The Original BUCCANEER

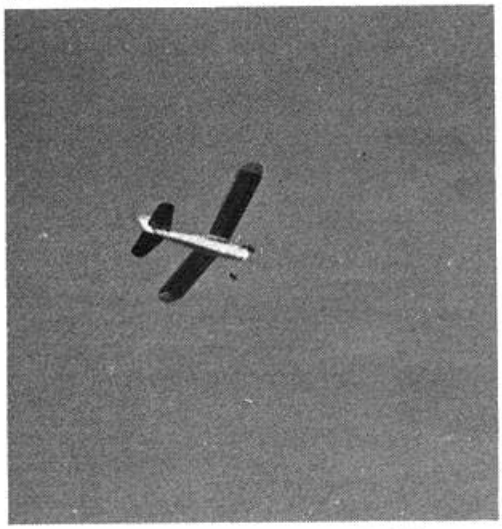
By D. B. Mathews

Outwardly identical to the original Buccaneer, this version has been beefed up to take the additional flight loads imposed by R/C maneuvering. It's still SAM legal, of course.

THIS WAS THE FIRST IN A LONG LINE OF "BUCS."

ORIGINAL BUCCANEER
TYPE: Old Timer R/C or FF
WINGSPAN: 84 inches
WING AREA: 1,126 square inches
LENGTH: 58 inches
ENGINE: .35-.55 (maximum .51 for S.A.M.)
RADIO: 3-channel

• HISTORY. This is a structurally simplified and strengthened Original Buccaneer. It employs contemporary materials and adhesives to develop a vastly stronger and more easily built modern version of this classic design. Modifications to



The Buc will fly forever on part throttle.

Fuselage is covered with polyester fabric, wings and tail are MonoKoted.

the wing include a much heavier leading edge, repositioned spruce spars with shear webs, a full depth trailing edge from store-bought stock, and tips that are much easier to construct as well as being vastly stronger. Fuselage changes include spruce longerons, solid cabin area sides to anchor the window framework, plywood bulkheads for alignment and strength, a strengthened rear end, and modernized landing gear attachments, as well as several other more subtle changes. The tail surfaces have been hinged, of course, as well as strengthened with sheet "airfoiler" strips. These changes were deemed necessary to correct a notoriously weak stabilizer and rudder. Please be assured that no outline or cross-sectional changes have been made that would violate the S.A.M. rules. This is truly a "beef up the built-ups" as described in the rule book.

Under no circumstance should this "Original Buccaneer" be confused with the later long-running Berkeley kit of the "Super Buccaneer." Rather, this is the very first design to carry Bill Effinger's name on the drawings; it is one of the earliest gas-powered kits in the U.S. Plans were offered only in half-size, with full-sized ribs and bulkheads; the earliest ad I can locate is in *Model Airplane News,* March 1936! Forty-four years ago! The Original Buccaneer was also shown in three-view forms in the 1937 Zaic Yearbook, along with such other history makers as "Quaker," "Miss America," "Tlush '36 Texaco Winner," and Frank Ehling's "Stick."

A kit for the Buccaneer was later introduced, containing strip and sheet wood, some straight lengths of wire, and a roll of bamboo paper wrapped around the plans. As sales picked up, Effinger introduced one of the first "package deals": deluxe improved kit, M&M airwheels, and a Brown Jr. All for $29.00 —certainly a bargain even in 1936.

The Buccaneer established an N.A.A. (the A.M.A. was born several years later) record of 63 minutes in October, 1936. Flown by Don Spaulding of Denver, the Buccaneer was actually followed in a car for four hours and 45 minutes before disappearing vertically. (The dethermalizer was not introduced until several years later.) Buccaneers took three places in Texaco at the '36 Nats, and one flew 20 minutes on the new fuel allotments in 1937.

The Buccaneer design was "cleaned up" and several structural weaknesses corrected to become the "Super Buccaneer," first advertised in the May 1937 *M.A.N.* This kit was to become the flagship of the Berkeley line for the next 20 years, with kits in production until the demise of the company. At one time, the Super Buccaneer could be purchased ready-built and test-flown for $125.00. Based on the considerable success of the design, Bill Effinger's crew developed numerous variations on the theme . . . the five-foot "Standard" of November, 1937, then the "48," "36," "B Special," and the "C Special." This enlarging-shrinking-altering-and-modifying became a Berkeley Models trademark throughout its history.

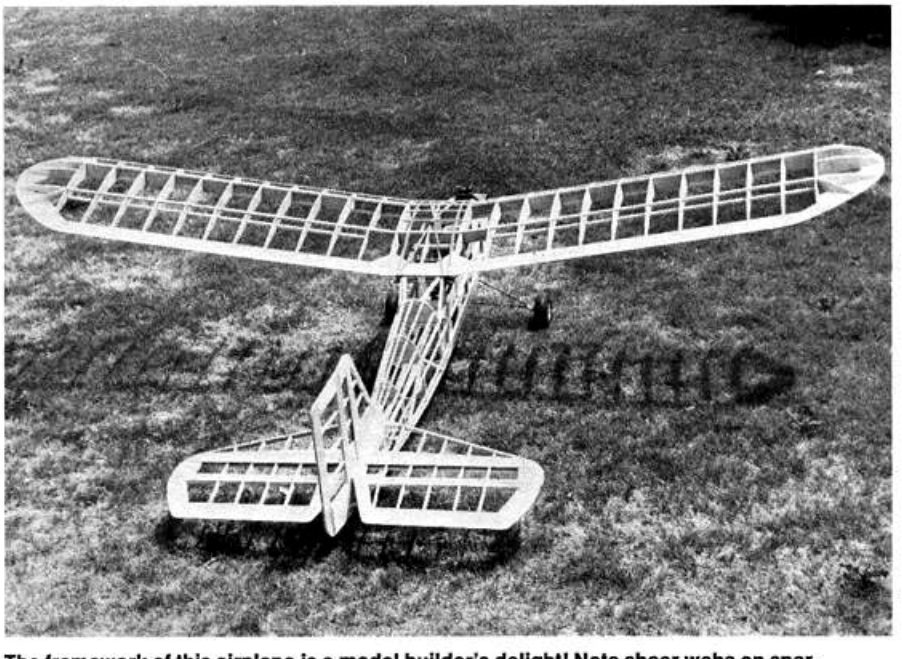
My own lifelong love affair with Buccaneers started when I was a wide-eyed 12-year-old boy with a "Modelers Dream Book" from Berkeley Models in Brooklyn. Purchased for a dime mailed with a three-cent stamp, the catalog had been thumbed through so many times that the print was fading, and the pages were held together with that newfangled "Scotch" tape. The great big "Buc" was what every kid would have bought in 1943 except for its $9.95 price tag; really "big" money when 15¢ would get one into a Saturday afternoon Gene Autrey-Roy Rodgers double "epic" at the local cinema.

Consequently, my modeling buddy and I pooled our rather limited resources to order a "Buccaneer B Special." After waiting what seemed to be an eternity, the red and white box arrived. Inside were some rock-hard balsa strips, some hardwood blocks (pine or bass?), and a bunch of formers and ribs printed on paperboard that closely resembled the bottom of shirt boxes. Why no balsa? World War II had made what little wood that was imported from Ecuador strategic for use in life rafts and such, so kit manufacturers compromised as best they could.

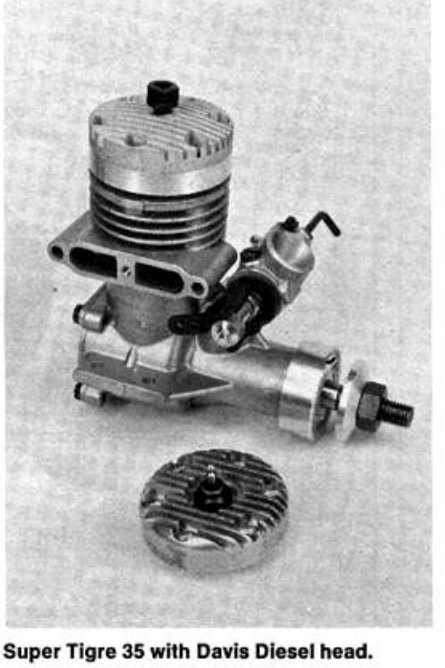
As the summer wore on, we managed to build a "B Special" out of the odd assortment of materials, but when covering time arrived we had no silkspan and no dope! Ever resourceful, we covered the framework with gift wrapping tissue using Comet glue as an adhesive; color and finish were produced using yellow enamel (Sherwin Williams 4-hour, as I recall).

The resultant product was a "Buccaneer B Special" that must have weighed 11 pounds, had no structural strength, but did have unbelievable warps! To us the model was absolutely beautiful and no one was cruel enough to tell us otherwise. Mercifully, engines were even more difficult to obtain than building supplies, so the model was never flown. For all I know, the thing may be buckling the rafters of someone's attic at this very

(Plans on next page; text continues on page 89.)



The framework of this airplane is a model builder's delight! Note shear webs on spar.



Super Tigre 35 with Davis Diesel head.

moment.

Even with the problems associated with that first try at a "gassie," I remain hooked on Buccaneers to this day. I resolved back then to make enough money and to acquire the needed skills to build a "real" (reads BIG) Buc someday. Thirty-seven years and several hundred models later I have, and that is the core of the article you are reading. I actually built and flew a "Super" several years ago, but considering how common they are, I have opted to develop the "Original" instead. By carefully re-engineering the design to eliminate its weaknesses, while rendering it much simpler to construct, we have developed a model more than able to out-thermal the Super due to its much lighter wing loading; and, of course, the construction ease does not suffer with the elimination of the Super's planked fuselage. Besides, where else can you find an old timer with a vertical fin this big?

Using three channels and a .35 to .55 engine, this model has such super stability and slow lady-like flight as to defy description. But even at such low speeds the rudder and elevator are still effective; the only negative thing in piloting the Original is getting the darn thing to quit flying, with power on.

On the other end of the flight envelope, the model will thermal beautifully and is large enough to remain visible at great distances. I frequently thermal mine while lying flat on my back in the grass.

This is a very versatile model in that it makes a perfect R/C trainer, a delightful sport model for touch-and-go's and slow loops, and can also be highly competitive in S.A.M. Antique and Texaco events—for which it is completely legal.

GENERAL TIPS. The basic adhesive used throughout this project is aliphatic-resin (Sig-Bond, Titebond, etc). The epoxy joints are made with slow cure types such as Hobbypoxy Formula 2. Do not substitute balsa for spruce in this model's construction. The large plywood section in the fuselage side is cut from three-ply paneling scrap "liberated" at a cabinetmaker's or from the scrap pile at a construction site. Sig 3/16" plywood will also work well. Always drill required holes at the time the part is being cut out; this is much simpler than discovering a missing hole after assembly. Trial-fit all components before applying adhesive.

A steerable tail wheel is not shown, as I seriously doubt the tail would stay down with enough power applied to move the model. The stabilizer is held onto the fuselage with bolts to facilitate transit and storage; it could easily be epoxied to the frame if the builder preferred.

TAIL FEATHERS. All sections of the tail are built flat on the board, with the sheet strengtheners added after the assembly but before sanding and contouring. The stab strengthener is not cut at the center; the rudder is notched to fit over it. Be certain to use the longest horns available (Sig #222) and start flying with the connectors in the outside holes until you develop a "feel" for this model. Hinges are installed in slots cut with a hinging tool and held with toothpicks. Cover the surfaces before final hinging.

FUSELAGE. Cover the plan with plastic wrap. Pin previously cut and sanded 3/16" plywood over plan. Assemble one side and allow glue to set 4-6 hours. Remove pins that will obstruct second side, cover joints with masking tape to ease separation, and build the second side over the first in the classic manner. Allow for an overnight glue cure, remove from building board, and separate the halves using a table knife to gently pop apart.

Trial-fit and adjust bulkheads A, B, C, and the landing gear blocks to their appropriate positions. Glue with Sig-Bond, then place the fuselage, with the wing rails pinned down, onto the top view. Use clothespins and masking tape to hold bulkheads in place, adjusting for squareness in all planes using a carpenter's square and right-angle triangles. Complete all cross braces (1/4" x 1/2") and allow everything to cure for at least 24 hours. With the fuselage still pinned upside down on the board, locate a center line on A, B, C, etc.; lay a straightedge over the marks and clothespin in place. Pull tail post together to meet directly over the center of top view. Check squareness in the vertical plane using a triangle, then glue the tail post together. Install cross pieces, bottom bulkheads and stringers, tail skid mount, etc.; allow for setting, then remove and add top turtle deck formers and stringers.

Bend up landing gear using a large bench vise, large Vise Grips, a length of steel pipe, and some method of cutting the wire. The gear is not difficult to bend if one takes his time, plans the bends, and is prepared to toss away a mistake rather than attempting to unbend it (an impossibility). Final assembly is best accomplished with the two sections mounted into the blocks in the fuselage bottom. Align the legs, then wrap with copper wire and solder.

Build up cowl and nose block, then curve to shape. Cut and epoxy stab mount to fuselage. When epoxy is set, tape stab into position, drill down through it and into the mounts, and install T-nuts and bolts. Install and drill cabin gussets for 1/4" dowels, but *do not* cement the dowels until the fuselage is covered and the windscreen installed. If a removable tank hatch is used, any of the currently available latch hardware will suffice.

WING. Develop two master ribs of plywood or metal to use as templates, then cut required ribs from a stack of 1/8" C-grain blanks. Although a jigsaw is immensely helpful, the ribs can be cut using a coping saw or even a long knife.

Shim up the notched leading and trailing edges as shown on the drawings, then position bottom spars on appropriate shims, using several ribs as a guide. Build 3/16" washout into both wings. Cut tips from 1/4" sheet as drawn, leaving outside contour for later development. The tips are notched to clear the bottom spar stubs, and are flush against the trailing edge stock and approximately one-third up on the leading edge.

Glue ribs into notches and onto spars, then add top spars, tip filler sheet, and gussets.

Remove panel from building board, draw tip outline using a cardboard pattern developed with carbon paper through the plans. Cut tip to rough outline with a coping saw, then sand outline and contour using a sanding block. Separate center section from panel.

Block up tip for 6" dihedral and sand angle using a flat table edge and sanding block; repeat for opposite wing. Epoxy panel to center section with dihedral blocked in; repeat for opposite side. Allow epoxy to cure, then remove panels from board.

Using two hacksaw blades taped together, cut slot through ribs and flush with face of spars. Slide plywood blank into slot, mark outline with pencil, remove, and cut to shape; epoxy into slots using clothespins to hold tightly against the spar.

Carve leading edge to contour; add center section braces and vertical grain shear webs. *Note:* Should the builder choose to use a strong and powerful .60-size engine, some consideration should be given to either covering the wing with polyester dress liner or adding shear webs to the rear spar as well. This wing might be prone to flutter in extreme high speed mode if covered only with MonoKote.

Epoxy 1/16" music wire to trailing edge of center section to relieve the cutting of the elastic wing hold-downs. I also epoxied 1/16" ply triangles at the point of maximum strain. Carefully final-sand and cover the wing.

TRIAL ASSEMBLY. Temporarily assemble all major components, then move servos and receiver fore and aft to obtain a CG approximately 3/8" forward of point shown (this compensates for the pushrods and covering that are not yet installed). For pushrods, I used Rocket City pushrod ends running into EZ-connectors on the servo end, and threaded pushrods and clevises on the back end. However, well-braced Nyrod type pushrods would be equally satisfactory, and perhaps slightly easier to install.

The prototype has the servo rails screwed through the ply sides and into the 3/8" square maple. The receiver is under the servos, with the battery held in a "cocoon" of foam rubber under the tank. Once again, the builder should use a mounting method with which he is comfortable; mine is merely a suggestion.

FINISH. My model's wing and tail are covered in MonoKote, applied over Balsarite. The fuselage is covered in polyester dress liner (also called "acetate sheathing" in some fabric stores). Although it is available in a myriad of colors, I chose to spray mine with white polyurethane after filling with three coats of clear *nitrate* dope. The polyester is applied in the classic silk technique: predoped structure, wet material stuck down with 50-50 dope-thinner. I have also applied this material in other projects using Coverite Quik-Stik on the frame and adhering the cloth using a MonoKote iron set on the Coverite setting. The wrinkles can then be pulled out using the iron before doping. Do not use butyrate dope under polyurethane paint or on any surface where overtautening could be a problem.

The lettering on the photo model is die-cut vinyl from an art supply store (EZ Letter Quik Stik). This is applied by spraying the MonoKote with water, adjusting the letters, and then squeezing out the water. Be certain to coat any area of this model that will contact raw fuel with a generous coating of epoxy or polyester resin.

FLYING. Always pre-run and set the engine at home, check radio operation with the engine running, range check, and *then* go fly. Takeoffs with the Buccaneer are a throttle function much like a J-3 or Champ in full size. Use rudder to maintain a heading as power is added, even resorting to a bit of *down* elevator to get her up on the mains. As the throttle is advanced, the plane will ease off the ground as you come back into neutral elevator. This model has such terrific lift and such a low wing loading that takeoff is nearly automatic. Conversely, landings require long approaches, lots of S-turns, and wheel landings . . . *the thing just doesn't want to quit flying,* and will go several hundred feet in ground effect. I have found it necessary to force the wheels into ground contact to slow her down. One thing is for certain: if you mess up a landing, the go-around is super simple.

The thermalling ability of the Buc is also outstanding. Left alone, it centers in the "cone" automatically and must be forced out manually. Find the bubble, set the trim tabs for a wide turn, and let the Buc do her thing. Almost always, piloting the model will get it out of "cone" rather than into it. I could go on and on extolling the virtues of this design, but that would only delay your finishing yours and joining the fun. So do it already!!!

As mentioned earlier, this is my second Buccaneer. The Super and this Original were both initially powered with an ancient ST 51 swinging a 12x4 prop. Although this combination moved both about very nicely, something about that howling motor always left me wishing I had a Forster 99 ignition engine for more realistic look and sound. On a hunch, I removed the 51 and substituted an ST 35 with a Davis Diesel head. After initially running the conversion on an 11x6 prop, I tried a 13x6 Rev-up—at which point the project became absolutely electrifying.

With a Semco muffler, the engine sounds much like a "sparker," has unbelievable torque, idles so slowly that it is often difficult to tell if it is running in the air, and generally converts the model into the most extraordinary flyer I have ever encountered. The model will lift off the ground at 60% throttle, climb at 50%, and cruise at 40%. That some readers will be skeptical of these claims is not surprising, but those who observed the unreal power of that little engine at the Lincoln Nationals can attest to the validity of the claims.

In this day and age of $20 fuel and $2 plugs, the Davis Diesel heads are surely destined to revolutionize model power considerations. I have now run mine in excess of 15 hours with no appreciable wear or carbon build-up. As a matter of fact, the motor looks brand new! I have not adjusted the head compression in months, yet three chokes and a single flip will start it nine out of ten times. I have yet to use an electric starter or be hit by a backfire. One must certainly *always* remember to use a large prop on a diesel, as its forte is *power* not rpm. I feel this is the cardinal rule of diesels; any problems I have ever seen with a Davis conversion invariably involved someone trying to run one on a glow-sized prop.

My enthusiasm for this conversion is boundless; I only wish all my powerplants were diesel. Whatever powerplant a builder chooses for the Original Buccaneer will certainly provide him with innumerable hours of pleasure, but the Davis Diesel can certainly add a completely new dimension. I recommend it to all of you without hesitation. Try it, you'll like it a bunch! ■