



**NEWSLETTER**

# *Carb Heat*

**Hot Air and Flying Rumours**

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## ***OCTOBER 2002***

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Canadian Aviation Museum**

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**President's Page  
by Gary Palmer**

Despite official announcements of the arrival of Fall, Summer like weather continued into early October. However, as I write this, we have returned to normal Fall weather, with hints of the frozen delights that await us.

**Chapter work projects .**

This means it must be time to start some major new chapter projects; and while George Elliott is keeping a tight hand on the chapter cheque book, **Dick Moore** continues to come up with ways to improve our facilities albeit with a less grand financial scope than last year. Projects recently completed include:

- 1) Addition of a paddle operated power assist for lifting and lowering the hanger door. The operation of the power assist is largely self evident, but it is important to note we do not have limit switches to **idiot-proof** things. We still depend on **you the operator** ensuring that you do not raise the door too high, or equally important lower it too far. You should use **manual control for the last few inches of travel** in either direction to avoid an expensive, embarrassing breakage of the counter-weight mechanism.
- 2) Hose reels adapted to power extension cable and air hose use to make it easier to **keep things neat and tidy** after use. Note these too depend on consistent, intelligent operator use for best performance.
- 3) The persistent leak in the chimney for the wood stove in the lounge has been finally found and fixed

**Upcoming Projects:**

**Dick Moore** will be contacting members to help with the refurbishment of the Lounge area. Projects include:

- 1) Repair of drywall damage near windows
- 2) Painting of walls which will necessitate relocation of furniture
- 3) Installation of new carpeting that was obtained at an exceptionally low cost courtesy of Irving Slone's contacts. This may be done in two phases overlapped with the painting to minimize shuffling of stuff.

The new carpet will really improve the appearance of the lounge. It also means we will need to be extra vigilant to treat the lounge with the same **respect we would treat our own living rooms** to keep it looking ship shape.

**October elections .**

As usual, our October meeting is the opportunity to step forward and become more actively involved in the running of your club. The positions open for election this year include **President**, **Membership Secretary**, and **Webmaster**. **Lars Eif** will be contacting potential candidates and conducting the elections at our meeting. I am pleased to note that we have already had one volunteer, and look forward to re-invigorating the chapter leadership team.

**Thursday Sept 19th meeting a great success**

**Gwen and Charlie Martel** put together a fascinating presentation highlighting their flight down east to **Newfoundland** last year in their Sportsman 2+2, C-GMTL. In addition to lots of great pictures, we gained an insight into the real world weather and flight planning challenges such a trip entails. High winds and fog were common challenges that didn't apply just to the in flight part of the trip; secure tie downs were essential to ensure the faithful air chariot was available for ensuing legs. The scenery down east is as fantastic as the people are friendly, and any who have ventured there invariably look forward to a return trip. I know that you join me in sincerely thanking Charlie and Gwen for a job well done. I hope we can look forward to vicariously sharing future adventures with them.

**Thursday Oct 17th meeting @ NAM: Custom Stainless Steel Exhaust System Fabrication**

If you need a custom stainless steel exhaust system for your project, you will want to catch **Bob McInnes** and **Tom Walton**, of **V5** (their company name). They will talk informally about exhaust systems and the kinds of work that they have done, as well as show some sample exhausts and mufflers that they have made. I look forward to seeing you at the Aviation museum, at our normal start time of 8:00 PM.

**Gary**

# **The Black Hole Approach:**

## ***Don't Get Sucked In!***

One of the major tenets of instrument flying is that you cannot rely upon your body, or kinesthetic senses to keep you upright. Repeatedly, your CFII has pounded into your head the premise that you can only believe what your eyes tell you. Just watch those gauges and all will be well. And it's true if what you are looking at IS the gauges. When the view is out the windscreen, however, you cannot always believe your visual perceptions.

Great! First you can trust your eyes, then you can't. What's the deal here? Well, it's all in being human. This marvelous species you're so proud to be a part of has evolved over millions of years as a land-based animal moving at a normal speed of about three to four miles per hour. You can also manage occasional short bursts of up to 15 mph. Any time you go faster than that or put your eyes higher than eye level above ground you're subject to misperceptions.

Okay. So, you know that you can't always trust our perceptions. What is a black hole approach and what makes it so dangerous? The term "black hole" refers to the terrain below the approach to the airport, not the airport itself. Simply put, a black hole approach is a long, straight-in approach at night to a brightly lit runway over featureless and unlit terrain. Over the years, the black hole approach has claimed the lives of many pilots both novice and experienced. Night flying has always been more dangerous than daylight flying principally because of the lack of perceptual clues we all depend on to keep the shiny side up. You're all familiar with the false perceptions you can fall prey to caused by using a sloping cloud deck for a level horizon and the unsettling ambiguity caused by mistaking sparse ground lights for stars. You can overcome these visual traps, however, by simply referring to the flight instruments on the panel. The black hole approach is different in that a glance at the flight instruments won't always clue you in to the danger.

## **Optical illusions**

Before we talk about black hole approaches, let's explore some of the ways your perceptions can mislead you. That will give us a basis for a better understanding of the illusions you experience during a black hole approach.

Your eyes really don't do the seeing your brain does. Your eyes simply transmit electrical pulses and your brain does the work of making sense of those spikes of electricity. It perceives what it "sees" in the setting in which it is viewed. The surrounding objects and colors or lack of them will have a big effect on what sense your brain makes of the electrical impulses sent to it by the retinas.

Seeing is not believing! But why would the brain play such tricks on you? It's all a part of how you make sense of the world around you. The visual surroundings of an object give you valuable clues about its size and distance from you. Lines can show perspective, which is an indicator of distance. The brightness of an object is another attribute the brain takes into account when determining the nearness of an object. We perceive dimmer objects to be farther away than bright ones.

## **Night perils**

Pilots have recognized since the early days of aviation that flying at night is more dangerous than flying in the daylight. In fact, flying at night in good weather is closer to a flight in IMC than it is to VMC. The low level of light means that the rod cells in the retina of the eye are going to be doing most of the work since they are more sensitive to very weak light energy. Unfortunately, the rods permit seeing only black, white, and grays. Since you base much of your perception of size and distance on color variation, you have a handicap already. Terrain and

clouds can be almost impossible to see at night until it's too late and as was said earlier, ground lights can be mistaken for stars and horizons.

But what makes the black hole approach so different and so lethal? Well, first, referring to the attitude indicator, altimeter, and turn coordinator won't immediately alert you to the problem. Pilots who succumb to the black hole illusion are convinced, sometimes until it is too late, that they are on the proper glide path and all is going well. Second, although you may know intellectually that the illusion is taking place, you will still have an overwhelming urge to believe your false impressions. You can't take any training to keep from experiencing this illusion. Like hypoxia, it WILL happen to you and your best defense is knowledge and avoidance.

***Figure 4: The visual angle subtended by the runway during a normal three-degree approach should get larger and larger as you continue the approach.***

Many researchers have studied the black hole illusion. Two Boeing engineers, Dr. Conrad L. Kraft and Dr. Charles L. Elworth, conducted a study in a specially developed night visual approach simulator flown by Boeing's senior pilot-instructors and came to some surprising conclusions. As you are aware, pilots flying a normal three-degree glide path see a constantly changing view of the runway. While the aiming point on the runway will remain stationary in the field of view, the visual angle occupied by the runway is constantly changing

## **When black isn't beautiful**

What Kraft and Elworth discovered is that pilots conducting an approach over featureless terrain at night tend to keep the visual angle of the runway constant. Now, I'm going to ask you to think back to high school geometry. Do you remember the theorem that says that if two inscribed angles intercept the same arc of a circle, the angles are congruent? Whoa! That was a mouthful and worthy only of a high school geometry teacher. As a matter of fact, the Boeing researchers found that the typical descent on a black hole approach, if continued to touchdown, would result in a landing (impact?) two to three miles short of the runway.

Although research has not yet discovered why pilots tend to keep the visual angle of the runway constant under black hole conditions, they have discovered that the condition is universal. You WILL be fooled if you try to conduct a long, straight-in approach over featureless terrain using only out-the-window references. There is no amount of training or practice that will make this illusion go away. The only defense you have is awareness and avoidance.

Some conditions make the black hole effect more pronounced. Be alert for the illusion when you observe these conditions:

- \* An airport that is on the near side of a brightly lit city with few or no terrain features or lights between you and the airport. The brightness of the city lights will give the impression that they are closer than they are.
- \* An airport that is on the coast or in very sparsely settled terrain such as deserts and wilderness areas. This is the classic black hole scenario. Los Angeles International landing to the east and Salt Lake City landing to the south are classic examples.
- \* A night with extremely clear air and excellent visibility. One of the things we use to judge distance is the normal hazing that distance provides. When the air is extremely clear, this lack of hazing makes things appear much closer than they really are.

## Coping with the black hole illusion

Since you know what sets you up for the black hole illusion, what can you do to keep from being sucked in? The most obvious is to avoid long, straight-in approaches. The black hole illusion disappears within two to three miles of an airport so the most obvious thing to do is to fly to the airport at a known safe altitude and then descend and fly a normal traffic pattern.

We said earlier that reference to the flight instruments will not help in a black hole situation and that is true for a quick reference to the attitude indicator, airspeed indicator or altimeter. Nothing there will be immediately suspicious. If you study the VSI, however, you may notice a larger than normal rate of descent, but that may not be apparent. You need to do a little analysis to see the whole picture. A three-degree descent 300 feet per nautical mile is the normal landing descent. If you see more than that, you should be suspicious. However, what in the cockpit measures descent angles? Your airspeed indicator and VSI do. For that three-degree descent, your rate should be five times your ground speed. If you're doing 120 knots across the ground, your rate of descent should be about 600 fpm. If you don't know your ground speed, using your indicated airspeed will be close enough to keep you out of trouble. Of course, to use this formula for a descent to the runway, you have to know how far you are from the runway. DME, GPS, or good old-fashioned pilotage should be able to tell you that.

There are many other theories about factors that may contribute to the black hole illusions. Some are more believable than others, but the thing you **must** believe is if the conditions are right, you can be fooled by the black hole illusion. The only way to keep from getting sucked in is to analyze what you see out the windscreen and be aware that you, too, can be fooled. Seeing is not believing.

by Linda D. Pendleton ([lpendleton@avweb.com](mailto:lpendleton@avweb.com))

This article can be found on Avweb at [www.avweb.com/articles/blackhole/](http://www.avweb.com/articles/blackhole/) with some very neat interactive illustrations that don't work in print.

## **AVEMCO PULLS OUT OF CANADA!**

As some of you already know, AVEMCO has pulled out of Canada for aircraft insurance. Any one who has a policy in force now will be supported until it expires, then it will not be renewed. Even though AVEMCO is a direct underwriter and policy supplier they cannot make the profit they want from us. They cite a "small" market and too much competition in Canada to make it worth while. Their "grace period" policy will end and thus coverage will terminate on the date the policy expires. They used to extend the coverage until you got around to paying them. They are advising that policy holders should arrange their coverage through another company 60 days prior to the termination of the AVEMCO policy so the aircraft has new coverage as soon as the current policy expires.

Fortunately for us Canadian owners, we still have an excellent provider through COPA with Marsh. Marsh are brokers and not underwriters. In fact there are four prime underwriters for the Canadian aviation market: AIM, Canadian Insurance Underwriters, Global (used to be British Aviation Insurance) and Co-Operators (this is who underwrites the COPA policy with Marsh). If you feel, for some reason, that the COPA plan (Co-operators underwriters) sounds high priced you can ask Marsh to see if the coverage you want is available through any of the other underwriters. Marsh writes policies through any of the four underwriters so don't be bashful just ask.

Marsh has stated that if an aircraft is covered now, it should be simple to arrange coverage through their company. No cases will require investigations/photos etc. to prove status of aircraft condition such as is the case when you change your car insurance.

I recently arranged insurance for my aircraft through COPA/Marsh and found the experience to be quite simple yet very "configurable". You can save a lot of money by paying attention to what you need. They have several plans (builders, silver and gold), each plan provides varying coverage, each is customizable for you as to the amount of liability and overall coverage, like hull, in flight, third party etc. Their silver wings coverage runs calendar years but their gold plan runs from the date the coverage begins for twelve months, this means that your coverage ends on the anniversary date of coverage instead of January first. In my case though, AVEMCO was quite willing to underwrite me at the end of August. In fact they sent me an E-Mail asking me to make up my mind by the end of August. I guess this is why they were applying pressure. The pressure is partly why I went with the COPA / Marsh product.

Generally, the AVEMCO pull out is due to the hardening of the industry, not Sept 11 2001 as most think. In fact Adam Hunt (COPA) found out that the industry had lost \$750 million prior to the Sept 11th event. As a result in-flight hull insurance is becoming very difficult to obtain. For instance an owner of a \$350K aircraft may not be able to get in flight hull coverage if they do not have 500 hours PIC (pilot in command) in type. In fact no one in Canada will provide insurance for some aircraft. Another good example is that AIM will not underwrite a Cessna 210. Adam has found many examples of tough to get insurance coverage. Us homebuilders are usually self-insured for hull in flight, from what I have found in my own personal survey. I guess we figure if we crack up the fuselage, we are better off fixing it ourselves and that the premiums saved would pay for the raw materials we would need to re-build. In my case I often forget about the "savings" as I spend the money some where else!

For you AVEMCO people, you can get more information about the COPA/Marsh insurance by calling Marsh at 1-800-361-1625 (Marsh is based in Montreal) or through the web site:

<http://www.marsh.ca/en/specialty/associations.shtml>

Thanks to Adam Hunt at COPA for providing much of this information, and to Marsh for answering all of my questions.

Curtis Hillier

Place your ads by phone with Rodney Stead  
@ 836-1410 or e-mail to [sttstmp@sympatico.ca](mailto:sttstmp@sympatico.ca)  
Deadline is first of the month. Ads will run for three  
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### Articles Wanted

I am always interested in receiving submissions for this,  
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