SIPA S-200

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little jet

BY BARRY

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The S-200

SIPA S-200 Minijet

Fun to fly

But very few of these petite little jets were ever made

BY BARRY SCHIFF

The French SIPA S-200 Minijet was the world's first civilian turbojet airplane to enter production. Moreover, it was the world's first VLJ (very light jet). With its twin booms, the diminutive aircraft bears a striking resemblance to the de Havilland DH–115 Vampire built in England after World War II.

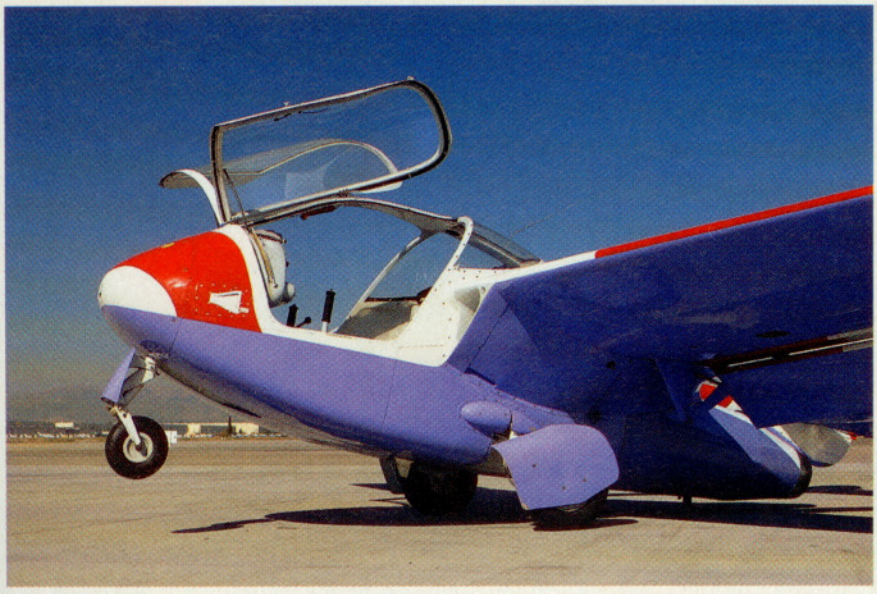
SIPA (Société Industrielle Pour l'Aéronautique) introduced the Minijet at the Paris Air Show in 1951, but the maiden flight did not occur until January 14, 1952.

The S-200 was designed by Yves Gardan, a respected designer of several European-built general aviation airplanes such as the Socata GY–80 Horizon.

Unfortunately, the petite jet made its debut as general aviation was experiencing a significant economic recession that did not show signs of ending until the late 1950s. Anticipated interest in the Minijet never materialized, and only eight were built.

In 1993, Asher Ward, an aircraft broker in Van Nuys, California, who specializes in unique aircraft, discovered a Minijet in Florida. N917WJ was owned by Don Whittington, a vintage-aircraft collector. (Whittington had found the airplane in Argentina during the mid-1980s where it was painted solid black and reportedly used for clandestine operations.) Ward purchased the aircraft from

PHOTOGRAPHY BY MIKE FIZER



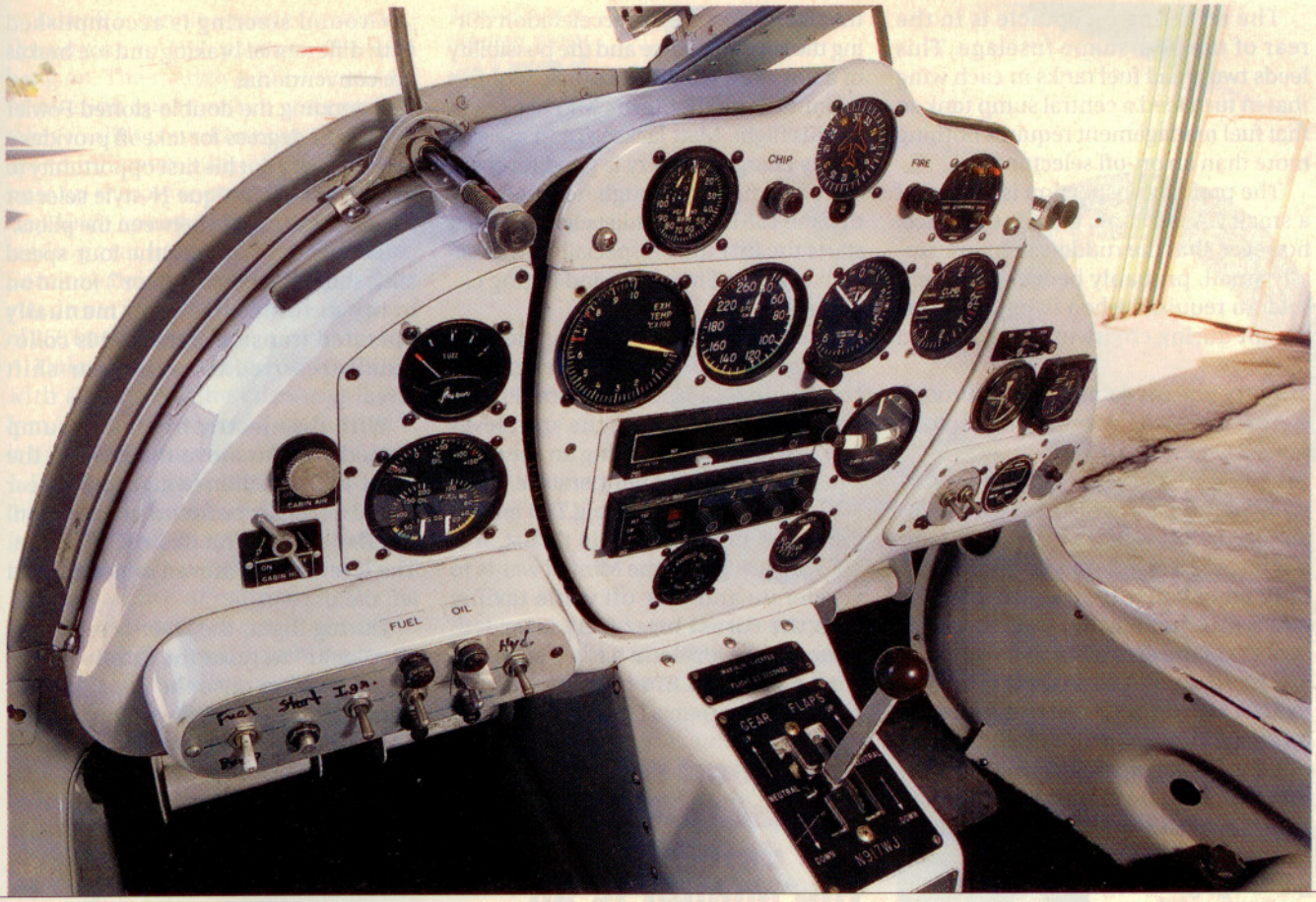
Whittington and had it trucked to Van Nuys. The aircraft was equipped with its original engine, a Turboméca Palas turbojet that delivered only 330 pounds of thrust. This resulted in a low thrust-to-weight ratio and relatively anemic performance (as reflected in the specifications on page 85).

Not satisfied, Ward modified the Minijet by replacing the French engine with a General Electric T58, the same engine used in the Bell UH–1 Huey. The T58 develops 1,350 shaft horsepower in the legendary helicopter, but produces 800 pounds of thrust when used as a turbojet instead of a turboprop. This 142-percent increase in thrust produces impressive performance.

The more powerful engine also is heavier and keeps the empty center of gravity relatively far aft. Ballast must be placed in the cabin to prevent the airplane from resting on its tail skid instead of its nosewheel. Ward uses a pair of heavy automotive batteries that are removed as soon as one person climbs aboard.

An air intake in each wing root leads to the engine, which is aft of the firewall behind the pilots.

Installation of the more powerful engine created an endurance problem, too. Fuel capacity is 55 gallons. This



The handle on the center console (left) resembles an automotive, four-speed gear-shift lever. It directs hydraulic pressure to raise and extend the landing gear and flaps. The center position is neutral.

was acceptable for the smaller engine, but the GE powerplant is much thirstier. Endurance is now only 30 to 45 minutes, which means that a flight should not be planned for much more than 15 or 20 minutes. This explains why the air-to-air photography on page 80 and 81 had to begin almost immediately after liftoff, and we were forced to accept whatever background happened to slip beneath our wings.

Ward, however, had a pair of original 15-gallon tip tanks that he plan to install. Thankfully, the plumbing needed for this is already in the wings. This will increase safe endurance to almost two hours.

The refueling receptacle is in the rear of the pod-shape fuselage. This feeds two small fuel tanks in each wing that in turn feed a central sump tank so that fuel management requires nothing more than an on-off selector valve.

The preflight inspection is typical of a small GA airplane. One does notice, however, that the rudders seem unusually small, probably because they are seldom required when flying a Minijet except during crosswind takeoffs and landings.

Entry into the cabin is made through a large gull-wing door on each side of the fuselage.

There are very few engine instruments on the panel because very few are needed. In addition to the oil temperature and pressure gauges, there is only an exhaust temperature gauge and a tachometer that indicates percentage of maximum-allowable rpm.

There also are two red warning lights. One warns of metal chips in the oil (land as soon as possible) and another warns of an engine fire. The only thing you can do about the latter is to shut down the engine; the aircraft is not equipped with bottles of extinguishing agent.

The large GE engine requires more electrical power to start than was required by the original, smaller engine, so the electrical system in the Minijet is not quite as substantial as it should be. Consequently, a pilot should be careful not to attempt a start unless the 28-volt battery is fully charged. Otherwise, he runs the risk of slow engine acceleration during the start sequence and the possibility of a hot start, which, of course, requires an immediate shutdown. My check pilot on this flight, Matt Jackson, told me that a fully charged battery is good for three start attempts, although he has found that the T58 in this Minijet almost always starts the first time (especially if the aircraft is headed into the wind during engine start).

Starting involves pressing the start button and waiting for the engine to accelerate to 20-percent rpm. Fuel is then added by moving the start lever forward while maintaining an ever-vigilant eye on exhaust temperature.

Considering that the big T58 engine produces substantial idle thrust, it is not surprising that the Minijet wants to accelerate and take off while taxiing with the thrust lever fully retarded. After all, the airplane has a maximum gross weight of 1,874 pounds, only 204 pounds more than a Cessna 152.

The good news is that the controls are delightful. The Minijet is an easy-to-maneuver airplane with a brisk roll rate and fingertip control forces.

Ground steering is accomplished with differential braking and toe brakes are conventional.

Extending the double-slotted Fowler flaps to 12 degrees for takeoff provides a new Minijet pilot his first opportunity to experience the unique H-style selector lever on the console between the pilots.

This lever resembles the four-speed stick shift ("four on the floor") found on many automobiles with manually operated transmissions and is colloquially referred to as the gear-shift lever.

With the electric hydraulic pump turned on, you move the lever to the lower-right position (where fourth gear would normally be found in a car) until the flaps reach the desired position. The lever is then moved to neutral and left there.

During flight, the lever is moved to "first gear" to raise the landing gear, "third gear" to raise the flaps, "fourth gear" to extend the flaps, and finally "second gear" to lower the landing gear.

This might seem a bit complicated at first, but becomes intuitive and easy to use after a little practice.

The thrust and elevator-trim levers are immediately aft of the gear-shift lever. A second throttle on the left sidewall allows each pilot to operate his control stick with his right hand and a throttle with his left in the tradition of military trainers and fighters. (SIPA had hoped to sell the Minijet as a military trainer and liaison aircraft as well as to the civilian market.)

The SIPA S-200 Minijet was the world's first civilian jet airplane and looks strikingly similar to the de Havilland DH-115 Vampire, the second and final jet-powered airplane developed by the British during World War II.

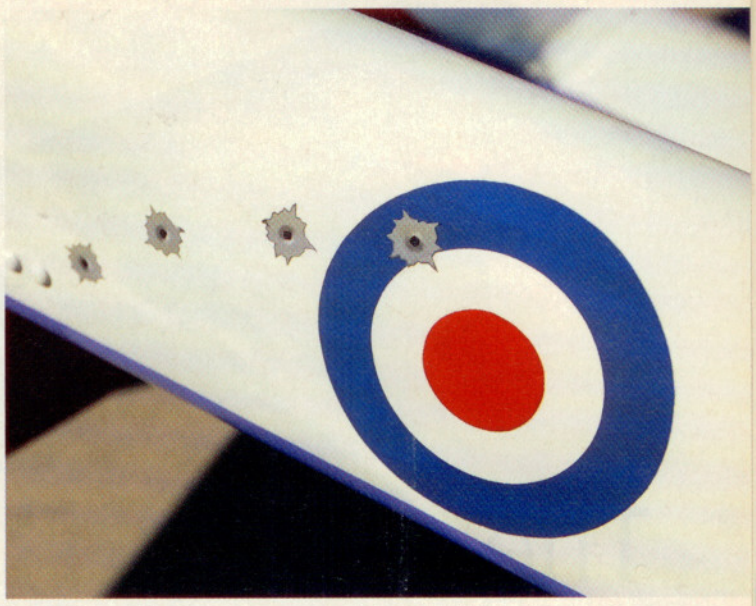
Takeoff is simple enough: Accelerate the engine to 100-percent rpm and hang on. The modified Minijet rockets to rotation speed in less time than it takes to shift your attention to the airspeed indicator. After liftoff, pull the nose up sharply so as not to exceed the flap limit speed of 80 knots and the landing gear limit speed of 120 knots. Continue holding the nose high so that you do not violate the red-line airspeed of 250 knots.

Unless power is reduced, the S-200 with a Huey engine climbs at 8,000 fpm. (With the original French engine, it had a maximum climb rate of only 1,140 fpm.) Cruise speed at 10,000 feet—the airplane is not pressurized—is 300 knots while burning 35 gph and with tip tanks installed.

One cannot, of course, climb this way for very long because of limited fuel. In reality, you should begin to think about landing as soon as the landing gear is retracted. Consequently, my investigation of handling qualities, performance, and stall characteristics was necessarily and severely curtailed.

The good news is that the controls are delightful. The Minijet is an easy-to-maneuver airplane with a brisk roll rate and fingertip control forces. It also has a 9-G limit load factor and is approved for aerobatics (except snap rolls). Inverted flight is limited to 20 seconds. Sadly, I did not have the fuel needed to explore this corner of the envelope either.

After posing the aircraft briefly for the camera, it was time to land. (It is time to land almost as soon as you leave the ground, and you always keep the airport in sight and within glide range.)



The airplane's previous owner had a sense of humor, and used decals to pretend that the aircraft had been hit by small-caliber gunfire during a dogfight.

I flicked on the electric hydraulic pump, shifted to "second gear" to extend the landing gear, and then shifted into "fourth gear" a second or so at a time to ramp the flaps down to a maximum of 35 degrees. The lever is then placed in neutral.

There is not much to landing the Minijet except that you should not begin flaring until you feel as though the seat of your trousers is about to scrape the runway. You are seated that low. (The tail skid below the tailpipe of the engine ensures that a tail strike does not damage the engine.)

N917WJ is truly fun to fly as long as you do not try to fly it for very long. It is perfect for someone who does not need to go far.

After this article was written for *AOPA Pilot*, the Minijet was purchased by William "Randy" Workman who now keeps the airplane at Darke County Airport in Versailles, Ohio. With the tip tanks installed, he reports that the safe endurance for a VFR flight is now almost two hours. Workman is planning numerous upgrades for the airplane, especially a fuel-management system to replace the single analog fuel-quantity gauge. AOPA

i Links to additional information about the SIPA Minijet may be found on AOPA Online (www.aopa.org/pilot/links.shtml).

Visit the author's Web site (www.barryschiff.com).

SPECSHEET

SIPA S-200 Minijet

Specifications

Powerplant	Turboméca Palas Turbojet, 330-lb thrust
Length	17 ft 1 in
Height	5 ft 10 in
Wingspan	26 ft 3 in
Wing area	103.0 sq ft
Wing loading	18.2 lb/sq ft
Power loading	5.7 lb
Seats	2
Empty weight	810 lb
Max ramp weight	1,874 lb
Max gross weight	1,874 lb
Useful load	1,064 lb
Payload w/full fuel	494 lb
Max takeoff weight	1,874 lb
Max landing weight	1,874 lb
Fuel capacity, std	55.5 gal (372 lb)
Fuel capacity, w/opt tip tanks	85 gal (570 lb)
Oil quantity	3.2 qt
Baggage capacity	22 lb

Performance

Takeoff distance, ground roll	1,149 ft
Takeoff distance over 65-ft obstacle	4,000 ft
Rate of climb, sea level	1,140 fpm
Max level speed, sea level	232 kt
Cruise speed @ 3,280 ft	205 kt
Max range (without tip tanks)	378 nm
Absolute ceiling	26,240 ft
Landing distance, ground roll	650 ft
Landing distance over 65-ft obstacle	2,500 ft

Limiting and Recommended Airspeeds

V_X (best angle of climb)	72 KIAS
V_Y (best rate of climb)	80 KIAS
V_A (design maneuvering)	130 KIAS
V_{FE} (max flap extended)	80 KIAS
V_{LE} (max gear extended)	120 KIAS
V_{NO} (max structural cruising)	125 KIAS
V_{NE} (never exceed)	250 KIAS
V_R (rotation)	65 KIAS
V_{S1} (stall, clean)	57 KIAS
V_{SO} (stall, in landing configuration)	50 KIAS

All specifications are based on manufacturer's original calculations and apply only to the original aircraft with the less powerful engine installed. All performance figures are based on standard day, standard atmosphere, sea level, gross weight conditions unless otherwise noted.