Vintage 1928:

The Heath "Baby Bullet" for the Heathkit Digital 5? No strange coincidence, the Heath Co. sank its roots in the golden age of aviation, 40 years ago. Company founder Ed Heath flew it to victory in 1928.

Nick Ziroli's

HEATH "BABY BULLET"

It is most appropriate for the new Heath Digital 5 system, going full circle from Heath aircraft kits of the past, to the fine Heath electronic kits of the present. May we recommend you sample a little aviation history . . .

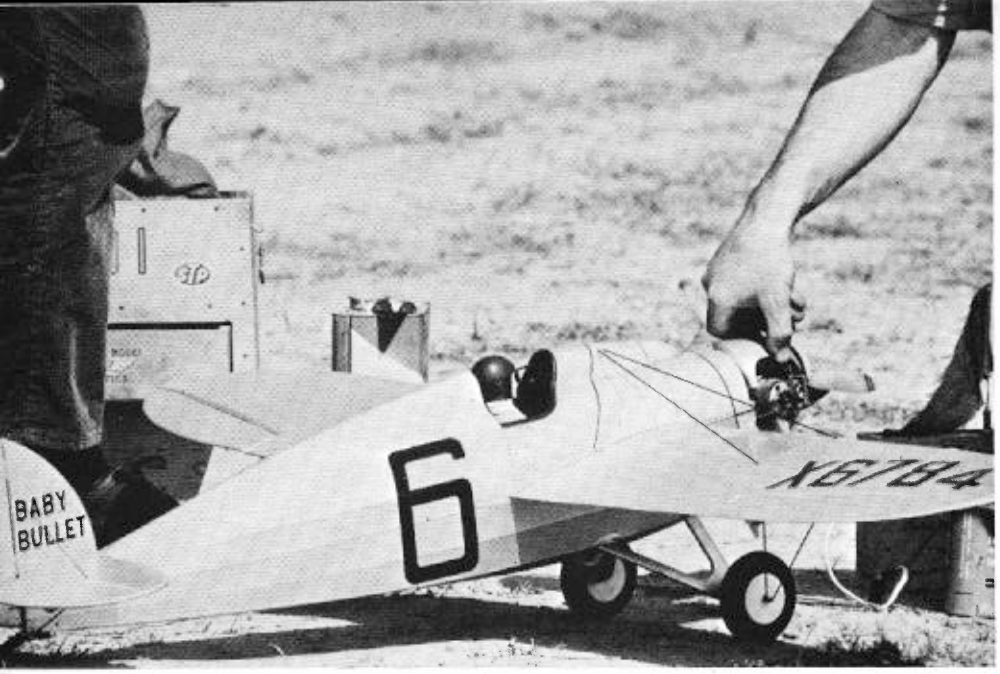
Miss Betty Ziroli with Dad's greasy old thing. Squeeze longerons doll, charge modeling fee.

♦ To appreciate the significance of the "Baby Bullet" you must first consider the year it flew and some of it's design features. The year was 1928, September, at the National Air Races at Mines Field, Los Angeles. Entered in the Under 300 cubic inch event was the new brainchild of Ed Heath and his designer Clare Lindsted. The exceptionally small size and clean lines, together with it's all silver finish made the name "Baby Bullet" quite appropriate.

One of the reasons for the tiny size, a scant 18′ 6″ wingspan, was the equally tiny size of the pilot, Ed Heath. The "Bullet" was designed as a one man airplane to fit Ed's 5′ 1″ frame. It was a shoe horn fit even for him. Due to the large front cockpit fairing there was no means of direct forward vision. The low position of the pilot allowed him to see out the side of the cockpit opening, only. This would not be permitted by today's racing rules.

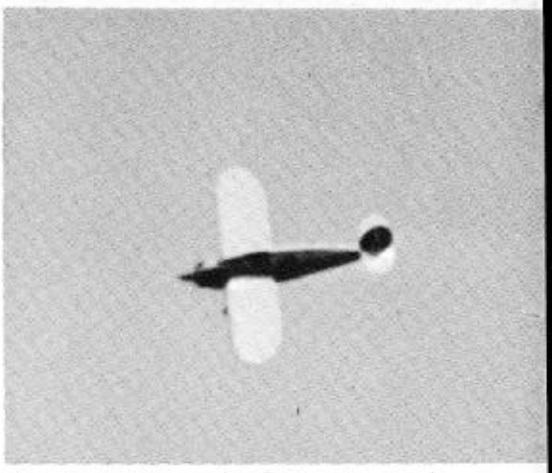
The airplane itself was clean and light in weight. A welded tubular fuselage and tail-section with fabric cover-

FULL SIZE PLANS AVAILABLE THROUGH "MODEL PLAN SERVICE"



The Heathkit Digital 5 within. Conventional in installation. The system worked flawlessly.

The moment is at hand. New ships tense nerves.



Rounding imaginary pylon. True racing aircraft.

HEATH BULLET ... continued ...

ed wood wings made the construction not uncommon to even the best racers of today. In fact, with improved pilot vision and a modern 190 cubic inch powerplant it could probably give the Goodyear boys a run for their money.

I feel it is safe to make this assumption, due to the fantastic speed to power ratio of the original "Bullet." During pre-race trials, speeds of over 150 mph were obtained. This is hardly super sonic, but considering that this speed was obtained with a 32 hp. engine, proved that Heath must have been doing something right.

The two cylinder, 32 hp. Bristol Cherub engine swung a 4' 4" diameter walnut prop. This engine coupled to the clean light weight "Bullet" proved more than a match for its competitors. It won the speed event easily, averaging 112 mph., lapping some of the slower planes as many as three times.

This was the only year the "Bullet" was flown in the form molded here. It was redesigned for the 1929 races. The improved version was smaller but not faster than the original ship. In the speed event it placed second at 105 mph., still not bad for 32 horses.

The "Baby Bullet" was never raced again after the 1929 air races. It's a shame that Ed Heath died in a plane crash in 1931. There is no telling what more this forward looking man might have contributed to aviation. The Heath Parasol is probably his best known design. Obtainable assembled or in kit form, it was very popular in the late 20's. Power was supplied by a Heath modified four cylinder Henderson motorcycle engine.

The Heath company continued to grow after Ed's death into what is now the tremendous Heathkit Company of Benton Harbor Michigan. Heath is the largest manufacturer of

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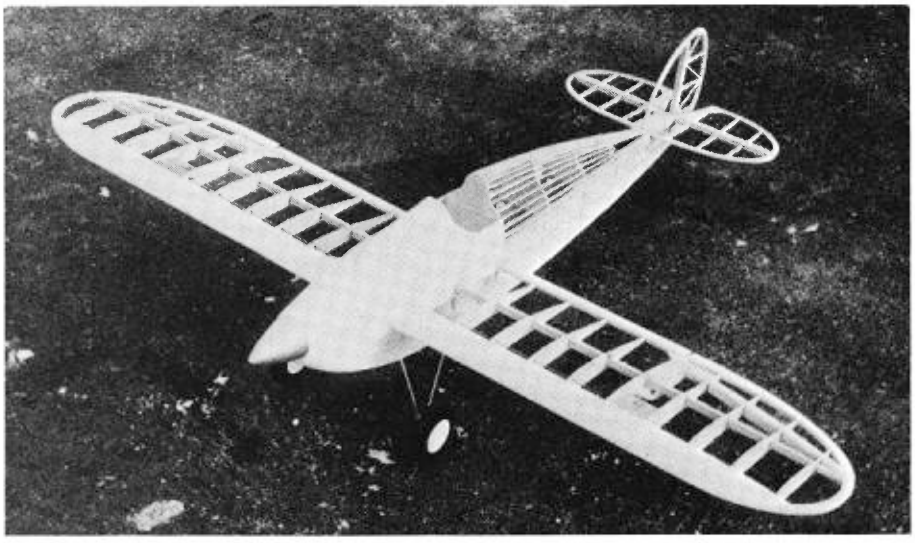
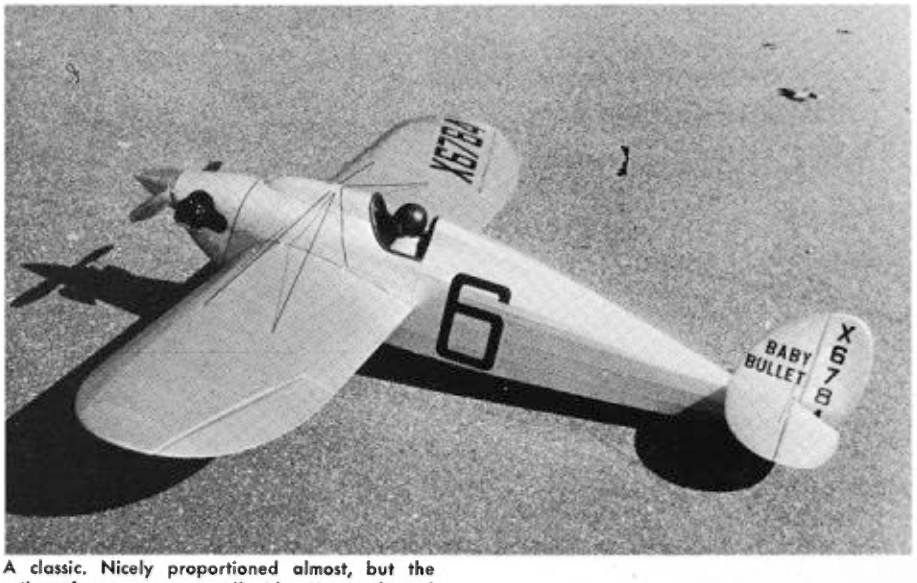


Boney bird, scale-like structure. Not easiest of airframes, but distinctive, unusual design.



A classic. Nicely proportioned almost, but the tail surfaces are on small side. Keep aft end light, C.G. where indicated. Not for a novice.

"BABY BULLET"

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electronic kits in the world. Everything in radio, hi-fi, test equipment and T.V. can be built from their kits at a sizeable saving over a finished product. More recently Heath has taken what must have been a long careful look at our radio control hobbies. Their decision was that there was enough of a market to warrant developing a proportional system in kit form. This is a good indication of how big our hobby is and how much bigger it is expected to grow in the future. An organization as large as the Heath company is not likely to spend the large sums of money necessary to put a kit such as this into production unless they are sure there is an active market for it.

We put one of the first systems available together and found it to be top notch in ease of construction and operation. Construction of the GD-47 Digital 5 system was reviewed here last month. This month we will cover the flight tests made in the "Baby Bullet". The small size of the servo's make them easy to mount into the smallest fuselage. Three servos can be mounted side by side in a little less than 3 inches. An aileron servo will fit flush in a wing that is over 1" thick.

The receiver is a little large for the .15 size multi's that are becoming popular. However it poses no problems for the average size model such as the "Baby Bullet". Installation here is conventional, the batteries pack in the nose, receiver and throttle servo behind it with the rudder and the elevator servo to the rear on transverse rails. The switch is mounted on the inside with a push-pull extension out the side. Fabric covering made this necessary. I have found this to be good practice regardless, as it keeps exhaust mess and dirt out of the switch. The aileron servo is of course mounted in the wing.

Actually the first test flights were not made in the "Baby Bullet". It was decided not to risk it with a new piece of equipment. This proved to be an unnecessary precaution as the GD-47 performed faultlessly in the test "Eindecker" and in the "Bullet".

The first flight on the "Bullet" proved lively, but manageable, due to a slightly heavy tail condition. This together with the small stabilizer area makes the elevator very sensitive. Be sure the center of gravity is not behind the location shown on the plan. Use a long elevator horn to help reduce sensitivity.

Performance, after trimming out the C.G. with lead, proved to be better than expected. A well worn smooth

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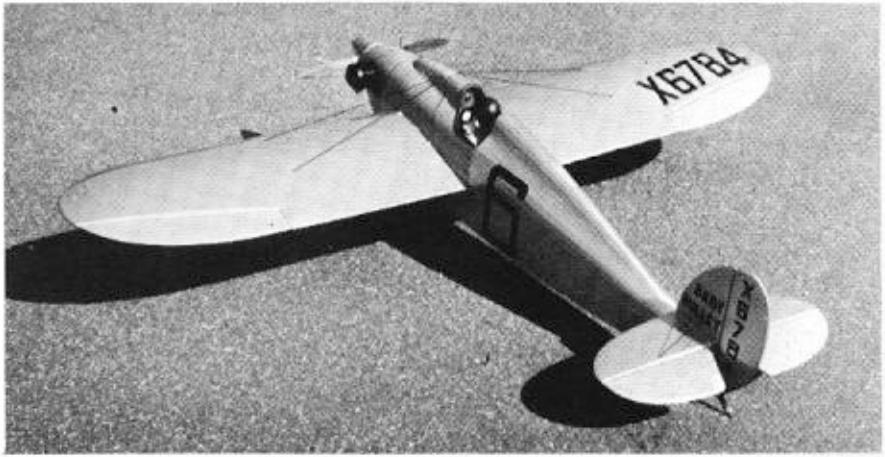
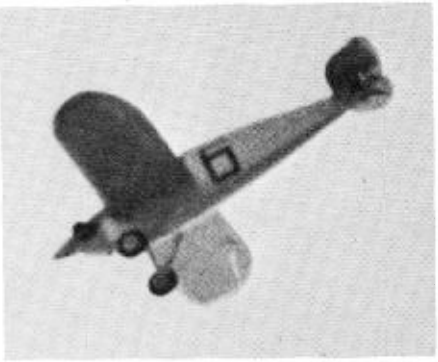


There are plastic types, but hand crafting is so satisfying to the soul. This is an IBIM type model, which means "I built it myself!"



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head ST/.45 does a good job at giving what I would consider scale performance. With a .60 in the nose things should really happen.

Scale appearance is very good. The only known deviations are slightly increased stabilizer and rudder area. The scale surfaces are very small as can be seen on the plan. I'm sure it would fly with the smaller surfaces, but I felt performance might suffer. The other change was to add a little dihedral. This is not for the sake of performance as we all know it is not necessary with ailerons. Instead it was done so the wing would not look like as if it were sagging. This is an unsightly illusion that occurs with a model wing, especially when the tips taper down. The airfoil also was changed due to the sharp leading edge and slight undercamber.

A big advantage of building a rather large model of a small plane is that a lot of detail can be included that would otherwise be difficult. At 3"-1' everything is one quarter actual size. Cockpit and engine details for instance are easily duplicated.

One problem I ran into was finding a suitable pilot. After a fruitless search for a realistic 3"-1' doll I found there was really no problem at all. William Bros. makes a 2⅝"-1' pilot bust, Ed Heath was 5' 1" tall. Figure it out and the William Bros. pilot is just about right. A block was added to the bottom of it and carved to shape to extend it into position. Heat was used on the neck to cock the head over as though he was looking around the cockpit fairing. This adds considerably to the realism.

My model was scaled from the fine drawings by Bob Cunningham that appeared in American Modeler a few years ago. Scale rib and stringer spacing was maintained to make the model as authentic as possible. So far it's main claim to fame is 1st in the non military scale category at the New Jersey Radio Control Show. This is a little Toledo sponsored by the Monmouth Model Airplane Club and held in Red Bank, N.J. Seaplane flying was featured with a number of fine flights put in. I was flying the Heathkit GD-47 in my "Eindecker" on floats. The great interest shown in the equipment makes it appear that this is going to be a very popular system.

Building the Bullet is not really difficult, however as with most scale projects it is not for the beginner. With this in mind only the construction points that might prove to be a problem will be discussed.

The major problem with the "Bullet" is the size of the nose. It is short and narrow. The short plain bearing ST.45 and a 6 oz. square tank fit in with not much room to spare. A larger engine and fuel tank may be a problem. An inverted engine may provide more room for the fuel tank. At any rate plan the engine-tank installation before beginning the construction. Make any necessary alterations in the mounts or formers at this time as it will save a lot of possible work later.

The ⅛" sides and ¼" nose doublers are joined with formers F-3 and F-4. When this is dry, pull the nose together with a "C" clamp and glue F-2 in place. This is a tough bend so work carefully. Add the remaining formers, crosspieces and tail post. The engine mounts and lower nose block are epoxied in place.

Bend the landing gear to shape and secure to F-5 and F-6 with metal clamps. Cement the ⅛" bottom sheet in place between the nose block and F-9. The stringers are now cemented to the sides and bottom. In order to reduce the sagging between formers in the rear deck, stringers were made up of two ⅛" squares. First one was cemented in place and then a second one was cemented on top of it. This makes them quite rigid. Plank the nose with ⅛" x ⅜" strips.

The wing is self explanatory. It goes together quickly and should pose no problems. Finish the wing completely, including covering, before building up the cockpit section on it. This is planked with ⅛" x ⅜" strips like the nose.

Three 10-32 screws hold the wing to the fuselage. Two at the trailing edge of the wing and one up through the bottom of the fuselage into the wing. Hardwood blocks are drilled and tapped for the screws. Epoxy the blocks in place.

Build the stabilizer, elevator and rudder. The fin is built in place after the completed stabilizer and elevator are in place.

Carve and sand the fuselage to shape. Make the cockpit section and the rest of the fuselage match up perfectly. Cover the bottom with silk or Silron first. Each side is done in one piece up to the top. The cockpit section is covered also.

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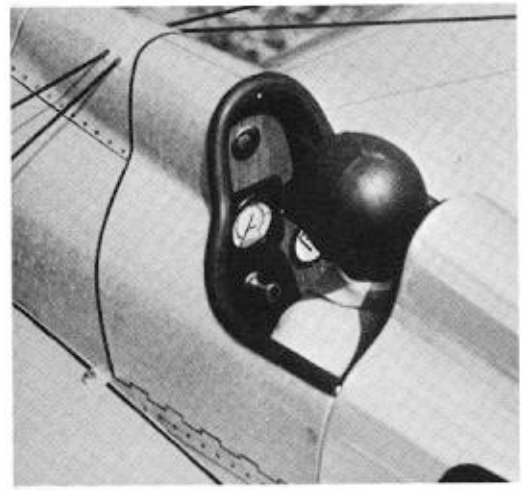
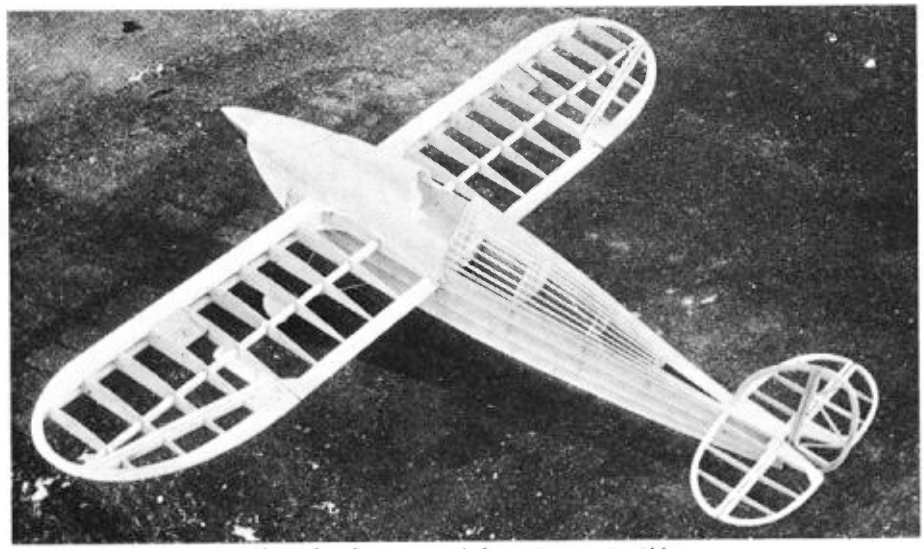
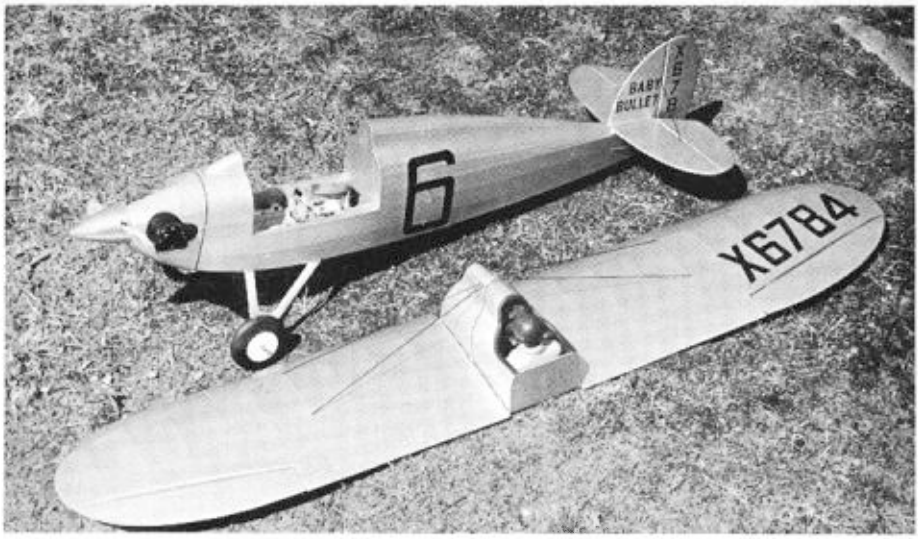


Melt his neck a bit to peek to port. William's Bros. pilot matches small stature of Ed Heath.



Sheeted siding, capped by stringers. Durable.



It comes apart like so. Sometimes unintentionally if you goof up. Heathkit fits in nicely.

HEATH "BABY BULLET"

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Use your own finishing method to complete the model. I used dope on mine. Enough clear was applied, sanding between coats, to get a good base for the final color finish. There's not much choice here. It has to be silver. The entire plane was sprayed with regular silver dope. Then the metal covered areas were masked off. These were painted with a mixture of grey and silver. This gives a realistic separation between the fabric and metal sections of the real plane.

All the metal panels including the spinner were decorated with machine turnings. Theres are round marks spun onto the aluminum with an electric drill. A large pencil type eraser was used to simulate these marks. It is a lot of work but well worth it. The eraser is cut off flat on the end and turned against the painted surface. This was the only way I could find to get a realistic mark. An electric drafting eraser was tried. Since it did not produce the same type machine mark and all areas could not be reached with it, the entire job was done by hand.

License and racing numbers were masked off and painted black. The name and numbers on the rudder were cut from black decal sheets. This could be used for all the numbers if desired. I prefer to paint them on. Cowl separation lines were applied with India ink and a ruling pen.

The instrument panel is completed outside the plane and then cemented in place against F-7. Actually this is not the scale position. It would be almost out of sight under the cowl. The panel is so easy to duplicate it would be a shame to hide it. Small black rubber windshield wiper hose that has been split on one side is used around the cockpit. The pilot, modified as described earlier is cemented to the wing sheeting in the cockpit. Leave room for access to the wing hold down screws.

To attach the rigging to the landing gear axles, hooks must be added to the wheel collars. Heavy black elastic thread is used to simulate the rigging. Holes are drilled through the blocks in the wing and the cockpit fairing. One piece of elastic is used. The tail rigging is done in the same manner.

A dummy cylinder is made of discs of 3/32" sheet and a carved block head, I could not find any good details of the Bristol Cherub engine up to this time, so it has not been completed yet.

Make up pushrods and install the radio equipment. I found it best to use "Nyrod" for the throttle linkage due to the difference in height, between the servo and engine. There is ample room for the Heath GD-47 or any other proportional equipment.

Before flying make sure there are no warps in the surfaces and above all the C.G. is in the correct location. When everything is operating both electronically and mechanically, first flights are in order. When I see the "Bullet" buzzing around an imaginary race course it makes me wish I could have seen the real one going through its paces. This was an exciting design born in the "Golden era of Racing." ●

Who needs a windshield, if you're faster than others? I like that kind of logic. Realistic.