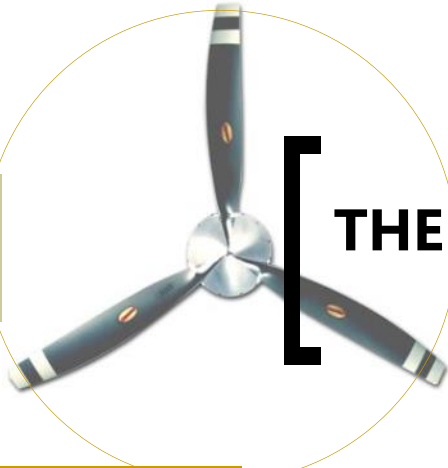


# THE SLIPSTREAM

THE NEWSLETTER OF GREEN RIVER EAA CHAPTER 441 KENT, WA

JUNE 2021



## PRESIDENTS COLUMN:

### INSIDE THIS ISSUE:

<b>PRESIDENTS COLUMN</b>	<b>1</b>
<b>DARIN'S RV ADVENTURES</b>	<b>3</b>
<b>GUESS THAT AIRPLANE</b>	<b>4</b>
<b>GUESS THAT INSTRUMENT PANEL</b>	<b>4</b>
<b>PIETENPOL UPDATE</b>	<b>5</b>
<b>EAA NEWS</b>	<b>5</b>
<b>EDITORS CORNER</b>	<b>6</b>
<b>MAYS GATHERING MINUTES</b>	<b>8</b>
<b>NEW MEMBER INTRODUCTION</b>	<b>9</b>
<b>GUESS THAT MOVIE/AIRPLANE</b>	<b>9</b>
<b>LAST MONTHS GUESS THAT AIRPLANES ANSWER</b>	<b>10</b>
<b>LAST MONTHS GUESS THAT INSTRUMENT PANEL</b>	<b>11</b>

### SPECIAL POINTS OF INTEREST:

PHYSICAL GATHERINGS TEMPORARILY ON HOLD UNTIL FURTHER NOTICE

### Presidents Column:

Density Altitude? But we live at Sea Level!

It's true, we live near the bottom of the atmosphere here in Puget Sound. You can tell by all the green on the Sectional Chart...and the expanses of seawater around Seattle. Most of the time, our temperatures are moderate, and airplane performance is pretty good. You don't really need to go to high altitude unless you want to get out of Puget Sound to go somewhere. But there might be another reason to go high. The weather guessers on the evening news are telling us that Seattle is in for hottest-of-all-time record-breaking high temps this weekend.

Oof da!

But with an average adiabatic lapse rate of -2 deg C/1000 feet, there's a clear advantage to filling the tanks and loitering at high altitude (Aaaahhhh!) This might be THE weekend to circle our favorite volcano (or two or three) for hours on end. But to do that, you've got to take off and climb with those heavy, full tanks.

Why is density altitude a big deal? Because at high density altitude, the air molecules are further apart, and there are fewer of them per cubic foot. Our engines are constant-displacement devices, so the intake stroke takes in only a given volume of air. At high outside air temperatures, there are fewer air molecules

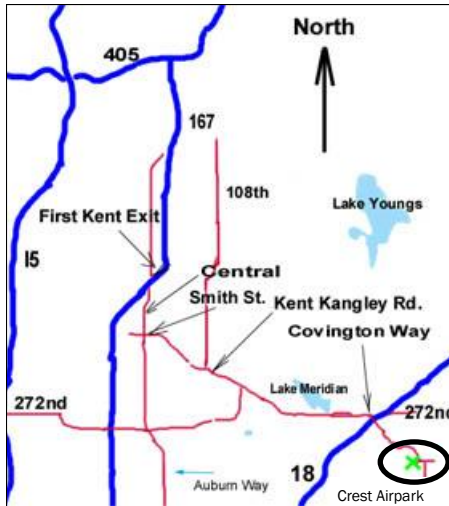
(specifically, fewer Oxygen atoms) going into the engine. And that costs horsepower. The drag is also lower, but we lose power faster than we gain in drag. Which is a real drag.

But isn't high density altitude only a problem IN the mountains? Get out your trusty E6-B circular slide rule and as they say "do the math". We're supposed to get to (or exceed 103 deg F at SeaTac on Sunday. That's right there next to 40 deg C. At sea level pressure, that 40 deg C produces an air density equivalent to almost 3000 feet above sea level.

Where that really hurts is takeoff and climb performance. My trusty Piper Arrow, with its anemic engine and short, stubby Hershey-bar wing isn't a stellar performer to begin with. The handbook (which we all know is based on a new airplane flown by golden-arm pilot under perfect conditions) says it can clear that 50 foot tree in 2300 feet of runway, and climb away at 880 (Hah!) feet/minute at max gross weight. But at a density altitude of 3000 feet, those numbers become 3500 (a 52% increase!) runway and 720 feet/minute (a 20% reduction). But wait, there's more...we don't have 50 foot trees here! So while that airplane might seem really comfortable on a 3000 foot runway day-in-and-day-out, that's not nearly long enough for the really hot days we've got coming up. Be careful, and check the numbers!

You homebuilt flyers did measure your specific airplane's perfor-

## WHERE DO WE MEET THIS MONTH?



Meets 4th Mondays 700 pm  
 17605 SE 288th PL, Kent  
 The Mellema Hanger



## JUNE PROGRAM

Catch up on projects and meet the new members

### Program

Catchup on projects

Here is our meeting information for Monday June 28th :

Join Zoom Meeting

Password: 919349

Phone one-tap: US: +12532158782,,95667374167# or +16699006833,,95667374167#

Meeting URL: <https://gettyimages.zoom.us/j/95667374167?pwd=MWU4cnZOCk0VUFDSEVqVmVhQ29hdz09&from=addon>

Join by Telephone

For higher quality, dial a number based on your current location.

Dial:

US: +1 253 215 8782 or +1 669 900 6833 or +1 346 248 7799 or +1 646 876 9923 or +1 301 715 8592 or +1 312 626 6799 or 833 548 0282 (Toll Free) or 877 853 5247 (Toll Free) or 888 788 0099 (Toll Free) or 833 548 0276 (Toll Free)

Meeting ID: 956 6737 4167

- 2021 OFFICERS**
- President:**  
 Brian Lee  
 (253)-639-0489
- Vice-President:**  
 Mark Owens
- Secretary:**  
 To be determined
- Treasurer:**  
 Steve Crider
- Tech Counselors/ Flight Advisors:**  
 Brian Lee  
 (253)-639-0489  
 Dave Nason  
 Jonathan Lee  
 (253) 508-1376
- Newsletter Editor:**  
 Roger Schert  
 (206) 713-9910
- windridershaman@gmail.com

## PRESIDENTS COLUMN CONTINUED, DARINS RV ADVENTURES:

mance and produce a flight manual, DIDN'T YOU? This weekend is not the time to find out what it really does at high density altitude. At least get a generic slide rule computer and/or a Koch chart. They will absolutely save your life.

I remember learning to fly in the summer in Iowa in a Cherokee 140, and 50-100 feet/minute climbs became "normal" but we had 10,000 feet of runway. You really don't want to realize that your takeoff and climb performance is seriously degraded right after liftoff from your "normal" 2500 foot runway.

Even though we're at low geometric altitude doesn't mean we're immune to density altitude challenges.

Fly safe.

Brian

### Darin's RV Adventures:

It Flies!!

Here is a link to the video I compiled from all the cameras. To view the video: [Click Here](#)

This is just a quick post to let everybody know that N88DA has taken to the skies! On Saturday morning the 19th of June, 2021 at about 10AM the airplane broke ground for the first time. She flew



beautifully with no trim changes, no heavy wing, and nothing less than a smooth climb. As expected I did get some high CHT values but with a slight reduction in power and RPM I was able to limit the highest to 421 and even then only 3 of the 6 cylinders broke 400 degrees. As soon as I leveled out all temps dropped nicely and I had no more issues with temps. The oil temps never got above 185 during the entire flight and that's with prop and throttle at max. I'm happy with how the engine is cooling so far. Airspeed and altimeter tested out perfectly against Harry's chase plane. The fuel flow is off considerably but that's to be expected and is an easy correction on my next fuel up.

The airplane is a dream to fly but its definitely on the heavy side for controls compared to all the other RV models I have flown. You actually have to push the stick instead of just thinking about it. :-)

I had one surprise during the flight, and that was the huge amount of aft stick needed to land. My approach was over the dump and that always has a bit of updraft followed by a significant down draft on short final. My approach was on target but I found that was almost unable to arrest the decent in time because the control stick was full aft and bumping into my belly! The landing was actually pretty good but it was very close to being a bouncer.

I have a few squawks (issues) that need addressing. One was discovered on flight three today. The prop control cycles just fine on the ground but in flight there is enough wind pressure on the cowling that it pushes it aft enough to block the governor control movement such that I can't bring the prop down below 2350 RPM. I should have that one taken care of in time for the next flight.





## TECH COUNSELORS AND FLIGHT ADVISORS



Chapter 441 is fortunate to have two tech counselors.

Feel free to call Brian (253)-369-0489 , or Dave Nason any time. You don't need to wait for some significant milestone in your project. Remember, this is not an "inspection".

The shop doesn't need to be cleaned for a visit. All are quite used to looking at pieces, parts, and assorted bits, and will be happy to answer questions, offer advice, and generally talk about projects, building, flying, or whatever.



## GUESS THAT AIRPLANE; GUESS THAT INSTRUMENT PANEL

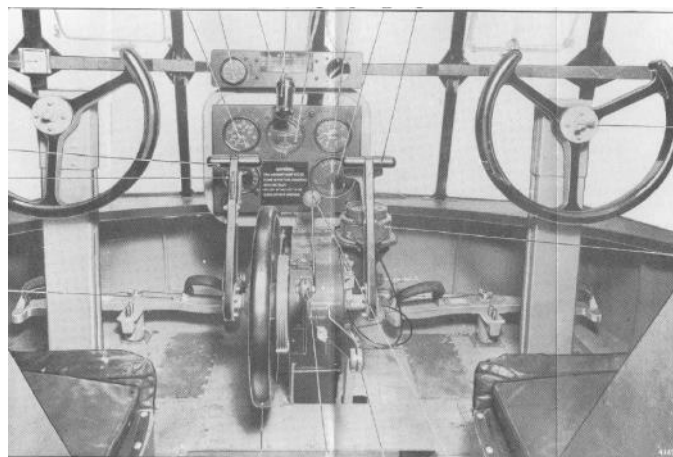
This months entry:

Go to Page 10 for Mays' 2021 airplane



This months entry:

Go to Page 11 for May's 2021 Instrument Panel



**DISCLAIMER:** The "SLIPSTREAM" Newsletter is published as a clearing house for ideas, opinions, experiences and member information. No responsibility or liability is expressed or implied. Anyone using or purchasing parts or product is doing so at his or her own risk, and is

## DARIN'S RV ADVENTURES, PIETENPOL UPDATE, EAA NEWS:

I also had some oil door issues. Most people have their oil door pop open on the first flight, and I knew that, so I reinforced the door so the latch would not flex. However, I did not reinforce the corners opposite the hinge and as a result those corners were bulging up due to the extreme air pressure in the cowling. Nothing that a little duct tape couldn't cure for flights two and three. :-)

I'm still chasing a couple of minor oil leaks and one grease leak from the starter. Otherwise the engine seems to be in good condition.

Oh, I should mention that on the runup for the first flight my coil (MAG) check failed on the right side (bottom plugs). This required a taxi back to the hangar where a simple cleaning of the plugs resolved the issue. Too much very rich run time on the ground. However, I mention this not only as a warning to others but also to let you know that I had great plans for lots of video of the first flight. Well, I did get good video but not from inside the airplane. In fact I had a 360 camera set up on the VS top as well as a GoPro camera installed in the cockpit. The 360 camera only caught the initial taxi out to the runup and the interior camera I forgot to turn on until I was already airborne and doing my initial circuits of the airport. Oh well, I had a few people there and still got some video so hopefully I will have a video to share in the near future.

A big thanks to the ground and flight crew for the day!

Harry, chase plane pilot  
Ben, the ground crew and videographer  
Randy the flight photographer and note taker  
Bob the ground crew car driver

To Read More: [Click Here](#)

### Pietenpol Update:

I am in Wisconsin on vacation. Will write a report on the Swift next month. She is safe and sound in our hangar in Oregon.

Jake

### EAA News:

GPS protection bill introduced to Senate:

U.S. Sens. Jim Inhofe (R-Okla.), ranking member of the Senate Armed Services Committee, Tammy Duckworth (D-Ill.), and Mike Rounds (R-S.D.) intro-



duced the RETAIN GPS and Satellite Communications Act on Wednesday, which, if passed, would force communications company Ligado to pay the private and public sector costs associated with any GPS interference from their terrestrial-based 5G telecommunications.

“GPS and satellite communications don’t only impact our military — we rely on it for so much of our day to day lives, which is why we need to take steps to protect not just the federal government from the harmful decision, but all state and local governments, private entities and consumers too,” Inhofe said. “Our nation has an integrated public and private sector infrastructure to support the reliability and use of GPS and satellite communications to navigate our cars and boats for recreation and commerce, to plow our fields, to manage equipment for transportation construction projects, to track our exercise and to predict weather patterns – the list goes on. When Ligado’s effort to repurpose spectrum causes interference in the infrastructure of those systems, as tests have shown it will, consumers and taxpayers shouldn’t bear the burden of updating countless systems. That cost should only be borne by the responsible party: Ligado.”

To Read More: [Click Here](#)

Teacher Day at EAA AirVenture Oshkosh 2021 Inspires Educators to Get Aviation Into the Classroom

EAA is hosting Teacher Day on July 30 at EAA AirVenture Oshkosh 2021, and educators are encouraged to attend this free event that brings new ideas and activities on incorporating aviation and aerospace into the classroom.

This event, supported by Gulfstream Aerospace Corporation, is open to all educators. The event comes

**EAA NEWS CONTINUED, EDITORS CORNER:**

along with a box lunch and an AirVenture wristband as a thank you to our educators.

“Teachers Day has been going on for many years here at EAA, and has grown to be a great event for educators to get together and take aviation and STEM activities back to their classroom,” said Cassie Cobb, EAA’s museum educator. “We want the teachers to bring something new back to their classroom and enjoy the day at the World’s Greatest Aviation Celebration.”

To Read More: [Click Here](#)

**Copterpack Multi-copter First Flight.** A video published late last month shows a pilot test-flying the self-stabilized electric backpack multicopter at a beach, presumably in Australia.

To watch the Video, [Click Here](#)

**Hints for Homebuilders – Crush Washers:** In this video, Dick Koehler demonstrates the proper use of crush washers. Dick is an A&P aircraft mechanic with Inspection Authorization (IA), and SportAir Workshop instructor. To watch the Video, [Click Here](#)

**The next Generation of Trailblazers:**

During the uncertain days of World War II, the United States population, men and women alike, moved out of their comfort zones and out into roles to support the war effort in any way they could. After the attack on Pearl Harbor, military recruiting stations had lines sometimes as long as a city block. Women left their homes to take jobs in production plants, which were vacant after much of the male work force was now in the armed forces. It would take our entire country joining together to defeat pure evil. And this challenge did not recognize skin color. Americans of all ethnic groups joined the war effort. One group of African Americans would change the course of history. They were given many nicknames, such as “Tuskegee Airmen” (due to where they trained in Tuskegee, Alabama) or “Red Tails” (due to the red-painted tails of their aircraft). Officially they were the 332nd Fighter Group. They had to fight racism before they could even get a chance to actually fight in the war. They learned to fly at Moton Field in Tuskegee, Alabama, and later served in Africa and eventually Italy where they flew bomber escort missions. The latter role is where the Red Tails became legends. The contributions of the Tuskegee Airmen far exceed just their wartime exploits. They became

a vehicle for the hopes and dreams of many who were minorities in the U.S. Thanks to a dedicated group, the ripples of their splash into history are still being felt.

To Read More: [Click Here](#)

**Video Shows AirVenture NOTAM Transition Points.** One of the updates to this year’s EAA AirVenture Oshkosh NOTAM from the FAA is the addition of transition points for the general aviation arrival route. Those transition points will be activated during periods when air traffic is at increased levels. A new video shows these points and helps pilots visualize the landmarks and routes that will help ease air traffic congestion. To watch the Video, [Click Here](#)

**Editors Corner:**

Hi everyone, I hope you are well and getting to fly. It is already time for our next meeting. Tempus Fugit time flies or is it really time fidgets with everyone’s perceptions of time? Both I guess. This last week has been kind of rough for me between Dentists and doctor visits. Then I tweaked my back this last wednesday and now my plans for camping and things have been somewhat short circuited.

You might remember that I mentioned that I had found a project in Olympia and just need to get it back to the house. I have the trailer available after a bit of a wheel kerfuffle. However, since my back has been tweaked, I will need a couple of people to help load and unload the fuselage. This weekend and early next week will be too hot so sometime shortly after that is when I should get it and return Marks trailer to





**EDITORS CORNER CONTINUED:**

him. Can a couple of guys help me out?

The project is a Wag Aero Sportsman 2+2 and most of the fuselage is constructed and the tail feathers. I want to add extended main landing gear and use one of the smaller Alaska Bush tires. I am not sure what engine I want to use, but it should probably be at least 150HP.

Does anyone have or know where a functional Scott or Maule tailwheel is for reasonable cost? The photos of a completed plane is how I am thinking that I want mine to look similar to. The other photos are the project as it sits in Olympia..

Once I get the project home, I plan to start working on it a little at a time. My first thing will be to get it on its gear and to assess what else the fuselage needs. I am thinking about a project visit for the Chapter, but many negotiations need to happen before I can set a date and time.

I am really impressed with Darin, a second RV flying

in such short order. Congratulations Darin!

**Zoom Meeting information:**

I have been trying to get a couple of presenters lined up, but so far I have not received an usable response.

Here is our meeting information for June:

Join Zoom Meeting

Password: 919349

Phone one-tap: US:  
+12532158782,,95667374167# or  
+16699006833,,95667374167#

Meeting URL: <https://gettyimages.zoom.us/j/95667374167?pwd=MWU4cnZOCk0VUFDSEVqVmVhQ29hdz09&from=addon>

Join by Telephone

**MAY GATHERING MINUTES:**

For higher quality, dial a number based on your current location.

Dial:

US: +1 253 215 8782 or +1 669 900 6833 or +1 346 248 7799 or +1 646 876 9923 or +1 301 715 8592 or +1 312 626 6799 or 833 548 0282 (Toll Free) or 877 853 5247 (Toll Free) or 888 788 0099 (Toll Free) or 833 548 0276 (Toll Free)

Meeting ID: 956 6737 4167

Build Straight  
Roger

**May Gathering Minutes:**

Ron W: No such thing as an experimental engine when it doesn't work. Willing to offer loan use of dimpler. Flying plane since VNC alternator. May have a grounding issue, The voltage had dropped from the initial. Looking into possible sources. Got a new position for the Go Pro. Working on getting a pilot's view location for the go pro. New airspeed indicator (actually a 3d printed fake instrument).

Steve Crider: Talked about valves. Borescope cylinders during inspection. Need to not let carbon build up on the valve seats. Has valve grinder.

Brian: Both ailerons off the glider and they are spotless. Germans never varnished gliders. Will varnish to comply with stc of the fabric. Found a new GP engine available for not much more than the mag's. Need a volunteer to take on Secretary.. Got an email from Illinois for a eagle flight for her grandson, but now to ask bring him to Oshkosh, Logan might do remotes (Normandy Aircraft)

Bruce: Dynon reads out 2 gallons, but the float works fine, report out indicates .2 gallon. Suggested pop rivet squeezer and pop rivets. ADSB out stopped working, finally found what it was caused by. Took right aileron off to re-skin. Can finish it by completing the painting.

Mark G: Moving and likes new hanger, 4200 SQ Ft hanger 172 is doing fine, may need to upgrade avionics. Looking at Switchblade to build. Hoping to fly the prototype this summer. roadable. Move should be complete soon. Kapowsin 2500 paved 20 + hangers, dozen active. Lights are not bright enough to safely land. Looking for an IA to come to Kapowsin. James Vaness recommended by Andy.

Andy K: Back in the build mode, spending like crazy

Look at the speed range to see if it would be fine to set for climb. Engine off the airplane Wednesday it went to Superior and it was disassembled. Collected all the parts Bearings gaskets and all the other parts available. New Crank is hollow from start. Brian asked if the plug was already out. Bought a vnc voltage regulator for the Li battery. Prop to ship in June. Shared borescope images

Jason Fish: When flashing the Raspberry, needs to put in the router name and password. Wing kit arrived, building flaperons Fuselage due in August. Deposit on engine and FWF due in Aug as well. Fuel senders have a strange thread, so decided to not include it in the kit. Not ok with ethanol and anything more than 12.2 volts into it, it blows up. May go to sight tube or a small float calibrated to full/empty.. Wanting a flight adjustable prop, but ... He has a friend that noted an 8 mph difference in fine vs coarse settings. want to put nut plates on inspection plates.

Mark O: Got to fly a couple of times. Fuel System annoyed him. Found Dynon not so good. Got senders to work and not be affected by magnetic anomaly. Will report back. Enjoying the R word. Bought a endo 3 P Mark has a borescope available for loan.

Scott Rinabarger: Got his ground portion of bi-annual to Working on RV Putting

Rusty Johnson: came across a deal for three 3-D printers sent one on to a friend. Raspberry 3 unit giving him a little issue. Only part way through the building 701 with ground adjustable. prop move getting back to building re-organization working on Pacer to get it flying. Flew to California. got a tailwind and a GS of 150 Kts. 120 - 130 mph. Return had to stop in Roseburg. 1950 gross, loaded it to Gross wt flew up 10800 ft. practicing short field landings need to lower speed by 5 mph to get better. Upgraded to LED and much improved. Can't get the adsb into iPad. Stratus is still working. Probably a Wi-Fi issue Jason suggested to go into iPad Wi-Fi setting to forget the connections and try to re-try new connection

Norm: No aviation

Doug Happe: Been busy but has flown 38 hours, Hot Rod returns from painter tomorrow. Should be wrapped up in a month. The battery circuit tends to shutdown in temps over 90.

Roger: Looking at a project in Olympia.



## NEW MEMBER INTRODUCTION, GUESS THAT MOVIE AND THE STAR AIRPLANE:

### New Member Introduction:

**Bill Gregory**, age 54, live in Gig Harbor, woodworker

Pilot for Delta Air Lines (First Officer on A330)

Seriously considering a RV10 build

Doing a lot of YouTube watching and reading forums to learn more

EAA exposure seems to be the next logical step in my research OH yeah, I need to get my SE Land license too:)

Bill

The Antonov An-2 was a single-engine bi-plane first built in 1946 in the Soviet Union. It has a variety of uses although primarily agricultural and utility roles both as a civil and military aircraft. Serial production of the AN-2 aircraft was carried out like this :

1949-1963 - aircraft plant #473 in Kiev where 3,339 aircraft were produced;

1959-2002 - WSK PZL-Mielec aircraft plant in Poland produced 11,915 machines.

### This Months Movie and Star Airplane:



1995 Comedy, drama, romance

### The Expendables 2:

The Expendables 2 was the second film of the Expendables franchise. It continued with the main characters from the first film:

Sylvester Stallone (Barney Ross)

Jason Statham (Lee Christmas)

Jet Li (Yin Yang)

Dolph Lundgren (Gunnar Jensen)

And included cameo appearances of :

Chuck Norris

Arnold Schwarzenegger

Bruce Willis

Jean Van Damme

The aircraft is an Antonov An-2R:



**GUESS THAT AIRPLANE:****Bristol Brabazon:**

The Bristol Type 167 Brabazon was a British large propeller-driven airliner designed by the Bristol Aeroplane Company to fly transatlantic routes between the UK and the United States. The type was named Brabazon after the Brabazon Committee and its chairman, Lord Brabazon of Tara, who had developed the specification to which the airliner was designed.

While Bristol had studied the prospects of developing very large aircraft as bomber aircraft prior to and during the Second World War, it was the release of a report compiled by the Brabazon Committee which had led the company to adapting its larger bomber proposal into a prospective large civil airliner to meet the Type I specification for a very large airliner for the long-distance transatlantic route. Initially designated as the Type 167, the proposed aircraft was furnished with a huge 25 ft (8 m)-diameter fuselage containing full upper and lower decks on which passengers would be seated in luxurious conditions; it was powered by an arrangement of eight Bristol Centaurus radial engines which drove a total of eight paired contra-rotating propellers set on four forward-facing nacelles.

Bristol decided to submit the Type 167 proposal to meet Air Ministry Specification 2/44; following a brief evaluation period, a contract to build a pair of prototypes was awarded to Bristol. At the time of its construction, the Brabazon was one of the largest aircraft ever built, being sized roughly between the much later Airbus A300 and Boeing 767 airliners. Despite its vast size, the Brabazon was designed to carry a total of only 100 passengers, each one being allocated their own spacious area about the size of the entire interior of a small car. On 4 September 1949, the first prototype conducted its maiden flight. In addition to participating in a flight test programme in support to intended production aircraft, the prototype made high-profile public flying displays at the 1950 Farnborough Airshow, Heathrow Airport, and the 1951 Paris Air Show

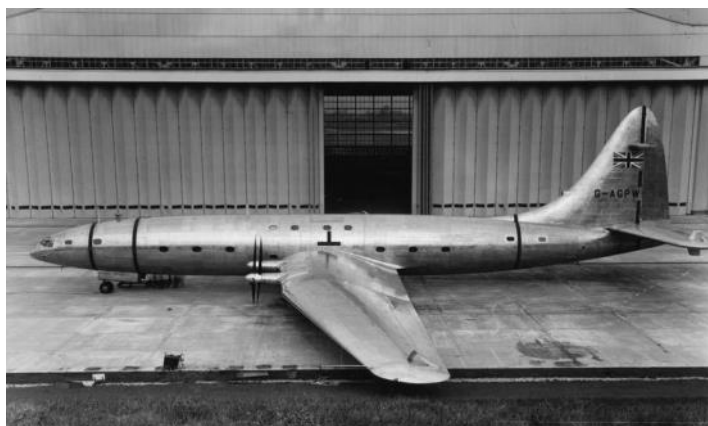
To Read More:

Wikipedia: [Click Here](#)

BAE Systems: [Click Here](#)

Air and Space Museum: [Click Here](#)

Historynet: [Click Here](#)

**Specifications:****General characteristics**

Crew: 6–12  
 Capacity: 100 passengers[29]  
 Length: 177 ft (54 m)  
 Wingspan: 230 ft (70 m)  
 Height: 50 ft (15 m)  
 Wing area: 5,317 sq ft (494.0 m<sup>2</sup>)  
 Airfoil: root:T.P.4; tip: T.P.5[30]  
 Empty weight: 145,100 lb (65,816 kg)  
 Max takeoff weight: 290,000 lb (131,542 kg)  
 Fuel capacity: 13,650 imp gal (16,393 US gal; 62,054 l)  
 Powerplant: 8 × Bristol Centaurus 18-cylinder air-cooled radial sleeve-valve piston engines, 2,650 hp (1,980 kW) each paired, driving contra-props through combining gearboxes.  
 Propellers: 3-bladed Rotol, 16 ft (4.9 m) diameter fully-feathering contra-rotating propellers[28]  
 Performance  
 Maximum speed: 300 mph (480 km/h, 260 kn) at 25,000 ft (7,620 m)  
 Cruise speed: 250 mph (400 km/h, 220 kn) at 25,000 ft (7,620 m)  
 Range: 5,500 mi (8,900 km, 4,800 nmi)  
 Service ceiling: 25,000 ft (7,600 m)  
 Rate of climb: 750 ft/min (3.8 m/s)  
 Wing loading: 54 lb/sq ft (260 kg/m<sup>2</sup>)



**GUESS THAT INSTRUMENT PANEL**

**F4f Wildcat:**

The Grumman F4F Wildcat is an American carrier-based fighter aircraft that began service in 1940 with the United States Navy, and the British Royal Navy where it was initially known as the Martlet.[2] First used by the British in the North Atlantic, the Wildcat was the only effective fighter available to the United States Navy and Marine Corps in the Pacific Theater during the early part of the Second World War. The disappointing Brewster Buffalo was withdrawn in favor of the Wildcat and replaced as aircraft became available.

With a top speed of 318 mph (512 km/h), the Wildcat was outperformed by the faster (331 mph (533 km/h)), more maneuverable, and longer-ranged Mitsubishi A6M Zero. However, the F4F's ruggedness, coupled with tactics such as the Thach Weave and High-side guns pass maneuvers using altitude advantage,[3] resulted in a claimed air combat kill-to-loss ratio of 5.9:1 in 1942 and 6.9:1 for the entire war

