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EXPERIMENTER™

SPORT PILOT & LIGHT SPORT AIRCRAFT

THE ZENITH/ZENAIR
CH 701

- **The Mifyter Adventure**
- **Powrachute Extravaganza**
- **About Heath Parasols**



EXPERIMENTER

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Front Cover - Roger Dunham pilots his CH 701 STOL aircraft for EAA's camera ship; see "The Zenith/Zenair CH 701" on page 24, (Photo by EAA Chief Photographer Jim Koepnick)

THE ZENITH/ZENAIR

CANADA'S SKY JEEP

CH 701

JIM KREHNICK



Pilots will go to great lengths to fly airplanes they like. I went to the Czech Republic to fly the CH 701. That's a long way, and I did like the airplane. The experience tells a story of light-sport aircraft development that may become increasingly common.

DAN JOHNSON

Like most light plane pilots, I've long been familiar with the designs of Swiss-born engineer Chris Heintz. His many aircraft models have put some 2,000 builders in the air. The low-wing, Piper Cherokee-like CH 601 is far and away the most popular airplane he's designed, with it representing more than 60 percent of all Zenith models sold. Yet, perhaps the most distinctive-looking design he's offered is the short takeoff and

landing (STOL) capable CH 701, the subject of our discussion this month.

Now the world grows smaller with Heintz's Canadian designs being manufactured in the Czech Republic and freighted to the United States for fun in the sky.

Old Country Flying

My travels to Eastern Europe following Aero 2003 brought me to the Czech Republic, some 300 kilometers

south of world-famous Kiev, to the lesser-known town of Stare Mesto in the Republic. This is where American Chip Erwin has set up shop to fully manufacture the designs of Chris Heintz. His business is called Czech Aircraft Works, abbreviated as CZAW, "CZ" being the two-letter symbol for the Czech Republic.

After arranging a license agreement with the Heintz family to build Chris' designs, Chip tapped into the Czech Republic's supply of highly educated

and well-trained aviation workers. Following the collapse of communism and the evaporating inflow of money from the Union of Socialist Soviet Republics (USSR), several major Czech aircraft builders fell on hard times. Their employees were happy to go work for a Yankee entrepreneur who wanted to build light airplanes and send them to Western Europe and the United States.

Sebastien Heintz, one of Chris' four sons, runs Zenith Aircraft Co., based in

Mexico, Missouri, and it sells only kits. CZAW's mission, then, is to build completed airplanes for sale in Europe...and eventually in the United States when proposed special light-sport aircraft (LSA) category is finalized to allow ready-to-fly aircraft to be sold in this country.

That plan now includes a company called SkyShop. Based in Stuart, Florida, SkyShop is already assisting some United States customers who are electing to purchase kits from CZAW. These

builders then travel to the Czech Republic and work on their airplane with assistance from factory personnel there. It's a great opportunity to be involved in all facets of construction of the airplane and have a wonderful travel experience at the same time. (As Zenith has demonstrated at air shows, building a CH 701 or 601 can be accomplished in a week, albeit a busy one with long hours.) After the owner/builder returns to the United States, his or her completed aircraft is



The most important feature of any STOL aircraft is its wing, which must have a high-lift coefficient to provide short takeoff and landing performance. Here you can easily see the leading edge slats, painted in yellow, on Roger Dunham's CH 701. At the back of the wing, full-span flaperons help to increase lift and provide good roll stability. Hoerner wingtips, a trademark of Heintz's designs, help keep airflow attached to the wing by maximizing the effective lift area while still minimizing the wingspan. To learn more about STOL design, read Heintz's "High-Lift Wing Design," at www.zenithair.com/stolch701/7-design-wing.html.



disassembled and shipped to Florida where SkyShop assists the builder in re-assembling the aircraft and making the first flight in it.

When the light-sport aircraft rules are finalized, establishing the more lenient kit-built experimental LSA category and the ready-to-fly special LSA, CZAW will be ready to ship airplanes as soon as the design can show conformance to the consensus standards that FAA has mandated each aircraft design must meet.

More Than 25 Years of Flying Fun

Chris Heintz's CH 701 was first introduced in 1986 "as an off-airport, short takeoff and landing kit aircraft." It was intended to address the desires of pilots who fly for fun and recreation, yet Chris wanted it to be a project first-time builders could successfully undertake.

"The STOL CH 701 was not designed to be just another pretty light aircraft," said Chip Erwin. "It was engineered to

offer outstanding short takeoff and landing performance, all-metal durability, and unparalleled ease of construction." It combines the construction methods of conventional aircraft with the short-field capabilities of an ultralight aircraft. The CH 701 features fixed leading-edge slats for high-lift, full-span flaperons (both ailerons and flaps), an all-flying rudder, and well-proven all-metal construction.

Using an architectural metaphor, the STOL CH 701 is form following function, Chip explained. "It looks like a Sky Jeep, which is what it's often called by its owners."

And, the Sky Jeep excels in short-field performance. The CH 701 I flew, powered with a 100-hp Rotax 912S engine, was airborne in less than 100 feet of asphalt runway. Rotation comes barely after you apply full throttle, and liftoff begins at 25 mph (as indicated on the airspeed indicator). The CH 701 literally leaps into the sky within four seconds from standstill. Naturally, a head wind will further shorten both time and distance for takeoff. In a word: impressive!

Working the Design

CH 701s and CH 601s are built in roughly equal numbers by Chip's CZAW operation. During my visit in early 2003, the company employed 85 production workers and 30 other staff members including engineers, quality control personnel, and administrative people. "We'll have the capability to build 300 aircraft in 2004," said Chip, as he explained a plan to move into new quarters as soon as a prior tenant clears out.

CZAW doesn't simply churn out Heintz designs. In addition to airplane manufacturing, it has developed its own all-metal float system. Many Americans have seen these conventionally made floats in both straight and amphibious gear at air shows around the country, but they may not have realized the floats hailed from the Czech Republic.

CZAW also builds the wings and tail sections for the Part 23-certificated



While Roger's 701 is a working "Sky Jeep," and shows a little wear on the cabin floor, it still provides a good look at the wide panel and distinctive Y-yoke common in Heintz-designed aircraft. Here's another scheme for outfitting your panel.



The CH 701's cabin is 41 inches wide at the shoulders. A baggage area behind the seats offers some in-cabin storage space. The aircraft's top-hinged doors make entry and exit from the aircraft easy, especially on floats.

OMF Symphony in a shop that is separate from the Zenith production line to meet the requirements for FAA certification. On my visit I saw parts for several Symphony 160s under construction.

To feed the production machine, Chip imports literally tons of aluminum sheet, steel, and other parts, much of it coming from the United States. This can set nervous American buyers at ease regarding trade deficits. Most instruments are also built in the United States. Fiberglass parts like the nose cowl are locally built in the Czech Republic.

Get In and Go

Entry into the CH 701 is simple; step in front of the strut with the door opened up wide against the bottom of



the wing and merely sit down and swing your legs in, though I helped pull my feet with my hands to clear the front cowl post.

The door closes with a single latch that's located at approximately your outside knee. On opening, a friction latch props the door open securely.

The CH 701 seats are comfortable, and the interior is nicely finished

with carpeting, protected for the customer during my test flight with plastic just like at an auto dealership. Shoulder belts are standard on both seats, and they're made in the United States, too. My flight-test aircraft was equipped with instruments set up for American sale, so I was right at home with feet and miles per hour indicated on the gauges. Obviously, for European consumers, the gauges feature meters and km/h readings.

I loved the great visibility out of the top skylight. It's quite useful in turns opposite the side on which you're sitting. On your own side, you'll have to look out the side window before turning.

While visibility from the CH 701 is not as wide as the company's clear-canopy CH 601, it was more than adequate. Of course, the design offers

the wonderful downward visibility of all high-wing aircraft that many pilots prefer for aerial sightseeing. Flying over medieval castles in the Czech Republic, I was pleased with the great viewing platform the CH 701 offered.

However, despite the wide cabin, a cross member overhead sometimes bumped my headset, suggesting that helmets might be uncomfortable for anyone but shorter occupants.

The CH 701's instrument panel switches were easily reached, and the instruments were easy to read. The panel offers adequate room for a variety of instruments and radios. When I observed the production line in operation, CZAW was even equipping one aircraft with an autopilot.

Chris Heintz's signature Y-shaped joystick handle worked well to my side (in the left seat), but I found it a bit more awkward to the right. With a right-seat occupant, I found motions to that side bumped into the other person's leg. The left side of the stick was equipped with multiple switches for trim control and radio transmit. The Y-stick should work excellently for training and allows more legroom than dual joysticks; however, it does offer ergonomic challenges compared to a side or center stick.

In my test CH 701 the throttle kept creeping forward, a problem I had to keep in mind. An adjustment should fix this, though it might pose a problem for a student; otherwise, the 701 is



A full-cabin skylight and large windshield and side windows offer excellent visibility. Extra-wide tires provide for a sure grip on landing at airports or off-airport unimproved fields.

a good choice for a training aircraft.

Powerful hydraulic brakes slowed the 1,100-pound aircraft well, and the landing gear has generous ground clearance for off-field landings. The CH 701 slab gear has a reputation as being extremely stout. Thankfully, I never tested its ability.

When you open the throttle of a 100-hp CH 701, be prepared for action. Much like a Quicksilver, its ground break is extremely fast on takeoff. This is a central feature of the design. Its leading-edge slots and full-flying flaperons were created to provide fast liftoffs from unimproved airstrips. Believe me, the machine works!

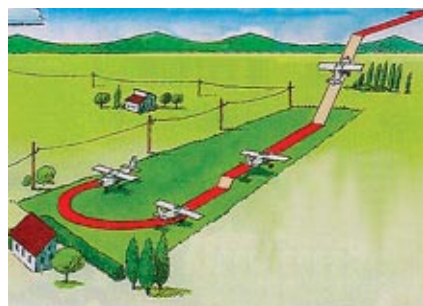
Takeoffs were easy if you were prepared. Landings took a bit more finesse, though the airplane can handle fairly rough touchdowns.

I found it necessary to keep the stick aft to prevent bobbing up and down. My checkout pilot, Mark, said the wing tries to start flying again unless you keep the angle high. Once you've started to raise the nose in preparation for final touchdown, you need to keep it up. The wing can fly so slowly that lowering the nose a bit makes the 701 think you want to resume normal flight.

Approaches to landing were made at 50 mph with a bit of power, though it

was obvious that I could come in much slower once I was ready for the plane's unique low-speed performance characteristics.

If you fly from unimproved, short, or soft airstrips...the Sky Jeep may be your dream plane.



Zenith Aircraft, kit manufacturer for the CH 701 in the United States, uses this illustration to depict the aircraft's STOL takeoff characteristics. Zenith advertises the aircraft has a takeoff roll of 90 feet (dual occupancy) when powered by an 80 hp Rotax 912 engine. Landing roll is listed as 140 feet.

The flaps were difficult for me to fully deploy. I could get enough flaps down for landing, but I needed a better technique to get the flaps all the way down. To deploy the flaps you reach down (near where a seat adjustment might be) and pull forward, an awkward motion that I could only manage to the first notch.

Fortunately, sideslips were very effective in either direction, thanks to the slab-side finish of the design. Standard large tires make off-field landings no problem.

Scrambling Into the Air

The CH 701's climb angle, expressed as deck angle, is very steep, yet this is not unreasonable as the fixed-slat wing provides genuine STOL characteristics. I measured climb, with the 912S, at better than 1,000 fpm dual and nearly 1,500 fpm solo. All measurements were done at about 1,000 MSL on a wintery day of about 20°F.

I cruised at near redline, about 105 mph, thanks to that engine. Frankly, I found it too much engine for the plane, and Chip readily agreed. However, he indicated that it was the right engine if you use amphibious floats.

All the pilots out at CZAW's nearby airfield agreed that the 701 has a high sink rate. This may be good for getting into tight fields, but Mark didn't want to be too low while away from the airport. He told me, "At 1,000 feet AGL, we'll be on the ground in 60 seconds." Later trials showed the 1,000 fpm sink rate to be about right, despite the high-lift wing.

In other testimony to its superior low-speed performance capabilities, a CH 701 has been configured to tow hang gliders in Germany. These aircraft prefer tows below 30 mph, and the 701 can do it. The low stall speed and excellent climb performance of the aircraft make the CH 701 an ideal tow plane for the slow-flying hang gliders.

As is often the case, I got to fly a brand-new plane. Consequently, all the pulley wheels and linkages were still a bit tight, which made the 701 rudders feel rather stiff. They tended to stay where they were put, which gave false

impressions of handling. I once thought the plane had a tendency toward a left turn (from the ball's position), only to realize that I had the rudder slightly depressed from a previous maneuver. Such tightness will loosen in time and won't be an ongoing problem.

Contrasting the rudders were very responsive ailerons, virtually regardless of speed. When I flew at a low (though probably not minimum) speed, roll pressures seemed almost as light as at cruise speed.

My Dutch roll coordination exercises were sloppy owing to the stiff rudders. At speed, very little rudder is needed, while at slow speeds more is needed (logically).

A medium-power stall did break and went rather sharply to the right side—rapidly enough that Mark flinched toward the controls. Despite the abrupt maneuver, recovery was easy. One factor affecting this behavior may have been the powerful engine and a prop set up for fast climb. Stick with the 80-hp engine and a medium performance prop, and you may never experience a sharper break.

Low-power stalls never broke and were extremely well behaved. With stalls coming at nearly 30 mph and with top cruise speed at nearly 100 (in the 100-hp, 912S-powered version), you have a wide speed envelope of better than 3-to-1.

Ready for a Long Trip?

The CH 701 probably won't be your ideal cross-country cruiser; it wasn't designed for that kind of flying. Rather, the CH 601 will prove much better for that realm of flight. But if you fly from unimproved, short, or soft airstrips, the Sky Jeep CH 701 may be your dream plane. Like many four-wheeled vehicles or SUVs, the CH 701 may not be the prettiest airplane on the ramp, but it'll take off from that ramp faster than almost any other airplane. Lots of sport pilots enjoy such gutsy capability.

Zenith reports more than 500 CH 701s are flying around the world. Many of these are kit-built, but a growing number are emerging from the Czech



SPECIFICATIONS

Note: All specs and performance figures provided by factory. Figures are unverified except as otherwise stated in article.

DIMENSIONS

Wingspan—27 feet
Wing area—122 square feet
Length—20.9 feet
Height—8.6 feet
Seating—2 side-by-side
Cabin width—41 inches at shoulder
Empty weight—580 pounds
Gross weight—1,100 pounds
Useful load—520 pounds
Payload—400 pounds
Baggage—40 pounds (cabin shelf)
Fuel—20 gallons
Wing loading—9.0 pounds/square foot
Power loading—13.75 pounds/hp*
Powerplant—50-100 hp

*Based on 80-hp Rotax 912

PERFORMANCE

Never exceed speed (VNE)—110 mph
Top speed—95 mph
Cruise speed—80 mph
Stall speed—30 mph
Max rate of climb—1,400 fpm
Service ceiling (est.)—12,000-plus feet
Takeoff distance—90 feet
Landing distance—140 feet
Cruise duration—5 hours
Cruise range, max—400 miles
Fuel consumption—about 4.0 gph

Republic. When the sport pilot/light-sport aircraft rules are finalized, the number of airplanes coming from CZAW's Stare Mesto plant is sure to increase sharply.

Indeed, CZAW is gearing up for that reality. Last month, Chip confirmed that he was expanding the company's manufacturing space by 50 percent, mostly to double the 701 production. "We shipped 30 percent more aircraft in 2003 than we did in 2002, but we still cannot keep up with sales. The 701

was introduced in 1986, and sales are still stronger than ever," he said. Perhaps Sky Jeeps simply do not lose their appeal.

The CH 701 should easily fit the proposed light-sport aircraft consensus standards. Chris Heintz and his sons, Sebastien and Nicholas, have participated in the ASTM standards-writing efforts. Their aircraft should meet the standard easily, and because CZAW builds true to the original design, so will its aircraft.

Even though it is only handsome in the way of a Hummer, the CH 701 enjoys a good reputation for its durability and outstanding STOL performance. Recently, I drove behind a Jeep that sported a three-foot-wide bumper sticker across its rear window that read: "It's a Jeep thing. You wouldn't understand."

If you're a CH 701 buyer, you'll likely understand. And you can fulfill your dreams today. ✈

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