

Praise for *Solo*

“[A] spare, heartfelt celebration of the flying life. . . . One of the great pleasures of this modest, winning memoir is [Edgerton’s] rediscovery of his youthful passion. In *Annabelle*, a funny-looking, high-nosed three-person plane, Mr. Edgerton finds true love the second time around. It’s a match made in sky-blue heaven, with just enough room, in the back seat, to accommodate a happy reader.”

—*The New York Times*

“A perfect read for anyone who wishes they could skip security and proceed right to the cockpit.”

—MSNBC.com

“Edgerton is either the best living novelist to fly planes or the best living pilot to write novels. . . . He casts his cockpit exploits—from flying combat missions over Laos during the Vietnam War to piloting a Piper Super Cruiser—in the same droll Southern prose that has garnered him a cult following—and gives readers an intensely rewarding aerial view of war, passion, and 400-mph adventure.”

—*Men’s Journal*

“[An] engaging memoir.”

—*Washington Post Book World*

“Anybody who has ever flown, or served in an air force, will find that Clyde Edgerton’s *Solo* brings back many memories, some of them pleasant, others terrifying. I found my years in the Royal Air Force coming back to me in one big gush, as exhilarating as one’s first ride in a military aircraft. If you like flying, you’ll love this book.”

—Michael Korda, author of *Charmed Lives* and *Man to Man*

“Give[s] you a whiff of the bedewed infield grass at dawn, and the sensation of what it feels like to take on and enjoy a thing totally alone, the way we hardly do anymore.”

—*The Raleigh News & Observer*

“I reveled in this true story of an Air Force pilot’s love affair with the skies. . . . With vivid recollections, Edgerton gives a candid account of his passion for flight, displaying his trademark humor.”

—*Southern Living*

“Even if you don’t give a hoot about airplanes, Edgerton’s graceful, witty writing is likely to

seduce you.”

—*The Charlotte Observer*

“In this memoir, Edgerton hasn’t really traveled all that far from his roots as a writer of fiction. In it one will find that impeccable sense of timing and inflection that marks his dialogue and that subtle humor he often slides our way.”

—*The Durham (NC) Independent Weekly*

“*Solo* is a fantastic book—spellbinding, exciting, funny, informative, moving, and beautifully, beautifully, beautifully written. Count me among the blessed legions of Clyde Edgerton fans.”

—Tim O’Brien, author of *The Things They Carried*

“Edgerton has written a most intriguing memoir of his love affair with flying and how he fulfilled it as a combat pilot in Vietnam. . . . Edgerton’s vivid but laconic style should captivate Vietnam and aviation mavens and general readers alike.”

—*Booklist*

“Clear and truthful, this is what it was like, bringing back all you did or wish you had.”

—James Salter, author of *Gods of Tin*

“*Solo* covers flying from Piper Cub to supersonic fighter and the Vietnam War. Pilots will feel a tug of pleasant nostalgia, and nonpilots will find it entertains while it teaches.”

—Bob Buck, author of *North Star over My Shoulder*

Solo



Raney

Walking Across Egypt

The Floatplane Notebooks

Killer Diller

In Memory of Junior

Redeye

Where Trouble Sleeps

Lunch at the Piccadilly

CLYDE EDGERTON

Solo

My Adventures in the Air

A SHANNON RAVENEL BOOK

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OF CHAPEL HILL

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First Paperback Edition

*With thanks to the boys,
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AUTHOR'S NOTE

This book is not for flying instruction. Some details—drawn from memory—may be inaccurate. And exceptions surely dot the landscape of my generalities about flight and flying. Those seeking technical accuracy should read the appropriate flight manuals, and for those needing a detailed, enlightened book about how airplanes behave, I suggest the classic *Stick and Rudder: An Explanation of the Art of Flying* by Wolfgang Langewiesche. Furthermore, the most consistently technical and “how-to” parts of this book are all together on pages 11–37 (“The Cherokee 140 and the Basics,” “Lessons,” and “Cross-Country”). So, if you’re not looking for nuts-and-bolts reading about flying, then you may want to skip those pages.

Most conversations in this narrative have been re-created from memory. Though all the people are real, most names (and radio call signs) are made up. Some facts may have become slightly distorted by the fog of time.

Many women pilots fly today, but none were present at flying events described in this book, and so none are included here. In any case, I respect women’s piloting abilities and significant contributions to aviation.

Finally, thanks to Karl Polifka, Jack McMahan, Bruce Williams, and Lloyd Kaufman for pointing out technical errors in the hardback edition of this book.

INTRODUCTION

YOU STAND AT THE end of a long dining room table that is bare except for a single toothpick lying there in the middle, pointed toward you. The toothpick is a runway—from two thousand feet up. You are alone in a little airplane. You are sweating, just home from your first solo cross-country flight. And as for that toothpick: you must somehow get a big spoon (your airplane) to land on it and stay on it *or you will die*.

I dreamed of coming home from a solo flight soon after I was old enough to look into the sky and see an airplane.

Sometimes a dream's realization falls short of the dream. Occasionally a dream and its realization match, and then we feel lucky.

For me, flying airplanes has trumped any dream of it. I could never have dreamed the hypnotic beauty of a lake of clouds scooting just below the belly of my aircraft, of towering cumulus cloud formations to my left and right. And I have been blissfully alone while flying solo, tucked securely in my protective cockpit, far away up there in a tiny spot in the wide sky, finding a peace that, as the Bible says, passeth understanding.

Aircraft engine and engine instruments have become, along with airframe and landing gear, an extension of my nervous system.

Beneath the exhilaration lies the unforgiving, exact nature of the whole business of flying: a dependence on geometry, on the number of degrees in a turn, on an exact speed and angle as two aircraft join into formation, or on imagined lines drawn through the sky. This dependency calls for skill. Skill brings confidence and security.

I've flown among billowing clouds, alone, in a supersonic jet, run the aircraft up against and through the edge of a cloud at four hundred miles an hour, turned the airplane on its back, cut the power, fallen upside down through vertical halls of air, and then snapped the aircraft upright and added power to climb again.

My almost crazy love of flying led me through Air Force pilot training, to an assignment in Japan, and on to a year of combat missions in Southeast Asia.

Eighteen years later I bought an old wood-framed, fabric-covered airplane. On summer mornings I'd look through the windshield, just ahead, at a dew-covered grass landing strip in the woods—rising to meet my landing gear. The exhilaration was back. I named my airplane *Annabelle*. The name sounded old-fashioned and romantic.

The philosopher in me warns that the thrill of flying airplanes in war should not be separated from the destruction that warplanes and their pilots bring to other human beings. But the writer in me—and the pilot in me—had to try. And in the process, I've knocked around in my mind's back rooms and closets, found old misgivings and worries about my relationship to my own combat flying, and pulled them out onto the porch.

PART 1
(1948—66)

**GETTING THROUGH THE
INITIAL SOLO**

Early Notions of Flying

ON SOME MONDAY AFTERNOONS in the late 1940s, I held a rough canvas clothespin bag for my mother as she gathered stiff, dry clothes from the clothesline. When an airplane flew over, she surely noticed my looking up. The biplanes were my favorites. They seemed to lazy along with a steady gentle-thunder sound through the blue sky. Perhaps she sensed that I longed to be up there; before I was five years old, she had taken me to the airport several times just to see the airplanes and had snapped my photo with airplanes in the background. One day years later, she drove me to the same airport to catch a plane that would take me away to Air Force pilot training and a war. She did not hesitate in granting me leave nor shed a tear that I know of.

Even so, she was, early on, very protective of her asthmatic only child; she kept an eye on me and guided and disciplined me. Her shielding behavior may have influenced my moving away from her toward danger. But—and lucky for me—despite being protective, she pushed me out into the world, out into our backyard, for example, to fistfight a boy who'd just chased me home. She encouraged independence. And perhaps that also enabled my step into the sky.

One day—I was in my forties and she in her eighties—we were talking at lunch. She sat across from me at her kitchen table, her hand resting around a glass of iced tea. She asked, “Do you remember me taking you to funerals when you were little?”

“Sort of.”

“People said you were too young, but I wanted you to experience everything. Do you remember me taking you up to see the electric chair?”

“Oh, yes. That’s kind of hard to forget.”

I was six years old at the time, but it turns out it wasn’t the electric chair. It was the chair sitting in the middle of the gas chamber at Central Prison in Raleigh, North Carolina. Not that I was making picky distinctions in those days. Maybe I should be thankful she didn’t take me to an execution, though given my early Bible training about crime and punishment, I might have enjoyed it.

As a boy I soaked up the provincial, conservative culture shared by my teachers, parents, extended family, and church. I learned that there was a God, and that he loved America better than he did any other country, and that any country opposing America was evil—and so was everybody in that country. Nobody said those words, but the message was there.

One of my uncles had lost his arm in World War I. I knew the following numerical facts as far back as I can remember: after being wounded in his arm and legs, he went twenty-four hours without medical attention, seventeen days without a change of clothing.

Two uncles and several cousins served in World War II. A calling to war was high and honorable. The movie star Audie Murphy had been a war hero. So had Ted Williams; he’d been a pilot. The national media depicted pilots from all of America’s wars as the most flamboyant of our country’s heroes. To me as a boy, that portrayal was compelling.

I toyed with the idea of becoming a fireman, then a doctor, but when I realized I could be a fighter pilot—a war hero flying airplanes—there was (it turns out) no stopping me, especially after I started seeing “the film.” It aired on a local TV station just before sign-off at midnight. An F-104 fighter jet (resembling a rocket with short, straight wings) flew through clouds, performing an aileron roll (a complete rollover from right side up, to upside down, to right side up again) and other maneuvers while the poem “High Flight” was read—all this just before the national anthem

played in the background. The film centered all my aspirations and hopes about where I'd end up: in a jet fighter cockpit.

My ticket, I discovered along the way, would be the four-year ROTC (Reserve Officers' Training Corps) program at the University of North Carolina. Cadets wore uniforms and marched in drills once a week, took classes in "military science," attended a summer camp after junior year, and on graduation became Air Force officers, though not necessarily on track to be pilots.

Soon after arriving on campus in the fall of 1962, I walked into the ROTC office. A cadet sat behind a desk.

"If I sign up for the program, can I become a pilot?" I asked. (I'd yet to fly in an airplane.)

"Sure. You'll have to pass a few physicals and some academic tests. You got twenty-twenty vision?"

"Yep."

We talked for a few minutes. Then he asked, "Ever had asthma?"

"Why?"

"Because that's the first thing they ask you, and if you've ever had it, you're gone. I've got bad eyesight. That's what stopped me."

A week or so later, I was filling out ROTC forms for those wishing to fly:

HAVE YOU EVER HAD ASTHMA? ___ YES ___ NO

Well, yes, but . . . I checked no. I would lie to fly.

I WAS NOT A HAPPY CADET. The whole business seemed "Boy Scoutie." I earned demerits for not having my belt buckle lined up with my fly. I quickly got into the UNC ROTC marching band—playing trombone—where the military protocol was more friendly. In my senior year I'd be offered a chance to earn my private pilot's license. If I didn't like flying in a small propeller-driven aircraft, or if I was no good at it, the program would allow me to pick a nonaviation Air Force career—but I wanted no part of that.

During my junior year I learned that a former girlfriend of mine, Ruby, was dating a guy who had a pilot's license. I called her.

"Ruby, would you do something for me?"

"What?"

"Tell your boyfriend I'm an old friend and ask him if he'd take me flying?"

"'Old friend'?"

"Well, you know, whatever. Yes."

"Is that what you want me to do?"

"Sure. I mean, you could go with us. Have you flown with him yet?"

"Yes."

"Was it fun?"

"Sure was."

"Will you ask him? I haven't flown in an airplane yet and I need to find out if I like it or not . . . on account of this ROTC thing."

"Oh, all right."

I met them at Horace Williams Airport in Chapel Hill, and Ruby's boyfriend took us up in a

Cessna four-seater.

~~I sat in the back and watched and listened as he taxied out; then I lifted away from the earth for the first time and felt suspended, completely dependent on the little airplane holding me. Piloting didn't seem terribly complicated.~~

I'D BE TRAINING AT the Raleigh-Durham Airport, where my mother had taken me all those years before to see my first airplane on the ground. The airport sits on land where my mother and previous generations of her family lived from the eighteenth century until the airport was built in the late 1930s. Less than a half mile from the airport boundary is a family graveyard with twenty-six graves. I've been there almost every year of my life for an annual grave cleaning.



The Cherokee 140 and the Basics

IN THE 1960S, CIVILIAN INSTRUCTORS hired by the government taught ROTC student pilots to fly. Mr. Vaughn (I don't think I ever learned his first name), about fifty, medium build, dyed black hair with a bald spot in back, was in charge of me and several other student pilots. Not an exceptionally able teacher, he was consistent and very safety conscious. Occasionally Mr. Vaughn displayed a sort of self-congratulatory and awkward sense of humor. But only occasionally. In fact, rarely. Maybe twice. He usually seemed a bit nervous, which didn't make me feel at ease. And he sniffed a lot: "If you'll check under here"—sniff, sniff—"you can see exactly how much strut extension is normal."

As we walked out to the aircraft, a two-seater Piper Cherokee, for my first flight, Mr. Vaughn spoke as if he'd said the same thing many times, as he surely had. What he said about the external preflight check held generally true for all the airplanes I'd ever fly. While he talked, Mr. Vaughn held his checklist—a little book—in his hand, and he insisted on the importance of using the checklist, not memory, so that nothing would be missed. My checklist was open and I was ready to follow along.

I'd studied the Cherokee 140 flight manual the night before, imagining how the real, live airplane would look up close in the morning.

There it sat, waiting, dew on the wings and windshield.

The first preflight went something like this:

1. "Approaching the aircraft, you look for general condition: no flat tires"—sniff, sniff—"no leaks of oil, gas, or hydraulic fluid beneath the aircraft."
2. Mr. Vaughn stepped up onto the wing and opened the cockpit door. "Look inside and be sure there are no keys in the ignition and that all the switches are where they should be. Remember this always: the guy who flew before you"—sniff, sniff (and here he looked at me as if to announce the punch line)—"is the dumbest pilot in the world. He left all the switches in the wrong position. And guess what? He's going to fly *after* you too, so you better leave everything just right for him." I looked in at the instrument panel, which was familiar from my studying. The electric, leather, and fabric smell of the interior masked another faint smell: fear.
3. "Now, back outside." He walked to the front of the airplane, and I followed. "Open the cowling, like this, just like a car hood, and check the oil level and general condition of the engine. No loose wires and so forth. Check here and here." The engine looked very clean. (I didn't think about its operating mostly in the sky away from dirt and dust.) "Close and latch the cowling."
4. "Check the propeller." Sniff. "Nicks in the propeller can really affect performance. It might not seem like they could, but they can." My hand followed his along the smooth edge of the propeller.
5. "Okay—now let's check the extension of the front wheel strut, under here. This is where cushioning comes in on landing. That's about what you want, right there, about four inches.

Think of a pogo stick. Hydraulic fluid does that. Does other jobs too, like the flaps, so you look carefully for leaks.”

6. “Now check the leading edge of the wing. Strong aluminum like the rest of the exterior. Be sure there are no dents or nicks that might interrupt the smooth flow of air over the wing. You’d be surprised how much drag a little dent or nick can cause.”

Mr. Vaughn placed his hand against the leading edge of the wing and walked along sniffing and talking, and I followed, staring at his bald spot, trying to remember as much as possible.

We, the student pilots, were also taking academic classes about flying. One book I did *not* read back in those days is Wolfgang Langewiesche’s classic *Stick and Rudder*. But I was absorbing some of its lessons. Langewiesche says,

Get rid at the outset of the idea that the airplane is only an air-going sort of automobile. It isn’t. It may sound like one and smell like one, and it may have been interior-decorated to look like one: but the difference is—it goes on wings. And a wing is an odd thing, strangely behaved, hard to understand, tricky to handle.

I was learning that when moving into the wind, the shape of a wing causes air to rush over its top faster than across its bottom, creating lift, a kind of suction from above. Langewiesche describes it as a pushing from below. As an aircraft reaches a certain speed along the runway, the wind pushes up the wings and the wings lift the airplane right up off the ground and into the air, and generally speaking, as long as the forward speed is fast enough, the airplane is held up in the air by the wings. The faster the forward speed, the more the wing is lifted. The propeller, turned by the engine, is pulling the airplane through the air whether the airplane is on the ground or not. An airplane propeller works, in principle, like a boat propeller. A *jet* airplane is pushed along by a kind of sustained explosion out the rear of the engine.

I’LL LEAVE MR. VAUGHN for a minute and explain a few more fundamentals.

To change the direction and speed of an airplane’s path through the air, the pilot moves controls inside the cockpit: (1) the stick coming up from the floor (or the yoke on the end of a rod projecting out from the instrument panel), (2) the rudder pedals beneath the feet, and (3) the throttle (usually a lever on a console or a knob located on the instrument panel).

The stick: If the airplane is flying straight and level, then the stick is centered. Move it forward, and the nose drops. Pull it toward you, and the nose rises. Push it left for a left turn, and right for a right turn. In the Cherokee 140, and in most civilian aircraft built since about 1950, a yoke has replaced the stick. The yoke looks like the lower half of a small automobile steering wheel. You turn it left, as you would an automobile steering wheel (instead of moving the stick left), and it causes the left wing to drop and the right wing to rise. You push it forward and pull it back to lower and raise the airplane’s nose, just as with a stick.

The rudder pedals: A vertical rudder (like a boat rudder) at the back of the aircraft, located on the back edge of the vertical stabilizer (the part of the tail that sticks up), is controlled by the rudder pedals and sometimes helps turn the aircraft left or right. The rudder can also help control the aircraft at slow speeds.

The throttle: The throttle lever or knob adjusts a valve that helps control how fast or slow you go. Of course, pointing the nose up or down also changes speed, because gravity is always working for you or against you, depending on what is needed.

Sit in the pilot's seat for a minute. If the engine unexpectedly quits while you are high in the air, ~~then point the nose down a little bit and you'll pick up enough speed to provide lift for the~~ wings, and the airplane will fly just fine, though it's gliding downward. The steeper the glide angle, the faster you go. Level out just a foot or so above the ground. (I'm assuming you're over the Nevada salt flats, a wide expanse of hard, level ground.) As airspeed decreases, lift decreases; but you can keep flying just above the ground by steadily increasing back pressure on the stick between your legs. Soon you reach a very slow airspeed and there's not enough lift on the wings to keep you up. You'll touch down gently and roll to a stop. No engine necessary—like a glider.

On the other hand, if you're flying along and the engine quits and you raise the nose or try to hold the nose up and not let it point down, there'll be less and less wind flow under and over the wings, and the plane will get so slow that it finally becomes uncontrollable. This is a *stall*, and after a stall the wings are ineffective, gravity takes over, and the airplane starts falling, regardless of which way the nose is pointing.

You can demonstrate how a wing works by holding your hand stiff and sticking it out the window of a fast-moving automobile, as if your hand were an airplane wing. You've done this before, of course. Your hand is shaped like an airplane wing: flat along the bottom (the palm) and curved over the top, with the edge out front (the index finger) thicker than the trailing edge (the little finger)—a shape that creates lift. When your hand is at just the right angle to the onrushing wind, you feel your hand being lifted. Think of that as the angle at which the wing is fastened onto the fuselage (or body) of the airplane. If your hands were big enough and you could stick them out both car windows and hold them stiffly at just the right angle to the oncoming wind, then at a certain speed the car, with you in it, would lift into the air. But once the car wheels left the ground, the forward speed would quickly drop and you'd fall back to the road.

MR. VAUGHN STOPPED along the leading edge of the wing. I picture myself, studying my checklist, walking into him.

7. "Stall-warning lever check: Okay"—sniff—"here in the leading edge of the wing is this very small, flat horizontal lever, about the size of a nickle, see? It's loose and it jiggles. Anytime you get too slow and there's not enough wind coming over it"—sniff—"it drops and a stall-warning horn sounds in the cockpit and the red stall light blinks. So you want to be sure this little lever is free to move up and down. Like that. See?"

8. "Pitot tube check." Mr. Vaughn turned to look at me, then looked back beneath the wing, near the stall-warning lever. "It's pronounced PEE-tow. This little bladelike object picks up the wind flow, see. It's hollow." He bends a bit and looks. "The wind flow through there tells your airspeed indicator how fast you're going. So you want to be sure it's not stopped up by a dead bumblebee, or mud, else you won't know your airspeed."

9. "Static port check," said Mr. Vaughn, reading from his checklist. "Here, on this same bladelike device, are several tiny holes not much bigger than pinholes. They're called static ports, and the air that goes into them allows your altimeter to determine air pressure and then tell you your altitude above sea level. Be sure the holes are clear."

Air does not know how high it is above the ground, but it does know how high it is above sea level—and your altimeter records that height. If you're sitting on the ground in Denver, Colorado, the altimeter says you are 5,431 feet up. If you then fly to Death Valley in California and land, your altimeter reads minus 282 feet up.

10. "Now we walk on around to the back part of the wing," said Mr. Vaughn. I followed along.

“Near the outer edge of the wing here is a flipper that moves up and down. An aileron. We move it up and down to be sure it’s not binding. When you lift this one, the other one—over there on the other wing—lowers.”

At times Mr. Vaughn confused me. But I was hesitant to ask questions. Our relationship didn’t allow a casual familiarity. But I knew not to go long without answers to questions. And sometimes after reading a confusing passage in a textbook or manual, I’d have to make my hand into an airplane, fly it around, and think.

Next time you have the window seat on a commercial jet and the aircraft starts a left or right turn, look near the end of the wing along the trailing edge, and see the slightly displaced aileron. The aileron is always raised on the wing that is dropping and lowered on the wing that is rising.

11. “The flaps,” said Mr. Vaughn, “are extended down with your flap lever in the cockpit, and they give the wing more lift at slow speeds. But they cause drag at high speeds, so they are only used at slow speeds, usually when landing or taking off. They help you get into the air more quickly and touch down at a slower airspeed. Be sure these rods are in place and secure.”

12. “Okay. Main landing gear check.” Here Mr. Vaughn squatted near a tire, and I squatted beside him. “The tires should be checked the way you check a car tire—no bald spots, no visible metal along the treads. Then you kick it.” He stood and kicked it. Then smiled at me. First smile. “And you check your struts here, just like on the nose gear. We need about four inches of extension.”

13. “Okay. Now we walk on to the tail section. This part, like a sail on a boat but not as tall, is the vertical stabilizer. You just reach up and grab hold of the trailing edge there—the rudder—and move it back and forth to be sure it’s not binding anywhere. Go ahead.” I could almost feel the cable move inside the hollow body of the airplane, and I imagined the rudder pedals moving in the cockpit.

14. “The other part of the tail section here is the elevator. Looks just like a small wing, designed as one piece, see.” Sniff, sniff. He grabbed it. “We can move the whole thing up and down to be sure it’s functioning without any binding. When you pull back on the yoke, it pivots and the trailing end is raised into the wind flow. That blows the tail down, and the nose goes up, so you climb.”

“Now we check the same things on the right of the aircraft as we did on the left.”

MR. VAUGHN HAD MADE clear how the flight controls worked, showing me what caused (1) one wing to drop and the other to rise so that I could turn left or right: ailerons on the outer trailing edge of the wings, operated from the cockpit by the yoke; (2) the nose of the aircraft to rise and descend: the elevator at the tail section, also controlled by pulling the yoke toward you or pushing it away; and (3) the aircraft to go faster or slower: engine thrust, controlled by the throttle.

Lessons

STARTING LATE IN THE FALL semester of my senior year, and through spring semester, Mr. Vaughn and I spent almost forty hours together in the Piper Cherokee 140. Before flying each day, we'd sit at a table and talk about what we were going to do. He'd sniff and hold his hand like an airplane to demonstrate—and as I recall, Mr. Vaughn's propriety made even this kind of gesture perhaps a bit embarrassing for him. I had a notion that he'd been flying a long time and that it was less fun than it had once been.

Early in my training, before soloing but after I was taking off by myself, we were flying along one day when I became aware of a clinking noise that I must have been hearing for some time but ignoring. I looked and saw that Mr. Vaughn was tapping the metal end of my unfastened seat belt against his yoke. I took the belt from him and fastened it around my waist. He didn't say a word, but I could tell he was proud of his method. And it worked. I've never forgotten to fasten my seat belt since. Other things, but not my seat belt.

The Cherokee 140 seemed sturdy and stable. It always cranked as advertised and I came to trust that it would do what I asked of it. Consequently my attention came to rest on what *I* was able or unable to do as a pilot. Worries about aircraft failure receded to the background.

In the air, when demonstrating a maneuver, Mr. Vaughn took control of the aircraft, showed me the maneuver while explaining it, then gave me the controls and let me practice.

After the flight, I'd get a grade: Fail, Fair, Good, or Excellent. I made Goods on the first several flights, even though I felt I deserved an Excellent or two. Mr. Vaughn seemed to have learned the grammar school teacher's dictum of rarely smiling before Thanksgiving. Finally, just before soloing, I got an Excellent.

Along the way, Mr. Vaughn taught me how

TO TAXI, TAKE OFF, AND LAND

The Cherokee 140 steers on the ground by means of a direct mechanical linkage between the rudder pedals and the nose wheel.

Taking off is relatively easy. You point the airplane nose down the runway, add power, and use the nose-wheel steering to stay in the center of the runway at first; then as airspeed increases, control reverts to the rudder; and then at fifty-five miles per hour you pull back on the yoke so that the nose wheel lifts from the runway. The airplane rolls on a bit and then lifts into the air. If the left wing starts to drop, you bring it back up with a turn of the yoke to the right and a touch of right rudder. The nose is kept in a climbing attitude (but not too steep) with back pressure on the yoke.

Landing is much more difficult. I remember the two of us on final approach the first time I landed. Not much talking going on—we'd been through this quite a few times, first with him flying the whole approach and landing, and later with me flying until close to touchdown, then turning it over to him. As I flew this approach, Mr. Vaughn lightly and slowly rubbed his hands on his knees. I could sense his readiness to grab the controls. I brought the airplane over the runway threshold and then I—tense, neck stretched to see over the nose cowling, holding my breath for touchdown—landed. It was not the best landing ever, but it was all mine.

TO FLY STRAIGHT AND LEVEL

On a clear day the flat line that separates land and sky—the horizon line—is visible way, way out there, all the way around. It's like the line that separates sea from sky, and as you climb

higher in an airplane, it does not get lower, as you might think. It stays way out there: you see it over the nose of your aircraft and near each wingtip when you're flying straight and level. It serves as a reference, and I learned to keep the tips of both wings the same distance from that horizon line for straight and level flying, and I also learned where the nose—in straight and level flight—rested in relation to that line.

TO PLAN FOR WIND DRIFT WHILE FLYING

Wind drift is comparable to a river current taking you across the river bottom while you “sit still.” Mr. Vaughn and I would find a straight road on the ground. We'd start following the road. The wind over the ground would be from left to right, say. He'd ask me to make S turns over that road so that the imaginary line our aircraft made over the ground looked like an S with the road splitting it like the two little lines in a dollar sign. The degree of bank in each turn had to figure in wind effect. To make the loops of the Ss approximately equal in size was not easy in a brisk wind.

TO REMEMBER THAT “THROTTLE CONTROLS ALTITUDE; NOSE CONTROLS AIRSPEED”

Instinct tells you to raise the nose if you want to climb, and to put in the power if you want to go faster. Mr. Vaughn's above rule of thumb broke through instinct. In order to climb, simply add a little power and the aircraft takes care of the rest. To go faster, just drop the nose a bit and the aircraft takes care of the rest. Thinking in his terms simplified some finer points of piloting.

TO NAVIGATE FROM POINT A TO POINT B

TO UNDERSTAND THE WEATHER CHARTS AND WRITTEN FORECASTS THAT COME TO THE AIRPORT HOURLY

It was another language—little figures and circles and designs.

TO TALK ON THE RADIO

I learned what to say, when.

TO MAKE A LEVEL TURN, A DESCENDING TURN, A CLIMBING TURN, A STEEP BANKED TURN

TO PERFORM SIMPLE AEROBATICS, LIKE A LAZY EIGHT

“Okay now. A lazy eight just draws an eight out there on the horizon with the nose of the airplane. Like this.” Mr. Vaughn added power and started a climbing left turn. As if the nose of the aircraft were a giant piece of crayon, he painted a horizontal figure eight along the horizon line far out in front of us. In the middle of the figure our wings were perpendicular to the ground. It was thrilling.

TO RECOVER FROM A STALL

As I said earlier, a stall occurs when the airplane, because of insufficient airflow under and over the wings, refuses to fly and starts to fall. The condition of the engine is not necessarily related to a stall. In other words, the engine generally keeps working just fine during a stall.

Picture a paper airplane you've just thrown. It swoops straight ahead and then climbs. But suddenly at the top of its upward turn, it stops and the nose drops. This brief stop is the moment of stall. The paper airplane does not have the power to continue its course, so the nose drops and points toward the ground, and the airplane heads in that direction (or else it spirals or spins toward the ground). Let's back up to that moment of stall. What has been keeping the paper airplane climbing is the speed of the air over the wings, coming from the force of your throw. That throw has caused the wind to push from below the wings and keep the aircraft up in the air, just as your hand stuck out the window of a fast-moving car is pushed upward as long as you keep the same correct angle and the car keeps its speed. When the speed of our paper airplane is low

enough, that upward wind push stops. Weight overcomes lift. The moment of stall occurs. The heavy nose falls first (if you've attached a paper clip to it, making it relatively heavy).

It's all clear and fine when you're talking about how it works with a paper airplane, but now sit in the left seat of the Cherokee 140 (normally the seat of the pilot or the student) with me while Mr. Vaughn, in the right seat (the copilot or instructor's seat), takes me through my first stall and stall recovery.

"We'll do a power-off stall first," he says.

We are flying straight and level. He pulls out the throttle knob to idle and we start slowing down, but to keep the nose up he gradually pulls back on the yoke as our speed decreases. (The single throttle was located between us, but we each had a yoke and a set of rudder pedals.) "We'll just let it slow down, but we're going to maintain our altitude as long as we can," he says. Soon we are down to about forty-five miles per hour and the stall-warning horn sounds (sort of like a teakettle), and immediately the airplane starts shuddering and shaking like a car going over a series of potholes. This is a little unnerving.

"There are your stall-warning signs," he says. Mr. Vaughn has pulled the yoke back to his stomach and is kind of wrestling with it to keep the nose of the airplane up and the wings level. Suddenly—with the yoke still back—the left wing drops, and then the nose drops as if a rope holding it from above has been cut. We head almost nose-first toward the ground. I now get the idea. Mr. Vaughn releases all that back pressure on the yoke as he thrusts the throttle knob in to 100 percent power, and we pick up speed quickly. Then he pulls the yoke toward him so that the nose comes right back up to level. "There we go," he says. "We caught it, recovered, and didn't lose but about two hundred feet," he says. "Now you try it."

I practiced power-off stalls several times, awkwardly, recovering with as little loss of altitude as possible, and then we tried power-on stalls. With a power-on stall, the aircraft enters a climb that is steeper than the engine can maintain. (Imagine starting up a mountain road that is too steep for your car engine.) The airplane climbs with the engine at 100 percent power. Speed drops, and at about forty-five miles per hour the stall warning sound comes on and the aircraft shudders. The nose is trying to drop, and I have the yoke back as far as it will go, trying to hold the nose up. Suddenly a wing falls and then the nose drops as if somehow released. You're in a stall but your engine is already at 100 percent, so you can't bring that in to help you recover; you must use rudder and ailerons to get the wings horizontal to the ground, and as you reach about fifty-five miles per hour with the nose pointed downward, you can smoothly but briskly pull the nose right back up to the horizon again. You've recovered and in the process lost minimum altitude.

A stall is a clumsy state of affairs—you momentarily lose control of the aircraft—and Mr. Vaughn was so precise and safety-conscious that his participation in a stall and recovery seemed incongruous. Nevertheless, we practiced and recovered from many power-on stalls, power-off stalls, and turning stalls.

All kinds of things can go wrong just after the moment of stall, depending on what the pilot is doing with the flight controls (yoke, rudder pedals, and throttle). The pilot may, for example, instinctively pull back on the yoke to keep the nose up, when the nose should be allowed to fall or should even be pushed over so that speed will increase. And in general, the closer to the ground a stall occurs, the more dangerous it is.

Mr. Vaughn and I practiced stalls at high altitudes, of course. We'd name an altitude that we would pretend was ground level. Let's say we chose five thousand feet. We'd pretend we'd just taken off from the ground and then at fifty-five hundred we'd stall our aircraft and attempt to

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