

Where Have All the Homebuilts Gone?

Thousands of E/A-B aircraft have been removed from the rolls, but most of them haven't existed for decades.

By Ron Wanttaja - April 27, 2020



Although several companies make Light Sport versions of their designs, only those licensed as Experimental/Amateur-Built are included in this report.

Most of you probably remember the heady days of the early 2000s, when every year saw the FAA's listing of the total number of homebuilt aircraft rise by a thousand airplanes or more. Every year, excited articles were triggered when the Experimental/Amateur-Built (E/A-B) fleet size expanded. "We've hit 30,000 E/A-B! 32,000! 33,000!"

Haven't seen such claims lately, have you?

And when today's numbers are published, they're hard to believe. If you've noticed any announcements at all, you're probably saying things like, "27,000 E/A-B Aircraft? Where did they all go?"

So, where did they all go?

Well, most of the missing homebuilts didn't exist at all—or, at least, hadn't existed for a few decades.

Let's take a look at what happened.

The FAA Registry

The FAA maintains a database of registered aircraft. It's actually several cross-referenced tables that, when combined, can provide a detailed description of a given N-numbered aircraft. Dozens of parameters are available, including make/model, serial number, year of manufacture, owner's name and address, installed

engine, etc. When an application for an N-number is received, the plane is added to the registry. Special flags note whether this is just a reservation or is for an actual aircraft.

Now...the question is, when is an aircraft removed from the FAA registry?

That's where it gets fun. Prior to 2010, aircraft were only removed at the registered owner's request. Typically, the "owner" in many cases was an insurance company, canceling the registration after the aircraft was totaled. There were, no doubt, some conscientious owners who canceled the registration when they scrapped an old airplane.



While most older homebuilt designs were strongly affected by the FAA reregistration effort, the Pietenpol saw a relatively low drop in fleet size.

But nothing forced them to. Other than getting periodic mail from the FAA, there wasn't any drawback being listed as the owner of a plane on the FAA registry. And because the owners didn't respond to any FAA queries, the FAA could never be sure whether the plane was still in existence or not. So they were kept on the record.

Security Concerns

After 9/11, the process for training pilots and registering aircraft came under a lot of scrutiny. The FAA was criticized for losing track of aircraft—for being unable to determine the actual owners of thousands of aircraft.

The requirement for triennial aircraft reregistration was born. Starting in January 2010, registered aircraft owners were required to renew their aircraft registration every three years. Reregistrations would have to be accompanied by a \$5 fee; the owners couldn't just check off a box on a postcard and send it back. The actual program was phased in over three years, so that everyone's registration didn't expire at the same time.

Since 2010, more than 80,000 aircraft have had their registrations canceled. That's a 21% reduction in the overall U.S. aircraft fleet.

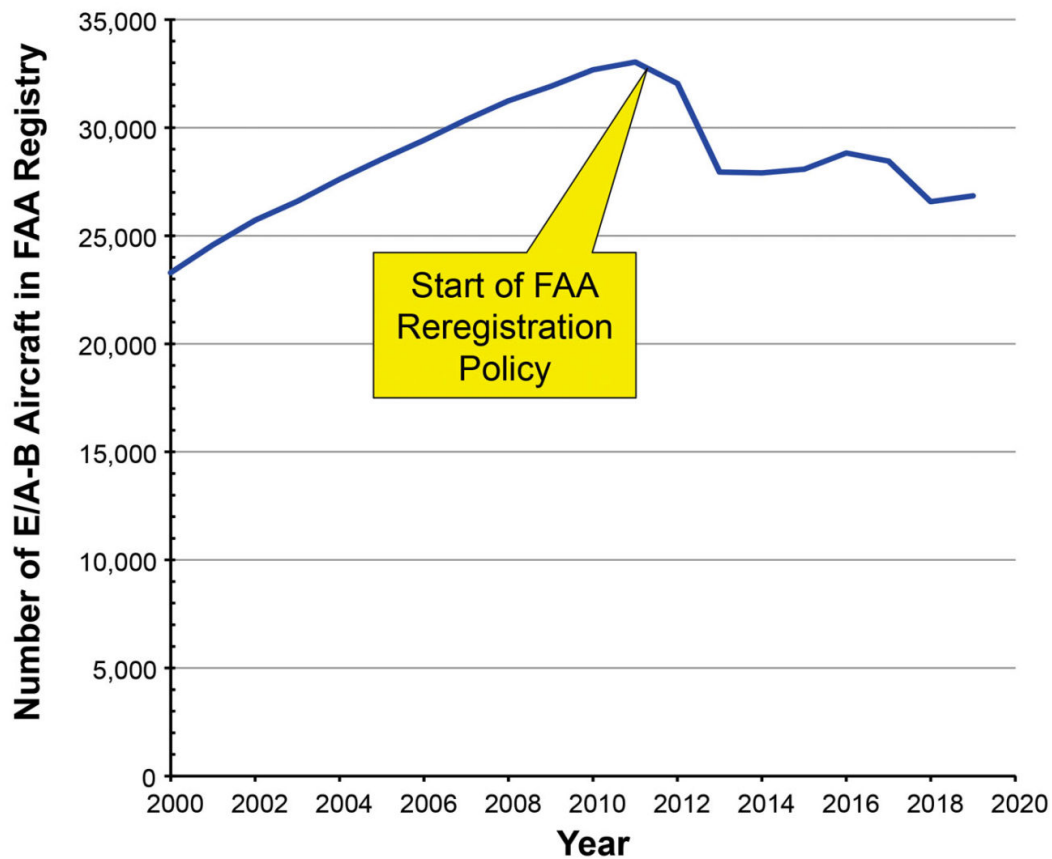


Figure 1: The total number of homebuilt aircraft was on a steady rise until the FAA instituted its triennial reregistration program.

Homebuilt Consequences

As of January 1, 2010, when the program started, there were 31,914 E/A-B aircraft. As Figure 1 shows, the population coasted up to just over 33,000 by the end of 2011, but after that, the homebuilt population tanked. About one-quarter of the homebuilt fleet was removed from the registry between 2010 and 2013, dropping to less than 28,000 by the end of 2013.

This caused some angst in the industry. People were used to the fleet increasing by 1000 or so homebuilts every year. Yet the numbers dropped and kept dropping. By the end of 2018, there were less than 27,000 E/A-B aircraft.

In reality, the number of active homebuilt aircraft wasn't affected. There were just as many aircraft flying; in fact, there were still, on average, a thousand new homebuilts completed each year. As Figure 2 illustrates, the problem wasn't that homebuilt airplanes weren't being built; it was because of aircraft being removed from the registry via the reregistration process.

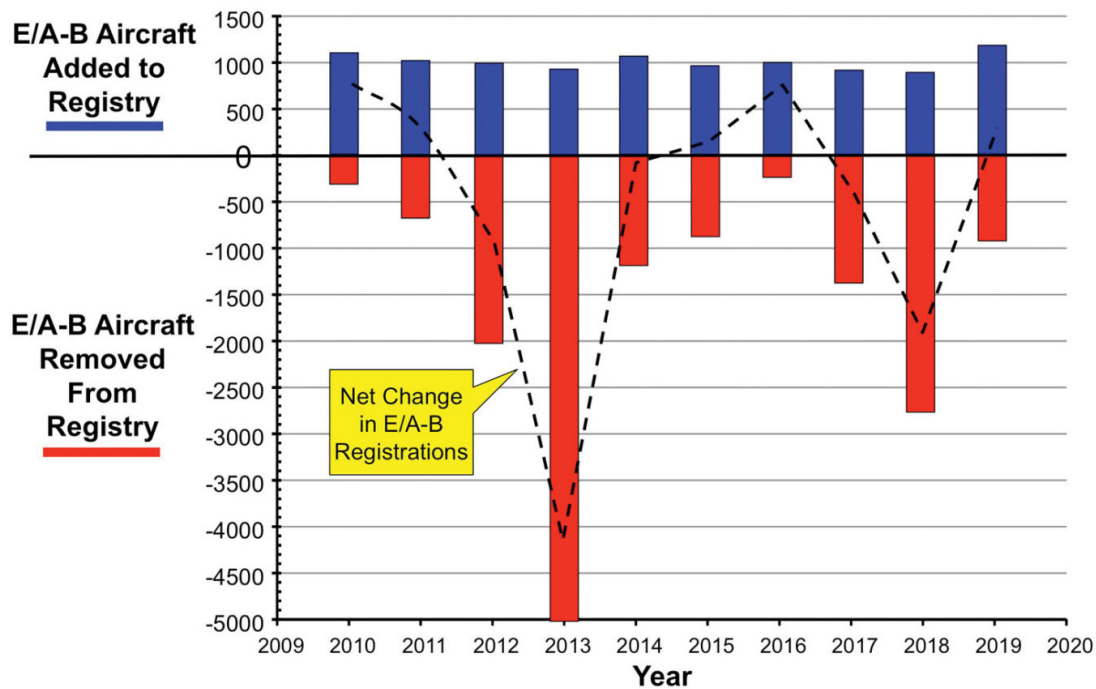


Figure 2: Since 2010, up to 5000 homebuilt aircraft have been removed from the FAA registry every year. Yet the production of new homebuilts is fairly constant.

Hardest hit were older homebuilts, the ones from the '60s and '70s. Ninety percent of Bensen Gyrocopters were removed, as were about two-thirds of the Quickies. Half the Fly Babys disappeared, as did about half of the Sonerais, BD-4s and BD-5s. Oddly enough, the oldest homebuilt of all—the Pietenpol—wasn't badly affected. It lost less than 15% of the fleet. (You can find a table showing the effect of reregistrations for multiple homebuilt types [here](#).)

The reregistration process was removing the dead wood from the aircraft registry, just like it had been intended. However, there was an unexpected complication. The FAA was tracking homebuilt safety based on the number of accidents vs. the fleet size. With the same number of active aircraft, the number of accidents didn't change much. But with a huge drop in fleet size, the accident rate took a big jump!



While only two new Glasairs were added to the FAA registry in 2019, nine examples that had previously been removed were returned. (Photo: Mark Owen)

Again, there was nothing actually wrong. It was just a byproduct of the dead wood being removed from the registry. But it certainly looked bad.

The issue was addressed at the annual EAA/FAA Recreational Aviation Safety Summit in February 2015. The FAA and EAA now emphasize tracking homebuilt safety by the number of accidents, rather than as a percentage of the fleet.

An Actual Drop

Buried in the chaff from the reregistration effort was the fact that homebuilt **completions** were actually slowing. About 1100 new homebuilts were added to the roster in 2010, but by 2018, this had dropped to

just 780.

What happened? We can't know for sure, but the primary culprit was probably the 2008 recession. It most likely triggered a steep drop in aircraft kit sales. Aircraft completions follow the sale of the kits by a number of years. Discretionary purchases like homebuilt aircraft kits probably took a while to resume, thus the kits purchased in 2011–2017 are just coming to completion.

More Homebuilts in 2019

Happily, we're seeing signs of recovery. Last year, 1179 new E/A-B registrations were added to the roster, the most in a single year since 2001. Three hundred thirty-five were previously deregistered aircraft that had been restored to the registry. But to the FAA, they count as new aircraft—so we'll count them, too.



Over 20% of new homebuilts in 2019 were RVs.

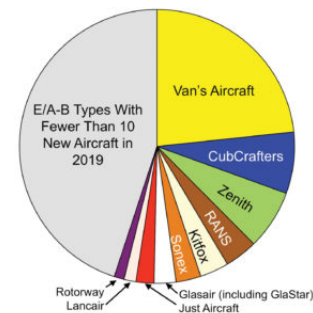
If we ignore the “restored” homebuilts, 844 actual new homebuilts were completed. What types were they?

As one would expect, **Van's Aircraft** led the way: 199 of the new aircraft were RVs. The RV-7 took the lead, with 51 examples. Second place was a surprise—in more ways than one.

CubCrafters was number 2, with 61 new Carbon Cub airplanes of all models. What's more, the larger airplanes in the stable, the 2000-pound gross weight versions of the Carbon Cub, saw 51 new aircraft added to the registry in 2019.

That's the same as the RV-7. Van's and **CubCrafters** tied for the most-produced homebuilt airplane in 2019*.

Of course, Van's wide offerings dilute the sales of specific models. If the company hadn't offered the RV-8 and the RV-14, more customers probably would have opted for an RV-7, and the comparison wouldn't have been close. Still, it's interesting when you consider that the Carbon Cub kit costs about twice that of a quickbuild RV-7.



A wide variety of homebuilt aircraft were completed in 2019. Relatively few companies saw 10 or more new aircraft.

In close third place with 60 new aircraft was **Zenith**. Over half (31) were CH 750s and 14 were CH 701s.

New Homebuilts Completed in 2019

Includes only companies with 10 or more completions

Type	Model	New E/A-B	Reregistered E/A-B	Total
AirCam	All E/A-B	11	2	13
CubCrafters	All E/A-B	61	1	62
	Carbon Cub EX-2/FX-2	10	1	11
	Carbon Cub EX-3/FX-3	51	0	51

Type	Model	New E/A-B	Reregistered E/A-B	Total
Glasair	All E/A-B	20	4	24
Just Aircraft	All E/A-B	18	1	19
Kitfox	All E/A-B	29	14	43
Lancair	All E/A-B	12	11	23
	Lancair 4	6	4	10
RANS	All E/A-B	33	13	46
	RANS S-5	1	1	2
	RANS S-6	1	3	4
	RANS S-7	6	4	10
	RANS S-12	1	3	4
	RANS S-14	0	2	2
	RANS S-18	2	0	2
	RANS S-19	7	0	7
	RANS S-20	12	0	12
	RANS S-21	3	0	3
Rotorway	All E/A-B	10	3	13
Sonex	All E/A-B	25	7	32
	Onex	6	0	6
	Sonex	10	6	16
	Subsonex	2	0	2
	Waix	6	1	7
	Xenos	1	0	1
Van's	All E/A-B	199	52	251
	RV-3	1	3	4
	RV-4	3	13	16
	RV-6/6A	18	21	39
	RV-7/7A	51	4	55
	RV-8/8A	44	5	49
	RV-9/9A	21	5	26
	RV-10	27	1	28
	RV-12	3	0	3
	RV-14/14A	31	0	31
Zenair	All E/A-B	60	7	67
	CH-601	6	2	8
	CH-650	6	0	6
	CH-701	14	4	18
	CH-750	31	0	31
	CH-801	3	0	3

New Builds: Newly registered E/A-B aircraft. Reregistered E/A-B: Previously deregistered aircraft restored to registry

Prognostication

What does the future hold? You're asking the wrong guy. Last year, I predicted that a lot more homebuilts would be deregistered in 2019 than actually were.

But things are certainly looking up. The net increase in homebuilts (new planes minus deregistered ones) was the second best in the last 10 years. The cyclical nature of the FAA’s reregistration process should result in fewer removed from the roster in 2020, and there are probably plenty of kits bought during the recovery from the 2008 recession that will be finishing up.



CubCrafters' EX-3 tied Van's RV-7 for number of new E/A-B aircraft registered in 2019. (Photo: CubCrafters)

To steal a line from Jim Weir—“**Stay tuned!**”

**The Carbon Cub EX-3 and FX-3 were counted together because the major difference between them is whether builder assist was used. Both models are licensed as Experimental/Amateur-Built. Similarly, the RV-7 and RV-7A (taildragger and nosewheel versions) were combined for the comparison.*

Ron Wanttaja

Ron Wanttaja is a systems engineer, engaged in satellite orbit/constellation design and analysis, launch vehicle and onboard propulsion system trades, and operations concepts for space systems. He worked on the early design studies for the International Space Station.