VOLUME 24, ISSUE 2

THE SLIPSTREAM

THE NEWSLETTER OF GREEN RIVER EAA CHAPTER 441 KENT, WA

FEBRUARY 2022

INSIDE THIS ISSUE:

Photos from the January site visit will be included in the March Newsletter.

PRESIDENTS COLUMN, PROJECT VISIT, PIETENPOL UPDATE:

Presidents Column:

We are going to step into the "Way Back Machine" for Februarys Presidents Column. This is a reprint of the March 2014 Presidents Column:

Springtime (finally!)

By now, you know that I just HATE winter in the Northwest. I don't know if it's the constant darkness, or the constant grey skies, or the constant rain or the low freezing level (all of which pretty much limit flying), but I don't like it. I know Jake calls it the workshop season, but even the garage seems dark and dreary in the wintertime.

Never mind all that, Spring is approaching, and quickly. We've passed into Daylight Savings Time (Soon this year Editors Note), and instantly, there's some light after work. Yesterday when I got into the vanpool in Everett, it was pouring down rain. When I woke up from my nap, the sun was shining with blue skies in Renton. It looked so good I thought about going flying!

Not so fast, though. If we haven't been flying (and I mean REGULARLY) through the winter, it's really time to pick a sunny Saturday afternoon and give the airplane a VERY thorough preflight. If it's been outside, it's time to look for bird nests, insect nests and water. Even if it's been inside, remember that even mice need a warm place to sleep, so we really should peel back the baggage flap and take a good look into the tail cone. Maybe pop a wing inspection panel and look around inside. Take a good look at tire inflation and condition, strut extension (cold weather seems to make things - but not tummies- go flat). See if the battery has any volts left. Even if it does, a few hours on a charger is a friendly way to bring it up to snuff, instead of starting the engine and letting the alternator cram 30 amps at a time into it.

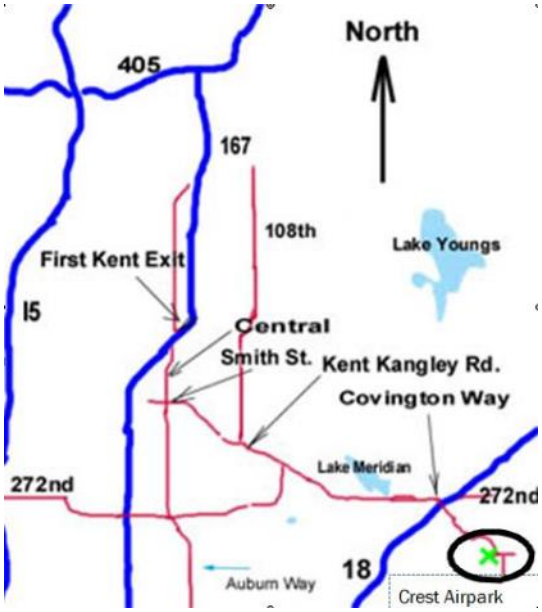
Once we're convinced the airplane's ready, it's time to think about the pilot. Even if you're not totally out of currency, it might be a good idea to go out on a dedicated "get the rust off" flight. That can be by yourself or with an instructor. Put in some dedicated practice in doing something you haven't done in a while: s-turns along a road, turns around a point, lazy 8's, even some takeoffs and landings: you know, short field, soft field, etc. Go to a safe altitude and slow the airplane down. Challenge yourself to see how slowly you can fly the airplane (remember minimum controllable airspeed?). If that thought scares you, take an instructor along.

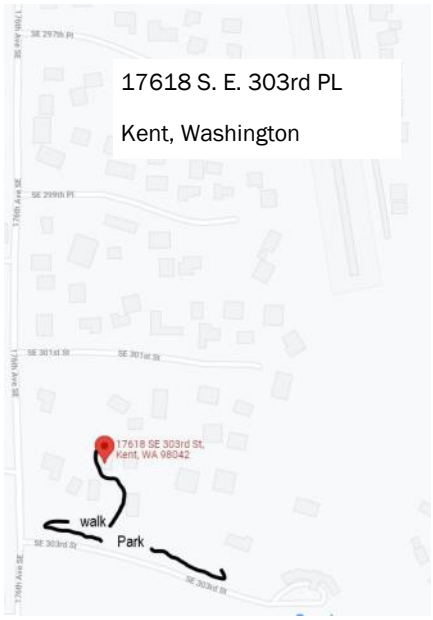
If you discover that things are kind of "sloppy", go practice again on the next good-weather day. If we do this until we're comfortable, we're setting the stage for a happy and safe flying season taking family and friends with us.

Fly safe.

Brian

WHERE DO WE MEET EACH MONTH?





FEBRUARY PROGRAM

Tech visit with Edwin Sharp

Program:

Tech Visit:

RV-14A (Nosewheel version)

His address is 29656 179th Pl SE, Kent WA, 98042

2022

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:

Berling Schert

(206) 713-9910

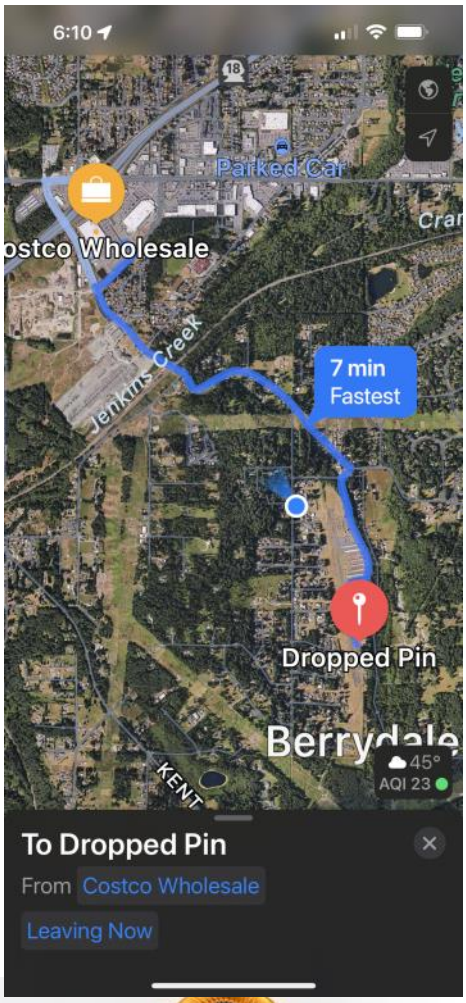
windridershaman@gmail.com

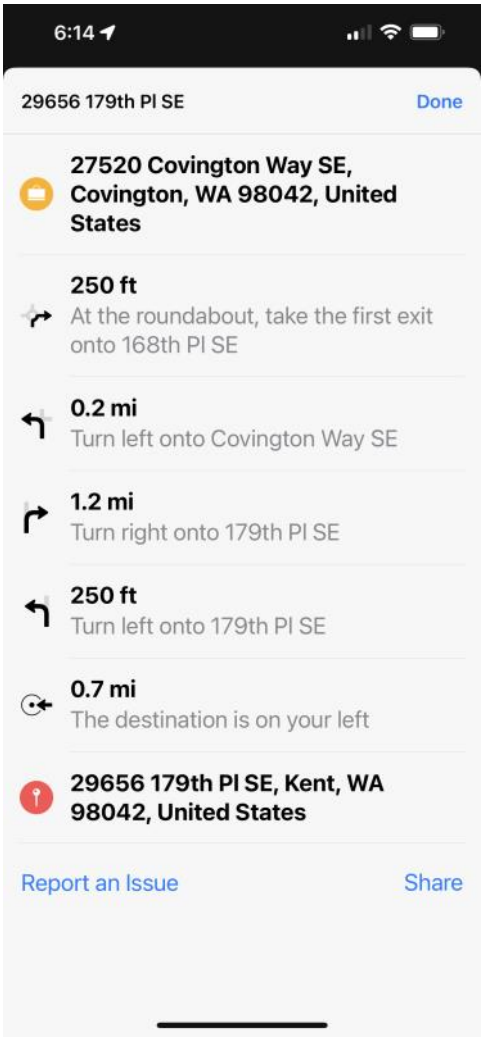
EDWIN SHARP PROJECT VISIT, PIETENPOL UPDATE, HIGHLANDER UPDATE

Project Visit:

We will be visiting Edwin Sharp this month. He is building a RV-14A (Nosewheel version)

His address is 29656 179th Pl SE, Kent WA, 98042 Please see the pinned map and directions below.





Pietenpol and Swift update:

Hello 441,

I am finally taking flight instruction in our 1946 Globe Swift after the completion of a series of maintenance upgrades over the past few months. Had a gentleman stop by the Independence airport with his Swift. We had a chance to shoot the two together and talk for several hours about the airplanes. Kent has owned his Swift for over 50 years!

Having fun and learning a lot...

Jake

Highlander Update:

The Scottish Highlander is now in my driveway here in Maple Valley. I thought it just needed a few touch-ups after the taxi test and engine run in Idaho, but the windshield broke from a stress fracture during the trip back here. Plus, it turned out the engine had some issues that needed corrected. Bottom line is I have probably about a month more of work before I can submit it for the FAA cert. It's a little harder working in the trailer (on bad days) or the driveway (nice days), but it is getting closer! I might bring the old windshield to the Chapter meeting, just because it is interesting to see how supposedly unbreakable Lexan broke.
Here's a shot of the plane in my driveway, tied to a tree for some engine runs.

Steve

Editors Corner:

I had to make a visit to the Hospital and it significantly affected

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 Guess that Airplane:

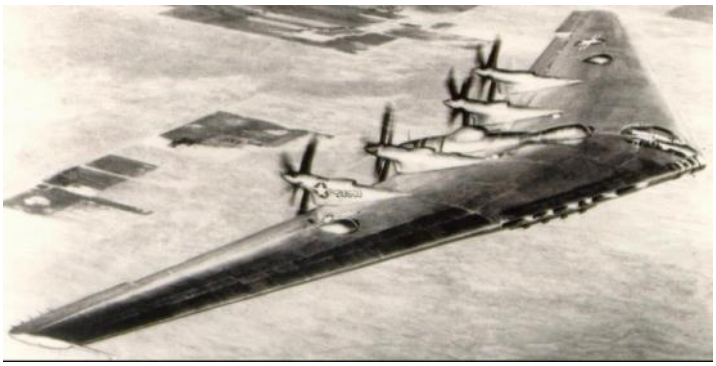
See Page 13 for January's Airplane:

This months Instrument Panel:

See Page 14 for January's Instrument Panel

XB-35/YB-49 DEVELOPMENT:

my ability to get the Newsletter done. I have continued to write it as if it was before the meeting. I also went into the Way Back Machine and pulled out the Presidents Column from March 2014. I have made a partial recovery and have to be diligent about my fluid and food intake, I am now back home. I managed to work some on the XB-35 article while in the hospital and am now getting back to working on it to present to the Membership. The XB-35 article has grown a little due to the inter-connectedness of the YB-49 into the XB-35 saga.



XB-35/YB49 Flying Wing Development:

The previous two excerpts introduced the development of the XB-35 Flying Wing Bomber and primarily focused on the two development scale piloted test beds for the research. They proved that the Flying Wing Concept was achievable but that there were still areas that needed more research. Some of the additional research was related to the hydraulic boosting of the flight controls. This in a primitive form was installed in the N-9M as a proof of concept and to prevent further accidents by the pilot not being able to over come air loads on the elevators when the M-9M went into a rear CG stall flat spin. The Northrop Engineers have admitted that the development of the boosted controls (one of the earliest actual implementations of hydraulic boost) was one of their most challenging feats of engineering. They discovered on the N-9M that the aerodynamic boosted controls didn't work as well as they though a hydraulic boost system would. They encountered hunting and buzzing. The engineers strapped the valves to the cylinders rigidly and that let the movement of the cylinder close the valve automatically. Eventually they allowed "neutral leakage" across the valve and that contributed greatly to its success. The leakage allowed linearization of the valve flow. Since the fluid was circulating, it didn't require heaters for the hydraulic oil.

The artificial feel system put a Q-bellows on the stick which increased the force required by the pilot as the airspeed increased. They trimmed the neutral position which trimmed the airplane without needing trim tabs.

The Development of the XB-35 was riddled with many problems. The initial contract for one XB-35 was issued in October of 1941 just two years after the formation of the Northrop Corporation. The number of employees in 1941 was about 1200 employees. The company was busy building British V-72 Vengeances and American A-31 Vengeances under contract to Vultee aircraft. They were also doing subcontract work for Boeing.

One of the problems arose from the US drafting engineers out from Northrop and other companies creating an engineering shortage at the start of the US involvement in WWII. Another issue was the need to get existing bombers and fighters produced, so there was extensive effort by the US Army Air Force Material Command to get that production ramped up to get the planes to the European and Pacific Theaters. Northrop was also developing the P61 Black Widow along with the XP-56 Black Bullet. Consequentially, Northrop's human resources were stretched fairly thin, though they considered the knowledge gained on the XB-35/N-9M/N-1M was applicable to the XP-56 and what was learned on the XP-56 was returned to the XB-35 project.

The USAAF Air Material Command (AMC) tried to get Northrop Engineering help from other West Coast Manufacturers, but the companies said that they were too busy with working their own contracts and could not release engineers to Northrop unless the government cancelled one or more projects. The USAAF AMC was in the depths of reviewing all of the development and production projects anyway, so they went to Glen L. Martin in Boston and cancelled their B-33 contract for performance issues and had them provide 357 engineers in the Boston Plant. Northrop was to do the development work on the XB-35 and Martin was to perform work on the Production version (YB-35).

Martin was under subcontract to Northrop from late 1942 to 1944. There was a lot of infighting between Northrop and Martin with little will in either company to work together. Martin had many beliefs that

XB-35/YB-49 DEVELOPMENT, CONTINUED:

Northrop was poorly designing the wing, including airfoil selection, engine installation, cooling ducting, clearances, maintenance related issues and ultimately that they knew best. They also made several end-runs around Northrop directly to the AMC without Northrop representation to express their concerns. Little was done by the AMC, Northrop and Martin to resolve these management issues. At the close of the contract with Martin, very little had been accomplished by Martin in the way of deliverables that would lead to a production version of the B-35.

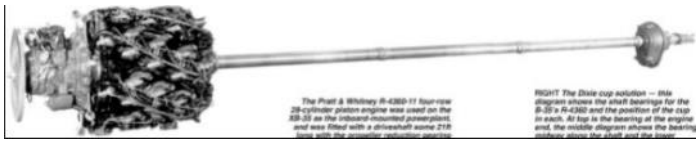
Government Furnished Equipment (GFE):

P&W R4360:

The XB-35 was designed around four Pratt and Whitney R4360 engines that would drive two contra-rotating propellers each on long shafts. The P&W R4360 was part of the Government Furnished Equipment (GFE). The engine was being developed by P&W and had cooling issues from the beginning and the dual rotation gear box thrust bearing was a major contributor to the delay of the engines. It took until late 1944/1945 for the delivery of the engines, which pushed back the contractual delivery date of the airplane to April 15, 1945. Engines were never delivered until early 1946.

Propellers:

Hamilton Standard 4 bladed props had RPM governor issues of hunting, vibration and erratic behavior. The combination of engine, contra-rotating gear box



and long drive shafts were not addressed by the USAAF and it fell to Northrop to resolve those design deficiencies.

Auxiliary Power unit:

The APU experienced numerous mechanical problems and shut down at some inopportune times and required a pressurized environment to run limiting max altitude.

Armament: This was to be a GFE, but the aircraft didn't fly until Post WWII and went through different configurations.

The design efforts continued from 1944 after the dissolution of the Northrop/Martin contracts. Delays continued due to the engine and propeller issues. at the manufacturers. The N-9M flight testing data (The N-9M had flight testing delays due to many different issues finally started coming in during the 1944 period. On June 28 1944 Col. Frank Cook flew the N-9MA through a series of flight tests. The Post flight report concluded:

"The flight characteristics of the N-9MA gave firm indication that the flying characteristics of the B-35 will be satisfactory. The flying scale model is small and very sensitive to its controls. The larger size and mass of the full scale airplane work in its favor in all respects so that the sensitiveness to control applications, rough air, and landing gear retraction and extension should be damped out. The rudders have a flat spot at neutral and the elevators are too sensitive. Both of these deficiencies should be easily corrected." (Excerpted from Northrop Flying Wings by Gary R. Pape with John M. Campbell Copy Right 1995 Page 81)

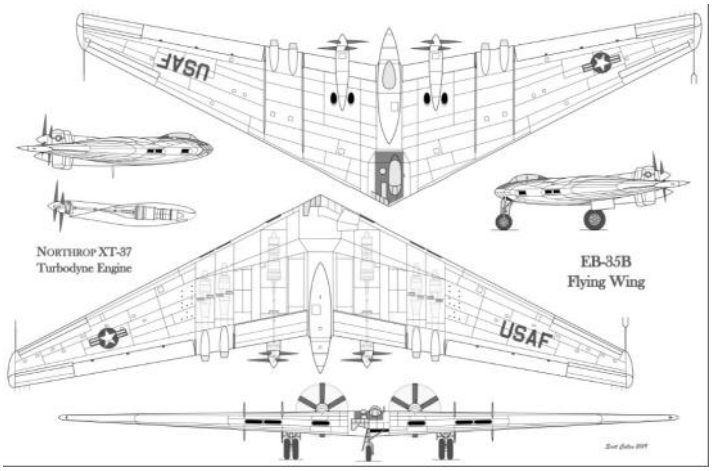
First flight of the XB-35 occurred on June 25, 1946, ten months after the end of hostilities in Europe. The US Air Force focus moved to cutting back production and development projects. The XB-35 still was in favor with the Air Force, but as Government personnel and directions changed it was loosing support fast..

The flight testing continued with many delays and issues that came up with the engines, over heating, vibration, Contra-rotating gear box was prone to cracking due to the flight loads, erratic behavior of the Propellers. In late 1947 the engine/gear box/ propeller issues seemed insurmountable. They had tried a three bladed contra-rotating propeller that did not resolve anything. It was decided to change to single propellers on each engine. They found that the new configuration caused increased stress in and cracking in the propeller housing and control surfaces. The single propeller caused additional turbulence over the wing. This reduced actual performance of the aircraft. Flights were also curtailed by landing gear doors that wouldn't close and engine overheating. The XB-35 consequently made very few flights during the 1947-1948 time frame.

Turbo-Prop design EB-35B:

One of the XB-35's was redesignated to ERB-35 (or EB-35B) to equip it with Northrop/Teledyne XT-37 Turbo-prop engines. Northop thought that this was a

XB-35/YB-49 CONTINUED:



better approach to fuel consumption issues of the strictly Jet engine YB-49. Northrop had rejected General Electrics Turbo-Prop and worked with Joshua-Hendy, Co.. Unfortunately Joshua-Hendy did not provide quality work and Northrop decided to create the Teledyne Corporation to off load the turbo-prop development.

Note that the “E” designation means exempt and not electronic.

The concept was to use 4 Jet engines and 2 XT-37 turbo-props with 2 each contra-rotating props. The Jet engines would be used for take-off and in-flight sprints, but throttled back during cruise. Jack Northrop thought that this would give the B-35 a 12,000 mile range, greater than the competing B-36. Sadly, this never made it into flight testing.

YB-49:

The AMC was thinking in 1944 that they really no longer wanted a propeller driven bomber. Northrop and the AMC were in talks about the jet powered version (YB-49) as early as 1944. They contracted for converting two XB-35's to the TG-180 turbojet engines. They did not want to completely redesign the aircraft by optimizing the wing for higher speed and the growing gross weight. The fuel thirsty nature of the TG-180 reduced the number of bomb bays from 8 to six for the additional space needed for the engines and fuel required to meet the range goal.

Two strakes and vertical fins were added to each side of the wing, one slightly inboard of the four jet engines and one outboard of the engines. This stopped a spanwise flow of the boundary layer and helped stabilize the aircraft. The leading edge received extensive redesign for the intake tubes for the jet engines. Design of the YB-49 was about 20 % complete by the end of 1945. Once again the GFE was creating havoc with the schedule. In August 1946 Northrop requested acceleration of the delivery of the Jet engines and the reversing gears for the alternator drive on the TG-180. Chevrolet was the manufacturer under contract from General Electric. All turbine engines were being transferred to GM's Allison division. In May 1947 it was estimated that the YB-49 would be delivered in September 1947.

The Air Force 689 inspection was concluded on September 18, 1947 First flight of the YB-49 occurred on September 29, 1947 (one year and 3 months after the XB-35). The vibration and noise was noticeably absent and the general flying characteristics were good. Jack Northrop was concerned that the contractual restriction limiting redesign of the XB-35 to Jet engine installation would ultimately hurt the design. The acceleration of the aircraft was incredible and the rear nose gear door blew off at 280 indicated. The pilot could not initially get the nose wheel down and was only able to after exhaustively using the emergency gear down mechanism. The gear doors were too slow to retract and forced the pilot to either pull up drastically or reduce power until the doors closed. The airplane flew more like a fighter and the test pilots were able to out turn their P80 Chase plane many times.

The YB-49 lost a canopy twice during testing above 40,000 ft and a ceiling limit of 40,000 ft was imposed. This limit caused increase fuel consumption and re-

XB-35/YB-49 DEVELOPMENT CONTINUED:

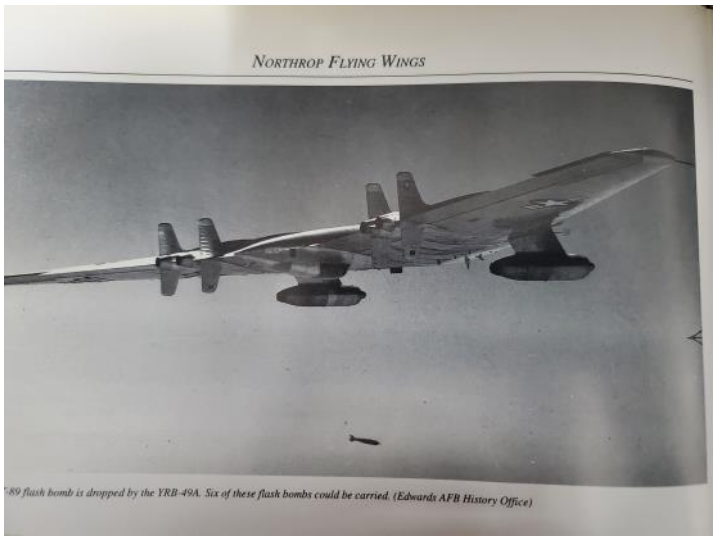
sulted in a range of only 4,000 miles with 10,000 pounds of bombs, while in-flight refueling was becoming available for the B-47 and other Air Force Aircraft, it was never designed into the XB-49, nor released to the YB-49 project by the AF. During testing it was discovered that the aircraft was invisible to radar until right over the radar station.

Maj. Robert Cadenas was critical of the aerodynamics of both of the prop driven and jet driven wings. The air masses of differing speed and temperatures meeting at the end of the airfoil induced instabilities and slight ducth rolls after maneuvers. During testing of the YB-49, he was doing high AoA stalls at 20,000 ft and the nose dropped into a negative "G" tumble. All control surfaces became ineffective and he used the left engines at full thrust to recover at 800 feet. He recommended a stall warning system.

Capt. Glenn W. Edwards became the manager of testing of the wings with only three hours in the type. On June 5, 1948, Maj. Danny Forbes, (pilot) Capt. Edwards (Co-pilot) Lt. Edward Swindell (Flight Engineer) and additional Clare C. Leon and Charles La Fountain (civilian highly knowledgeable Flight Engineers) went on a test flight without a detailed flight test plan and no Chase Planes. They had indicated that they were going to perform high AoA stalls increasing power after each stall. They planned for these tests to occur at 15,000 ft. The Aircraft was observed from the ground to go into a tumble and then pieces of the aircraft separated from it before it crashed into the desert. While there was no definitive proof of what happened, Jack Northrop thought that the pilot induced more than 4.8 g's in a high speed recovery dive and the outer third of the wings broke off of the structure. The aircraft crashed flat and inverted. It was known and discussed with the pilots that using the rudders to recover from the flat spin only made the situation worse. Northrop's primary flight test pilot repeatedly demonstrated safe recovery from this condition. The Air Forces decision to not redesign the aircraft for the jet engines and higher speeds as well as increases in gross weight came back to haunt the project.

Bombing testing:

The Airforce installed the Norden Bomb sight on the YB-49 and compared the results to the antiquated B-29. The Norden sight was not an ideal platform for the YB-49 and was being replaced by the Air Force. The B-29 was a very stable aircraft and could be set-up for a bombing run in 45 seconds, while it took the YB-49 about 4 minutes to set up and had about 50% accuracy compared to the B-29. The Air Force was moving more in the direction of nuclear bombs which never needs the same accuracy as standard bombs. But again, they never released the data and GFE needed for carrying them to the B-49 project. The testing finally included linking the YB-49 to the Honeywell E-7 Little Herbert auto-pilot which appeared to



89 flash bomb is dropped by the YRB-49A. Six of these flash bombs could be carried. (Edwards AFB History Office)

resolve the accuracy issues.

Stability/Spin issues:

The Air Force AMC was highly critical of the YB-49 stability so much so, that Maj. Cadenas (the primary AF test pilot) went public saying that he considered it marginally stable in all three axis with small and slow phugoid oscillations (Slow and gentle Dutch rolls with 1 to 2 degree diversions). and that he did not consider the aircraft to be "unstable" as much as AMC was indicating, and that the aircraft was a design concept that required advancement in technology and further development. The wing was susceptible to aft CG stall/spin scenario. Testing confirmed that at high AoA and aft CG a stall could develop into a spin. If the pilot used the normal procedure of kicking the rudder opposite to the spin, it unstalled the rising wing and stalled the lowering wing which increased the spin and descent rate considerably. Testing also confirmed that using the aileron, quickly restored the aircraft to an unstalled condition. A slow and gentle

XB-35/YB-49 DEVELOPMENT CONTINUED:

pull up to recover from the dive was required to prevent over-stressing the wing.

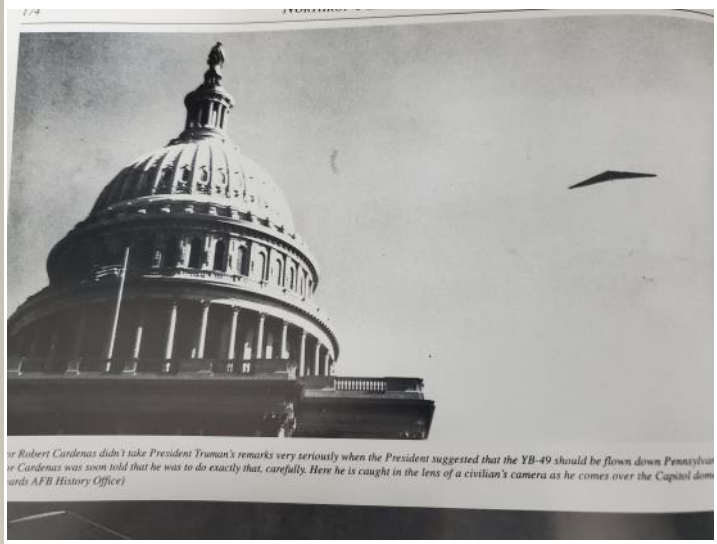
Sabotage?

The YB-49 was flown from Muroc to Washington D.C (Andrews AFB) on 9 February 1949 to participate in an airshow. It flew the distance in 4 hours and 15 minutes (An additional 10 minutes to land and park) at an average speed of 511 mph comparable to the January 1949 flight of 4 hours 13 minutes at an average 580 mph of the P-80A Shooting Star. At roughly the same time the XB-47 flew from Moses Lake, Washington to Andrews at 607 mph which showed the AF that other bombers were available that were marginally faster than the wing.

President Harry S. Truman toured the wing and was full of praise for it. He suggested that they fly it down Pennsylvania Avenue over the White House.

Maj. R. Cadenas was told to do just that, but very carefully. A man from Washington was standing on the steps leading up to the White House and took a photo. He later sent the slide to Maj. Cadenas without any identification and said that he didn't want to be caught with it as he understood that this was a Top Secret Space Plane.

The YB-49 went on to fly to Wright-Patterson AFB, Dayton Ohio. It then headed back to Muroc, but encountered fire in 6 of the 8 jet engines and safely landed in Winslow Arizona on a runway that was only 50 ft wide and the landing gear was 41.2 ft wide. They had to be towed back to the end of the runway. Northrop replaced the 6 engines and it continued on to Muroc without incident. Each engine had its own oil supply and it consumed one gallon of oil every hour and the supply was 20 gallons per engine. They had been flying only a couple of hours and it was unlikely that the oil consumption was increased that much, so it was felt that the proper procedure of topping off the oil in the engine bays was not followed. There was a lot of speculation that M/Sgt William



...r Robert Cardenas didn't take President Truman's remarks very seriously when the President suggested that the YB-49 should be flown down Pennsylvan... ...r Cardenas was soon told that he was to do exactly that, carefully. Here he is caught in the lens of a civilian's camera as he comes over the Capitol dom... ...urds AFB History Office)

Cunningham was deliberately sabotaging the project. He was the FE assigned on the fatal crash of the YB-49 with Capt. Edwards, but he put himself into the hospital that day as well as on the day the wing left WPAFB to return to Muroc.

The End of the XB-35 and YB-49 saga:

Flight testing continued at Edwards AFB until March 15, 1950 when the wing was taxing to determine the forces on the stick at lift-off when the nose wheel began to violently shimmy and then collapsed. The Air-

XB-35/YB-49 DEVELOPMENT CONTINUED:

craft broke in two and fire erupted. The crew were safely evacuated, but injuries were suffered by them. This included M/Sgt Cunningham received major head injuries while the remaining crew suffered bruises and a broken wrist. M/Sgt Cunningham later died in a motorcycle accident fueling the theory that he was culpable to the accidents that occurred during testing.

The RB-49A a reconnaissance version of the YB-49 was contracted for in 1948. However as the policies and personnel of the USAF were changing quickly, the Air Force indicated on June 17, 1948, that the RB-49 was only a means to keep Consolidated in business as a sub-contractor to Northrop and that Consolidated would produce the majority of the RB-49s. Then on July 16, 1948 Secretary of the Air Force W. Stuart Symington told Jack Northrop that he should merge with Consolidated and that penalties for not doing so would be cancelation of all YB/RB-49 aircraft. Jack Northrop remembered well the problems he had with Martin and declined the merger.

It should be noted that Symington was deep in a scandal about fraud with the B-36 contract, although he managed to survive that episode unscathed. Northrop kept a low profile to make sure that his company would survive and go on to produce the F-89 Scorpion and the Snark cruise missile. Management changes were forced that moved the wing management to Consolidated, but as the will to produce the aircraft wound down, the Air Force started to remove the GFE, including the engines and all production jigs, dies and engineering drawings. All USAF reports on the flight testing was eliminated, many of which were positive to the wing. They then scrapped the remaining aircraft. Only the reports on the slow thick wing or the problems survived the Air Force purge. Jack Northrop finally was forced out of his company in November 1952. The final flying wing was scrapped on November 17, 1953.

Specifications:

XB-35:

General characteristics:

Crew: 9: pilot, copilot, bombardier, navigator, engineer, radio operator, three gunners
Length: 53 ft 1 in (16.18 m)
Wingspan: 172 ft (52 m)
Height: 20 ft 3.5 in (6.185 m)
Wing area: 4,000 sq ft (370 m2)
Aspect ratio: 7.4
Airfoil: root: NACA 653-019; tip: NACA 653-018
Empty weight: 91,000 lb (41,277 kg) with turrets
Gross weight: 154,000 lb (69,853 kg) with turrets
Max takeoff weight: 209,000 lb (94,801 kg)
Fuel capacity: 10,000 US gal (8,300 imp gal; 38,000 l) internal; 18,000 US gal (15,000 imp gal; 68,000 l) with bomb-bay auxiliary tanks fitted
Powerplant: 2 × Pratt & Whitney R-4360-45 Wasp Major 28-cylinder air-cooled radial piston engines, 3,000 hp (2,200 kW) each mounted left and right outboard
(Pratt & Whitney R-4360-17 Wasp Major with 8-bladed contra-props)
Powerplant: 2 × Pratt & Whitney R-4360-47 Wasp Major 28-cylinder air-cooled radial piston engines, 3,000 hp (2,200 kW) each mounted left and right inboard
(Pratt & Whitney R-4360-21 Wasp Major with 8-bladed contra-props)
Propellers: 4-bladed Hamilton Standard HSP24F60-344, 15 ft 3 in (4.65 m) diameter constant-speed fully-feathering pusher propellers
(originally flown with 8-bladed contra-rotating propellers)

Performance:

Maximum speed: 391 mph (629 km/h, 340 kn)
Cruise speed: 240 mph (390 km/h, 210 kn)
Range: 7,500 mi (12,100 km, 6,500 nmi)
Service ceiling: 39,700 ft (12,100 m) (restricted to 20,000 ft (6,096 m) due to APU problems)
Rate of climb: 625 ft/min (3.18 m/s)
Wing loading: 45 lb/sq ft (220 kg/m2)
Power/mass: 0.07 hp/lb (0.12 kW/kg)

Armament:

Guns: 20 × .50 in (12.7 mm) M3 Browning machine guns in six remotely controlled turrets and one tail stinger
Bombs: 52,200 lb (23,678 kg) of bombs, maximum

YB-49:

General characteristics:

Crew: 6
Length: 53 ft 1 in (16.18 m)
Wingspan: 172 ft 0 in (52.43 m)

XB-35/YB-49 DEVELOPMENT CONTINUED:

Height: 15 ft 2 in (4.62 m)
Wing area: 4,000 sq ft (370 m2)
Aspect ratio: 7.2
Airfoil: root: NACA 653-019; tip: NACA 653-018
Empty weight: 88,442 lb (40,117 kg)
Gross weight: 133,569 lb (60,586 kg)
Max takeoff weight: 193,938 lb (87,969 kg)
Powerplant: 8 × Allison J35-A-15 turbojet engines, 4,000 lb (18 kN) thrust each

Performance:

Maximum speed: 493 mph (793 km/h, 428 kn)
Cruise speed: 365 mph (587 km/h, 317 kn)
Range: 9,978 mi (16,058 km, 8,671 nmi) maximum [20]
Combat range: 1,615 mi (2,599 km, 1,403 nmi) with 10,000 lb (4,536 kg) bombload
Service ceiling: 45,700 ft (13,900 m)
Rate of climb: 3,785 ft/min (19.23 m/s)
Wing loading: 33 lb/sq ft (160 kg/m2)
Thrust/weight: 0.23
Armament
Guns: 4 × .50 in (12.7 mm) machine guns (to be mounted in rotating "stinger" tail cone on all production aircraft)
Bombs: 16,000 lb (7,260 kg) of ordnance

YRB-49A:

Specifications:

Length: 53.08 Ft
Wingspan: 172 Ft.
Height: 14.98 Ft.
Wing area: 4500 Sq. Ft.
Aspect Ratio: 7.4
Airfoil: root: NACA 653-019; tip: NACA 653-018
Empty weight: 84,000lb.
Gross Weight: 206,000 lb.
Max Take Off Weight: 165,000 lb
Powerplant: 6x 5,000 lb (22,241.11 N) Allison J35-A -19 engines

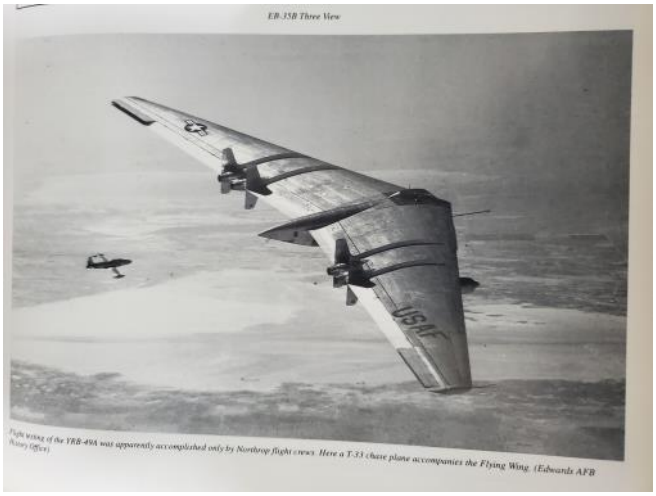
Performance:

Maximum speed: 381 mph
Cruise speed: 340 mph
Range: 2,250 mi
Service ceiling: 45,500 ft
Rate of climb: 3,785 ft/min (19.23 m/s)
Wing loading: 33 lb/sq ft (160 kg/m2)
Thrust/weight: 0.23
Armament
Guns: None
Bombs 6 188 lb Flash Bombs

Final thoughts:

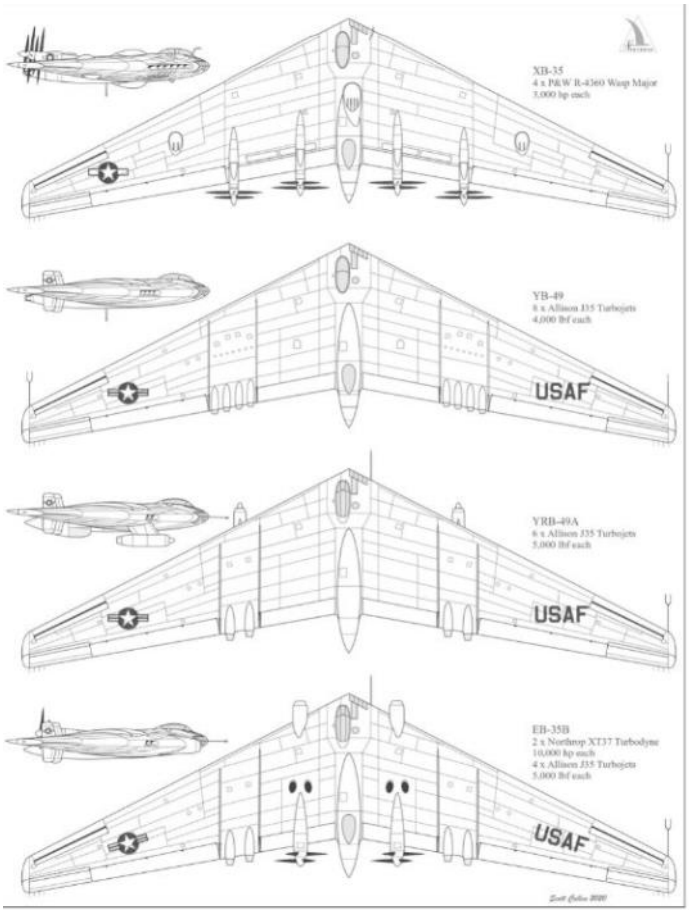
The XB-35 Project was beset with problems from the start of the project. The US entry into the war created Engineering and production shop shortages, shortages of material as the USAAF AMC ramped up production of existing aircraft and new development. Issues between companies that was not managed by the companies and the AMC involved. Issues with USAAF provisioning and management of GFE that stalled development. The fast pace of development of engines and other aviation concepts. The USAF/DoD preference for an inferior, but more conventional bomber (B-36), imposing restrictions on not updating and redesign of the airfoil and structure to optimize the aircraft for the higher speeds and stresses of jet engines and gross weight increases, imposing carriage of nuclear bombs, but not providing GFE and data/design to the project and not relieving the requirement. and finally the post war draw down of corporations and design that didn't ramp back up until after the start of the "Cold War."

Northrop as a company survived the exile of Jack Northrop and the B-2 project came out during the Carter Administration. Jack Northrop was invited to Hawthorne in April 1980 to be shown some of the work being done on the B-2. He was quoted as saying "Now I know why God has kept me alive for so long." He was 85 and suffering from Parkinson's disease, but happy that his concepts were going to be produced for the USAF. He passed away on February 18, 1981.



XB-35/YB-49 DEVELOPMENT CONTINUED, MOVIE AND AN AIRPLANE:

The Flying Wing concept lives on in the B-2 and other blended wing aircraft that have been developed and put into research and production since the 1950's.



References:

Northrop Flying Wings by Gary R. Pape with John M. Campbell
Copyright 1995 Library of Congress Catalog Number 94-66966
Northrop Flying Wings by Peter E. Davies
Published in electronic format 2019.

To Read More:

Wikipedia (XB-35): Click Here
Wikipedia (YB-49): Click Here
Military Factory (XB-35/YB-35): Click Here
TVD (XB-35): Click Here
JoeBaugher.com (XB-35): Click Here
National Museum of the United States Air Force (YB-49): Click Here
XB-35 You Tube:
YouTube (XB-35): Click Here
You Tube (XB-35): Click Here
AMC XB-35 and XB-36: Click Here
YB-49 Youtube:
Youtube): Click Here
YouTube: Click Here
Youtube First Flight YB-49: Click Here
Story of the Northrop YB-49: Click Here

Movie and an Airplane:

Last Month:

Con Air is a 1997 American action thriller film directed by Simon West and starring Nicolas Cage, John Cusack and John Malkovich. Written by Scott Rosenberg and produced by Jerry Bruckheimer, the film centers on a prison break aboard a Justice Prisoner and Alien Transportation System aircraft, nicknamed "con air."

To Read More: Click Here
Aircraft: Fairchild C-123 Provider.
To Read More: Click Here

This Months: Stars William Holden.

GUESS THAT AIRPLANE:

Kamov Ka-22:

The Kamov Ka-22 Vintokryl (rotor-wing, or literally, (air)screw-wing) (Cyrillic:Камов Ка-22 Винтокрыл) (NATO reporting name: Hoop) was a rotorcraft developed by Kamov for the Soviet Air Force. The experimental transport aircraft combined the capabilities of a helicopter for vertical take-off and landing with those of a fixed-wing aircraft for cruise. The Ka-22 carried a large payload, having a hold comparable in size to the Antonov An-12. Eight world records for altitude and speed were set by the Ka-22 in its class, none of which have since been broken.

Development

In order to increase the effective range of a helicopter, Kamov designer Vladimir Barshevsky drew up a design for a helicopter with wings and an aeroplane propulsive system. In 1954 a proposal was agreed to produce three Ka-22s. The programme was delayed and on 28 March 1956 prototypes 2 and 3 were cancelled. The Ka-22 first lifted from the ground on 17 June 1959, and made its first untethered flight on 15 August 1959. Serious control difficulties were encountered, leading to orders being postponed until the problems were solved, and in July 1960 an order was received to manufacture three more Ka-22s.

Design

The Ka-22 was in essence a fixed-wing aircraft with rotors fitted above the wing tips. An engine was mounted on each wing tip, with drive to both a four-bladed tractor propeller and a four-bladed main rotor. The original prototype was powered by 5,900shp Kuznetsov TV-2VK engines, although these were later replaced by the 5,500shp Soloviev D-25VK.[citation needed] The fuselage contained three-seat cockpit above the glazed nose and a main cargo area large enough to contain 80 seats or 16.5 tonnes of cargo. The entire nose could swing open to starboard for loading bulky items. In helicopter mode, the propeller drive was disconnected, and the flaps were lowered to 90 degrees. In fixed-wing mode, the lifting rotors were free to windmill, and the aircraft was controlled by the ailerons and tail surfaces. The twin-wheel landing gear was fixed.

To Read More:

Wikipedia: Click Here

Avistar: Click Here
Military Factory: Click Here

Specifications (Ka-22)

General characteristics
Capacity: 100 passengers
Length: 27 m (88 ft 7 in)
Wingspan: 22.5 m (73 ft 10 in) fixed wing
Wing area: 105 m2 (1,130 sq ft)
Empty weight: 28,200 kg (62,170 lb)
Gross weight: 35,500 kg (78,264 lb) VTO
Max takeoff weight: 42,500 kg (93,696 lb) STO
Powerplant: 2 × Soloviev D-25VK turboshaft engines, 4,045 kW (5,424 hp) each
Main rotor diameter: 2 × 20 m (65 ft 7 in)
Main rotor area: 795.2 m2 (8,559 sq ft) total
Propellers: 4-bladed Variable-pitch propellers

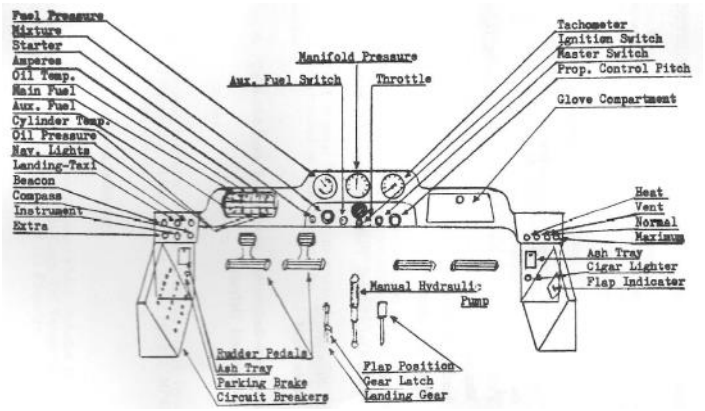
Performance

Maximum speed: 375 km/h (233 mph, 202 kn)
Range: 450 km (280 mi, 240 nmi)
Service ceiling: 5,500 m (18,000 ft)

GUESS THAT INSTRUMENT PANEL:

Bellanca 260:

Bellanca established itself in the market for 6-8 seat aircraft, but believed that it could also successfully sell smaller 3-4 seat aircraft. To fill this niche Bellanca designed The '14-7 Cruisair' as a modern, low-wing cantilever monoplane with a fuselage intended to contribute lift to the design. Although the prototype flew with fixed tailwheel undercarriage, the 14-9 production version was the first US light aircraft to be mass-produced with retractable undercarriage, the main wheels rotating aft into wheel-wells in the wings, with approximately 50 produced before production was interrupted by World War II.



	IAS		IAS
Top speed	207 mph	Normal operating range	68-197
Cruising speed (75% pwr @ 9000 ft)	201 mph	Maximum flap extension speed	110 mph
Design cruising speed	167 mph	Flap Opr. range	48-110 mph
Stalling speed	49 mph	Maneuvering speed*	115 mph
Maximum landing gear operation speed	124 mph	Rate of climb	1800 ft/min
Maximum gear down speed	180 mph	Best rate-of-climb speed	120 mph

Best angle-of-climb speed	101 mph	Best angle of climb	12°
Service ceiling	20,000 ft	Baggage capacity	186 lbs
Absolute ceiling	22,500 ft	Wing span	34'-2"
Fuel consumption	13.2 gal/hr	Wing area	161.5 sq ft
Fuel capacity	57 gal	Length	22'-10¾"
Cruising range	800 miles	Height	6'-2"
Prop diameter	78-8A	Power loading	10.3
Engine—Continental	10-470-F	Wing loading	16.7
HP and RPM—260 hp, 2625 rpm		Tire pressure	28-30 lbs
Gross weight	2700 lbs	Flight-load factor, flaps up**	+3.8 -1.52
Empty weight	1700 lbs	Flight-load factor, flaps down**	+3.5
Useful load	1000 lbs		

* The maximum speed at which you can use abrupt control travel without exceeding the design-load factor.

** The design load factors are 150% of the above and in all cases the structure meets or exceeds design loads.

ACCESSORY CONTROLS

Dashboard control panel:

1. Headphone Jacks
2. Microphone Jacks
3. Starter
4. Landing and Taxi Light Switch
5. Navigation Lights
6. Fuel-Gage Tank Selector—works with fuel selector valve.
7. Map and Magnetic-Compass Light Rheostat
8. Instrument-Panel Light Rheostat
9. Cigarette Lighter

Right sub-panel:

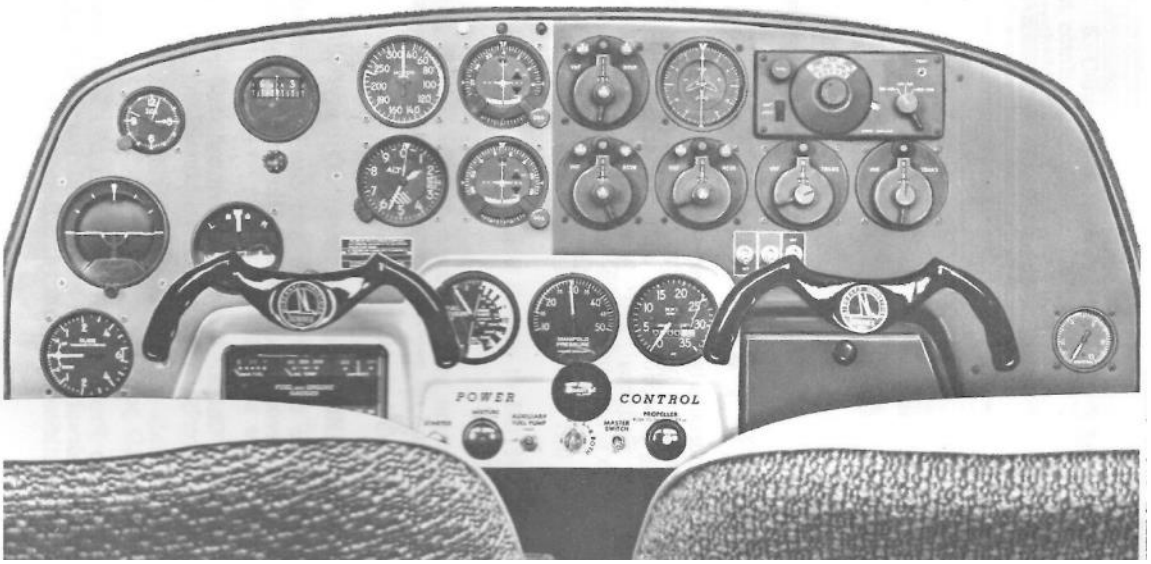
10. Cabin-Heat Control. Pulling out increases heat.

Center of cabin ceiling:

11. Cabin Light

Instrument-panel deck:

12. Windshield Defroster



15