Cleaveland Aircraft Tool
2225 First St. Boone, IA 50036
(515) 432-6794   (515) 432-7804 (FAX)
mail@cleavelandtool.com
www.cleavelandtool.com

C-Frame Tool Instructions

Thank you for purchasing the Cleaveland Aircraft C-Frame tool. This is probably the most useful tool that you will purchase during the construction of your project.

Each tool is packed with one short .401" shank set holder, one long set holder ram, one flat set for flush riveting, one return spring, and one o-ring to keep the spring in place. The bottom receptacle will fit any .401" shank rivet gun set. Many of you will already have these universal head sets for use in your 2X or 3X rivet gun. Our tool is designed to make dimples for 3/32" & 1/8" flat head rivets and will also make dimples for #4, #6, #8, & #10 screws.

To ensure that the sets are perpendicular with the skin you will need to build a small table around the C-Frame. This table is designed to sit on the workbench and removed when the c-frame is not in use. We have included plans for this table on the opposite side of this page. Using the table you will save many hours and ensure that all of the dimples are uniform.

To build the c-frame table aquire all the materials on the material list. Layout the lettered pieces in the pattern below and screw them together. You may wish to add triangle support blocks in the corners for added rigidity and a good support for the adjustable feet. Once the frame is together lay the plywood top on, square up the frame, and screw down. Be sure to cut the rear notch out and drill the set holder hole before attaching carpet. Once you have verified that the c-frame will fit in this table you are ready to attach the carpet. The carpet keeps the skin from getting scuffed up as small chips will fall down into the carpet instead of rolling around under it. You should keep this vaccumed periodically to avoid chip buildup. Carpet should be attached with spray glue as instructed on the can, with carpet tape, or with staples. Low pile kitchen or indoor outdoor carpet seems to work the best. Last but most important is the adjustable glides, these can be found at most hardware stores. They have feet with a machine thread on top, the thread screws into a socket that presses into the wood. It is best to find a nut with the matching thread to use as a lock once the table is tweaked. Insert one glide into each corner. Insert the c-frame under the table and drop in the set holder. Insert the ram into the bronze bushings and drop the spring and o-ring on the ram. Next insert a set of dies with the male in the bottom. The dies are always the same thickness so the setup will work regardless of the die being used. Take a razor blade (or anything thin, flat, and light) and lay on the flat surface of the male die (not up on the funnel). Let the ram come down and hold the razor blade in place. Now adjust the feet so the razor blade is hovering 1/16" over the carpet. Remove the razor blade and use a small square or a perfectly square block to ensure that the ram is square to the carpet. Tweak feet and repeat this as necessary for front to back and side to side. When finished put razor blade back in and verify it is about 1/16" proud of the table. If the die is recessed it will cause one dent per dimple in the skin! Once finished tighten nuts to lock feet and set the o-ring should so that there is about 3/4" between the ram and set holder in the hands off position.

The most common error when dimpling with this tool is striking the ram too hard. This leaves rings around the top of the dimple and deforms the aluminum sheet. Two or three light blows are better than one hard one.

When dimpling, put the male die on the bottom set holder and the female on top. Move the aluminum sheet until the pilot on the male die projects up through the hole. Set the female die down over the male pilot and hold down with your hand. Strike the ram two or three light blows. Practice this procedure on scrap pieces of aluminum before starting on a real skin. Experiment with different weights of hammers and different levels of impact until you find the right combination for you.

H I

G

F

A

6"

B

C

D

E

.75

A   pine   ¾ x 2½ x 48"
B C D E   ¾ x 2½ x 34½"
F G   ¾ x 2½ x 21"
H carpet   ¼ x 36" x 48"
I plywood   ⅜ x 36" x 48"

3"

36"

G

F

48"