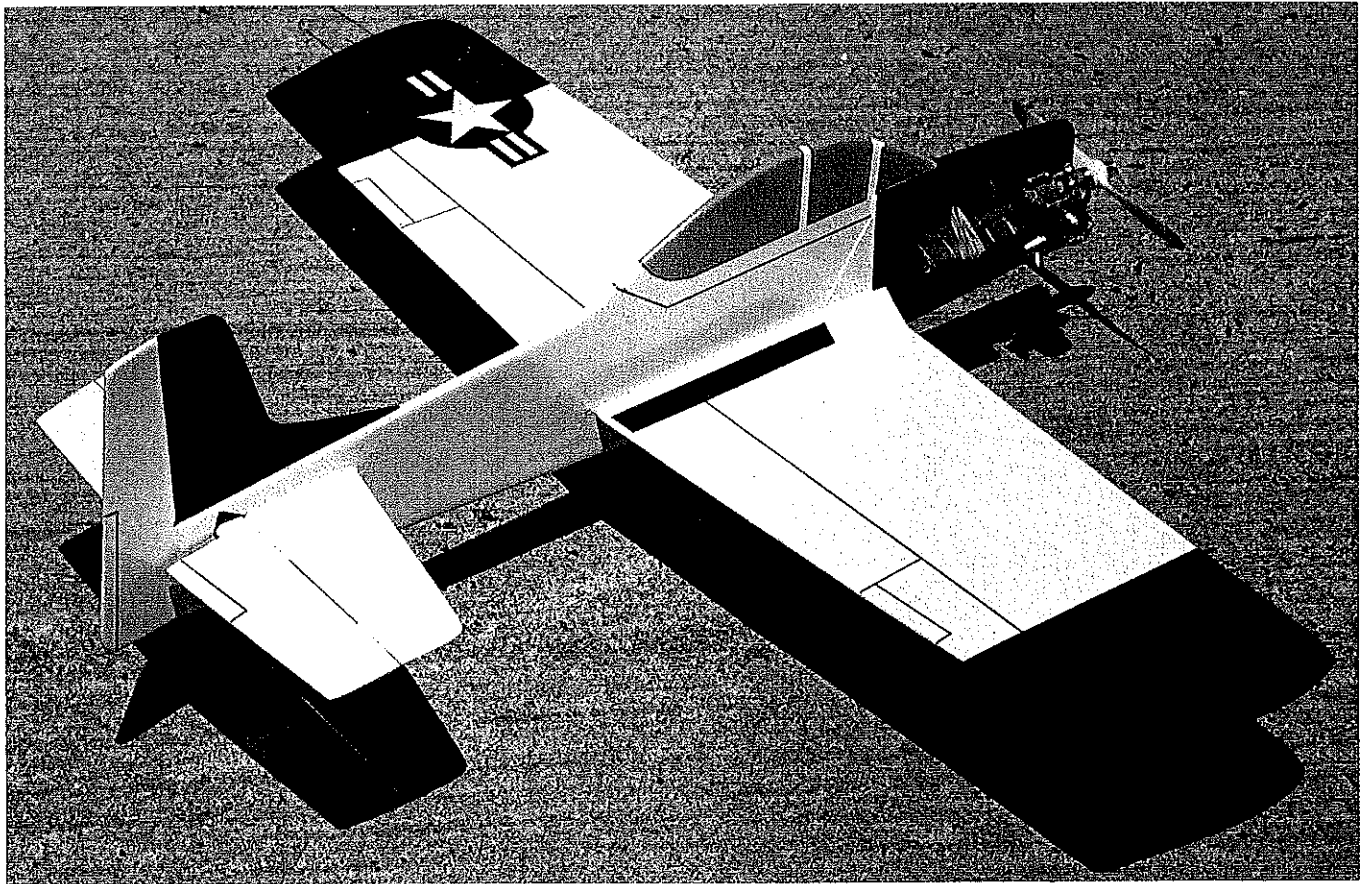


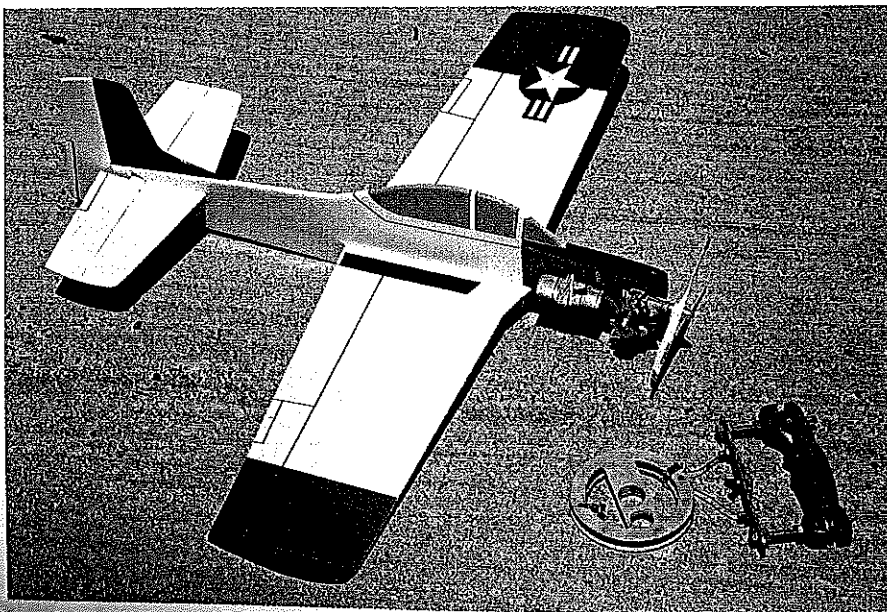
# T-28

870

■ Dick Sarpolus



Although this model is a sheet balsa profile and is not true scale, it sure looks like the North American T-28 military trainer.



Simple, rugged 1/2A aircraft like the T-28 can fly the entire Stunt pattern at a fun level. When flown over grass, they bounce back from most crashes.

Military aircraft are always popular modeling subjects, and the North American T-28 has been well-liked by modelers since it first flew in 1949. I felt the T-28 would be an ideal choice for a Control Line profile project; the T-28's clean lines would be easy to fashion in sheet-balsa construction.

The 1/2A-powered sheet-balsa profiles are a bargain way to enjoy CL flying; they're low-cost, easy to build, and offer plenty of aerobatic capability. Easy to underestimate, today's all-balsa 1/2As are not just a lump on the end of a string. With a good engine, sized correctly, and flown on 35-foot wire lines (rather than string), these airplanes can be put through most of the aerobatic pattern; not contest-quality maneuvers, but well enough for plenty of flying fun.

Because they're light and strong enough to bounce back from most crashes (if flown over grass fields), they're suitable for beginners, while skilled pilots can still use their flying ability for relaxed flying fun.

I like to build and fly these small CL projects as a definite change from the larger, more-complicated aircraft I usually work

on. I really built the T-28 because I had just purchased a new 1/2A engine, the NorVel BigMig .061. This Russian-built power plant seems to be a .40 that has been scaled down to 1/2A size; a good trick.

I particularly like the way I can get a good engine run for a complete flight, and the engine will do that consistently. Makes it fun to fly.

### CONSTRUCTION

For the model layout, I enlarge a scale outline drawing on a copy machine, making the fuselage side view first to the length I want, and then the wing and tail surface outlines to the span size I want. Then I fudge the outlines and overall surface proportions to get the sizes and moments needed for Control Line aerobatic flying.

A model designed like this isn't intended for any sort of Scale competition, but it will fly well, and when finished and trimmed well, will look enough like the original aircraft.

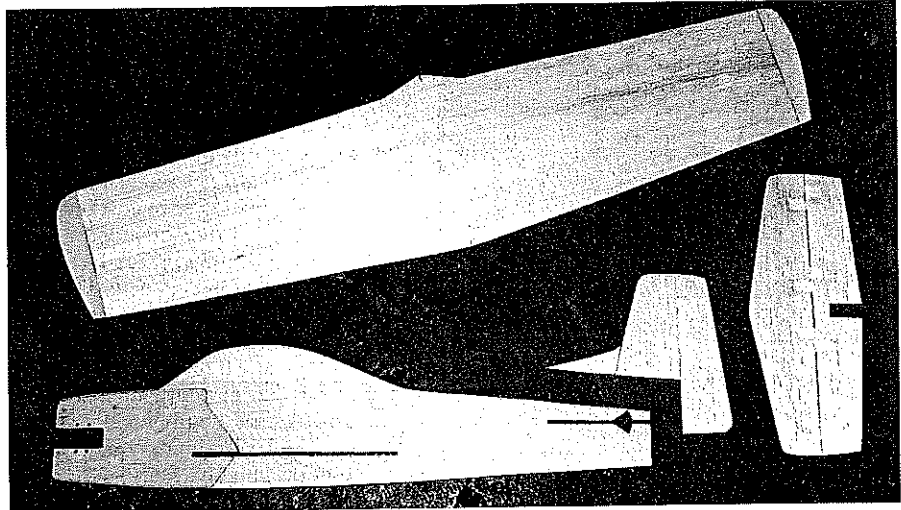
The construction used is very basic. Fuselage is 1/4 balsa with 1/2 plywood nose section doublers. Wing and tail surfaces are 1/8 balsa, and the bellcrank mount and leadout guide are 1/8 plywood. Hardware is all hobby shop-available: a nylon two-inch bellcrank, a bolt-on nylon elevator horn, 1/16 wire pushrod, and .025 wire leadouts. Hinges are the traditional CL cloth over-and-under style, and the fuel tank is a small-size usual CL type; I use the Perfect brand.

I suggest that you cut out all parts of the aircraft before beginning assembly; if you have all materials on hand, with the simple construction it will take only a few evenings to build up the model. I have a jig saw and a band saw but a model like this could be built by hand-cutting the parts without too much trouble.

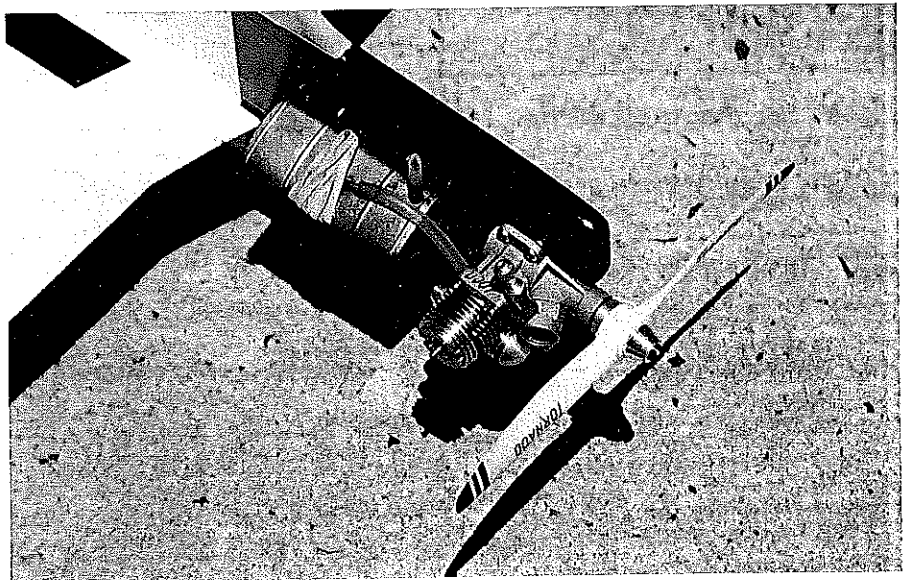
(I usually spend more time painting and trimming these aircraft than I do actually building them, but part of the fun for me is putting enough detail on for a good appearance, yet not adding weight to hurt the performance.)

Cut up the plans for the parts patterns, or trace the part outlines if you want to save the plans. Edge-glue whatever width wood you have to get the widths necessary for the fuselage and wing; I like the aliphatic-resin wood glues for edge-gluing. Don't be too particular about wood selection; I try for medium-to-firm balsa. Really hard balsa isn't needed, and it would be too heavy; soft, light balsa wouldn't be strong enough for the large sheet wing. These airplanes bounce back from most crashes into a grass field, and when they do break, cyanoacrylate (CyA) glue or five-minute epoxy can usually get them back into the air quickly.

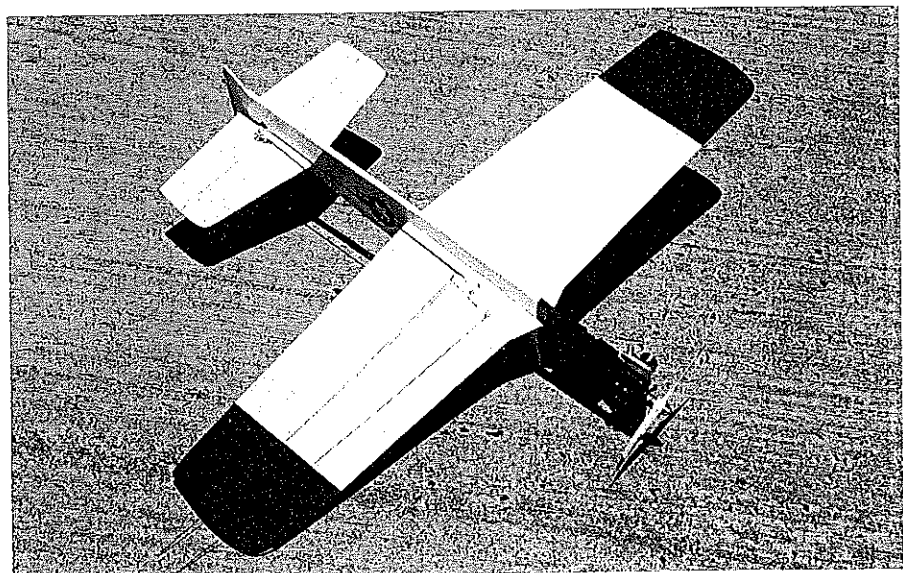
**Fuselage:** Glue the hardwood engine mounts in place at the proper spacing to suit the engine you'll be using. The Cox Tee Dee .049 or .051 would be an



Major subassemblies complete. All parts are sanded thoroughly, and all edges rounded, prior to final assembly.



Norvel BigMig .061 with 3/4-ounce Perfect tank. The T-28 is flown on .008 or .012 stranded steel cable 35 feet long.



Simple control system uses a nylon bellcrank and control horn on the elevator, wire leadouts and pushrod from bellcrank to control horn.

# T-28

**Type:** CL Sport

**Wingspan:** 29 $\frac{1}{4}$  inches

**Engine:** NorVel BigMig .061

**Construction:** Sheet balsa

**Finish:** Butyrate dope

alternative to the NorVel BigMig engines.

You could use one of the Cox reed-valve engines with built-in fuel tank by changing the nose section to include a plywood firewall with balsa reinforcing blocks behind it, if desired. The reed-valve engines are lower in cost but they have less power; I'd recommend sticking to the BigMig or Tee Dee engines. I've heard that a new slightly larger engine by another manufacturer will soon be on the market—another new engine and I'll probably be building another new airplane.

Use epoxy for the plywood nose doublers; the five-minute type if you want to build quickly. Mark and drill the engine mounting holes through the plywood and hardwood engine mounts.

For a cleaner appearance, if you want to avoid the usual engine cutout in the left side of the fuselage, leave that side doubler uncut and add small plywood pads on the outboard side of the fuselage

to raise the engine mounting lugs enough so the crankcase clears the opposite side doubler.

You might also want to put the wire hook for retaining the fuel tank only into the outboard side of the fuselage by cutting a slot into the outboard side only and epoxying the hook into the fuselage with a small plywood filler piece in the slot.

**Wing and Tail:** Cut the wing parts to shape and glue the separate tip sections on; the grain direction will help the wing resist warps. A sheet-balsa wing like this can sometimes warp even after the airplane is completed and painted; I don't know how to get rid of a twist in a finished model. However, because the sheet wing is so flexible, any warps just don't seem to bother the airplane's flying.

Sand the edges round on the wing and on the balsa tail surfaces. Glue the rudder to the fin so that it is offset  $\frac{1}{4}$  inch toward the outside of the flying circle. After the model is assembled, a small bit of lead or wire solder glued to the bottom of the outboard wing is the tip weight.

For final assembly of the T-28, slide the wing through the fuselage slot and align it at right angles to the fuselage. I hold the wing in place with a few pins and then tack-glue it with CyA glue, following with epoxy for strength. I use a finger to make small fillets from five-minute epoxy mixed with microballoons around all fuselage and wing and tail surface joints, for strength and appearance.

I install the elevator hinges before gluing the stab into the fuselage, using several coats of good old-fashioned model airplane glue on the hinges. I like the traditional appearance of the cloth hinges; they're easy to put on, provide free movement, and they seem to last as long as any model does. The tail surfaces are added to the fuselage, aligning them with the wing. Add the plywood bellcrank mount and leadout guide and the outboard tip weight.

The nylon bellcrank is mounted with a small screw. A nylon control horn is bolted to the elevator, and a  $\frac{1}{16}$  wire pushrod connects the two. Bend the pushrod so the elevator and bellcrank are lined up in their neutral positions when connected, so you get equal elevator travel in each direction. The fuel tank will be held in place right behind the engine with a rubber band over the wire hook installed earlier.

With everything checked out, the engine, bellcrank, and control horn are removed, to be mounted again later with the leadouts after the model is painted and trimmed.

**Finish:** I've always used butyrate dope to paint all-balsa aircraft like this; I've been



The author and a full-scale T-28 in Pensacola, Florida. This is a surprisingly large aircraft; Dick is six feet, three inches tall.

The North American T-28 has an interesting history. After its first flight in 1949, it was produced in quantity from 1950 to 1957, with roughly 2,000 being built.

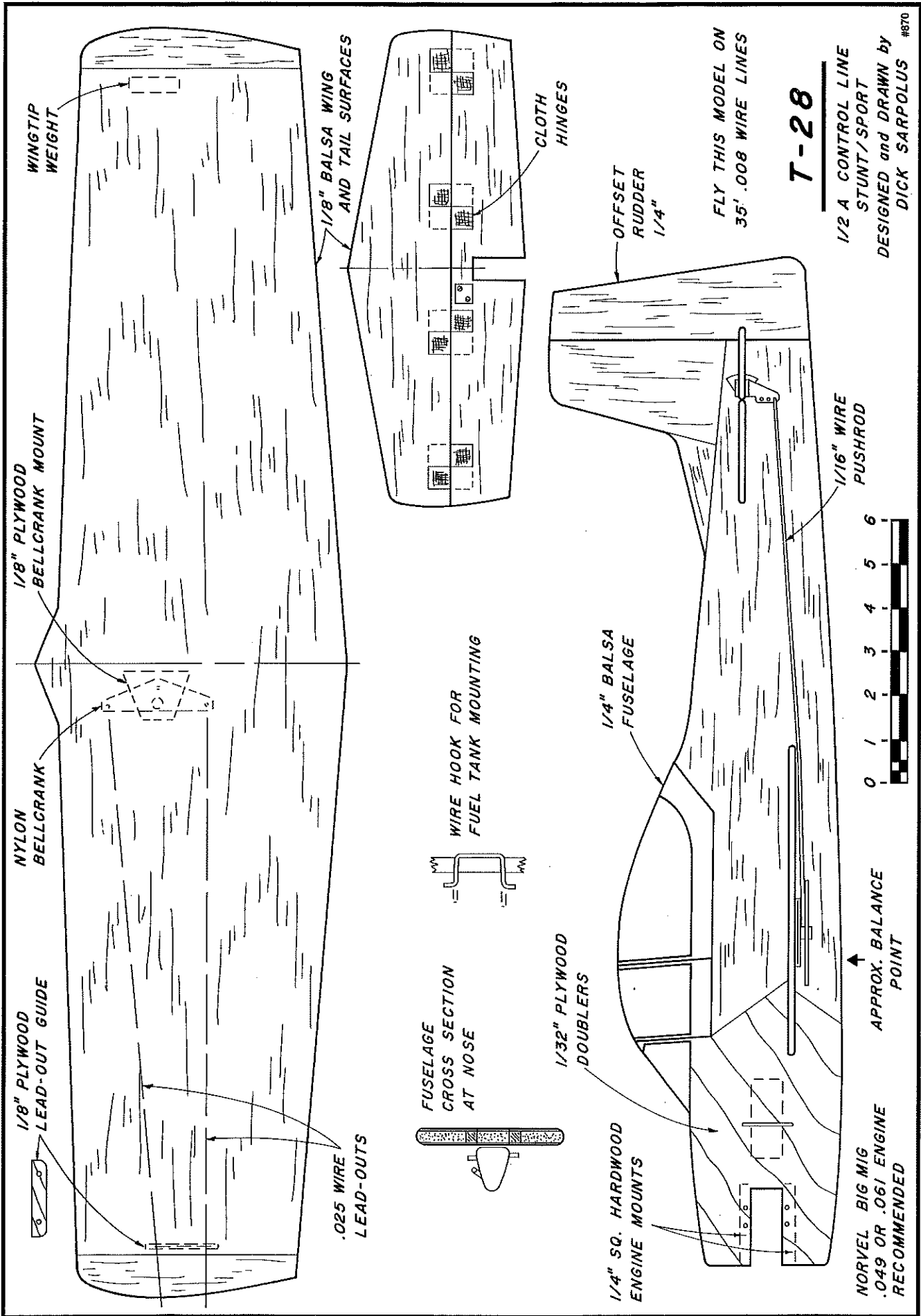
The T-28 was designed to replace that other well-known North American trainer, the T-6. The first T-28As for the Air Force had 800 hp engines, while later T-28B and T-28C models for the Navy had 1,425 hp engines; the Navy got about 800 aircraft. The T-28Cs had arresting gear for carrier operations.

In 1962 the Air Force modified 200 of their T-28s, adding the 1,425 hp engine and redesignating the

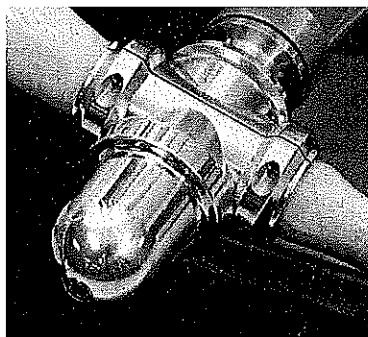
airplanes as T-28D, using them in Vietnam. In 1963, North American modified a few T-28s by adding a Lycoming T-55 turbine engine with 2,450 hp! The nose of the aircraft was lengthened for proper balance with the lighter turbine engine. The turboprop-modified T-28 was intended as a powerful close-in jungle ground attack fighter, but I believe very few were built. The turbine-powered version would also make an interesting model.

I've been close to several T-28s, and was surprised by their large size; this is a big aircraft.

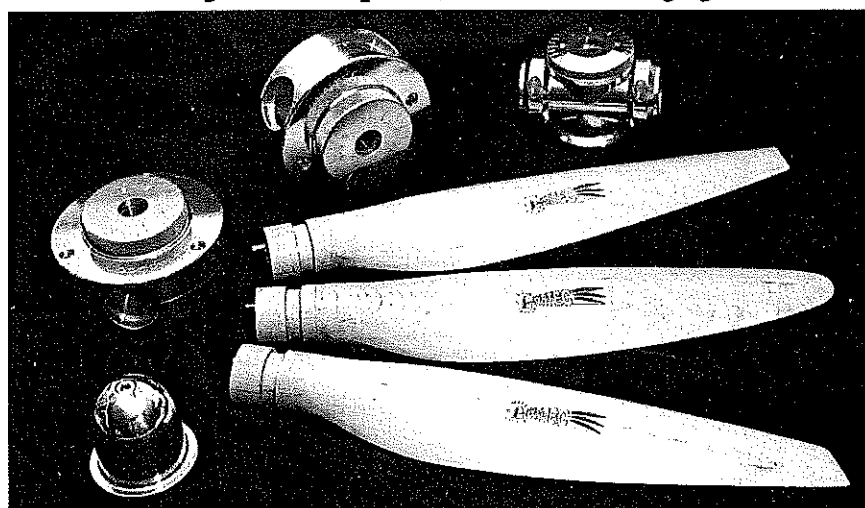
*Dick Sarpolus*



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working with the butyrate for 40-plus years, I am used to it, and I see no reason to change.

Use whatever paint system you prefer, but do not try for a really super finish, with all signs of the wood grain hidden; it takes too much paint and adds too much weight. I suggest just enough of a finish to get a reasonable appearance and protect the wood from fuel and exhaust oil.

Sand the entire model thoroughly with fine paper, then apply a coat of sanding sealer and sand it completely to fill much of the grain. Follow with four or five coats of clear dope, sanding between each coat, to seal the wood. Spray on two or three coats of color—the minimum needed to cover with an OK appearance. I brush on any trim paint, masked with Scotch™ fine-line masking tape with some clear dope brushed along the edge to be sure of clean edging. I used white overall for the T-28, with some red and black trim, and light blue for the canopy.

There are many paint and trim schemes to pick from, since the Air Force and Navy used the T-28. The Navy had some painted all yellow and the Air Force had some fancy paint jobs on airplanes used for officer transport.

A few inked panel and control surface lines add some detail, and the whole airplane gets a few coats of sprayed-on clear for protection and gloss. Mylar® stick-on military insignia add the final touch.

**Preflight:** Mount the engine, tank, and control hardware, and check for proper balance. The model will likely balance close enough without adding weight, but if nose weight or tail weight is needed, you can drill a 1/8 hole into the fuselage and glue in a length of heavy solder.

Put a washer under the front of each engine mounting lug for several degrees of outthrust to assist in keeping the lines tight while flying. I use .008 or .012 stranded cable flying lines, and have heard that .008 solid wire lines make even less drag. I prefer the stranded cable lines because they're more resistant to kinks and breaks.

Adjust the engine before launch, holding the airplane in a nose-high position. Have the launcher keep the lines tight and point the airplane slightly toward the outside of the flying circle as he/she takes a few steps and releases the model with a forward motion, in a level attitude. Try putting the T-28 through every maneuver you can think of, and make some up.

Enjoy CL flying: the only direct-connection way to fly! ➔

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