THE FRONT OF THE LINE

Tow pilots benefit from glider experience

BY BARRY SCHIFF

For all of recorded history, man has envied and aspired to emulate the birds. The closest he has come is to soar among them on the quiet wings of a sailplane. ◆ Flying gliders has been a personal passion since I first flew a Pratt-Reed PR–G1 in 1957. If it were practical and if I were appointed czar of aviation, I would mandate that all pilots take their first lessons in a sailplane. Without the masking effects of power, there is no better way to learn the fundamentals. ◆ Most sailplane flights in the United States begin with an aero tow. This involves attaching one end of an approximately 200-foot-long polypropylene towline to the nose of the sailplane and the other end to an approved hitch on the tail of a towplane. After that, the

PHOTOGRAPHY BY MIKE FIZER

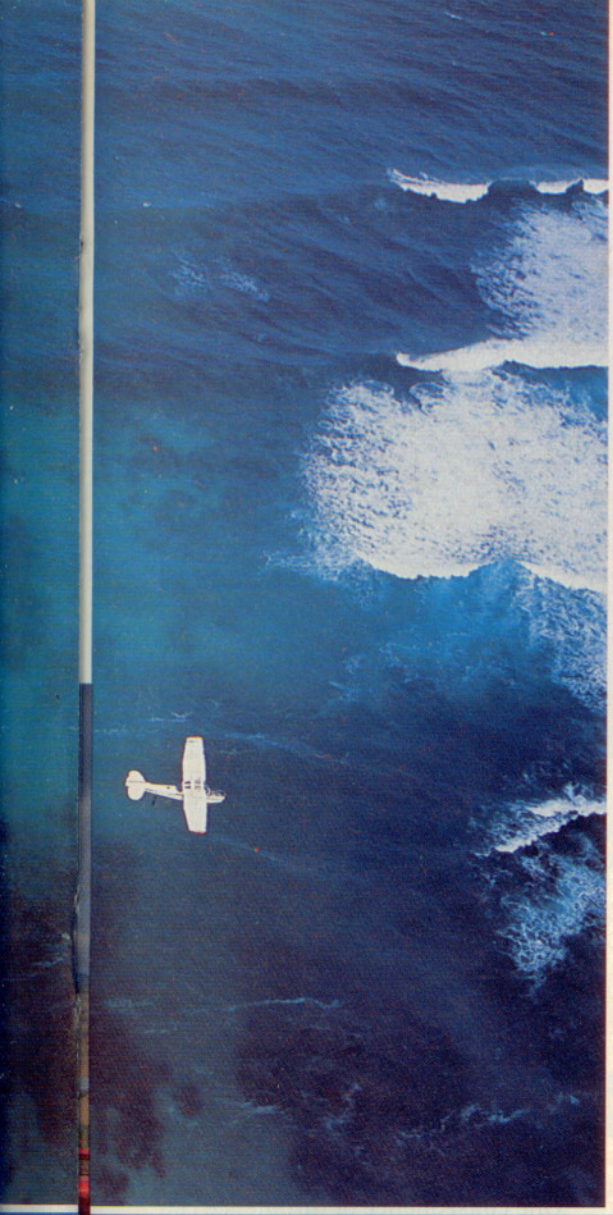
sailplane is towed aloft and flown in formation behind the tug until the glider pilot opts to pull the release knob and free himself from the umbilical cord.

After almost 40 years of soaring, I began to realize that I had always taken the towplane and its pilot for granted. It was time, I thought, to see what life was like at the front end of a towline—and I did so during one of my frequent visits to Soar Hawaii, the largest soaring school in the state and the only one that rents modern gliders. It is located at Dillingham Airfield on the northwest tip of Oahu, where—because of the trade winds—ridge soaring conditions are so reliable that soaring enthusiasts are attracted from all over the world.

Elmer Udd, a 37,000-hour, retired Northwest Airlines Boeing 747 captain, owns and operates Soar Hawaii and consented to teach me the ropes (no pun intended) of being a tow pilot. He has made "tens of thousands of glider tows"—as many as 85 in one day—and was superbly qualified for the job at hand. (A tow pilot obviously gets to make lots of takeoffs and landings.)

The sailplane will lift off before the towplane, in one of an aero tow's trickiest moments.

Most towplanes are taildraggers. They are more maneuverable on the ground and cope best with the rough strips from which glider operations often are conducted. Also, the rudder of a taildragger usually is more effective than are the rudders of other airplanes. This makes it easier to maintain heading when the glider slides toward one side of the in-trail formation and pulls the tail of the towplane in that direction. One disadvantage of a



taildragger is that it is possible for the towline to become entangled in the tailwheel during ground operations.

Soar Hawaii's towplanes are 1951 Cessna L–19 Bird Dogs powered by 213-horsepower Continental O-470 engines.

Udd began my training by emphasizing that the tow pilot is in command of the formation as long as the two aircraft are tied together. He also is responsible for the condition of the towline.

When taxiing toward a sailplane, the tow pilot must remember that he is dragging a long towline and must be careful not to snag anything with it.

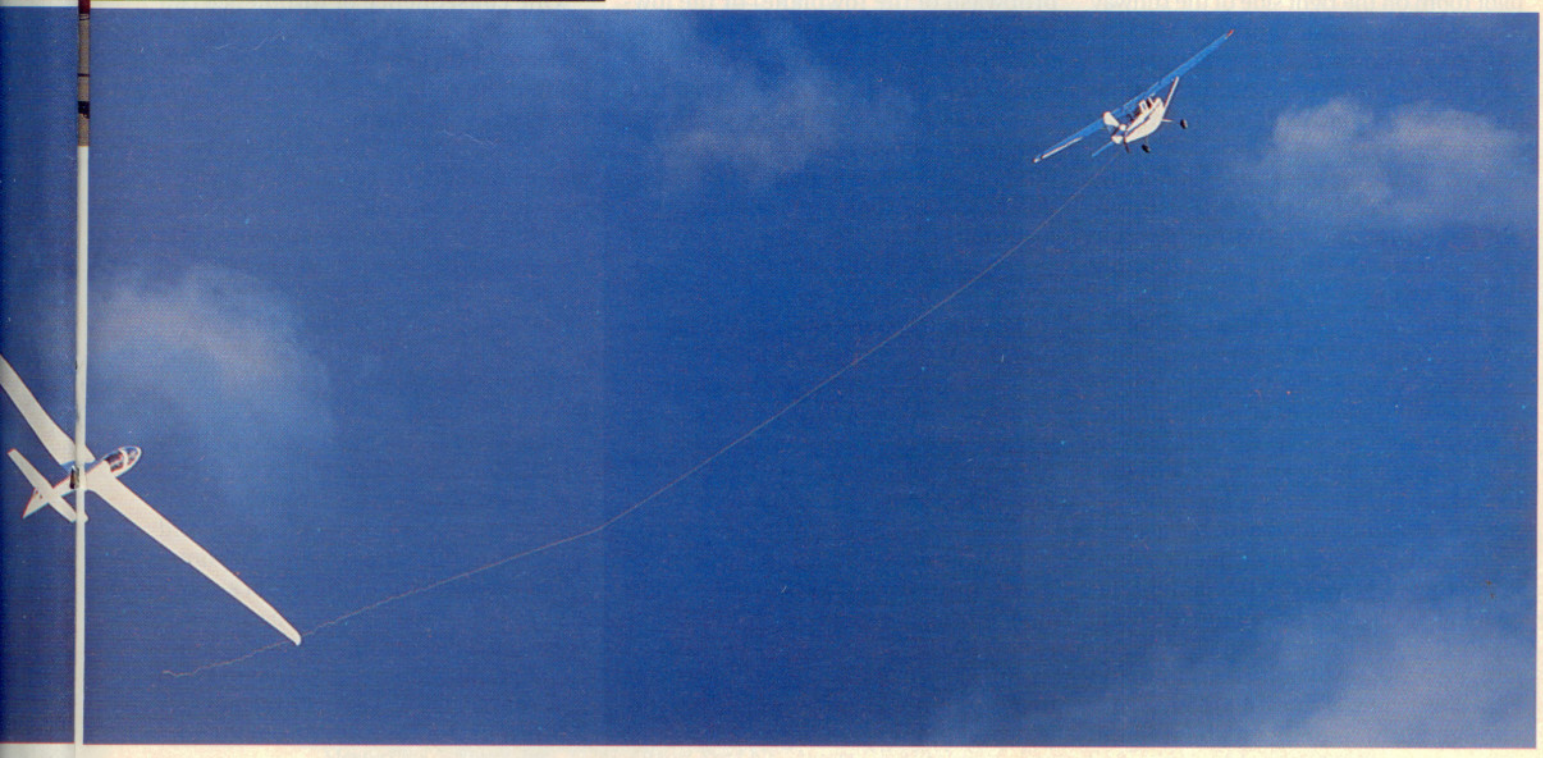
After the line has been attached to the sailplane, the tow pilot taxis slowly away to remove the slack and straighten the rope. If he taxis too far or too fast, however, he risks jerking the sailplane.

Traffic approaching to land is a greater hazard than usual because once the tow pilot is lined up on the runway for takeoff, he cannot easily look behind for aircraft on final approach. The best procedure is to have a ground crewman available to signal the tow pilot when it is safe to depart.

To avoid disaster, before takeoff the tow pilot should look aft and determine that the spoilers on the sailplane are retracted (in most cases), the glider's canopy is closed, no one is in front of the glider, and the glider pilot signals his readiness for flight by fanning his rudder. (This purposeful rudder movement also proves to the tow pilot that there really is a pilot aboard the sailplane; yes, unmanned gliders have been towed aloft.)

The glider's drag and weight somewhat limit takeoff acceleration and yaw control of the towplane, but there still is enough rudder authority to maintain directional control (provided the glider pilot maintains a position directly behind the towplane). The good news is that the pull of the tow rope makes it almost impossible to lose directional control of the taildragger during takeoff.

The sailplane's lower stall speed will cause it to lift off before the towplane, representing one of the most hazardous moments of an aero tow. If the glider pilot allows his aircraft to begin climbing, the towline will hoist the tail of the tug and could prevent the tow pilot from



taking off. (If the tug's tail is raised high enough, the propeller can buzz-saw the runway.) If the tow pilot is unable to become airborne, he has no alternative but to pull the tow-release mechanism in his cockpit and set the glider free. The tow pilot should continue with the takeoff and get out of the glider's way, because the glider pilot will have no option but to land straight ahead.

If the tow pilot encounters a problem with his airplane during takeoff and is forced to abort, he should release the glider and veer left, which gives the glider pilot room on the right side of the runway to roll past the tug and brake to a halt.

If the towline breaks during the takeoff roll, the airplane should continue the takeoff and yield the entire runway to the glider pilot.

After liftoff, the glider pilot should fly no more than 5 feet above the runway until after the tug is airborne. He must concentrate on staying immediately behind the tug.

The tow pilot usually stays in ground effect after liftoff until reaching climb speed. Otherwise, the drag of the glider can make it difficult to accelerate, especially at high density altitudes. (Tow speeds vary from 50 knots for a trainer to 70 knots or more for a high-performance sailplane loaded with ballast.)

Should a rope break occur when lower than 200 feet agl, the glider pilot should land straight ahead (on or off the airport). If the break occurs above 200 feet, he probably will turn around and land downwind. If above 400 feet, he has enough altitude to fly an abbreviated traffic pattern and land into the wind.

Turbulence can cause slack in the rope, which might cause the glider to catch up.

During climb, the glider pilot flies in either the high-tow position (above the propwash of the towplane) or the low-tow position (below the propwash). Tow pilots generally prefer that the glider pilot maintain a "high tow," because this makes it easier for them to see the sailplane in the rearview mirror. Glider pilots also prefer a high tow. If the rope breaks, that portion remaining attached to the tug will fall safely below the glider.

Considerate sailplane pilots fly slightly left of the tug's tail to apply a slight right yaw to the towplane. This relieves the tow pilot from having to hold right rudder throughout the climb and is most appreciated. If the glider is flown too far left, however, the tow pilot must apply left rudder during climb to maintain heading, which is opposite to normal rudder application and feels very strange.

Unless arrangements have been made to the contrary, the tow pilot should keep the sailplane within gliding range of the airport throughout the climb. Extended tows usually are made upwind of the airport to facilitate the glider's return for landing. When beyond gliding distance of the airport, the tow pilot should alter course as necessary to keep the glider near an area where a safe forced landing could be made.

Towing in turbulence is a physical workout. The sailplane, especially when flown by a student, yanks the tug's tail every which way. Should the sailplane pilot get so far out of position that he loses sight of the towplane, he is instructed to release from the tow immediately to reduce the potential for a midair collision. Also, if the glider gets too high while being towed, it can force the tug into a dive.

One consequence of turbulence can be a slack rope, which might allow the glider to begin to catch up with the towplane. The sailplane pilot solves this problem by turning slightly toward one side of the formation until the rope begins to straighten. To prevent the rope from jerking both aircraft (or breaking) as it becomes taut, the sailplane pilot simultaneously yaws his aircraft toward the tail of the towplane and lowers his nose slightly, which softens the restoration of tension on the line. (Another way to take up slack is for the glider pilot to induce a gentle slip or skid.)

Slack ropes are more of a problem when towing a sailplane in level flight, such as when towing cross-country. The sailplane is much "cleaner" and tends to catch up with the towplane. Slight deployment of the glider's spoilers at such a time creates the extra drag needed to keep the towline taut.

Sailplane pilots are required to know how to "box the wake" (fly a rectangular pattern in the smooth air outside the

towplane's wake) and occasionally practice this proficiency maneuver during tow. The sailplane pilot transitions into a low tow; slides left, for example; pulls up; slides right; and so forth. After completing the box, the glider pilot returns to the high-tow postion. To prevent his tail from being pulled in all directions, the tow pilot must constantly compensate by applying appropriate rudder and elevator pressures throughout the maneuver.

It is helpful if the tow pilot also is a sailplane pilot and knows where to find rising air ("lift") that helps the formation to climb more rapidly.

Ultimately, the glider pilot pulls the release knob in his cockpit and leaves the formation. It is natural to assume that the tow pilot would notice the release by a sudden surge in performance, but he might not notice this at all, depending on the amount of towline tension at the instant of release. After visually confirming that the sailplane has released, the tow pilot usually descends to the left, while the sailplane pilot turns right to eliminate the possibility of a midair collision.

In rare instances, a glider pilot might not be able to release from the tow because of a faulty mechanism. In such a case, he will move to the right, fly alongside the towplane, and rock his wings. This signals the tow pilot to fly toward a safe area and pull his release to give the glider its freedom.

In the rare event that neither pilot can release, a formation landing will be made.

In the rarer instance when neither pilot can release, the glider pilot will move to a low-tow position beneath the tug's wake in preparation for a formation landing. This maneuver is not as difficult as it might seem and is practiced by new glider pilots. The tow pilot, however, must land far enough down the runway to give the sailplane pilot (who is below the tug and will land first) plenty of room to touch down on the runway and not before it.

After landing, the glider pilot applies brake pressure to slow both aircraft. This prevents the glider from catching up with and passing the towplane, which could force the tug into a ground loop.

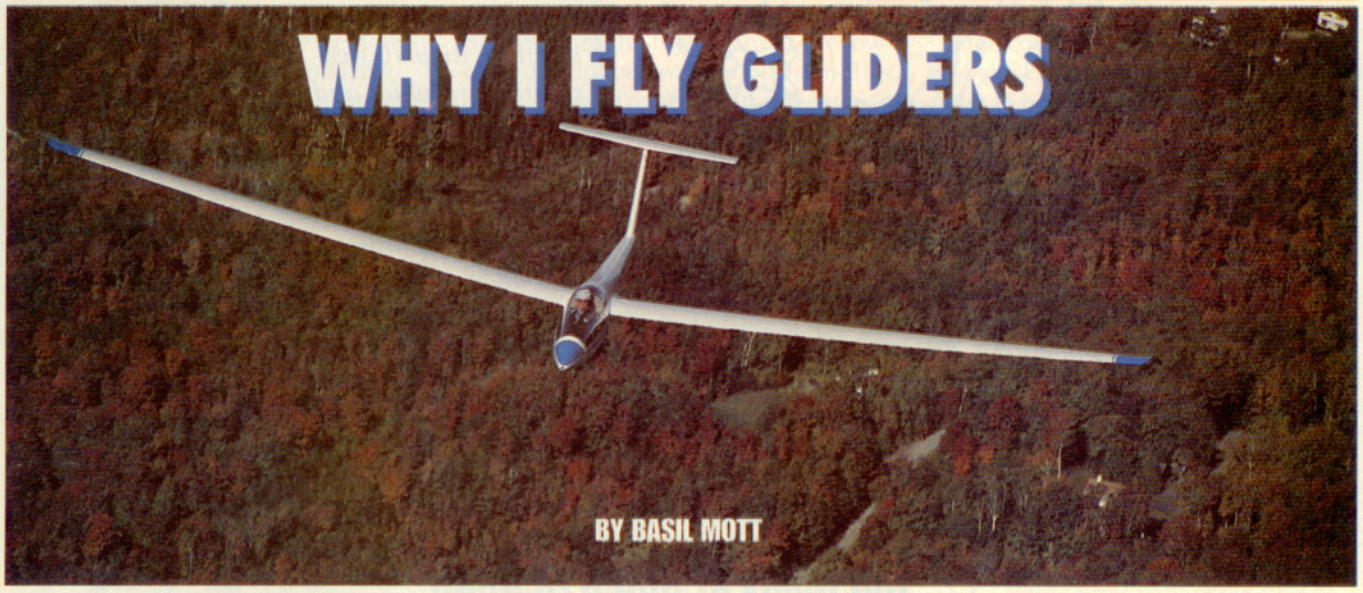
Following a normal release at altitude, one of a tow pilot's major concerns is shock-cooling the engine. Slow climbs and rapid power-off descents are not conducive to powerplant longevity. The key is to reduce power only partially until the cylinder head temperature cools to some established value. Although Soar Hawaii has experienced a few scored and cracked cylinders as a result of shock-cooling, Udd claims that he still gets about 2,000 hours out of each engine. This, he says, probably occurs because he and his pilots are careful not to reduce power too rapidly at the top of the climb and because the airplanes are flown so frequently.

In some cases, the tow pilot overflies the runway and drops the rope, whereupon it is retrieved by someone on the ground. Although this is the best way to preserve a towline, many operators prefer landing with the towline attached, because this reduces turnaround time on the ground.

When landing with the towline attached, the pilot must approach high enough to prevent the rope (which dangles 50 feet or so below the towplane) from snagging something in the runway threshold and grabbing the pilot's attention.

Becoming a tow pilot is not a simple matter of hopping in a towplane and taking off. The regulations mandate specific training and a logbook endorsement by a glider instructor.

Being a tow pilot means working outdoors ("working" is the operative word here), meeting great people, building flying time, and earning a few (very few) dollars in the process. For some, it can be an enjoyable and challenging way to begin a career as a professional pilot. □



GARY SAMSON

WHY I FLY GLIDERS

BY BASIL MOTT

IT looked like a good day for soaring. As Joe, the line boy, helped me to move my glider into takeoff position, puffy little clouds were appearing magically in the sunny blue sky, a sure sign that there would be good thermals. When the towplane pulled into position, Joe ran out and retrieved the end of the towline. Kneeling beside my open cockpit, he told me to open the tow release and attached the line. After making sure that it held, he signaled the towplane to take up the slack.

I scanned the cockpit and instrument panel again: *elevator trim OK, altimeter set to field elevation—970 feet, radio frequency—122.8, electric variometer on,* and closed and locked my canopy. When I gave Joe the thumbs-up, he gently picked up my left wing tip, leveling the wings of my 50-foot white fiberglass

bird, and, after looking to see that the runway and pattern were clear, signaled the towplane to go.

The glider started to roll and gain speed. It felt good as it responded to my touch. I lifted the tail a little and held the bird straight behind the towplane. Then, with a little back pressure, it lifted itself into the air. I kept it close to the ground, helping the towplane to gain speed until it rose into the sky. We were now partners, tied together like prisoners in a chain gang. But what a wonderful imprisonment. The trees and houses and rolling hills of Sugar Hill and Franconia, New Hampshire, quietly came out of hiding and looked up at us as we climbed toward the clouds. When we turned south toward Cannon Mountain, all of my old friends jumped out to greet me—Mt. Lafayette, Franconia Notch, the Kinsman ridge, and Mt. Washington.

I was a vagabond in the sky, but I also understood that I was a privileged guest.

The towplane entered a thermal and began to circle in it—free altitude—before heading for Cannon Mountain, 4,060 feet, and the Kinsman ridge. I had to concentrate to stay in position—*stay on the inside of the turn, above the airplane's wake, please. He's rolling out. We're almost to the ridge.* I kept a tight rein on my bird as we climbed Cannon Mountain's spine only 100 feet above the trees. Had we hit a strong downdraft, I could have quickly released and turned right or left and had plenty of air below me. Near the top, and 3,000 feet above the airport, I pulled the tow release and turned right as the towplane turned left.

I was now free and on my own—no propeller to keep me up—but not alone. I had good friends—magnificent mountains and valleys, and friendly air going up in thermals and on the mountain's slopes and cliffs. But I had to behave; the same air spilled down the thermal's sides and the lee sides of the high terrain. I rolled out of my turn and flew along the windward side of the ridge, heading toward Kinsman, gingerly testing for rising air. Gradually I gained 500 feet. Yes, the ridge was working, as I thought it would. I tuned in 123.3 and passed the word. When I reached the first Kinsman peak, I turned and flew back toward Cannon—600 feet more. It felt wonderful. I was a vagabond in the sky, but I also understood that I was a privileged guest. With the ridge working and the thermals growing, I knew that I could fly for hours.

When I reached Cannon, I headed over the valley for the nearest cloud. When I reached it, losing only 200 feet, I felt a shove, like being pushed in a crowd. My auto variometer began to sing—climb, climb. I did, quickly, circling under the cloud, working to stay in the strongest lift. *Just keep using the thermaling skills that you've learned.* My variometer told me that I was going up 650 feet a minute—at no charge. When I got to 6,800 feet, near the cloud base, I left—FAA regulations, sensible ones too. Power planes on instrument flight plans fly through them.

I decided that it was a great day to fly over Mt. Washington, at 6,288 feet the highest peak in the White Mountains, which is surrounded by dense forest. *Remember, the closer you get to it, the farther you are from landable terrain if things fall apart. "Stay high" is the rule.* I was on top of the world as I played around the mountain between 6,500 and 7,000 feet, watching the old tram railway cars chug to the top, puffing big coughs of dark smoke, and the visitors enjoying the great view, some peering through the coin-operated telescopes to get a better one. In my bubble canopy, I had the angels' view.

The soaring conditions were so good that I flew up the Connecticut Valley almost to Colebrook, near the Canadian border, awed by the majesty of it all. On my way home, trusting my fancy navigation and glide slope instrument, I arrived at Mt. Lafayette, 5,249 feet, high enough to visit the hikers along the Appalachian Trail. After a wide orbit of our home valley, I buzzed the field at 200 feet with enough speed to pull up with a healthy 65 knots on my downwind leg. I dropped my gear and, with my dive brakes, greased my baby on and rolled up to my car and trailer—4 hours from takeoff.

Now you know why an old Navy pilot flies gliders. □

A former carrier-qualified naval aviator, health care consultant, and dean emeritus of the University of New Hampshire, Basil Mott, AOPA 428484, *is currently a freelance writer and the owner of a Rolladen-Schneider LS-4. He has accrued 2,500 flight hours during his 53 years of aviation activity.*