CADALYST LABS Software Review

FAB Professional

Sheet-metal design

If you use AutoCAD to create your sheet-metal fabrication drawings, you are well aware of AutoCAD's limitations. To overcome these shortcomings, Striker Systems offers FAB Professional, an AutoCAD add-on for sheet-metal fabrication. FAB Professional is a collection of five distinct modules: SS-DESIGN, SS-UNFOLD, SS-NEST, SS-PUNCH, and SS PROFILE. FABCAD, a stand-alone version of FAB Professional that uses an AutoCAD OEM engine, is available for users who don't already own AutoCAD.

FAB PROFESSIONAL

Sheet-metal fabrication software

pros: Reliable; easy to use; impressive toolset.
cons: None significant.
price: $750–$12,000 add-on suite; $1,250–$13,000 FAB CAD stand-alone version.

Striker Systems
800.950.7862 sales@striker-systems.com

Pat Davis is an AutoCAD drafter in Lansing, Kansas.

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For this review, I tested FAB Professional using an 866MHz Pentium III with 256MB RAM, Oxygen GXVI graphics card, AutoCAD 2000 and 2000i, and Windows 2000. Installation is straightforward and requires an authorization code. By the time you read this, Striker Systems should have released a new version that is fully AutoCAD 2002–compatible. FAB Professional's toolbars use a black background to distinguish them from AutoCAD's gray ones (figure 1).

SS-DESIGN

SS-DESIGN provides the standard interface for all Striker Systems products and automatically loads with your AutoCAD drawing. As with all modules in FAB Professional, you can purchase SS-DESIGN separately for $750. It provides a wide variety of general- and special-purpose drawing utilities. You can do just about everything SS-DESIGN does with AutoCAD commands, but SS-DESIGN helps you do it with fewer commands and far less effort. Note that if you need to make a correction, you must use the SS-DESIGN Undo command rather than AutoCAD's to ensure that the previous command is completely undone.

SS-DESIGN provides a number of drawing standardization tools. For example, you can use layer management tools to create a layer control system. You assign layer information

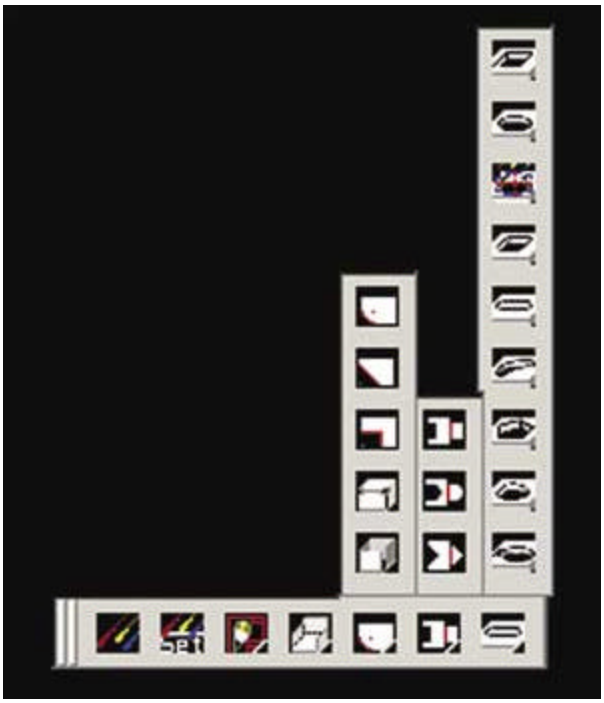

Figure 1. Fab Professional's toolbars have a distinctive black background to distinguish them from conventional AutoCAD toolbars.

to various tools and when you use them, they automatically assign the objects to the correct layer. Additional tools manipulate objects based on layers.

Multiple users over a network can access the user library that stores objects as blocks and store and retrieve common standards. You can group items and store text properties such as component description, part number, library name, and material.

An advanced drawings border system lets you create intelligent drawing borders, complete with title blocks and revision information. A drawing history function saves design notes with the drawing, which others can read when accessing it.

SS-DESIGN's parametric commands reduce the number of steps required to create or modify an object. For example, when you select an existing feature or object, the AutoCreate command determines the object type and size, if applicable, executes the corresponding SS-DESIGN or AutoCAD command, and creates a new feature or object (figure 2). The AutoModify command is similar—it modifies a selected object to a new size or insertion value.

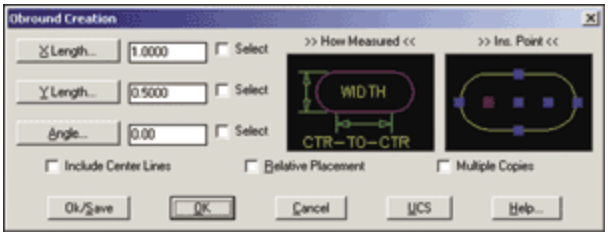

Figure 2. The Auto-Create and Auto-Modify commands allow features to be created or modified through an intuitive dialog interface.

A unique and useful drawing verification system cleans up drawings with errors such as overlapping and duplicate lines, endpoints that don't connect, nontangent arcs, and out-of-plane geometry. I found it extremely useful for a variety of chores—from checking and correcting drawings from colleagues or clients to correcting advanced drawings.

SS-DESIGN's autodimensioning library lets you specify dimension variables to control features such as hole chart representation, hole types to be displayed in hole charts, sort order, dim scale, and description. Hole charts can also include special shapes such as slots and rectangles. You can associate geometry with linear dimensions. When the dimension value changes, the geometry changes accordingly. SS-DESIGN's bill of materials system generates a complete stock list of parts with reference balloons.

The module also includes tools to quickly create shapes such as rectangles, radius rectangles, obrounds, and polygons. Side and corner modification commands create side notches, radius corners, and corner notches. These tools are very easy to use and work on 2D and 3D wire frame geometry.

The program also offers tools to create 2D and 3D sheet-metal parts such as parametric flanges, tabs, offsets, extrusions, notches, holes, and slots. It creates 3D wire frames rather than solids.

SS-UNFOLD

SS-UNFOLD ($1,495 stand-alone) is a 2D and 3D wire frame sheet-metal unfolding program that creates flat models using straight line or arc bend representation. You start with a model that shows material thickness or is a single-surface wire frame. To unfold solid models, Striker Systems offers a Mechanical Desktop–based SS-SOLID UNFOLD for free.

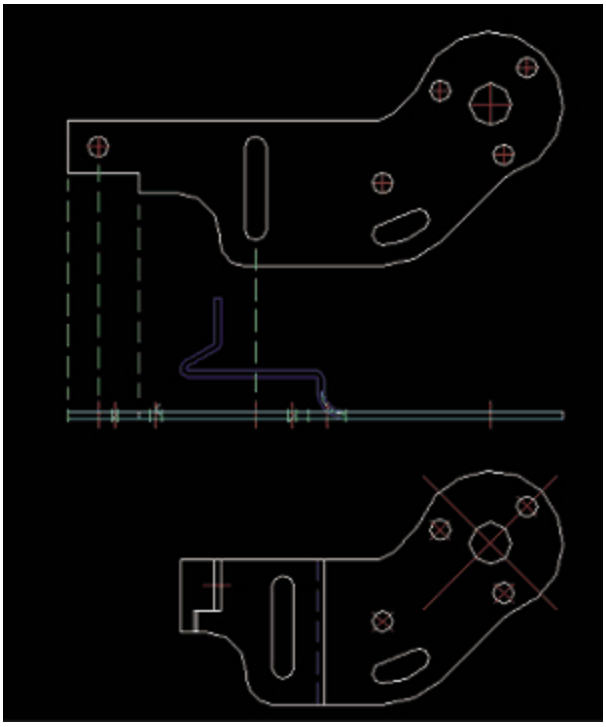

Figure 3. Unfolding a 2D cross section provides proper positioning of part features in the flat.

You store bend information in a user-defined calculation table and material library. SS-UNFOLD uses a neutral axis percentage to determine the percentage of material that stretches as the bend transforms into a flat pattern. If you use bend allowance calculations or bend deductions to calculate the amount of stretch, a bend allowance calculator returns the neutral axis percentage. When you execute an unfolding operation, the software compares the radius of the object in the current drawing to the thickness ratio of the closest entry in the calculation list.

The 2D unfolding command lets you transform 2D orthographic views as well as 2D section views into flat patterns. It processes and positions part features such as holes and notches within the flat pattern (figure 3). Unfolding 2D geometry is far more difficult and time consuming than unfolding 3D wire frame geometry. Conversion requires a great deal of manual drawing processing in addition to the 2D unfolding commands.

Each bend in the flat pattern contains all data necessary to create the bend—bend number, bend allowance, neutral axis, bend and form radius, bend angle, overbend angle, and bend direction. You can view bend data on-screen or print it out. You can also add a bend chart with references to a drawing. A transitional unfolding feature creates flat patterns from cylinders, cones, square-to-rounds, and other shapes.

SS-NEST

Most MCAD packages lack a true multipart nesting system such as SS-

NEST ($1,995–$5,495 stand-alone). This module optimizes part placement while reducing scrap. With the Preferential Hole Filling function, you can nest additional parts inside the holes of larger, previously nested parts, so parts are cut from material that would otherwise be scrap (figure 4). Master Plate support lets you reduce the number of distinct NC programs required to complete the job. It also supports filler parts, which can be assigned to any job if space on the sheet is available.

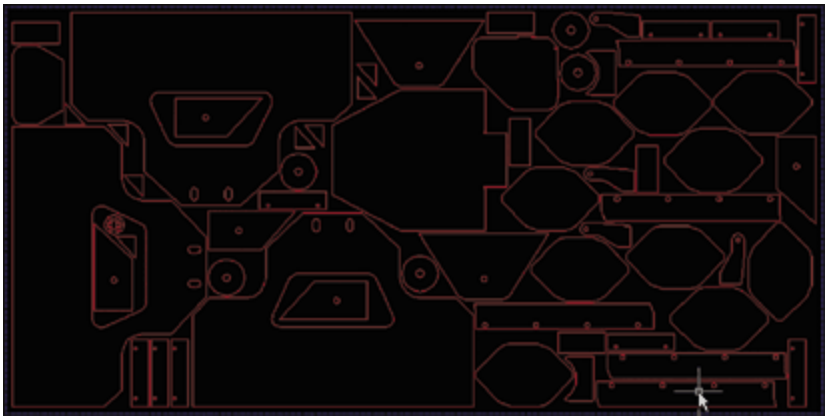

Figure 4. Multipart nest for laser processing automatically generated through MRP Interface feature of SS-Nest.

When used with SS-PROFILE, SS-NEST assists with head-down processing and common-edge cutting with CNC laser, plasma, and burning machines. The head-down cutting feature reduces machine runtime by keeping the cutting head down when moving between parts and holes within a part. Common-edge cutting optimizes the nest job further by positioning the edges of different parts together so they can be cut with a single pass.

Working with the SS-NEST module is straightforward. You begin by adding parts to a Nest Library from the User Library or from your drawings. When you select objects to create a Nest Library part, SS-NEST prompts you to select any areas inside the part that are large enough to have smaller parts nested. You then complete the part detail information, such as part number, description, machine used to process part, material properties, sort options, and nesting options.

Next, you define the nest kit by specifying sheet material type, size, thickness, the number of sheets available, margins, and the distance to maintain between parts. You then add the desired parts from your Nest Library, specifying the minimum and maximum number of parts per sheet. If the material thickness of the parts in the nest kit differ, SS-NEST automatically separates those parts into separate jobs. The nest kit can then calculate options such as filling the last sheet with parts, preferential hole filling, squaring all parts at the far end of the sheet to create the largest piece of scrap available, nesting direction, and corner of sheet to start.

You then insert the layout(s) from the processed nest kit into a drawing. SS-NEST creates a part table to show sheet and part numbers, number of parts, and sheet use percentage. Then you generate an NC program with SS-PROFILE and SS-PUNCH.

I was impressed with how well SS-NEST works. With SS-NEST, I created a nested sheet in a fraction of the time it would have taken manually, while reducing scrap an average of 15%.

SS-PUNCH

SS-PUNCH ($4,995 stand-alone) is a graphical system used to create tooling paths for CNC turret punch presses. A customized postprocessor translates graphical tooling into a machine-specific NC program. Once you load a post into a drawing, SS-PUNCH represents the machine table, material sheet size, and available punching area in the drawing with different- colored hidden lines (figure 5). Clamps, clamp dead zones, and clamp travel ranges are represented and numbered in ascending order from the load position of the table.

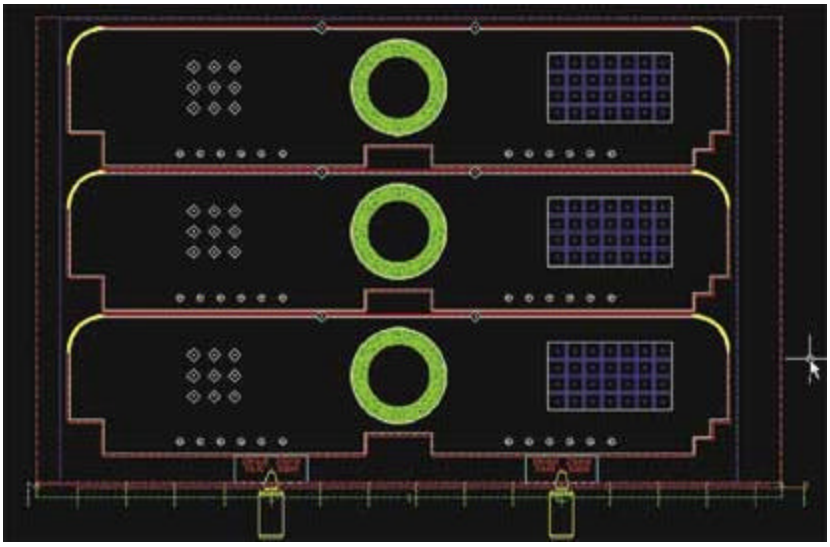

Figure 5. Tooled sheet layout for turret punch press operation generated by SS-Punch.

SS-PUNCH provides several methods to create tooling paths, including a Quick Punch command. You simply create or insert the part, start the Quick Punch command, and select a perimeter edge of the part. As long as the machine driver has available tooling set in the turret configuration, it tools the entire part. It processes the part based on your current part option settings. As with all the tooling path creation options, if a problem arises with a particular shape, SS-PUNCH marks that shape with a callout.

You can also create tooling paths by using the Full Auto Process or Punch Part commands. The Full Auto Process commands provide a dialog box where you access all the commands necessary to process a part. You can modify the turret or change the program information. The punch part commands let you specify how to process a part. These include perimeter, corner, hole, standard shape, irregular hole, and part information options.

As SS-PUNCH processes a part, it searches for turret and cribs based on your configuration to find the appropriate tooling. If it doesn't find the tooling shape, the program uses multiple tools to clear the shape or marks it with a star if it determines the shape can't be processed with available tooling. Once the part is tooled, you can easily create a multiple part grid, or the part can be nested with the SS-NEST module.

SS-PUNCH provides a flexible turret control system that lets you create and save multiple turrets. You can also create new tools.

A quick toolpath optimization option lets you optimize a single tool or all the tools at once. You can limit toolpath direction, maintain cycle hits, and check

for duplicate hits. An interactive toolpath optimization option is also available. Automatic and interactive repositioning commands give you control over tool processing and handling unique situations. The Auto-Repositioning command automatically detects tool hits that are outside the valid punching area. If the sheet needs to be moved, flipped, or rotated, SS-PUNCH walks you through the process of repositioning the sheet.

SS-PROFILE

SS-PROFILE ($4,995 stand-alone) is a graphical system that creates automatic and interactive tooling paths for CNC laser, plasma, oxyfuel, water jets, routers, and other two-axis cutting machines. It uses customized post-processors to translate graphical tooling into a machine-specific NC program.

Once a post loads into a drawing, SS-PROFILE displays with different-colored hidden lines to show the machine table, material sheet size, and available burning area. It represents and numbers clamp, clamp dead zones, and clamp travel ranges in ascending order from the load position of the table.

The simplest way to create a toolpath is to use the Auto Part Define command and select the perimeter of the part. Cutting conditions are obtained from the user-configurable Profile Utilities dialog box. SS-PROFILE automatically applies the proper kerf compensation and applies lead-ins and lead-outs based on settings in the Modify Default Leads dialog box. A yellow toolpath warns you if a lead-in or lead-out cuts into a part.

SS-PROFILE also offers extensive toolpath modification and optimization options. By simply picking on the part, you can adjust kerf values and cutting conditions. You can optimize parts according to their order and location, maximize head-down possibilities, reorder internals, move the leads, and ensure that the cutting head doesn't pass over a previously burned path.

General information

SS-PROFILE and SS-PUNCH use the same interface to create an NC program. It's straightforward and offers options such as creating a setup sheet, part checking, and viewing the program as it is created. Optionally, SS-PROFILE lets you redraw a part by reading the NC program. Contact Striker Systems for specific information about machine drivers.

FAB Professional includes comprehensive on-line help and training tutorials. If you are familiar with AutoCAD, sheet-metal fabrication, and machine shop practices, these tools help you quickly become productive with the product. Video clips explain individual commands and general procedures. Striker Systems also offers on-site training.

I've only scratched the surface of what FAB Professional has to offer. FAB Professional is a well-thoughtout application suite. The ease with which you can create sheet-metal fabrication drawings makes it an extremely valuable tool that helps you be more productive and accurate, especially when you compare creating those same drawings with AutoCAD alone. You can download trial versions of FAB Professional's modules and product demonstration video clips on Striker Systems' web site.

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