

10 HOT NEW iPad AVIATION APPS REVIEWED

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SR22T

True Turbo for Cirrus

Lower rpm and vibration, and burns unleaded fuel



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CIRRUS SR22T

Tried, True, Turbo

>>> The latest SR22 makes use of a Continental factory turbocharged engine. The upside is sky-high.

STORY AND PHOTOS BY ROBERT GOYER

THE HOPE IS THAT, AS A product develops, it will mature. And I mean "mature" in the good way, you know, like expensive wine, fine Swiss watches and very fast airplanes, like the Cirrus SR22.

I was the first journalist to fly the original SR22, and I've flown every new one since, some of them for several hundred hours. Based on my experience in the airplane, I feel confident in saying that a new SR22 is a substantially better airplane in nearly every respect than the original. Most of that improvement has been incremental, with a few big exceptions, including the upgrade to the G3 model a few years back and the concurrent offering of the Turbo model, as well as the introduction of the Entegra and Perspective flight decks.

While largely invisible to the naked eye, the latest improvement, the upgrade to a Continental factory turbocharged engine, is also a big deal. The new engine, the Teledyne Continental TSIO-550-K, provides several very noteworthy quality-of-life, longevity and performance advantages over the Tornado Alley turbo-normalized engine and does it for the same price. Cirrus will continue to offer the Tornado Alley engine, so customers will be able to select the engine option that best suits their needs or tastes.

The new dash number is unique to Cirrus, at least for the time being. The previous engine, the IO-550-N, was converted by Tornado Alley Turbo from a naturally aspirated engine to a turbo. Tornado Alley also added its patented GAMInjectors to even out fuel flow and balance cylinder temperatures.

The new engine is a lower compression engine, 7.5:1 versus 8.5:1 for the

Tornado Alley product. The lower compression means the -K model has slightly less efficient specific fuel consumption, but it also means it has better detonation margins. It's also covered by a Teledyne Continental factory warranty. Moreover, it also features balanced fuel injection. Continental just doesn't have a trade name for it.

While continuing to sell both products, Cirrus is talking about the new engine as a big upgrade. In a press release, Cirrus vice president Pat Wadick said, "In addition to a quieter operation, lower weight, a smoother ride and many other refinements, the new SR22T offers Cirrus customers a high performance, twin turbocharged option with the additional benefit of greater future fuel flexibility."

That last bit — "future fuel flexibility" — is the most intriguing and controversial part. More on that in a bit.

The new engine comes with new

intercoolers, new NACA inlets, two big air filters and new louvers. The nose does look a bit different. A change unrelated to the engine is a newly designed nose gear, which features for the first time on a Cirrus an oleo strut, a change that owners will surely welcome and which could be adopted on other Cirrus models over time.

Time for a Change?

When Cirrus introduced the Turbo it made the unusual decision to go with the same naturally aspirated engine, the IO-550-N, that it had been using in the SR22 since the inception but to have it modified by aftermarket turbo specialist Tornado Alley under an STC. The airplane, the SR22 G3 Turbo, was a big hit, and the Tornado Alley mod seemed a great fit for the '22, providing excellent lean-of-peak fuel flows and remarkable ease of use for pilots. The system is dirt simple to operate.

In most instances, you simply push the mixture and power levers full forward on takeoff and leave them there until you level off at your final altitude.

The Tornado Alley engine burns about 35 gallons per hour in the climb, though it climbs very strongly, so the total amount of time spent in climb is relatively low. Once you're at altitude, you simply do what Cirrus owners refer to as "the big pull," reducing the fuel flow to around 17.5 gph, which is the setting at which you cruise, and cruise plenty fast too, at better than 200 knots in the midteens and quite a bit faster in the 20s (where I very seldom fly). Engine management in the Tornado Alley engine is that simple.

So I was curious to see how the workload would be with the new engine. I have to admit that since I've been flying the G3 Turbo, I've gotten quite used to not having to fiddle with the mixture. You pretty much set it



and forget it. Would the Continental turbo be more work?

I was also curious to see how the Continental engine would deliver on the other highly touted Tornado Alley benefit, more even cooling across the cylinders through its GAMInjectors. I've been impressed by the performance of the GAMInjectors, but to be honest, based on my flying a similar Conti engine last year, I suspected I'd find good cooling performance from the -K model as well.

Surprising Performance, Expected Ease

I wasn't expecting much of a difference in terms of performance from the new engine as I advanced the power on the '22T and began to roll down 17L at Austin Bergstrom, but I was surprised right off the bat. The SR22T accelerates more briskly than the G3 Turbo, and that's saying a lot.

In the seat was Cirrus product guru Matt Bergwall, who'd been doing a cross-continent stealth sales tour with the new airplane before its official launch and had amassed more than 30 hours in it since he'd left the Duluth, Minnesota, headquarters of Cirrus a week earlier.

In addition to the new get-up-and-go, also noticeable was the lack of cam

action toward the end of the throttle travel. As you probably know, the 550 model that Cirrus uses has no prop control, though it does have a constant-speed prop. Instead of an independent lever control, it uses a cam actuator in the throttle to increase the prop pitch as you push the throttle toward the stop, increasing the prop revolutions per minute to its limit of 2,700.

The new SR22, on the other hand, is limited to 2,500 rpm, which is arguably the most important change with the new engine option. Push the throttle forward and you simply get more power without an attendant increase in rpm. I like that a lot.

The 2,500 rpm rating is great in many respects. It makes the airplane quieter both inside and outside the cockpit, it makes it feel noticeably smoother, and it will make it a better neighbor at noise-sensitive airports.

The rated power of the engine, 315 horses, is just five horsepower more than the previous engine has, but nobody thinks it produces just 315 hp. Based on certification quirks, the engine is given, Bergwall told me, a kind of worst-case-scenario rating. While not quoting numbers, Bergwall said the engine makes substantially more





power than 315 hp, and that's why it performs a lot more than a couple of percentage points better than the Tornado Alley engine airplane.

The climb rate with the -K model was noticeably better. On takeoff and climb the additional power does good things for performance, with better acceleration and very strong initial rates of climb. And as you climb to altitude, the benefit continues, as you're able to hold a little more power every step of the way. Based on my flight, at 8,000 feet, for example, we were producing the kind of power the Tornado Alley conversion would produce at around 7,000 feet.

As you might expect, the new engine uses more avgas on climb, but not by a lot. We were looking at a fuel flow of around 38 gph, which is about right for the additional 10 to 20 hp — the horsepower figure is a guess. But it is

Continental's policy to provide an engine that is sure to produce rated horsepower, a trick it achieves by building its engines to produce a good deal more than rated horsepower. We maintained 1,200 fpm at 130 knots up through 8,000 feet and then between 800 and 900 fpm up through 16,500 feet. So even though the airplane is burning three or four gallons more per hour in the climb, it's climbing faster, which cuts down on the amount of time you're running the engine at max fuel flow.

This higher fuel burn does reduce the published endurance, but only by a few minutes. Mostly because of the increase in climb fuel burn, the max range for the SR22T is about 100 miles less than the Tornado Alley engine's. In some cases, that might present a reduction in utility. For those pilots like me who religiously pad their

fuel reserves, it will have less impact.

Once we leveled off at 16,500 feet, I got to see what the performance differences are in cruise, and as far as I can tell, the SR22T is a little faster than the previous model while burning slightly more fuel, or as fast while burning slightly less. At 16,500 feet and at the same fuel flow as the Tornado Alley airplane, the new airplane was truing 195 knots, which is a little faster than before. When you pull the power back a little, to 14.5 gph, we were still seeing an impressive 185 knots true at that altitude. And at 13 gph, the true airspeed was still 172 knots. The Tornado Alley airplane, for the record, also has excellent performance at economy settings.

As I mentioned, one of the big benefits of the Tornado Alley system is its simple leaning procedures. Sensitive to

that, Cirrus worked hard to make the -K model engine just as easy to manage, and it succeeded. When you level off in the SR22T, you reduce manifold pressure gradually, and as you do, the green arc expands and a blue line appears, indicating the proper lean of peak fuel setting. Just lean until the indicator matches up with the blue line, and you're done.

The last benefit Cirrus talks about for the new engine is improved descents, thanks apparently to a different default prop-pitch setting when you pull the power back. The difference is noticeable but hardly required; it's not particularly difficult to manage descent speeds to begin with.

Future Fuels, Current Controversy

The introduction by Cirrus of the new engine brought with it some controversy.

As you might know, there's a coalition of users, the Clean 100 Octane Coalition, which is pushing for future aircraft fuel to be 100 octane and not some lower number. One current frontrunner, 94UL, is essentially 100LL without the lead.

Some coalition members see Cirrus' introduction of the new model as a capitulation to the 94UL movement, a claim that Cirrus denies. Bergwall told me that the company is not taking a position on a future fuel but is simply trying to provide future flexibility for its customers.

The criticisms seem to me more political posturing than anything having to do with the science. The Dash-K engine, after all, will surely work fine on whatever future 100UL fuels emerge, if any. In fact, it will probably work better than higher compression engines will, because it has better detonation margins and is more tolerant of impurities.

Impressions

I've got quite a bit of time in Cirrus airplanes, and I currently lease a share of a PlaneSmart Aviation SR22 G3 Turbo. I love the airplane — and the provider — and have been very happy with the Tornado Alley engine.

That said, I like the new SR22T even better. Perhaps this is the big reason why, in early voting, Cirrus customers are overwhelmingly choosing the factory turbocharged model over the Tornado Alley conversion, a trend that I would expect to continue.

The big factors for me are the lower engine rpm, which make the airplane smoother and quieter, the smoother throttle operation and the improved takeoff and climb performance. These are not huge differences, but they are important differences.

A larger differentiator to me is the subtle feeling that the new engine imparts on the SR22. With the TSIO-550-K, the SR22 is a simpler, more elegant and better integrated product. These are traits that Cirrus has worked hard for years to build into its flagship, refining it to the point that it can proudly call the airplane a "mature" product in, of course, the very best sense of the word. ✈

Cirrus SR22T

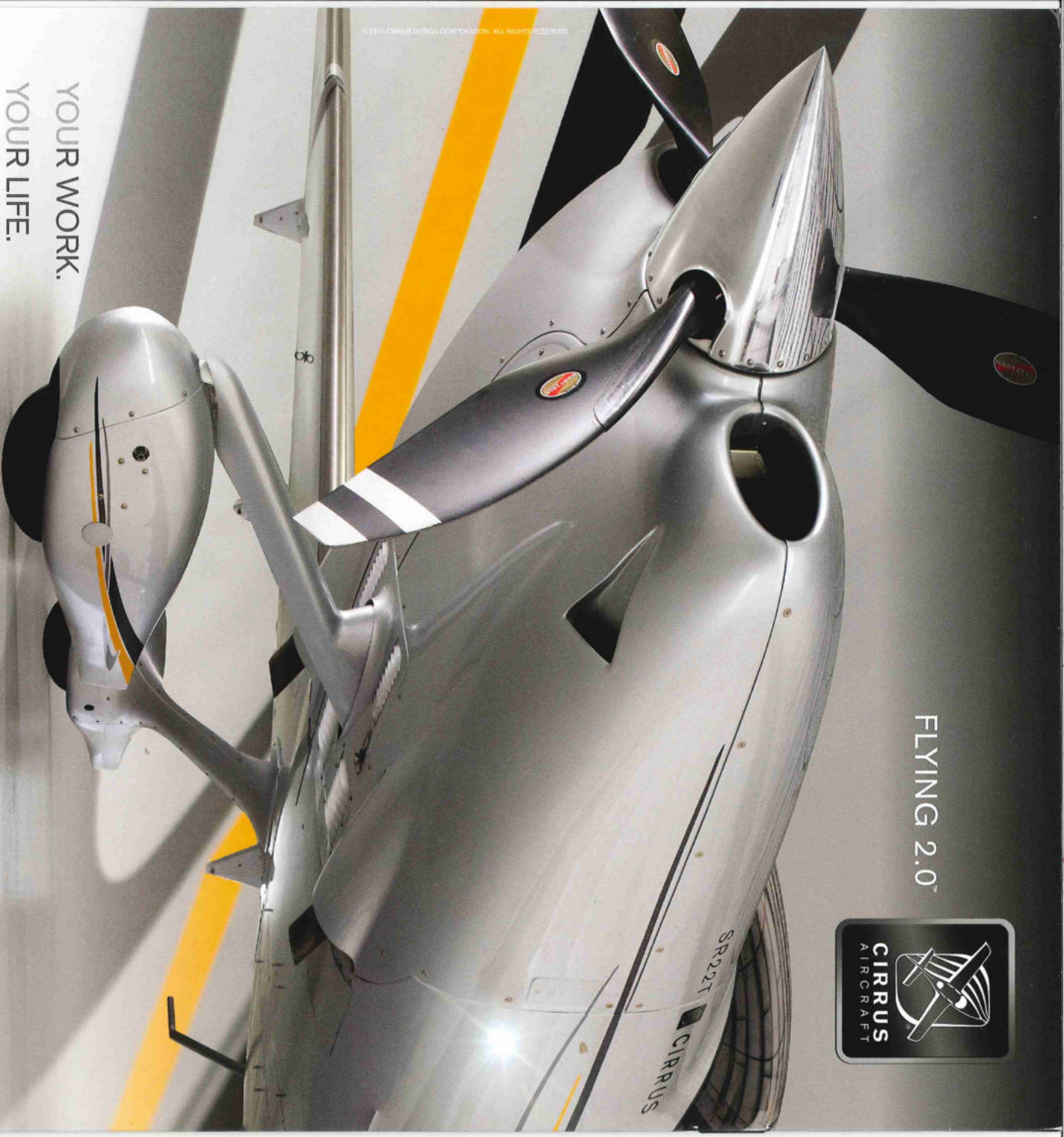
The Cirrus SR22T flown for this report was outfitted with the Cirrus Perspective by Garmin flat-panel fully redundant avionics suite with the GFC 700 dual-channel digital autopilot and digital AHRS and air data. The airplane was also outfitted with Garmin Synthetic Vision Technology displayed on the primary flight display of the Perspective system. All data is from the airplane flight manual and reflects standard day conditions. cirrusaircraft.com

Base price	\$475,000
Price as tested	\$630,000
Engine	Continental TSIO-550-K, 315 hp
TBO	2,000 hrs
Propeller	Hartzell 3-blade, 78-in dia
Seats	4
Length	26 ft
Height	8.9 ft
Wingspan	38.3 ft
Wing area	144.9 sq ft
Wing aspect ratio	10.1
Max ramp weight	3,409 lbs
Max takeoff weight	3,400 lbs
Standard empty weight	2,348 lbs
Useful load	1,061 lbs
Max usable fuel	92 gals/552 lbs
Payload, max fuel	509 lbs
Ceiling (certified)	25,000 ft
Wing loading	23.5 lbs/sq ft
Power loading	11 lbs/hp
Takeoff distance over 50 ft	1,267 ft
Max rate of climb	1,400 fpm
Best rate-of-climb airspeed	101 kts
Best angle-of-climb airspeed	78 kts
Max cruise @ 25,000 ft	214 kts
Cruise, 75% power, 10,000 feet	176 kts
IFR range, no wind, 75% power @ 25,000 feet	947 nm
Landing distance over 50 ft	2,344 ft
Stalling speed, flaps up	66 kts
Stalling speed, flaps down	59 kts
Maneuvering speed (VA)	133 kts
Max structural cruise speed (Vc)	177 kts
Never-exceed speed (VNE)	201 kts

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