

Shrouded in mystery, the He 100 held the World's Absolute Speed Record. The scale model was built to race, too.



HEINKEL'S

By Walt Wilson

RECORD BREAKER

Photos by the author

I'm a member of the Spirits of St. Louis Club, which has the distinction of putting unlimited scale model racing on the map. Each year, we conduct a Sport Scale contest, which is perhaps the fastest flying event in the world (See "Warbirds Unlimited" in June '81 *Scale R/C Modeler*). The rules dictate that models must be WWII vintage, prop-driven machines, however, they may fly in post-war markings or configurations (i.e., they can be models of the Reno Unlimiteds). Speeds and scale fidelity are both important, and one's choice of aircraft must be a good balance of a documentable airplane, and a go-for-broke speed machine.

To my way of thinking, in pursuing a good model for the contest, it seems logical that one would pick a plane that was the fastest possible in its full-size configuration. Naturally, the P-51, Spitfire, FW 190, and other notable WWII fighters come to mind, and these many-times-kitted models are all great choices. However, a typical contest shows all of these in great numbers, and I wanted something a little out of the ordinary.

I did my homework and, after considerable research and documentation hunting, I found a plane that met all of my requirements. In 1939, this machine set a World Absolute Speed record. It was much publicized, yet the plane was shrouded in mystery . . . it was the Heinkel He 100.

The mysterious Heinkel was born of a design request by the Luftwaffe in 1935. They wanted a machine which would serve as the standard fighter throughout the war. With so much at stake, Focke Wulf, Arado, Messerschmitt and Heinkel all responded. The only two competitors were the Bf 109, and the Heinkel He 112. They were nearly equal in

performance, and each had certain very desirable traits.

After a lot of testing, and a certain amount of political string pulling, the Messerschmitt was chosen. Ernst Heinkel was not easily discouraged, and he felt that there should be more than one fighter available to the pilots of the Fatherland. He continued development, unofficially, of the He 112. Werner von Braun was even involved, conducting experiments with a rocket powered version, and the He 112-V5 became the first

man-carrying rocket plane. But, the He 112 received poor acceptance, and even the foreign sales were only mediocre. The final blow was when the Luftwaffe notified Heinkel that he was expected to build only bombers, while Messerschmitt would exclusively concentrate on the more prestigious fighter development.

Not one to take it lying down, Ernst Heinkel decided to build his fighter swan song . . . the ultimate flying machine which would capture the elusive World Absolute Speed



HEINKEL'S RECORD BREAKER

Record. His goal was to shatter the 450 mph mark in level flight. He worked with designer Siegfried Gunther to perform an intensive study of the requirements for an aircraft of this type. As the drawings proceeded, the type designation He 100 was assigned to the project.

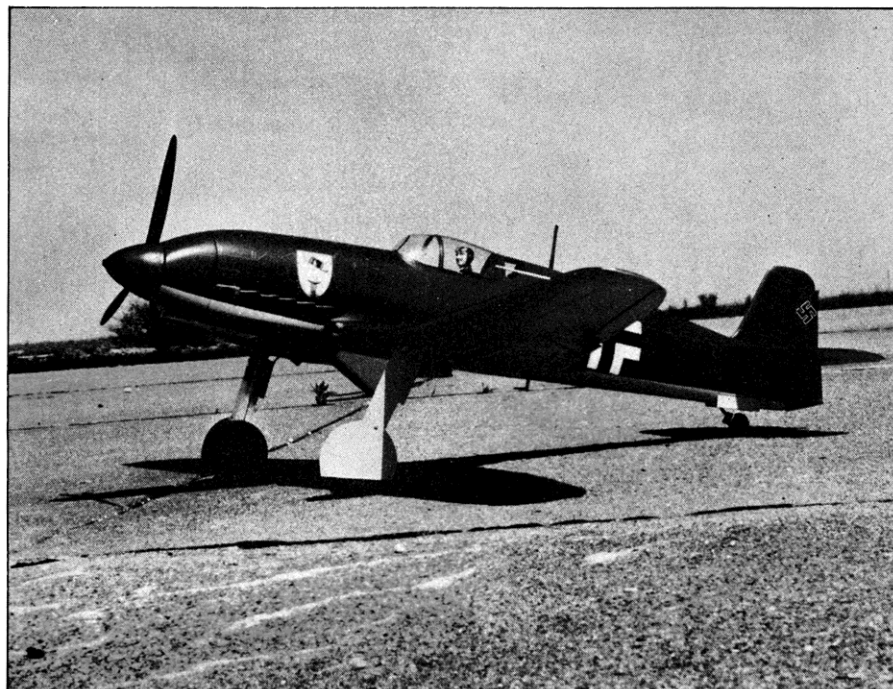
The powerplant was to be the latest Diameler Benz DB 601A engine, which developed 1,070 hp. In order to minimize drag, the radiators were designed as surface cooling units, and an evaporation and condensation system was incorporated into the leading edge of the wing, and along parts of the fuse. The poor ground handling of the Bf 109 led to the inward retracting wide-track undercarriage of the Heinkel.

The first prototype He 100V-1 was flown on January 22, 1938 . . . it was immediately obvious that per-

formance was superior to anything on wings. Plans were immediately made for a 100 km closed course speed record attempt. However, before this could materialize, the Luftwaffe confiscated the V-1 for "military testing."

The Heinkel He 100V-2 was quickly finished, with some refinements and a more powerful DB 601A-1 engine (1,175 hp). Arrangements

The turtledeck looks a little humped, because of the canopy lines. Note how low the thrust line is.



were made with the FAI for a record attempt on June 6, 1938. As last minute preparations were being made, Ernst Udet, who was probably Heinkel's strongest supporter in the higher echelons of the Luftwaffe, arrived at the field and asked to be allowed to fly the record flight. Realizing Udet's vanity, and afraid of offending so strong a political ally, they granted permission.

On his test run, Udet was clocked

at 394.4 mph, which exceeded the previous record by 50 mph. In his enthusiasm, Udet ignored the temperature warning lights, and it was feared that he had cooked the Daimler Benz. No further attempts were made that day. The Luftwaffe, always on the lookout for propaganda, publicized the event as the flights of a stock military He 112. They immediately confiscated the V-2 for test purposes.

(Continued on page 70)



HEINKEL'S RECORD BREAKER

(Continued from page 33)

Prototypes V-3 through V-7 were completed, with various configuration differences. The V-4 through V-7 models were delivered to the Luftwaffe for testing and military demonstrations. Visiting Allies, witnessing the startling performance of the Heinkel, were told that this was

a stock production fighter. The V-3 served for many propaganda photos, and it was ultimately written off after a landing gear failure.

The He 100 V-8 was completed and outfitted with a specially prepared DB 601R engine, capable of developing 1,800 hp (for very short bursts). The engine life expectancy was calculated in terms of minutes. The V-8's wing was only 24 feet in span, while the stock He 100 had a span of 30 feet, 10 inches. This meant an area difference between 118.4 sq. ft. and 155 sq. ft. Even in its stock configuration, the Heinkel was a small plane by contemporary fighter standards.

On March 31, 1939 Heinkel achieved one of its goals. The He 100 V-8 established a new FAI Absolute Speed Record of 463.92 mph. Pictures were immediately released of a production He 100 D-1, and the feat was much publicized.

Messerschmitt had also been working on an aerial hot rod. Their Me 209 V-1 was designed solely for speed record attempts. Cooling system limitations prohibited engine runs of more than 35 minutes. The political pull of the Messerschmitt

The author decreased the size of the spinner, to achieve a small frontal profile. The He 100 has a cross section comparable to a Formula 1 racer!





team gave them access to the experimental DB 601R engine, which could out-turn the Heinkel engine, and produced 2,300 hp in brief one-minute spurts. Just 26 days after the Heinkel record, the Me 209V-1 set a three km speed record of 469.2 mph. The engine overheated and seized on landing. Much publicity followed, and Germany now held both the 100 km and three km World Absolute Records.

Heinkel was not necessarily thrilled by having his thunder stolen. He calculated that his He 100 V-8 could have done the three km course at 478 mph, with the 1,800 hp engine. With the same 2,300 hp engine as the Messerschmitt, the sky was the limit! Another record attempt was set, but Goering intervened. Germany held the records, and propaganda purposes had been served. The Luftwaffe wanted the industry to gear up for wartime production . . . and Heinkel stubbornly continued to seek a contract to produce fighters.

The He 100 V-9 was built, and was the first of the series to be armed. It had two 20mm cannons and four 7.9mm machine guns. It did not perform nearly as well as the unarmed versions. A V-10 was built, but it never flew. It was determined, through testing the He 100 V-9, that the design did not handle satisfactorily when equipped with the desired amount of armament (Bf 109 performance also fell off badly as it



The wing has a slight inverted gull to it, which helps to keep the gear struts short.



Although the fuselage seems to have a lot of strange angles, the Heinkel is really a very clean, aerodynamically sound aircraft.

HEINKEL'S RECORD BREAKER

became more heavily armed). The He 100 was rejected as a Luftwaffe fighter, even though it was 63 mph faster than the Bf 109E with the same engine. Also, the DB 601A engines were in short supply, and Messerschmitt was consuming all that could be produced for use in the Bf 109 and Me 110s. No other suitable engines were available, so the He 100 was not to be as a production fighter.

The He 100 V-8 was put on display in the Deutsches Museum in Munich, where it was destroyed during the war. The surviving prototypes were sold to Russia to be studied in development of the YAK-3 and YAK-9. Three He 100 D-0 models were sold to Japan, where they were copied in development of the Kawasaki Ki-61 "Tony."

Twelve He 100 D-1s were on the production line when World War Two broke out, and were completed as a private air force to be flown in defense of the Heinkel factory, by factory test pilots. The twelve magnificent birds were repainted and photographed many times, to convince the Allies that the Luftwaffe had hundreds of them. They were identified as He 113-7s and also as He 12Ds, to further confuse the enemy. Several squadron insignias were used and numbers and national insignia were frequently changed. There is no record of the He 10D-1s ever seeing combat.

* * *

The He 100 D-1 modeled carries the "hat and dagger" crest, and number 21. I selected this particular subject because there is an excellent color three-view in Aero Publications No. 12 *Heinkel 100, 112*. That publication also has an outstanding 1/72-scale five-view drawing, showing all panel lines and additional details. I scaled up my working drawings the easy way, by making viewgraphs (overhead transparencies) and projecting them on a wall. After some "squaring up" and adjustment of the projector to eliminate the "keystone effect," I traced the outline on vellum. Of course, I established the size of the model ahead of time, so it was just a matter of moving the projector to the correct distance from the wall, until the projected image was the proper size.

I originally designed the model to meet the 1980 Warbirds Unlimited rules, which require a minimum of 450 square inches of wing area for a .40 (1981 rules required 425 for scratchbuilt aircraft). I decided on a .40 because of the highly developed state of the art of .40 size pylon racing engines and propellers. Besides, I happened to have a good running K&B 6.5 cc front valve engine with a Perry pumper which meets all of the requirements.

The 1980 Warbird rules required no muffler (1981 rules DO require a muffler), but they required that mini-pipes and tuned pipes not be exposed for more than one inch at the end. This is to avoid having a great big tuned pipe hanging on the side of an otherwise nice scale model. Warbird rules for 1981 required a muffler which does not have to be buried (no static judging downgrading will result from having an exposed muffler, this *does not* include tuned pipes). The model pictured has a mini-pipe completely enclosed, and dumps the exhaust just above the leading edge of the right wing.

Since this is no longer legal for Warbirds competition, the plans do not show this installation. Mac's #2651X muffler will work with the rear exhaust K&B 6.5 cc engines. Engines with side exhaust ports may be used with any conventional muffler that will fit. The engine is mounted horizontally for a couple of reasons. The cylinder could be entirely enclosed in the upright position, but cooling would be a real problem. If adequate air holes were provided, there would be almost no forward angle from which the nose would look like the real aircraft. Also, getting the rear exhaust out would be a serious problem involving more holes. As it is, from almost any angle on the left side, there is no evidence of a model engine. On the right side, the exhaust port is really not offensive. The carburetor is enclosed, except for an air intake and a needle valve hole, and the only real giveaway is the cylinder head.

The plans from Hal Osborne are enlarged from my original drawings, for a .60 engine. Hal has taken the trouble of changing some of the scale details, such as the nose area, to more accurately adhere to existing documentation data. This will make this larger-scale Heinkel more competitive in standard scale contests.

I can supply drawings of the .40-powered racing version discussed in this article. These aren't as professionally done as the Osborne drawings, but they certainly can be used to build a model. My address ap-

pears at the end of this article, and my plans sell for \$10.00.

At the scale I selected (1.7 inches-to-the-foot), the closest scale spinner diameter should be 3½ inches. Because the ideal propeller size for a K&B 6.5 engine is in the 8½ to 9

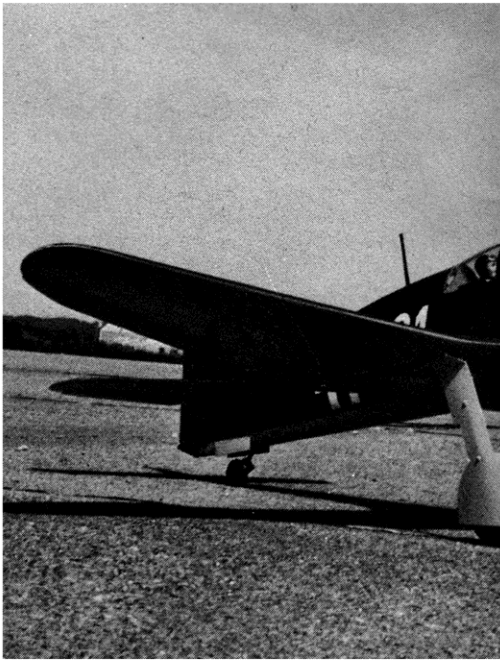
HEINKEL'S RECORD BREAKER

inch range and the idea of turning a 3½ inch plastic spinner around 24,000 rpm is a little scary, I cheated a little and used a three inch spinner to allow more effective blade area. If the He 100 were to be used for something other than pylon racing, a larger propeller and true scale diameter spinner could be used.

Because of the thin airfoil section, and forward location of the landing gear, Goldberg retracts were the ideal choice. It is necessary to trim some material off the top of the nylon mounting bracket in order to fit within the wing. I chose Sonic Systems drivers for convenience, power, and the positive action of a pneumatic system. The air tank is built into the fuselage behind the cockpit. The rather large 3½ inch Universal scale wheels retract into the wing beautifully. Because the landing gear covers must be formed around the wheels to match the wing contour, I made them of .016 inch aluminum. Plywood or fiberglass could be used, if desired, with a little more work.

The unusually shaped canopy caused some problems. This was my first attempt at forming a canopy, but everybody told me how easy it was, so I forged ahead. I have no vacuum forming equipment, so I tried forcing the heated acetate down over a form with a frame—it didn't work, I kept getting wrinkles. After several attempts, I gave up and called Nick Zirolu, who had a construction article on a similar size He 100 D-1. He told me how he vacuum-formed the canopy, and that he happened to have a few left. Very quickly I made arrangements to buy one, and crossed my fingers hoping that it would fit. As it turned out, it matched my mold almost perfectly.

Construction of the He 100 D-1 fuselage is straightforward, using a balsa crutch and formers sheeted with 3/32 balsa. The nose is carved from balsa blocks. The cowl ring separates on the cylinder centerline and comes off, to make the engine completely accessible. The tail sur-



faces are $\frac{1}{4}$ inch balsa with $\frac{1}{64}$ inch plywood edging. The wing is cut from foam and has three $\frac{1}{8}$ inch plywood dihedral braces in the center section. I felt that it needed reinforcement in the area of the rather large wheel wells and landing gear cutouts. The wing is sheeted with $\frac{1}{16}$ inch balsa. The entire bird is covered with 0.6 oz. fiberglass cloth and K&B surfacing resin. The three wing joints are reinforced with two oz. glass cloth and surfacing resin.

For finishing, I used K&B Super Pox Primer and R&S Perfect Camouflage Paints. Prior to applying color, I sprayed a coat of Hobby-poxy aluminum on all of the "metal" surfaces and taped all of the panel lines using $\frac{1}{64}$ inch Chartpak tape. I made doors, where applicable, with a thin self-adhesive aluminum product called "Trim Brite," available in automotive sections of most discount stores. After spraying a couple of coats of color, I pulled the tape off and applied another coat of color. When the paint was dry I masked and painted all of the insignia. Then I steelwooled the entire bird and gave it a coat of flat satin clear R&S Perfect Paint. Exhaust carbon smudges were airbrushed on with flat black Formula "U." Since there is no record of any of the He 100 D-1s ever seeing combat, I didn't put any powder smudges around the gun ports.

The proportions of the Heinkel are perfect for stable flight, with generous moment arms and a healthy stab volume. Don't expect the model to be a slow-poke, for it will really move at the $5\frac{3}{4}$ pound weight I achieved. The frontal area with the modified spinner is comparable to a Formula I racer.

HEINKEL'S RECORD BREAKER

Just because I designed my Heinkel to go fast, doesn't mean that you have to fly it like a racer. With a sport .40 and the reconfigured scale nose outline, the He 100 would be a great sport or contest machine. If you want a pure Sport Scale contest machine, I'd suggest getting the Osborne plans for the .60-sized model. The light weight would offer good aerobatic potentials, and it certainly doesn't look like any other Luftwaffe machine you've ever seen.

Even if you never turn a pylon with your Heinkel, the model is a good project to build and fly. Just as the full-size prototype was a world record breaker, your He 100 will be a winner, too!

* * *

If you would like more information on the current rules for the Warbirds Unlimited racing event, feel free to write me for the present rules, as well as the dates for our next contest. Now is the time to start building that Heinkel, so that you'll have a winning machine in time for the races this fall. Walt Wilson, 3000 Persimmon Drive, St. Louis, MO 63301. □