

CONSTRUCTION



BUG'S EAR

by Bill Evans

These wing things come in all sizes, including this one that matches its big brothers with a .020. Your scrap box will provide all the materials!

THE DEVELOPMENT of the Simstar has included many versions from the .049 to the .15, the .35, the .40, the 6.3, a 7.3, a Quadra, twin .049s, twin .15s and twin .41s. It was inevitable that an .020 would emerge.

Several Sundays ago, while working in my shop and facing more projects than I could possibly finish, the thought of an .020 Simstar began to play on my mind. After pulling the just-received and long-awaited Cannon super mini-system from its carton, I began to calculate and sketch. Since I had behind me the experience of already designing 27 variations of the Simstar, it was not long before a 24 in. span, 150 sq in. wing took form on paper, to support the 7 oz to 11 oz ship. The fuselage lines took shape around the wing and radio components.

So, in the time between 5:00 p.m. and 9:00 p.m., the craft took shape and was covered, and the engine (T.D. .020) and radio were installed. The only problem was that it was too late in the day for a test flight.

As I sat back to admire the smallest R/C I had ever built, my wife Joan came in and remarked, "that's as cute as a bug's ear!" So, the Simstar .020 was christened the "Bug's Ear."

Since this was my very first experience in actually building a model of a model, I was surprised at how quickly the little pieces went together and how easy it was to iron on a few scraps of covering.

The test flight was a cinch—the Bug's Ear left my hand easily and it performed all the maneuvers of its much larger predecessors. There were three surprises. First, due to its size, I found that it was helpful to keep it a bit closer than normal-size ships. Next, the roll rate is faster than I have ever



Bug's Ear is really a tiny Simstar with all the fine flight characteristics of its big brother. That's Sandy Reed holding the tiny wing on the left page; Cox .020 power.

seen. It took some practice to get one roll instead of two. Finally, when it was inverted, the tank drained and the engine quit. This was due to the tank mount being vented and filled at the top. This problem can be solved by capping the vent line after filling the tank.

Because of its small size, the Bug's Ear can be flown on a very small field (tennis court size). I have flown it on a tennis court at night with the court lights on, but I do not recommend that practice. Keeping the ship in sight while looking up into the lights is almost impossible—once was too much for me.



Bob Sheuerman built this Bug's Ear version and took the photographs. There is little material needed to build Bug's Ear. A scrap box of your scraps should do the trick.

The final flight test was on a slope. I removed the prop, put a small plane over the nose to cover the engine and the plane a push off the slope. It flew well and it was a pleasure to see miniature model dart back and forth.

For your convenience, Bug's Ear cores (\$6.00) may be ordered from Research, 20825 N. Roscoe Blvd., Park, CA 91306. Add \$2.00 for California residents add 6% sales tax.

CONSTRUCTION The materials are almost too few to list. Check your scrap box for most items and proceed:

1. Cut out fuselage parts as plans.
2. Pin 1/4" sheet fuselage to a flat surface.
3. Glue and pin 1/4" fuselage bottom.
4. Glue and pin 1/4" ply for fuselage sides.
5. Glue and pin 1/4" sq longerons in place (top and bottom).
6. Glue and pin fuselage rear in place.
7. Glue and pin rear for fuselage.
8. Sheet wings with 1/4" film is recommended to fit foam cores.
9. Trim wing sheeting, leading edge and wing tips.
10. Cut out fin and shape.
11. Construct sliding landing gear.
12. Cut lightning bolts.
13. Sand and join with epoxy.
14. Make cutout in fuselage to fit into fuselage.
15. With the wing...

(Plans on next pg., see page 100)



BUG'S EAR

—by Bill Evans—

These wing things come in all sizes, including this one that matches its big brothers with a .020. Your scrap box will provide all the materials!

THE DEVELOPMENT of the Simitar has included many versions from the .049 to the .15, the .35, the .40, the 6.5, a 7.5, a Quadra, twin .049s, twin .19s and twin .61s. It was inevitable that an .020 would emerge.

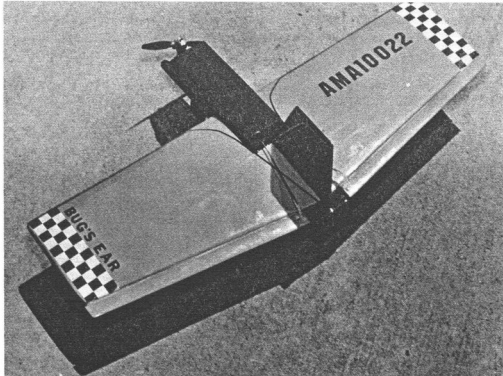
Several Sundays ago, while working in my shop and facing more projects than I could possibly finish, the thought of an .020 Simitar began to play on my mind. After pulling the just-received and long-awaited Cannon super mini-system from its carton, I began to calculate and sketch. Since I had behind me the experience of already designing 27 variations of the Simitar, it was not long before a 24 in. span, 150 sq in. wing took form on paper, to support the 7 oz to 11 oz ship. The fuselage lines took shape around the wing and radio components.

So, in the time between 5:00 p.m. and 9:00 p.m., the craft took shape and was covered, and the engine (T.D. .020) and radio were installed. The only problem was that it was too late in the day for a test flight.

As I sat back to admire the smallest R/C I had ever built, my wife Joan came in and remarked, "that's as cute as a bug's ear!" So, the Simitar .020 was christened the "Bug's Ear."

Since this was my very first experience in actually building a model of a model, I was surprised at how quickly the little pieces went together and how easy it was to iron on a few scraps of covering.

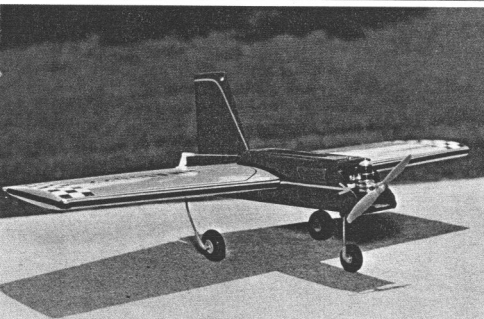
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Bob Sheuerman built this Bug's Ear version and took the photographs. There is little material needed to build Bug's Ear, a search through your scraps should do the trick.

The final flight test was on a slope. I removed the prop, put a small plastic bag over the nose to cover the engine and gave the plane a push off the slope. It flew very well and it was a pleasure to see this miniature model dart back and forth.

For your convenience, Bug's Ear foam cores (\$6.00) may be ordered from Soaring Research, 20825 1/2 Roscoe Blvd., Canoga Park, CA 91306. Add \$2.00 for shipping. California residents add 6% sales tax.

CONSTRUCTION. The materials are almost too few to list. Check your scrap box for most items and proceed as follows:

1. Cut out fuselage parts as shown on plans.
2. Pin 1/16" sheet fuselage bottom down on a flat surface.
3. Glue and pin 1/16" fuselage sides to fuselage bottom.
4. Glue and pin 1/8" ply firewall in place.
5. Glue and pin 1/8 sq in. fuselage longerons in place (top and bottom corners).
6. Glue and pin fuselage top (front and rear) in place.
7. Glue and pin rear former in place.
8. Sheet wings with 1/32" balsa. "Core-film" is recommended to bond sheeting to foam cores.
9. Trim wing sheeting, and glue and pin leading edge and wing tips in place.
10. Cut out fin and elevons. Sand to shape.
11. Construct sliding tray.
12. Cut lightening holes in wing panels.
13. Sand and join wing using 5-minute epoxy.
14. Make cutout in wing leading edge to fit into fuselage.
15. With the wing in place on the

(Plans on next pg.; text continued on pg.110)

CANNON SUPER-MICRO (CE-9) SERVOS

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CUT HATCH FOR EQUIPMENT ENT AC

TEE DEE .020
ENGINE

RECEIVED

BATTERY

▼=INDICATES THE EDGE OF
1/16" BALSA FUSELAGE SIDES

3/32
DOUBLER.

1/8 PLY

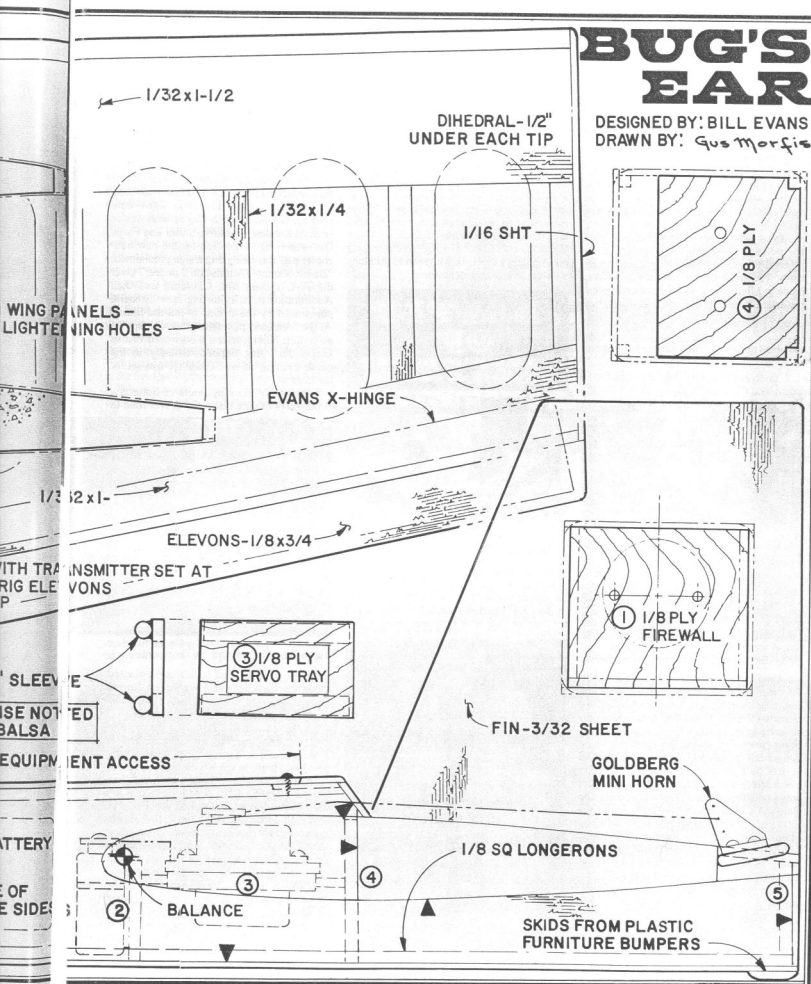
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BUG'S EAR

DESIGNED BY: BILL EVANS

DRAWN BY: Gus Morfis





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BUG'S EAR

(Continued from page 13)

fuselage, trim elevons to clear fuselage and wing tips.

16. Final sand and cover all components.
17. Epoxy sliding tray into position in fuselage.

18. Epoxy wing and fin into place.
19. Install radio and engine, and balance per plan.

Be sure to set the elevators 1/32" above what is normally neutral. This 1/32" of up elevator (at neutral) is required to provide the reflex necessary on flying wings.

Charge your batteries per the manufacturer's instructions and you're on your own, either on the slope or under power.

SPECIFICATIONS. Here are the specs on the smallest of the Simitars:

Type: Sport flying wing

Wingspan: 24"

Wing chord: Root 7", tip 5"

Total wing area: 144 sq. in.

Wing location: Top of fuselage pod

Airfoil: Semi-symmetrical reflex

Wing planform: Swept trailing edge

Dihedral: 1/2" each tip

Overall fuselage length: 13"

Radio compartment area:

(1)6"x(w)1 1/4"x(h)1 1/2"

Vertical fin height: 6"

Recommended engine: T.D. .020

Fuel tank size: T.D. tank mount

Recommended number of channels: 2

Control functions: Elevons (2)

Weight ready to fly: 7-10 oz

Wing loading: 7-10 oz

BASIC MATERIALS. Again, you'll probably be able to find everything in your scrap box.

Fuselage: Balsa and ply

Wing: Foam and ply

Empennage: Balsa

CONTROL TOWER

(Continued from page 10)

teered to retrieve our models, as we rarely hit the runway, and would do anything to help and learn about R/C flying. He certainly has pursued his R/C modeling interests, as well as a successful engineering career. Now, here is Joe's recent letter to me:

"It was certainly a pleasure speaking with you on the phone today and reminiscing about the 'good old days' before I had to deal with the 'real world'."

"The C.A.R. module is a very basic device that merely acts as a decision block which allows you to fly coupled if you want to, and automatically becomes 'transparent' when you decide to use the rudder. This way, you don't have to remember to turn it on or off at the transmitter as some of the newer radios re-

quire. In this sense, I guess it could be called 'intelligent.' It's fairly easy to install, certainly within the skills of the typical R/C modeler. Worst case failure mode is getting stuck either coupled or uncoupled—no loss of control. I can honestly say I haven't had any reported failures to date. Electronically, the decoder is 80% CMOS (Combination Metal Oxide Semiconductor) with one linear chip (LM 311) for the clock. It also features reverse polarity protection (of itself) via a reverse biased power rectifier.

"One problem, if you can call it that, is with the trimpot. I've gotten many calls from modelers saying they can't get the module to couple properly. It turns out that they didn't realize that the trimpot has an adjustment range of twenty turns, end to end, of its range; most radios will fail in the middle (ten turns from either end where you hear the slip clutch 'click'), plus or minus two or three. I ship the units set up for a 1.4 millisecond servo neutral, so it usually doesn't take more than a turn or two to get it set. The active 'range' of the pot setting is about one-half to three-quarters of a turn. This range should be 'centered' around neutral so that equal deflection of the rudder stick causes decoupling to occur. That's about all there is to it."

"I recommend treating the unit just as you would a receiver or battery pack (wrapped in foam rubber). The only

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