

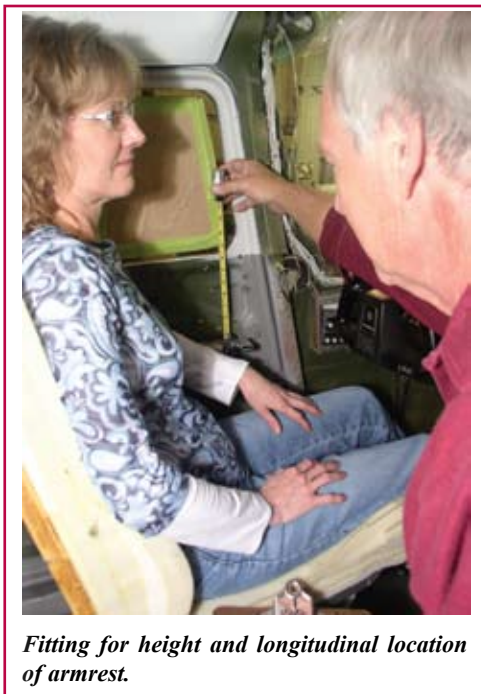
Renovation:

# Side Panels - part II

By Dennis Wolter

With the renovation of factory original armrests covered in last month's article, it's time to move on to what I feel is one of the most exciting parts of Cessna interior renovation: the modification of armrests. How many nicely executed interior re-dos have we seen where all that effort failed to really modernize the look of the interior because not much was done with the old, often quite dated, armrests. That's not to say that keeping the original armrests is always the wrong thing to do. If you want to retain the character of a vintage airplane in restoration, the old armrests are a very valid part of the original design. Some factory original designs are quite elegant and functional and will look great in the new interior. It's your choice.

The reason we so enjoy designing, fabricating, and installing custom armrests and side panels is that, of all the elements that go into an interior, changing the armrest and side panel design can completely update the aesthetic character and comfort of the new interior. At first glance, who really notices headliners, carpet and interior trim? Let's face it: seat design and side panels steal the show and set the design temperament for the entire interior. Other components and details are important, but they'll probably be noticed after the armrests and seats have been scrutinized.



Functionally, re-designing an armrest can greatly increase room as well as comfort in your interior. Locating an armrest at the correct elbow height is a major part of the new human factors package. And no two people have exactly the same proportions. Two 6'2" people can have substantially differ-

ent upper-arm and torso lengths, requiring different armrest heights if real comfort is desired. A long-legged person will position their seat further aft, requiring an armrest position that is also further aft; get my drift here? The only way to optimize dealing with human geometry is to have the owner/pilot and the airplane in-house for about an hour of fitting and note-taking.



If the client is outside the normal dimensional range (ie: very tall or very short), we first build the new seat foam (ie: have the client sit in this newly-foamed seat temporarily installed in the airplane. We then locate the correct height and longitudinal position for the new armrest. While we're not focused on seats in this article, the dimensions and shape of a seat relate very closely to the side panels and armrests. In



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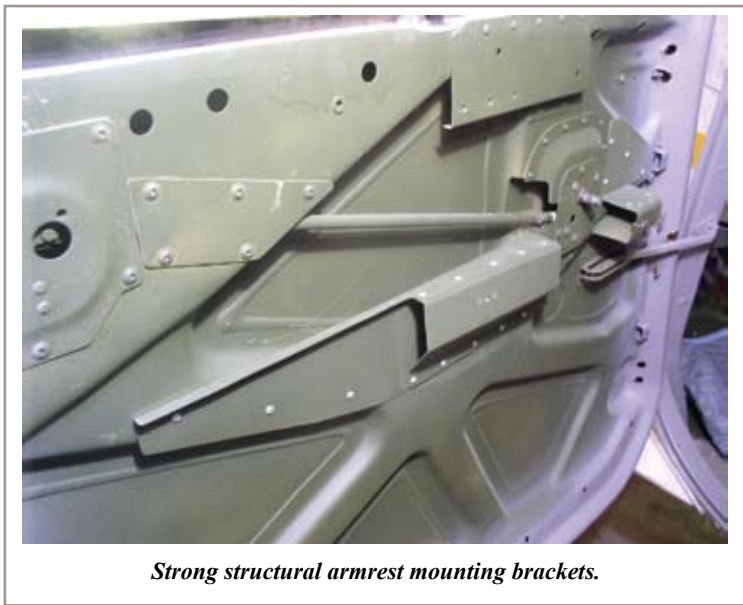
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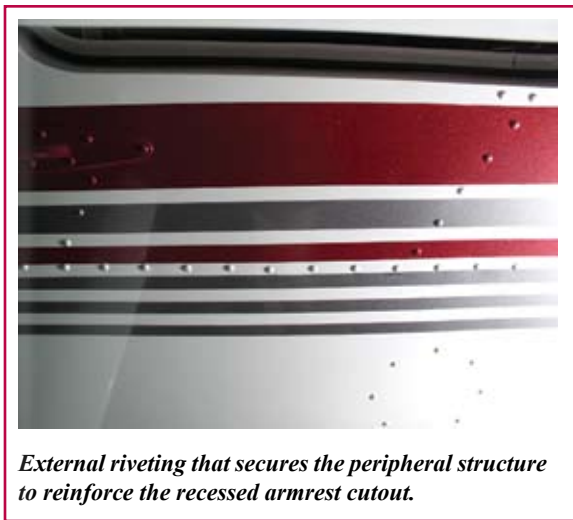


*Strong structural armrest mounting brackets.*

dealing with extreme cases or special needs, we've actually used lateral spinal x-rays to guide us in building a seat for someone with serious spinal issues or injuries. It's all about properly supporting the skeletal structure. The concept of mail order "custom" seats and side panels is really an oxymoron.

In some Cessna models, an oppor-

forward door handles have a door latch link rod that runs diagonally through the area where a recessed armrest would be located. Be wary of armrest designs that are purported to be recessed when they actually protrude into the cabin. They give the impression of being recessed, but the most "recessed" point of the armrest is actually sitting against the original inner



*External riveting that secures the peripheral structure to reinforce the recessed armrest cutout.*

door skin surface. No gain in width whatsoever. The latching link rod in these later Cessnas eliminates any hope of gaining additional cabin width that we can achieve in earlier models. It's important in newer Cessnas to build a strongly structured armrest pad that extends inward and above the forward door handle so that your elbow doesn't rest on a hard metal handle.

I can't go much further in this armrest business without giving our fear-

less leader, John Frank, a little credit. When we did the interior in his 210 in 1997, John was worried about the leather wearing on the high-use area of the armrests. We agreed that his concern was justified; we just disagreed on how to solve the problem. John wanted us to design and install a velcro-mounted armrest pad that could be easily removed for re-covering if necessary. I was very skeptical as to Velcro's ability to firmly hold the armrest pad in place. After some "friendly debate," I relented and we did

tunity exists that allows us to cut into the door structure and recess the new armrests into one inch or more of formerly dead space, greatly increasing elbow room. Think of it as making the cabin two inches wider; it's one of the few freebies we can take advantage of. (If the factory were to build the fuselage 2" wider it would mean more drag and less speed.) This accessing of space can only be done on older Cessnas that have aft-position inner door handles.

Airplanes equipped with the newer

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*Aft recessed molded armrest in a 182.*

it John's way. Well, it appears John was right. This system has worked great over the past years. John has already shipped his armrests to us once for recovering. One of the rewards of being in a creative business is learning things from others. I always keep an open mind, (Thanks, John!).

Here at Air Mod we have developed four basic types of modified Cessna side panel / armrest designs. The first, and least expensive, system is a molded, more contemporary looking screw-mounted design that can be either recessed (for the earlier Cessna aft-handle doors), or non-recessed (for the later forward-handle doors). Both designs require the fabrication and installation of .050" 2024T3 structural aluminum sup-



*Aft armrest support bracket*

port brackets. This system allows the cost-saving use of the original door side panels. If the recessed armrests are being installed, both the original door panel and the door structure are modified to accommodate the armrest cut-out. FAA regulations and accepted engineering principles require that if a hole is cut in the inner door skin, that hole must be structurally



*Aluminum rail-mounted continuous armrest with separate pan-type recessions at each seat.*

reinforced in a way that recreates the structural integrity that was compromised by the armrest recession cut-out.

All that theory means that you have to reinforce the hole and the photo shows how it's done. This is a job for someone with an airframe mechanic's license and requires a logbook entry thoroughly describing the entire process. Be sure this modification is done properly. We've been asked more than once to repair some real hack jobs done by disreputable persons. The world can be a scary place.

Using these molded screw-mounted armrests for the aft seats in all Cessna singles is a far less difficult process. The structural geometry of the aft armrest areas is such that recessed armrests can be used in all single engine Cessnas from

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*Continuous armrest mounted with contoured aluminum rails that create a phantom recession.*



*Look Mom! No mounting rails and lots of room for open design.*

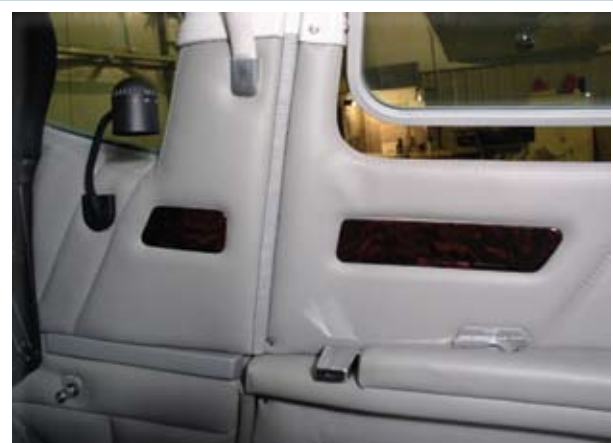
1946 until today. Again, a strong mounting bracket and a side panel recession must be made. When all is said and done, you end up with a more modern looking, more comfortable, more durable, easier to install and remove, cost effective and, in most cases, lighter armrest. Sounds like a win/win situation to me.

The second side panel / armrest upgrade system involves fabricating completely new armrests and side panels. We first

executed this design in AOPA's "Better Than New 172" in 1994. Since then, we have installed this system in about one third of the Cessnas we do, including twins. This system incorporates a continuous armrest that runs the entire length of the cabin. The armrest is hard-mounted to the airframe structure with extruded aluminum J-shaped rails. The upper and lower side panel sections fit into the rails, eliminating the need



*All-aluminum construction of the continuous armrest design.*



*Real hardwood trim components add texture, color and design.*



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for screws to hold them in place. If the airframe allows for the installation of recessed armrests, we fabricate a separate recessed armrest pan that is blind mounted to an aesthetically shaped cutout in the upper side panel. This separate armrest pan and cutout visually defines the armrest and becomes an important part of the interior design. This new side panel system is light, durable, very easy to install and remove, and looks great. Maintenance technicians love it. Access to the area behind the side panels is simple and easy, saving time and eliminating possible damage. You don't have to remove the armrests to remove the side panel. A continuous armrest design also allows for a convenient and functional mount-



*Reading light and mic & phone jacks are nicely installed in a continuous aluminum-mounted armrest.*

ing of intercom jacks, accessory plugs and reading lights, which are unaffected when the side panels are removed.

A third side panel / armrest design system is similar to the previous system with the hard mounted continuous armrest and the extruded aluminum side panel mounting rails. However, the upper mounting rail in this design is formed outward to create the recession for the armrest, resulting in a completely different but equally functional aesthetic design than the previously described system. This design presents a sculpted continuous mounting rail and a formed one-piece upper side panel recessed armrest. The side panel has a clean, uncluttered appearance. Sometimes less is more.

Our fourth and final side panel / armrest design is a sculpted one-piece side panel arrangement with one of John Frank's famous Velcro-mounted armrest pads. By eliminating the mounting rails, the entire side panel becomes an open canvas waiting for the artist to apply a new side panel pleating design. In this as well as the other three designs, the components are fabricated from durable aircraft aluminum. Compared to the original Cessna fabrication techniques, these systems are a quantum leap forward in all function, durability and design aspects.

The aforementioned systems are the ones that work the best for us. I have

seen other companies who are also creating some exciting and functional designs. Always be sure of what is being done behind those nice-looking panels and make sure you get appropriate paperwork.

Whether you choose to keep your original armrests, or opt for a modified version, a lot can be done to customize the armrests and side panels. Side panel pleating should complement the new seat upholstery to create a cohesive and elegant design. For instance, if a traditional seat style is to your liking, the side panel pleating layout should be designed to emulate what was done on the seats. Wood trim panels can be included to add a bit of elegance, color and texture. Gooseneck reading lights add a great deal of convenience and function. Properly located and aesthetically installed intercom jack mounts can give a custom built-in look to a feature that is often just awkwardly stuck on a side panel. The message here is to think every detail through from a design standpoint. One thoughtless choice can stick out like a sore thumb.

The point is that you don't have to retain those 1950s-looking side panels if your tastes run to something more in-



*Accessory plug installed in an aft rail-mounted armrest.*

novative. Installing a new interior can be an opportunity to create a modern, beautiful, safe, more durable and easier to maintain cabin environment.

Next month it's on to higher things – headliners, where, as you guessed it, a lot can be done to make them better. Until then, fly safe!



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