

INCIDENCE GAUGE

Here's an incidence gauge that Jim Keck (Club Secretary) has used for the last 30 years. He made it from a magazine article. It is at least \$40 cheaper than the ones you buy and works just as well. He plans on bringing his prototype to the next ARCS meeting on the 21st of March.

The original incidence gauge was built in about 1972 from an article in a model magazine (I don't have the magazine). This is not an original design, but has been modified slightly for ease of assembly. This will assist in making a straight airplane

Jim Keck



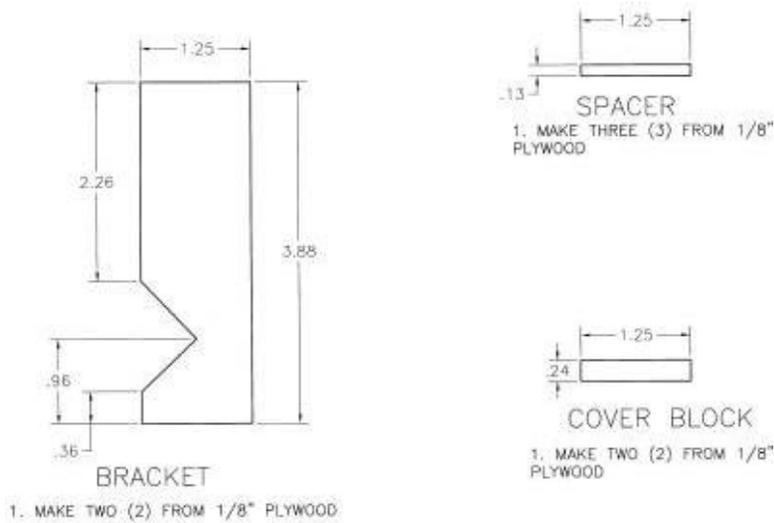
INCIDENCE GAUGE ASSEMBLY AND USE

THE FOLLOWING IS A LIST OF MATERIALS USED ON THE ORIGINAL GAUGE. THEY MAY BE VARIED DEPENDING ON THE RULER USED. NOTHING IS CRITICAL.

1. Yard Stick – aluminum (cut in half-use half that starts at 1). The second half makes a great straight edge for cutting monokote.
2. Line Level – Stanley makes a little one used on the original.
3. 1/16 “ thk clear plastic – This is the material for the Pointer. I made the original from an old drawing triangle.
4. 6”x 6” x 1/8 plywood – any plywood will work
5. 6” x 6” clear plastic – I took the plastic from an old wallet. Flat plastic from any packaging will work.
6. A piece of graph paper – I had some with 1/10 inch grid, but any grid will work. It can be drawn with a straight edge.
7. (1) 4-40 x 3/8” pan head screw
8. (1) 4-40 x 3/4” socket head cap screw
9. (1) # 4 flat washer
10. (1) # 4 lock washer (split)
11. 15-minute epoxy
12. 5-minute epoxy
13. 4-40 tap and # 43 drill
14. 1/8 drill

The above items will get you finished. Modify as necessary to meet your needs.

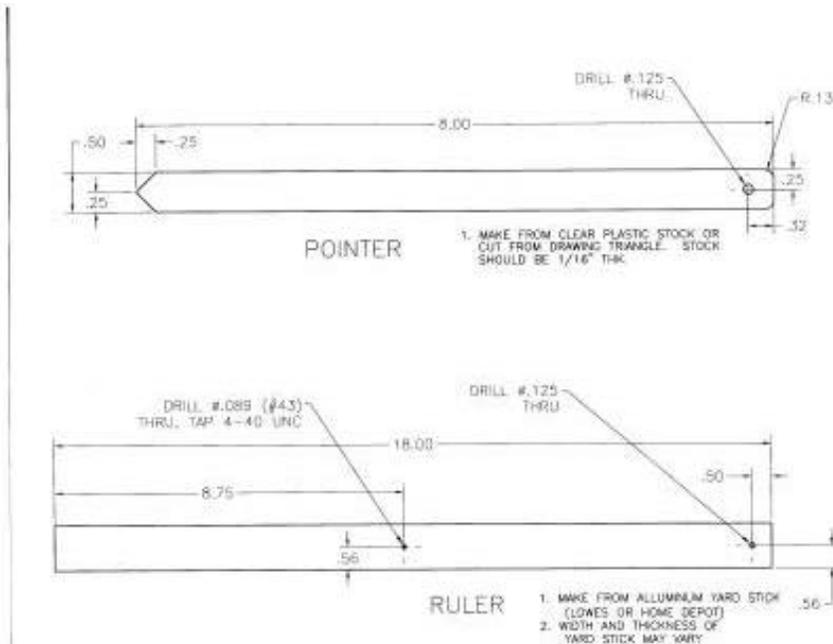
GENERAL INSTRUCTIONS



Cut out all the plywood pieces. Just make sure the cuts are square. The front and rear brackets must be identical and the notches in the same place.

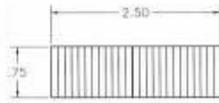
Pre-drill and tap (4-40) the Top Cap. A couple of drops of CA on the threads will make them hard.

Cut the metal yardstick in two pieces at the 18-inch mark. Remove burrs and break the sharp edges. Drill a 1/8" hole at approximately the 17" mark in the middle of the piece. This is a neat hole to hang up the gauge when not in use. It can be omitted. Use some sandpaper and rough approximately 1" of the opposite end of the ruler (down before the 1" mark on both surfaces). This will provide some grip for the epoxy.



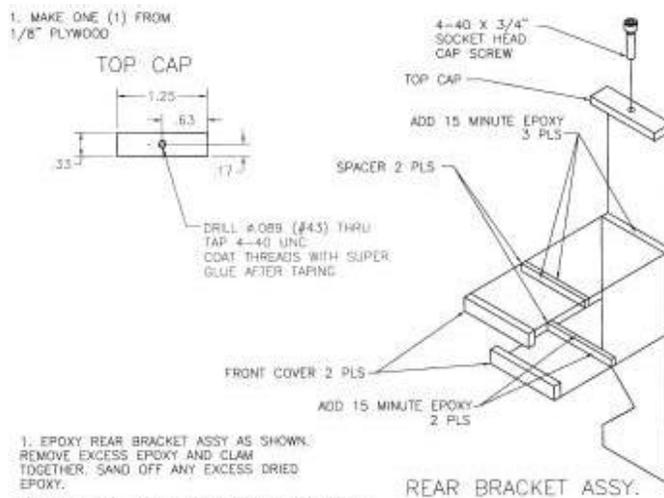
Epoxy (15-minute) the front bracket to the backside of the ruler. Make sure that it is perpendicular to the edge of the ruler. Let the epoxy cure for about an hour before proceeding. You can build the rear bracket assembly as shown on the drawings. You should use the second half of the yardstick to trial fit the rear bracket assembly. We do not want to knock the front bracket out of alignment.

1. MAKE FROM PAPER OR THIN CARD STOCK. MARK GRID IN CONVENT MARKS. GRID SHOWN .1 INCHES. GRAPH PAPER ALSO WORKS WELL.



GRID CARD

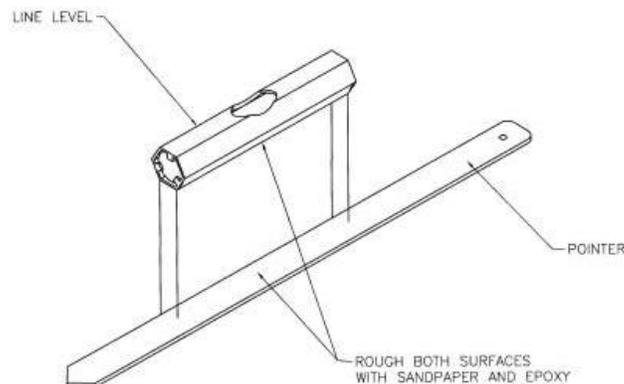
Assemble the rear bracket assembly using the drawings. Glue the spacers to the rear bracket as shown (5-minute epoxy). Check the spacing so that the bracket will slide on the ruler. The spacers should be just slightly thicker than the ruler. After the epoxy has cured (about 30 minutes), sand them with a flat sanding block so that they are approximately .003 thicker than the ruler. That is the approximate thickness of the clear plastic used for the clear plastic cover. Glue the top cover in place and install the 4-40 socket head screw.



1. EPOXY REAR BRACKET ASSY AS SHOWN. REMOVE EXCESS EPOXY AND CLAM TOGETHER. SAND OFF ANY EXCESS DRIED EPOXY.
2. AFTER REAR BRACKET ASSY EPOXY HAS CURED, DRILL THROUGH SPACER AND FRONT COVER AND RE-TAP FOR 4-40 UNC SCREW. THE SCREW CAN THEN ENGAGE THE RULER.

REAR BRACKET ASSY.

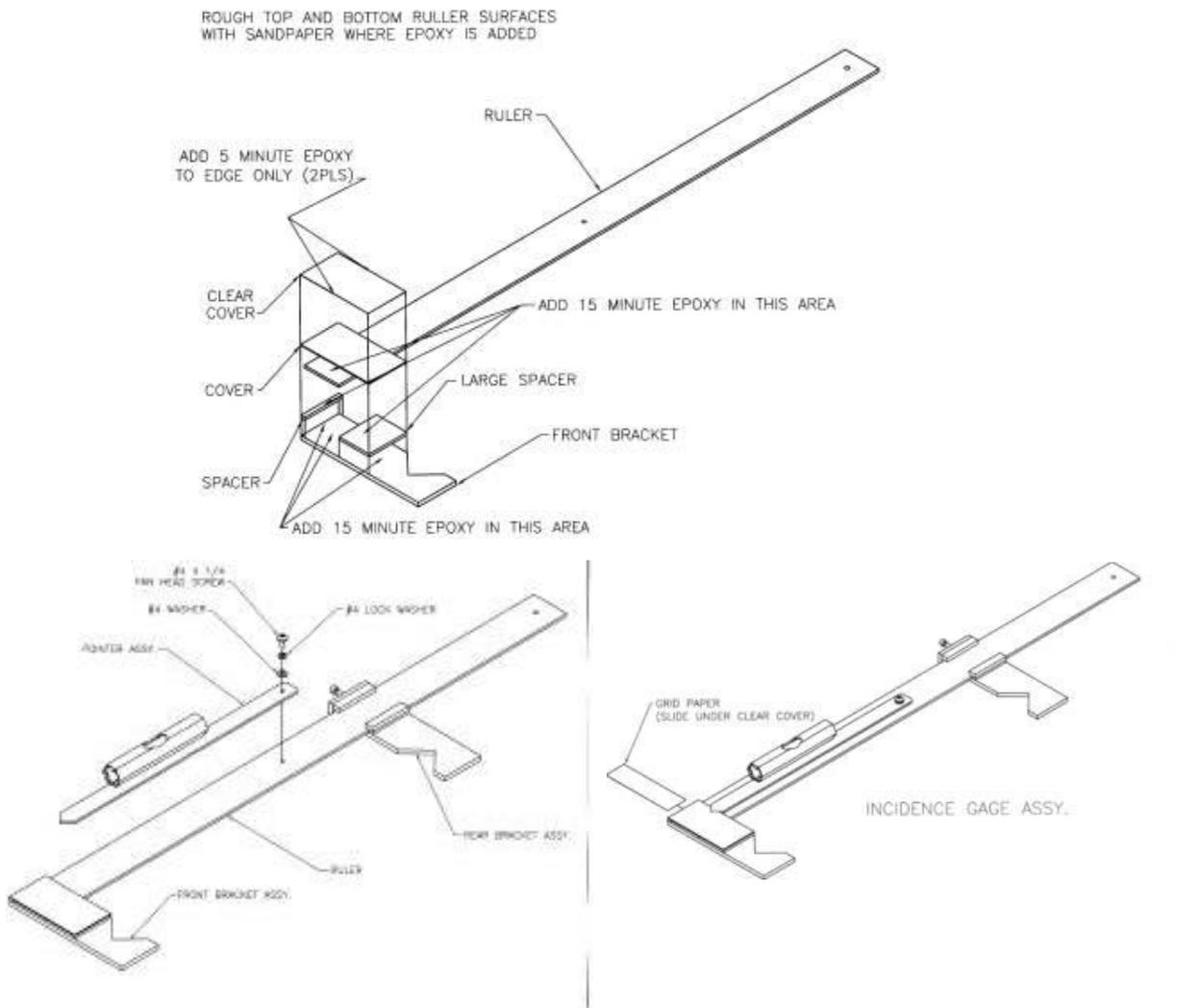
Complete the top portion of the front bracket assembly. Add the spacers (sanded flush with the top of ruler), cover and clear plastic cover as shown on the drawings.



POINTER ASSY.

Epoxy the line level to the clear plastic pointer. Attach the pointer assembly to the ruler using a 4-40 x 3/8 pan head screw, lock washer, and flat washer. Tighten the pan head screw so that the pointer moves, but with some friction. (The pointer should stay in position when moved). Slide the Grid Paper under the clear plastic cover as shown on drawings.

FRONT BRACKET ATTACHMENT



USE OF THE GAUGE

1. Place the airplane on a table. Block it up so that the horizontal stabilizer is approximately level. Just eyeball it.
2. Place the Incidence Gauge on the horizontal tail. Adjust the rear bracket to grab the elevator.
3. Move the pointer (the level is attached) until the bubble shows level.
4. Adjust the grid card to the point of the pointer. This is the zero point.
5. Carefully loosen the rear bracket and remove the Incidence gage from the horizontal tail and place it on the wing of the aircraft near the fuselage. Be careful not to move the grid paper or card. If the wing incidence is 0-0, with the pointer on the zero mark of the grid reference, the bubble should be level. If not, move the pointer to level the bubble. Note on the grid the wing incidence. Check the plans and shim the wing as necessary to change the incidence to match the plans. If you are building an airplane, do this often during the final assembly to ensure a true airplane.