

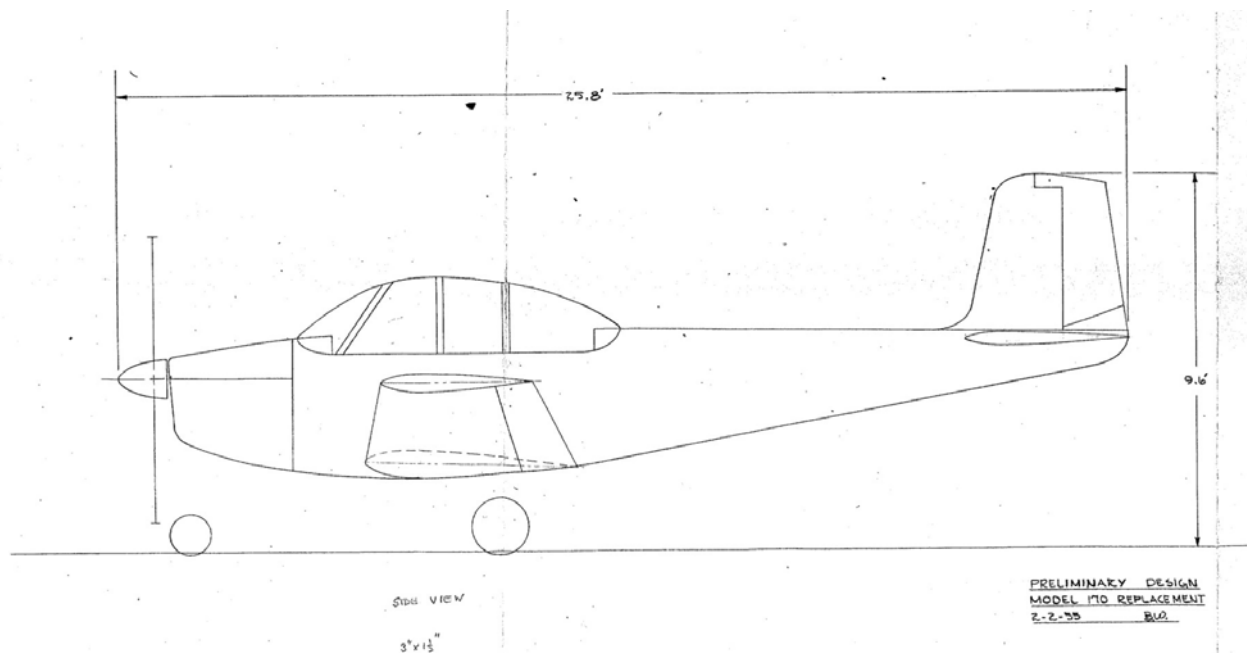
The low wing Cessna 170 – a great idea that didn't fly

Air Facts Journal

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The three views, of the airplane described by the article title, that accompany this piece were taken from an "unofficial" board size drawing I knew I had stowed away somewhere around the house, but only recently found and reclaimed. The drawing is entitled "Preliminary Design, Model 170 Replacement" and dated February 2, 1955. It is initialed as drawn by "B.W." That it doesn't have a drawing number, nor an assigned project number for the model illustrated says it was not a formally established undertaking of the Cessna Flight Test, Aerodynamics and Preliminary Design group of which I was a member back in early 1955. It was just a pictorial of a great idea I had – and since I hadn't looked at it for about 50 years it was a revelation for even me. I wasn't real sure of what I would see.

Low wing Cessna 170 drawing



The tail looks familiar, but the rest looks very un-Cessna.

In early 1955 we had what I thought were three exceptional and certain to be widely accepted low wing Cessna designs in work: the twin, prop driven Model 310, already being sold, the twin jet T-37 Air Force trainer with prototypes being tested for qualification, and the four engine prop driven Model 620, which – while still in development – in my view was going to be big. Big for a Cessna airplane and a big seller in its business aviation arena.

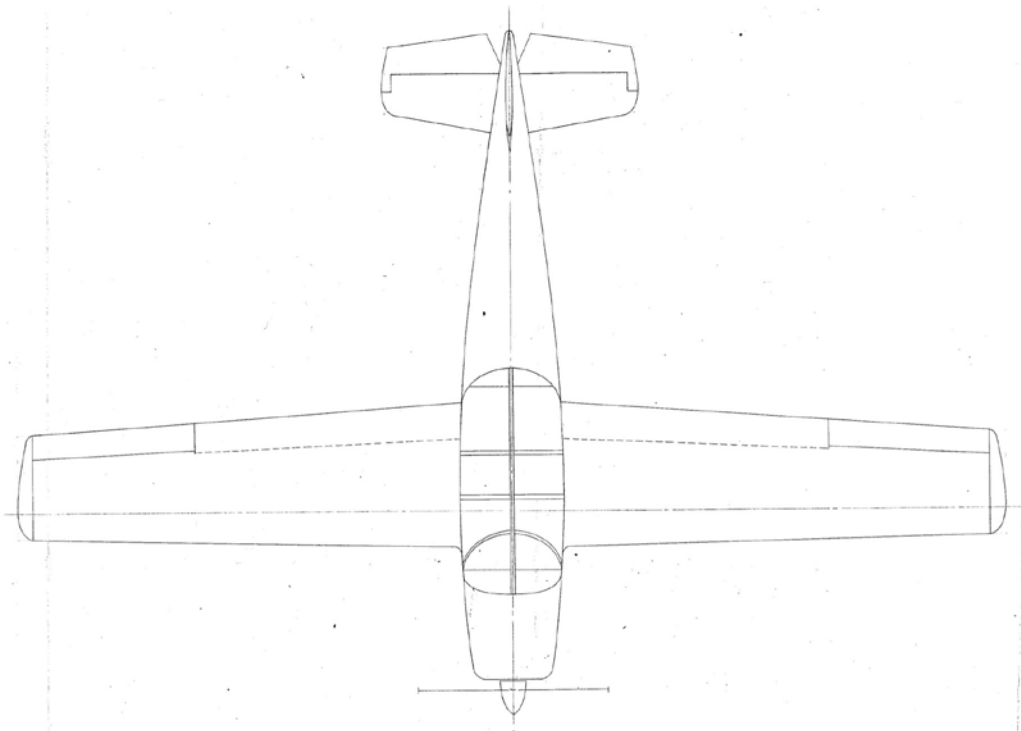
Sure we had a couple of great single engine airplanes, the Models 170 and 180, but they were of the comfortable looking, familiar but staid old high-wing configurations. What we

needed, I thought, was a complete line of sporty looking low-wing designs, requiring a redesign of the 170 and 180 to fit in the sequence from commercial single-engine four-place airplanes through the recip and jet twins, the 310 (commercial) and T-37 (military), and finally to the four engine 620 business aviation entry. (Depressing note: The 620 was canceled two years later just as it was being certificated. The other two became the icons I anticipated.)

Thus I worked with a preliminary engineering board designer, both of us located in the engineering area in the aft part of Cessna's experimental hangar, to create a vision of the concept of good looking low-wing versions of the 170 and 180 – not concrete designs but something to generate interest in the idea with the company management.

That board designer, B.W., was Bill Wise, later to be VP of Engineering for competitor Beechcraft. My memory says we did a similar design, as that presented here, for the 180 as well and why I decided to save only the 170 replacement drawing is a mystery – maybe they looked too much alike. My memory also says I did only fundamental stability and control and performance analyses on each just to make sure we were presenting reasonably practical examples. It was that new concept for Cessna – that is, let's be totally more sporty – but not specific configurations, that I wanted considered.

Cessna 170 low wing from above



From here it looks like any other Cessna.

At the date of the drawing we were working on the next 170 model, the 170C, which would have been a tail wheel airplane with a squared off empennage – and were not considering a tricycle gear version of the 170 at all. But competitors were offering tri-gear, four-place models – most specifically the high-wing Tri-Pacer – and sales of the 170, the B model, were

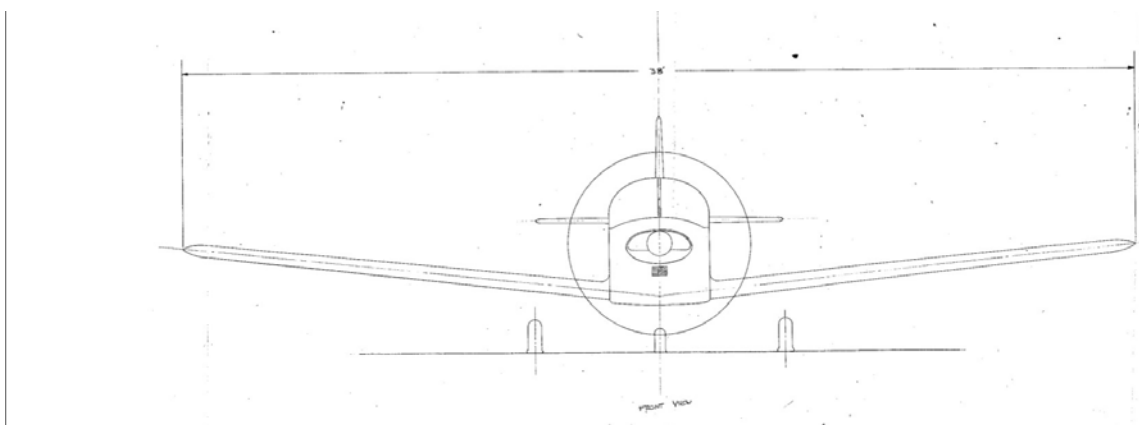
tapering off. So a decision was made to expedite a tri-gear 170, the 172, with the squared off tail we had designed for the 170C. That expedited project used a lot of our resources – the 172 was offered for delivery in 1956 – and I don't know if my low-wing concept was lost in the shuffle, or was just not considered as fungible as the quickly available 172.

Note that I never got an actual turn down on the "170 Replacement," just never heard anything. Later that year I moved West to the Military (T-37) Division and was as surprised as anybody with the great reception that grew for the 172, which of course was a product of the Commercial Division back on the other side of town. Readers will know that it became the most produced airplane in the history of aviation. Maybe going for the 172 was a great management decision.

Readers may also be disappointed in the low-wing 170 design presented here. It's not a major departure in design, so maybe is, and might have been, seen as just a "vanilla" offering. Additionally the drawings leave out a lot of detail that would be interesting to aircraft devotees. Most importantly, the cabin area is shown as a fighter like canopy arrangement, and no method of entry is depicted – could have been a sliding or rotating canopy, or even doors that encompassed that part of the canopy. Off to the side on the original drawing, and not reproduced here, is a pencil sketch of what looks like a step, such as for passengers to get between wing and ground. It may have been the result of a post-drawing discussion. Other things likely on the views with this article are my recent notations for getting the trimmed down versions from the original – and not poor lettering on Bill's part.

The design is a tricycle geared one, so all of our models would then be, but the drawing doesn't show whether it is fixed or retractable – the initial idea was fixed gear, as the 170 and 180 were. (And the subsequent 172 and 182 were, as well.)

Low wing Cessna 170 from front



It almost looks like a Cherokee from the front.

The propeller is only outlined, but we would have selected a fixed pitch for the 170 version, and a constant speed propeller for the 180 version. The drawing shows a symmetrical

wing airfoil, but that only indicates I hadn't selected one of our standard airfoil sections yet. This design has the "square" tail of the 170C, and its derivative 172.

The low-wing design(s) doesn't have the "draggy" struts of our high wing models, and I may have gone overboard on assuring good overall performance by using a higher aspect ratio wing than on the 170 and 180. The new design was intended to fit in a standard T-hangar too, and the additional span might have made it somewhat harder to maneuver getting the plane in and out.

We of course had in the back of our minds the familiar low-wing versus high wing trade-offs, but a consistent, low-wing, high performance appearance in our series was being intentionally, if silently, proposed as the dominant consideration.

Cessna 170B



The tailwheel, high-wing Cessna 170 was a fine airplane, but did it lack some modern styling?

So we showed a low-wing, fixed tri-gear configuration. It was at least five years later that a similar configuration, the Piper Cherokee, was offered by a competitor. But what familiar low wing airplanes were our competitors offering, or which were being flown, in the meantime? In the two place category there was the tail wheel, retractable gear Globe Swift, or the fixed tri-gear (unspinnable) Ercoupe. The nominal four passenger Beech Bonanza was tri-gear, and retractable, and so was the North American/Ryan Navion – and it had a sliding canopy. That's OK for the "Poor Man's P-51." Might have to go back to the Spartan Executive to find a four-place low-wing airplane with a retractable gear in a tail wheel configuration.

And it was almost ten years before Beech offered the four place, fixed, tri-gear Musketeer, and it took Cessna more than a generation to provide, actually someone else's, low wing, fixed-gear 170 like airplane, the 350 Corvalis. Of course it had other more modern aspects than our 1955 170 replacement had.

So Cessna, and others, later mimicked that low wing 170 replacement approach. That makes me even more happy to now be able to show you the conceptual three view of our/my

1955 low wing 170 design. And I still think the idea of a complete line of fast looking low wing Cessna airplanes was a good one. The timing just wasn't right.