CRAFTSMAN'S CORNER

Ben Owen

INSTRUMENT LIGHTING

26E
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by ***Don Wall, EAA 218017***
5471 Lake Howell Rd., Ste. 202
Winter Park, FL 32792

During the final construction of the instrument panel on my Glasair RG, I ran into the problem of installing adequate and balanced lighting. I purchased as many instruments as possible with night lighting installed. Some of the instruments came without factory lighting installed. I soon discovered that individual post lights would not work on the instruments without a flange.

The AG, DG or tach did not have a flange. The screws which attach the instrument to the panel go into the instrument case. There was no place to install the post light except to set it off to the side. Since I had constructed my panel with very little room to spare between instruments, I needed another solution.

I decided to introduce a lighted spacer between those instruments that could not accommodate a post light. Three designs were selected, fabricated, installed and evaluated. The designs, however, are simply variations on a basic overall design.

DESIGN 1 — I fabricated a faceplate the same size as the instrument (see photograph) out of 3/16 inch Plexiglas. I used a flycutter and cut out a 3 inch diameter hole in the Plexiglas. The outside of the plate was dressed to the size of the instrument. To light up the instrument I selected two mini bulbs which are about 1/8 inch in diameter and about 3/16 inch long. I then drilled three holes into the edge of the Plexiglas. The center hole has the light bulb in it. The other two holes were used to imbed the solder joint. After I soldered the leads to the aircraft wiring, I buried the solder joints into the holes. I also routed a small path between the center hole to the other holes to accommodate the small wire leads. I then used five minute epoxy to pot the solder joints, the wire track and the bulb. In this manner, the wire leads to the lighting plate were solidly connected.

As an option, I fabricated a ring from black plastic of the size similar to the faceplate of the other instruments. The addition of this ring, however, is simply cosmetic. Should you choose not to use this ring, then cut the hole the same size as the hole in the panel. To increase the reflected light in the unit, I painted the entire plastic assembly, except for the flycut surface, with white paint. Next, I painted over the white with flat black. The surface cut by the flycutter should be drum sanded with fine sandpaper and buffed, as it is the reflecting surface. To control the light output from each unit, I installed in series a small inline variable resistor (Radio Shack trim pot). In this manner, each light can be adjusted.

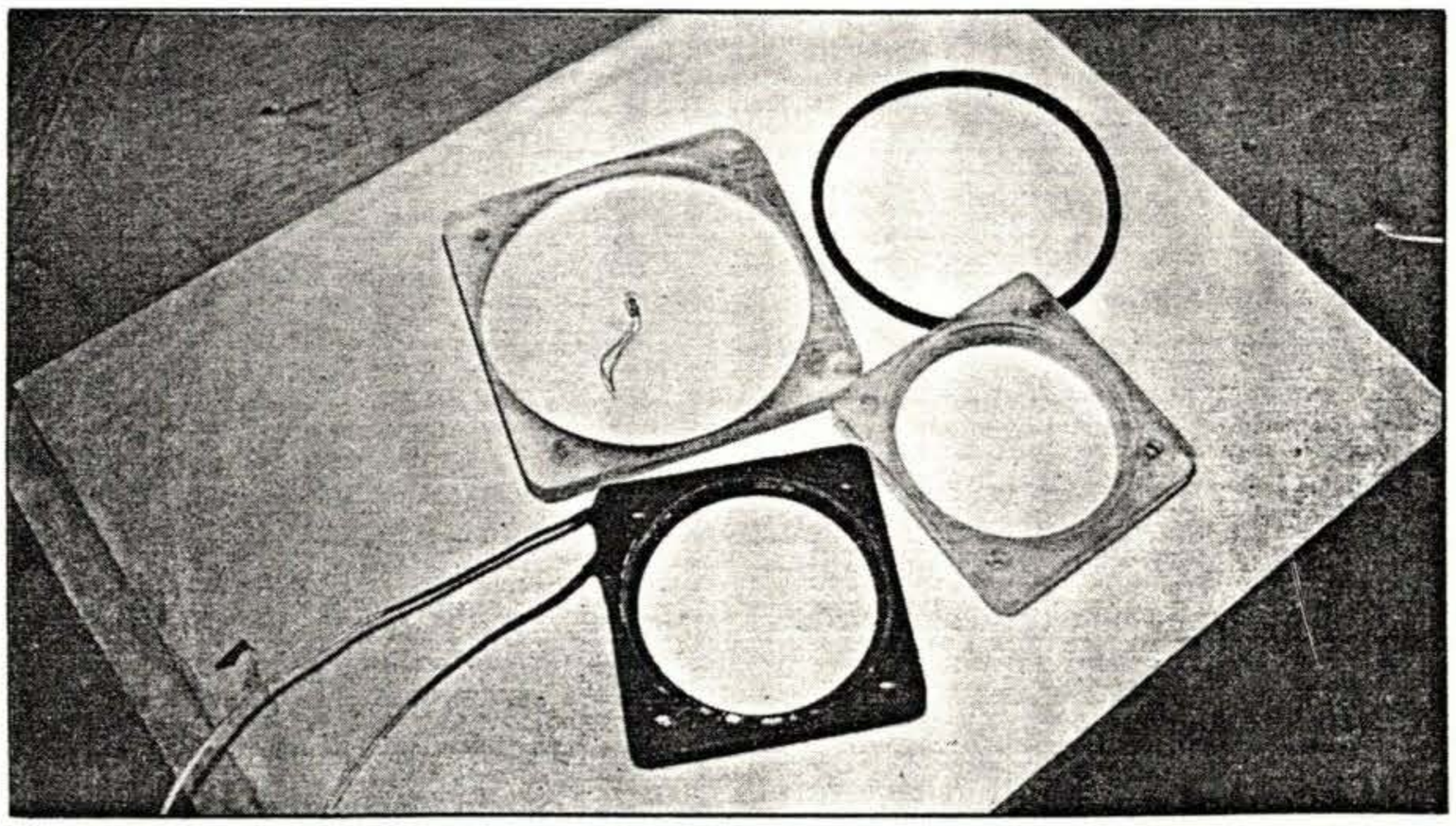
DESIGN 2 — As a variation, I fabricated one instrument lighting unit from a solid piece of 1/16 and fly cut a piece from 1/8 thickness. I glued them together with a superglue. I then glued the ring on the solid piece. This variation gave the effect of having the same depth as the other instruments. The inside flycut had to be carefully buffed prior to gluing on the 1/16 face plate. The flycut surface was then masked to protect it from the paint.

DESIGN 3 — Where it was possible to remove the faceplate from the instrument, I fabricated a lighting unit without the cosmetic ring or solid cover plate. I removed the faceplate and installed the unit between the instrument and its face plate.

EVALUATION — During tests, I found that excellent lighting was achieved using two light bulbs in each unit. Although one bulb could be used, the light intensity across the face was not uniform. I would recommend installing the bulbs at the upper left and upper right hand corners.

To complete the interior lighting, I installed an overhead flood lamp which also served to be a panel flood or map light. The one I used came from a late model Oldsmobile.

This overhead lamp also served to light up the baggage area of the cockpit.



The ⅛" diameter bulb is shown in the middle of this large 3⅛" unit. The cosmetic ring is shown at the upper right. At the lower right is a 2¼ unit before installing the bulbs. A completed 2¼ unit is shown in the foreground. Black cosmetic ring is glued to the *outside* of the unit so as not to cover the interior clear plexiglass circle.

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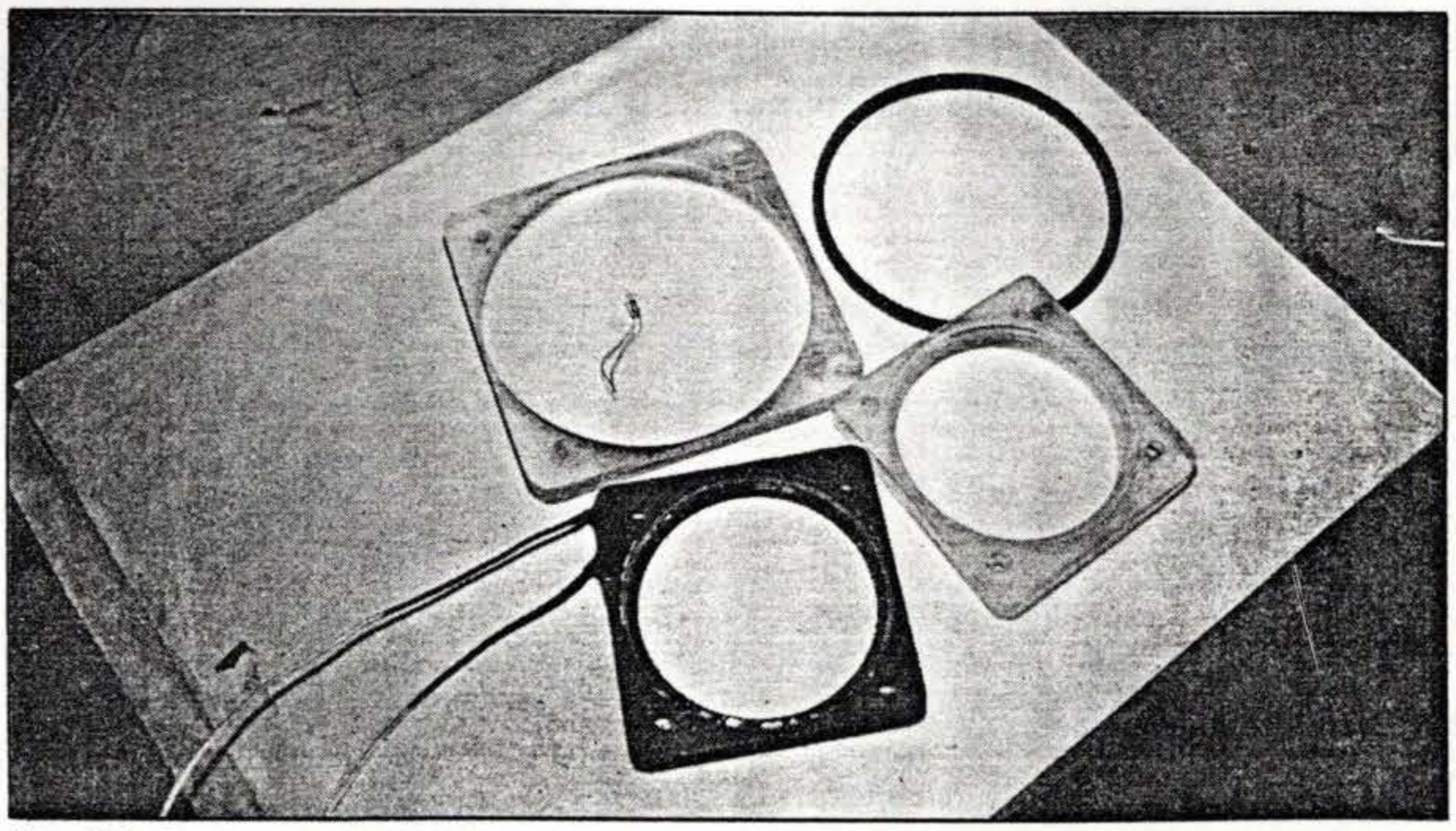

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