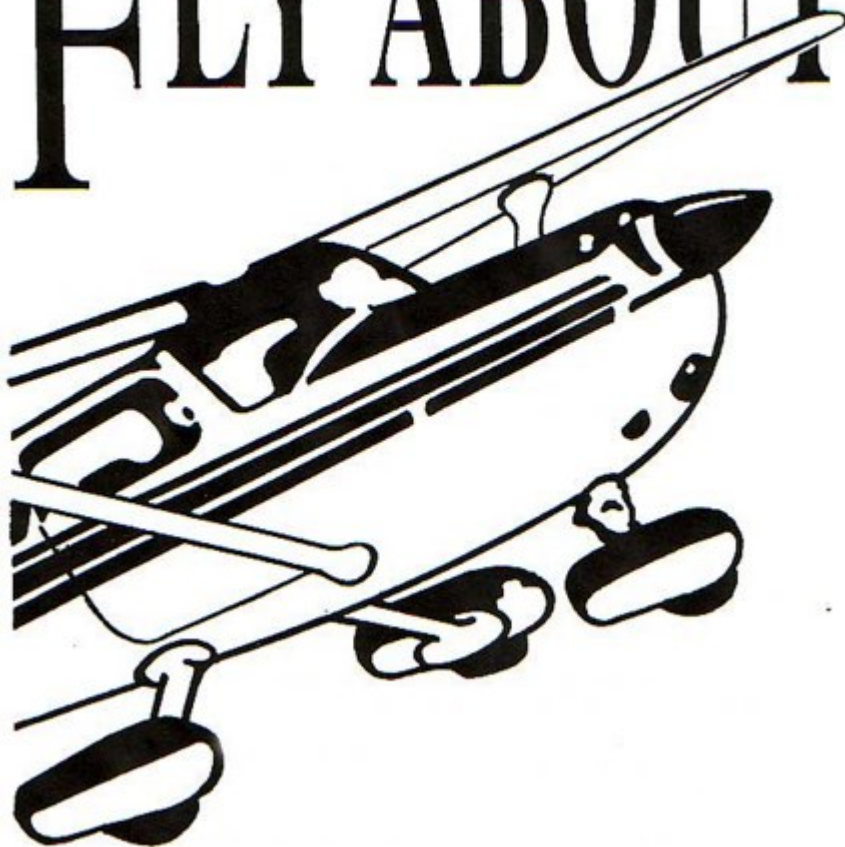


FLY ABOUT



OFFICIAL ORGAN OF THE NORTHAM AERO CLUB (INC)

POST OFFICE BOX 247 NORTHAM WA 6401

PRINT POST 100018823

Volume 45 Issue No. 10

October 2014



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Club Presidents Report

Another busy month gone by, nearly Christmas already. The Committee for the National Hot Air Ballooning Championships 2015 held a very successful afternoon tea/information session for local businesses, community groups and interested persons. This event was held in the Northam Aero Club Clubrooms and the afternoon exceeded the Committees expectations in the number of attendees.

The following Wednesday, the Northam Aero Club held an airfield tour for the Northam Shire Senior Executive Managers and Shire Councillors. This was a successful afternoon and attended also by local Hangar operators. One of the Councillors that I took up for a flight was Cr Ray Head. He enjoyed, yet again, his flight but on Friday he sadly passed away quite suddenly. I am very saddened to hear this news but feel honoured to have taken him up for his last flight and offer my sincere condolences to his family. Another fellow pilot, Rod Carter, who was the Cunderdin Shire President and a very keen Glider pilot also passed away on Monday. Rod took me solo when I was gliding in Cunderdin. My deepest sympathy to Wendy and family. Ray and Rod will both be dearly missed.

We have started to have a few students and pilots taking lessons with our Instructors, with some going on to complete their Licences, great to see. Once again, Peter ran the monthly competition which was enjoyed by all. Check out our Calendar in the Flyabout for up and coming events.

MJ, our Flyabout editor, has moved back to Victoria from Darwin and I have a bet with Heather being a Melbourne girl herself that MJ you will not last a year back in Victoria after having lived in Darwin. Ha ha ha.

Enjoy your flying all,

Cheers, Errol

Club Captains Report

Sunday 12th October and we waited until 9.30 am for the cloud base to lift above minima, which it obligingly did. -- so-- wind is 140 at 15 knots, should make this one interesting!

MOKINE SORTIE- N.A.C. October Comp.

1942 October 9th 11.42 am, RAAF Avro Anson crashes and burns, its 4 crew perish.

The crash site is approx. 9.5 nm from YNTM. There is a dedicated memorial at the crash site on Avro Anson Rd Mokine.

IN MEMORY of this, NORTHAM AERO CLUB AIRCREW overflow this site in tribute as part of the monthly Flying Comp.

With nominated times and tasking as follows:

Take off and climb to 2,500 ft east of airfield.

TIME STARTS with Overhead Departure radio call maintaining 2,500 ft tracking 200 degrees for Spencers Brook. At Spencers Brook, track 253 degrees for Mokine Memorial Search Area, (appr 4 nm) .

Crash Site / Memorial is in trees just off "L" shaped bend in Avro Anson Rd. approx co-ordinates: lat/long -- 31°45' / 116°35'. -- only approximate.... Marker is WHITE post and rail FENCE running north/south just west of site. Report Ground Crew activity/details etc here:

Depart crash site tracking 080 degrees and descend to 1,500 ft (for separation) for appr 9 nm to intercept Northam-York Rd, at Carter Rd "T" junction. 2 tanks should be visible.

Report ground Crew activity / details if any here:

Depart "T" junction tracking 005 degrees, climb to and maintain 2,000 ft, and make INBOUND call.

At Gt Eastern Hwy, maintain 2,000 ft and position aircraft for a midfield cross to the dead side.

TIME FINISHES with "overhead crossing to the dead side" radio transmission....

Aircrew were supplied with VTC map with all tracks drawn in and "crash site" marked accurately.

Closest to their nominated time was first, next closest was second, and so on.

Each pilot handed his Nominated Time to the judges in a sealed envelope to be opened at de-brief post event.

As "esteemed Judges" Dave and Sean posted the actual times on the board at de-brief , Peter had a big smile on his face, 'cause he was only two seconds off ,

BUT Ashley's was next sealed envelope opened , and that wiped the smile off Pete's face! ONE SECOND out! Well done Ashley!.

Judges were Gail and Mavis stationed at "crash site" with flashing beacon to attract search aircraft to the location.

Dave and Sean at YNTM presiding over Start / Finish times and Departure/ Inbound / Overhead arrival radio transmissions.

THANK YOU to all our judges, we really appreciate your input, as always.

Howie took charge of the barbeque/catering for the day , thank you for that Howie, our many visitors loved your cooking!

as usual our pilots flew well and were very safe in their flying; our pilots flew with some of our guests as passengers,they all loved it.

We welcome a new competitor in Geoff Winsor flying a lovely early 172 looking like it was only made yesterday,thanks for joining us Geoff.

RESULTS (placings were only a short time interval apart in most cases)

Flying Comp Placings : 1st Ashley, 2nd Peter, third Geoff Winsor at his first attempt, good on you Geoff,love your plane!4th Dave and 5th Errol, who was, according to him,

lured off course by a couple of mermaids at Farmer Browns Fish Farm.(is that where you lost your starboard wheel spat mate?)

NOTE: the Club Cessna 172 is there waiting for you all,she wants you to fly more and practice for the next comp in the next 30 days while you indulge in the passion.

Club Aircraft Bookings -ring Matt on 0407873700 or 0896223001 / email big.matty@hotmail.com

NEXT COMP is Sunday 9th November. Circuit work or straight in approach / local flight combo.

Full details to all pilots next few days, so there is plenty of time to practice eh?

Cheers, Peter Hill.

Bob Emery's - Oz Runways Tips

Lets plan a flight Northam to Albany, to Kalgoorlie, to Northam.
There are several ways to do this.

Here's an easy method.

Open OzRunways

Open Perth VNC on map button - Change to WAC when required from map button.

Touch the map near Northam (or search for airfield)

Select YNTM ala. You can save the FAC if you wish for future use as a favorite, by opening FAC then add button, RHS top, then one of the five top buttons to store, (you can overwrite stored FAC,s)

Select Set YNTM as origin of plan

Scroll map to Albany, touch near it, select YABA AD and select add to plan

Check map button to see route now appears on map

Continue as above by adding YPKG, then YNTM. Touching on the name on plan sheet means a landing, (changes to green colour)

Try adding FAC for each airport to favourites

Try inserting waypoints eg Kattanning, on any leg by holding finger on route leg and dragging to a new way point, select insert into plan. Create your own waypoints by touching map, naming.

Check plan sheet any time by touching top LH button.

Try editing altitudes, from plan sheet to 3500, 3500, 4,500 ft. Note your plan is now saved on plan button. Delete plans by swiping. Add winds and note changes to plan sheet times and headings. Hit go fly before you go.

Enough for this month. Next month we will look at creating and submitting a flight plan including SARTIME from our plan. Have fun. ClearProp!

OzRunways Evening

at

NAC clubrooms Sat Nov 29 @ 7pm.

All welcome, bring your Ipad or just yourselves.

Enquiries to Bob Emery 0419 043 583.

bobemery51@gmail.com

Sheep on a Spit



Come down to
Northam Aero Club
9th November at 2.00pm
and join us for a
Sheep on a Spit dinner.
Baaahh open, see ewe there!!

Look out skies, here I come

Well I thought the trip from Maitland to Darwin (via Bourke, Thargomindah, Mt Isa, Birdsville and Borroloolah) in the PA-28-160, VH-RTL was the “bees knees”. Two days of non-stop adrenalin rush, however our following trip, Darwin to Benalla (Victoria) two months later was ‘the icing on top of the cake’. After leaving Darwin at 6am, we headed to Tennant Creek. Clear skies, full tanks and a fist full of kit-kats. And of course, we were wearing Ray-Bans. What more could a girl SKIPPING WORK want? Well more of an “old girl” actually. All of this old girls flying lessons, all ten and a half hours, had been at Bankstown so a chance to join my brother on the first trip was the ultimate flying experience. I have learnt so much, how to fuel a plane, for a start. I viewed amazing sunrises over remote outback Australia and sat staring at the horizon from sunrise to sunset. None of which I had the opportunity to experience in an hour or so lesson at Bankstown. Here we were- off again. This could become addictive.

After a brief pee, fuel fill and oil check at Tennant Creek we were off to Alice. This leg was truly magnificent. The glowing red soil and ranges filled me with pride. Aah! This is why foreigners consider us Aussies so bold and raw. Are we a product of our land? At 6,500 feet I had to remark to my pilot that “I sure am glad that this big rough country was my place of birth”. The pilot agreed “it’s the land to call home”.

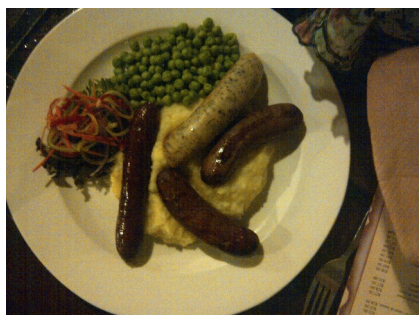
Initially we had hoped to get to Coober Pedy for the night however, daylight was running out a lot quicker than we had planned, so an overnighiter at Alice Springs it was. We bedded down at Elkira Motel. Close to the Airport and conveniently opposite Kmart, where we purchased some much needed cushions for under our numb bums. Directly behind Elkira is the Overlanders Steakhouse Restaurant where I enjoyed croc, emu, camel and roo bangers and mash. My brother went for a more conservative, traditional mixed grill. The décor & memorabilia is amazing it is just like dining in my grand-fathers old tin shed on the farm!

A good sleep and early start had us in the air and on our way to Coober Pedy by 630am. We discovered that Alice Springs Airport didn't open until 8am so we could have skipped the flight plan. The day was clear and comfortable with a good strong tailwind. We made good time, averaging 120 knots groundspeed and topping it off with a ground speed of 149 knots at one point. From Coober Pedy to Leigh Creek we maintained good time and after a brief, and I mean "BRIEF", pit stop we headed to Mildura, only to find we did not have the appropriate carnet card for the bowser. This problem was solved very quickly by a very kind Mildura Aero Club member, (Denis Moy) who provided us with his carnet to access the bowser. I was keen to do some navigating, so after some discussion my brother finally relinquished his WAC chart. There's something about men and women navigating a vessel together, be it cars, boats or planes that infuses "TENSION". This necessitates a whole other article, which I'm sure my brother will organise. Racing the end of day light cruising at 4500ft we let the winding Murray River guide us on the final leg of our trip. Sunset was at 18:02 and Last light was 18:34, touching down at Benalla at 18:12, with not much daylight left. After such a wonderful trip I didn't feel tired, all I could think about was when could I do this again.

The cockpit of our little plane
VH-RTL "Rattles"



Our "Coat of Arms" on a plate!!
My delicious meal from the Overlanders Steakhouse, Alice Springs



FOR SALE



Sky Arrow 650TCNS

Currently hangared at Northam

Year	2007
Time In Service	120hrs
Category	Utility (<i>Certified Day-Night VFR</i>)
Engine	Rotax 91S
Prop	Hoffman Fixed Pitch
Nav/Com/GPS	Garmin GNS430
Audio Panel	Sigtronics SPA 400
Transponder	Garmin GTX-327
Avionics Other	Emergency Locator Transmitter

Call Geoff Hill 0418 854 538

The Man Aviation History Almost Forgot

Charles E. Taylor

by Bob Taylor

Three men were involved in the invention and development of the first powered airplane -- that's right three. Everyone knows about the Wright brothers; but that third man was Charles E. "Charlie" Taylor, a quiet genius who loved cigars and the sound of machinery. Although he contributed in a major way to one of man's greatest achievements, his name was almost lost in aviation history -- and if it hadn't been for Charlie that first powered airplane would never have gotten off the ground.

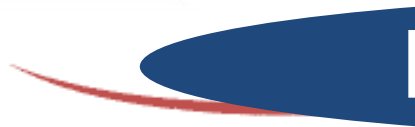
Charlie Taylor was born on a little farm in Cerro Gordo, IL, on May 24, 1868. As a boy, Charlie moved to Lincoln, NE, with his family. Charlie quit school at the age of 12 and went to work as an errand boy for the *Nebraska State Journal*. However, Charlie was mechanically inclined; so later, when he began working with machinery in the *Journal's* bindery, it came easy for him.

When Charlie was in his twenties, he moved to Kearney, NE, where he went into the business of making metal house numbers. In 1892, Charlie met a young lady named Herietia Webbert, and married her two years later. In 1896, the Taylors moved to Dayton, OH, where Charlie worked for Stoddard Manufacture, which made farm equipment, and later bicycles. It was in Dayton that Charlie met the Wrights. Mrs. Taylor's uncle rented the building on West Third Street, next to the Wright brothers, for their bicycle business. This was a convenient connection, because, in 1898 when Charlie started his own machine shop, Orville and Wilbur Wright brought him special jobs, including a bicycle coaster brake, which they had invented but later dropped.

Charlie eventually sold his tool shop for a profit and went to work for the Dayton Electric Co. However, he didn't like his job; so he gladly accepted, when the Wright brothers asked him to work for them at \$18.00 per week. This was a good decision for several reasons: the Wright brothers' shop was only six blocks from where Charlie lived, he could ride a bike home for lunch every day, he was making eight dollars a week more, and he liked the Wright brothers a lot.

Charlie started to work for the Wright brothers on June 15, 1901, doing routine repairs on bicycles. This let the Wright brothers pursue their experiments with gliders, which included many trips to Kitty Hawk. After one of these trips, realizing that they needed more accurate technical data than was available, the brothers decided to build a small wind tunnel, one with delicate force balance. With this, they could measure the amount and direction of air pressures on level and curved surfaces operating at various angles, and improve their theories, based on their gliding experiences.

Building the wind tunnel was the first job that Charlie Taylor did for the Wright brothers that had any connection with aeronautics.



Sun	Mon	Tue	Wed
2	3	4	5
9 Club Comps Committee Meeting Sheep on a spit	10	11	12
16	17	18	19
23	24	25	26
30			



November 2014

Thu		Fri	Sat
			1
6		7	8
13		14 FA Published	15
20		21	22
27		28	29

The wind tunnel was a rectangular box with a fan at one end driven by a natural gas engine. Charlie ground hacksaw blades and used them for balance in the tunnel. The Wright brothers did many experiments in their wind tunnel; and from this data they began to make their 1902 glider, with Charlie machining many of the parts. On August 13, 1902, the brothers shipped the glider to Kitty Hawk. They conducted several flights with the glider; and on October 31, 1902, the Wrights returned to Dayton to make plans for a powered airplane. Through their experiments, the Wrights were able to accurately predict the horsepower – eight -- which was needed to produce and achieve powered flight. The next problem was where to get a light engine that would produce eight horsepower. The Wrights knew that a steam engine might suit their purpose, but a gasoline engine would be safer and more efficient.

On December 3, 1902, the Wrights sent letters to almost a dozen automobile companies and gasoline engine manufacturers, asking if they could produce or modify an engine that would develop eight to nine brake horsepower, weigh no more than 180 pounds, and be free from vibration. Most companies replied that they were too busy to undertake building such a special engine.

Falling back on their own mechanical experience, the Wright brothers decided to design and build their own engine. They estimated they could build a four-cylinder engine, with four inch stroke and four inch bore, weighing no more than 200 pounds, with accessories included. By their calculation, it would develop the horsepower necessary to power the glider in flight. Now the problem was who was going to build the engine; but it was easily solved. The brothers decided that they would give the task to Charlie, while they would build the airframe. Charlie was excited about this new challenge. From his knowledge of mechanics and design, he knew that the engine design was basic, straight forward, simple, and capable of being successful. Charlie had very limited knowledge about gasoline engines; but he used his craftsmanship, genius, enthusiasm, and efficiency to tackle the task.

Charlie started building the engine in the winter of 1902-03. Without any formal drawings available, it was necessary for each part to be crudely sketched out by the Wrights or Charlie on a piece of paper. After a thorough discussion about it, Taylor would pin the drawing above his workbench and go to work to complete it. Using these sketches and specifications, he finished the engine in six weeks -- an amazing accomplishment.

I want to describe in some detail how Charles Taylor made the engine; so you can appreciate the craftsman he was. The first problem that Charlie and the Wrights faced was the crankcase. The case had to be light and strong. Aluminum was still a rare metal in those days, and it was difficult to get a good sound casting. John Hoban, foreman of Buckeye Iron and Brass Foundry in Dayton, took on the job of making the crankcase, using the strongest aluminum he had. The cylinders, which were turned from fine-grain gray cast iron, had a bore of four inches. The top and bottom of the cylinders were threaded, so they could be threaded into the crankcase and a water jacket could be threaded on them.

The next major task for Charlie was making the crankshaft. Being a mechanic most of my life, I would never even attempt taking on a project of making a crankshaft with the equipment that Charles Taylor had -- a drill press, a lathe (both run by a natural gas engine), and hand tools. Charlie secured a plate of high carbon tool steel that measured 1-5/8 inches thick, six inches wide, and 31 inches long. On the plate he traced an outline of the crankshaft and carefully, painstakingly drilled hundreds of holes along the outline of the crankshaft. This weakened the plate enough so he could knock the excess material away with a hammer and metal chisel.

Once this was done, he had the rough cut crankshaft ready for the lathe and the finish cut. With the small natural gas engine chugging away at full power, driving the wide leather belts that turned the lathe, Charlie turned out a near perfect crankshaft, to the thousandth of an inch. The next part that Charlie worked on was a fly wheel from a solid block of cast iron.

The connecting rods, intake valves, exhaust valves, pistons, valve guides, rocker arm, and numerous other parts that made up the complete engine were carefully thought out by Charlie and tailored to fit the operation of the engine. Charlie painstakingly assembled the engine part by part, fitting and refitting each piece, with the meticulous care of a jeweler making a watch. He scrutinized every detail. He assembled and disassembled the parts, time and time again, making sure of their operation, until all the parts were working in harmony.

It took a lot of genius and ingenuity; and the engine was finally complete and assembled in February 1903. Mounted on a test stand, it ran well, producing eight horsepower at 670 rpm and 11 hp. at 1000 rpm. Charles E. Taylor had successfully built the first aircraft engine.

As a result of the engine producing 12 horsepower at full rpm, the Wright brothers were able to add another 150 pounds to the aircraft, which allowed them to strengthen the wings and framework. The engine, with its dull propeller drive, drove two counter rotating pusher propellers by means of chains. The Wright brothers designed and tested propellers in the wind tunnel and built several propellers that would be used for the first successful flight. Charlie also made all of the metal parts, such as all of the metal fittings where the wooden struts joined and spruce spars and Roebling truss wires were attached.

On September 23, 1903, the Wright brothers left Dayton for Kitty Hawk to start preparation for man's first powered flight; and the *Flyer* followed on September 25. The *Flyer* was assembled and the engine was installed on November 2. To reduce the danger of the engine ever falling on the pilot in case of a wreck, it was placed on the lower wing to the right of center. When the engine was started, the vibration from the irregular firing caused failure of the prop shaft extensions. Charlie made new shafts out of solid steel which held up during the first flights.

On December 17, 1903, in the mid morning, after a run of about 40 feet at a rate of approximately seven to eight mph, the first successful powered aircraft lifted off and flew 120 feet in 12 seconds; thus introducing a new era of transportation. Although the first flight wasn't publicized that much, Charlie and the Wright brothers were very excited.

he Wright brothers decided to build another flying machine, but decided against going again to Kitty Hawk. They looked near Dayton for a level place for flying. After a few days of searching, the Wrights found a suitable ninety-acre pasture, often called "Huffman Prairie," which belonged to Torrence Huffman, a Dayton bank president. He allowed them to use it free -- provided they didn't run over his cows.

Charlie and the Wrights built a hangar to house the airplane, and moved into the new facility on April 20, 1904. Charlie took care of the field and facility, while the Wrights were going around the country and the world. He was the first airport manager.

In a 1948 interview Charlie said that he had "always wanted to learn to fly, but I never did. The Wrights refused to teach me and tried to discourage the idea. They said they needed me in the shop and to service their machines, and if I learned to fly I'd be gadding about the country and maybe become an exhibition pilot, and then they'd never see me again." How prophetic those last words were!

The Wrights were trying to sell the aircraft to the military and started to do demonstration flights at Ft Myer, VA, on September 3, 1908. Orville flew and Charlie kept the aircraft in good flying condition. On September 17, Charlie was slated to fly with Orville; but before the flight, larger propellers were installed to compensate for the heavier weight of the two men. At the last minute Charlie was replaced by Lieutenant Thomas Selfridge, a 20 year old West Point graduate from San Francisco.

During the flight Orville heard a strange noise. He looked around, but didn't see anything. However, he decided to shut the engine down and land. Suddenly, there were two large thumps and the aircraft shook violently, as Orville tried to control aircraft to the ground.

About 20 feet from the ground, the aircraft started to correct itself; but it was too late. The aircraft hit the ground, killing Lieutenant Selfridge and badly injuring Orville Wright. Lieutenant Thomas Selfridge became the first casualty in a powered aircraft. After the accident, Charlie investigated the crash scene and found that the new propellers, which they put on before the flight, had delaminated. Charlie reported his findings to Orville, who was in the hospital recovering from his injuries. Charlie was therefore the first person to investigate a fatal powered-flight accident.

Charles Taylor continued to work with the Wright brothers until 1911. At this time an adventurer and pilot, Calbraith Perry Rodgers, wanted to make the first continental flight across the United States. He purchased an aircraft from the Wright brothers, together with enough parts to build two more aircraft. Orville realized that the aircraft would not last more than 1,000 miles without proper maintenance; so he lent Charlie to Rodgers, knowing that he would be the only one that could keep the plane flying successfully for that

Charlie sent his family ahead to California and got on the three car train that was to accompany the flight. One car of the train was a repair car, in which the aircraft parts would be stored and the aircraft repaired. It took Cal Rodgers 49 days to cross the United States. Three days, ten hours of that was actual flying time. His longest single flight was 133 miles. He had 16 crashes; and the aircraft was repaired so many times that at journey's end only the vertical rudder, the engine drip pan, and a single strut of the original plane remained -- a tribute to the skill Charlie demonstrated in keeping the aircraft flying.

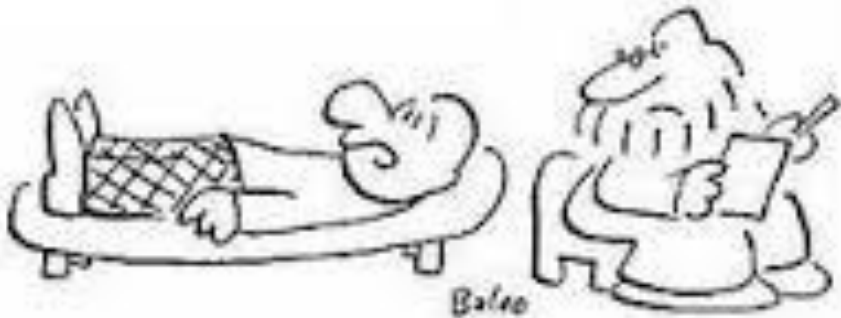
This was the last of Charlie's big adventures. He returned to Dayton and worked for the Wright-Martin Company until 1920. He eventually moved to California and lost touch with Orville Wright, but things turned bad for Charlie. The Depression hit and Charlie's machine shop failed. He lost his life's savings in a real estate venture and his wife died. Charlie Taylor's contribution to aviation was forgotten until 1937 when Henry Ford was reconstructing the old Wright bicycle shop in Dearborn, MI.

Detectives found Charlie working at North American Aviation in Los Angeles for 37 cents an hour. None of his co-workers realized he had built the first aircraft engine. Charlie worked for Ford until 1941, when he returned to California and worked 60 hours a week in a defense factory. However in 1945, Charlie suffered a heart attack and was never able to work again.

In November 1955, a reporter discovered Charlie in Los Angeles General Hospital's charity ward -- he was almost destitute. His income was his Social Security and an \$800 a year annuity fund, belatedly established by Orville Wright before his death in 1948. The aviation industry immediately started a campaign to raise funds for Charlie. He was moved to a private sanitarium, where he died a few months later on January 30, 1956, at the age of 88. Having no close relatives, Charles E. Taylor was buried in the Portal of Folded Wings Mausoleum, dedicated to aviation pioneers, located in Valhalla Memorial Park, Los Angeles.

Charles E. Taylor was the last of the three that shrunk the world by building the first successful powered airplane – he was the mechanic who made the flight possible.





"It's not flying I'm afraid of — it's
driving to the *airport!*"

HANGAR SPACE REQUIRED

Hangar space required at Northam for a C172
Owned by a Northam Aero Club Member:
Either rental or would be possibly interested in
looking at purchasing a hangar,
If you can help please call:

Tony Sandler 0400 229070

Mavis's Munchies

Nearly sixty years ago there was a recipe on the Cadbury Cocoa packet for a Chocolate Meringue Pie. This pie was much like a Lemon Meringue pie to make but the lemon filling was replaced with a rich creamy chocolate pie filling.

As I entered my adult years I yearned for this desert but could no longer find the recipe on the cocoa packet. So, as you do I wrote to Cadbury and asked for the recipe. After about six weeks Cadbury wrote to me to inform me that they no longer had any record of the recipe, but from my description they were able to get their test chefs to replicate it. After sitting on this single copy of this recipe for over 15 years it is now time to share one of the most delicious deserts you will ever make. Enjoy!

1/4 c. cocoa
2/3 c. sugar
1/2 c. flour
3 eggs, separated
2 c. milk
1 tbsp. butter (butter)
1 (9") crust, thin & baked
1 tsp. vanilla



In top half of double boiler mix all dry ingredients. Add beaten egg yolks, milk and butter and vanilla. Stir until smooth. Place over boiling water and cook, stirring continuously until filling gets thick and creamy (I use a wooden spoon).

Put filling into baked pie crust.

Beat egg whites until foamy.

Add 2 (or more) tablespoons sugar slowly while beating, continue beating until stiff.

Put meringue on top of pie and brown meringue in 350 degree oven.
Serves 6 to 8.



BAR ROSTER 2014-15

AUGUST		
2nd-3rd	-	Matt
9th-10th	-	Peter
16th-17th	-	Les
23rd-24th	-	Howie
30th-31st		Crofty

NOVEMBER		
1st-2nd	-	Matt
8th-9th	-	Howie
15th-16th	-	Crofty
22nd-23rd	-	Les
29th-30th		Ashley

SEPTEMBER		
6th-7th	-	Matt
13-14th	-	Ashley
20th-21st	-	Peter
27th-28th	-	Howie

DECEMBER		
6th-7th	-	Peter
13th-14th	-	Matt
20th-21st	-	Howie
27th-28th	-	CLOSED

OCTOBER		
4th-5th	-	Crofty
11th-12th	-	Les
18th-19th	-	Ashley
25th-26st	-	Peter

JANUARY		
3rd-4th	-	CLOSED
10th-11th	-	Les
17th-18th	-	Crofty
24th-25th	-	Ashley
31st-1st Feb		Peter

Bar Hours

Sat. 5pm—7 pm

Sun. 5pm—7pm

How to Drop Flour Bombs—Part One

Prediction of Ballistic Separation Effect by Direct Calculation of Incremental Coefficients

Eugene Kim* and Jang Hyuk Kwon*

**Department of Aerospace Engineering, Korea Advanced Institute of Science and Technology, 373-1 Guseong-dong, Yuseong-gu, Daejeon, 305-701 Republic of Korea*

Key Words: BSE(Ballistic Separation Effect), Incremental coefficient, Unsteady calculation

1. Introduction

When a new weapon is introduced, target point estimation is one of important objectives in the flight test as well as safe separation. An aircraft OFP(Operational Flight Program) predicts the trajectory of unguided bomb and the ground impact point. A pipper positioned on the cockpit head-up display indicates to the pilot the predicted target point in real time, so the simulation algorithm must be as simple as possible. Actually, the fire control computer runs such a simulation during every computational cycle(0.02-0.25sec.)[1]. Therefore the OFP ballistic bombing algorithm is basically a three-degree-of-freedom point mass(drag and gravity) particle trajectory generation program.

If there are no influences, a bomb would fall along the OFP-predicted trajectory and impact at the target point. The actual dynamics of a released bomb, however, is much more complicated than that modeled in the fire control computer due to the fact that forces and moments act along all three axes of the bomb. The trajectory is perturbed by aircraft separation effects such as aircraft flow-field effects and ejector-induced forces and moments. The bombing algorithm must account for aircraft separation effects by means of initial position and velocity increment[2].

The aircraft flow field effect called BSE(Ballistic Separation Effect) is one of the largest miss-distance factors. Especially, in the case of an unguided bomb without control surfaces, the target point is controlled only by the input of pilot. Therefore, an accurate prediction model applied to OFP in the BSE region is important.

The best approach to generate a trajectory model is the flight test. It is a realistic method but difficult to gain dynamic data because of its excessive expense. Other approaches such as wind-tunnel testing and prediction methods can generate the trajectory model or help to design the flight test schedule. But the incremental aerodynamic coefficients in the aircraft flow field so-called BSE are difficult to predict. Generally, semi-empirical

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NEXT CLUB COMPETITION

Sunday 9th November

NEXT CLUB MEETING

The next Northam Aero Club Committee Meeting
will be held at the club rooms on

Sunday the 9th November 2014 at 13:00 (1pm)
