COSMIC CAT

Next year will climax the trend to more realistic R/C models. This semi-scale beauty combines a Goodyear's exciting looks with an aerobatic performance good enough to win contests. Why not make your 1967 ship a crowd stopper?

By BILL WISCHER

If you think that the Cosmic Cat looks like a Goodyear racer, you're right; that's exactly what I had in mind when I built it. While the model Goodyear event was producing scale and semi-scale models that looked like the real thing in the air (though flying characteristics often left much to be desired), the majority of our stunt ships were going in the opposite direction. With square fuselages and the cylinder sticking up in the breeze, any attempt to resemble a full-size aircraft was doomed to failure.

I built a Cosmic Wind (original version with a turtle deck, looked like a Long Midget) for pylon racing and it was a total flop. Like many scale ships, the tail moment was too short, with the attendant problems. The CG was hyper-critical, and aside from the fact that it stalled when it was going 80 mph (a situation not improved by its 6½ lb. weight!), it was still wonderful to watch in flight—after I got it going faster than the stalling speed.

Hence, when I started to build my next stunt ship, I was determined to build a model that looked like an airplane. The Goodyear style affords advantages over other configurations. You can hide the engine in a cheek cowl (made to order for an opposed twin) and the full-size design was capable of aerobatics. Some changes are needed from scale dimensions to pro-

Bill's model is an obvious take-off on the Cosmic Wind Goodyear racer. This was no accident! It is fast and responsive on its Enya .60.

The powerful engine is well cooled and, being very reliable, it presents no problem when fully cowled. This plane was designed for big engines exclusively.

The interior of the fuselage is cavernous. The little Controlaire digital servos seem almost lost. Note the sponge padding between servos.

vide good flying characteristics. To alleviate the Cosmic Wind's porpoising problems, I used the standard multi practice of having a long tail moment. The wing was changed to full symmetrical (RAF-30, thank you Jim Kirkland).

That's all find and good you say, but how about the landing gear; who ever heard of a Goodyear ship with a trike gear? The trike gear fraternity is quick to point out the disadvantages of taxiing with conventional gear, particularly in a wind. You can still do the proto takeoff, but the taxi back to the hangar provides minor problems.

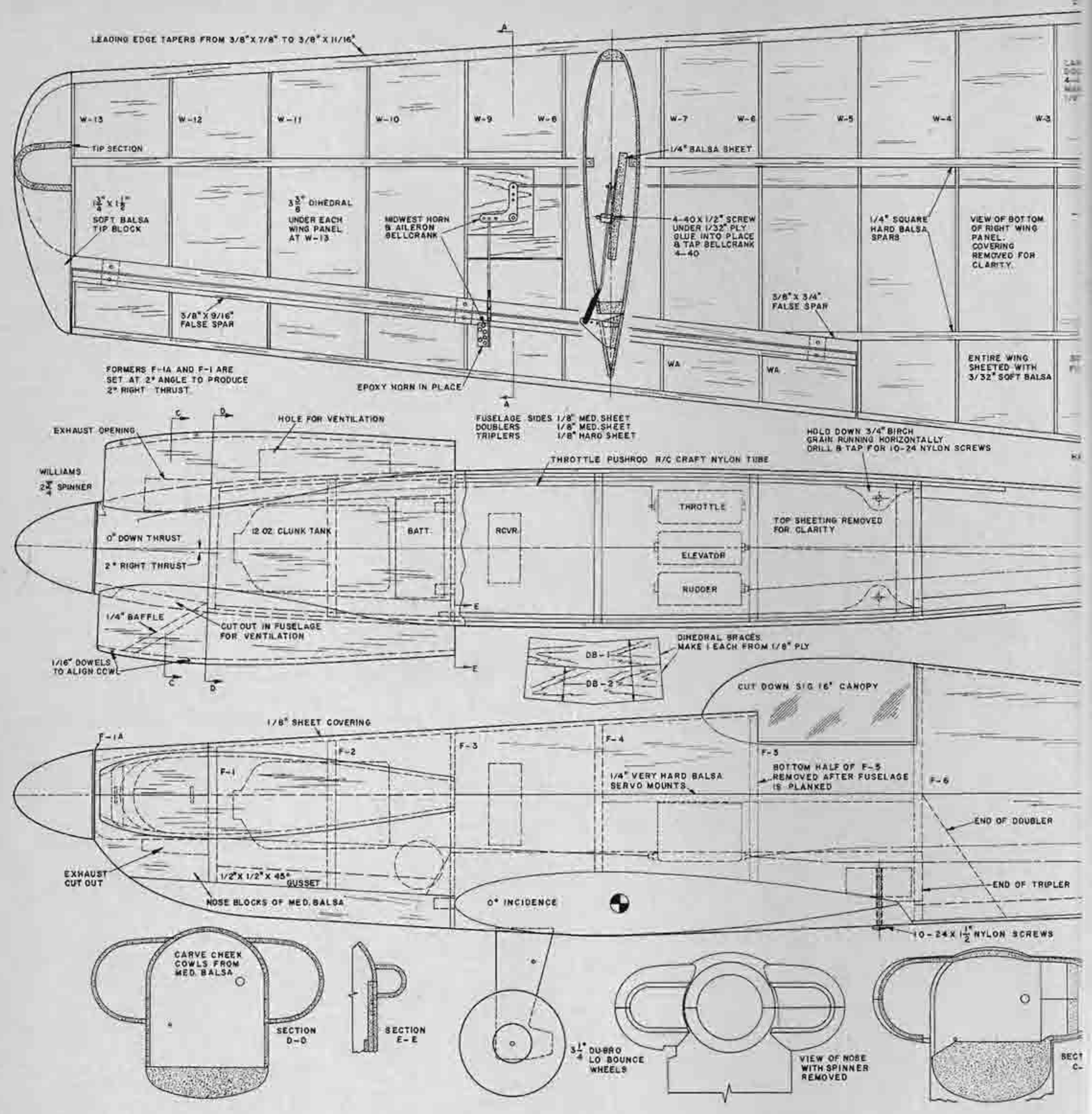
But, have you ever seen a trike gear make a real, honest to goodness, rise-off-ground like a conventional gear can; one that gently lifts off, not zoom off like a skyrocket? You can't do a three-point, full-stall landing with a trike gear either. Even if you don't make a three point, a conventional gear still saves face with the tail slowly settling; not the arrival appearance that the trike gear gives you. It takes a while to get the hang of flying with conventional gear, but you'll find yourself reviving the lost art of landing and taking off.

The landing gear might provide you with a problem; I got a scrap of aluminum from a nearby retail metals warehouse. If you're in a pinch, a Sig 18" landing gear blank will get you in the ball park.

The tab on the landing gear is for attaching wheel pants; should you get more energetic than I was. I used bolt-on axle stubs.

Construction is the run of the mill except in a few places. Don't depend on the four 1/16" dowels to hold on the cowl, they won't. I use a 2-56 screw that jams in the bottom of a hole drilled half-way through the motor mount. For a motor mount, I recommend a Tatone radial mount to fit your particular engine. It's easier to buy one than to make one like I did. Being in the boondocks, I couldn't get one. To get juice to the glow-plug, I mounted a sub-miniature phone jack in the cowl, about two inches back of the engine. I used heavy stranded wire, one going to the motor mount and the other on the glow-plug using a brass collar that I tightened on by the means of a set screw.

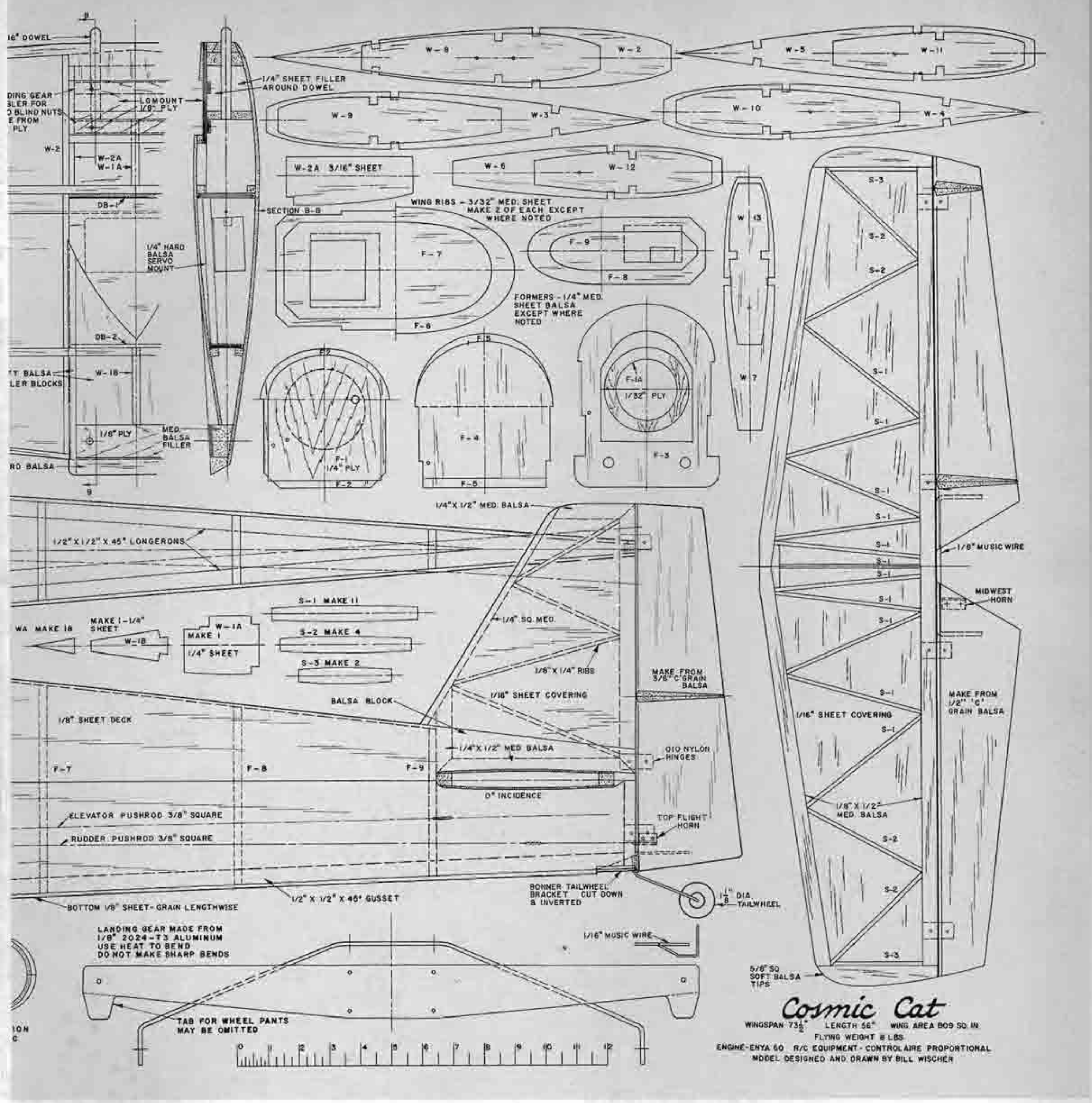
I planked the fuselage top with 1/8" x 1/4" strips, though there's nothing wrong with using a sheet instead. For the servo mounts, if you don't have rockhard balsa, use 1/8" plywood instead; servos have a bad habit of crushing anything (*Continued on next page*)



softer and coming loose.

For a brake, I added one of those "spring around a drum" (what else do you call them?) deals to the tailwheel. Cut off the end of a Pylon Brand fuel filter for a bushing; this also keeps the thing from making electrical noises. The linkage is a piece of dial cord, available from radio stores. Solder a brass tube to the tailwheel strut with the tube ends pointing upward to aim at the tie-on on the brake at the back end, and to a point about 1" back of the hinge line on the elevator. On the elevator, stick a long glass head pin in the elevator and tie the dial cord to it.

The Cosmic Cat is quite easy to fly, with the takeoff and landing being the greatest concern (this is news?). Taking off, kick in about 1/8" of up trim, let it run about 100 feet before applying a small amount of up elevator, if it hasn't already taken off by itself. Don't try to haul it off; the original weighs eight lbs. and won't tolerate that kind of handling. Taking off with conventional gear you will have to hold a good 1/2" of right rudder when you release the airplane. Gradually bring the rudder back to neutral as you gain flying speed. Those of you who want to get more weight on the tailwheel for better taxiing can move the landing gear up to the leading edge of the wing; but you will have to be more careful in landing to avoid bouncing. If the airplane doesn't taxi straight, give the gear on the opposite side of the turn toe-out. A toed-out landing gear will



give you better handling than toe-in.

Now that you have the Cat in the air, glance at the other fellows. They sit up and take notice. The big bird really flys! It's the realism that gets them. Not only does it look like a real ship, it flys like one. It does maneuvers more like a full-sized aircraft than any other ship I have built. You can do nice big 80′ loops with no tendency to fall off. The roll rate is slow enough; after all, it is a big airplane. It does wonderful slow rolls, really slow. The Cat is a good, stable, inverted flyer.

Landings are pretty nifty after a bit of practice. Because of the fairly thick wing tips, the landing can be slowed up to near the stalling point. Ease it on in for a three-point. After a while you will become proficient enough to land on the wheels and let the tail slowly settle. That usually gets you a hand from the gang.

While practicing for the FAI tryouts I found it did a good job of the maneuvers. The double stall turn was perhaps the most difficult; try one sometime. But make sure you have enough altitude to recover from any trouble you may get into. A tail-slide can be done quite regularly. It does a fine job on the top-hat, plenty of power up front.

I prefer to build a bigger, somewhat heavier model to the small light jobs. They are certainly more stable in the wind; and I just like the way the big ones fly. With the Cat you get a good, solid feel to the maneuvers. This I like. Don't consider (*Continued on page* 56)

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an engine smaller than a 60. At 8 lbs. the 60 does a good job of pulling it through the air. With anything less, you are going to have problems.

Many of you will want to get the weight down. On the wing use light 3/32" covering; if you can't get what you consider light 3/32" balsa, go to 1/16". That is what I intend to do on the second ship I build. An Armalite wing would also bring the weight down. If you choose your balsa carefully, you should have no problems getting the weight down a pound. The Cosmic Cat doesn't set the world on fire, but it sure gets the job done.

And it looks pretty!

Awesome Challenge

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cooperated closely with the four companies, supplying test and design data from the massive B-70 and YF-12A aircraft. On the 6th of September 1966, the four packages were submitted. The Government is making its choice. Shortly, the Nation will know.

The two basic aircraft designs are at the same time similar, but significant differences exists. Of the two, the Lockheed is perhaps the more conventional because the wings remain in a single configuration in all modes of flight. But what wings! One-hundred sixteen feet of double-delta sculptured heat-resistant metal with a total area of almost 9500 sq. ft. Dart-shaped, the Lockheed has no horizontal stabilizer as such. The unique double-delta configuration has undergone extensive testing at Lockheed's Burbank activity since 1962. Lockheed engineers feel that the basic simplicity of the fixed-wing design offers a big edge over Boeing's more complex and expensive variable sweep movable wing.

As an aircraft accelerates through the transonic region into supersonic flight, its center-of-lift moves aft, thus changing the entire balance of the aircraft. The Concorde solves this problem by a massive pumping of fuel to and from ballast tanks almost like a submarine trimming its pitch angle; the Boeing by sweeping the complete wing rearward from its pivot point while in flight. But Lockheed's double-delta wing features a smaller knife-edged landing edge which becomes an effective lift producer only at supersonic speeds. The added lift up front tends to support the forward end of the aircraft even though the original center-of-lift has moved backward. Trim is thus maintained and landing characteristics will, it is hoped, be even better than some present subsonic craft.

Boeing approaches the problem differently. Perhaps the single most noteworthy design feature of both designs is Boeing's variable sweep wing. Using an approach similar to that of the F-111 aircraft, Boeing's SST will vary the angle at which the wing intersects the fuselage. For takeoff and subsonic flight over congested areas, the wings are held in their full-forward configuration of 30 degrees. The sweep of the wing in this configuration is not unlike that of any conventional subsonic aircraft. Boeing engineers are convinced that this mode of operation will provide them with a substantial edge over Lockheed in the ability to maintain good low speed landing characteristics and low noise levels over populated areas. High-lift devices, similar to those used on present Boeing designs and now almost a Boeing trademark, will be used to further improve landing characteristics.

At supersonic cruise, the leading edge of the wing is swept back 72 degrees from the fuselage. While descending from its cruise altitude of 60,000 ft., the wing is placed in an intermediate position which combines the best features of both configurations—good cruise speed and economical utilization of fuel. The wings move on a single massive pivot, but so quietly and smoothly that, Boeing predicts, passengers will be unaware of the transition. "Complexity," states one senior engineer at Boeing, "is a sin only when it leads to unreliability. It becomes a virtue when it increases performance and safety." In supersonic flight, the wings and horizontal stabilizer meet, and the aircraft is as delta-shaped as its Lockheed competitor; with the 30 degree sweep at subsonic speeds, Boeing is making a dynamic and imaginative attempt to have the best of both worlds.

Both aircraft will be capable of Mach 2.8 cruise at altitudes above 60,000 ft., for