

## A DO IT YOURSELF PANEL FOR AN OLDER MOONEY

Early model Mooneys have one well known shortcoming: one of the poorest designed instrument panels in the industry. The cramped panel has a random distribution of instruments, including some 2 1/4 inch World War 2 vintage instruments, and a lack of growth space

Our 1966 E-Model, "Mike", was not immune to this instrument panel dysfunction. So when we bought a King KCS-55A HSI, it seemed logical to take the opportunity to upgrade the left side panel to a 201-type design. This new panel would have more full-sized holes and a standard layout for the basic flight instruments. In the back of our minds were future goodies, e.g. Stormscope and S-Tec autopilot.



*The original "Shotgun" panel*

With our airplane budget depleted from the purchase of the HSI, we were unprepared for the cost of the panel upgrade. I called Paul Loewen of Lake Aero Styling and Repair (LASAR) of Lakeport California which offers a panel upgrade. Paul quoted approximately 2000 dollars for the work. I didn't understand how a "little piece of metal" could cost so much. Paul was unconvincing in his statement that it "just seems to take a lot of time to put one in". Paul has also displayed 201-type instrument panels kits at Kerrville and at West Coast MAPA fly- ins. The price of about 450 dollars seemed more reasonable, so I decided to buy one and install it myself.

Let me state right at the beginning, this is not a "bolt it together and put it in" type of kit. It took me over 60 hours, to install the instrument panel. There was quite a bit of drilling and fitting required. I am handy with tools but have had little experience with aircraft maintenance. With more experience, it would take much less time. I would recommend that only persons with some aircraft experience undertake this task. Now that the job is finished, I understand why Paul Loewen charges 2000 dollars.

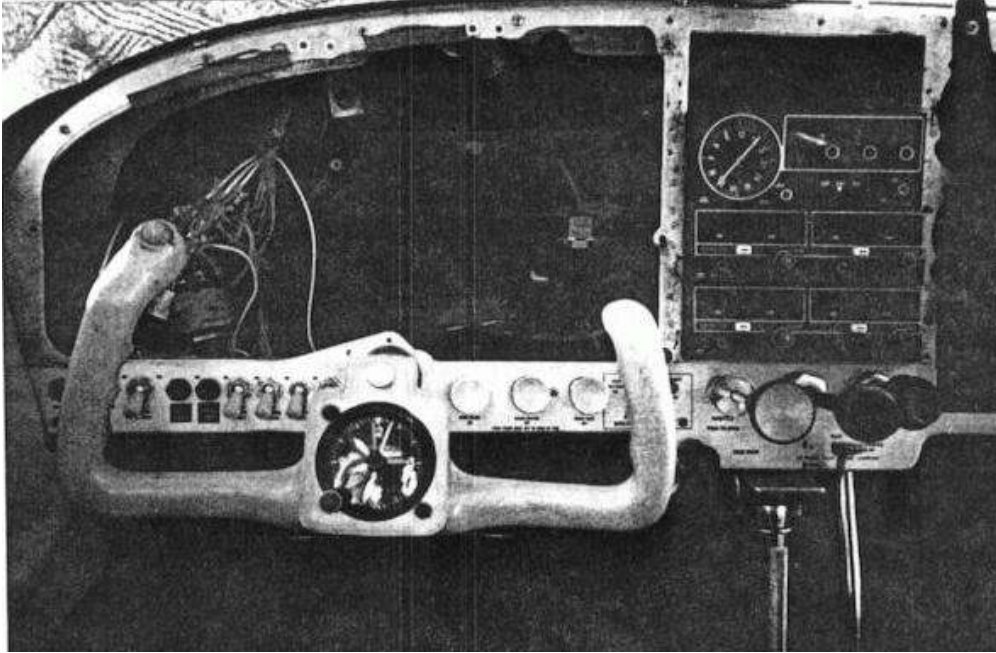
The LASER instrument panel kit is custom made for each customer's specific requirements. I explained the desired layout to Paul over the phone. The machined panel arrived in about a week by UPS. The workmanship was excellent. All of the instruments fitted the openings exactly (very precise work is required).

The new panel has room for 9 full-sized holes in place of the 6 full-sized and 2 small (2 1/4 inch) holes in the original panel. The panel is also completely vertical whereas the original panel has a bend in the middle so that the lower half of the panel slants outwards with the instruments canted up toward the pilot. The new panel also has a standard layout for the basic six flight instruments with the HSI in the bottom middle. One of the additional holes contains a VOR/LOC indicator and the remaining two holes are blanks (for now). There is room for a Hoskins FT- 101 Fuel Flow Computer, gear position lights, mag switch and master switch. Paul recommended that I replace the high and low vacuum lights with a 1 inch vacuum gauge. I ordered the panel in an Epoxy white finish which is attractive but turned out to be difficult keep from getting marred during the fitting and installation process.

The kit consisted of the panel itself and all the hardware required to install it. This included a triangular sheet metal fillet used to close up the opening at the right hand end of the panel next to the radio stack.

The xeroxed handwritten instructions are adequate but some terminology would be familiar only to an aircraft mechanic. LASAR would improve the overall quality of the kit if contained more professional looking instructions. In any case, the project must begin with a thorough study of these instructions.

I started the job by removing the plastic panel overlay and unscrewing all the instruments and other items from the panel. I then unbolted and removed the original aluminum panel. Don't forget to disconnect the battery before you start. It is essential that all instruments be disconnected and removed to provide working room. See the DURING picture. Most of the electric, gyro, and flight instruments had to be replumbed for their new location since the original connections were not long enough to reach the new instrument locations.



*In Progress: The old panel and all instruments were removed.  
I wondered "What have I done?"*

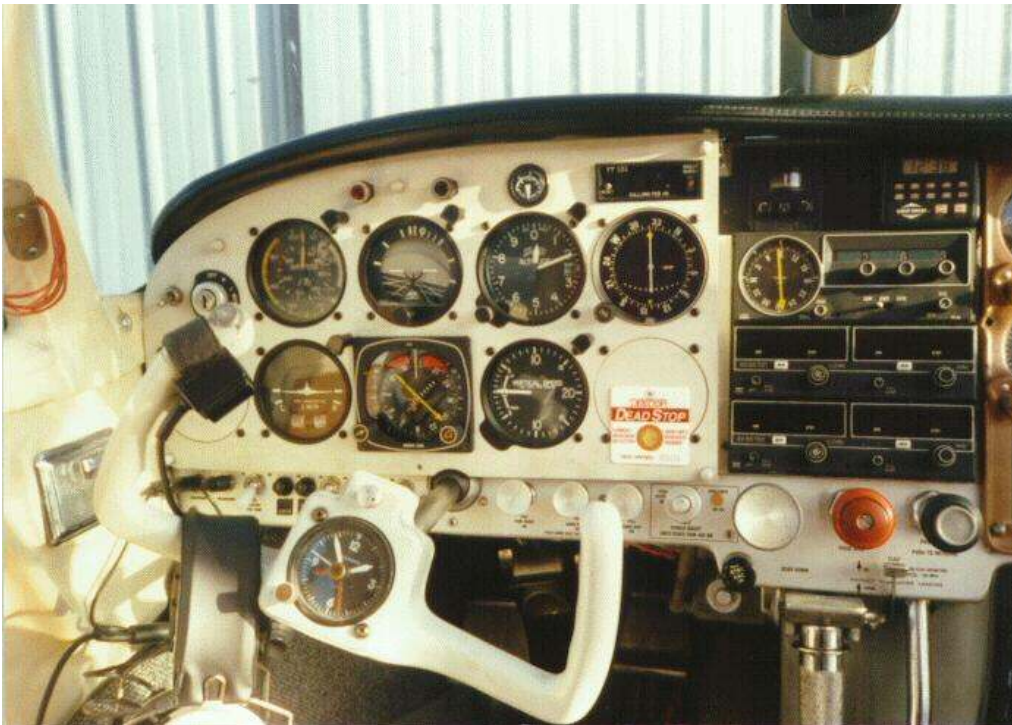
A was a shock to discover that it was necessary to relocate the bracket that holds the pilot's control wheel. This triangular structure, which supports the control wheel shaft as it passes through the panel, points upwards. In its original position, this point interferes with space required for instruments in the panel. It must, therefore, be rotated 180 degrees so that the point is downwards. New holes are drilled in the supporting panel structure and excess aluminum filed off. I was not happy fooling with this critical component of the aircraft control system, but I followed the instructions exactly and it came out well enough. A 90 degree power screw driver would have made the job easier. Paul Loewen suggested that some panel layouts would not require this modification. I would recommend such a layout if possible.

The original panel has an integral aluminum bracket at the top that holds the top part of the panel away from the aircraft structure. Since the new panel is vertical, it stands out further than the original. The kit has three bent aluminum support brackets that are screwed into the aircraft structure. New shock mounts are provided for the six top and bottom mounting points. The panel is fitted by securing the lower right corner of the panel to an existing mounting point and locating the positions of other attach points. Holes must be drilled for the upper support brackets and shock mounts. This is a delicate job and care must be exercised to ensure that the panel is level and vertical. The most difficult part was yet to come. It turned out that with the new panel layout, none of the instruments at the perimeter of the new panel would fit. They hit the panel support structures or the radio stack support. I bought a sheet metal nibbler from Radio Shack (several are also advertised in Trade-a-Plane) and attacked the offending aluminum with the nibbler and a collection of metal files. I took care to prevent metal filings and chips from falling into the electronics and vacuumed occasionally. It took countless cycles of

mounting the panel, mounting the instruments, noting where they hit, removing the instruments, removing the panel, filing and nibbling and then repeating the entire process. During this activity the panel became quite grungy and the white finish suffered numerous nicks and scratches. It would have been a good idea to have covered the panel with contact paper, masking tape, or the like to protect the finish during the fitting process.

The new Turn Coordinator, which replaced the old 2 1/4 inch Turn and Bank, interfered with a big bundle of original factory mounted electrical cables. This bundle had to be carefully opened and the wires routed on either side of the TC. At no time, did I have to rewire anything in order to make room for the new instruments.

Finally, the basic panel was installed and the instruments mounted with plenty of wiggle room. After a month of idleness "Mike" was fired up and everything still worked. The result is functional and attractive (see AFTER photo). I must admit that I am pleased with the results.



*The Completed Panel*

At this point, I had some difficulty getting the plane signed off by my local AI. The job looked OK but I had to down play the extent of the work that had been done. It was a mistake not to involve the AI from the very beginning of the project. LASAR's sample Form 337 definitely under-represents the complexity of the job although it does contain the magic words that make AIs and the FAA happy. I would suggest that you discuss the instructions with an AI before you order the kit. If there are no problems, proceed. For

West Coast people, Paul will sign off the work if done in accordance with the instructions.

In summary, the new panel is a big improvement. I had a good time and learned a lot about my plane during the installation. However, the job should not be taken lightly since it's a lot of work and there is potential for screwing up. One thing is sure, I am about 1,500 dollars richer.

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