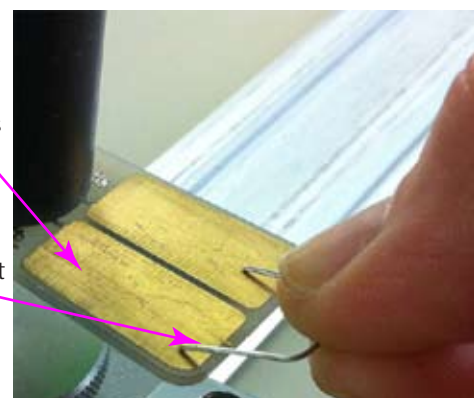
RLC Accuracy: ± 0.1%
Power requirements: 90-250 VAC; 50 or 60 Hz; 60W max

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.

Touch Pads

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.