March

Wing Clips

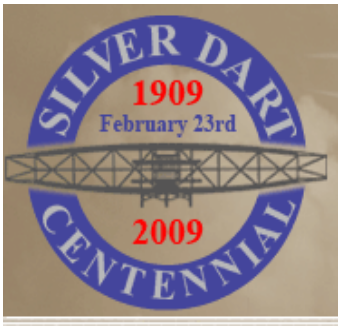
2009

Abbotsford Flying Club Newsletter

Next Regular Meeting March 11th @ 1930 at the clubhouse

(Photo for AEA 2005 Inc. courtesy of Marian Bell Whitcomb, Baddeck, NS, Canada)

Monday, February 23rd, 2009
C-IIGY – the Silver Dart replica makes four flights –
celebrating the end of the 1st Century of Flight in Canada and in the Commonwealth,
making way for the first day of the 2nd Century of Flight in Canada and in the Commonwealth.



Up Front: What better picture could we have "*up front*" this issue of *Wing Clips*? Photo and article scammed from COPA. Check out the links to centennial activities and the "Hawk One" air demonstration schedule.

"Thousands celebrated the last day of 100 incredible years of powered flight in Canada and the Commonwealth in Baddeck, NS, Canada, Sunday morning, Feb. 22nd, as three national Canadian television networks - CBC, CTV and Global TV - filmed thousands of thrilled and cheering visitors lining the Baddeck Look Off atop the Trans-Canada Highway … along the shores of Bras d'Or Lake … and out on the ice itself as they saw history in the making … while witnessing a series of flights flown by retired NASA / Canadian Space Agency astronaut Bjarni Tryggvason.

The flights began early Sunday – on the eve of the 2nd Century of Powered Flight in Canada and in the British Commonwealth. Sunday started off clear and sunny and remained that way all day for what was to have been a series of test flights … all in preparation for the official Canadian flight of the century which had been slated for Monday, Feb., 23rd - weather permitting. By early Monday morning, however, the weather looked iffy as to whether C-IIGY could fly today."

History

The original Silver Dart aircraft was the result of considerable effort by the original Aerial Experiment Association. The group was formed in 1907 by Alexander Graham Bell, the inventor of the telephone. He also had a great interest in kite aerodynamics and manned flight. The first controlled, powered flight in Canada took place off the ice-covered Baddeck Bay in Nova Scotia, on February 23rd, 1909.

The pilot was a flight pioneer by the name of John Alexander Douglas (J.A.D.) McCurdy. These were definitely the heady early days of aviation in Canada. The Wright Brothers had lifted off in 1903 and the first flight in Europe by a Brazilian, Santos Dumont, was made just a mere 3 years before the Silver Dart's flight.

The AEA came into being when McCurdy and his friend, Frederick "Casey" Baldwin, two young and very bright graduates from the University of Toronto, decided to spend their summer vacation in Baddeck Nova Scotia, Canada. McCurdy had spent his youth there and his father was the personal secretary of Dr. Bell. One day as the three sat discussing the exciting field of aviation and some of Bell's aeronautical ideas, Bell's wife, Mabel, suggested they form an association to exploit their collective ideas. She even agreed to fund the fledgling organization.

Dr. Bell also invited Glenn H. Curtiss, to participate in the venture. As an American motorcycle designer and manufacturer, he had acquired considerable experience with light-weight gasoline engines. The United States government took interest in some of the AEA's ideas and proposed that it should have an observer participate in the plans and discussions. Thus, Lieutenant Thomas Selfridge joined the group.

With no shortage of ideas, the group built three prototypes in sequence, each building on the experience of its predecessor. These were the Red Wing, the White Wing and the June Bug. The June Bug with Glenn Curtiss at the controls broke several aviation records and won the Scientific American award for the first official one-kilometre flight in the United States of America.

The AEA's fourth effort was the Silver Dart, designed and piloted by McCurdy. It was first test-flown in Hammondsport, NY, in late 1908 and was then shipped to Dr. Bell's summer home in Baddeck.

On February 23rd, 1909 it made history with McCurdy at the controls when it became the first controllable powered aircraft to fly in Canada - and the possibly the British Empire. About two weeks later on March 10th 1909, McCurdy flew the aircraft on an astounding 20-kilometer circular flight around Baddeck Bay.

The Silver Dart was made principally of bamboo, ash, spruce, metal tubing, and wire cable. The wings were

covered with silver-coloured, rubberized balloon cloth - hence the name Silver Dart!

Its engine was a rather cantankerous V-8 water-cooled engine that at its best probably put out no more than 35 or 40 horsepower at 1,600 rpm. It spun a 2.43 m-diameter (8') propeller. As did some previous aircraft of the day, the Silver Dart had its two-plane elevator mounted on the front - Canard style. It was 3.65 m (12') wide and made the aircraft very sensitive around its pitch axis.

The Silver Dart made about 30 flights in the Baddeck area before the AEA proposed a demonstration to the Canadian Army. The Army was not all that enthusiastic but did invite the AEA to Petawawa, ON. The sandy and hilly take-off and landing areas made getting off the ground very difficult. On their 5th demo flight - with Casey Baldwin on board as a passenger - McCurdy struck a rise in the ground and crash-landed.

That was the end of the Silver Dart's career.

Only four pieces of the original aircraft remain - the fuel tank and radiator in the Bell Museum in Baddeck, and the engine and propeller in the Canadian Aviation Museum in Ottawa.

"Heavier-than-air flying machines are impossible."

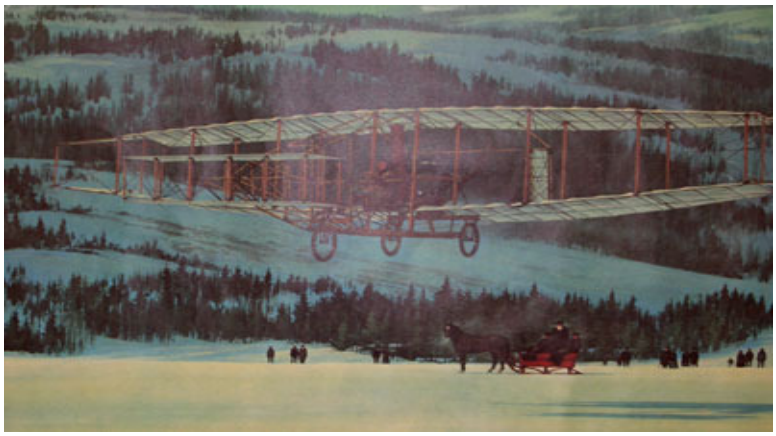
Lord Kelvin President, Royal Society 1895

President's Column: by *Steve Stewart*

I just returned from the kick-off meeting for the "**100 First Flights"** event that is planned for June. The initial press announcement was a great success in the local papers and has already generated a strong response via the website and email enquiries. It's timing was dictated by the opportunity to leverage interest in the centennial of powered flight in Canada, and this is also what inspired the name chosen for the event. Now we have to make it happen. There are many opportunities for members to get involved, and our previous experience with the EAA Young Eagles program up to 2003 is very valuable. On the day we will need pilots, aircraft, people to run registration, ground school and all the other important things. The need at present is for organization. A number of members have already volunteered and everyone is encouraged to sign up in whatever capacity they can. This should be a great event for everyone involved, as well as the children on whom it is focused. It has already focused public attention on the flying club

SILVER DART SPECIFICATIONS

First Flight in Canada - Feb 23rd, 1909
Total flights - 50
Wing Span- - 49 ft., 1 inch (15 m)
Length - 39 ft., 4 in. (12 m)
Height - 9 ft., 7 in. (2.9 m)
Empty weight – 610 lbs. (277 kg)
Gross weight-- 860 lbs. (360 kg)
Take off speed - 38 mph (61 km/h)
Cruise speed - 43 mph (69 km/h)
Rate of climb- - ?
Ceiling - 70 feet



Hangar14: by *Rick Duerksen*

Well, early Spring greetings from your Bar & Social guy. I recently moved my "office" into a different room in my basement. My desk now is next to a 4' x 10' window, that does not now - nor probably ever will - have curtains. From where I sit, I can see the airplanes that are turning from downwind to base for runway 19, just outside my window. I used to be able to identify certain airplanes by sound. Of course, now that Rene is flying a different airplane, I will need to learn a new sound. Used to always know when Rene and Steve were doing their formation circuits. I think they might have used my place as a turning reference point. Anyways.....

Let me bring you up to date. First off, we have to make sure that Jake Remple is not out of town when we have our monthly general meeting. While he was out strolling the beaches of Hawaii, I was trying to do the 50-50 draw sales at the February meeting. I did not get nearly the sales that Jake was able to generate at the previous meetings. Despite this, we did have a few buyers. The draw was won by Paul Coltura, who promptly donated his winnings back to our social fund. This is becoming a set pattern. In January, Brian Burke donated his winnings to the AFC, and I found out the other day that our first 50-50 winner, Dan Giesbrecht, donated his winnings to the Missionary Aviation Fellowship. MAF is an inter-denominational organization that sends pilots and aviation resources to various missions in many countries. Now as your Social Director, I really appreciate these additional funds. However, maybe we are setting a bad example. If everyone starts donating the winnings back to the club, I think that perhaps our sales will drop off. Members might think that they will be expected to follow the previously set example, and stop buying tickets. So, let me make this clear. I am planning on buying the largest group of tickets that Jake sells. And I am keeping the winnings, if I win the draw. At most, I might buy a round of drinks later that evening, after most members have left the building.

Had another successful TTTT-TGIF on Feb 20/09. Celebrated the 100th anniversary of Canadian powered flight and raised a glass to remember the 50th anniversary of the cancellation of the Avro Arrow Project.

Dean Lundstrom brought a couple of Arrow videos, and I put a few wings - get it, 'wings' - on the BBQ to mark the day. I got the wings from Neufeld Farms at 32215 King Rd. Dan sold them to me at cost, which was a nice gesture. They run a very nice store there, and they also do a great job at running fund raisers. Check them out at www.neufeldfarms.ca

Former members Gene and Mary-Anne Faber dropped in for a while, as well. Our next TTTT-TGIF is Mar 20th. We will use this as an excuse to celebrate the Spring Equinox and St. Patrick's Day. Drop in any time after work and bring your wife and/or girl friend along. If you are wearing something green, you will get a special discount on your first drink. And, like I said earlier, a green liver does not count. I will have some Irish beers on hand, and also a bottle of Jameson Irish whiskey. Now, this stuff is or could be, bad news. My good friend Dwight Falk, who is a past member of the AFC and a current Embrarer 190 driver for Air

Canada introduced me to "Dr" Jameson about 2 years ago. Actually on the very day that Air Canada hired him. It was simplify a "celebratory" drink. OK, maybe we celebrated a bit more than called for. Anyways, a shot of Jameson with a bit of Ginger Ale and a couple of ice cubes - one of the few great Irish exports.

Mark Saturday, March 28th on your calendar. We are having a Pot Luck Dinner that day. Dinner will start at 17:30, but drop in any time after 15:00, and plan on staying late. Invite some friends, and offer o supply the salad, main course, or dessert for them. Lets have a great turn out for this social. I have recruited a few club members who are willing to donate an hour of flight time to give rides to our many non-flying club members who, for various reasons have not sat in an airplane for sometime. If you would like a ride, please let me know so I can do the scheduling. There are a few planned activities for this day. For the kids, a small petting zoo (at the least, my dog), a paper airplane folding competition, and a balsa-wood glider contest. If I can justify the cost, I might bring in Mr. Flowers, an Abbotsford based balloon clown. There will also be beer can airplane building opportunities for us older guests. Maybe a bit of Bachii Ball and a golf putting contest. Larry Runnalls has offered to bring a few Segways out that day. If you have not had the chance to drive one of these things, you will want to get in line. They are a real hoot. Anyways, remember, March 28th. You can contact me with any questions at hangar14@shaw.ca

In anticipation of some of our up-coming social events, I thought we might want to do a major clubhouse cleaning. March 21st, is the day on our calendar for this event. This will be combined with a hangar and airplane cleanup as well. Drop by the club anytime after 9:30. If enough people show up, it will not take more than a couple of hours to get everything into shape. I'll put a few Smokies onto the BBQ for lunch. And if you have a portable pressure washer that you can bring along, you get an extra "thanks" mention.

I am going to be working in Alberta for the next couple weeks. In fact, I will be flying to YEG in about 10 hours, so I don't have the time to write, edit, and send my own DHC-2 (Beaver) story to *'Skoop'* Buchholz. I'll save that for another newsletter. In the mean time, Jake Rempel will look after the bar for me while I am gone. And, as always, I welcome all comments to hangar14@shaw.ca Thanks for your time,

Rick, your BS guy

Ton's Question of the month:

On the left side of the C-172 fuselage, what are the holes near the air scoop for??

"You can always tell when a man has lost his soul to flying. The poor bastard is hopelessly committed to stopping whatever he is doing long enough to look up and make sure the aircraft purring overhead continues on course and does not suddenly fall out of the sky. It is also his bound duty to watch every aircraft within view take off and land."

— *Ernest K Gann, 'Fate is the Hunter*

Fuel Watch
Prices on March 9, 2009

Airport	Price
CYXX	$1.402 / litre
CYVK	$1.37 / litre
CYNJ	$1.41 / litre
CYCW	$1.45 / litre
CYPK	$1.41 / litre
CZBB	$1.48 / litre
CYYJ	$1.493 / litre
KBLI	$4.21 US/gal
CYLW	$1.319 / litre

Please note that "Fuel Watch" location and price listings in no way indicate approval or disapproval of any Vendors by the *"Wing Clips"* Editor or the Abbotsford Flying Club and executive.

Some Memories of the Nimrod AEW **by *Steve Stewart***

This article shares some reminiscences of the BAe Nimrod AEW with which I was involved from 1978 to 1982. Writing about the Nimrod AEW was prompted by a posting on the Club Forum which is quite critical of the aircraft. I don't like to see an aircraft criticized when the problem was really with the mission system avionics. So, although I don't know *all* the details of the aircraft I can at least tell what I remember about the airframe mechanical systems, which did all work very well.

First, the background: AEW stands for Advanced Early Warning and for the UK it provided a function equivalent to what DEW, Distant Early Warning, did for North America. The difference was that AEW had to be airborne, because there is some water around the UK. Even with the best airborne peek over the horizon, the phrase 'three minute warning' summed up how much

time was available from first detection to when those Victors and Vulcans had to be in the air. I believe that in the 1950s and 1960s the AEW role was performed by carrier-borne Fairey Gannets and that this is probably a picture of one. Not surprisingly, by the 1970s the need was recognized that these should be replaced. The solution *was* surprising, and I have to think it was meant as a stopgap. It was to take Avro Shackletons and convert them to taildraggers so that a radar could be carried under the nose. The Shackleton, at a glance, is easily mistaken for a Lancaster (at least by me), but it has different engines and contra-rotating propellors. The AEW conversions entered service in about 1971. It is amazing to think that the UK's front line AEW role continued to be provided by these aircraft right up to 1991, and they were fitted with a radar originally designed in 1944 and simply taken out of the Gannets for re-use. In the picture, the Shackleton is the one in the foreground ! When I was at BAe Woodford working on the Nimrod, an in-service Shackleton visited for some testing, (of which I can't remember the details). Climbing on board was like instant time travel. It was no preserved museum piece. Everything was fully functional. You had to climb over the wing spars to reach the cockpit; there was no trim; and the toilet was not much more than a hole in the rear cabin floor. It had the feel of being in use and as though it's next mission could be to go and take out a dam in the Rhur. Now, the thing about Lancasters, Shackletons, Vulcans and Nimrods is that they were all AVRO products . Although, admittedly, the Nimrod was converted from the Dehaviland Comet. When Dehaviland went bust in the early 1970s a lot of their people moved to what was then Hawker Siddeley at the Avro Woodford factory to continue looking after the Victor as well as contributing to Nimrod projects among other things. The maritime surveillance, MR, Nimrods were already well established by that time. To make a Nimrod from a Comet involved installing more powerful Spey engines, losing most of the windows, fitting a full length pannier for the bomb-bay etc, and stripping out all the interior to make room for a planeful of avionics. The picture shows a Nimrod MR2. I believe that these have visited Abbotsford for the Airshow at least once. However, the usual reason for coming to Canada was to conduct cold weather trials. The in-flight refueling probe over the cockpit was fitted during the Falklands war in 1982. There were additional airframes available, and in the mid 1970s the go ahead was given to create an AEW Nimrod using a GEC Marconi radar.

I started at the Woodford factory of what had then become British Aerospace in 1978, when the design work for the Nimrod AEW was already well under way. The basic idea was to put a huge microwave radar in a radome in the nose, and another one, just as big in the tail. Aerodynamically it looked very unlikely to fly. But it did. I think this was in large part to a lot of very

strategically position vortex generators that kept air flowing to the wingroot-mounted engines, and over the rear control surfaces. On the ground the front radome only cleared the tarmac by inches. This pictures doesn't really give enough impression of how big those radomes looked up close. The first radar development aircraft looked even odder. It was a Comet with just the nose radome, so not having the Nimrods pannier made the radome look even bigger; but I cant find a picture of this aircraft.

I was in the Mechanical Systems Office, which was responsible for things like fuel systems, hydraulics, cabin conditioning, landing gear, and avionics cooling. For the AEW our major task was to create a system that could keep all those radars and avionics cool. The heat load was very high, and on an aeroplane the only place it can be dumped is to the air as it blows past. However, no additional tampering with the aerodynamics was going to be acceptable – to perform the mission already required a large angle of attack which meant that equipment operators, who sat sideways in the cabin, would lean to one side for hours, and the walk to the front of the cabin was definitely uphill. It was this cooling system that I became involved with. The design recognized that the wings were the only available radiator surface on the aircraft. But, to just somehow transfer the heat to the fuel, then pump it out to the wings wouldn't provide enough cooling. All that would do is to make the fuel hot. Fortunately the wing stringers on the Comet wing are tophat stringers, so, with the wing skin they form a closed passage of approximately triangular cross-section. If hot fuel was pumped outboard through these passages it would maximize the heat transfer through the skin to the outside air. The ends of the stringers had been originally left open, so they all had to be closed off and plumbed in to the heat transfer system. The basic protocol was to have large heat exchangers in what was previously the bomb-bay, from which hot fuel was pumped out through the stringers to tank 4 in the wing tip. Of course the engines already took their fuel from the pannier tank and inboard wing tanks before even thinking about the outboard tanks.

To get the waste heat from the avionics in to the fuel was another problem. The MR Nimrods had used a fairly simple suck system that pulled air from the cabin through the electronics and along the cabin roof to five fans at the rear which dumped hot air outside the aircraft. Replacement air was provided by the cabin conditioning system. This system was retained because there were a lot of units common to both aircraft, but it was obviously not capable of handling the much bigger heat load of the AEW. This high load prompted the creation of 3 closed-loop air cooling systems and two liquid cooling systems. One liquid system used a water-glycol mix, and the other used a saturated chlorofluorocarbon, dichlorodifluoromethane, that went by the tradename PP3. The air loops picked up heat and transferred it to water-glycol system. The PP3 system flooded the electronics and travelling-wave tubes which were at the heart of the Marconi microwave radar design. The water-glycol and PP3 systems transferred heat to the fuel via the heat exchangers in the pannier.

My first tasks were the header and top-up tanks for the

water-glycol and PP3 systems. Both fluids expand and contract with temperature, and the header tanks included a contents monitoring function, because it was critical that fluid levels did not get low, and the weight of large top-up tanks would be too much of a penalty. The PP3 was actually very heavy. It's specific gravity was 1.8, but it looked just like water. We were told it cost 180 pounds (sterling) per gallon.

I also did a lot of work on the commissioning equipment and procedures, and the ground support equipment for the liquid systems. It was critical that the PP3 maintain its dielectric strength, because it actually flooded the travelling-wave tubes where it picked up heat in a nucleate boiling mode and also electrically insulated all the components from each other. So the fluid couldn't have any particles in it, and the system had to be perfectly clean. To clean the system before putting the PP3 we modified surplus GSE trailers that had originally been built for the Victor avionics systems. They held 35 gallons of Arklone which is basically dry-cleaning fluid. Pumps on the trailer circulated the arklone through the aircraft system. Once particulate sampling standards were met, the system was drained back to the trailer and then dried out. In those days we believed that chlorofluorocarbons were perfectly harmless and inert. The whole trailer system was simply vented to atmosphere, and to dry out the aircraft system we blew hot nitrogen through it, while also using big heaters on the heat-exchangers which were at the lowest point in the system. The process put a lot of CFCs into the atmosphere, but that Arklone was a great solvent and really cleaned things out well.

The other thing about PP3 was its propensity to dissolve air. Left open to the atmosphere, it absorbed air. This was a problem because the partial pressure of the dissolved air was such that in the nucleate boiling mode the air could come out of solution. That would mean no boiling heat transfer locally – causing local over temperature, and no dielectric capability in the air bubble. So before putting PP3 on the aircraft all the dissolved air had to be removed. We did this by applying vacuum above the liquid, this sucked out the dissolved air. The down side was that it also evaporated a lot of that precious liquid. At the time we accepted the high cost of blowing away expensive CFCs, but never thought of other consequences.

At one point I needed to source some schrader valves with Viton elastomers for use as bleed valves in the PP3 system. The sales rep was very keen but wanted to know how many we needed. I think their orders for schrader valves were usually in quite large numbers. I only needed six per aircraft. I think each of those valves ended up being very expensive.

Anyway, the whole avionics cooling system worked great. It was capable of keeping everything cool just using half its capacity and pumping hot fuel to just one wing. We also did a lot of changes to the hydraulics and a number of other fuel system modifications. I've already said that the aerodynamics obviously worked, even though the shape was quite odd. The reason that the project was cancelled was not because of the aeroplane. The problem was with the mission system avionics and radar, which was GEC Marconis part of the project. Despite great efforts, these problems could not be resolved. I think there were both hardware and software issues. In 1988 a Boeing proposal to supply E-3D Sentry aircraft was accepted and the Nimrod AEW project cancelled after having cost over one billion pounds. The AEW airframes were too grossly modified to be converted back for use as MR aircraft, so they were scrapped. However, I do still have the only unit ever made of an ejector pump intended for transfer of fuel from the wing pod tank 4A to the number 4 tip tank. This was something I designed myself. It was manufactured at great cost, and bought as scrap by me for 38 pence.

The E-3D Sentry aircraft entered service in 1991, allowing the Shackletons and their very old radars to go into well deserved retirement.

Editor Comments:

My thanks to president Steve for the article on his involvement with the AEW Nimrod. A very interesting read. Also to Bob Robertson (our COPA Flt 83 rep) for reporting his personal experience with the PCAS. Rick has been faithfully passing on his B/S reports. What's with snow on the ground in Langley, March 9th? Looking forward to spring. Added a page listing events for possible club fly-outs. Appreciate all your submissions.

ME AND MY PCAS MRX. By *Bob Robertson*

The single issue which cemented my decision to purchase the Zaon MRX PCAS (Portable Collision Avoidance System) followed an incident at the Chilliwack Airport in January 2008.

I was approaching the Vedder Canal and spotted a 172 meandering in a south eastern direction towards the Cultas Lake area. I made my initial call to Chilliwack traffic and stated that I was inbound for a landing, over the Vedder and Highway #1 at 1500 feet and descending, along with my intentions to fly eastbound over the Fraser River. Three nautical miles out, I made another call to Chilliwack traffic announcing my position over the Fraser River and my intentions to report over the city. The only response was from an aircraft in the circuit and he was reporting downwind right, runway 7 for touch and goes. I reported over the city and stated I would call crossing midfield. As I was approaching midfield, the local traffic reported downwind right for touch and goes on runway zero seven. I called crossing midfield, reported my position & altitude, spotted and acknowledged the downwind traffic ahead in sight and stated I would report joining downwind right hand for runway zero seven for a full stop.

No sooner had I completed my report and was checking for additional traffic to the left before I initiated my turn, when I was startled by a 172 that crossed from left to right in front of me and was about 30 feet lower. I recognized the aircraft – it was the same one which I had spotted near the Vedder. Apparently the pilot had joined the circuit from the south and had not made any calls up to that point. I widened out my turn and once established downwind right, I called again mentioning that I was now number 3 following an aircraft which wasn't making any radio calls. This prompted the pilot to stammer out a response that he was now on downwind and was going to do a touch and go. I wasn't too happy.

MRX Mounted on flight deck of LCR

The following day, I ordered a Zaon MRX from Calgary Pilot's Supply. It is a compact unit smaller than a deck of cards and sits unobtrusively on my glare shield without impairing my ability to scan for traffic. The unit can be powered by 2 double AA batteries and also comes with a power adapter. Installation is simple with 4 Velcro mounting dots, also supplied.

Before I installed it in my aircraft, I took the unit out to the airport and parked along the ring road close to the approach it Runway 19. From there, I had an unobstructed 360 degree view of the sky and with the help of the instruction book (which is excellent) I fired up the unit and was able to work my way through the pages of the instruction book without flying into anything. With all the traffic around and at different ranges and altitudes, it was easy to relate to what the unit was displaying and the surrounding traffic.

Without getting into all the nuts and bolts of what goes on under the hood of the unit here is a brief description of how the unit works (with some help from the Manual. Download the Manual from the Web site for more information.)

What is PECAS?

PECAS, which stands for Portable Collision Avoidance System, is a trademark of Zaon Flight Systems for technology similar in function to TCAS (Traffic and Collision Avoidance System). Their informative web site is located at this address;

http://www.zaon.aero/

How does MRX work?

MRX is a stand-alone passive system. Passive systems are different from active systems such as TCAS etc. Active systems can be found in commercial airliners, corporate jets and higher-end general aviation aircraft. They actively interrogate aircraft transponders within a specific range. Passive systems like the MRX listen for the replies to these interrogations, as well as for ground-based RADAR interrogations.

The Traffic Screen.

The unit has a Traffic Screen where traffic is displayed in range and altitude relative to your local altitude (above you or below you, as indicated by + or -). It shows Range in Nautical Miles, Relative altitude above or below in 100s of feet (FL) and Vertical trend indicator (arrow showing up or down). Vertical trend is based on the target's actual altitude ascent / descent rate, not the relative altitude change rate.

MRX Indicating traffic 0.9 NM + 100 ft.

The Importance of Relative Information.

The key to displaying smooth understandable traffic information is relativity. If the information is always relative to your aircraft, you are your own point of reference. Range is relative to your location, as is the relative altitude (i.e. +600 above you altitude). For instance, if only the altitude of the other aircraft is known, you would have to find your own altitude by another glance at the altimeter then do the math. However, MRX contains these instruments and will do these calculations for you. You will see a live, relative representation that requires no translation, whenever you glance at the MRX display.

Traffic Advisories and Alerts

The MRX unit has operator selected ranges and altitudes. The range settings are 5 NM, 3 NM and 1.5 NM. Altitude settings are +/- 5000 ft, +/- 2000 ft or +/- 500 ft. The default setting is 5 NM and +/- 2000 feet.
The easiest way to picture the unit's operation, is when you turn on the unit and select the range and altitude coverage, you create a bubble of awareness around your aircraft. The width of the bubble is defined by range and the height is defined by altitude. The width and height of the bubble can be reduced on one or both axis.
Using the 5 mile radius and 2000 ft default setting as an example, your bubble is of that size. You will receive an Advisory alarm if traffic comes within 1.5 NM & +/- 1000 ft. If the traffic comes within 0.9 NM & +/- 700 ft you will receive an Alert alarm. These alarms are attention getting. The Advisory alarm is lit up on the display along with 2 loud audio beeps and the Alert alarm is also lit up on the display with 4 loud beeps. The Advisory and Alert alarms are different depending on what the range setting is. However, vertical trend is also used to prioritize when two aircraft are on converging paths and both are within +/- 1000ft. Alerts and advisories are determined by the range to the aircraft, are on converging with them, and what range setting you have selected.

Advisory Alert (Difficult to photograph w/digital camera)
Unit will then show range, altitude & vertical trend after Advisory warning

Threat Prioritizing

MRX tracks the most significant threat to your course of travel (the primary aircraft). Should MRX determine that a new aircraft has become a greater threat than the one currently displayed, the unit will beep once and NEW will be displayed for two seconds, followed by the new aircraft information.
Following the rule that "accidents can only occur at your altitude" the aircraft with the least vertical separation, or where the relative altitude is less than any other, is determined to be the primary aircraft.
The unit is able to calculate distance and altitude relative to the unit. It is important to remember that if an aircraft does not have a transponder, if the transponder is not turned on or there is no radar coverage in the area to interrogate a transponder, then no signal will be received by the unit. Another important aspect to realize is the MRX will not give you a bearing to the interrogated unit. It will give you range, altitude, and vertical/descending trend of the target relative to your position but not a bearing relative to your position. The more expensive Zaon unit, the XRX does have the ability to indicate quadrant direction.

When it comes to threat prioritizing, the primary aircraft is chosen by using the following criteria.
Threat aircraft relative altitude separation (vertical separation).
Threat aircraft vertical trend (ascending or descending over time).
Local aircraft vertical trend.
Range to target, if two or more aircraft match with regard to the above criteria.

Traffic 1.9 NM, 700 feet above (+ arrow) Vertical trend, climbing (up arrow)

Roberto's Observos.

All in all I am quite happy with the unit and consider it money well spent. Battery life is pretty decent, the display is easy to read, audio alerts catch you attention even if you're wearing a headset, and the setting of range/altitude is pretty intuitive.

Because the unit has a built in altimeter, it will work in aircraft that do not have a transponder such as gliders or if you are below radar coverage, the internal altimeter allows PCAS to function normally, establishing a base reference for your altitude and displaying relative altitude for traffic, so if you're below radar coverage it will indicate traffic in the radar coverage. There are other functions available such as being able to view you local squawk code, your internal altimeter altitude and the altitude your transponder is reporting.

It continues to be a learning experience every time I use it. I consider the MRX to be a back up to my regular scan and never depend solely upon it for spotting traffic.

An old pilot was once asked what he used for navigation since his airplane wasn't equipped with the latest GPS and flat screen navigation units – his response was "a clean windshield and a current map." So I will paraphrase his comment by saying I use" a regular scan, a clean windshield and carry extra batteries for the backup unit."

It is always nice to know ------ ***"Who is out there?"***

Here are conditions when the MRX comes in handy. (Flash wiped out display)

Please feel free to contact me should you have any additional questions or want to see how the MRX works.

Flying Events Calendar:

Following are a few upcoming events that would make for some fun club fly-outs.

April 25, 2009 **Skagit Tulip Fly-In and Airshow**, Burlington, WA. 360-757-0011.

May 2nd – **Vernon Flying Club Annual Rust Remover**, Vernon airport.

May 10th, Cache Creek, BC (AZ5): **10th Annual Fly-In** breakfast from 8:30 a.m. until noon. Located at the Cache Creek Airport 50 Miles West of Kamloops and 11/2hrs from Chilliwack. Everyone welcome flying or driving. For more information pleas contact Andy Anderson 250-453-2281 or 250-457-7333, email ashirl@telus.net.

May 16, **Summer Thunder 2009** YCW Chilliwack, BC 604-270-4269

June 6, 2009, **Chelan Pancake Fly-In** Chelan, WA. (S10). 509-682 4109.

June 6, **Nanaimo Flying Club's Annual fly-in**.

June 12, 13, 14 **The 4th Annual Lumby Air Races** will be held in conjunction with Lumby Days. Closed circuit triangle and rectangle racing for HG and PG, around the town of Lumby BC

June 20, **Boundary Bay Air Show** ZBB Boundary Bay, BC 604-946-5361

June 21st, Vernon, BC: The Silver Star Rotary Club presents it's **1st annual Wings and Wheels** event from 10:00 a.m. to 4:00 p.m.. New, experimental, automobiles, bicycles, RV's and more. Attention pilots **Vernon Flying Club pancake breakfast** for fly-in's from 8:00 a.m. to 10:00 a.m.. Happens rain or shine, indoor and outdoor exhibits and seminars, on site food vendors, nearby parking and shuttle services. Tickets at the gate for $5.00 per person, $20.00 family and children under 6 are free. For more information please visit our website at www.silverstarvernon.org.

June 27th, Langley, BC (CYNJ): **Langley Fly-in**. Homebuilts, certified, ultralights open to all. Celebrating 100 yrs of Canadian flight with a special display of Canadian designed and mfg'd planes. The ladies as always will have hot dogs, chili and their famous pies for sale. Awards, seminars and prizes. Hosted by the Langley Aero Club. For more information please contact Ken Wardstrom 604-882-0799 or email kenward@axion.net.

July 4th, Pemberton, BC, (CYPS): COPA's Flight 151/**Pemberton Flying Club 3rd. Annual Fly-**in. Come and enjoy the day with us and show off your aircraft. BBQ provided by Pemberton Lions. Hours are 11:00 to 15:00. Whistler Skydive Demo and More. For more information please contact Christine Timm 604-894-6676 or email cmtimm@telus.net

July 4, 2009, 8am – 5pm. **Annual Hope Flight Fest**

July 4 **RAAC Chapter 85 Fly-In** CAK3 Delta BC b.prior@ieee.org http://www3.telus.net/airpark/

July 8-12 **Arlington Fly-In** AWO Arlington WA. http://www.arlingtonflyin.org

July 18, 2009, **2nd annual Princeton Airport Appreciation Fly-In.**

Jul 18 – 19 2009 **Nimpo Lake Fly-In** COPA flight 72, 12th annual BC Floatplane Ass'n AGM & Social. Located at the Nimpo Lake Resort, N end of Nimpo Lake. Guests welcome to all events. Presentations, lots of door prizes, silent auction, feast, & "refreshments" provided. Dance to live band Sat. nite & our Pres. cooks pancake breakfast Sunday before the fly-outs. Lots of dock space, concrete ramp & parking, dirt strip (100X1600) right behind, and Anahim Lake paved strip only 15 (road) minutes away. For more information please call 250-742-3239 or email 12th annual BC Floatplane logan@xplornet.com.

July 24-26 **North Cascades Antique Airplane Fly-In** 3W5 Concrete WA

Abbotsford Flying Club
30540 Approach Drive
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Phone 604-854-3670

Abbotsford Flying Club Newsletter
Published Bimonthly
Distributed to members and flying clubs
www.abbotsfordflyingclub.ca

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Calendar of Events

Ongoing Events

- Sundays: Fly Outs 0800 - 1200
- Fridays: TGIF

General Meetings: 730 pm

March 11	April 8	May 13

Executive Meetings: 730 pm

March 25	April 22	May 27

Programs: March 11: Donn Richardson: Aerobatics

Upcoming Events

Date	Day	Time	Event
March 20	Friday	17:30	**TTTT-TGIF. Spring Equinox and St. Patrick's Day**. Green drinks and green livers. Come out and join us. Bring a friend. Contact Rick at hangar14@shaw.ca
March 21	Saturday	09:30	**Clubhouse, hangar, and airplane clean-up day**. 09:30 and on. Drop in and help with our spring cleaning. Smokies on the BBQ when we are done. Contact Rick at hangar14@shaw.ca
March 28	Saturday	15:00+	**Pot-Luck Social**. 15:00 - ?? Dinner at 17:30. Games, contests, and fun. Invite your friends, neighbours, or family. Contact Rick at hangar14@shaw.ca

AFC Executive 2009

Steve Stewart	President	604-504-5998
Mark Thibault	Vice President Programs	604-855-4874
Tom Grozier	Treasurer	604-533-0005
Millie Watson	Secretary	604-852-4598
Bob Bryan	Director Membership	604-826-1128
Dean Lundstrom	Director Building & Social	604-8549-416
Rick Duerksen	Director Social & Building	604-835-2145
Chris Konrad	Director Aircraft Maintenance	778-808-1218
Ton DuCrocq	Director A/C Safety & Flyouts	604-530-2876
Keith Sim	Director Bar & Flyouts	604-864-0093

AFC Air Show Directors

	Steve Stewart	604-504-5998
2-year	Brian Burke	604-504-0993
	Jonathon Dugdale	604-870-1807
	Bob Fatkin	604-854-5655
	John Palmer	604-859-6884
	Horst Rode	604-599-4842
	Jim Webb	604-859-8431
1-year	Aaron Edwards	604-313-0880
	Ron Price,	604-856-9830
	Donn Richardson	604-941-0595
	Auggie Rinz	604-888-5740
	Renee Robertson	604-941-6611
	Larry Runnalls,	604-864-0226