



AMA Chapter #3798

Chino Valley Model Aviators

Official News



February 25, 2020

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www.chinovalleymodelaviators.org

"To create an interest in, further the image of, and promote the hobby/sport of radio controlled aircraft"

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Aviation Trials:



"Hi Mom, I think I just flunked my pilot's exam!"

Support our Local Hobby Shop



Valley Hobby
Prescott Gateway Mall

Randy Meathrell's Big Sky Surfer Glider with FPV



Rick Nichols at right, checking out the FPV.



Randy with his very big Sky Surfer.

John Stewart's DLE-20 Powered P-51D "Geraldine"





Bill Gilbert: CVMA President's Message



Our general meetings continue to be well attended—great participation by the membership. The show-N-tell portion of the meetings exhibit some great craftsmanship and creativity of our members, lots of interesting models, as captured in the pictures on page eight.

The E-Warbird racing event is gaining some traction with an airframe type now decided upon. And it seems there is a good level of interest and participants.

(See Randy's Profile Foam bird below)

Indoor Flying sessions are available to the membership in conjunction with the CDA club. Associate membership in that club will allow us to participate in their scheduled indoor flying events. We will continue to explore events at a larger indoor venue in the near future.

It's the time of the year where we do some annual maintenance to the field; please monitor your email for notices of field closure or work parties. We just had the pre-

emergent weed control sprays applied. Next on the list is crack sealing of the runway, and an assessment of some weed damage to the west end of the runway.

Lastly, please fly safely. It is easy to get exuberant during our enjoyment of these flying creations. Use common sense and keep in mind what could happen if "things go south". We've had a good safety record, let's keep it that way, and continue to enjoy flying! See you at the field!

Bill

CVMA Flight Instructors

- Steve Shephard- Chief Flight Instructor
- Al Marello-basic
- Lloyd Oliver-basic
- Riley Harley-basic
- Jack Potter-gliders



P-40 decal sticker by Bill's print shop in Chino Valley.



Randy Meathrell's foam P-40 Profile racer, see page four for more information. More on war bird races coming in the future.

What Aircraft is This?



See Page Ten

CVMA NEWSLETTER

AMA Chapter #3789
Published Monthly

President — Bill Gilbert



Vice President — Doug McBride



Treasurer — Harold Ellis



Secretary — Bob Steffensen



Safety Officer — Steve Shephard



At Large Member — Dan Avilla

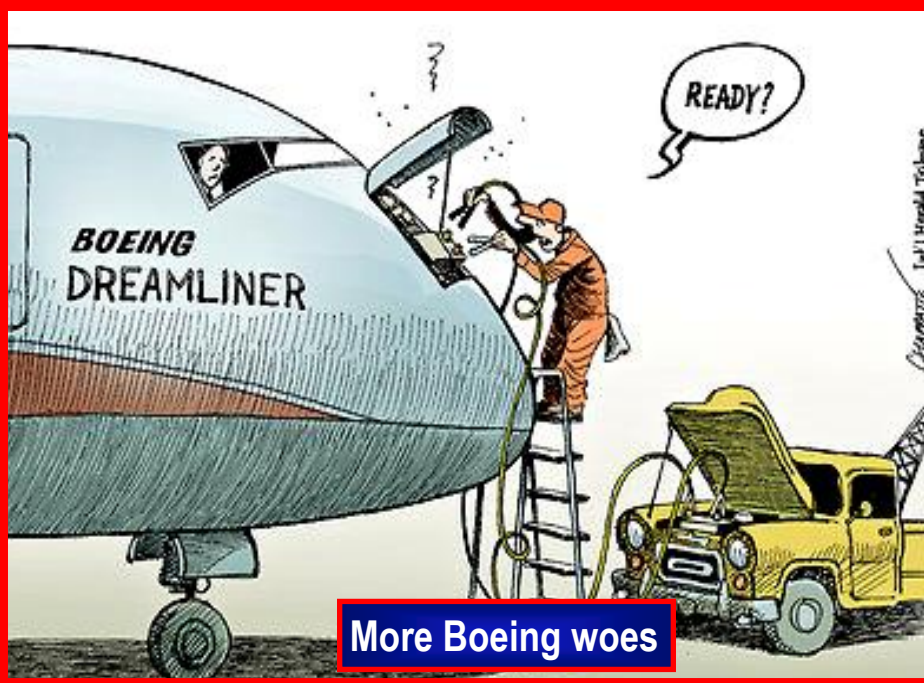


At Large member—Dennis O'Connor



Newsletter Editor — Bob Shanks





More Boeing woes

2020 — MARK YOUR CALENDARS

- May 9** Spring Fling, Fun Fly Swap Meet
- June 6** E-Warbird Races
- July 4** PotLuck and Fun Fly
- Aug. 8** Combat Wing Pylon Races
- Sept. 19** Annual Steve Crow Memorial Fun Fly
- Oct. 24** Annual Build & Fly Challenge
- Dec. 4** Christmas Banquet

Field Clean Up as needed before events

Club Meetings:

Third Wednesday of Each Month—7 PM
Prescott Airport Executive Building



BORN IN A BARN?

**IF YOU ARE THE LAST ONE TO LEAVE THE FIELD:
PLEASE REMEMBER TO LOCK THE GATE.**



SAFETY: ALWAYS A CRITICAL ISSUE

All members, many have already done so, should register with the federal government to obtain their FAA registration number to be affixed to all models. All of us should have not only the FAA number but our AMA number on our models. Some members have small decal type or address labels print ed out with both numbers to place somewhere on the model, preferably on the exterior of your models.

Your editor had registered some time ago with the FAA and was attempting to renew and spent over an hour trying to find his number but to no avail. Even if your number has expired and you have not renewed yet that number along with your AMA number should be on your planes.

We have approximately 3 years before all of this becomes mandatory in some form. Hopefully by that time a more reasonable and workable system will be in place.

At this point we all should be contacting our legislative representatives as well as contacting the FAA in a very calm logical way. Write your congressman and senator.

In a recent phone call from Congressman Gosar's office contact, your editor found out Gosar's office is working with the AMA as well as using the appropriate congressional protocols to get something done.

Here's a sample registration form below you would get in the mail after registering and paying your \$5.

At this point the proposed rule is unworkable and costly in its present form. Not only that, some of the

language and possible rules are being misunderstood. Some say we all will have a 400' ceiling for flights, our fields maximum has a 700' ceiling. There is much to sort out and modify but there is time, valuable time to contact the FAA (by March 3) and your political representatives.

So get registered if you haven't already done so. Your editor has seen some members certificates as many have already registered. Get those numbers on your planes along with your AMA number in a place that is visible. Fly Safe Members!



Federal Aviation Administration

Small UAS Certificate of Registration

CERTIFICATE HOLDER: JAMES SAMPLE

UAS CERTIFICATE NUMBER: FA12345678

ISSUED: 07/04/2019

EXPIRES: 07/04/2022

For U.S. citizens, permanent residents, and certain non-U.S. corporations, this document constitutes a Certificate of Registration. For all others, this document represents a recognition of ownership.

Operators of unmanned aircraft must ensure they comply with the appropriate safety authority from the FAA and economic authority from the DOT. To operate as a recreational flyer, a person must meet all the statutory conditions of the exception for limited recreational operators of unmanned aircraft 49 USC 44809. Persons who do not meet any of the statutory conditions may not operate under the statutory exception for limited recreational operators of unmanned aircraft and would need to operate the unmanned aircraft under part 107 or any other applicable FAA authority.

To fly under the exception for recreational flyers you must:

- Register your drone
- Fly only for recreational purposes
- Follow the safety guidelines of a community-based organization
- Keep your drone within the visual line of sight or via a visual observer
- Give way and do not interfere with any manned aircraft
- Get prior authorization before operating in controlled airspace
- Fly at or below 400' in uncontrolled airspace
- Comply with all airspace restrictions
- Pass an aeronautical knowledge and safety test

Club Members Flying Machines



Dave Bates EDF F-16

Rick Nichols Javelin



ERAU Student Landing at Prescott Airport



Photo on the left is [Rick Nichol's](#) Javelin sporting decals from "Bill's Print Shop" in Chino Valley. Have any special needs for art work check with Bill. Bill came out with his daughters for Rick's maiden flight, the Javelin flies very well.

The photo at right is a lucky shot [Bob Shanks](#) captured at the Prescott airport of a ERAU student landing. Bob was standing just off highway 89 capturing him on final approach. His 300mm telephoto zoom lens compresses distances making the mountains in Flagstaff appear closer than they really are in reality. This photo was featured in ROX Media's first ever Prescott area coffee table book now available. An 11x14 inch print on canvas was sold for \$100 at a recent ROX event raising money for the local Boys and Girls Club.

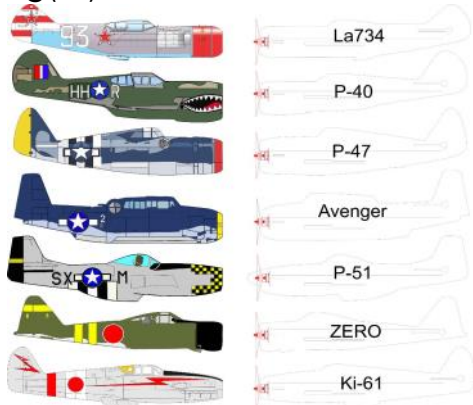
War Bird Racing is Back!

By Randy Meathrell

Many members have asked to bring back the T-28 Pylon Races we held for many years. Unfortunately, the T-28 is no longer available so we needed to find a different solution.

Talented member Steve Zingali has a laser cutter and can make just about any model you might want out of foam. Together we have developed inexpensive profile racing warbirds that can be built and flown for under \$100.00. The kit will include the airframe, motor, ESC, servos and battery. All you have to do is assemble, add your radio and you are ready to race.

We offer 7 different profile models and a full size vinyl decal of the chosen racer included in the cost, or you can paint the racer any way you want. If you would like to join the fun call Randy Meathrell @ (928) 830-2258. Here's the choices available:



SAFETY ALERT

We have a lot of new members so as a reminder, please read our rules at the field, especially if you don't fly very often; a nice safety review before flying.

ALWAYS call out your intentions, it has been brought to the board's attention that some are not calling out intentions. THIS IS A MUST. Our winds are fickle, we have variable crosswinds as well as sudden complete 180 degree wind shifts, so we allow folks to land up or down hill on the runway so call out intentions loudly.

Low passes must not be done over the runway but parallel with and away from the runway.

Also if you must retrieve your plane from the runway do so quickly especially on busy flying days. Or taxi off the runway and LOUDLY declare you are CLEAR.

Club Members Flying Machines



Steve Zingali's delta wing creation.



Dave Domzalski's small foam EDF F-86.

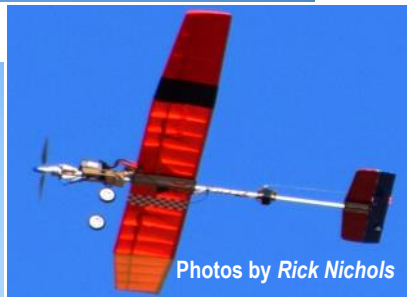


Clint Manchester's Extreme Aerobatic Biplane.

Rick Nichols launches his delta wing.



Matt Butler's Pitts.



Photos by Rick Nichols



Jack Potter's foam eagle



Bob and Steve Zingali check out the CG.

Bob Shanks had kept an old glider wing from years ago living and flying in Tucson. With Steve Zingali's help he used a metal tube and resurrected this "Ascent" glider. Steve cut out some tail feathers for Bob so now it flies again complete with landing gear.



Clint Manchester hand launches Jeremy Beck's Horizon Hobby's V-900 racer.

Pre WWII 1939 Lockheed L-133 Starjet Proposed Turbine Powered Fighter

The Lockheed L-133 was an exotic design started in 1939 which was proposed to be the first jet fighter of the United States Army Air Forces (USAAF) during World War II. The radical design was to be powered by two axial-flow turbojets with an unusual blended wing-body canard design capable of 612 mph (985 km/h) in level flight.

The USAAF passed on the 1942 proposal, but the effort speeded the development of the USAAF's first successful operational jet fighter, the P-80 Shooting Star which did see limited service near the end of war. The P-80 was a less radical design with a single British-based Allison J33 engine, with a conventional tail, but it retained a wing which was the same shape as the outer wing sections of the P-38 Lightning.

The Lockheed aviation company was the first in the United States to start work on a jet-powered aircraft, the L-133 design started in 1939 as a number of "Paper Projects" by engineers Clarence L. "Kelly" Johnson and Willis M. Hawkins and Hall L. Hibbard. By 1940 preliminary work on a company-financed jet fighter had been started, which progressed to several different versions on the drawing board. In the meantime, Lockheed was working on an axial-flow L-1000 turbojet engine of their own design, which was intended to power the culmination of the twin-engine jet fighter project, the Model L-133-02.

Throughout World War II, the development of a jet-powered fighter had the potential to bring a decisive advantage in the air battles of the war; as history played out, only Germany built significant numbers of jet fighters before the war ended, but they reached service in the Luftwaffe too late to make a difference.

On March 30, 1942, Lockheed formally submitted the L-133-02-01 to the USAAF for consideration powered by two L-1000 turbojets and featuring a futuristic-appearing canard design with slotted flaps to enhance lift, the single-seat fighter was expected to have a top speed of 612 mph (985 km/h) in level flight, but a range of only 310 mi (500 km) [2]. The L-133 had a main wing shape that was essentially identical to the outer wing sections of the Lockheed P-38 Lightning. In many respects the L-133 was far ahead of its time, with futuristic features including: canard layout; blended wing-body planform; and two engines in a very low-drag integral fuselage location.

The USAAF considered the L-133 to be too advanced for the time, and did not pursue the project. The experience gained with the design served Lockheed well in the development of the USAAF's first operational jet fighter, the P-80 Shooting Star. Although entering service after the war had ended, the P-80 was less advanced than the L-133. Because the USAAF didn't give the L-133 project the go-ahead, the advanced engines intended for the L-133 had long pauses in their development. The most expedient engine choice for the P-80 thus became the Allison J33, based on British centrifugal compressor designs. The P-80 was a cheap-to-build single-engine aircraft with a conventional wing and tail plane design, not using the blended wing-body and canard layout of the L-133.

General Characteristics

Crew: 1

Length: 48 ft 4 in (14.73 m)

Wingspan: 46 ft 8 in (14.22 m)

Wing area: 325 ft² (30.194 m²)

Powerplant: 2 × Lockheed L-1000 axial-flow turbojets

Performance

Maximum speed: 625 mph (985 km/h)

Armament

4 × 20mm nose-mounted cannon



Star Fighter from the Isle of Wight: The Saunders-Roe SR.177

<http://worldatwar.net/chandelle/v1/v1n2/saro177.html>

The Saunders-Roe SR.177 was an ambitious attempt by the British Royal Air Force in the 1950's to develop a combination jet- and rocket-powered interceptor to defend against the threat of Soviet bombers. But a new military budget laid out by the U.K Parliament in 1957 canceled the project.

The research paved the way for the similar Saunders-Roe SR.53, two of which were built and underwent flight tests. The second prototype of the SR.53 crashed in an aborted takeoff on its 12th flight test, exploding on impact and killing the pilot. In 1957, the Federal German *Luftwaffe* decided to replace its first-line fighter, the F-86 Sabre, with a supersonic, multirole airplane. Eventually, this modest requirement would balloon into one of the biggest military procurement programs of all time, the complete re-equipment of NATO's non-US, non-UK air forces with a single, common type. In the end, Lockheed overcame all opposition to its Starfighter (allegedly by being very free with bribes). But in the beginning, the odds-on favorite and front-runner was a very different aircraft, the Saunders-Roe (SARO) P.177, an unusual rocket/turbojet hybrid from a now all but forgotten manufacturer of flying boats based, of all places, on the Isle of Wight.

Nazi Germany's rocket-propelled Me 163 point-defence interceptors made a deep impression on Britain's air staff, an impression out of all proportion to the actual merits of the concept. In the 1950s, turbojets still suffered from many of the ills that plagued them during the war years: slow acceleration, poor initial rate of climb, relatively low thrust-to-weight ratios, and combustion difficulties at high altitudes. Afterburners were still in their infancy, particularly in Britain (the first afterburner to grace a British-designed engine was designed and built in Sweden, by Volvo Flygmotor, for the Rolls-Royce Avon used in the SAAB J35). Fast, high-flying, nuclear-armed Russian heavy bombers were expected at any time. Under the circumstances, the light, fantastically high-thrust rocket engine seemed like a godsend.

The Short PD.7 Rocket-powered Interceptor

At first, the RAF envisioned their maximum performance interceptor as a pure rocket airplane, like an Me 163 but with substantially more fuel. It would be armed with a battery of rockets that would be salvoed in a single firing pass. This concept proved impractical. The winning design, Short's PD.7 project, was almost a flying fuel tank. Every possible nook and cranny was filled with fuel or oxidizer. Yet calculations showed it to be still impossibly short on range. It could reach a bomber that passed conveniently close to its base at almost any altitude. But it could not fly out of its way or stop a cruise-missile carrier before the latter could launch its weapons. Pilots were also less than enthusiastic about the idea of routine, nose-high, dead-stick landings in a delta-winged flying fuel tank full of explosive fumes.

At this point, Saunders Roe, a small firm known mostly for small production batches of maritime utility aircraft, suggested a novel, mixed power arrangement. Rockets had been combined with jets during the Second World War, notably on the experimental Me 262C. But, in this application, the Walther rocket engine had been an auxiliary powerplant for boosting the JUMO 004 turbojet's modest climb performance. The SARO concept was different. Like the pure-rocket PD.7, the proposed SARO SR.53 would have a rocket, the de Havilland Spectre, for its main, combat powerplant. But it would also carry a small turbojet designed originally for disposable target drones, the Armstrong-Siddeley *Viper*. The *Viper* would serve as a sustainer engine during cruise and recovery. It was compact and very light, yet it was cleared for long-life service use at 1640 lbs.

The SR.53 had a tiny, mid-mounted, cropped delta wing, a T-tail, flush, side-mounted air inlets for the jet, and a ventral nozzle for the Spectre. It could carry two de Havilland Firestreak infrared-guided air-to-air missiles on the wingtips. It weighed about 15,000 lbs., spanned 25 ft, and was 45 ft long. Two were built, and flight tests began in spring, 1957. These revealed that the aircraft performed pretty much as predicted. Forty-two flights were made before a fatal accident and a growing lack of interest by the RAF led to the grounding of the remaining aircraft. (Modeler's note: MPC marketed a 1/72-scale model kit of the SR.53 in the late 1960s or early '70s.)

Bracket creep killed the SR.53. It met the original, target-defence specification to a T. But the air staff had, in the meantime, decided that the new fighter had to have an all-weather radar set. The aerodynamicists at Farnborough wanted a bigger jet engine, better matched to the airframe's ideal, cruising Mach number. The rocket could then be optimized for maximum turn, climb, and speed performance. They felt that the turbojet should be a supersonic engine in the 7,000-8,000 lb-st class. The rocket boffins wanted a different rocket motor, one that burned its kerosene (i.e. jet fuel) with familiar, readily available (though dangerous) liquid oxygen rather than the Spectre's exotic, high-test hydrogen peroxide (HTP). As new requirements piled up on top of old ones, size and weight grew. The chance for an early production contract for the SR.53 evaporated and the plane was never developed, tested or produced.

The SR.177 Attracted a Lot of Attention

The SR.177 did initially attract considerable attention overseas. The United States backed the development program. At this point, the English Defence Minister, Duncan Sandys, issued the famous White Paper that cancelled almost every British aircraft development program in favor of guided missiles. The Royal Navy and German orders suddenly had to support the whole program. Then the Navy backed out as well.





FEBRUARY 2020 CLUB MEETING



The General Membership meeting for February 19, 2020 opened at 7pm, when President **Bill Gilbert** brought the meeting to order. We opened with Pledge of Allegiance.

Club membership stands at 160. There were 46 members present including new and former member **Nick Henderson** and guest **Matt Campos**.

Minutes of January 2020 meeting were unanimously approved with no corrections.

President's Agenda

Randy Meathrell has volunteered to be the EM for the June warbird race. He showed us candidate: a foam silhouette warbird series... a **Steve Zingali** design with several profiles and a reasonable build price.

Bill Gilbert presented options for indoor flying. With Casa del Aero (free with a \$30 associate membership) at Prescott HS on the third Sunday of the month; PV Event Center is rentable for a \$100 fee per session, CVMA could arrange; Bill showed his Edge 540 from Twisted Hobby Kits and said it is a good indoor flyer. Many comments flowing into the NPRM for the FAA proposal for Remote ID for UAS. Make

your voices heard, comment period ends March 2. Send to your elect representatives; and contact other friends in other clubs. Do comply with current regulations to register with the FAA and label each of your aircraft as required.

VP **Doug McBride** noted the need for some minor runway repairs to tamp down some weed damage to the runway.

Treasurer **Harold Ellis** presented Treasurer's report. The balance is \$11,667. Report was approved unanimously.

Secretary **Bob Steffensen** recruited volunteers of bring goodies for openings in the calendar. Schedule is complete.

Safety Officer **Steve Shephard** said to fly safely, announce intentions and clear aircraft from the runway quickly. (See page 4 for Safety Alert)

Member Comments

Larry Parker suggested member work shop pictures; **Dave Domzalski** volunteered to present a foam hotwire cutting class; **Rick Nichols** said we should "can" sidebar conversations when someone else is talking! We broke about 7:40pm for cookies provided by **Bill Gilbert**. Thanks Bill!

We resumed the meeting at about 8:00pm.

Planes and Projects

Don Ferguson brought in his OV-1 Mohawk; **Don Crowe** showed us a Wedell-Williams Trophy Racer; **Matt Mrdeza** designed a Viper pusher with a floating canard; **Steve Zingali** showed his foam warbird and a mod to combat wing to facilitate streamer attachment; **Mark Lipp** displayed his recent build of a Fokker Eindecker III; **Lee Boekhout** demonstrated his hover craft creation; **Harold Ellis** recently completed a light weight "Low & Slow"; **Dave Domzalski** showed his indoor flyer bi-plane; **Jack Potter** built a spare parts flyer...a "Dumpster Diver Special".

Door Prize/Raffle

Mark Lipp won the door prize consisting of the proverbial bottled glue, Velcro tie down straps and a flash light. **Bob Steffensen** won the Flight Line twin engine F7 Tiger Cat in the raffle. We adjourned about 8:30pm.

Respectfully, **Bob Steffensen** Club Secretary



Steve Zingali brought 3 models: a P-40, (top) Yak-55 and a Combat Delta.

Mark Lipp's huge Eindecker.

Bill Gilbert's foam Edge 540.

Lee Boekhout's hover craft.

Randy's Meathrell's foam P-40.

Harold Ellis' designed "Low & Slow".

Matt Mrdeza's pusher the Viper.

Don Ferguson's OV-1 Mohawk.

Dave Domzalski's indoor flyer.

Don Crowe's trophy racer.

Hypersonics: The Need for Speed

The Following Article Citations: [Aviation & Space Technology](#), [Lockheed Martin](#) and [Aviation Week](#)

AVIATION & SPACE TECHNOLOGY REPORT

SR-72 rumors are that Lockheed Martin's Skunk Works is ramping up development of system technology on Hypersonics as observers report the first sightings of a demonstrator vehicle believed to be linked to the Skunk Works' planned SR-72 high-speed aircraft project, *Aviation Week & Space Technology* recently reported.

"Although I can't go into specifics, let us just say the Skunk Works team ... is doubling down on our commitment to speed," said *Orlando Carvalho* of Lockheed Martin's Aeronautics unit. He went on to say, "Over the last decade progress has been moving quickly, and hypersonic technology is clearly becoming

apparent to everyone as a game changer," he added. "We continue to advance and test technology which will benefit hypersonic flight and are working on multiple programs, including two DARPA (Defense Advanced Research Projects Agency) efforts."

In June 2019 Rob Weiss, executive vice president and general manager of the Skunk Works, hinted that progress toward an optionally piloted SR-72 flight research vehicle was proceeding on schedule. One technology demonstrator, believed to be an unmanned subscale aircraft, was observed flying into the U.S. Air Force's Plant 42 at Palmdale, CA, where Skunk Works is headquartered. The vehicle, which was noted landing in the early hours on an unspecified date in late July, was seen with two T-38 escorts. Lockheed Martin declined to comment directly on the sighting.

Lockheed Martin's Advanced Development Programs, better known as Skunk Works, might be further along in the development process for the SR-72 than it has let on. A proposed hypersonic reconnaissance and strike aircraft, the SR-72 would serve as a replacement for the famed SR-71 Blackbird, which was retired by the Air Force back in 1998. In June, Lockheed announced early progress on the program, and now a source reportedly told *Aviation Week & Space Technology* that they spotted a small demonstrator aircraft landing at Skunk Works facilities in Palmdale, California, possibly associated with early tests for the unmanned SR-72 program.

The reported sighting corresponds with announcements from Lockheed regarding progress in hypersonic aircraft research. The aerospace firm previously reported work on a combined-cycle engine that uses elements of both a turbine and a scramjet to achieve hypersonic speeds, something Lockheed Martin tested with partner Aerojet Rocketdyne from 2013 to 2017. Two combined-cycle engines are planned to power the SR-72, which is designed to be about the same size of the SR-71 and could achieve first flight in the late 2020s.

LOCKHEED MARTIN REPORT

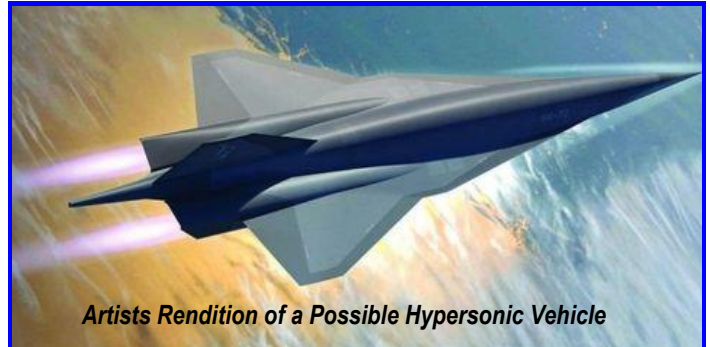
An optionally piloted flight research vehicle (FRV) is also in the works to flight test elements of the SR-72 design. The FRV will be about the size of an F-22 and use a single combined-cycle engine for propulsion. Development of the FRV is expected to begin next year and first flights could occur as soon as 2020. Leading up to the FRV, Lockheed could be conducting ground and flight tests on even smaller demonstrators, which might explain the small aircraft that was reportedly spotted landing at Lockheed Martin facilities in California.

AVIATION WEEK REPORT

According to information provided to *Aviation Week*, one such technology demonstrator, believed to be an unmanned subscale aircraft, was observed flying into the U.S. Air Force's Plant 42 at Palmdale, where Skunk Works is headquartered. The vehicle, which was noted landing in the early hours at an unspecified date in late July, was seen with two T-38 escorts. Lockheed Martin declined to comment directly on the sighting.

In addition to the sighting, Orlando Carvalho, executive vice president of aeronautics at Lockheed Martin, alluded to the SR-72 program at this week's SAE International Aerotech Congress and Exhibition in Fort Worth, Texas. "Although I can't go into specifics, let us just say the Skunk Works team in Palmdale, California, is doubling down on our commitment to speed," he said, as reported by *Aviation Week*. Carvalho went on to say, "Hypersonics is like stealth. It is a disruptive technology and will enable various platforms to operate at two to three times the speed of the Blackbird... Security classification guidance will only allow us to say the speed is greater than Mach 5."

With classified military aircraft development, it has historically been the case that systems and flight testing begin years before details of the program are made public. Such was the case with the original SR-71, as well as the F-117 Nighthawk and the B-2 Spirit stealth aircraft. The fact that Skunk Works is letting some information slip about the SR-72 program, combined with the possible subscale demonstrator sighting in Palmdale, suggests the Blackbird's hypersonic successor could only be a matter of time.



Artists Rendition of a Possible Hypersonic Vehicle

NAME THE PLANE: BELL VTOL X-14*

Made out of parts from a Beech Bonanza and a Beech T-34 Mentor, the Bell X-14 was an all metal OPEN cockpit jet designed to experiment with new VTOL technology. It was originally powered by two Armstrong Siddeley Viper turbojet engines, which were controlled by thrust vectoring nozzles situated at the aircrafts center of mass.

These engines allowed the Bell X-14 to reach a top speed of 180 mph and, if the pilot ever felt like freezing to death, a service ceiling of 20,000 feet. Two years later, the engines were replaced with GE J85s, and the airframe was shipped of to NASA, where it would fly until 1981. Only one airframe was ever built, and it is in private ownership, being restored.

The X-14 first flew on 19 February 1957 as a vertical takeoff, hover, then vertical landing. The first transition from hover to horizontal flight occurred on 24 May 1958. In 1959, its Viper engines were replaced with General Electric J85 engines. That year the aircraft was also delivered to the NASA Ames Research Center as the X-14A.

During the development of the P.1127, Hawker test pilots Bill Bedford and Hugh Merewether visited NASA Ames to fly the X-14 and acquaint themselves with jet V/STOL aircraft handling prior to the first flights of the prototype P.1127. It served as a test aircraft for NASA until 1981.

The X-14 project provided a great deal of data on VTOL (Vertical Take Off and Landing) type aircraft and flight control systems. The X-14A also was used by NASA for research on lunar landing maneuvers. The X-14A aircraft flight control system was



similar to the one proposed for the Lunar Module. Neil Armstrong, the first man to walk on the Moon, once flew it as a lunar-landing trainer.

In 1971, the X-14A was fitted with new engines (General Electric J85-GE-19) and re-designated the X-14B. An onboard computer and digital fly-by-wire control system were also installed to enable emulation of landing characteristics of other VTOL aircraft.

The X-14B was used in this test role until it was damaged beyond repair in a landing accident on 29 May 1981. At the time, there were plans to develop an X-14C with an enclosed cockpit. There were also

plans for an X-14T trainer. None of these further versions got beyond the planning stage.

During all of its years of service, the X-14 was flown by over 25 pilots with no serious incidents or injuries.



* https://en.wikipedia.org/wiki/Bell_X-14
<https://community.infiniteflight.com/t/bell-x-14-aircraft-of-the-week/105027>