

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



ERA22LA254

AUTOMATIC DEPENDENT SURVEILLANCE- BROADCAST (ADS-B) STUDY

Aircraft Performance Study

By

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A. ACCIDENT

Location: Tredyffin, Pennsylvania
Date: June 1, 2022
Time: 1527 eastern daylight time (EDT)
1927 UTC
Airplane: Cirrus Design Corporation SR22, N432CP

B. SUMMARY

On June 1, 2022, about 1527 eastern daylight time, a Cirrus SR22, N432CP, was substantially damaged when it was involved in an accident near Tredyffin, Pennsylvania. The private pilot and passenger received serious injuries. The airplane was operated as a Title 14 Code of Federal Regulations Part 91 personal flight.

C. PERFORMANCE STUDY

1.0 Aircraft

The Cirrus SR22 is a single-engine, four-seat composite airplane. It has a gross weight of 3,600 lbs, a cruise speed of 183 kts, and a service ceiling of 17,500 ft.



Figure 1. Accident airplane, N432CP.

2.0 Available Data

This performance study is based on Automatic Dependent Surveillance-Broadcast (ADS-B) data provided by the Federal Aviation Administration (FAA). ADS-B broadcasts an airplane's Global Positioning System (GPS) position and other data to the ground where it is recorded. The GPS position has an accuracy of approximately 20 meters (65 ft) in both the horizontal and vertical dimensions.

Also used in this report are select air traffic control (ATC) communications as provided by the FAA [1].

3.0 Weather

Weather was recorded for 1615 at Wings Field Airport (KLOM), nine nautical miles (NM) north-east of the wreckage location. The temperature was reported as 82°F (28°C), the dew point was 68°F (20°C), and the barometric setting was 29.85 inHg. Winds were 8 kts from 130°. Visibility was ten statute miles.

4.0 Flight Path

The airplane took off from Georgetown County Airport (KGGE) about 12:32 EDT (Figure 2). The airplane climbed to 11,500 ft above mean sea level (msl) (Figure 3) and flew north-northeast towards its intended destination of Wings Field Airport (KLOM) outside of Philadelphia, Pennsylvania. The airplane began a series of descents after 14:43.

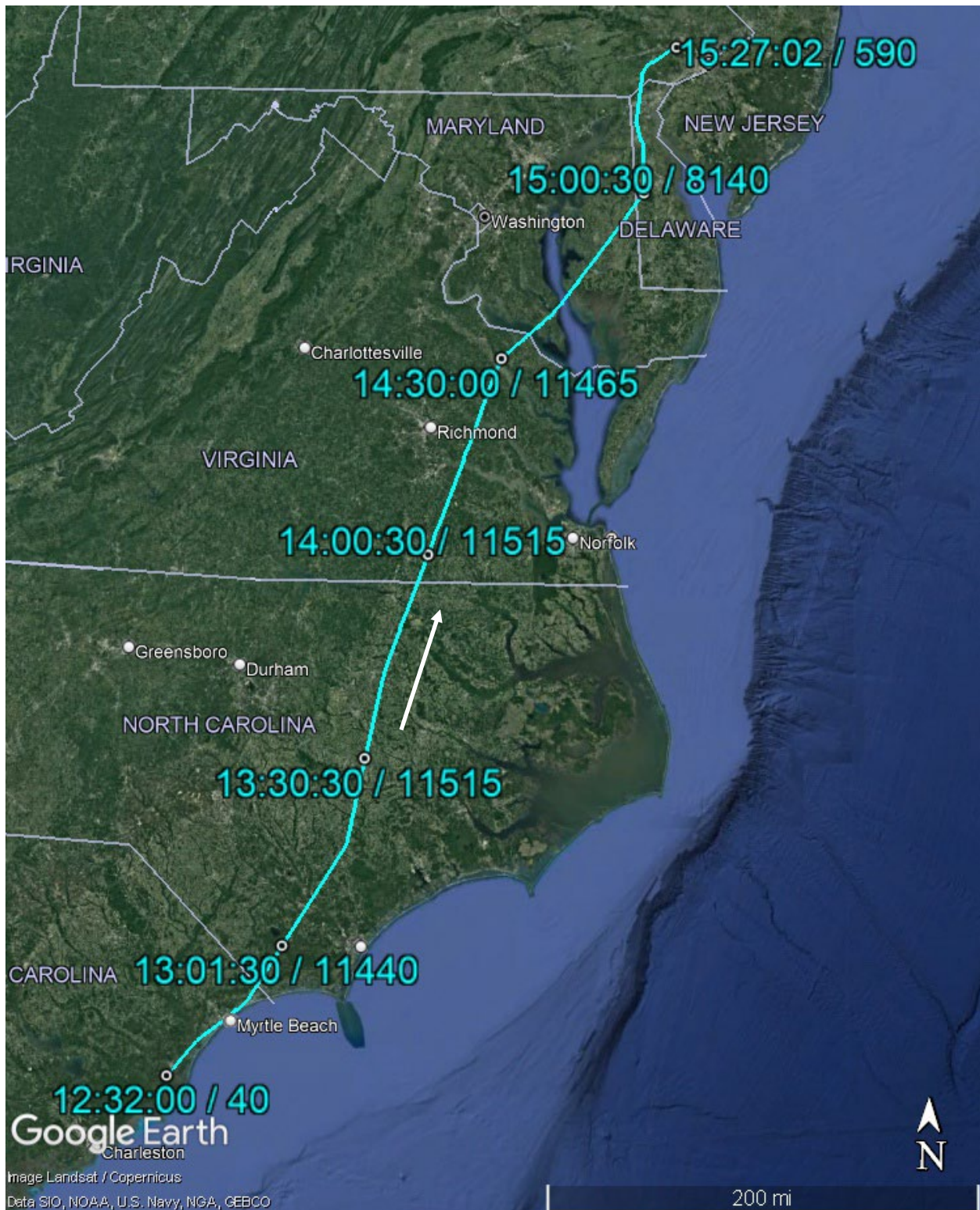


Figure 2. Flightpath with selected times and altitudes (msl) noted.

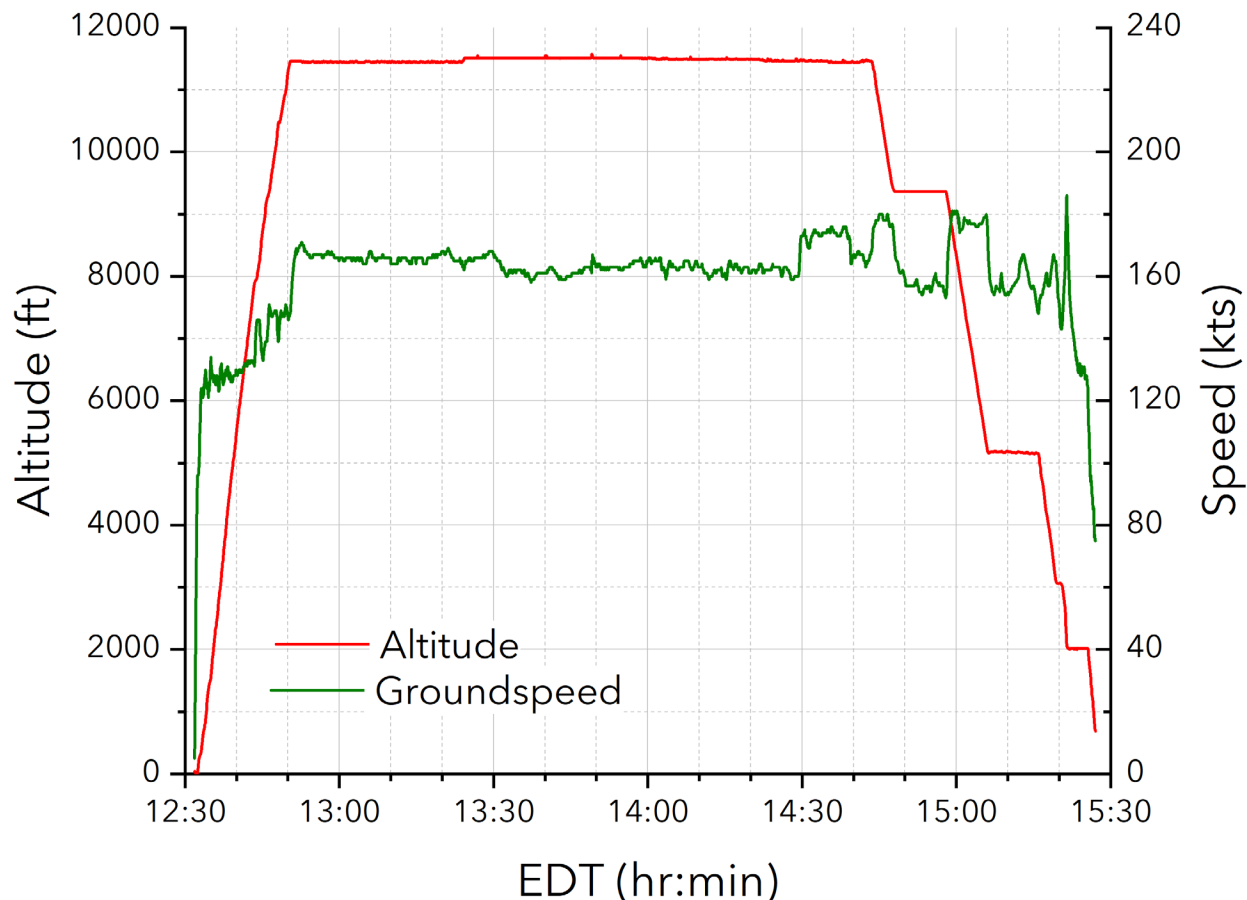


Figure 3. Recorded altitude (msl) and groundspeed from ADS-B data for whole flight.

The pilot requested vectors for the area navigation (RNAV) approach for runway 6 at KLOM at 1512. The pilot was instructed to proceed to MODENA (MXE) and to begin the approach from there. The airplane crossed MXE at 15:19:28 (Figure 4), but did not initially turn onto the runway heading until the controller contacted the pilot at 15:21. By 15:21:30 the airplane was aligning with runway 6, had descended to about 2,000 ft, and was slowing to a groundspeed of about 130 kts (Figure 5) (assuming the KLOM weather conditions were representative, the calibrated airspeed was approximately 125 kts). The RNAV approach for runway 6 shows the minimum altitude at PHILA as 2,200 ft decreasing to 2,000 ft at PLAYS, and continuing to descend from there to runway 6, with an airport elevation of 302 ft. The pilot canceled the IFR (instrument flight rules) approach at 15:23 and crossed PHILA at 2,000 ft. The airplane maintained 2,000 ft until 15:25:36, about 3.5 NM before PLAYS (8.6 NM before the runway threshold).

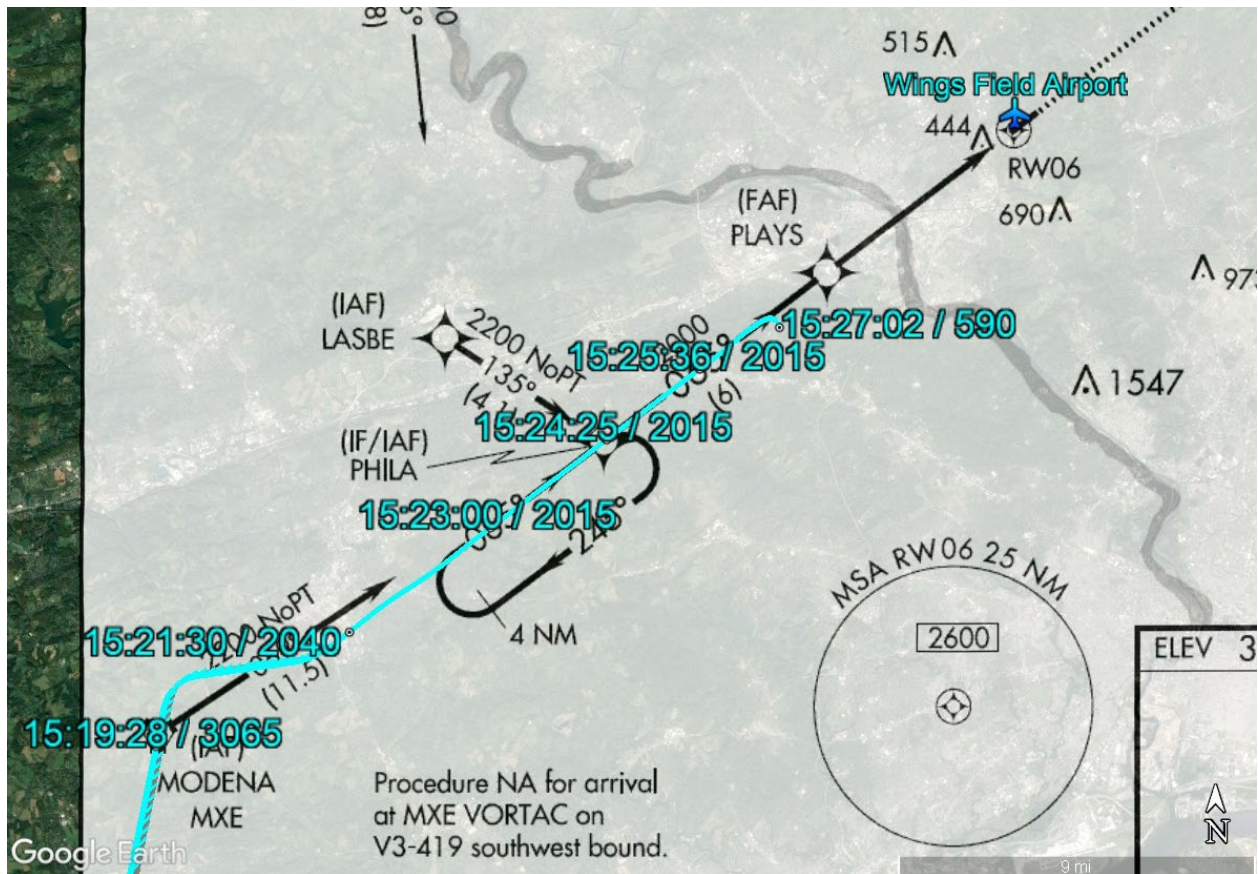


Figure 4. Flightpath with selected times and altitudes (msl) shown overlaid on a portion of the RNAV (GPS) RWY 6 chart for LOM.

After 15:25:36, the airplane then began descending and slowing, losing altitude at a rate of 610 ft per nautical mile traveled, very close to the maximum glide performance specified for the airplane¹. After the accident, the pilot reported a loss of engine power during flight and the decision to land.

¹ The maximum glide ratio is 9.6 : 1, or the airplane will move forward 9.6 ft for every 1 ft of altitude lost, assuming no wind, power off, and windmilling propeller [2].

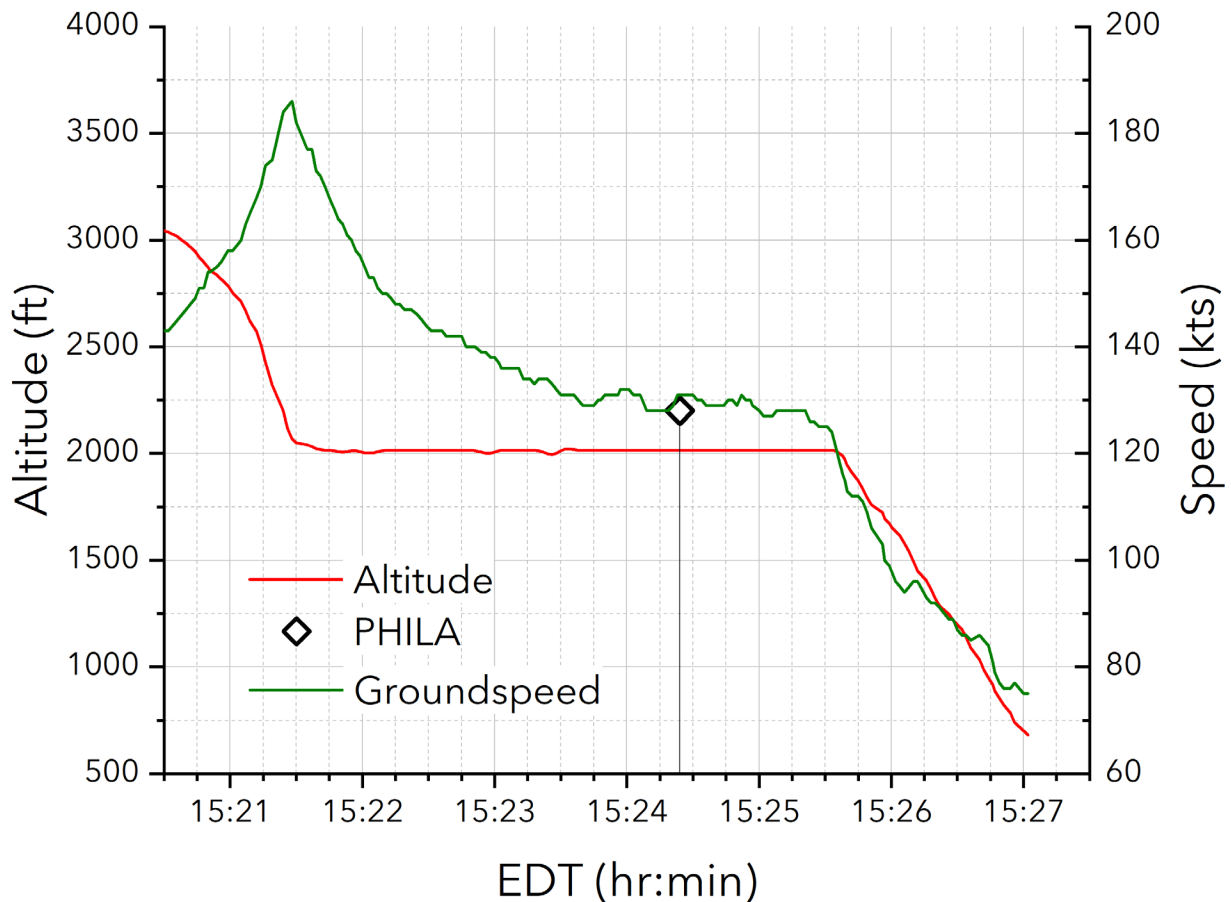


Figure 5. Recorded altitude (msl) and groundspeed from ADS-B data for whole flight. The height of navigation aid PHILA and when it was passed is noted.

The airplane descended steadily and by 15:26:30 was about 700 ft above the terrain and approaching a golf course (Figure 6). The airport was still over 7 NM away. The airplane made a right turn towards the golf course which rapidly increased the descent rate and further slowed the airplane. The airplane impacted the golf course before coming to rest near some trees.

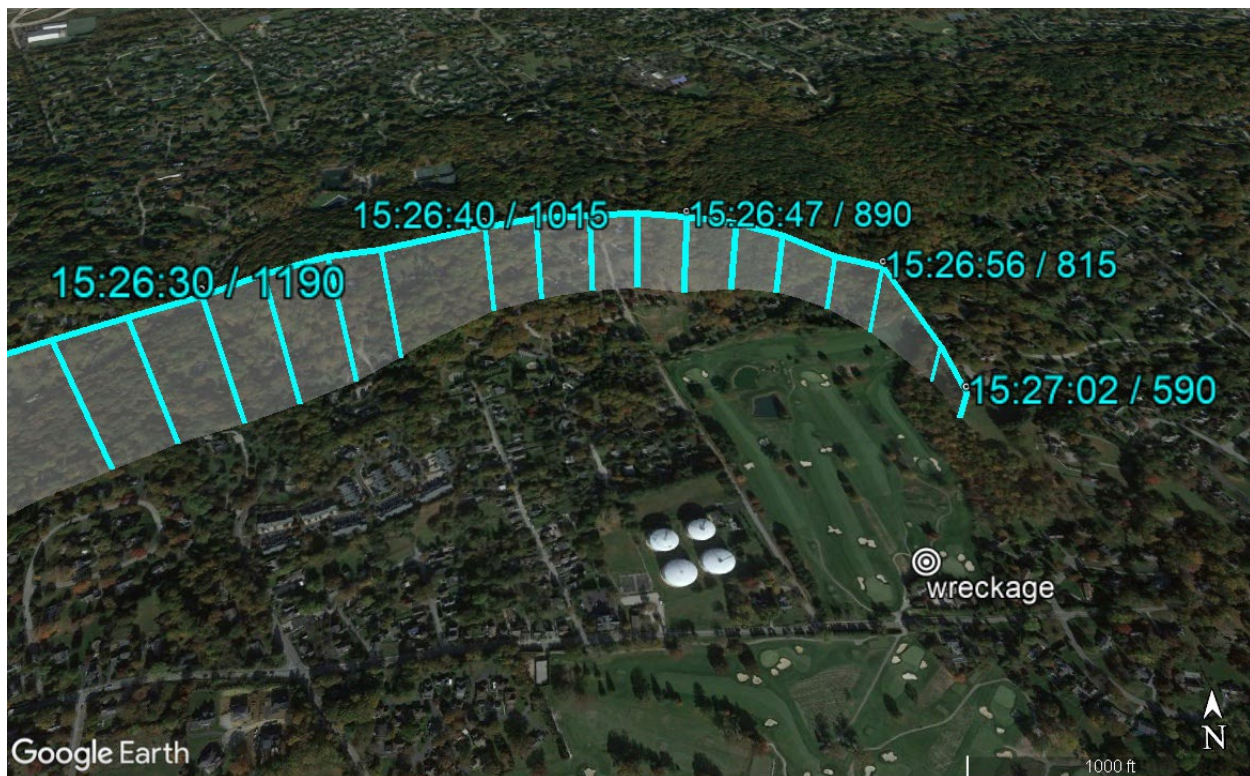


Figure 6. Airplane flight path with selected times and altitudes (msl) noted. The final wreckage location is marked and was at an elevation of approximately 480 ft.

D. SUMMARY

The airplane lost engine power while on approach, 8.6 NM from the runway threshold. The airplane glided, achieving the reported maximum glide ratio, for over 1.5 NM. Once less than 700 ft over the terrain, the airplane turned to land in a golf course.

E. REFERENCES

1. Aircraft Accident Package. 22-003-PHL, N432CP, SR22. June 01, 2022, 1927 UTC. Department of Transportation, Federal Aviation Administration.
2. Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for the Cirrus Design SR22, 2003.