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AIRCRAFT

# Cirrus SR22-G3

With more than 700 design changes, the latest Cirrus SR22 seems like a whole new airplane.

By Robert Goyer September 5, 2007



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**Cirrus SR22-G3**

I swapped frequencies on the 430 and made my call to the controller. "Austin Departure, Cirrus Two Four Seven Sierra Romeo out of one-point-six for 4,000, one-five-zero on the heading."

"Cirrus 247SR, roger, climb and maintain 4,000. And Seven Sierra Romeo, uh, we have you down for 25,000 feet for your final altitude. Is that right ... ?"

Reid Nelson, Cirrus' Dallas sales rep and my demo pilot that day, looked over at me and rolled his eyes slightly. "I get that all the time," he said over the intercom.

I keyed the mic, "Uh, roger, Austin, two-five-zero is correct. This is one of the new turbocharged SR22s."

"Well, that's a first for me, Seven Sierra Romeo" the controller came back. "Turn left 040, climb and maintain one-two-thousand."



While Reid might be getting that question for a while longer, it probably won't be more than a few months before controllers everywhere are used to sending SR22s to the flight levels.

Turbocharging just sells. As soon as Cirrus introduced the turbocharged G2 version last summer, it started getting orders for the model in much greater numbers than it expected. It's not just a Cirrus phenomenon. Over the past four decades just about every new, turbocharged version of a good normally aspirated airplane immediately began outselling the original, usually by a wide margin.

And so it has been with the SR22, first with the G2 and now with the G3. A normally aspirated G3 will still be available, but we'd guess it will sell in much smaller numbers than the turbocharged version.

One big reason for this is that with the G3, the turbocharged airplane will also be available with air conditioning, which was *not* the case with the G2 turbo. For pilots who are based in hot places, deciding between turbocharging and air conditioning was a bit of a devil's bargain. With the G3, you can get both.

The airplane we flew for this report, however, didn't have A/C. At press time Cirrus was still working on the installation and the certification. It was expected to be available sometime this fall. The system will be electric, with the condenser and battery situated toward the back of the airplane in order to help keep the CG aft and give better elevator control.

### **G3: Just New or Really Better?**

There are, according to Cirrus-I didn't count them-more than 700 individual changes to the airplane.

And, unlike any of the previous upgrades to the SR22, the G3 boasts substantial *aerodynamic* changes. And those changes aren't just skin deep. The G3 simply flies better than the G2.

I've got a few hundred hours in SR22s at this point, and I've always enjoyed flying the airplane. That's because they're roomy, comfortable, well equipped and fast. In terms of handling, however, they never felt great, until

now. The new G3 handles beautifully.

Mostly that's because of an all-new wing. It's almost identical in shape and span to the one on previous models, but it has a lot more dihedral, which added enough stability that Cirrus was able to eliminate the rudder/aileron interconnect. This greatly enhances the feel of the airplane, giving it much more pleasing flying qualities.

The wingspan is the same, but the new wing features a longer internal spar, so it can have shorter tips, which freed up room internally for more fuel, an additional 11 gallons. It's a welcome improvement, especially since the added fuel, and, hence, range, comes without a resultant decrease in full fuel payload. That's because the new wing is lighter, to the tune of around 66 pounds, or around 11 gallons worth of weight. Free lunch.

There are new features on the wing, too, including better recognition and taxi lights, a longer, continuous TKS leading edge, with the stall strip deiced, as well, and improved aerodynamic shapes on the trailing edge of the airfoils. And the fresh air vent is no longer situated on the wing root, a good, quick way to tell G2 from G3.

Two other noticeable differences are the length of the gear and the prop. The G3 sits about three inches higher than previous models, and it employs the wide-chord composite Hartzell prop introduced last summer on the G2 Turbo. Cirrus made the rear steps longer and lowered the handhold to keep it easy to get up on the higher-situated wing when boarding.

The interior of the G3, which is where we pilots spend most of our time, after all, is much improved over an already nicely refined environment. Again, I don't know just how many of those 700-plus changes were done on the inside of the airplane, but I'd guess a high number. There's a new, sleeker and flusher switch panel in front of the pilot, new and much improved environmental controls on the right side, all new headliner and panel surrounds and improved door mechanisms. The leather interior in the airplane I flew was black, which is a nice color, so long as you keep it hangared and have air conditioning.

The G3 is equipped with the Avidyne Entegra flat-panel avionics system, with large-screen PFD and MFD. And the system has a lot of capability, including XM Weather, engine monitoring, CMax Charts and much more. The system makes use of a pair of Garmin GNS 430 navigators with built-in comm radios. The autopilot is the rate-based S-Tec 55X. While the Entegra remains a fine system when coupled with the Garmin navigators and has a lot of added capability over the first sets in the SR22, the feature-rich S-Tec 55X seems better suited to the speeds and altitudes of the nonturbocharged model.

## **How Does It Fly?**

I've had the chance to fly the SR22-G3 on two occasions now, once at the Sun 'n Fun Fly-In in April and once out of Austin this summer.

As you might know, the G3 Turbo is the result of a partnership between Cirrus and Tornado Alley, which

developed the STC for the turbocharger installation. Originally, Tornado Alley was going to do the install at its home in Oklahoma, but the sheer volume of orders quickly forced Cirrus to shift gears. The STC work is now integrated into the production line in Duluth.

The mod puts twin turbochargers and twin intercoolers into the SR22, giving the airplane turbo-normalization. This doesn't boost the manifold pressure at sea level, but allows the engine to continue to develop 100 percent power all the way up to 25,000 feet. As a result, engine management is much less complicated than with a straight turbocharger while continuing to give the airplane excellent climb and cruise performance, even up to the flight levels.

We took off from Austin with a flight plan to go to Louis Armstrong International (MSY) in New Orleans at 25,000 feet, grab lunch and then head back at 12,000 before trying our luck at 16,000 feet.

Even on the takeoff roll the feel of the airplane is nice, with the rudder and aileron controls being more fluid than on previous SR22s, again because of elimination of the interconnect. After advancing the throttle as smoothly as I thought I needed to, but not quite as smoothly as I should have, we accelerated very quickly-gotta love that new prop-and we soon were at the rotation speed of 71 knots. We climbed out at 1,200 fpm and went to approach.

In the G3 the climb is accomplished one of two ways. Best power-full throttle and full rich on the mixture-puts roughly 35 gallons an hour through the system. Conversely, you can do a lean of peak climb, which gets you up at a slower rate of climb, roughly 600 fpm, but uses only 17.5 gph in the process. Cirrus estimates that when climbing to 25,000 feet, the lean of peak climb saves about five gallons of gas and increases the range by about 60 nm.

On our way out to New Orleans, there really wasn't a good reason to go at 25,000 feet. The winds up there were very light, just a few knots of a quartering tailwind, and there was no pressing meteorological need to go that high.

The climb up to FL 250 was fine. Up through 10,000 feet we maintained better than 1,000 fpm and 130 knots in the climb, and above that we were able to keep it climbing at 800 fpm all the way up to 250, on a day that was nearly 20 degrees hotter than standard. We monitored the CHTs as we climbed, and they all stayed well below 380 degrees, which is below redline but still recommended. Because there's no indicated airspeed hold function on the autopilot, the S-Tec 55X, you need to guesstimate a vertical speed in order to arrive at a climb airspeed. It's a roundabout way to do it, but not difficult.

At 25,000 feet we got the best forward speed out of the G3, 222 knots true. But that was at 98 percent power, which requires a fuel flow of around 35 gallons per hour. Which we could have done all the way to New Orleans if we'd wanted.

Instead we took a look at how best economy would look at that altitude, and it's impressive. At 2500 rpm and a measly 14 gph, we were seeing a true airspeed of 197 knots. And even though we'd been in the air for an hour already, we still had around four and half hours of flying time, or about 1,000 nm of no-wind range, left in the tanks. So for shorter trips, you can go really fast, while for longer trips, you can pull the power back and cruise at good true airspeeds for a very long time.

## Pilot Challenges

While the G3 Turbo's performance numbers are impressive, there are additional demands on pilots who fly up in the flight levels, demands that shouldn't be taken lightly.

Oxygen is the most critical consideration, especially at the airplane's ceiling of 25,000 feet, where a pilot typically would have only three to five minutes of consciousness without supplemental oxygen.

The G3 has a built-in oxygen system to help make managing O2 needs easier. The pilot can check the system's status on a small console just forward of throttle. It indicates that the system is working and gives a readout of the amount of pressure available. In the center of the ceiling just between the two rows of seats is the oxygen access panel, with four ports arranged logically enough with two ports (left and right) in front and in back. You can hook up your mask (above 18,000 it's required) or cannulas there. We used masks with built-in intercom connectors. Reid also set up the 430s to remind us to check our O2 stats every few minutes, and we checked our blood-oxygen levels and pulse with a pulse oximeter, the Flight Stat, a must-have \$395 accessory.

If you've worn masks before, you know they're not a lot of fun, and that's one of the big downsides of turbocharged nonpressurized airplanes. But for a lot of pilots, the added performance of flying really high makes the discomfort worth it.

## Managing the Big Letdown

Another thing that pilots will have to get used to when moving up to the flight levels is descent management. Luckily, the Garmin 430s in the Cirrus have a vertical nav utility that makes it easy. On our way into New Orleans, the controller gave us a clearance to descend at pilot's discretion to 11,000 feet by the initial approach fix for the arrival into MSY. We input the figures into the 430 and found out that we'd need 850 fpm to get down in time, so we dialed that into the autopilot and headed down.

**Cirrus SR22-G3 GTS Turbo** The airplane flown for this report, N247SR, has the GTS turbo package, which includes all the available SR22 options except air conditioning, which adds \$17,100 to the price. Standard equipment includes dual Garmin GNS 430 navigators, Mode-S transponder, TAWS-B, stereo audio panel, TKS ice protection and tinted windows. The standard Avidyne Entegra flat-panel avionics system includes 10.4-inch diagonal primary flight and multifunction displays, with XM satellite weather, CMax Jeppesen electronic approach charts and electronic engine monitoring. The autopilot is the S-Tec 55X two-axis autopilot with roll

steering. Also standard with the G3 Turbo is a Precise Flight, built-in, four-place oxygen system. All specifications are from the manufacturer and are for maximum weight and standard conditions unless otherwise noted. Price as equipped...**\$525,500** Engine...**Continental IO-550-N, 310 hp, with turbonormalizing system** TBO...**2,000 hrs** Propeller...**Hartzell composite three-blade, constant speed** Seats...**4** Length...**26 ft** Height...**8.7 ft** Wingspan...**38.3 ft** Wing area...**144.9 sq ft** Max takeoff weight...**3,400 lbs** Standard empty weight...**2,230 lbs** Useful load...**1,170 lbs** Max usable fuel...**552 lbs/92 gals** Payload, max fuel...**518 lbs** Wing loading...**23.5 lbs/sq ft** Power loading...**11 lbs/hp** Certified ceiling...**25,000 feet** Best rate-of-climb airspeed...**101 kts** Best angle-of-climb airspeed...**78 kts** Max rate of climb...**1,400 fpm** Cruise @ 25,000 feet...**211 kts** IFR range @ 25,000 feet...**886 nm** Cruise @ 12,000 feet...**186 kts** IFR range @ 12,000 feet...**831 nm** Stalling speed, flaps up...**66 kts** Stalling speed, full flaps...**59 kts** Takeoff over 50 ft... **1,594 ft** Landing over 50 ft...**2344 ft** Vne/Vno...**201 kts/180 kts**

In an unpressurized airplane, staying on top of the descent planning is critical, because as you descend, the cabin, unlike in a pressurized airplane, descends in real time, so your ears (and those of your passengers) will suffer if you don't plan ahead. As it was, it worked out fine.

My first landing of the day was easy, though the slightly higher gear of the G3 and the slightly heavier nose of the turbocharged airplane make for a different sight picture and a different feel. But the handling improvement was evident. In fact, when I flew the airplane back at last year's Sun 'n Fun, my first several landings were with a 10-15-knot crosswind on a narrow strip off and away from the show. It was a great introduction to the G3, as the cross control necessary for the crosswind landing allowed me to get a good feel for the way the new airplane handles. Smooth and sweet. Cirrus pilots are going to love it.

## Mid-Teens

Like most turbocharged singles, the G3 Turbo really has a lot going for it with fewer of the downsides of high-altitude flight when it's being operated in the teens. On our flight back from the Big Easy, we cruised first at 12,000, with no O2 required, and later at 16,000, using the cannulas.

Our initial cruising altitude of 12,000 feet gave us an idea of the way many pilots will wind up flying their G3 Turbos, with no O2 required, with good true airspeeds, better than 190 knots, low fuel flow (17.6 gph) and terrain clearance for the vast majority of the lower 48. But 12,000 feet will very seldom put you above even developing convective weather.

And areas of developing weather were all around us on our return flight. By the time we asked for and got 16,000 feet, the cloud cover had grown to be continuous. For the most part the tops were just below us, and it was easy to deviate around the few buildups that were slightly higher. And we could have asked for 18,000 or higher, but were happy where we were, making 200 knots true on 17.5 gph, which is a couple of gallons per hour less than it takes to get around 180 knots out of the normally aspirated airplane at 7,000 or 8,000.

Plus on this day our altitude gave us plenty of weather visibility. We could see with the naked eye where the

buildups were when we were still a hundred miles or more away. And I couldn't help but mentally put myself down at 8,000 or 10,000 feet, which would have situated us smack dab in the middle of the weather. True, most of the clouds were bumpy but harmless, and with XM Weather you can see the trouble spots on the Nexrad a good ways down the road. But at FL 160 we were in the clear, cruising in smooth air and deviating only occasionally to stay that way despite the scattered storms building around us. It was a better way to go. And fast.

## Making the Transition to the Turbo

One of the big questions about the turbo program with the SR22 is, how easy, or hard, is it going to be to move up to the flight levels? The question remains to be answered. But based on my few flights in the turbocharged airplanes (both the G3 and the very similar G2 version), I think it's going to be doable. The biggest hurdle will likely be the very different engine operating procedures. I found myself having to think consciously about what I was going to do next with the throttle and mixture, tasks I never have to think twice about in the normally aspirated airplane, because they've become second nature. Like me, longtime SR22 drivers will have to unlearn those instincts and learn some new ones.

And I hope to get some firsthand experience at making the leap, as the shared ownership program I fly with, PlaneSmart, has just signed a multimillion dollar deal to replace its fleet of G2 SR22s with turbocharged, air conditioned G3 models, starting just after AirVenture. I'm certainly looking forward to learning all about it.

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