Bermuda Dunes Flight Training

Cirrus SR20 Transition & Training Manual (Modernized G1 Edition)

"If you aren't having fun, you're doing it wrong."

HOW TO USE THIS MANUAL

Welcome to Bermuda Dunes Flight Training! This manual is your roadmap to mastering the modernized 2001 Gen 1 Cirrus SR20. While we integrate rigorous standards, this guide is built on our core philosophy: honesty, candor, and a relentless focus on making you a safe, competent pilot.

- **Prerequisite:** You must hold at least a Private Pilot certificate.
- **The Mission:** To move you from "Cessna thinking" to "Advanced Avionics thinking". Transitioning to a high-performance aircraft requires a shift in mindset and energy management.
- **The Authority:** This manual is a companion to the Pilot's Operating Handbook (POH). The POH and the Pilot-in-Command (PIC) always remain the final authorities.

SECTION 1: GENERAL AIRCRAFT SYSTEMS & LIMITATIONS

We don't guess in the cockpit. Transitioning to a high-performance aircraft means you need an intimate, memorized understanding of the airframe's physical limits and mechanical systems.

Powerplant & Propeller

You are managing a heavier aircraft with 200hp. The throttle and propeller are mechanically linked to govern RPM, meaning your power management directly affects the constant speed propeller hub.

System	Specification
Engine Manufacturer	Teledyne Continental
Engine Model	IO-360-ES
Engine Type	6-cylinder, horizontally opposed, direct drive
Cooling & Fuel	Air-cooled, fuel-injected
Horsepower	200 HP @ 2700 RPM
Max Engine RPM	2700 RPM
Oil Temp Limit	240°F (115°C) maximum
Oil Pressure Limits	10 PSI minimum, 100 PSI maximum
Propeller Type	Hartzell Constant Speed (2 or 3 blade)

Weights, Fuel & Fluids

Energy management starts with weight and balance. Do not assume you can fill the tanks and put four adults in the cabin.

Category	Limit / Capacity
Max Takeoff Weight	3000 lb
Max Landing Weight	2900 lb
Standard Empty Weight	2050 lb
Max Useful Load	950 lb
Max Baggage Weight	130 lb
Total Fuel Capacity	58.5 U.S. gal
Usable Fuel	56.0 U.S. gal (28 gal per wing tank)

Fuel Grade	100/130 Green or 100LL Blue
Oil Capacity	8 U.S. qts

Airspeed Limitations (V-Speeds)

These numbers are not suggestions; they are structural and aerodynamic boundaries. All speeds are in Knots Indicated Airspeed (KIAS).

Speed	KIAS	Definition
Vs0	56	Stall speed in landing configuration
Vr	70	Rotation speed
Vs1	69	Stall speed in a specified configuration
Vapp	75	Approach speed
Vx	81	Best angle of climb
Vy / Vclb	94	Best rate of climb / Standard climb
Vgld	95	Best glide speed
Vfe (100%)	100	Maximum flap extended speed (Flaps 100%)
Va	110-130	Maneuvering speed range
Vfe (50%)	120	Maximum flap extended speed (Flaps 50%)
Vno	165	Maximum structural cruising speed
Vne	200	Never exceed speed

Flight Controls & Structural Limits

The SR20 does not fly like a Cessna 172. The control surfaces and trim systems require deliberate, trimmed inputs.

- **The Trim System:** Pitch and roll trim systems do not move a trim tab. Instead, an electric motor changes the tension on a spring cartridge that holds the flight control in your desired setting.
- **Control Locks:** This aircraft is not equipped with control locks because the trim spring cartridges possess sufficient power to overcome wind gusts on the ramp.
- **Flaps:** The wing flaps are electrically controlled, single-slotted flaps. They are driven by a motorized linear actuator. Positions are 0% (0°), 50% (16°), and 100% (32°).
- **Load Factors (Max Gross Weight):** At Flaps 0%, the structural limits are +3.8G to -1.9G. With Flaps extended (50% or 100%), the limits tighten to +1.9G to -0G.

SECTION 2: THE ENVELOPE OF SAFETY (RISK ASSESSMENT)

We don't fly into the "unknown". We set hard limits based on your experience.

Initial Operating Experience (IOE)

Your first 100 hours in the upgraded SR20 are your critical "learning phase". Even if you have prior glass experience, the dual GI 275s and G5 require specific electrical load management awareness.

- **30 Days:** Complete the Practical Risk Management Course.
- **60 Days:** Recurrent training flight with me to review your progress, focusing heavily on automation management and aeronautical decision-making (ADM).

Personal Weather Minimums (The UND Category System)

Identify which category you fall into based on your total time and Cirrus hours:

- **Category A (Low Risk):** >1000 Total Time / >100 hours in Cirrus.
- **Category B (Medium Risk):** Typical transitioning pilot.
- **Category C (High Risk):** Low time or first-time glass pilots.

Criteria	Category A	Category B	Category C
Day VFR Ceiling	3,000 ft	4,000 ft	5,000 ft
Day VFR Visibility	5 miles	8 miles	10 miles
Max Crosswind	15 kts	10 kts	5 kts
Runway Surface	Hard Only	Hard Only	Hard Only

SECTION 3: DEVELOPING PROFICIENCY

Stick and Rudder vs. Buttons: Over 75% of accidents are pilot-related. In our upgraded G1, the Garmin GI 275s and G5 make situational awareness incredible, but don't let the autopilot make you lazy.

- **The Challenge:** Hand-fly the airplane whenever safe to maintain the tactile feel of the SR20's spring-cartridge roll trim system.
- **The Mindset:** After 31 years of flying and accumulating nearly 2,800 hours of total time, I consider myself to be always still learning. That same humility and dedication to continuous improvement is required in the left seat of a Cirrus.
- **The Skill:** Proficiency is "use it or lose it". If you aren't flying 2-3 times a month, your proficiency is degrading.
- **Maintenance Transparency:** You focus on the flying; I'll focus on the aircraft. Our removal of the vacuum system means your instruments won't quit when you're in the clouds, but you must now master electrical dependency.

SECTION 4: STANDARD OPERATING PROCEDURES (SOPs)

We fly by the numbers. Every time. SOPs are the baseline for a safe flight. At Bermuda Dunes Flight Training, we believe in radical consistency. The exact same flow that keeps you safe on a clear day VFR hop is what will save your life during a high-workload IFR diversion.

Checklist Philosophy

- **Do-List:** Read an item, then perform the action. Used for critical or non-routine phases (Pre-flight, Engine Start, Run-Up, Emergencies, Shutdown).
- **Flow Pattern:** Perform the actions in a logical spatial path through the cockpit (e.g., from the center console, up the stack, to the GI 275s), then verify with the written checklist. Used for dynamic phases (Takeoff, Climb, Cruise, Descent).

Part 1: The Phase-by-Phase Flow

1. Engine Start & Avionics Setup (Do-List)

- **The Engine:** The IO-360-ES requires proper priming. Throttle 1½", Mixture Rich, Prime ON 6-10secs then switch to boost. Crank. I found if I use full throttle and full mixture to prime the engine then that usually ends up in a flooded state. Keep a close eye on oil pressure.
- **The Avionics:** Alts 1+2 ON, Avionics ON. Verify both GI 275s and the G5 boot without flags. Verify the battery backup percentage on all digital instruments. Enter the initial flight plan into the Garmin 430s.

2. Taxi (Flow, then Verify)

- **The Flow:** Brakes tested immediately. Flight instruments checked during turns (Heading turning freely on the GI 275, turn coordinator showing correct direction).
- **Electrical Check:** Ensure the alternator is keeping the bus voltage in the green before you even reach the run-up area.

3. Run-Up (Do-List)

- **The Flow:** 1700 RPM. Traditional magneto drop (max 175 drop, 50 diff).
- **The Modernization:** Without a vacuum gauge to check, this is where you obsess over the electrical system. Verify alternator output is robust and absorbing the load, as your primary flight displays are 100% electrically dependent.

4. Before Takeoff (Flow, then Verify)

- **The Flow:** GUMPS check. Gas on fullest tank. Undercarriage (fixed). Mixture set for density altitude. Propeller full forward. Switches (Boost pump ON, Pitot heat as required) and Seatbelts.
- **Lights, Camera, Action!** (Lights, Xpdr, Mixture).

5. Climb & Cruise (Flow, then Verify)

- **The Flow:** Minimum for flaps up is 200'. I've watched too many SR 22 Pilots put flaps up when they're only 25 feet off the runway because they've reached 85kts. 600' AGL Caps is available.
- **The Climb:** 1500' AGL. Boost pump OFF. Transition to cruise climb (95-105 KIAS) to keep the CHTs cool.
- **Cruise:** Level off, let the aircraft accelerate to cruise speed (120-140 KTAS), then reduce power to 55-75%. Lean the mixture using the EGT/CHT engine monitor to your target fuel flow. Engage the S-Tec 55X autopilot and verify it is tracking the GI 275 source.

6. Descent & Before Landing (Flow, then Verify)

- **The Flow:** ATIS acquired. Altimeter set on all three digital displays (Primary GI 275, G5 and Static-Sourced Altimeter). Brief the approach.
- **Before Landing:** Boost pump ON. Mixture rich (or set for field elevation). Autopilot disconnect verified.

7. Shutdown & Securing (Do-List)

- **The Flow:** Avionics Master OFF (protects the GI 275s from voltage spikes). Mixture idle cut-off. Mags OFF. Master OFF. Ensure the G5 and GI 275s successfully power down and do not remain draining on their internal batteries.

Part 2: Maneuver-by-Maneuver Guide

The SR20 uses a spring-cartridge roll trim system, meaning it flies a little heavier than a 172. You have to fly it deliberately. Here are the target numbers.

1. Steep Turns

- **Entry:** 120 KIAS.
- **Execution:** Roll smoothly into a 45° to 50° bank.
- **The Catch:** As you pass 30° of bank, the SR20 will lose lift rapidly. You must add 1-2 inches of Manifold Pressure (MP) and significant back pressure. Use the GI 275 attitude indicator to hold the horizon line precisely, but keep your eyes outside.
- **Recovery:** Roll out exactly on your heading, reduce the added power, and relax the back pressure to prevent ballooning.

2. Slow Flight (Dirty Configuration)

- **Entry:** Power back to 15" MP. Below 119 KIAS, Flaps 50%. Below 104 KIAS, Flaps 100%.
- **Execution:** Maintain altitude while slowing to 65-70 KIAS.
- **The Catch:** Pitch for airspeed, power for altitude. In the SR20, this requires constant, small throttle adjustments. Keep the ball perfectly centered; right rudder is mandatory here.

3. Power-Off Stalls (Approach to Landing Simulation)

- **Entry:** Establish a stabilized descent at 75 KIAS with Flaps 100% and power around 12" MP.
- **Execution:** Slowly retard the throttle to idle and pitch up to maintain altitude until the stall breaks.
- **Recovery:** The moment the stall breaks (or at the first sign of the horn/buffet, as briefed), simultaneously reduce the Angle of Attack (AOA) by relaxing back pressure and adding FULL smoothly applied power. Arrest the descent, pitch for 75 KIAS, and retract flaps to 50% immediately, then 0% once a positive rate of climb is established.

4. Power-On Stalls (Takeoff Simulation)

- **Entry:** Slow to 67 KIAS (Vr) with Flaps 50%.
- **Execution:** Add full power and aggressively pitch up (approx. 15-20° nose up) to induce the stall. Step heavily on the right rudder to counteract the massive left-turning tendency from the IO-360.
- **Recovery:** Relax back pressure to reduce the AOA. Level the wings with the rudder, not the ailerons. Once unstalled, establish a positive rate of climb at Vy (96 KIAS) and retract the flaps.

5. Instrument Approaches (Non-WAAS)

- **Execution:** Since our Garmin 430s are non-WAAS, we do not have LPV minimums. You must be intimately familiar with LNAV step-down fixes.
- **The Flow:** 2 miles outside the Final Approach Fix (FAF), be at 100 KIAS and Flaps 50%. At the FAF, gear is fixed, so verify Flaps 50%, start your descent, and dial the power back to ~12-15" MP to maintain 90 KIAS down the approach course. Keep your scan moving between the GI 275 CDI and your altitude.

APPENDIX A: THE P.A.V.E. CHECKLIST

Use this before every flight. If you have "Marginal" items in two or more categories, do not fly.

- **P - Pilot:** Sleep, Stress, Medication. Are you physically and mentally prepared to manage a high-performance aircraft today?
- **A - Aircraft:** Are the GI 275s healthy? Is fuel adequate for your alternates? Is the G5 fully charged and free of flags?
- **V - Environment:** Is the weather meeting your Category minimums? A smart PIC knows when to alter plans—whether that means diverting for weather or just putting it down early to avoid punishing afternoon turbulence.
- **E - External Pressures:** Are you in a rush? Is "get-there-itis" creeping in?

APPENDIX B: TRANSITION SYLLABUS (LESSONS 1-8)

- **Lesson 1 (Ground):** The POH, ADM, and Garmin GI 275 menu logic.
- **Lesson 2 (Flight):** Automation Management. Cross-country scenarios using the autopilot and managing GPS navigation.
- **Lesson 3 (Flight):** Airframe Handling. Steep turns, slow flight, and stalls.
- **Lesson 4 (Ground):** Scenario Analysis. Discussing GA accident statistics and "What Ifs."
- **Lesson 5 (Flight):** Digital Emergencies. Electrical failures, alternator management, and load shedding (Essential Bus focus).
- **Lesson 6 (Flight):** Manual Competence. Hand-flying stabilized approaches and handling simulated anomalies without the autopilot.
- **Lesson 7 (Flight):** SRM Scenarios. Handling ATC, diversions, and high-workload environments.
- **Lesson 8 (Evaluation):** Final check. You are the Captain.

MICHAEL'S APPENDIX: ADVANCED MANEUVERS & AIRSPEEDS

Airspeeds & Ground Reference Maneuvers

- **Private Pilot Ground Reference:** 100 KIAS
- **Eights on Pylons:** 120 KIAS
- **At-Altitude Maneuvers:** 120 KIAS (adjust down to 100 or 110 KIAS based on current performance)

Stall Procedures

- **Power-Off Stalls:** Execute a normal entry, establishing a descent at 80 KIAS before inducing the stall.
- **Power-On Stalls:** Slow to 75 KIAS, apply 65% power, and pitch up.
- **Safety Note:** Avoid taking power-on stalls to a full break to mitigate spin risks; recover at the first indication of a stall.

Traffic Pattern Operations

- **Downwind Leg:** Set ~50% power to maintain 100 KIAS; transition flaps from 0% to 50%.
- **Base Leg:** Reduce power to 15-20% (as needed); transition flaps from 50% to Full (100%).
- **Final Approach:** Modulate power at 15-20% as needed to maintain glidepath.

Final Approach Speeds

- *Rule of Thumb:* Add 5 knots to the final approach speed for every flap setting omitted.
- **Full Flaps:** 75-80 KIAS
- **50% Flaps:** 80-85 KIAS
- **0% Flaps:** 90-95 KIAS

Specialized Landing Techniques

- **0-Flap Landings:** Reduce power early to get on the backside of the power curve, then increase power to "drag" it in using an intentional slow-flight attitude. This prevents the airspeed from running away without the drag of the flaps.
- **Power-Off 180s:** Drop flaps to 50% immediately upon pulling power and begin your turn sooner. Banking with 0 flaps causes the aircraft to drop rapidly. While this technique technically reduces your maximum glide range, it yields far better consistency and checkride pass rates.