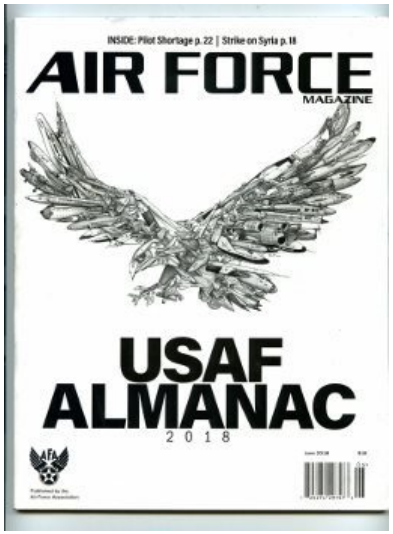
A Rather Unique Magazine “Cover Art”!

The cover of the June 2018 (annual almanac) issue of the Air Force Association’s magazine .....



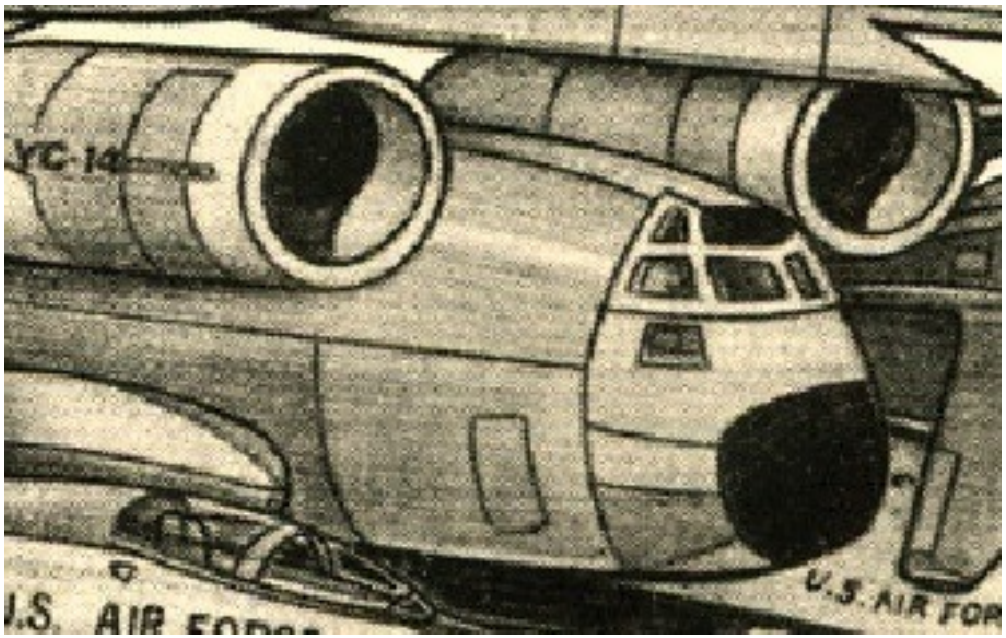
The cover of the June 2018 (annual almanac) issue of the Air Force Association’s magazine...
...is unusual, being dominated by the “X-Plane Eagle” artwork that is reproduced at the top of this page. Look closely at that image: it is a collage of artist Don Stewart’s ballpoint pen drawings of many of the experimental aircraft that the USAF has flown over its nearly seventy-one year history!

Actually, while in many of the sketches the “X” denotes a pure experimental research mission (for example, X-1, X-4, X-5, etc.); on others the “X” is a *modifying prefix* to that design’s basic aircraft mission designator, for example, making the XB-43 an experimental bomber. On still others, a “Y” *prefix* modifies a basic mission code as a prototype; as in YC-14 where it designates a prototype transport.

See https://en.wikipedia.org/wiki/1962_United_States_Tri-Service_aircraft_designation_system#Basic_mission for more on the system.

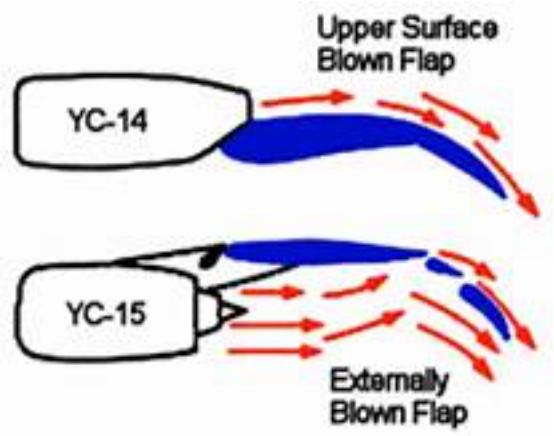
So, how many of the "Eagle's Feathers" can you identify?

As an old Troop Carrier guy, one that immediately caught my eye was the Boeing YC-14.
You'll find it half-way down the eagle's LEFT wing.



This rather odd looking assemblage was Boeing's entry in the Air Force's ***Advanced Medium STOL Transport*** (AMST) technology demonstrator project of the mid-1970's. Two of each of two quite different designs were built to compete in a "fly-off" by a USAF test group.

Boeing's design, which became the YC-14, featured UPPER surface blowing of the inboard wings and flaps for added lift at slow speed ...and therefore slower approach speeds. To achieve this, two massive, hi-bypass turbofan engines were cantilevered well out in front of and above the wing. When the flaps were extended and the slot between wing and flaps closed, the exhaust of those big fans blowing OVER the upper surface of the wings and flaps, followed the curvature over and down by what is known as the **"Coandă effect"**, thus achieving a measure of **downward** vectored thrust . The upper sketch below illustrates the principle; see https://en.wikipedia.org/wiki/Coand%C4%83_effect for more detail.



The Douglas AMST design became their entry as the YC-15. It was more conventional, with four engines under the wing externally "blowing" the slotted flaps for high lift, illustrated in the lower sketch.

The technology of both designs proved very workable, but other forces were at work which prevented either new medium transport design from being built in

quantity. As is often the case, other priorities of the USAF, the rest of the Defense Department, and the national budget as a whole had prevented a new 1970's transport to replace the C-130. (Today' C-130's continue to be replaced by new C-130's nearly a half-century later.....)

The Douglas (now Boeing) externally blown flap concept did appear a few years later in the design of the much larger C-17.

For me, the YC-14 "eagle-feather" in the picture struck a nerve: back in 1972 I had been notified of selection to serve on the maintainability team within the Air Force task force that would evaluate both airplanes in the AMST program. (At the time I was as a mid-level maintenance supervisor in a C-130 unit, also having considerable tactical airlift pilot experience in C-119's, C-123's, and C-130; to include flight test and the "you call, we haul" of tactical airlift combat operations in the latter two types. On being selected, that AF personnel center "froze" me so I could participate in the YC-14/YC-15 "fly off".

But my selection had been premature, with the AMST program getting stretched out! Delayed so badly, in fact, that after almost two years I was "unfrozen", and in late 1973 was tapped for an unrelated assignment overseas. The "first flights" for the two airplanes did not occur until ***much*** *later ....August 1976 for the YC-14 and August 1975 for the YC-15. By then I was already half-through my three year overseas assignment!*

So I never did get near either of the two "YC-" types. But it would have been fun!

Today, the #1 YC-14 prototype today survives engineless (above) in Arizona at the Pima Air Museum.

The second YC-14 remains in storage at the nearby Davis Monthan AFB “boneyard”.

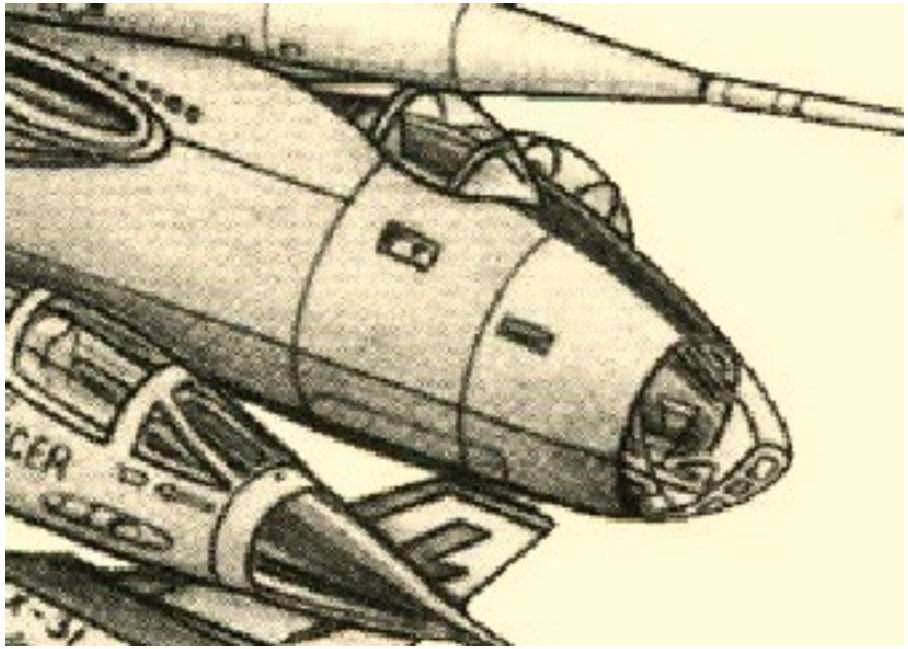
The #1 YC-15 had wound up in further testing at Edwards AFB. After an engine failure and emergency landing at Palmdale, with not-economically-repairable damage, it was fortunately close enough to Edwards that it could be moved by road, where it remains in the Edwards test museum. The other YC-15 was scrapped at Davis Monthan.

Incidentally, while the USAF decided not to proceed with Boeing’s YC-14 transport to employ Romanian aerodynamicist Henri Coandă’s upper-surface blowing effect, the Russians did!

For the past forty years the Russians very successfully built and flew sort of a “mini-YC-14”, the Antonov An-72 above, on both military and airline STOL missions. https://en.wikipedia.org/wiki/Antonov_An-72

But back to those “eagle feathers”

.....in the drawing. Below the YC-14 the nose of a rather unusual bomber can be seen peaking out ....an unusual proboscis for appearing “bug-eyed” with the pilots having separate, side-by-side canopies instead of more common cockpit glazing. The much more unusual feature that you CAN’T see is what the pair of contra-rotating propellers in the tail, powered by a pair of side-by-side Allison V-12 engines in the center fuselage via LONG parallel drive shafts ....made of multiple sections of P-39 drive shafts!



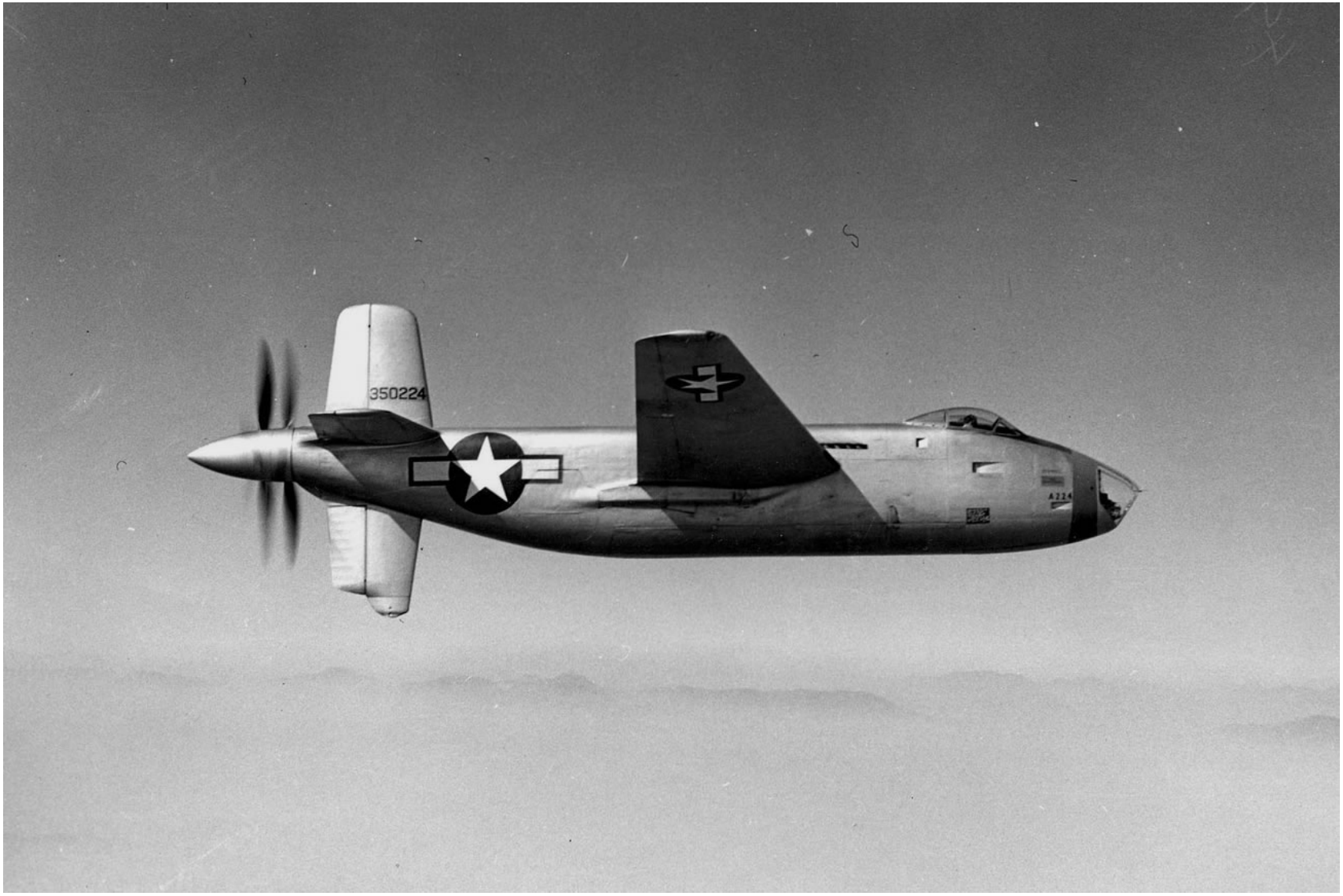
It caught my eye because fairly recently I had encountered the real thing. Or at least, I encountered PART of it. That was two years ago at the 60th year reunion of my USAF pilot training class, at the National Museum of the United States Air Force in Dayton. One of our special treats had been a private tour of the museum’s restoration hangar.

Our longest time in the facility was spent at this B-17, which has since become the museum's "Crown Jewel": the famous B-17F "Memphis Belle" in her full glory. Her restoration since finished, you have likely read about the hoopla that was attendant with it being put on display in the museum on the 75th anniversary of its crew completing their 25 combat missions.

Our docent, Dean Burnside (incidentally a retired KC-135A pilot), was particularly thorough in explaining the work being done on "Belle" to a bunch of really old pilots; so I made sure to get a picture of him. At the time what I hadn't noticed behind him were these two rather odd looking, very dirty, and wingless ducks stashed in the corner.

Lo and behold: they were the fuselages (only!) of two **“X-craft bombers”;** the pusher-prop-driven Douglas XB-42 “Mixmaster” at left, and its jet derivative XB-43, at right!

Below, what the they looked like when they still had their wings, and could fly.



I’ve heard from a reliable source that wings of one of these unique aircraft have gone missing, and for the other are in the museum but badly damaged .....from (it was further reported) having been removed with a chain saw!

My guess is that we’ll not likely we’ll not see either of these historically significant Douglas bombers on display in the museum any time soon ....if ever.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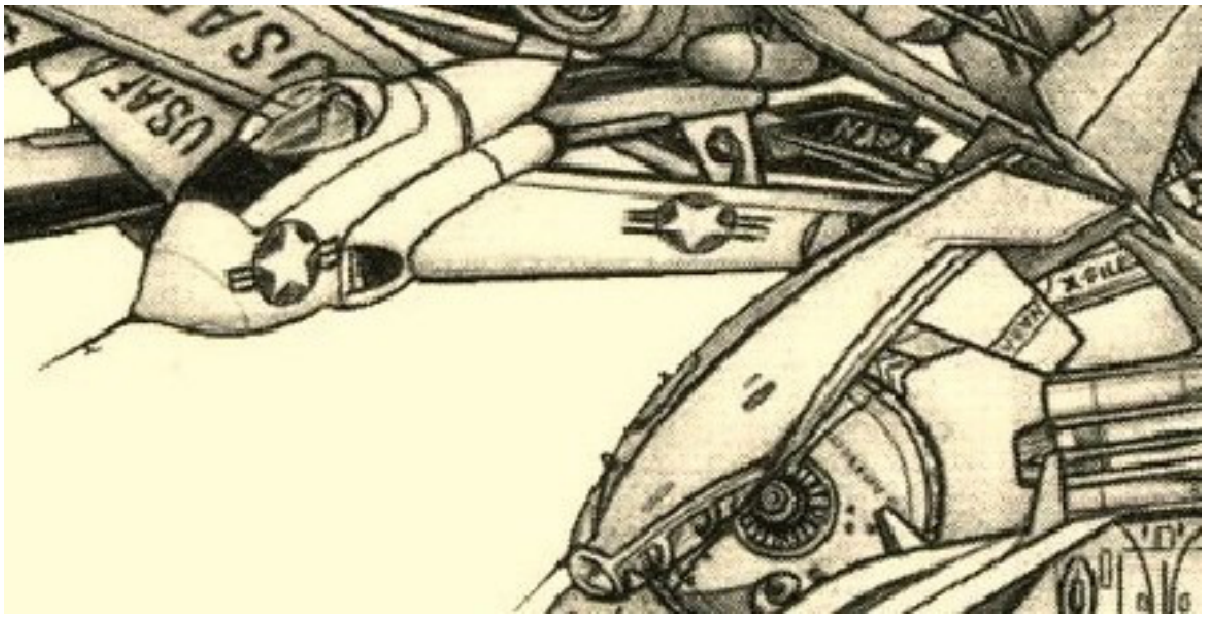
Now, about some of the other X-craft feathers....of that drawing. Many of them ARE on display in the Research and Development Gallery in the recently opened new fourth building, of what I still call "the Air Force Museum".



One of them is the X-4 ....in the cover drawing seen as the little aircraft just to the left and above the "eagle's" eye. (The vertical tail is obscured.) Only twenty-two feet long with a wingspan less than twenty-seven foot wingspan, in official nomenclature the X-4 was named the "Bantam", but I'd guess that nickname was likely like most. That is, only used for public consumption ....in the P.R. releases and on the sign placed in front of the airplane on Armed Forces Day displays at Edwards AFB.

The X-4 was used to investigate stability issues of tailless aircraft in the critical transonic regime. Two were built, one had problems and so served out its time being cannibalized as a "hangar queen" with its parts supporting the second. A great link for the X-4 program can be found here: https://en.wikipedia.org/wiki/Northrop_X-4_Bantam

My photo below, taken at the aforementioned reunion, includes an assortment of X-craft. The X-4 is hanging at upper right. In front of it the X-5 hangs over the right wing of the surviving XB-70 "Valkyrie" ....itself a lone survivor of its program, its sister XB-70 having spectacularly crashed in the accident of which you've no doubt seen photos.


X-1B
6682

Others in the picture include a surviving Bell P-59 ....America's first jet fighter ...parked at floor level behind the XB-70. Behind the P-59 is the Bell X-1B; to its right is the pioneering XF-92 delta wing fighter. Peeking at us from the extreme right is an early product of what would become known as Kelly Johnson's "Skunk Works" at Burbank: the specially-modified P-80R (44-85200) built especially for a world speed record attempt.
http://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/195772/lockheed-p-80r/

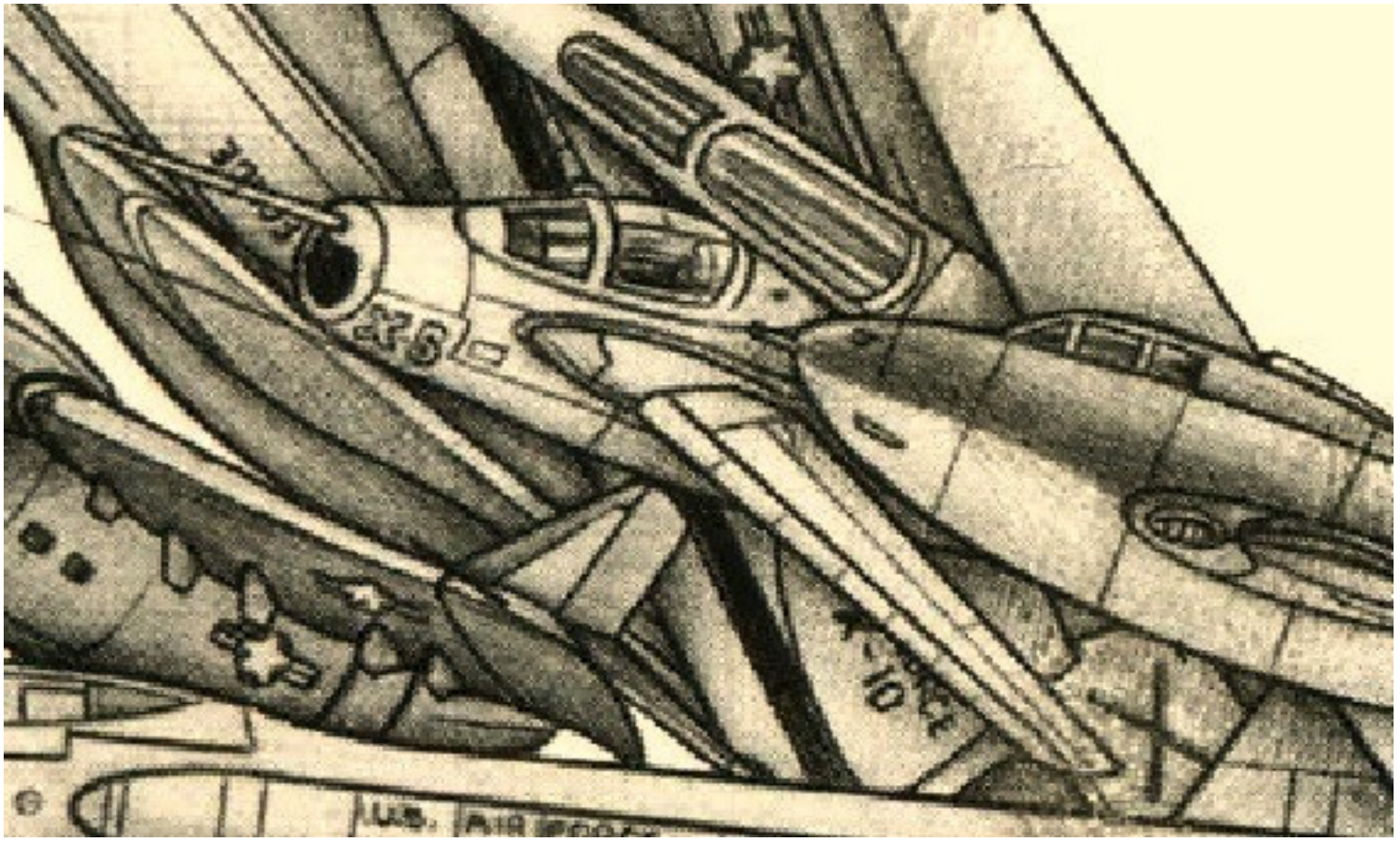
Hiding in the background against the wall and seen again, below; is the North American X-10 .....basically a supersonic drone which took off and landed like an airplane to prove concepts and technology for early cruise missile development, and in the process making great strides in supersonic unmanned flight technology. All this happened nearly seventy years ago! https://en.wikipedia.org/wiki/North_American_X-10

Going back to the AFA cover art ....did you notice the Eagle's EYELID? It's actually the image of an inverted X-craft ....this one being a type designed and flown to investigate the how-to-do-it of wingless "lifting bodies".....today so important in SPACEcraft that must become AIRcraft when they return to earth. For example, the Space Shuttle.

These "airplanes without wings" flew surprisingly well, generating lift from shapes sometimes resembling milk bottles or even flat irons. They have a rich history, with the same airframes sometimes rebuilt in an entirely new configurations. You have likely even seen over and over the spectacular crash of one of them .... the video of the M2-F2 crash became the opening sequence every week of actor Lee Major's "Six Million Dollar Man" TV series! The picture on the next page shows what it looked like when it quit bouncing and tumbling ... click on this link for more info. https://www.nasa.gov/missions/research/classic_tv.html.

That airframe (repaired) is now in the Smithsonian's National Air & Space Museum: the NMUSAF has several other of these historic lifting body test airplanes, lined up alongside the XB-70 with the X-15.

But to get back to the Bell X-5 ....the Air Force museum has the survivor of two built, seen with the X-4 hanging over the XB-66.



In the “Eagle” drawing, it’s hiding in a clutch of the Eagle’s other “feathers” in the left side of the drawing.

The two X-5’s were built to explore early variable wing geometry or “swing wing” configurations. Today, S/N 50-1838 survives at the NMUSAF. Flight test determined that the X-5 had poor stall/spin characteristics, especially at high angles of wing sweep. The word used to describe the X-5’s spin was “vicious”. The second X-5, 50-1839 crashed on October 14th, 1953 during spin tests, killing test pilot Captain Raymond Popson when he was unable to recover.

The X-5's were based on the technology of the captured P.1101, one of fighters in the German "Emergency Fighter Competition" begun in mid-1944 in the face of increasing Allied air superiority. A good review of that German program can be found here http://www.luft46.com/mess/mep1101.html)
Messerschmitt designed and built the P.1101 in their secret engineering center in Oberammergau* at the base of the Bavarian Alps; a facility previously unknown to the Allies and therefore never bombed. The fascinating story of this "Skunk Works"-type operation can be found here http://falkeeins.blogspot.com/2016/03/messerschmitt-p1101-prototype.html

An idea of the small size of the P.1101 can be found in this almost-cheesecake photo of an American technical officer with the Oberammergau P.1101 not long after hostilities ended, showing off his prize to his harem of WAC's.

All I can add, is that ***"war is hell"*** …..

*Any former G.I. who had a tour in post-war Germany and that took advantage of the well-known U.S. Forces recreation center at Garmisch-Partenkirchen, will likely remember driving through Oberammergau to get there …. they're only about 12 miles apart by road, but less than eight "as the crow flies".

Oberammergau is the location of the town's truly world-famous religious "Passion Play", an elaborate stage presentation based on the life of Christ, which for hundreds of years (since 1634!) has been staged ever ten years, is known world wide, and has been seen by millions. The next one will run from May to October in 2020; the last one in 2010 ran for over five months and more than a hundred performances.
See https://en.wikipedia.org/wiki/Oberammergau_Passion_Play