PILOT FLIGHT CHECK:
the SN-601 CORVETTE

Is there room in the U.S. market for another bizjet twin? Mais oui, says our roving reporter, who flew Aerospatiale's new entry in France—avec plaisir

by ED MACK MILLER/AOPA 466824

■■ I arrived at the guard gate of the big Aerospatiale plant in Saint-Nazaire at 9:25 a.m., five minutes early. Right on time came Jean Malaise, Dan Gerard, Bob Briot and Andre Jouanet, four guys right out of a Saint Exupéry novel.

No trouble with English—they all spoke it. Better than I do. Gerard, a whirling armature of a man, flew for TWA for many years and is now Corvette support manager. Malaise got his flying training at U.S. Navy bases in this country as a French exchange officer. Briot, chief test pilot on the Corvette, did the same with the U.S. Air Force, flying F-84s.

In a few minutes I was in Briot's office, up to my eyeballs in Corvette.

My first question was the high, hard one: Who needs another business jet?

Clean and handsome, the No. 2 Corvette, with tip tanks, climbs to 20,000 feet in seven minutes. The two Pratt & Whitney (UACL) JT15D-4 turbofans combined will produce 4,620 pounds of thrust.

Behind that came a curve: With the American dollar down in value, what has the Corvette got that would make an American buyer opt for it over one of the fine U.S. bizjets?

I really didn't expect to score with either delivery, because people just don't go around sinking big sugar into the development of an aircraft that isn't going to make it.

Briot, who has a kind of John Wayne/Gregory Peck look about him, grinned and pushed across his desk a photocopied monograph. It was a paper he had given to the Society of Automotive Engineers at the March 1972 National Business Aircraft Meeting in Wichita. It was entitled "Why Another Light Twin Jet: The SN-601 Corvette?"

"Read it later," said Danny Gerard. "The weather's closing in. Why don't you go fly now?"

Briot and Malaise gave me a short tour of the production line at the Saint-Nazaire plant and a walkaround of the plane we were to fly, No. 1, designated F-WUAS.

"Didn't you lose the prototype?" I asked.

"Yes," Bob Briot said, "at Istres, near Marseilles, in 1971. It was being flown by government inspectors, like your FAA. We've never been sure what caused it. There was conjecture that it was a stabilizer problem."

The plane is clean, handsome. In a way it looks like the Falcon 20, which

many confuse it with. The Falcon, of course, is built by Dassault, and although the empennages of the planes are almost identical, the nose configurations vary radically. The Corvette has four cockpit windows and a longer "droop snoot," while the Falcon has a seven-window cockpit configuration.

Aerospatiale, formed in 1970 by the merger of Nord Aviation and Sud Aviation, is government owned, employs 43,400 people working in 10 main plants, and has produced the Caravelle, the Concorde SST (in conjunction with the British), the A-300 Airbus, the Transall military transport, helicopters, light aircraft and several types of missiles. There has recently been talk of a merger with Dassault.

The Corvette design got its start as an entry in a competition to fill a French government request for a twin-turbofan trainer and communications plane. The Corvette is "little on the outside, big on the inside," with an interior cabin length of 18 feet 9 inches, and is basically intended as a short-haul transport for a maximum of 14 passengers, cruising at a top speed of 0.77 Mach.

Like the Cessna Citation, it is a fairly unsophisticated plane, boasting "SSE"—space, silence, and economy.

F-WUAS, without tip tanks, was flown in the 1973 Paris Air Show by Briot—Jouanet flying F-WRNZ, No. 2, at the same time, with tips. In some regimes of flight, the tips seem actually to aid (probably by helping the fences straighten spanwise flow). For instance, in the Corvette charts, at comparable weights, climb time to 20,000 feet is eight minutes without tips, seven with. With tips there's an 11-pound saving to 20,000. The situation reverses in level flight.

The Corvette, with mainly conventional systems, is no new departure in aircraft. Fueling is single-point from a fuselage bay. The nose avionics and radar compartment is spacious and easy of access. The entrance door, on the left side, is a clamshell, with two steps in the bottom section.

Single-wheel nose and main gear look rugged, the nose tire having a rubber chine flange to deflect standing water from the engine inlets, which is only a problem at about 30 knots, according to Briot.

Ailerons interact with "swiss cheese" spoilers for roll action. Speed brakes are also "slabs with holes," above and below the wing, activated almost instantly by a switch on the side of the throttle knobs. The wing flaps are divided into two groups and cover nearly three-fourths of the wing span. They are long-travel, double-slotted (Fowler) type.

The engines, aft mounted, are Pratt & Whitney UACL JT15D-4 turbofans of 2,310 pounds of thrust apiece, with a bypass ratio of 2.5. (An alternate engine is the French-built SNECMA Larzac.) External power plugs in on the left side of the flight compartment.

To me, probably the most unusual thing about the plane is its anti-icing system. Protection on the inboard leading edges of the wings is standard (because of the engine intakes directly behind). Anti-icing of the outer sections is optional. But the way the system does it is unique. An anti-ice fluid, T.K.S. (like Prestone), is pumped out through tiny openings in the leading-edge surface under pressure from a four-gallon tank. The pilot presets the amount needed before entering icing.

We didn't have to worry about icing that day, for the temperature was 21°C (70°F) on the ground at Saint-Nazaire's Montoir Field. But there was visible moisture, with an 800-foot overcast, a light wind (280/08), and an altimeter of 29.95. The field is nearly at sea level (10 feet msl).

Upon entering the aircraft, I turned to the rear to get an evaluation of decor, spaciousness and seating comfort. Here I struck out because F-WUAS is, of course, not yet certificated, and hence is loaded with test equipment. All I could vouch for was that it sure did look big inside.

The cockpit was also spacious and easy of entry (easier, I must add, than my 747; I generally bang my bean getting into the JumBoeing cockpit).

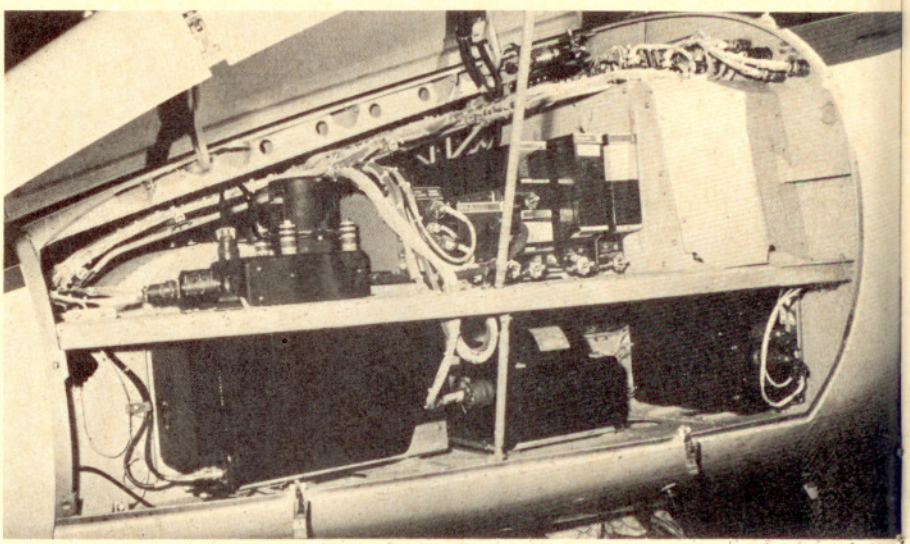
I slipped into the comfortable left seat and sized up my surroundings. With an eye on selling the Corvette as a pilot trainer for airline aircraft, Aerospatiale has given the plane an airliner "front end," including room between seats for an entirely adequate jump seat.

It was hot in the bird, and eyeball air from top center was just what was needed. There's a handy handle on the center post, too, to aid in getting seated. Armrests are just right, but throttle position was awkward for a Boeing driver, being lower and much farther aft. I had to use two motions on the throttles—pull up, rotate the palm, and push forward.

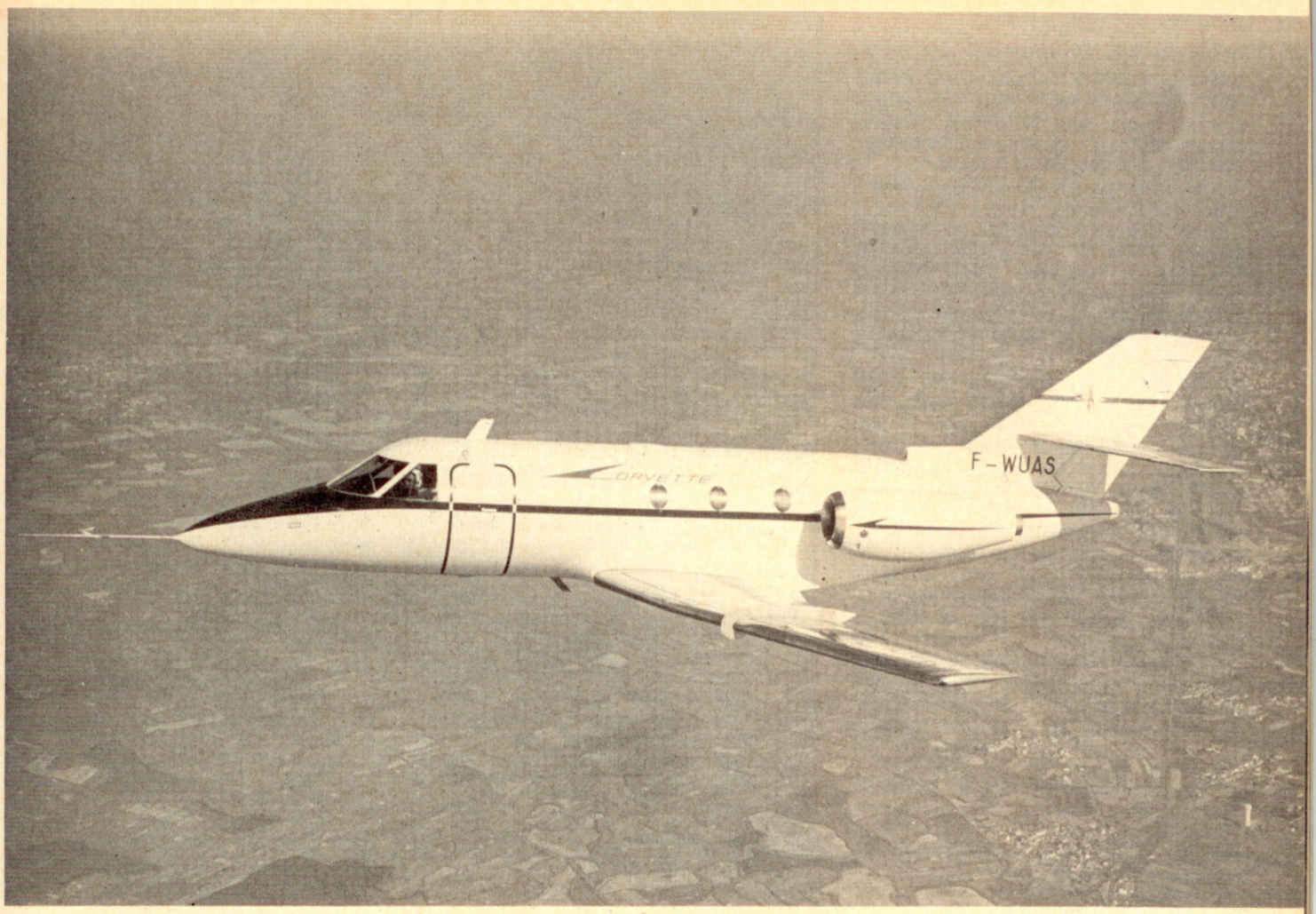
Overhead switches are nicely placed in a semicircle above the windshield, and tell-tale anunciators are in a slim line on the sub-glareshield. I felt very much at home in the cockpit and especially with the instrument display. The only things I had difficulty finding were trim and flap position indicators.

Briot had changed to an orange flying suit with a built-in "window" pocket above the right knee, a logical and simple follow-on for the test pilot's kneeboard.

Firing up the engines was standard, and I found myself taxiing as though I'd been flying the plane for years. Nosewheel steering is by a tiller off the cap-



Nose avionics and weather radar compartment of the Corvette is spacious and easy of access. Also housed herein is the battery. External power plugs in on the left side of the flight compartment.



No. 1 Corvette, flown by the author, is minus the tip tanks that will be standard on U.S.-marketed aircraft. Cruise speed is 0.72 Mach. Economy range of the executive version is 1,675 nautical miles.

tain's left knee. It's slightly sensitive but easy to get the hang of.

Montoir has one runway, 7,874 feet long, oriented 8-26. I was cleared the length of the runway to position on runway 26. This gave me a chance to taxi at max speed and sense the transition from nosewheel steering to aerodynamic control, which happens at about 60 knots. I kept forgetting that there was no steering through the rudder pedals and had to go back to the tiller at slower speeds.

Then we were cleared and rolling. The Corvette just felt good, like an old shoe. Although in weight (13,400 pounds) it was much closer to the general aviation twin I had flown last, it felt much more like an airliner—a 737 or DC-9.

Exact figures aren't in the book yet (until certification, which will be done by next spring under both FAR 23 and 25), but Briot noted that minimum control speed on the ground is about 73 knots, while minimum control speed in the air is about 88. Critical engine failure speed at this weight was 104 knots, rotation speed 114, and takeoff safety speed 116.

Control pressures were normal—just right—for rotation. Eleven degrees nose up seemed right to hold takeoff safety speed plus 10 knots. Gear up with positive rate, and, at Bob's direction, we picked up 140 knots and cleaned up the flaps (no need for a noise-abatement profile).

A right turn to the north, with radar directing us to a work area at 20 "thou" north toward Saint-Malo and Normandy.

As we climbed, I played with the plane, noodling the controls and trying to get the feel of the breakout forces. I had read somewhere that at high speed the aileron control forces were so high that Aerospatiale was looking at a fix. At barberpole they were stiff but, I felt, desirably so. After all, on planes with boosted controls (none of the Corvette controls are), "stiffening" devices often have to be added so that some boob pilot doesn't jam in a rudder at high speed and tear the plane apart. Or, in Boeing's case, the outboard (big) ailerons lock out when the flaps come up, so a muscular pilot won't twist the wing.

The airplane is stabilizer trimmed, and elevator forces are light enough so that I had to keep telling myself "make love to it," to make sure I wasn't too rough in pitch control. The trim tabs are set up with pitch and roll on the left top of the yoke horn (like a T-33) and rudder on the right horn. The latter was the one that took some getting used to for me.

I had Bob demonstrate the engine-fire procedure and asked him what technique is used to initiate an emergency descent. Easy, he said: Power off, speed boards, and 300 knots give better than ten-grand-a-minute descent. We did it down to 10,000. Fun!

Then steep turns and stalls, the latter clean, in takeoff configuration out of a turn, and "full garbage" straight ahead. The plane is honest, with plenty of aileron control till it begins to mush, lateral control staying through the entire spectrum.

Pitch changes from speed brakes, flaps and gear usage are minimal and easily countered. Like the Citation, the Corvette has no exotic devices, stick-shakers or pushers.

I had wanted a two-engine ILS, using the coupler, but got shot down twice on that. Saint-Nazaire has only an ADF approach, so we'd have to drop into Nantes Chateau Bougon for the ILS. But Nantes was below minimums by now—and the Corvette's autopilot was disconnected at the moment.

I settled for an NDB penetration to Montoir. Minimum descent altitude was 500 feet (490 feet above the ground). With gear down and 20° flaps, I saw the

field, dimly, when we got to minimums and went to full (35°) flaps. It was getting so sticky that Bob said, "Rather than a full stop, shoot a touch-and-go, and I'll cut an engine on takeoff."

Approach speed with full flaps was a little over 100 knots.

Even though I kept telling myself I wasn't in a 747, I still leveled off high and had to stair-step down. Finally, much chagrined, I put it on fairly decently, and Briot gave it the gun on both engines, getting the flaps to takeoff position, trim set.

As I lifted off, pretty far down the runway, he cut the No. 2 engine. It wasn't bad to hold. I got gear up and had to remind myself that "the trim, dummy, is not on the pedestal, but right on the horn of the yoke in front of you."

It was right here that I was wishing the Corvette was really a helicopter, because I had a craving for altitude. Visibility wasn't too good, and we were heading for the Saint-Nazaire shipyards, filled with huge cranes that stuck up as high as we were.

Discretion being the better part of both valor and wisdom, Briot restored the power and gave me vectors downwind for runway 26. I held 800 feet and

AEROSPACE SN-601 CORVETTE (100 SERIES)*

Specifications

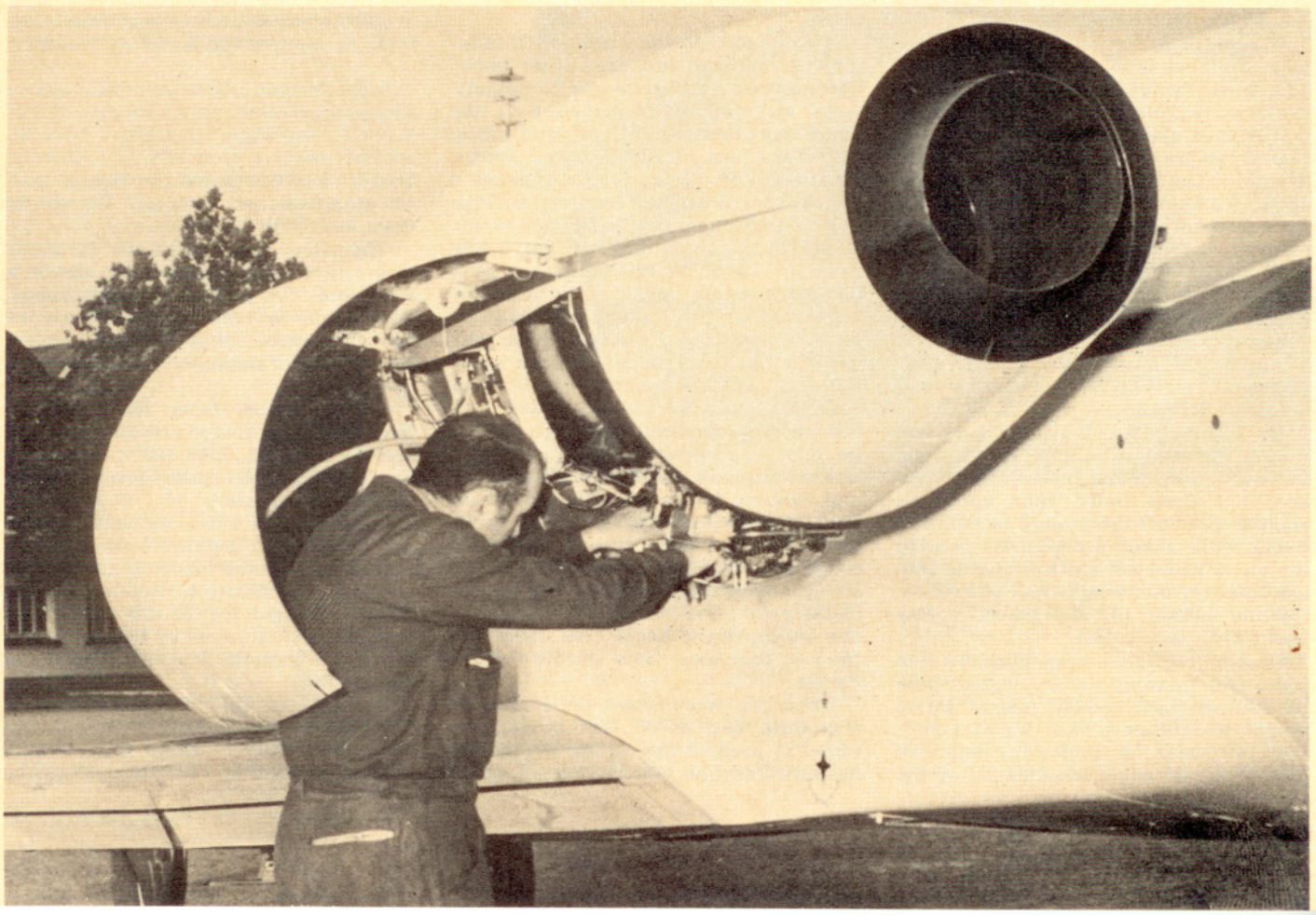
Engines	2 Pratt & Whitney (UACL) JT15D-4 turbofans, 2,310 lb thrust each
Length overall	45 ft 4 in
Height overall	13 ft 10 in
Wingspan	45 ft 2 in
Wing area	237 sq ft
Aspect ratio	7.45
Landing gear:	
Wheel base	17 ft 1 in
Wheel track	8 ft 5 in
Maximum takeoff weight	13,450 lb
Maximum landing weight	12,125 lb
Aircraft empty weight (equipped)	8,304 lb
Fuel weight	4,125 lb

Performance (Preliminary Data)

Balanced field length (at 13,450 lb)	4,100 ft
Takeoff distance over 35 ft at 13,450 lb (standard-day conditions)	2,800 ft
Landing distance at 12,125 lb	2,065 ft
Normal cruise (IAS) at 36,000 ft	420 kt/0.72 Mach
Economy cruise (IAS) at 29,000 ft	348 kt
Maximum operating altitude	41,000 ft
Maximum range (30-minute reserve):	
Economy cruise, 4 passengers	1,675 nm
Normal cruise, 4 passengers	1,565 nm
Economy cruise, 6 passengers	1,335 nm
Normal cruise, 6 passengers	1,245 nm
Price (with complete avionics package, 7-place standard deluxe executive interior, full-size restroom)	Approx. $1.3 million

*Figures apply to aircraft with wingtip tanks installed, since all Corvettes delivered in this country by Aerospatiale's U.S. distributor, Air Center, Inc., will have tip-tank installation.

Easy access is provided to the aft-mounted turbofans. Offered as an alternate engine is the French-built SNECMA Larzac, each producing 2,750 pounds of thrust.



he cut back No. 2 again. I had to strain to keep the field in sight, but the flying was easy as far as the plane was concerned. I kept minimum flap, took gear on base, and full flaps when I had the field made. My single-engine landing was better than my touchdown with both engines.

Briot reminded me to pop the spoilers ("The switch is on the throttles, Dumbo," I reminded myself), and I used hard braking to see how the binders worked. Excellently. I could see how Corvette could claim to "land safely on 500 airfields in Europe, and 1,350 in the U.S." Briot had noted that "several lightplane pilots with limited experience had been given an hour of training and were able to touch down between two marks, 150 feet apart, and come to rest within 1,500 feet."

We shut one engine down, and I taxied on in, still feeling very much at home. It was none too soon; the weather wasn't very friendly.

I asked questions while we sat for a while in Briot's office, and Jean Malaise helped answer my queries.

The plane (100 series) will be certificated by about March 15, 1974, and, as delivered in the U.S., will cost in the vicinity of $1.3 million, including avionics and a 7- or 10-seat interior.

A later version (the 200 series) will be stretched about six feet for commuter airlines. It will have 18 seats, cost possibly $1.7 million, and be certificated about a year later.

Before *au revoir*, I hated to ask it, but I did: Why not put bigger engines on this fine bird?

Briot laughed. "You have not yet read my literary masterpiece." I promised I would, but it wasn't until the next afternoon, on Air Inter destined for the south, that I got to read Briot's "Why Another Light Twin Jet?"

It bore out my original—and hardly startling—conviction: people just don't put up $$$ for this kind of project without thinking the problems through.

In essence, Briot's piece noted that:

- The average passenger load on corporate jet aircraft has been "increasing steadily," from 2.3 in 1965 to "probably 6 in 1973."
- Passengers transferring from luxurious big jets would prefer a nice small jet to a propeller-driven commuter plane.
- A cabin size would have to accommodate up to 12 passengers, and this cabin size would then lend itself to a wide assortment of deluxe custom interiors.
- A relatively unsophisticated plane that could use airports built for conventional and turboprop aircraft, and yet carry big loads, was needed.

The dilemma (and opportunity) was speed vs. cabin size. Also needed were an approach speed of about 100 knots and a built-in ruggedness that would allow operation from short, rough airfields.

There was an obvious price "hole" between the most simple and the more exotic business jets being built that seemed to be just right for the projected Corvette to slip into.

Aerospatiale has "a lot going for it" in proposing to enter the jet field, according to Briot. Because of the magnitude of the Aerospatiale program, many cost-cutting advantages accrue to Corvette; well-developed techniques and already invested machines or processes are available from other programs.

Briot says that the arrival on the scene of the JT15D-4 engine meant a "happy marriage" with the Corvette, for this is a new and yet dependable engine, with good growth potential, and one that is good in high-altitude, high-temperature situations because it is flat-rated.

Especially for the stretched "200 series" aircraft, Aerospatiale sees no competition in the making. Hence the confidence that Corvette will make its way.

Exclusive U.S. distributor for the Corvette is Air Center, Inc., at Wiley Post Airport in Oklahoma City. The company recently announced sale of its first six Corvettes—including one to William P. Lear—for delivery beginning in May 1974.

Did someone say Lear?

Well that, as well as the flying performance of the Corvette, gets my attention. □