

CaseCAD User Guide

Contents

[Overview](#)

[Types of Cases](#)

[Foam Properties](#)

[Understanding the Display and its Coordinate System](#)

[Designing Pockets with CaseCAD](#)

[Ordering Fabrication](#)

[Details of Program Operation](#)

[Contacting Us](#)

Overview

CaseCAD is a simple *CAD* (Computer Aided Design) program to help you plan and obtain case inserts made of high-quality packing foam. You could, of course, cut pockets in foam yourself, perhaps using a serrated kitchen knife or a single-edged razor blade. CaseCAD offers a more modern tool—your computer and the Internet—in recognition that packing foam is a notoriously difficult thing to cut.

The trouble most people encounter when they try to cut case foam for themselves explains why factory-provided foam sets typically come pre-scored, so that the user has merely to pluck out foam squares to make pockets. While convenient, the resultant pockets rarely match the shape of the equipment they are supposed to house: Because the openings must conform to a pre-scored grid, curved pockets are impossible, and even for rectangular items, the fit might be awkwardly tight or awkwardly loose. Worse, the slab of prescored foam, being physically compromised from the start, tends to fall apart with use.

CaseCAD's fabrication service sidesteps these problems by offering case owners the opportunity to specify the shape of pockets precisely using this simple CAD program. Because the case inserts we provide are laminated from multiple layers of foam, you can specify the depth of each pocket and even place deeper pockets within shallower ones to accommodate objects of complex shape. CaseCAD will also add "finger holes" for each pocket automatically. These openings allow you to grab an object easily and withdraw it from the foam, adding a professional touch to your case insert.

After you design the exact foam insert you need using CaseCAD, you can order it immediately online. Within a few days, we will ship you a case insert sculpted to your specifications using a computer-controlled router. Instead of having rough, jagged or ill-fitting cutouts, the interior of your case will have precisely shaped pockets. So with CaseCAD the inside of your case will function optimally, and it will look every bit as clean and professional as the equipment it houses.

The operation of CaseCAD is largely intuitive—go ahead and experiment with it now. The tips shown when you place the cursor over the various buttons provide enough information to get you started.

Types of Cases

If you are configuring a foam insert for one of the more popular *PELICAN™* equipment cases, CaseCAD will size the foam for you. Just choose the appropriate model in the start-up wizard. Need to outfit another type of equipment case? Just select *Custom Case* in the start-up wizard and you will be prompted to specify the length, width and depth of your custom foam insert. That is, you should enter the **interior** dimensions of your case. Note also that **you should specify that the insert be at least ¼ inch less than the depth of your case** to allow for manufacturing tolerances in the thickness of the foam layers used.

The start-up wizard also gives you options for fitting inserts to cases with canted sides and rounded corners. And CaseCAD allows you to make whatever side cutouts you need to accommodate locks or other protrusions. So you will be able to fit the insert exactly to your case.

Foam Properties

Our case inserts are fabricated of a premium-quality packing foam—something usually found only in high-end, custom-made cases. While flexible, this material is much more resilient than the soft foams one typically finds inside cases. With soft foams, equipment can easily “bottom out” in a fall, whereas the type of foam we use is similar to that employed in protective athletic gear, so your equipment will be much better protected from shocks. This foam (a polyethylene packing foam) does not absorb moisture when exposed to rain or spills.

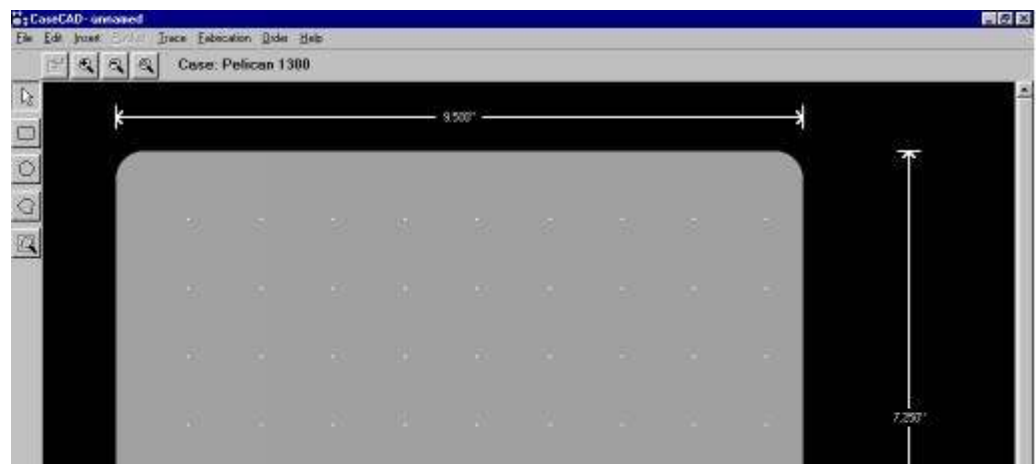
Although our foam is of roughly the same color (charcoal gray) and density (2 pounds per cubic foot) as the type of foam typically seen in hard-sided cases, it is physically much tougher, so it holds up much better over time. And the foam we have selected has a soft feel, further adding to the quality of your custom insert.

For customers who elect to have foam for the lid included, the material we use depends on the depth of the lid. If it is 1” or less, the lid foam will be the same material used for the main section of the insert. For lids that are deeper than 1”, we normally use a combination of foam types: convolute (“eggcrate”) urethane foam backed by the more resilient packing foam used in the main section. This provides a good combination of flexibility and protection. (For more information, see “Manufacturing Specs” documentation.)

Understanding the Display and its Coordinate System

CaseCAD represents the foam as a gray rectangle on the screen and sets the origin of the coordinate system at the upper left corner of this rectangle. This point corresponds to the back left corner of your case when placed flat on a table in the usual position, with the lid hinges located away from you.

The height of the gray rectangle shown on the screen then corresponds to the back-to-front dimension of the foam insert; the width of this rectangle corresponds to the left-to-right dimension. White dots are shown at 1-inch intervals for reference. The X measurements



indicated in the status line at the bottom of the screen give distances to the right of the origin point. Similarly, the Y measurements give distances downward from the origin. All measurements are in inches.



Note that you can temporarily shift the pockets you design in CaseCAD off the foam while you are working, but you must position all pockets at least 1 inch within the perimeter of the foam before saving the file and ordering fabrication. (For *PELICAN*[™] cases or other cases with sloping side walls, the required margin is slightly wider, so as to maintain adequate spacing between the pockets and the angled walls of the case.) You will be alerted when you try to upload the design if the placement of any pocket fails this test.

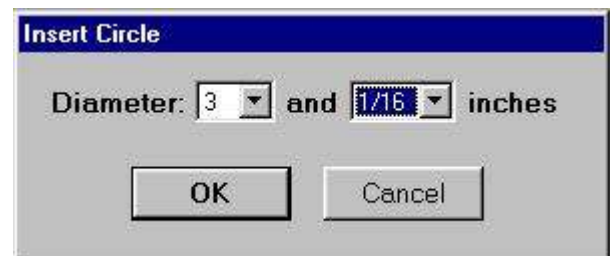
Designing Pockets with CaseCAD

You can use CaseCAD to create an infinite variety of pockets. Many common objects call for a pocket in the foam that has the shape of a circle, a square, rectangle or a regular polygon. In such instances, all you need to do is to measure the object with a ruler and to enter the relevant dimensions when prompted. Some things, however, have rather complicated outlines. For such items, CaseCAD allows you to design matching pockets of arbitrary shape by specifying the vertex points of an irregular polygon.

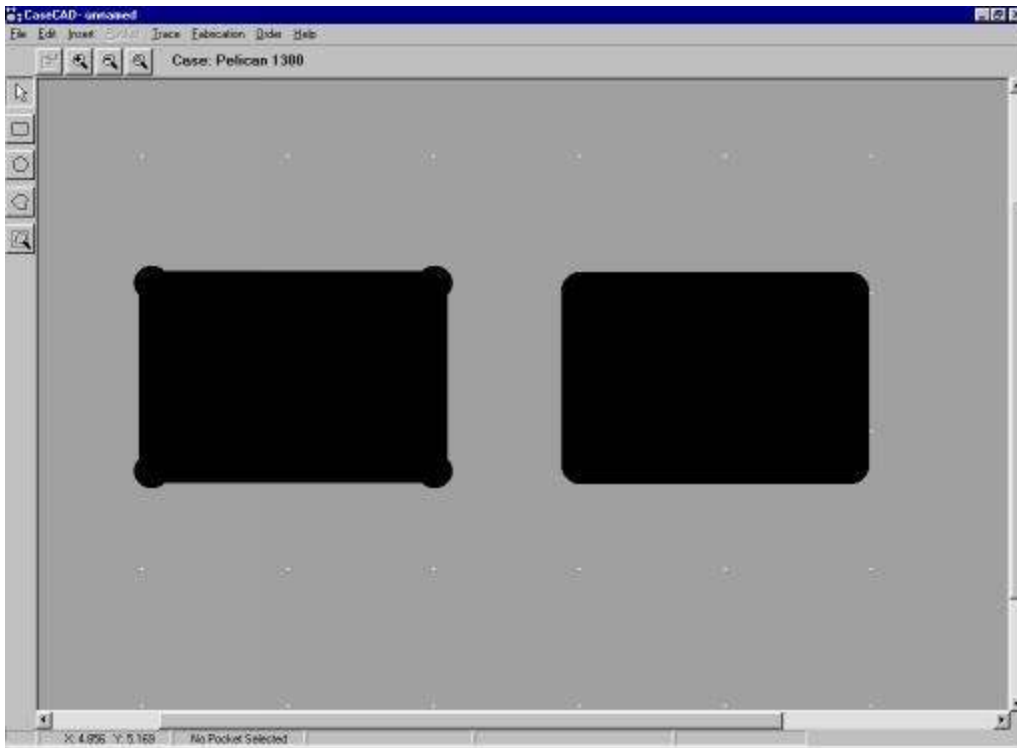
Specifying the Shape

To create a circular pocket, choose *Circle* from the *Add* menu and then enter the diameter you desire in the dialog box that appears.

Note that you can also create circular pockets using the Circle tool on the left-hand tool bar to draw a circle with the cursor. You can easily adjust the size of an existing circle by dragging on one of the red anchor points shown when you select it, by choosing *Display and Edit Properties* from the *Pocket* menu, by clicking on the Properties button on the top tool bar or by simply double clicking on the pocket itself.



Squares and rectangles can be created similarly, with the *Add* menu or by dragging after choosing the Rectangle tool on the left-hand tool bar. As with circles, CaseCAD allows you to display and edit their properties at any time. By default, rectangles are created with small circular openings cut into the four corners (below, left); these provide a helpful amount of clearance in case the object that is to be inserted into the pocket has sharp, right-angle corners. Or you can choose to not to have these openings made, which will result in the corners of the pocket being rounded to a one-eighth (0.125) inch radius (below, right).

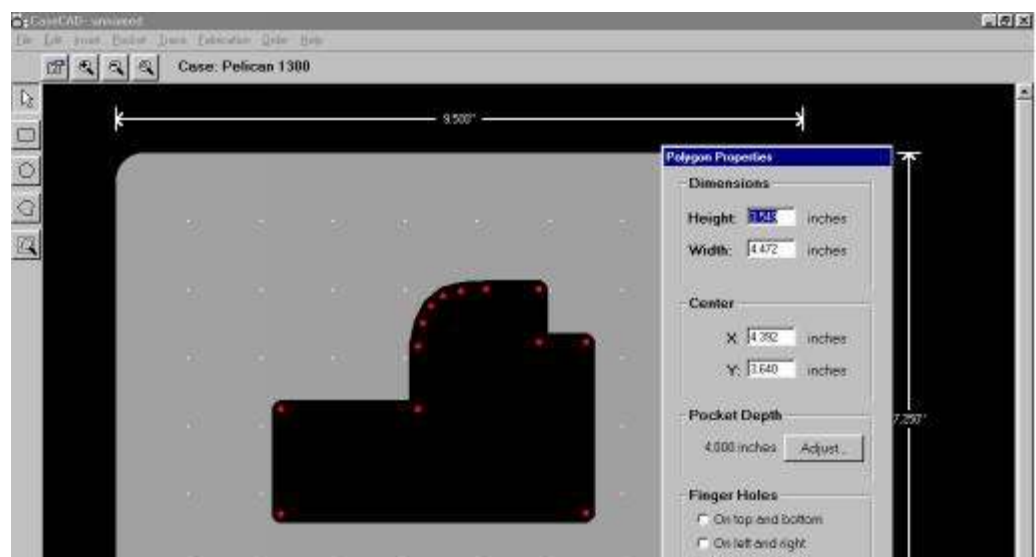


You can also use the *Add* menu to create a regular polygon (a hexagon or an octagon, for example). This option is useful too for creating oval pockets: just create a regular polygon with a large number of sides (say, 100), which you can then apply different horizontal or vertical scale factors using the *Pocket* menu (*Pocket* → *Scale...*).

You can create a pocket of arbitrary shape by first selecting the Polygon tool on the left-hand tool bar and then clicking where you want vertices to be located. You close the polygon by clicking on the starting point or by depressing the space bar.

Selecting the polygon by clicking on its interior shows the location of its defining anchor points, any of which can be moved by dragging on it or by right clicking on it and entering the desired X-Y position into the appropriate fields. Right clicking also allows you to delete an anchor point or to insert an additional anchor point adjacent to the one you've chosen. You can drag on any of the anchor points to change the shape of the pocket or the location of the finger holes associated with it. You can also display and edit the properties of the pocket, such as the depth or the orientation of finger holes, as needed.

Polygons can also be used to make side cutouts. Why would you want a side cutout? Because many cases require openings around the perimeter of inserts to accommodate locks, hinges and so forth. You can easily arrange such cutouts by first creating the appropriate shape with the Polygon tool. You must then do two things. First specify



that the resulting pocket not have finger holes (double click on it and choose *No finger holes*). Next, you must be sure that at least two of the anchor points fall on the straight sides of the foam perimeter.



Note that if you selected a *PELICAN™* case with wheels from the start-up wizard, cutouts will be made automatically near the base of the insert to provide proper clearance. The blue rectangles show the location of these cutouts, which are on the bottom of the insert. Positioning the cursor over these blue rectangles will indicate how deep a pocket you can place over these bottom cutouts without interfering with them. You should be mindful of this limitation, because the software will not impose any special limits on pockets placed near these areas.

Tracing

"But I want to make a rather intricately shaped pocket—how do I know where to click?" CaseCAD can help you fit complicated shapes—just use the *Trace* menu. Here you can choose *Object on the Screen* and then trace the object directly by holding it against the face of your computer monitor. Even better, if you have a scanner you can capture a jpg or gif image of the object you want your case to hold and choose *Trace Stored Image* from this menu.

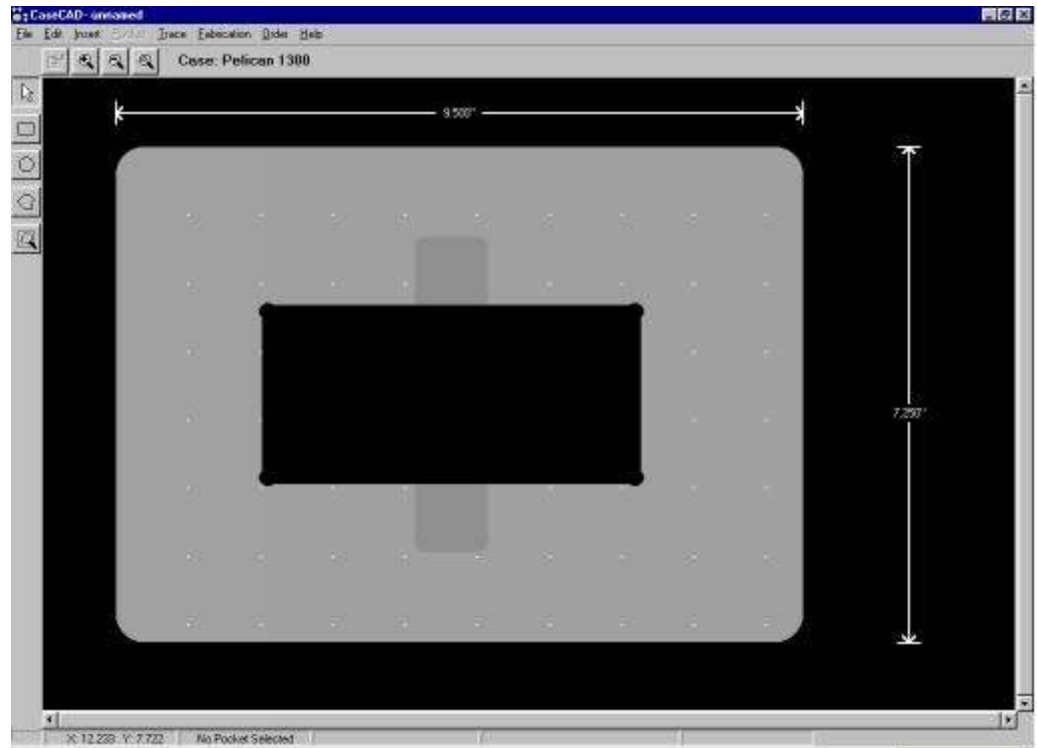


You can then click around the perimeter of the object shown in the image to design the pocket. This makes even complex pockets a snap to create. And you can readily adjust things later (shifting the location of individual points, adding or deleting points and smoothing the outline of the entire polygon), allowing you to achieve results of professional quality both quickly and easily.

Finger Holes

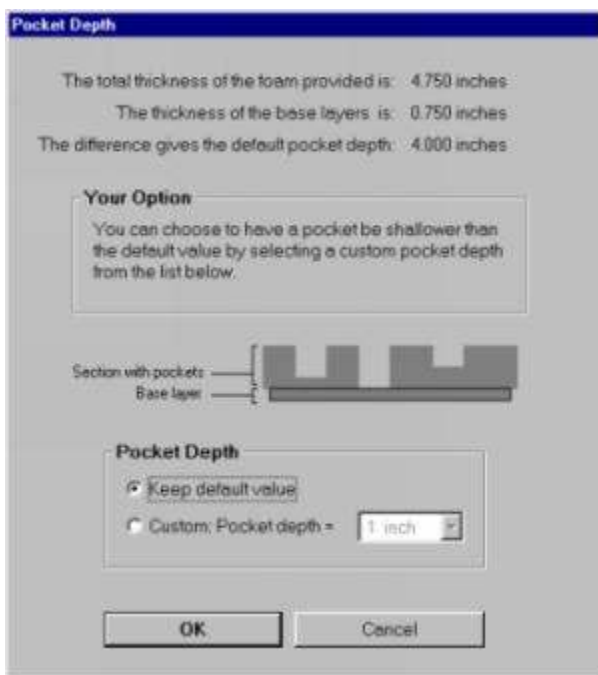
Each of the pockets you create, whether a circle, square, rectangle or polygon, will by default have a pair of finger holes straddling it. These appear as light gray rectangles or squares on the top and bottom (or left and right) sides of the pocket.

These one-inch-deep openings allow you to grab hold of your equipment without having to squeeze your fingers between an encased object and the foam. You can change their shapes by dragging on the anchor points that define them when you have the pocket selected. And you can shift them from the top and bottom to the left and right when you display and edit the properties of the pocket. You can also choose to forego finger holes from any given pocket, but this option should be reserved for special situations, such as when the pocket is placed within another one or when it is being used to make a side cutout.



Depth Adjustment

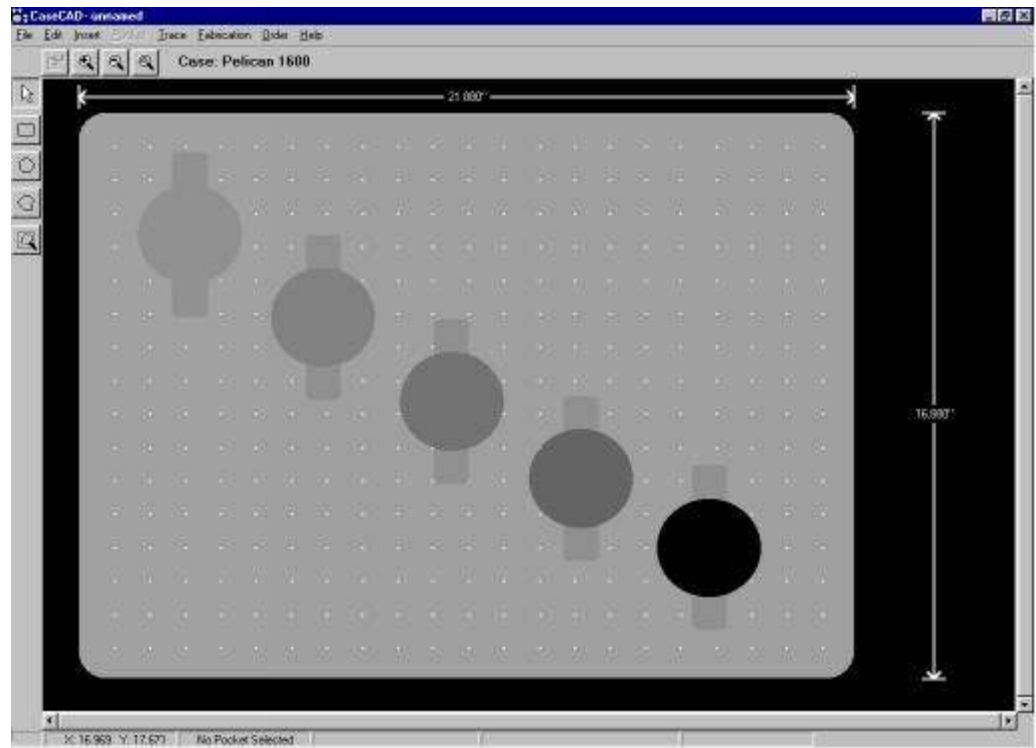
When first created, each pocket will be set for the maximum depth possible. That is, the pocket will be configured to extend all the way to the fixed-thickness layer of foam that is attached to the base of your insert. The thickness of this base layer varies, depending on the model *PELICAN™* case you are using or, if you are designing an insert for another type of case, on the specifications you provide when you first begin the project. You can easily change the depth of any pocket when you invoke the window to display and edit its properties.



CaseCAD uses different shades of gray to help you keep track of pockets that are of different depths, with the darkest grays corresponding to the deepest pockets.

You can make rather complex openings in the foam by combining pockets of different depth. As you will be able to see from the display, in areas where pockets of different depths overlap, the deepest pocket takes precedence. Thus you can place a deep pocket within a shallow one but not vice versa.

If you do place a pocket within a pocket, you'll note that when you click on it, both that pocket and the larger pocket within which it is located become selected. To manipulate the deeper pocket, simply select the shallower pocket first and then lock it using the Pocket menu (*Pocket*—>*Lock*). This allows you to select the deeper pocket and adjust its position or properties. To unlock the other pocket, use the Edit menu (*Edit* —> *Unlock All*).



Testing the Fit

Although printing a paper copy of the complete design is rarely necessary, ***we strongly advise you to print a copy of each and every pocket you create and test it by cutting the shape from the paper with a pair of scissors and placing the object you want to encase in the opening.*** You can do so by selecting the pocket and then choosing *Print Selected Pocket* from the *File* menu. (The fiducial marks provided allow you to test pockets that are larger than a single sheet of paper: You need merely to align the fiducial marks and tape the pages together before cutting.) This simple exercise allows you to evaluate the fit of the pockets you specify before committing to them.

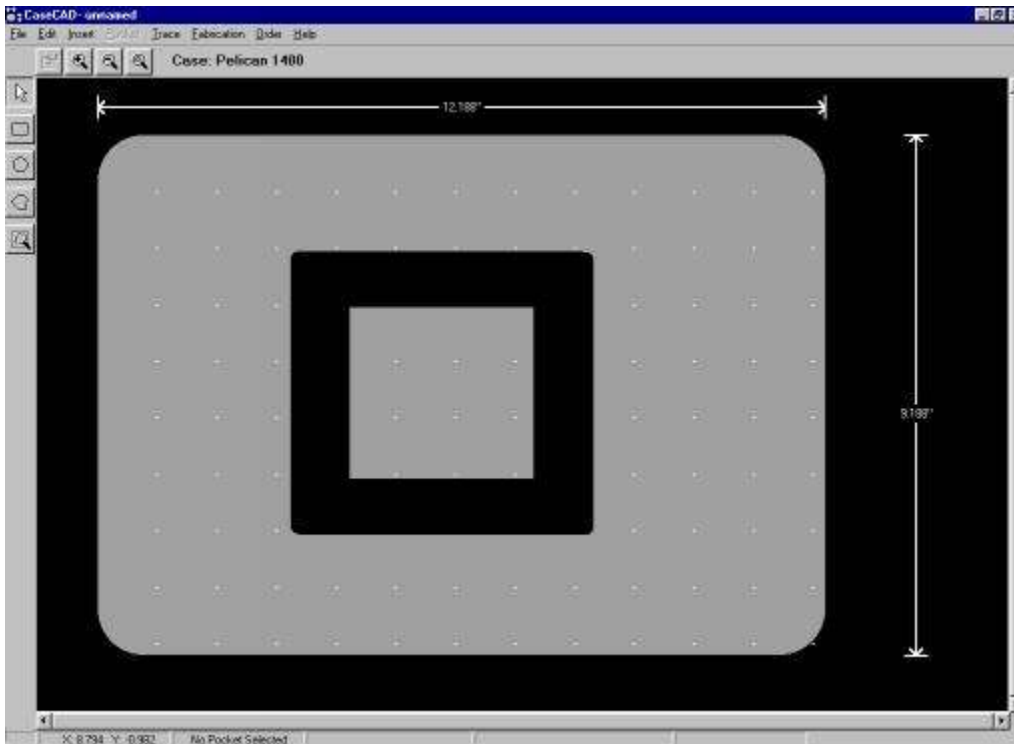
How exactly should an object be fit? The walls of a pocket should just “kiss” the sides of the object it is supposed to contain, but they do not have to do so everywhere. Indeed, it’s better to leave some clearance, particularly around any irregular protrusions, than to try to match each and every feature of an object you want to house. Having the sides of a pocket in light contact with the encased object in just a few spots is all you really need to prevent it from shifting. Minimizing the area of contact in this way ensures that you will be able to insert the object and withdraw it without encountering too much friction. ***Make sure that the object fully clears your paper cutout and do not rely on the compressibility of the foam if things look at all tight.*** Rather, adjust the shape of the pocket and try it out again. Don’t be surprised if it takes you a few tries to get things perfect; this is normal. The beauty of using CaseCAD is that you can experiment easily with paper and scissors and get everything to fit as you want before you order the foam insert to be made.

Spacing Between Pockets

Although the CaseCAD software does not impose a mandatory minimum, you should leave at least 1

inch of foam between pockets (including any finger holes). Allowing less than this not only compromises protection, but it can also compromise accuracy, because thin walls between pockets will tend to flex while the foam is being machined. Another reason to space pockets comfortably far apart is that thin walls of foam between pockets offer very little surface area on the bottom for adhesive, so are also prone to delaminate. **If you choose not to follow our guidelines and place pockets closer together, you must take responsibility for any unexpected results.** The same concern applies if you create a polygon that folds back on itself or has its finger holes awkwardly placed so as to leave only a thin wall of foam standing between openings on either side. (We reserve the right to decline orders for designs with pockets that are, in our view, placed too close together for good results.)

Although it is usually okay to arrange for two or more pockets to overlap so as to create a more-complex shape, you should use this technique with caution, making sure that you do not isolate any area on the foam with a "moat" of surrounding pockets or finger holes. That is, you must maintain continuity of the foam that borders your pockets. So, for example, you should **not** overlap four thin rectangles like this:



Submitting such a design would result in an insert with a single square pocket, without any "island" of foam in its center.

Another reason to use caution when you combine two or more pockets to create a more-complex shape is that you will use up your standard allotment of pockets more rapidly than if you had constructed the desired shape using a single polygon. Creating a polygon might take you a few moments more, but it's usually well worth the effort, especially because polygons allow you to add or delete individual anchor points, unlike the other fundamental shapes CaseCAD uses.

Ordering Fabrication

The *Order* menu allows you to compute the cost of the foam insert you have configured and to upload your design to us for fabrication. The price you see quoted will depend on the shape and size of your insert, whether you choose to have new foam made up for the lid of your case and whether the number of cuts required for the pockets exceeds the standard allowance (which is equal to 24 one-inch-deep pockets, 12 two-inch-deep pockets, 8 three-inch-deep pockets and so forth.). To learn more about our fabrication procedures, read the Manufacturing Specs help file (found with this document under the *Help* menu). For a full description of our pricing formula, consult www.CaseCAD.com. Please understand

that our prices are subject to change.

Before you upload a design for fabrication, you should of course make sure that the pockets you have specified are sized and arranged exactly as you want them. As mentioned, you'll be assured of your design if you print each pocket, cut out the printed shapes with a pair of scissors and then compare the openings to the objects you intend to encase in foam. (See [Designing Pockets with CaseCAD.](#))

Note that before uploading you must first save your design, which creates a **.ccd** file in the directory of your choosing. Continuing with the order wizard then allows you to upload your design to our servers. This, of course, requires that your computer is connected to the Internet. Use the software's Order menu to upload one or more designs. When done uploading, the software will launch your Web browser and navigate to a page at CaseCAD's online store from which you can purchase one or more of your custom designs using secure e-commerce protocols.

Normal turn-around time from receipt of payment over the Internet to shipping of a single insert is six business days. A good rule of thumb when purchasing multiple inserts is to allow one additional business day for each additional insert in your order. If we anticipate substantially greater time will be needed for fabricating the items in your order (say, because of a large backlog or an unexpected equipment failure) we will alert you and provide our best estimate of the time needed to fabricate your insert. Once we complete your order, we will send you an email message containing a tracking number so that you can follow the progress of the shipment.

If you experience any trouble uploading or purchasing the insert you have designed, send a message describing the difficulty to support@CaseCAD.com so that we can remedy the problem as quickly as possible.

Details of CaseCAD Operation

The Menu Bar

The *File* and *Edit* menus will be familiar to you. The *File* menu allows you to start a new project, open an existing one or save one to a file, which will then be given a **.ccd (CaseCAD)** extension. This menu also allows you to print individual pockets or a copy of your complete design. Because a typical case will be larger than a single sheet of letter-sized paper, the printout will contain a series of numbered crosses, which allow you to align the multiple sheets needed to encompass the project.

The *Edit* menu allows you to cut, copy and paste shapes and also to delete them. This menu also provides for undoing the previous operation, selecting all pockets and for unlocking all pockets that had been locked to prevent changes.

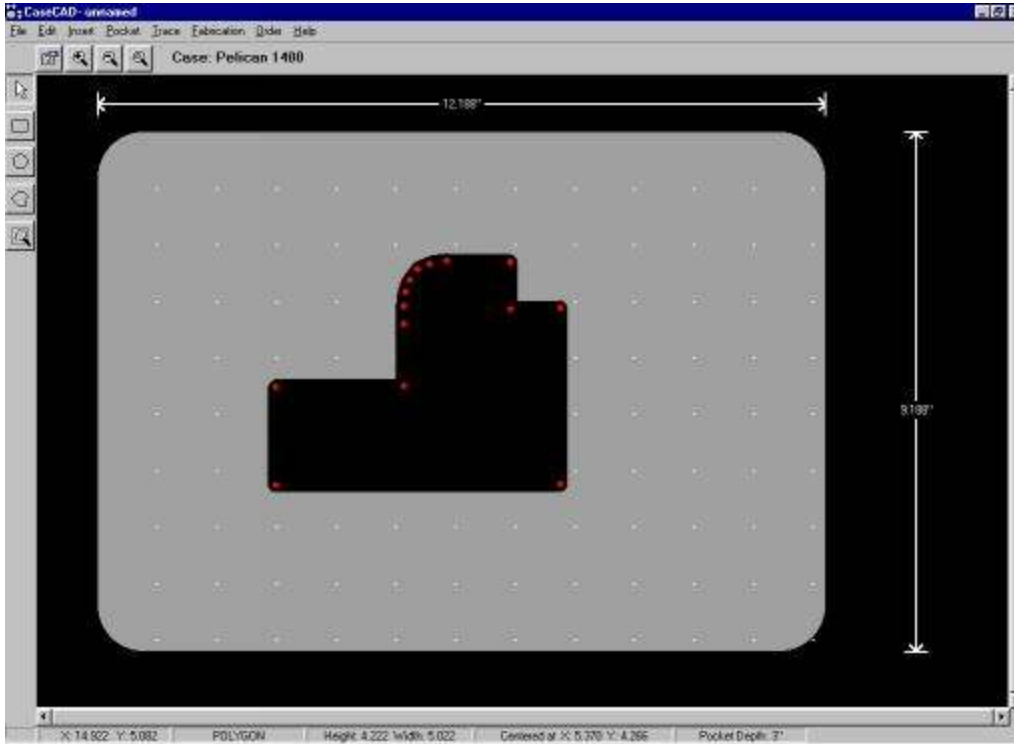
The *Add* menu lets you add a square, rectangular, circular or (regular) polygonal pocket according to the dimensions you set in a dialog box. You can then move the pocket anywhere on the foam simply by dragging on it.

The *Pocket* menu allows you to perform various operations on the pocket you have selected—that is, on the one that you have clicked on with the arrow cursor so that its red anchor points are visible. Using the *Pocket* menu you can:

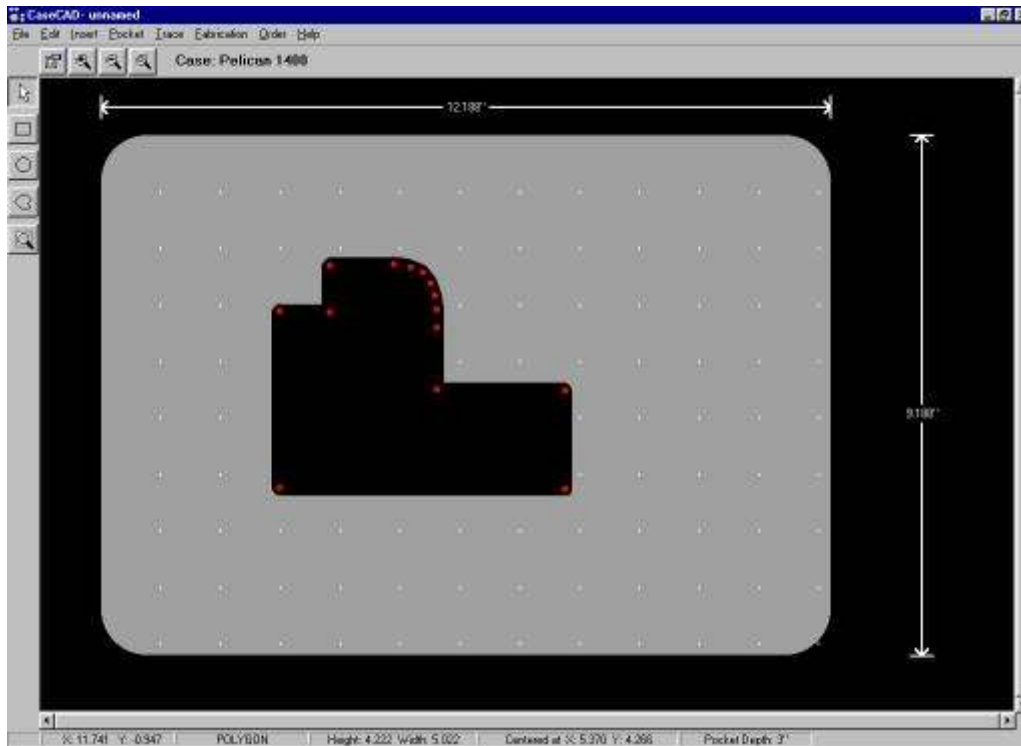
- Display and manually alter the properties of the selected pocket
- Lock the selected pocket so that it cannot be moved or modified accidentally. (Unlocking is accomplished using the Edit menu.)
- Enlarge or shrink the selected pocket uniformly, or (for rectangles, squares and polygons) stretch and squeeze it in one dimension only

- Change the orientation of the finger holes, which are placed on either side of a pocket so as to allow for easy insertion and removal of equipment. (A feature we strongly recommend using, except perhaps in a few special circumstances.)
- Rotate a polygon by the number of degrees you specify
- Smooth the perimeter of a polygon by applying a specified bevel to each vertex point
- Flop a polygon, which is useful for situations where you have drawn a polygon by tracing over an image of the bottom of the object you want to encase in foam

Flopping thus allows something like this:



to be easily converted into something like this:



You can also use the last item on this menu to manipulate multiple pockets—either aligning them or distributing them evenly in the X or Y direction.

The *Trace* menu provides the means to fit pockets to even the most complex shapes. Perhaps the easiest and most accurate method to fashion a pocket for a complicated shape is to trace over a .jpg or .gif image of the object that you want to encase in foam. For many objects, you can acquire a suitable image simply by scanning it on a flatbed scanner. Just specify to CaseCAD the resolution of the image (in dots per inch, dpi) after you open it. As with circles and rectangles, you will want to design your pocket so that the walls are just “kissing” the object in few places; that way the fit will not be so tight that it is difficult to get things in and out. So don’t try to match every little feature on the object you want your case to hold, which is difficult (or impossible) and, in any event, unnecessary. Rather, design your pocket to leave ample room where small protrusions stick out to the side of the object. Having the sides of the pocket make contact where the perimeter of the object is more regular is a better strategy. Note that you need not outline the object perfectly when you first trace over its image: you can easily modify the position and number of anchor points after completing the polygon.

To review, the steps for matching an arbitrary shape are:

1. Scan or otherwise obtain a .jpg or .gif image of the object you want to match. A relatively low resolution scan (for example, 75 dots per inch) works perfectly well.
2. Use the *Trace* menu, choosing to trace over a stored image.
3. Use the dialog box presented to you to open the image file.
4. Specify the resolution of the image in dots per inch (dpi) in the dialog box shown to you next.
5. Once your image is displayed, pick a pen color that will stand out and click around the edges of the object to define the pocket, matching the *outside* of the line to the shape you want to fit. End by clicking on your starting point or by pressing the space bar.
6. If necessary shift anchor points by dragging on them until you have them all arranged correctly. As noted, you need not match every little feature on the object. Indeed, you should make sure that you leave enough space so that no part of your equipment will tend to hang up on the surrounding foam.

7. Click *Make Pocket* to add the pocket you have designed to your project.

CaseCAD's *Trace* menu also allows you to trace over an object placed against the screen of your computer. This is more cumbersome than working with an image file, but allows you to skip the scanning step. Because the height and width of computer displays differ, you first must provide a calibration by measuring the dimensions of the colored window you see when you invoke this option.

The *Configuration* menu allows you to select whether you want lid foam included with your insert. This menu also allows you to modify the overall size and shape of the insert (dimensions, corner rounding radius, and so forth). You can also use this menu to review the configuration of your design and to look up its six-letter product code (which is assigned when you upload the design to CaseCAD's online store).

The *Order* menu allows you to find out the cost of the foam insert you have configured, to upload your design to us for fabrication.

The *Help* menu provides access to this document and to a short companion guide describing our manufacturing specifications.

Tools at the Left

The set of tools shown at the left side of the main window are arranged so that only one tool is in use at any given time. The choice of tool depends on the action you want to perform.



This tool is used to select a pocket by clicking anywhere inside it. Once you select a pocket, its anchor points (red dots) become visible. You can modify the shape of the pocket or the configuration of the associated finger holes by dragging on one of these anchor points. You can also modify an individual anchor point (or add an additional anchor point adjacent to an existing one) by right clicking on it.

Double clicking on the interior of a pocket with the selection tool brings up a window that shows the properties of the selected pocket and allows you to modify them. The selection tool also allows you to move a pocket by dragging on it. Dragging on an anchor point modifies the shape of the pocket. Note that after selecting a pocket, you can add to your selection by holding down the shift key or the control key and clicking on another pocket.

What do I do if I inadvertently create two identical pockets placed one on top of the other? This might happen, for example, if you copy a shape and paste it into the project, then copy the original shape and paste it again. Clicking on the pocket then selects both the pocket you see and the one underlying it. Double clicking will result in an error message telling you that more than one shape has been selected. The solution is merely to move an anchor point on the perimeter of the pocket. This will change the shape of the visible pocket, allowing you to see (and manipulate) the one underneath independently.



This tool is used, naturally enough, to create rectangular pockets. Simply drag the cursor (a cross) in the main window, which will create a rectangle.



This tool works similarly. After selecting it, you can create a circular pocket by dragging in the work window.



This tool allows you to create a polygon with any number of sides. After selecting this tool, the first click in the work window will start the polygon and an anchor point will become visible. Subsequent clicks in the window create the sequence of points that define the polygon. To finish, click on the original point (where the first anchor is shown) or depress the space bar.



This tool allows you to zoom into a selected area. Simply drag the cursor across the region of interest, and the zoom will be adjusted accordingly.

Buttons at the Top



With a shape selected, clicking on this button shows its properties, which you are then free to modify.

There are three buttons for changing the zoom:



This button zooms the view in.



This button zooms the view out.



This button sets the zoom out all the way so that all of the foam will be visible in the window.

Contacting Us

We urge you to contact us by email with questions, comments or suggestions about CaseCAD or our Internet-based fabrication service. Just send a message to support@CaseCAD.com.

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