

CLEVELAND TOOLS BUILD

QUALITY.

Don't let inferior tools limit your workmanship

INSIDE
**Answers to the
most common
construction
questions.**



**CLEVELAND
AIRCRAFT TOOL**

FOR BUILDERS BY BUILDERS



For more than forty years my family has owned and built experimental airplanes. We've been sharing our knowledge and favorite tools as Cleaveland Aircraft Tool for more than 25 years. Our experience with building techniques, process and our relentless eye for quality should be evident in the selection of tools and accessories we carry for metal aircraft.

Our riveting and RV-specific products are designed and manufactured by us to ensure the highest standard of production and we offer a 100% satisfaction guarantee on their performance.

We believe that **superior tools are a pleasure to use and inferior tools are only a frustration.** Through teaching builders' classes we've seen that even a novice builder quickly improves and their technique can soon outpace the quality their tools can deliver. Ask any experienced builder; we all have a box full of tools purchased at "bargain" prices that proved to be inadequate for the job.

While others might suggest "upgrade options" to nearly every tool they sell—we remain committed to carry only the tools that make the difference—and when you can pick something up locally for less, we'll say so.

I hope you enjoy this Best-Of catalog of stand-out tools and pointers. For our full product line and more building tips visit www.CleavelandTool.com.

Happy building and smooth skies,
Mike Lauritsen, for the family





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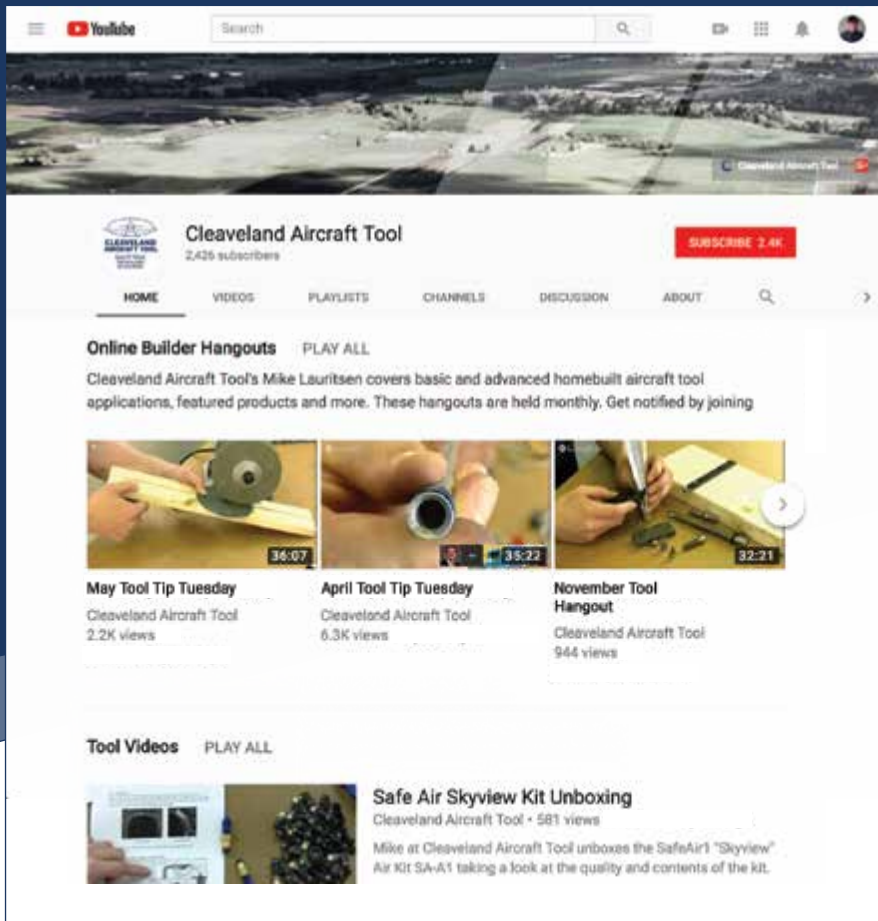
About Cleveland Tool

Generally open Weekdays 9 AM - 5 PM Central time.

Orders received by 2 PM Central are often shipped the same day. Backordered items are filled as soon as possible and will not be charged until shipped.

To view our full product line visit www.ClevelandTool.com

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[YouTube.com/clevtool](https://www.youtube.com/clevtool)





BEFORE YOU BUILD

Before You Buy Tools, a Few Things to Know

1 You should LOVE the tools you're using.

You'll be using these tools for hours at a time for several years on a project that's costing you tens of thousands of dollars.

2 Good tools account for about 5% of the total cost of your project.

When "saving" on cheaper tools, remember that 90% of the cost of a project is your time. We often hear, "I wasted so much time with XYZ-tool! Yours works like a dream!"

3 Get a buddy who's done it before.

People who have built an airplane before have been through the exciting and sometimes frustrating step of getting everything set up. If you need connected to a builder in your area, use VansAirforce.net, check with the EAA and call us.

4 Free shipping is actually expensive.

Free shipping offers mean you're paying for it in the tool price. We ship your tools based on your needs—fast or cheap. If we do offer free shipping it's because we messed up and it's the right thing to do.

5 You get what you pay for in aviation.

It's hard to take calls from customers who have paid money for cheap tools and now have to spend the money twice. Ouch. See #2 for some context.

6 Service and support are included.

Call and talk to the people who sell you the tools and equipment for your project. You're going to put up to 2,000 hours into a build and we can help you know what to ask.

7 Your tool kit should be customizable.

Every builder and shop has different needs. You may need more equipment down the road or maybe less up front. We change our kit to fit your needs.

8 There are 14,000 dimples on a flush rivet Van's RV, so use the highest-quality dies.

We could talk specs about geometry, springback technology... however, just read one of many discussions about our dimple dies on VansAirforce.net.

9 Tank dies are not a myth.

We made them specifically to account for the layer of tank sealant, which requires a deeper dimple to create a flush rivet. We like the way they work. We are perfectionists. We don't develop tools that we don't believe in and use ourselves.

10 Enjoy the process.

Call us. Mike and Annette will do all they can to get you what you need for your project.

How a Project Actually Adds Up

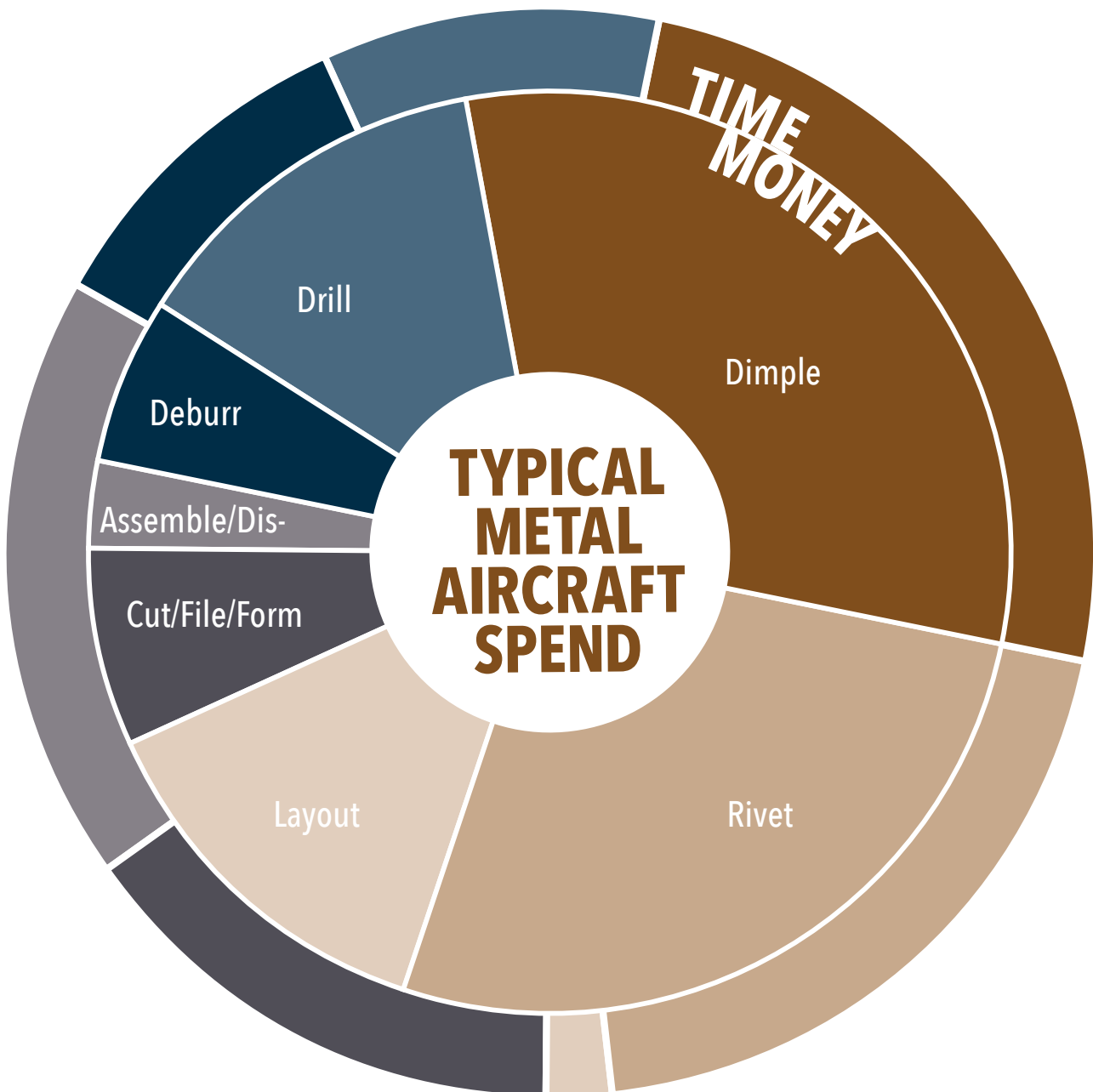
The question we hear most often is, "How do I know where to spend or save during my build?"

Looking at a project in context of time and money is how we determine which tools we carry and what we recommend specifically to you.

For example, you can sink a ton of money into deburring. Options exists for top-of-the-

line bits in every hole size, 10-piece file sets, bench and die grinders. But since deburring only amounts to 10% of your time during the build, we'd recommend splurging on an activity you'll spend more time with, like dimpling or riveting tools.

This chart was informed by 25 years of helping builders make tool selections and receive feedback about how they spent time.



Riveting Right: Know When You're There



This little tool is more than a little help in calibrating your eyes to what good rivets look like. As you're practicing (and yes, you should always practice on scrap aluminum before tackling your kit) use this handy gauge to check your results. Keep it until you're satisfied with your work and more importantly—your consistency.

The gauge accomplishes three points of confidence throughout your build:

1) Confirm the correct rivet length prior to setting with the notches at the center.

The width of these notches is not a gauge, only the height. The height on the notch is 1.5 times the width of the rivet. This should be measured from the back side of the material to the end of the rivet. For a dimpled rivet the gauge is used from the bottom of the dimple to the end of the rivet.

2) Measure the width or diameter of the shop side (the tail) of the rivet after it has been set with the holes at the edges.

The rivet-size specific hole is used to measure the ideal diameter (1.5 times the original diameter) of the shop head once you've fully squeezed it. New builders often don't know what to shoot for without measuring each rivet with calipers (a real time-sink).

3) Confirm the ideal height of the shop head of the rivet with the corner notches.

If the rivet is too thin there will not be enough material to make the rivet structurally sound. A perfectly set rivet with one-half the original diameter thickness is the goal.

So stop squinting or shrugging at your practice rivets and know for sure that you're doing it right.



ALL-IN-ONE RIVET GAUGE

RLG-1 \$16.50

Gauge measures -3,-4,-5,-6 universal head and flush rivets.

Used to check proper length of exposed rivet shank BEFORE setting, and to check for proper length and width shop head AFTER setting.

KITS

No Regrets! Tail-to-Tips Packages **RV-KIT STARTS AT \$2,100**

More than 25 years of building experience and an EAA Grand Champion Lindy inform what we put in this kit (and what we leave out). Our quality-guaranteed tools are selected for building the Van's RV series (customization for other metal aircraft is available). As an industry leader we've set the trend for what's in tool kits. Ours produces a higher-quality result and more enjoyable experience—please see the Dimpling and Riveting pages for specific details.

Don't love it? Send back the non-consumables and we'll refund that money.

You'll spend several thousand hours using these tools and their cost is about 5% of your overall build. So do it once, do it right. Your kit will be based on your RV-series, Quick Build sections and dream upgrades—like the pneumatic squeezer.

TYPICAL KIT CONTENTS **Customize Yours at CleavelandTool.com/mykit**

Part	Qty	Part	Qty	Part	Qty	Part	Qty
3M Screw On Mandrel	1	1/4" Sioux Drill 6000rpm	1	3X Rivet Gun	1	Cleaveland Hand Squeezer	1
3M 1/4" Mandrel	1	Inline Air Flow Restrictor	1	One Piece Rivet Gauge	1	3" Pneumatic Yoke	1
3M Scotch-Brite Red Hand Pad	5	Lightweight Airhose Kit	1	Back Rivet Set	1	3/32" Dimple Die Set	1
3M Cut & Polish Wheel - 1"	2	#30 Straight Flute Reamer	1	1/8" Cup Rivet Set 3.5"	1	3/32" Close Quarters Die Set	1
3M Cut & Polish Wheel - 2"	1	#40 Straight Flute Reamer	1	1/8" Dbl Offset Cup Rivet Set	1	3/32" Tight Fit Dimpling Fixture	1
3M Cut & Polish Wheel - 6"	1	12" Cobalt Drill #30	1	1" Mushroom Set	1	1/8" Rivet Dimple Die Set	1
10" Flat Curved Tooth File	1	12" Cobalt Drill #40	1	Back Rivet Plate	1	#6 Screw Dimple Die Set	1
1/8" Drive Pin Punch	1	#10 Cobalt Jobber Drill	1	Tungsten Bucking Bar	1	#8 Screw Dimple Die Set	1
3/32" Drive Pin Punch	1	#12 Cobalt Jobber Drill	1	1/8" Wedge-Loc Fastener	150	1/8" Squeezer Cup Set	1
1 Tapered Alignment Punch	1	1/4" Cobalt Jobber Drill	1	3/16" Wedge-Loc Fastener	25	#1 Flat Sqz. Set 1/8"x1/2"	1
Threaded Micro Stop Countersink	1	#19 Cobalt Jobber Drill	1	3/32" Wedge-Loc Fastener	300	#4 Flat Sqz. Set 1/4"x3/8"	1
Countersink Cutter - #10 Screw	1	#21 Cobalt Jobber Drill	1	1" Cleko Clamp	4	#8 Flat Sqz. Set 1/2"x3/8"	1
Countersink Cutter - 1/8" Rivet	1	#28 Cobalt Jobber Drill	1	1/2" Cleko Clamp	4	Wooden Die Block Organizer	1
Countersink Cutter - 3/32" Rivet	1	#30 Jobber Drill (pkg of 6)	1	Cleko Pliers	2	C-Frame Bench Dimpling Tool	1
Countersink Cutter - #6 Screw	1	#40 Jobber Drill (pkg of 6)	1	3pc. Aluminum Deburr Handle	1	Offset Hand Seamer	1
Countersink Cutter - #8 Screw	1	3" Hex Deburring Tool	1	#3 Unibit 1/4"-3/4" x 16ths	1	Edge Forming Tool	1
						Fluting Pliers	1





Avoid the Air Drill? Yes, Really.

Of the more expensive tools to choose during your build, the air drill might be one you can skip. As kits have improved the drill is becoming less necessary. Back in the day when we started the RV-4, kits weren't pre-punched, so we had to layout and drill each hole.

Today's kits come with the holes pre-made and the step that enables a higher quality build is actually reaming. Reamers center perfectly in pre-punched holes and precisely mill to size the hole before dimpling. Reamers remove a small amount of material that occurs as the metal was punched through, reducing the amount to deburr.

With our straight flute reamers you can achieve a smooth result using a locally-available, standard battery-operated drill. The money saved may make this an interesting option for some builders—especially at the beginning.

As you progress in the build, you're likely to reconsider adding an air drill to the toolbox due to decreased weight and increased speed. We like the Sioux Palm Drill best, weighing only 1.3 pounds when paired with our Lightweight Air hose Kit—but you can certainly get going on that tail with lesser equipment without a lesser result. The choice is yours.



SIoux PALM DRILL

ADS-40 \$248

Our favorite drill since the early '90s—the finest drill we've had in our hands.

1/4" KEYLESS CHUCK

KC140I \$62

Standard 3/8-24 internal thread to attach to any drill.

All metal construction.

1/4" chucking capacity.

Heavier than the Jacobs 1B, but no chuck key to keep track of.

STRAIGHT FLUTE REAMERS

RSF-"SIZE" \$10-\$25

Size	Part No.		
#40	RSF-40	0.188"	RSF-188
#30	RSF-30	0.311"	RSF-311
3/16"	RSF-316		
1/4"	RSF-140		

Used for cleaning up rivet holes on pre-punched kits

Work better than drill bits.

Maintain self in center.

Enlarge holes cleanly.

Less deburring required.



LIGHTWEIGHT HOSE & COUPLER KIT

AC-KIT \$30.80

This lets you leave the heavy rubber hose and coupler on the floor. Kit contains ten feet of very flexible air hose with mini coupler and three Mini Plugs for use in your air tools.

Rectus couplers are very high quality and are German made.

Their superior flow characteristics result in lower pressure drop than standard couplers. Rated for 1000 psi maximum.

Mini connectors - small size and light weight to reduce fatigue. Max flow rate on mini coupler is 21cfm.

Large couplers - standard industrial interchange or MIL C-4109-E

Shop the full range \$3-17 at www.ClevelandTool.com



- ACB316M14
- ACM21B316
- ACM21F14
- ACM21M14
- ACM21M18
- ACM23M18
- ACM23M14
- ACM23F14

Less Sharpening=Faster Building

Keep cutting edges sharper, longer by using Boelube. Apply it to drill bits, files or any kind of saw blades.

It comes in two forms: a paste and a solid stick. We like to have both on hand for different type of tools. The solid stick is ideal for files and saw blades—just apply it like ChapStick to the blade and it easily coats the teeth. If some of the Boelube winds up on the surface you're cutting or filing, wipe it off with a paper towel right away. If you let it cool, it will become solid again,

and you'll need to use grease remover to get it off.

The paste form of Boelube is a better choice for drill bits, because you just dip your drill bits into the jar to coat them. The paste is also easy to wipe off your material after drilling since it keeps its paste-like consistency, unlike the solid stick.

These lubes can keep your cutting surfaces sharp ten times longer—and since we would rather be building than sharpening, we're big fans!

BOELUBE - DRY PUSH-UP STICK

LBL-13 \$3.85

Multipurpose lubricant developed by Boeing keeps cutting edges cool for longer life and a sharper cutting edge.

Use with drill bits, taps, reamers, files, saw blades, deburring tools, and belt sanders.

Works well with wood, composites, graphite, and metals.

BOELUBE - 12 OZ. PASTE

LBL-307 \$23.50

Paste works better on cold tools and vertical surfaces.



Shop the full product line at www.ClevelandTool.com



Air Hoses and Fittings ★ Tool Kits Cutting and Forming Drills and Bits Riveting Miscellaneous Tools Accessories

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This kit exemplifies our commitment to quality.







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Looking for our entire product lineup? Head over to www.CleavelandTool.com and stay as long as you like. Our website is open 24 / 7 / 365.

Scan me with your mobile device.
Good things will happen.



Maintaining Your Scotch-Brite Wheel

Scotch-Brite wheels all develop grooves over time that you'll want to smooth out. There are a few approaches to dressing the wheel—like using a file or even buying a special wheel dresser—but I've found one technique that is particularly effective, as well as easy and inexpensive. All you need is 36-grit sandpaper with a sticky back and a piece of scrap wood about a foot long. Stick your sandpaper to the board. Lay your board flat on your workbench under the wheel. Then lift up the edge of the board nearest you, keeping the other end on the workbench, until the sandpaper touches the wheel. By doing this, you create a nice level surface that ensures you are dressing the wheel evenly.



Turn on your wheel and use the sandpaper to smooth it out, always keeping the back edge of your scrap board flat against the workbench to ensure level. This gets messy!

Watch our how-to video for a demonstration.

[youtube.com/clevtool](https://www.youtube.com/c/clevtool)

3M CUTTING & POLISHING WHEEL 6" 3MW-7A6 \$87

6" x 1" x 1" Center Hole (with reducer for 1/2" shaft)

3M CUTTING & POLISHING WHEEL 2" 3MW-7A2S \$13.75

2" x 3/4" x 1/4" Center Hole (needs mandrel 3MM140)

3M CUTTING & POLISHING WHEEL 1" 3MW-7A1 \$6.85

1" x 1" x 3/16" Center Hole (needs mandrel 3MM100)

Long-lasting and aggressive for tough deburring and polishing.

Use to deburr and radius edges. Will not load up like a grinding wheel.

1" & 2" wheels for use in drill or die grinder for tight spaces.

Van's Aircraft recommended.

Mandrels available online ClevelandTool.com

LIGHT DEBURRING WHEEL 6" 3MW-77S6 \$85.80

6" x 1" x 1" Center Hole (with reducer for 1/2" shaft)

3M EXL INITIATED WHEEL 1" 3MW-2S1 \$6.05

1" x 1" x 3/16" Center Hole (needs mandrel 3MM100)

Scotch-Brite Light Deburring Wheels are designed for removing fine burrs and polishing at the same time.

1" wheels for use in drill or die grinder for tight spaces.

Mandrels available online ClevelandTool.com

3M REDUCER BUSHING 1-1/2" 3MR-150 \$3

1" diameter bushing for reducing the hole of wheels from 1" to 1/2".
Included with 6" wheels.

HEX DEBURR TOOL 3"- CHATTERLESS DB-04 \$18.70

Deburring bit with hex shank fits into a cordless screw driver.

A 100 degree, one-hole chatterless deburring bit comes fitted to the 1/4" hex shank.

Use in a cordless screwdriver to make deburring drilled holes almost effortless.



DIMPLE



CLEVELAND HAND SQUEEZER & DIMPLING TOOL

65% Less Effort To Set a Rivet 30% Lighter = Fast and Enjoyable Build

Our hand squeezer doesn't use the standard cam action found on all other squeezers. Our innovative patented design sets the rivet using **ONLY 35% OF THE FORCE** required on other models.

The Main Squeeze accepts pneumatic 214C style yokes which can be used on a pneumatic squeezer body.

Quick change yoke pins allows you to rapidly change yokes without using tools.

Threaded ram is easily adjusted to compensate when setting various length rivets or when dimpling various skin thicknesses.

Compare quality and features, then the price of other hand squeezers and you will find this is an outstanding value.

Watch our comparison video for a demonstration.

 youtube.com/clevtool

THE MAIN SQUEEZE BY CLEVELAND TOOL SCH-22 \$285

This squeezer outperforms all other squeezers on the market. As with all the tools we sell, pull it out of the box and give it a try. If you don't agree send it back.

We recommend the 3" yoke for most applications (Included in kit, below). The larger yokes tend to get heavy for repeated work.

1/8" maximum diameter rivet.

Manufactured from 6061-T6 Aluminum, with anodized finish.

Weight: 19 oz. without yoke. (29 oz. for next-lightest competitor).

Size is 13-1/4" L, 3-1/8" W, and 15/16" D without yoke.

Force required to set an AN470-4-2.5 is 22.4 lbs. at the end of the handles (64 lbs. for others).

EASY-SQUEEZEY KIT SCH-KIT \$395

SQUEEZER HANDLE	SCH-22
3" YOKE	SNY-30
QUICK CHANGE YOKE PINS	SQP-20
1/8" X 1/2" FLAT SET	SSF-1
1/4" X 3/8" FLAT SET	SSF-4
1/2" X 3/8" FLAT SET	SSF-8
1/8" UNIVERSAL CUPPED SET	SSC-4

Dimple HALF of Your Airplane *FASTER* with a Pneumatic

(and sure, it squeezes those rivets at the edges too)

PNEUMATIC SQUEEZER BODY (NO YOKE) SNB-214 \$588

This Pneumatic Squeezer is manufactured in the US using all new US Manufactured components. We tell you about this difference so you know what you are paying for.

Our squeezers come WITH the ADJUSTABLE ram (a \$90 value) reducing the number of flat sets needed. It's just the right thing to do and saves dozens of hours in set-up.

This type of squeezer requires a larger initial investment than the manual type—however, it will speed up dimpling and riveting significantly.

The uniformity of dimples and rivets will be superior to those squeezed by hand.

All moving parts are heat treated and tempered to ensure trouble free service.

3" YOKE (RECOMMENDED) SNY-30 \$135

2.5" THIN NOSE YOKE SNYT-255 \$143

4" THIN NOSE YOKE (HELPFUL TO HAVE) SNYT-405 \$165

Shop the full range of yokes at www.ClevelandTool.com

AUTO-SQUEEZE KIT SN-KIT \$685

PNEUMATIC SQUEEZER SN-214

3" YOKE SNY-30

QUICK CHANGE YOKE PINS SQP-20

ADJUSTABLE SET HOLDER SNSHA-45

1/8" X 1/8" UNIVERSAL CUPPED SET SSC-4S

1/8" X 1/2" FLAT SET SSF-1

1/8" X 3/8" FLAT SET SSF-2

1/2" X 3/8" FLAT SET SSF-8

1/8" UNIVERSAL CUPPED SET SSC-4



Need help choosing a yoke?
[youtube.com/clevtool](https://www.youtube.com/c/clevtool)

Slippery Flat Sets? Try This Fast Fix

Flat sets are very shiny and slick, so they like to slide across the aluminum skins when you use them to set rivets. You're putting 3,000 pounds of force on the ends, so they try to move out of the way. If you experience a lot of rivets sliding when you set them, try giving your flat sets some better traction. Just drag the flat set across a piece of concrete a few times. Then turn it ninety degrees and drag it a few more times. This

will create a crosshatch of scratches that will give a lot more grip when you set rivets, so they are less likely to slide when you squeeze them. Your flat sets will grow shiny and slick again with use, so just repeat the process whenever they start to slide again.

Where to find the concrete? I just use the sidewalk outside. If you get some strange looks from your neighbors, just say you're building an airplane in your garage.

FLAT SETS

- 1/8" body length x 1/2" diameter
- 1/8" body length x 3/8" diameter
- 1/4" body length x 3/8" diameter
- 1/2" body length x 3/8" diameter

ssf-# \$7.70 EACH

- SSF-1
- SSF-2
- SSF-4
- SSF-8

CUP SETS

- 3/32" x 3/8" body length
- 1/8" x 3/8" body length

ssc-# \$9.35 EACH

- SSC-3
- SSC-4



DIMPLE



Don't make 14,000 mistakes on your plane.

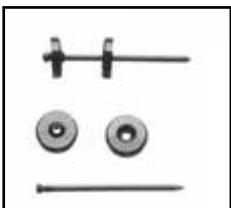
We guarantee these dies work better than any others or we will give you a refund!

Springback Angle on Die Faces Minimizes Skin Deformation. Skins remain very flat!

Precision-Made on CNC Machine

Stainless Steel – Heat Treated

Polished Dimpling Surfaces



CLEAVELAND SPRINGBACK DIES

3/32" RIVET DIMPLE DIES **DIE426-3 \$42.90**

1/8" RIVET DIMPLE DIES **DIE426-4 \$42.90**

3/32" SMALL DIA. FEMALE DIE **DIE426-3S \$21.45**

1/8" SMALL DIA. FEMALE DIE **DIE426-4S \$21.45**

Small diameter female die allows dimpling in close quarters. For example, when a hole has been drilled too close to a flange.

#6 SCREW DIMPLE DIES ***DIE509-6 \$42.90**

#8 SCREW DIMPLE DIES ***DIE509-8 \$42.90**

#10 SCREW DIMPLE DIES ***DIE509-10 \$42.90**

BUILDER TIP: Consider not purchasing the #10 die for Van's RV series. Learn why on bit.ly/die-ten-screw

TANK DIES - 3/32" RIVET **DIE426-3T \$42.90**

Tank dies make deeper dimples to allow for the layer of tank sealer between the rivet and the skin. Rivet will set flush with the skin's surface.

SUBSTRUCTURE DIES **DIE4263SS \$42.90**

Used for substructure dimples where standard 4263 die is used on the skin.

Deeper dimple allows skins to nest perfectly on the substructure rather than the traditional gap seen when using the same dies on skin and ribs/stiffeners.

14K PERFECTION

DIE-KIT \$335

6 PAIRS OF DIMPLE DIES

DIES - 6 SETS

2 SMALL DIAMETER DIES

DIE426-3S & -4S

SET OF 4 FLAT SETS

SSF-SET4

3/32 UNIVERSAL CUPPED SET

SSC-3

1/8 UNIVERSAL CUPPED SET

SSC-4

WOODEN ORGANIZER

DIEB-45

3/32" CLOSE QUARTERS DIES

DIE426-3CQ \$27.50

1/8" CLOSE QUARTERS DIES

DIE426-4CQ \$27.50

Just what you need where a squeezer or C-Frame won't reach.

Use pop riveting tool (not included) to pull the die mandrel and squeeze the dimple.

Same superior design as our standard dies.

TIGHT FIT DIMPLING FIXTURE

DIE426-3DF \$38.50

Used in hard-to-reach places like the vertically-snug, last set of holes on the aft end of an aileron rib.

Screws to workbench overhanging enough to allow rib flange to slide over. Machined springback female die built in.

Use standard male die in rivet gun or C-Frame ram to make dimple from top. Only 1/4" thick.

How to Check Your C-Frame Alignment

If you're having trouble with dimple dies breaking, a likely culprit is a misaligned C-Frame. To check your C-Frame's alignment, remove the ram, turn it upside down, re-insert it, and drop it straight down onto the set holder. Then very gently brush your fingers over the place where the ram is touching the set holder. You will immediately feel if they are not perfectly aligned. Be sure to check the alignment all the way around.

Now, to check the angle of the ram, bend down so you are at eye level with the tool, and look carefully to see if there is any light coming through where the ram meets the set holder. If you see a wedge-shaped crack of

light, you know that the ram is not perfectly flush with the set holder. To adjust the angle of the set holder, slide a piece of aluminum foil under the plate to shim it. Slip in the foil and scoot it around until you see no cracks of light between the set holder and the ram.

If your ram isn't aligned with the set holder, very slightly loosen the cap screws on the bottom of the C-Frame, just until the lock washers start to decompress—about an eighth of a turn should do it. Next, use a hammer to gently tap the plate that holds the set holder, adjusting it in the correct direction. Keep tapping and adjusting it, feeling the ram until it's perfectly aligned. Finally, tighten the cap screws.



C-FRAME TOOL

CF-80 \$218

The C-Frame dimples and sets rivets. Our design is a combination of the best features of several similar tools we have used during our builds.

Uses a .401" receiver on the front end, allowing standard rivet sets to be used in the base for back riveting. The .401" riser can also be used to hold a die in the rivet gun, eliminating the need for an additional tool to accomplish this.

The tool assures the dimple dies or rivet sets are held perpendicular to the skin's surface, producing a consistent result.

New builders gain confidence within a couple dozen practice hits.

Use the C-Frame for dimpling all control surfaces and internal areas of aluminum sheets.

It is also very useful for riveting stiffeners and hinge fittings to the wing and empennage spars using a back rivet set, RSB-12 (page 20).

Throat Depth: 22 inches.

Arm: 1" x 2" x .120" wall steel tubing.

Base: 1-1/2" x 4" x 5/16" channel.

Bushings: 1/2" ID sintered bronze bushings.

Base Set Holder: Accepts a .401" shank - same as a rivet gun. Use any .401" shank rivet tools in C-Frame.

Ram: Stainless, heat treated. Ram accepts .187" shanks of dimple dies or squeezer sets.

Return Spring: Low tension spring holds ram off skin for positioning.

C-Frame Table: Plans for building a carpet covered wooden table top available online.

This provides a perpendicular work surface level with the dimple die.



Nearly 200 Inches of Tighter Edges

One mark of a great build is smooth skins. These indicate mastery of various metalworking techniques and our Edge Former is a great help in achieving this look.

Anywhere metal skins overlap and are riveted together—think wings, tail and fuselage—the tension of the rivet and the lack of tension on either side of a rivet creates a “wave” edge in the metal. This is the opposite of the look you’re going for in a drool-worthy airplane.

The old way of dealing with this “wave” was to use a homemade tool that was imprecise and stretched the metal unnecessarily.

Our Edge Former locks down with consistent

tension and controls the angle of the bend, ensuring no stretching occurs when bending in a single pass to eliminate the “wave”.

The Edge Former effects roughly 200 inches of most RVs. **If you’re doing the Quick Build wings and fuselage you can skip this tool.**

BUILDER TIP: Don’t set the tension too tight. The tool works because of the angle created by the rollers—not due to pressure. Seeing a tight crease in the metal, or having to muscle through, are indicators of setting it to tight. Practice on scrap metal to perfect tension.

Watch our how-to video for a demonstration.

[youtube.com/clevtool](https://www.youtube.com/clevtool)



EDGE FORMER

EF-60 \$49.35

This is a tool that REALLY WORKS!

Roller shape forms a slightly turned edge on aluminum to assure a tight fit along the joints of overlapping sheets.

Hardened stainless rollers are attached to Vise Grip handles.

Handle is at a comfortable-to-use angle.

Rollers are adjustable to the aluminum thickness and once set can be locked to reproduce exact results.

Very controllable.



FLUTING PLIERS

FP-200 \$38

Flute flanges between rivet holes to flatten ribs and bulkheads.

Protruding jaw spaces the beginning of the flute back the proper distance from the web.

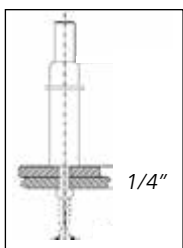
Makes nice narrow flutes - shallow or full depth - without sharp nicks left by other brands.

No nicks means no stress risers to cause trouble later.





ASSEMBLE



3/32" WEDGE-LOC
3/32" WEDGE-LOC
1/8" WEDGE-LOC
1/8" WEDGE-LOC
5/32" WEDGE-LOC
3/16" WEDGE-LOC

BAG OF 25 / CL332-25 \$19.75
BAG OF 100 / CL332-100 \$79.00
BAG OF 25 / CL18-25 \$19.75
BAG OF 100 / CL18-100 \$79.00
BAG OF 10 / CL532-10 \$8.75
BAG OF 10 / CL316-10 \$8.75

Wedge-Loc by Monogram Aerospace Fasteners are the best quality clekos being manufactured today.

We guarantee they work better than any other brand or send them back.

Spring-loaded plunger-type fasteners used to hold drilled components tightly together prior to riveting. (See cleko pliers below)

Steel bodies are plated in different colors to distinguish sizes.

BUILDER TIP: Most clekos are used on the tail cone.

If you're doing a quick-build fuselage of the RV-7,-8,-9 you can cut half of what's recommended.

GET-IT-TOGETHER WL-KIT **\$78.50**

Just enough of everything to get started.

Includes:

Cleko Pliers - CLP20
 3/32" WEDGE-LOC - Bag of 25
 1/8" WEDGE-LOC - Bag of 25

5/32" WEDGE-LOC - Bag of 10
 3/16" WEDGE-LOC - Bag of 10
 1" CLEKO CLAMP - Qty. 2
 1/2" CLEKO CLAMP - Qty. 2



CLEKO PLIERS

CLP-20 \$8.80

Nickel plated pliers.

Use for installation and removal of Cleko-Loc, Kwik-Loc, or Monogram (Wedge-Loc) brand fasteners.

Fits all sizes of clekos and cleko clamps.



1/2" CLEKO CLAMP

CLC-50 \$3.05

1" CLEKO CLAMP

CLC-100 \$3.30

- Spring-loaded plunger type clamp fasteners operated using cleko pliers.
- 1/2" or 1" deep jaws.
- Useful for holding sheets to ribs or bulkheads prior to drilling.
- Good quality fasteners work smoothly & hold tightly.

RIVET

RIVET GUN 2X – up to short 1/8" rivet
RIVET GUN 3X – up to short 3/16" rivet
RIVET GUN 4X – up to short 1/4" rivet

RG-2X \$275
RG-3X \$275
RG-4X \$267

Newly manufactured to Cleaveland Aircraft Tool specifications.

Accepts .401 diameter shank rivet sets.

*** EZ Change Retaining Spring included. ***

2x is easier to get the hang of, but a 3x hits the same rivet fewer times

Extra sensitive teasing throttle for full control.

Spool valve provides slow, heavy blows needed to drive rivets.

Rubber grip for comfortable solid feel. Light & compact.

Designed to operate with 90 psi air pressure.

Hardened tool steel piston and alloy steel cylinder for long life.

Limited lifetime warranty.

While we do sell the Sioux gun (below), we rarely consider it an upgrade. The rivet guns above are made by a former CP Engineer with a lifetime of experience in rivet guns. They are every bit as good as the Sioux, although not US made. Generally we recommend taking the extra \$120 and putting it somewhere that will make a difference in your build.

BUILDER TIP: DO NOT mistake an "Air Hammer" or "Muffler Tool" for a RIVET GUN. Such tools are not intended to be used for riveting. They hit too hard and too fast. They are not controllable and will ruin your project.

EZ CHANGE RETAINING SPRING

RGS-25 \$6

This spring makes changing sets quick and easy.

Change sets without removing spring. Included with Rivet Guns.

SIoux 2X RIVET GUN

RG2X-SIOUX \$395

Fine-teasing trigger for controllable riveting.

Quick Change and Beehive springs included.

Made in USA.

BACK RIVET SET 12" BACK RIVET SET

RSB-35 \$31.90
RSB-12 \$37.40

Setting rivets from the back side always produces better results.

1/2" diameter flush set with slim DELRIN spring tension sleeve.

Used for setting flush rivets from the back side.

Tension sleeve safely holds both layers of aluminum tightly together while riveting.

12" version can be used in the c-frame, or to back rivet wing skins.

Watch our how-to video for a demonstration. [youtube.com/clevtool](https://www.youtube.com/c/clevtool)

BACK RIVET PLATE – 4 x 8"

BBRP-48 \$27.50

BACK RIVET PLATE – 4 x 16"

BBRP-416 \$49.50

Blanchard ground back rivet plate is designed to slip into a cutout in a 1/4" Masonite bench top cover and sit just proud of the surface. Perfect for back riveting control surfaces.

Any steel plate will do, just make sure it's smooth and absolutely flat.

Melting Rivets Like Butter: Tungsten Bars

Bucking a rivet doesn't need to intimidate. Sure, the spaces you'll reach into are often tight and it really is a two-person job. But bucking rivets can be an artful challenge and a skill that's downright braggable once you get it right.

When bucking to set a rivet, you'll often be on opposite sides of a skin and coordinating each step of the process with your building partner. First, you push on the rivet to work with your bar, confirming the correct rivet. Next, attempt to form a tripod with two fingers and thumb, holding the bar perpendicular to the skin—and hang on.

Professional aviation assemblers (think Boeing employees) prefer these tiny Tungsten bars because their 1.9-times-higher mass provide gains over traditional alloy bars.

These smaller bars are easier to fit into tight spots and usually just two shapes will get you through a build. They also provide a more controlled, more precise result because it will take fewer hits with the rivet gun to squeeze the rivet. Builders often remark that using a Tungsten bar feels like they are melting the rivet—instead of being bucked by it.

Mike's favorite is the BBT-41 because it allows for more finger surfaces and it can get around the head of a nearby cleko. W&C Pro-builder, Keith, favors the BBT-12 fitted firmly against his palm for maximum stability.



TUNGSTEN BUCKING BARS

4 X 1.4-1 X 3/8" .64LB

1 X 4 X 5/8" 1.7LB

1 X 4 X 3/8" 1.0LB

2 X 1 X 1" 1.5LB

BBT88 \$65

BBT41 \$135

BBT77 \$85

BBT12 \$110

Tungsten bars are the very best bucking bars.

Made from solid Tungsten, these bars are over twice as heavy as cast steel bars.

Small size allows it to fit into tight places.

All surfaces are polished.

Designed by and made for Cleaveland Aircraft Tool.

SMOOTH SKIN START SMO-KIT \$225

Get to the good stuff right away with this kit. Great for new builders—next you'll choose your drill, squeezer and rivet gun. Perfect techniques with practice on scrap.

#40 & #30 STRAIGHT FLUTE REAMERS

#40 & #30 DRILL BIT PACKS OF 6

3/32" SPRINGBACK DIMPLE DIES

1/8" Springback DIMPLE DIES

TUNGSTEN BUCKING BAR - 1 X 1 X 2" 1.5LB

ALL-IN-ONE RIVET GAUGE

RSF40/30

DBJ40/30P

DIE 426-3

DIE426-4

BBT12

RLG-1



FINISH



CLEVELAND VALVE STEM INFLATION TOOL VS150 **\$42.90**

1.25" Gauge Graduated 0-50 psi.

Useful Range 10-60 psi

1/4" FPT Air Inlet

Air Outlet fits standard Schrader Valve - Push Straight On

Access valve stem through small (3/4") hole in wheel pant.

Working length from end of valve stem to outside of pant is 6" to fit all RV pants.

Dimensions are 12.25" x 3" x 2" - 1/2" max diameter.

Simply push on tire valve, read gauge, depress fill lever, release fill level, read gauge, repeat as necessary! Press small brass button on side to deflate, if necessary.



STAINLESS TIE DOWN RING RVTR4 **\$28.50 each**

Now when you park that beautiful airplane of yours you no longer have to thread in an ugly tie down ring. This annealed stainless tie down ring looks classy and performs well.

1 7/8" overall with a 0.8" major diameter. Threaded stud is 1 1/8" long with 1" of 3/8"-16 threads.

Sold individually.



CANOPY COVERS varies by model **\$210-315**
CUSTOM FIT FOR VAN'S RV SERIES AND THE F1 ROCKET
Made from EXCLUSIVE nano-weight fabric.

The whisper thin silver gray fabric reflects heat and sheds water yet breathes (lets water vapor evaporate from underneath).

Smooth fitting covers are secured with nylon straps.

Buckles overlap fabric and never touch your paint.

Storage pouch included.

Weighs less than 2lbs (RV10 weighs 3lbs).



KOGER SUN-SHADES varies by model **\$195-287**

Keep the hot sun off of your head on those bright days.

The light weight silver fabric shade is stretched between bows.

The shade slides forward or back out of the way in a track that you adhere to the canopy.

Get your perfect fit for the Van's RV at CleavelandTool.com.

Models also fit many bubble-style canopies.

Designed and produced by RV builder, Ralph Koger.

FOR BUILDERS BY BUILDERS



**CLEVELAND
AIRCRAFT TOOL**