by DON DOWNIE / AOPA 188441

ne Where are you going? How long will you be gone?
For the power-plane pilot-barring the unexpected-these questions are easy to answer. For the balloonist, however, they are imponderables: his route will be dictated by the wind, his landing spot by the terrain.

On a recent flight in Fred Krieg's "Royal Eagle," a Raven hot-air balloon, I had an exhilarating, if brief, opportunity to compare my world as a power-plane pilot with that of the aeronaut. (An "aeronaut" pilots or crews a lighter-thanair craft, termed an "aerostat.")
With Fred as our pilot, four of us had lifted off very early in the morning from Perris (Calif.) Airport. Balloon launchings usually take place just after sunrise, when winds are at a minimum and the balloon has more lift in the cooler air.

Below us, Fred's wife, Hajnal, drove a white pickup truck carrying our ground crew, who would help subdue and secure our unwieldy sphere when we brought it to earth again. (Hajnal and Fred both work for United Air Lines, he as a flight engineer on DC-8s, she as a senior stewardess. They have enough seniority to get days off together to fly and teach in balloons.)
We had just floated up over a rocky ridge when Fred spotted a sprawling turkey ranch below and swore softly. "Turkeys are the worst thing on the ground, as far as I'm concerned," he said, as he cut down the blast of the Raven's four-barrel propane burners to a low, steady vernier burn. "Those turkeys are the dumbest creatures on the face of this earth. If the shadow of our balloon drifts across those pens, we'll have turkeys piled up in every corner, with half the birds suffocated or trampled to death. I've never had an incident with either turkeys or chickens, and I want to keep it that way."
We held our breaths as we dangled in our gondola, watching the balloon's hulking shadow drift with agonizing slowness past the corner of the turkey farm. Some of the birds spotted us, but no full-fledged panic developed. A relieved Fred wiped a spot of sweat from his handlebar moustache and eased on the "power" again to take us to a higher altitude.

At present there are some 300 hot-air balloons and 1,000 aeronauts in the United States. Popularity of the sport has increased with the development of new materials and techniques: tough, inexpensive, rip-stop nylon; dependable Velcro rip panels, permitting rapid deflation of the balloon after landing; and, most important, efficient propane burners, with adjustable controls, that heat the air within the balloon, causing it to rise. The modern hot-air balloon is a far cry from the Montgolfier balloon, filled with hot smoke from a straw-fed fire, in which the Marquis continued on page 24


The modern hot-air balloon. Illustration courtesy of Raven Industries.

## INNOCENTS ADRFT: a look at the.




Hot-air balloons launch at early dawn from Santa Ana (Calif.) Marine Air Station. These flights were part of a recent three-day seminar to qualify FAA personnel for giving balloon flight checks.

BALLOONING continued
d'Arlandes and Pilâtre de Rozier made man's first aerial ascent in Paris in 1783.

Like other forms of flight, hot-air ballooning isn't cheap. The major American balloon manufacturers-Barnes, Piccard, Raven, and Semco-market products costing from $\$ 3,400$ for a 30,000 -cubic-foot single-seater, to about $\$ 5,500$ for a 56,000 to 77,000 -cubic-foot model, and on up to $\$ 12,000$ for a 105,400 -cubic-foot giant. Accessories include trailers, extra fuel tanks, a blower for inflation, instruments, and repair kits. (Two colorful items on the accessory list for the Barnes balloon are a $\$ 340$ champagne cabinet and \$125 velvet drapes.)

There's crew expense too-for example, it takes four
people to launch and retrieve Fred Krieg's Raven safelythough many enthusiasts are willing to work for the experience alone.

N74RE, Fred's four-place "Royal Eagle," is a 77,500 -cubicfoot S-55 model, completely FAA approved and licensed for commercial operations, including flight instruction. Its splendid, stately design pattern cost an extra $\$ 2,000$ over and above the basic $\$ 7,500$ price, and the four-barrel heating system, designed for competition, added another \$262.50. With all burners going, the "Royal Eagle's" rate of climb, at full gross weight, is a whopping $1,100 \mathrm{fpm}$.

On our flight, with four sets of feet sharing space in the gondola with two 22 -gallon propane tanks, there really wasn't too much room remaining. Each of us was wearing a crash helmet; helmets help cut down on the blast noise from the burners and keep the heat from curling your hair.

They could also be extremely handy in the event of a highwind landing, in which a partially buoyant balloon could produce a series of bounces that might pitch an occupant from the gondola. (There are no safety belts, since you really wouldn't want to be dragged behind the gondola until things came to a halt.)

Because of the mass of the balloon (the "Royal Eagle" is 55 feet in diameter) and its leisurely pace, you have virtually no sensation of either height or speed in flight. You're just hanging there, letting Mother Nature do her thing-an involved spectator, and little more, until it's time for the landing. There's no radio (except in competition flights) or transponder or ELT, and you have the right-of-way over everything in the air except the birds.

Your flight is completely silent when the burners are turned off, and extremely noisy when they're blasting. When things are quiet, you can hear subtle changes in the velocity of the wind that ripples the balloon's bunting.

Heat-sensitive dots are installed near the top of the balloon, and they will change color at certain temperatures. The Raven canopy has a standard heat capability up to $250^{\circ} \mathrm{F}$ maximum, and a redline of $275^{\circ} \mathrm{F}$. If the top temperature reaches $280^{\circ} \mathrm{F}$ for as long as one minute, or ever reaches $300^{\circ} \mathrm{F}$, the canopy must be returned to the factory for a major overhaul.

Controls and instruments in the Raven gondola are deceptively simple. The two propane tanks will keep the balloon aloft from four to six hours, depending on the payload and density altitude. The "instrument panel" has a sensitive altimeter, a sailplane-type rate-of-climb indicator, and a pyrometer-the last being an instrument that measures the temperature of the air at the top of the balloon and tells the pilot, at the time of liftoff, when flight temperature has been attained. There's also a compass, required by FAA to be aboard all aircraft.
"That compass doesn't really do much good in flight," says Fred. "You're going to go with the wind no matter what happens. Maybe it might be helpful if you had to hike out of the boonies, but if you're in that situation, you've already goofed."

Panel of the "Royal Eagle" is Spartan, but functional. Instruments (from upper left) are variometer, pyrometer, and altimeter.


Gloves are a necessary item of equipment during flightfor warmth; to help in handling the myriad ropes that control the skirt of the balloon, the maneuvering vent, and the deflation port at the canopy top; and to flick away liquid drops of freezing propane that occasionally drop to the fiber-glass bottom of the gondola.

Undoubtedly the greatest skill required in any balloon flight-aside from the decision on whether or not to take off under existing weather conditions-is the landing. You're looking for a wide, smooth field, uncluttered by trees, ditches, or powerlines-and, hopefully, one that your ground crew can get to with a minimum of trouble.

When it was time for the "Royal Eagle" to land (Fred always plans to land with at least 20 percent of his propane supply remaining in the tanks), we zeroed in on a grassy plot with a road, right down the middle of it, for our ground crew in the pickup truck. As we came down, however, the vagaries of the wind shifted our flight path toward a 100 -foot-high rocky mound. Fred applied all four burners, and just as it seemed we were nose-to-nose with a boulder the size of a house, we shot up the hill to try anew. (Just as in a power plane, you're really not in trouble as long as you have adequate fuel.)

Our next objective was the hard-packed corner of a farmer's sod field. Again an access road made it possible for the pickup crew to come in underneath us. A tall sprinkler system presented a possible hazard to the deflating

The "Royal Eagle's" colorful
captain, Fred Krieg, readies his craft for liftoff.


balloon, but two husky ground-crew members grabbed the 100 -foot tether rope and pulled us to a stop. Hajnal headed toward the downwind side of the balloon as Fred eased us down, with brief blasts on the burners, to a smooth landing.

Then, having turned off burners and fuel tanks, Fred gave a strong pull on the rip strap, and the hot air rushed out of the deflation port at the top of the balloon. It is only at this stage of the operation that you fully realize the size and unwieldiness of an aerostat going limp, and you get a rather vivid picture of the problem it could be with gusty winds and/or no ground crew available.
"Sometimes we deliberately let the gondola slide through a stand of trees to slow down in a high wind, and then pull the rip strap at about 10 feet. Landings are a little harder, but the envelope deflates quickly, and there's a minimum chance of being dragged," Fred explained, while the pickup crew rolled up the balloon canopy and tucked it away safely inside the gondola.

At this point, the owner of the farm came out to see what was going on, and Fred applied his smooth manner, inviting the farmer to come and watch the next balloon launching a week later.
"In the $51 / 2$ years I've been flying from Perris," said Fred, with a twirl of his moustache, "T've never had anyone on the ground get sore. If you're careful in picking your landing spots, and stay away from growing crops, no one seems to object."

If you're after a private certificate in ballooning, the new Part 61 of the FARs requires a minimum of six balloon flights (one of which must be solo), totaling at least 10 hours. These flights must be supervised by a holder of the commercial free-balloon rating.

For the commercial rating, the new regs specify a minimum of 35 hours of pilot time in balloon flight, including two solo flights of at least one hour's duration. With this commercial rating goes a blanket authorization to teach ballooning and act as a qualified CFI.

A number of industry representatives and some FAA examiners feel that a distinctive instructor's rating should be required for hot-air balloons, just as it is for all other forms of flight (except hang-gliders, at this writing).

Fred Krieg says, "It is my personal feeling that even a good hot-air balloonist should have a minimum of 50 flights and 100 hours, with about 35 percent dual and 65 percent solo, before he can instruct for hire."

Though FAA now regulates both balloons and balloonists, present-day aeronauts seem to have preserved the dash and mystique of earlier days. For example, Ted Farrell, a Los Angeles lawyer, carries along a nine-page mimeographed answer sheet when he flies his Raven balloon, "Teddy Bear." Item number 12 asks: "Why do [balloonists] carry wine or champagne?"

Reply: "In the early days of ballooning . . . balloons often landed on farms. The farmers had never seen balloons before and sometimes attacked them with pitchforks. The balloonists found it to their advantage to carry wine or champagne to give to the farmers upon landing. We still abide by this custom, both out of tradition and practical considerations. And if no farmer shows up? Of course, we drink it ourselves!"

Ballooning is a whole new regime of flight, and I found it easy to see why enthusiasts get up in the wee hours, drive for miles to a suitable launch site, inflate their unwieldy bags, and soar into the stillness of the dawn.

If you're impatient or have a tight schedule, ballooning is not for you. But if you're in no great hurry and don't really care where you're going-and if you relish the thought of a friendly voyage that lets you lean over the side and chat with the folks on the ground-I highly recommend it.

Just stay away from those turkey ranches!

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[^0]:    "Royal Eagle" floats above plowed fields near Perris (Calif.) Airport.

