Saunders, cont'd from p. 3

as deep as you want for as long as you like, and then the body can properly absorb the nitrogen. when your air is about run out, rise to the surface. You have to stay within specific limits to be safe - and keep **PF**: And nitrogen narcosis ... the risk of an accident to a minimum.

PF: What about the boat?

gear and divers, we will carry a sidescan sonar, a GPS (ground positioning system) unit, safety and emergency PF: Anything else you want to add? items, and so on. McQuest Marine has an excellent boat Just a few last comments. Water looks nice most of the be used on the dive. We may get help from the noisy place. That's because water conducts sound very Canadian Navy, with the HMCS Kingston and her well and a diver hears this amplified sound easily. The three of the models; I surmise from the shape on the noise or sound is coming from! And water changes camera that that's what they were. There are possible three more, but farther out. And covered with at least ft, so are oranges; by 60 ft, greens and yellows; and at them for exhibit. It will be hard and time-consuming some sort of light. I hope I didn't give the impression work, boring at times. With costs. And stress.

PF: Is this all your responsibility?

RS: I am lucky to have excellent team members: Bill Coyle, Ian Farrar, Jim Garrington, Ken McMillan and Bil Thuma.

PF: Back to diving. What about the bends? RS: A good question. First, you have to remember that the air we breathe is made up of approximately 20% oxygen, 79% nitrogen and 1% other gases. Nitrogen is not used by the body and goes into the blood. We learned in school that oxygen is fuel and carbon dioxide is the waste product. At sea level, the pressure of the air that we breathe is 14.7 psi or 1 atmosphere (atm); at 30 ft - 2 atm (the mixture is the same, but twice the nitrogen and oxygen); at 60 ft (3 atm) it's 3 times, and so on. Yet the lungs need air supplied at the same pressure as the surrounding water. It's like a plastic bottle of pop. If not opened still under pressure, the carbon dioxide in the pop stays put. Open the bottle, and the bubbles rise rapidly as the pressure is released. In the same way, as the diver ascends, nitrogen (remember, it goes into the blood) returns to its gas form as pressure is released. And here is where problems can happen - when the gas bubbles are too big, they can block arteries. The result - joint pains; rupture of tiny lung vessels; even a stroke or heart attack. That's the whole reason for the dive tables I mentioned. The ascent to the surface, depending on

depth, water pressure, on the body. You just can't dive depth and time in the water, has to be gradual so that

RS: That's when the diver, because of breathing large amounts of nitrogen, begins to feel a false sense of well-being, lightheaded - sort of drunk. It can happen Divers need a good-sized boat; the bigger, the better. A anytime. The remedy - in the first place, dive with a lot of equipment will be needed for the summer dive to buddy who is always close by; recognize what is find the Arrow models. For example, besides diving happening; and start ascending until the feeling passes.

(Extreme Surveyor) and equipment. Hopefully, it will time; natural, peaceful. Below the surface, it can be a divers. This would be great. We hope to find at least only trouble is that the diver cannot really tell where a colour according to depth: at 15 ft, reds are gone; at 30 three generations of mussels and silt. It will be some 100ft, everything is bluish. So if you want to see what job to bring the models up and restoring and preserving something underwater is really like, you really need that underwater is a hostile place. It can be, that's true. But it also can be fascinating, always challenging. Just as long as the diver knows what he is doing, and is watchful and prepared.

> PF: Bob Saunders, thanks very much for taking time from your very busy schedule to tell our members some of the basic facts about scuba diving. Hopefully, you'll have much more to tell us about the underwater Arrows in a future PRE-FLIGHT. Good luck in your endeavours!

> > NOTICE OF ANNUAL GENERAL MEETING

AEROSPACE HERITAGE **FOUNDATION OF CANADA**

SATURDAY, JUNE 24, 2000 10:00 AM

TORONTO AEROSPACE MUSEUM 65 CARL HALL ROAD TORONTO (DOWNSVIEW) ONTARIO



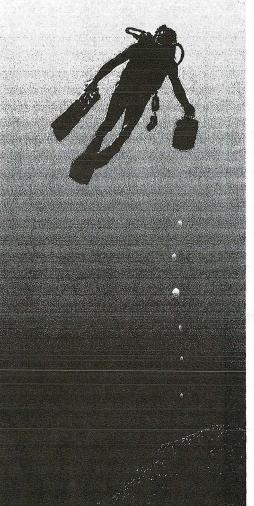
Vol. 11, No. 3

May - June 2000

A seven year dream:

finding the Arrow models

An Interview with Bob Saunders, **AMRP Co-ordinator**



After the tragedy of the destruction of the Arrow, those who worked to make this aerodynamic masterpiece fly were in shock. Not only were they disillusioned, they were stunned; and they were deeply angered at their inability to do anything. They felt powerless. And so they went to other places and fields; their talents were not wasted. Their bitterness and anger at this senseless act of the Canadian government stayed with them. To terminate the program with no plausible explanation! To make sure the Arrow and its memory would not return to haunt the government and those responsible for the deed! Not one Arrow for succeeding generations to marvel at, to admire its creators. Yet the Americans knew about the Arrow and used its research findings most effectively to the benefit of U.S. industries. The British knew. The Germans knew. And certainly, the Soviets knew and had the documentation and even more. Sadly, as Bill Turner pointed out in the previous issue of *Pre-Flight*, the Canadian people did not know, to a great extent thanks to the cooperative print and radio media. But the Arrow stayed in the memory of those who drew the lines, moulded the metal, connected the pieces, touched the multitude of parts, put them all together and made them fly in the Arrow. One of these who worked on it was the late Gerald Saunders, founding member of AHFC and father of Bob Saunders. Gerald passed on his memories, his disappointment and sense betrayal by the government to his son, Bob, a certified diver. Seven years ago, Bob decided that he had to research and locate the Arrow aluminium/magnesium models that were fired and fell into Lake Ontario. He was interviewed, not so much to tell of the search itself, but of the complexities and dangers linked with underwater exploration, especially in an unforgiving, cold Lake Ontario.





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President's mailing address:

9560 Islington Avenue RR #3 Woodbridge ON LALIA7 905-893-8023

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> Aerospace Heritage **Foundation of Canada** P.O. Box 246, Etobicoke D Etobicoke ON M9A4X2 (416) 410-3350 www.ahfc.org

FROM THE PRESIDENT

HELP WANTED!

The Directors of AHFC give freely of their time and personal funds to ensure the continuation of the Foundation and its various activities. However, with the Foundation's growing involvement with the Toronto Aerospace Museum and the increasing complexity of our projects, we need more people to volunteer their help. Specifically, right now, we need a secretary. This involves attending one meeting a month, preparing the minutes and other correspondence, i.e. total commitment of about five or six hours. The Board would be most pleased to hear from someone willing to take this position on. And regarding the Arrow models, AHFC has a new search permit for them in Lake Ontario. Please note that this project is a lot more complex with respect to conservation regulations than had been realized. But we will succeed!



Saunders, cont'd.

PF: Bob, why would a sensible young man like you want to dive in cold, dark Lake Ontario?

RS: I have asked this same question of myself a couple of times. Part of it is the locating and recovering of the Arrow models. It's a matter of national pride. This would be for the people of Canada. Another part of it comes from my late father and his work on the Arrow. Still another part is me. It's the way I am. I remember as a kid being interested in a lot of things, especially when they test you. Even now, I have the thought of skydiving someday and recently have started the process of becoming a licensed pilot, which involves a lot more training than just taking off and landing a plane and starts with a comprehensive ground school.

PF: But scuba diving?

RS: My scuba connection comes from the military. I was in the air force reserve (411, 427) in my twenties. I still am a fully-certified diver and enjoy it a lot. I would suggest that those who can, should give it a try. It's a great sport. And to answer the question I now can see coming, yes, my wife is also certified, though now she's more into antiques.

on Avro and Orenda. The Foundation is PF: Let's get to the diving. What about physical demands in the water?

RS: You need to feel comfortable in the water. That means being able to swim a fair distance, from deep to shallow water; to be able to tread water; to be able to wear heavy scuba equipment. You have to be in good physical condition.

PF: Is there a certain amount of risk involved?

RS: Yes, and sometimes a lot. But if a good diving plan is made, one that covers many possibilities, then the risk is much smaller. That bit also keeps you alert while diving. A good diver - whether sport or professional - is certified, experienced, never takes anything for granted, follows the rules and regularly does checks of all diving equipment.

(cont'd on p. 3)

Saunders, cont'd from p. 2

PF: Which is what you and the other divers will 7. Weights to keep you down. A diver has air in the wear when searching for the Arrow models. Give our members a short list of this equipment. **RS:** OK. I'll explain the basics as we go along.

1. Mask (covers eyes and nose). It's usually made of soft rubber, and with a snug fit, doesn't letwater in. If you wear glasses, a special frame can be made by an optician, which then can be clipped on to the mask.

2. Compressed air cylinder, containing air, not oxygen (lungs, by the way, cannot tolerate pure oxygen, which is destructive to them, like acid).

kept loose at the sides of the body.

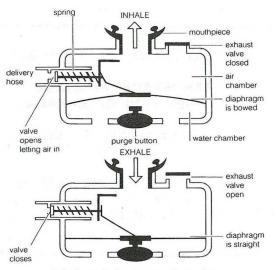
4. Regulator reduces pressure from 3000 psi to for in that dive. The gauge can be worn on the wrist. 100/14, supplying air to the diver as needed, depending c.a. cylinder and has a mouthpiece at the other end. It's contribute in different ways to the safety of the diver. simple, strong and very efficient.

left. If it's down to 1/4, it's time to go up!

6. Wet suit, made of neoprene foam (the foam has between nylon linings, protecting it. It lets in a small layer of water (neck, cuff and ankle openings) which the body heats, providing a thin layer of insulation.

PF: Why dark grey or black?

RS: The suit? A lot of divers feel that black is the best colour for a wet suit. It shows up well when looking up toward the surface, which, of course, is lighter. But when reaching the surface, a florescent orange (or other visible colour) on the hood should easily be seen from the tending boat. You don't see too many of these, even though the colour makes sense. So the hood is usually the same colour as the suit.



Inhale-exhale stages of regulator.

Pre-Flight

- lungs, and some of the equipment is boyant. Without the weights (worn like a belt), the diver could not get below the surface of the water.
- 8. Boyancy compensator allows hovering at the same depth (sort of like fish do). The diver controls boyancy with air from the main cylinder. Sort of like trimming an airplane for level flight.
- 9. Depth gauge, worn on the wrist. Watch for down time, compass, knife and underwater torch, if needed. Just like the pressure gauge, the depth gauge too must 3. Swim fins (a good pair) do most of the work to be accurate with a very small margin of error. If, for move the diver about in the water. The arms usually are example, it shows a shallower depth than the diver really is, there is the risk of going deeper than allowed
- 10. Other equipment. Dive watch/timer, compass, on the pressure of the water. One end is attached to the knife, underwater light, and so on, as needed. They all

5. Air pressure gauge tells you how much air you have PF: It seems that a diver has all this attached strategically to his body.

RS: In a way, you almost have to. A diver has to many nitrogen bubbles!). The neoprene is sandwiched know what's happening. That's why the instruments are easy to read. You need to know what you are doing and what is happening at all times. A good diver plans how deep, how long, and so on. In fact, there are specific dive tables that give a wide range of recommendations to avoid problems with the effects of

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