It takes off like an airplane, flies like a helicopter, and lands like a STOL. It's also noisy, has a high rate of sink, and short range

Aero Resources' Super J-2 gyroplane, along the Pacific Palisades coastline, near Torrance, Calif. Photo by Don Downie

by MAX KARANT / AOPA 18

Pilot Flight Check: SUPER J-2 'AIRPLANE'

There are several names that are loosely applied to present-day versions of the venerable autogiro. The version we flew recently is the Aero Resources Super J-2 "gyroplane" [March PILOT, page 81].

It's important that the reader clearly understand the difference between the autogiro and the widely familiar helicopter. The autogiro's rotor is not driven by the engine, and is free to rotate from the force of air and the weight of the machine. A clutch enables the pilot to get the rotor started through the regular aircraft engine, after which it is disengaged and rotates freely. The helicopter rotor, on the other hand, is driven continuously by its engine. In case of an engine failure, the helicopter rotor has the freewheeling characteristics of the autogiro's rotor, which enables it to make a safe forced landing.

The autogiro is the simpler of the two "rotary-winged aircraft," as some purists call the class. Juan de la Cierva, the autogiro's inventor, first flew one in 1923. The J-2 is a current example, powered by a conventional 180-hp Lycoming aircraft engine driving a three-blade pusher prop. Unlike the helicopter, which requires fairly extensive, complex training, this autogiro is very much like an unstable plane that the average private pilot can learn to fly in six to eight hours. A lot of that time is spent learning to overcome the inherent lack of stability (stability is virtually nonexistent, particularly when the J-2 is compared with just about any small, general aviation fixed-wing aircraft). This is nothing peculiar to the J-2 or any particular rotary-wing aircraft; it just about drove me up the wall with a small helicopter in which I got my rating. But once you become accustomed to the fact that you're flying this ship 100 percent of the time, you then begin to use it for a wide variety of interesting purposes.

There are two versions of the J-2: the standard, with a two-blade prop,

Rear view, showing Hartzell three-blade prop and rotor.

All photos by the author, except as noted

SUPER J-2

(*Continued from preceding page*)
which they call a trainer; and the Super J-2, which is the same aircraft with a three-blade prop. List price of the standard is $19,950; the Super lists for $21,950.

baggage with two 170-pound people. Gross weight is 1,600 pounds, and range, with the maximum 24 gallons of fuel, is 200 miles.

The J-2 is fun to fly, even when you use it for business reasons. It has many of the attributes of the helicopter, for a fraction of the price. It's STOL, even more so than a Cub. The helicopter is VTOL, but the difference is less than 300 feet. I could get into a baseball diamond with a helicopter, and would want just a bit more room with a J-2. But maybe by the time I got really proficient with the J-2 (I had less than 30 minutes in N4322G, which I flew the other day), I could get close to helicopter performance.

Deluxe instrument panel includes standard series of instruments, transponder and VHF com set (both Bendix Avionics), plus dual controls.

AERO RESOURCES SUPER J-2

Specifications	
Engine	Lycoming O-360-A, 180 hp
Propeller	Hartzell 3-blade, constant-speed
Width (ft/in)	11/2
Length (ft)	16
Height (ft/in)	8/3
Rotor diameter (ft)	26
Gross weight (lb)	1,600
Empty weight (lb)	1,090
Useful load (lb)	510
Fuel capacity (gal)	24
Performance (FAA-certified at 1,600-lb gross)	
Speed (mph)	110
Takeoff and landing speed (mph)	40
Range (mi)	200
Rate of climb (fpm)	700
Liftoff (ft)	540
Landing roll (ft)	80
Takeoff (ft) over 50-ft obstacle	1,200
List price	$21,950

This is the total baggage compartment, which is located under the seat. Super J-2 can carry about 26 pounds of baggage with two 170-pound persons aboard. Horizontal handle beside seat is what pilot uses to engage clutch from engine to rotor, to start rotor turning while on the ground. When the rotor is up to speed, the pilot releases the handle and the rotor is free-swinging from then on. Headsets hanging on rear bulkhead are all the pilot and passenger have to hear radio communications (and to keep out noise).

Both versions of the J-2 are two-place. Actually they're identical airplanes ("airplane" is what the Aero Resources people always call it, instead of "autogiro" or any of the fancier names), with the Super just gussied up a bit.

The two-place cabin is quite compact; there's very little room to toss charts, plotters, etc., around on the floor. The baggage compartment is under the seat, and it can carry about 26 pounds of

Closeup of the rotor head. It's primarily a Hughes helicopter rotor that has been modified.

But I enjoyed wandering around the nearby landscape, flying at treetop height, hopping back and forth across the Potomac River with ease in a moment, where it would have taken an hour or two to get to the same place with a car. And therein lies the attractiveness of the J-2. It's short-range at best, but a construction man, for example, can hop from site to site all over the place. I'm looking forward to ferrying a J-2 back from the Gardena, Calif., factory to the East Coast, in "low and slow" short legs, just seeing the country as no one else other than a helicopter pilot could ever see it. Land on motel lawns to stay the night; land beside a good-looking restaurant when you spot one. . .

The constant comparison of the J-2 with the helicopter is inevitable, because both are rotary-wing aircraft and do essentially the same thing. Once I'd gotten my helicopter rating, I'd hoped I could go on enjoying this type of flying whenever I had the opportunity. But most helicopter fans reckon without the cost. You can operate a J-2 for pennies, compared with a helicopter. And that's a prime part of Aero Resources' goal for the J-2—people who want helicopters but can't afford them. They hope that, once they get these customers, the J-2's durability and low cost will keep them, without further need for the helicopter.

I wasn't permitted to sit in the left seat, which is the normal place for the pilot. The reason is that the lever for engaging the clutch between the engine and rotor on the ground is located on the left side of that seat. Otherwise, both seats have dual controls. The sticks and rudder pedals are conventional airplane controls. The J-2 has rudders, and you use them to counteract the torque on takeoff. Otherwise, you can fly the J-2 largely with the stick. But you keep your feet on the pedals; the "standard" instability requires an occasional touch on the rudder to take the aircraft out of a skid.

On a typical flight, you start the engine just as you do in an airplane. You taxi out while the engine is warming up. Once it's warm enough, you engage the clutch by pulling up on the lever beside the left seat. The rotor engages, and you leave it there until the rotor speed reaches about 500 rpm. Then you release the clutch, and give it more power. Once you start to move, the rotor is on its own. On takeoff, you just open the throttle wide, wait until the airspeed is about 40 mph, then ease back on the stick. The rotor slows to about 370 rpm as you climb out. Forward speed builds up to 80 mph in the climb, at 2,650 rpm. We were off the ground in about 300 feet. Normal cruise is 75 percent power at 95 mph indicated.

We climbed to 1,000 feet to do some slow flying. With the power back to 10 inches and the airspeed indicating 27 mph, we had plenty of control and a high rate of sink. It was the equivalent of a helicopter autorotation landing.

One thing about a J-2 in flight: you certainly know it when you're flying inside it. And so does everyone outside, for at least a mile around. Aero Resources has a "noise" program, and it will have to pay off. I'd neglected to take along my earplugs, which I even use in my own plane. But my plane's noise is like that of a sailplane, compared with the J-2 noise. At the moment, everyone wears those big military headsets that cover half the side of your head, trying to ease the racket. The ship I was in had a cabin speaker, but it was better to use the padded headset. If the J-2 soundproofing program—inside and out—can be accomplished soon, they'll ward off angry neighbors, and deafened pilots.

So far, 74 J-2s have been delivered. Fourteen "incidents" have occurred, in which J-2s were damaged to varying degrees—but not a single person has been scratched. Four of these incidents were due to company oversights. (For example, the nosewheel was redesigned to include a lock as well as steering.) Even though J-2s have been flying for about five years—and one student hit a tree on takeoff and went end-over-end three times—the aircraft still hasn't hurt anyone.

Aero Resources estimates there will be about 100 J-2s in use by the end of this year, for a total of about 175 built and delivered. They're presently making six to eight per month at Gardena, where the whole company was moved (from Lake Havasu, Ariz.) after it was bought from McCulloch, and the factory is just about ready for full production.

The J-2 was designed by D. K. Jovanovich, who designed the Hughes helicopter. He first got together with Bill Lear (AOPA 6975), who wanted to get into the rotary-wing business. In the process, Lear picked up the Brantly helicopter and dropped the J-2 (and since has dropped Brantly). McCulloch then bought Jovair, the Jovanovich research and development company, and changed the name to McCulloch. He went through the certification cost and FAA process, and then decided he didn't want to build up production facilities in Arizona. So he sold out to George J. Morton (AOPA 447198), a Gardena manufacturer, who is now building the J-2. □