

# PHYSIOLOGICAL TRAINING FOR GLIDER PILOTS

by BRIAN MASTERS

I and my fellow glider pilots Al Parker, Buz Hurt, Wally Scott, and Charles Stead have recently completed a very fine course laid out by the FAA for pilots who fly high. The course was held at Webb AFB, Texas, under the eye of Capt. Dick E. Wilson and Capt. Lillie, USAF.

It is a well-known fact that many of us fly at heights over 10,000 feet in our sailplanes without oxygen. I have flown many times up to a height of 18,000 feet without oxygen, feeling fine with "a sense of well-being." But after taking this course, I shall think twice about going to heights over 10,000 feet without that much-needed oxygen.

We as pilots may feel fine, but our bodies and brains are being slowly damaged by the lack of oxygen. The medical term used is hypoxia. At sea level our bodies take in a certain "partial pressure" of oxygen to the lungs. At 18,000 feet the total air pressure is only one-half of that of sea level; at 30,000 feet one-quarter; sea level being 14.7 psi. Breathing 100% oxygen is no guarantee of well-being at great heights since 100% of a low pressure is only that low pressure.

The phrenic nerve works the chest as a bellows to fill our lungs with air. The carbon dioxide content of our lungs controls our breathing rate, normal rate of breathing being 16 per min.

As a pilot gains height he may start worrying about the lack of oxygen and begin breathing fast to get more air into the lungs. The result is to reduce the carbon dioxide level in the lungs which will cause ill effects on the pilot. This is known as hyperventilation.

Many factors affect us as we fly high; G forces will cause pooling of the blood, bringing stagnation. If one has been drinking alcohol or taking drugs, the hypoxic effect will come much earlier in the climb and is called histotoxicity.

Pilots who have not been in a pressure chamber test do not know what effect they will have regarding the lack of oxygen. It creeps up on you and you will pass out; could be, from this world.

If you don't know your hypoxic

system, put on your oxygen at 10,000 feet, or take a pressure chamber course and find out. These courses are run by the FAA at Air Force Bases for the low cost of \$5. They are well worth it and could save your life and the lives of your crew. The course lasts about two days with 12 hours of lectures and films and one and one-half hours in the pressure chamber. The lecture subjects are the Atmosphere, Oxygen and the Body, Eyes, Ears, Night Vision, Vestibular Organs and Balance, Vertical Direction of Gravity Forces.

The pressure chamber flight we took consisted of a climb to 29,000 feet at 3,500 fpm on 100% oxygen. At 29,000 feet we leveled off for 10 minutes; then a 12,000 fpm descent to 20,000 feet, checking our ears and sinuses. At 20,000 feet we took off the oxygen mask and started to write our name as many times as we could on a sheet of paper. After about eight times, the writing became steadily worse and very slow. The brain did not let on to us that this was so. After the twelfth time or a little over, one could not read it. If one kept on writing, he would pass out, but before this could happen the instructor would put on our oxygen masks, feeding us 100% oxygen. In a few seconds we could see the results. "Oh, man." We then descended to airfield level at 3,500 fpm.

The next flight was to be decompressed from 8,000 feet to 29,000 feet in about two seconds without our oxygen masks on. Upon feeling the hypoxic effects, we had to put on our masks, giving us 100% oxygen. I took about 1 min. 40 sec. to get the effects. When I went to pick up my mask, my brain could not work at speed and it took "ages" to get on oxygen; even then, the instructor had to help. So you see, you have to work fast when feeling the effects of hypoxia.

High flying has a great effect on the ears, sinuses, teeth and stomach. The stomach is about five times as large at 29,000 feet because of the trapped gases in the stomach expanding. Soda pop will play hell with you at these heights as will many rich foods. You must be physically fit to fly at heights; even a cold will do

great damage to a pilot's ear drums.

If you have a chance, take this course for the small sum of \$5 and know your hypoxic system. Upon completing the course, you will receive an FAA Certificate F2900, Physiological Training, lasting three years from date of the course.

I and the lads would like to express our thanks to Webb AFB for helping us find the truth about high flying and toward safe civil flying. Thank you, gentlemen.

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## RED RIVER ROULETTE

(Continued from page 11)

appeared futile, a little blooper came out of nowhere and I carefully herded the Ka-6 up and across another abandoned airport with large concrete runways and little else. There are quite a few in this part of the country, obviously the remains of war time training fields. I would like to tell you that it was a case of sheer genius, cunning, dexterity and unadulterated skill that kept me aloft, but I cannot, for all the while I had an overwhelming feeling that the search for a main highway and a telephone contributed most to the continuing success of the flight. After struggling along from one dubious landing spot to another, and working well within the capabilities of an easy glide into Strother. Lady Luck extended her bountiful but belated hand and one of those bloopers developed into a full-blown thermal. The Ka-6, Lady Luck and I arrived with 1800 ft. to spare. One of the "miracles" of soaring.

Inevitably, I awakened to the fact there were no sailplanes at Strother, none in the air, and no trailers on the ground. They didn't even have a red carpet out. An obvious error. From there I wandered on to a field marked as Oxford. They didn't have a red carpet, either. In fact, not even a building. So, rather than penetrate on into the wilds of an obviously unfriendly area like Wichita, I turned back and landed at Strother.

Extremely elated, I was anxious to make the natives aware of this spectacular feat of soaring, all the way from Texas, yet. I slowly disembarked and stood by the side of my craft, patiently waiting, and making like I was trying to keep the blasted wind from blowing it into the next county. Where were the dedicated ground crews, spectators and photographers that were coming to bear me away on their shoulders in a victorious march