

GLASTAR AND SPORTSMAN TOOL LIST

TAIL KIT

The following list includes the required, recommended and optional tools for building the GlaStar or Sportsman rudder, horizontal stabilizer and elevator. However, no such list can be considered definitive, because many operations can be performed using any of several different tools, and individual builders will have their own preferences for particular tools and techniques.

1. Adjustable wrenches, small, 2
2. Air compressor, at least 75 psi capacity
3. Aviation snips, left and right offset type
4. Bandsaw or scroll saw with at least 10—12" throat depth and a fine-toothed, metal-cutting blade (recommended)
5. Belt sander, bench-mounted (recommended)
6. Bench grinder (optional)
7. Bench vise
8. Blind rivet puller with nosepieces for 3/32" and 1/8" rivets
9. Bolt cutter or heavy-duty wire cutter
10. Bucking bars (see Note 1 below)
11. C-clamps, large, approximately 6 (see Note 2 below)
12. C-clamps, small, approximately 10 (see Note 2 below)
13. Center punch
14. Chalk line (optional)
15. Chip chaser
16. Cleco pliers
17. Cleco side-grip clamps, approximately 15—20 (a variety of jaw depths recommended; see Note 2 below)
18. Clecos, 3/32" and 1/8", approximately 150 each
19. Crosscut saw or electric circular saw
20. Digital level accurate to 1/2° (recommended)
21. Dimple dies, 3/32"
22. Duckbill pliers or other smooth-jawed equivalent with approximately 1/2—3/4"-wide jaws
23. Ear protectors (for riveting; highly recommended)
24. Edge deburring tool (recommended)
25. Extension drill bit, 12" length, #40
26. Fine-point marking pen (Sharpie brand recommended)
27. Flat and round files, fine-toothed, assorted
28. Fluting pliers
29. Fractional drill bits, jobber length, 1/16", 11/64" and 1/4"
30. Framing square or carpenter's square
31. Hacksaws, standard and single-ended
32. Hammer, small
33. Hand seamer (optional)
34. High-speed drill motor, pneumatic (highly recommended) or electric (acceptable)
35. Hole deburring tool
36. Locking C-clamp, Vise-Grip-type, 3" jaw (recommended)
37. Micro-stop countersink cage with 100°, piloted cutters in #40; #21 or #20; and #12 or #10 sizes (see Note 3 below)
38. Number drill bits, jobber length, #40, #30, #21, #19 and #10
39. Open-end wrench, 9/16"
40. Panzer file or body file
41. Phillips screwdriver (cordless electric recommended)

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| <p>42. Piloted hole cutter, 9/16", or equivalent Unibit</p> <p>43. Protractor</p> <p>44. Right-angle drill motor or adapter with #40 and #30 bits</p> <p>45. Rivet gun, 2X size, with straight flush-head set and straight and offset universal-head sets in 3/32" and 1/8" sizes</p> <p>46. Rivet squeezer with flush-head sets and 3/32" and 1/8" universal-head sets (highly recommended)</p> <p>47. Riveting/dimpling "C"-frame</p> <p>48. Ruler, 12" steel, graduated in 1/32s of an inch</p> | <p>49. Scriber or awl</p> <p>50. Socket wrench with 9/16" socket</p> <p>51. Spirit levels, various lengths, including 72" carpenter's level and 12—24" torpedo level</p> <p>52. Spring clamps, large, rubber-padded jaws, approximately 6 (see Note 2 below)</p> <p>53. Spring clamps, small, rubber-padded jaws, approximately 10 (see Note 2 below)</p> <p>54. Straightedge, metal or wood, at least 72" long</p> <p>55. Tape measure</p> <p>56. Try square or combination square</p> |
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NOTES:

1. Our experience has shown that three different styles of bucking bars are sufficient to complete all the riveting on the GlaStar or Sportsman. Sources of these three bars are given below. However, bear in mind that the choice of an appropriate bucking bar for a particular riveting situation is not an exact science; individual riveters will find different styles most useful in different situations. That having been said, we recommend the following:

From Advanced Air Tool Co., Inc.: #638, #647 and #760B-2

From Aircraft Spruce & Specialty Co.: TP-638, AT-721 or TP-647, and TP-760B-1

From U.S. Tool and Industrial Supply Co.: TP-638, TP-721 and TP-760B-1

2. It may have been Wilbur or Orville Wright who first coined the Oldest Adage of Homebuilding: "You can **never** have too many clamps!" The preceding list specified a number of different styles of clamps, ranging from special aircraft Cleco side-grip clamps to hardware-store spring clamps and C-clamps. Many of these different types can be used interchangeably in a variety of situations, but no matter how many you have of how many different styles and sizes, you'll run into some situation where you wish you had different ones. Our recommendation is that you procure a few of each of the styles and sizes specified above, and then see which ones you seem to need more of as your construction progresses.
3. #21 and #20 piloted cutters are interchangeable, as are #12 and #10 cutters. Some sources will offer one size, others will offer the other.

WING KIT

The following list includes tools that are required, recommended or optional for building the GlaStar or Sportsman wings, ailerons and flaps and that are **not** included in the tail kit list.

1. Arbor press (recommended)
2. Box and/or open-end wrenches, 3/8"—3/4"
3. Cabinetmaker's web clamps (optional)
4. Clecos, 1/8" extended grip, 6
5. Clecos, 3/32" and 1/8", at least 250 and 200 total, respectively, including those used in the tail kit construction
6. Clecos, 5/32" and 3/16", 15 each
7. Die grinder, pneumatic (recommended) or electric (acceptable) with non-metallic rotary cutting wheel
8. Fractional drill bits, jobber length, 3/32", 3/16", 11/32", 3/8", 1/2" and 9/16"
9. Lead body hammer (preferable) or rubber mallet (acceptable)
10. Letter drill bits, jobber length, D, E and U sizes
11. Non-metallic abrasive wheel (e.g., Scotch Brite) for drill motor or die grinder
12. Piloted countersink cutter, 100°, #30 size
13. Piloted countersink cutter, 120°, #30 size (see Note 1 below)
14. Piloted hole cutters, 1", 1-1/4", 2-5/8", 3", 3-5/8", or equivalent Unibit and/or adjustable fly cutter(s)
15. Plumb bob and line
16. Right-angle drill bit, 1/4"
17. Rotary files and drum sanders for drill motor or die grinder (recommended)
18. Ruler, 12" steel, graduated in 1/10s of an inch
19. Straight reamers, .540", .5625", .6" and .6240" (acceptable), or two equivalent step reamers (recommended; see Note 2 below)
20. String line, 16' minimum
21. Torque wrench (recommended)
22. Transit (optional)

NOTES:

1. This countersink is required for a flush-head blind rivet used in the construction of the flaps. It is less widely available than the standard, 100° cutters, and is therefore available directly from New Glasair/New GlaStar. Order P/N 081-02001-01.
2. These reamers are used for the wing spar attach bolt holes. A pair of appropriate step reamers is available from New Glasair/New GlaStar on a rental basis. Call the Order Desk for terms and availability; refer to P/N 810-6250-001 and P/N 810-5625-01.

FUSELAGE AND FINAL ASSEMBLY KIT

The following list includes tools that are required, recommended or optional for building the GlaStar fuselage and that are **not** included in the tail or wing kit list.

1. Air chuck for inflating tires
2. Aircraft scales
3. Allen wrench, 3/32"
4. Articulated inspection mirror
5. Assorted sockets, 3/8"—3/4"
6. Bevel gauge (recommended)
7. Cable clamps, screw-type, 1/8", 4
8. Cable cutter (preferable) or sharp cold chisel (acceptable)
9. Cable tensiometer (borrow if possible)
10. Carbide-tipped, piloted countersink cutters, 100°, #30 and #12 (recommended; see Note 1 below)
11. Channel-lock pliers, large
12. Cobalt drill bits, jobber length, 1/8" (or #30), 3/16" (or #10) and 5/16" (highly recommended; see Note 2 below)
13. Countersink bit, 100° (uncaged)
14. Drill press (recommended)
15. Drill stop, #30
16. Duck bill pliers or safety wire twisters
17. Electric drill motor, heavy-duty variable-speed
18. Electric fan, 6"—8" diameter, with clamp mount (recommended)
19. Electric saber saw with carbide-grit blade (recommended)
20. Fractional drill bits, jobber length, 9/32", 19/64", 5/16", 23/64" and 13/32"
21. Goggles or equivalent eye protectors (for use while catalyzing resin; highly recommended)
22. Gram scale (see Note 3 below)
23. Heat gun (optional)
24. Heavy-duty scissors or rotary cloth cutter (see Note 4 below)
25. Heavy-duty, variable-speed electric drill motor
26. Hole saws, 2-1/4" and 3-1/8", or equivalent fly-cutter or instrument panel cut-out dies
27. Hot-melt glue gun (recommended)
28. Large-gauge syringe (without needle), at least 5cc
29. Letter drill bit, jobber length, F size
30. NicoPress swaging tool (borrow if possible)
31. Non-metallic abrasive wheel (e.g., Scotch Brite) for bench grinder
32. Phillips screwdriver, large
33. Piloted hole cutters, 1/2", 5/8", 11/16", 7/8", 1-3/8" (optional) and 1-5/8", or equivalent Unibit(s) and/or adjustable fly cutter(s)
34. Portable work light and/or flashlight
35. Protractor level (optional)
36. Rat-tail file, narrow
37. Respirator or dust mask (for use while grinding or sanding fiberglass; highly recommended)
38. Rivnut installation tool, size 8-32 (see Note 5 below)
39. Rule, 18", or equivalent straightedge
40. Sanding block, at least 12" long (see Note 6 below)
41. Scale, accurate to the nearest ounce
42. Sheet metal edge rolling tool (optional)
43. Shop vacuum
44. Small needle-nose pliers, forceps or clawed pick-up tool
45. Spring scale, fisherman's pocket-type (recommended)
46. Standard screwdriver, medium

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| <p>47. Straight reamers, .3745" and .4375"
(see Note 7 below)</p> <p>48. Threading die, 1/4"—28, and handle</p> <p>49. Try square, small (3" blade ideal)</p> <p>50. Tubing beader (borrow, if possible)</p> <p>51. Tubing bender, 3/8" (recommended)</p> | <p>52. Tubing cutter (recommended)</p> <p>53. Utility knife</p> <p>54. Vise-grip pliers, 2 pairs</p> <p>55. Wood boring bit (spade or Forstner),
7/8" (recommended)</p> |
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NOTES:

1. Carbide-tipped countersink cutters are recommended for use on fiberglass laminates. Fiberglass is extremely hard on ordinary tool steel, and although regular countersink cutters will work, they will wear out quickly.
2. Cobalt drill bits are recommended for drilling through the hardened steel of the landing gear legs. Ordinary high-speed steel bits will work, but you will probably ruin several of them before your landing gear installation is complete.
3. A tungsten steel rotary cutter designed especially for cutting fiberglass cloth is available from New Glasair/New GlaStar. Order P/N 810-0215-501.
4. Rivnuts are female-threaded fasteners installed like a blind rivet—the installation tool mushrooms the interior portion of the rivnut collar against the inside surface of the skin, locking the collar securely in place. Required for installing the rudder base fairing, this tool is available from New Glasair/New GlaStar; order P/N 081-01001-01.
5. New Glasair/New GlaStar sells a 17-1/2"-long sanding block with a rubber-cushioned aluminum base and a hardwood handle. The block takes standard-sized sandpaper sheets. Order P/N 270-0168-101.
6. The .3745 reamer is used in installing the wing struts. It, along with a special drill jig and an 11/32" drill bit, is available for rent from New Glasair/New GlaStar. Order P/N 981-0300-01.

TOOL SOURCES

The following sources are recommended for specialized tools that are not available locally:

Advanced Air Tool Co., Inc.
131 Allen Blvd.
Farmingdale, N.Y. 11735

Tel.: (800) 238-2471 (outside N.Y. state)
(516) 249-1011 (in N.Y. state)
Fax: (516) 249-5886

Aircraft Spruce & Specialty Co.
Box 424
Fullerton, Calif. 92632

Tel.: (800) 824-1930
Fax: (714) 871-7289

Aircraft Tool Supply
P.O. Box 370
1000 Old U.S.-23
Oscoda, Mich. 48750

Tel.: (800) 248-0638
(517) 739-1447
Fax: (517) 739-1448

Avery Enterprises
Hicks Airfield
2290 W. Hicks Rd., Hangar 54-1
Ft. Worth, Tex. 76131

Tel.: (800) 439-8400
Fax: (817) 439-8402

Cleveland Aircraft Tool & Material
1804 First St.
Boone, Iowa 50036-4417

Tel.: (515) 432-6794

U.S. Industrial Tool & Supply Co.
15101 Cleate St.
Plymouth, Mich. 48170

Tel.: (800) 521-4800
(800) 521-7394
Fax: (313) 455-3256