Beechcraft Mentor



Beechcraft designed the Mentor as a high-speed prop-driven trainer. The plane is fully aerobatic, including outside maneuvers.

An accurate scale model of the T-34 advanced military trainer still seen today on active duty. It is easy to fly yet stuntable.

BUD ATKINSON

SCALE builders are always on the lookout for good scale subjects; ones that will adapt to model building and have good flying capabilities. Many times an airplane that is ideal for RC scale is overlooked. I think the T-34 has been, up to now, one of the overlooked. It's easy to build and has very good flying capabilities, much the same as our Class III stunt ship.

The Beechcraft model 45, named Mentor after the trusted servant of Greek mythology, first flew as a prototype in late 1948. Since that time the Mentor has served as a training airplane for thousands of United States Air Force and Navy pilots and continues in use at some military installations even today. Approximately 100 of the Wichita-built trainers are still in operation at the Pensacola Naval Air Station.

The Mentor was designed and privately financed by Beechcraft as a primary and basic trainer for the military services. It filled the design requirements so well, that over 1000 units were produced by Beechcraft for domestic and export sale. The aircraft was also produced under license from Beech by Japanese, Canadian and Argentine firms.

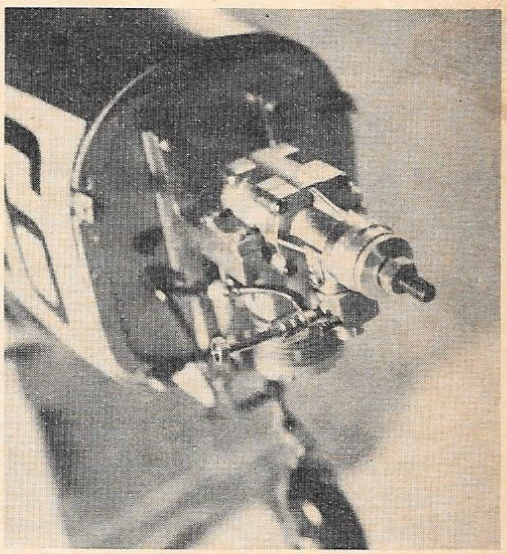
The Mentor, a single-engine, all-metal, two-place trainer, was built around the then-new Beechcraft Bonanza design to assure high performance while retaining economical operation and low fuel consumption.

The prototype aircraft was test flown December 2, 1948, by Vera Carstens, now retired, who was then Beechcraft's chief test pilot. The prototype Model 45 was powered by a Continental E-185 engine. It had a cruise speed of 160 mph at 10,000 feet and a top speed of 176 mph. Service ceiling was 18,000 feet and gross weight 2650 pounds.

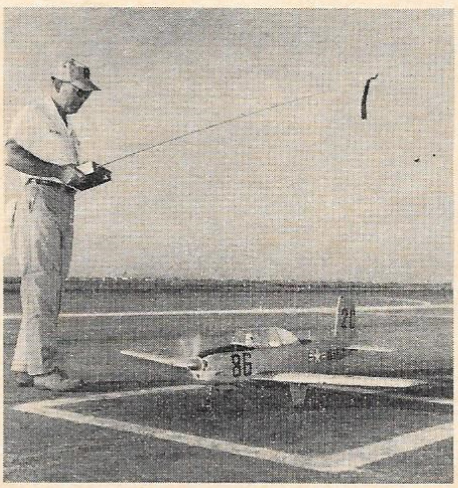
The Mentor was stressed for ten positive and 4.5 negative "G's" and was fully aerobatic — a feature demonstrated in exhibitions at the Cleveland and Miami air races in 1949 and 1950 by the noted aerobatic pilot Beverly E. "Bevo" Howard. Betty Skelton also flew demonstration flights in the early Mentor. Additional demonstrations were flown in the United States and overseas by Beechcraft and guest military pilots through 1949 and 1950, winning every evaluation competition entered.

First production model of the Mentor was delivered to the U.S. Air Force, October 1953, at Edwards Air Force Base.

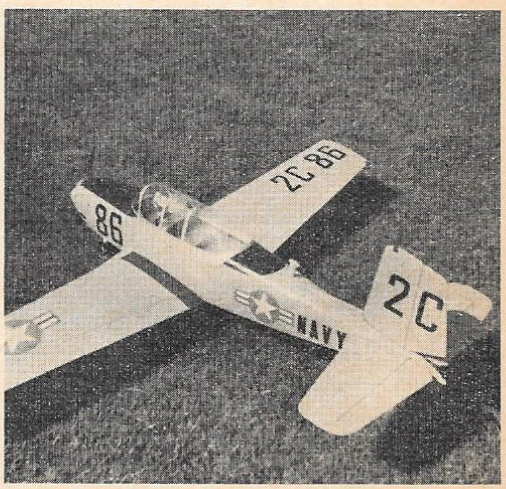
Continued on page 64



Under the fiberglass cowl (which is available from Ace R/C Inc.), an Enya .60 on Midwest mounts and a Lakin nose-gear assembly.



Following a realistic landing with the flaps down, Bud taxies the Mentor into the "hangar" at the 1967 Nationals at Los Al.



Because of its large flying and control surface areas, the model T-34 flies just as well, and is as aerobatic, as the real plane.

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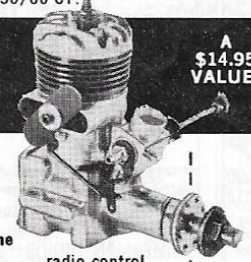
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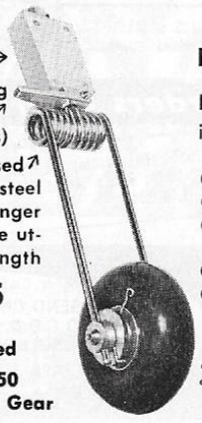
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Engine Starter

Continued from page 26

If you are in need of a starter unit for your speed engine, it may be well worth your time in obtaining one of these Cox 140 engines and converting it into a starter unit. Cox makes several different versions of this engine. Model No. 800-19 was chosen because it had the fuel tank and base mounting bracket already on the engine.

Only one machined part is required — the spinner adaptor and pull-cord unit. Even if you don't own a lathe, any good machinist can make this piece for you at a reasonable cost. All the necessary dimensions are given in the illustration.

It would be nice if you could put this adaptor unit on the power takeoff shaft, except for one very important factor. And that is, it would be turning in the wrong direction to start your speed engine.

It is advisable to run your Cox 140 engine several times to become familiar with its running characteristcs before removing the recoil starter mechanism. Unlike other Cox engines, this one does require a break-in running period. An operating manual comes with the engine and should be read thoroughly before starting your engine.

The type of mounting stand you make is up to you. The one shown in the photos (and the illustration) is quite easy to construct. Wheels or skids can be installed on it for ease in moving it around.

If you make the wooden mount as shown, be sure to give it a couple of coats of enamel or epoxy paint. Two-cycle engines are known to collect oil around the exhaust and other running parts and the stand will be much easier to wipe clean if it is painted.

Although the Cox 140 engine is equipped with a muffler, it is a bit on the loud side. This is quite noticeable when you are starting a .15 size engine. Perhaps you may want to adapt another type of two-cycle muffler to the Cox engine if this part bothers you.

When the starter unit is warmed up, it will start with one good pull of the starter cord, a most useful feature if you need a fast restart. It won't take long for your helper to appreciate this bonus feature, especially on a hot contest day — and you on your third attempt.

For some time there have been rumors going around that Cox was coming out with a larger engine. Well, the rumor was correct. But it wasn't a .29 or .35 as many had thought it would be. However you speed merchants can still find a use for it if your old starter unit is giving out on you! You will be surprised with the results.

Beechcraft Mentor

Continued from page 27

There it underwent evaluation in training conditions similar to those it would encounter in actual use. At one time during the evaluation, one Mentor was flown 23 hours and 20 minutes continuously with only seven brief ground stops for refueling and crew change.

A total of 1904 Mentors were manufactured by Beechcraft from December 1948 through 1958. These included 353 of the YT-34 and T-34 models produced from March 1950 to October 1, 1956 for the U. S. Air Force. The U. S. Navy version, the T-34B, was in production from October 1954 to mid 1957 with 423 units delivered. Beech also produced 318 units of the Model 45 for export.

Fuselage Construction: The T-34 fuselage is simple and straightforward, much like any stunt ship, and since it has slab sides and bottom, it makes for easy construction,

Giant new SIG R/C Superscale T-34 MENTOR by Bud Atkinson

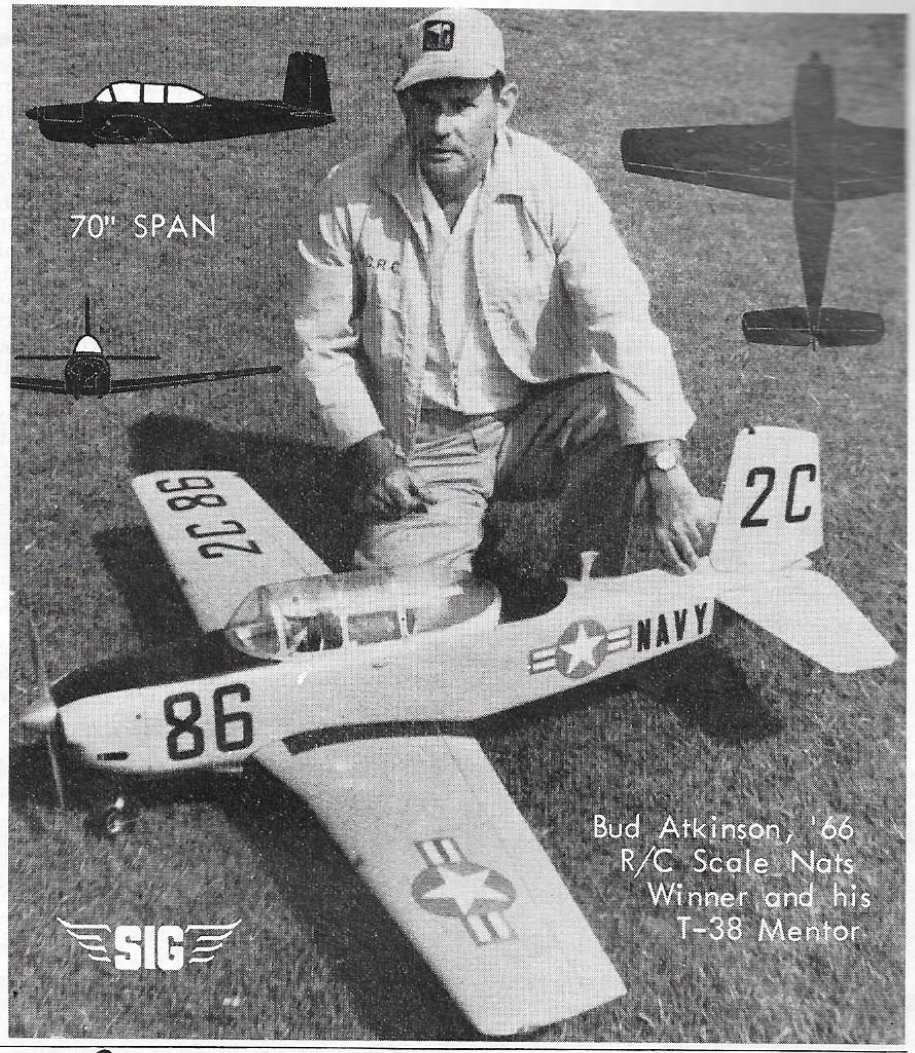
★★★★★★★★★★★★★★★★

Featured in this same issue of "American Aircraft Modeler" (on page 27), this superb R/C ship, by nationally known designer Bud Atkinson, is one of the finest examples of the scale builders art ever flown. Already it's won no less than nine first places in the eleven contests in which it's been entered.

This authentic replica maintains the Sig reputation as a leader in the R/C kit field. The kit includes a tough plastic cowl (which takes dope), a one-piece 17" butyrate canopy, die-cut balsa & plywood, formed main landing and nose gear, nylon bellcranks and control horns, 3 large sheets of full-color fuelproof decals — plus super-detailed construction plans. See it at your local dealer today — an outstanding value at $36.95.

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Bud Atkinson, '66 R/C Scale Nats Winner and his T-38 Mentor

not time consuming, as with many scale airplanes that have round fuselage that require a lot of planking. Only the top deck is planked on the T-34; if desired, the rear deck can be installed in a one or two piece sheet. Also, the T-34 had no wing fairing, like say, on a P-51 or Spitfire, which are rather hard to build and fit properly. I used a fiberglass cowl, as I do on all my scale airplanes, and is certainly worthwhile. However, the cowl is large and could be made of wood. A glass cowl may be obtained from Bee Line Products for $9.75.

Make sure the firewall is well epoxied onto the fuselage, as the big mills have a lot of power. Also, the nose gear can, as we all know, put a lot of strain on the firewall. I have to date, about 100 flights on my T-34 and the firewall shows no stress cracks. Check plans carefully to see how the firewall is installed.

I do not show any servo mounting, as there are about five different propo servos being used to date, so adapt servo mount to your particular servos. The T-34 has lots of room, so there is no problem.

The T-34, as with many scale airplanes, loses much in appearance if the proper canopy is not used. Most of the trainer-type airplanes had rather large greenhouse type canopies, and to the average modeler, this presents a problem. The canopy I used on my T-34 was made especially for the T-34 by Sig. Glen told me he still has the mold pattern for the T-34, and the canopy can be had upon request from Sig for $2.75; very reasonable for a canopy that's almost 18 inches long and 4 inches wide. The small bubble under the elevator is to house the rudder horn that protrudes outside of the fuselage slightly, so a small balsa fairing was used to cover the torque rod end and rudder horn. So, it's out of

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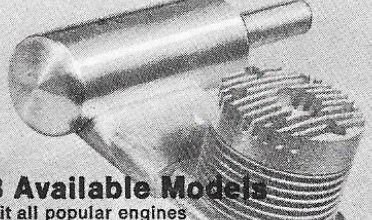
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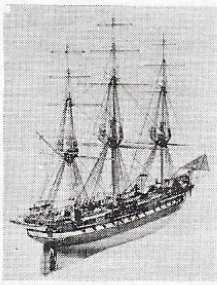
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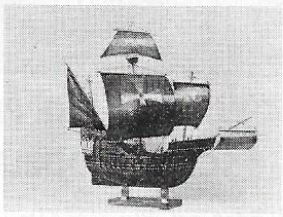
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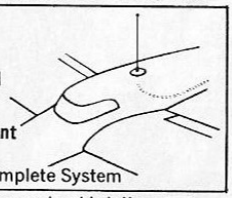
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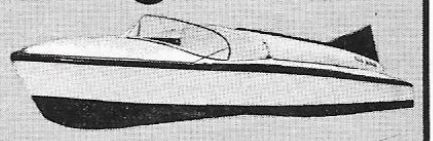
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scale! There's not much explanation needed on the fuselage, as it is easy to construct.

Tail Construction: There are no problems here, as the fin and rudder are standard, as is the stabilizer and elevators. Care should be taken to select your wood; avoid hard, heavy balsa, as the tail is large, especially the elevators and rudder, which are made of solid sheet and should be of soft balsa. One of the pitfalls of scale seems to be to come out tail-heavy. All fairing tail blocks should be of soft balsa. Only the counter balance portion of the elevators and rudder should be of hard balsa, with grain running 90 degrees to elevator and rudder grain. Do not silk elevators or rudder; use tissue paper, so as not to warp.

Wing Construction: As you can see by the plans, the wing is constructed about the same as any stunt wood wing would be. Landing gear installation is standard. Epoxy gear block well as scale jobs are heavy and some rougher landings are usually experienced. The airfoil used on the T-34 is a basic 2412. I believe it to be one of the finest for scale. The flaps are scale, and are rigged the same as you would strip ailerons. I have found this to be much easier than the bellcrank operated hookup, as it's easier to make adjustment. A 1/16" wire yoke may be used for hooking-up to servo.

A word on the flaps; it's a real thrill to use flaps on a scale model, as it was on the prototype. There have been some misgivings on the use of flaps in the past, but if they are properly installed and wisely used they add much to your scale airplane. More on flaps later.

A note of interest on the main gear doors: do not attach doors to landing gear! I don't care how good a landing you make, the gear doors will flex with the gear and dig into the wing, damaging the wing skin. Glue or epoxy the doors to the wing itself with about 1/8 inch clearance from the gear leg. In this way the gear can flex and not disturb the doors. I have flown my T-34 out of grass fields and have made some rough landings with no damage to doors or wing. The wing could be made of foam with no trouble, if so desired.

T-34A — T-34B: My model is the T-34B, or Navy version, and as a trainer was all yellow-orange, with black lettering. Note the V cut out of the lower section of the rudder. T-34A, as used by the Air Force was basically the same, but was all natural aluminum, with black letters. The T-34A did not have the V cut out on the rudder. Don't ask me why. The Navy T-34 used only the OMNI antenna, as plans show. You may find T-34's on about any Navy or Air Force base today, and are a variety of colors from all white to wild red, white and blue ones.

Flying Notes: I have built many scale RC airplanes, and many barely made first flights that needed adjustments — shifting of weight, etc., but the T-34 made almost perfect first test flights. If I build a thousand scale models, I will still hate that first flight; all that work and money, and loving care that goes into a scale RC airplane, and there is always the possibility it will go home in a basket. I hope they all fly as well as the T-34 did in its maiden flight. The only adjustment to date was to the nose gear for a straighter taxi.

Make your first flights with flaps up, to get your T-34 trimmed and get the feel of the controls. I found it smooth, but yet responsive on full command; the ailerons are very responsive for a scale, and corrective rolls are easy to accomplish. I found, in fact, that the T-34 will do any maneuver required in the stunt pattern. After a couple of flights are made and she is trimmed to your satisfaction, try flaps on takeoff. I have about 35 degrees full flap on my T-34; you will notice the takeoff run somewhat shorter, and the climb out steeper with flaps. Let it gain 50 or 60 feet of altitude, then pull up the flaps; don't pull flaps too soon! As soon as the flaps come up, the nose will drop back to level flight. Too soon or too low flap retraction, and the T-34 will drop its nose to gain flying speed and can be rather hairy if too low or slow. For landing, I drop full flaps at about 40% power, or on my downwind leg of my traffic pattern; you will notice the nose come up; trim with control stick, not control trim, as you may have to make a go around or apply full power, and you don't want downtrim. Anyway, I don't! The nose will level as speed reduces. As you turn into the final, slowly reduce power to about 20% (I like to fly them in myself). You will notice that the T-34 will fly at this setting at almost a perfect three-point attitude. As you are almost to the landing spot, reduce the power to 10 or 15%, and as she touches the main gear chop all power, and the Mentor will stick like on fly-paper. Power may be added in the final if too short with no ill effects, — just don't let the nose get too high. Don't panic if you have to make a go around with the flaps down; no harm is done, as you can over-ride the flaps with a slight bit of down elevator till you feel you are at a safe altitude. I have tried dropping full flaps at high speed and no adverse condition occurred. The nose came up only to about 40 degrees in a big arc. It is not advisable to do this as you could damage the servo or the flaps themselves.

I believe you will find, for a scale airplane that's 95% scale, the T-34 Mentor flies and handles very well and is a joy to fly, even on those no-contests Sundays. So let's build more scale!

Radio Control World

Continued from page 38

MACRCMAC Blasts. Big midwest meet each year is that sponsored by the very active McDonnell R/C MAC, and their 10th annual on Aug. 26-27 was no exception. Weather was bright but windy. Two mid-air collisions livened things.

Interesting frequency breakdown of entrants showed that 25 were on 27 Mhz (9 were on 27.145, 6 each on 26.995, 2 each on 27.045 and 27.095); 5 were scattered on 50 Mhz band; 1 was on 72.08, 2 each on 72.96 and 75.64. Apparently all transmitters were proportional; 23 dual stick, 8 single stick. The sponsors put out a very neat 12-page booklet about their own club, and other clubs in the area, AMA maneuvers, and other RC matters.

AMA "Class" Committees. Set up to promote Class I and II flying, both in competition and "Sunday flying," two Committees composed of avid proponents of the old Class I and Class II (which essentially went out of the rules at the end of 1967) have been formed, will operate within AMA framework. The Class I Committee has appointed an avid flyer in this category in each of the AMA districts; you can get their names from AMA headquarters; this group has set up a complete set of rules for comp. flying, including many maneuvers from the 1967 rules book, plus some new ones that such planes can perform. They will also allow wheel brakes and ground steering via RC, but other rules are essentially as per last year.

The Class II Advancement Committee included eight avid Class II flyers when we first heard from them, probably have many more now. Again, get addresses from AMA. This group expects to follow the 1967 Class