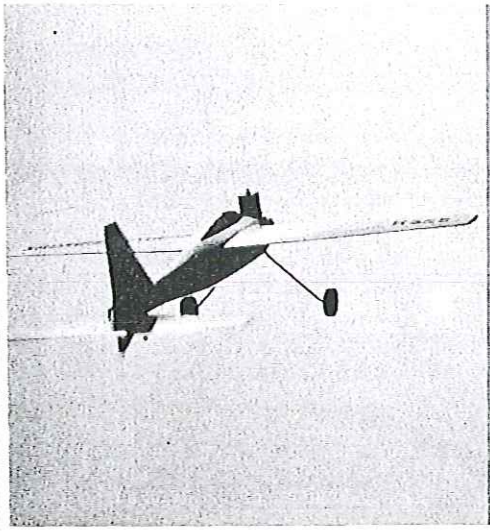
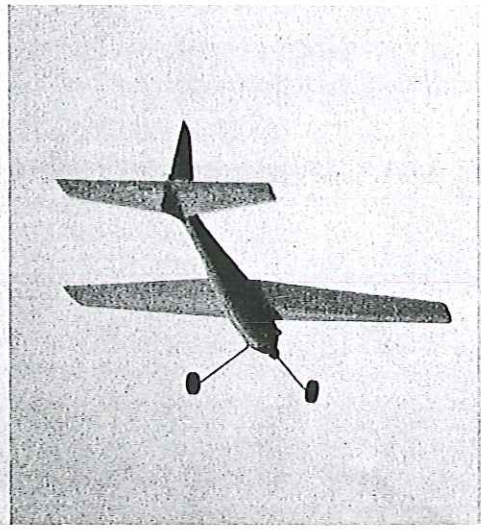
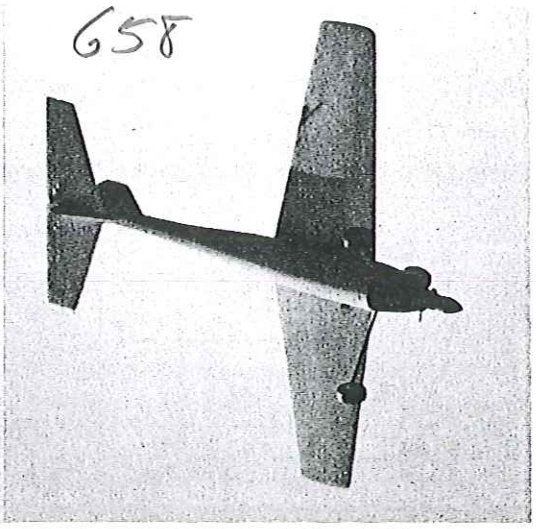






In-flight photos of the Streak with Monoline control. The Streak can also be built for two-line control by installing a standard bellcrank. Below right: Bob Dorn, president of the Northern Virginia Control Line Club, shows off the Shuriken Streak. Bob assisted with the initial flight tests. The model proved to be a stable flier, yet responsive to Monoline control. Note the earmuffs to protect against that shrieking ½A engine.

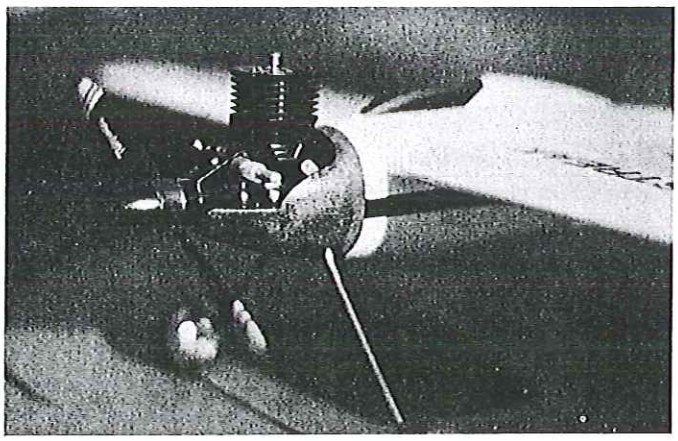
Shuriken Streak

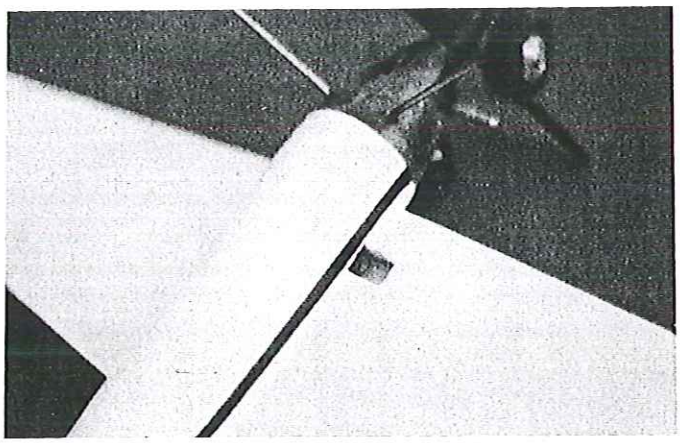
Designed as a test bed for the new high-tech Shuriken ½A engine, this CL sport/trainer has other uses as well. With it you can try out and monitor engine improvements, fuels, props, and other performance items. To boot, this peppy model makes an excellent Monoline trainer. ■John Hunton

THE COX TEE DEE engines, with their steel pistons which are perfectly suited for operation in the moderate rpm ranges, have rightfully been the standard of the ½A class for many years. But two newly available .049 engines—the Chinese CS and the BV Shuriken (named after the star-shaped weapon that the Ninja use)—offer the ½A flier magnificent alternatives. These sophisticated engines utilize the modern ABC (aluminum piston and chrome-plated brass sleeve) technology which allows them to be operated at a much higher rpm range and develop considerably more power. The Shuriken is designed to turn 30,000 rpm for sport flying and up to 40,000 rpm for limited operation in Speed.

Called the Streak, this Control Line sport/trainer was created principally as a relatively fast and stable test bed for working with the powerful new Shuriken engine. The model can, however, be flown with either the Cox or the Chinese CS.

The Streak also performs two secondary functions. First, while an option is shown for installing a conventional bellcrank, the plane is detailed with Monoline control for





Left: Close-up of the Shuriken engine installation. Note the sleek Fourmost engine mount. The model was designed to fulfill several functions: as a test bed for the new Shuriken engine, as a simulation of RC Pylon Racing (flying at comparable speeds) for easily quantifiable racing component testing, to serve as a Monoline trainer, and as a CL Speed pylon pilot conditioner. Right: The single control line feeds through the window visible in the bottom of the wing to connect to the control unit inside. Monoline control is very different from two-line. Control is by push-pull motion of the hand. It's fairly easy, though, once you get the feel of it. The single wire also has less drag than the standard two-line unit.

use as a Monoline trainer. Second, it's intended as a test bed for ½A RC Pylon Racing.

Control Line Speed flying, the most macho of the racing events, is alive and healthy today. Many of our best engine people are involved in Speed flying—for one thing, it's relatively easy to quantify results—and with the new ½A engines on the market, I look for a renewed interest in ½A racing of all types. A great many RC racing pilots were bred in the Speed circles, where they gained an excellent background in engine preparation.

With the incredible speeds of today's models, however, the pilot has become a limiting factor. If you're not small, wiry, and quick, you'll have trouble getting around the pylon. The Streak will allow you to practice flying on the pylon by adjusting line length to achieve the desired lap speed. More on this later.

The Shuriken-powered Streak flies at approximately the same speed as RC Pylon racers (around 85 mph), making it an excellent test bed for engine improvements, various fuels, and, most of all, propellers. Flown on 42-ft. lines, the model can be accurately timed for five laps using a stopwatch. By dividing this time (seconds) into 900, we arrive at mph.

Using the Streak as a Speed trainer was suggested by J.E. Albritton, who experimented with the concept successfully himself. The following table shows current CL Speed records and the time in which the pilot must make one circuit around the pylon:

½A Speed: Charlie Legg, 144.17 mph, 42.0-ft. lines, 1.25-sec. lap time.

A Speed: Dub Jett, 180.83 mph, 52.5-ft. lines, 1.42-sec. lap time.

B Speed: Sher/Garzon/Brown, 218.23 mph, 60.0-ft. lines, 1.28-sec. lap time.

D Speed: Garzon/Brown, 212.43 mph,

Monoline

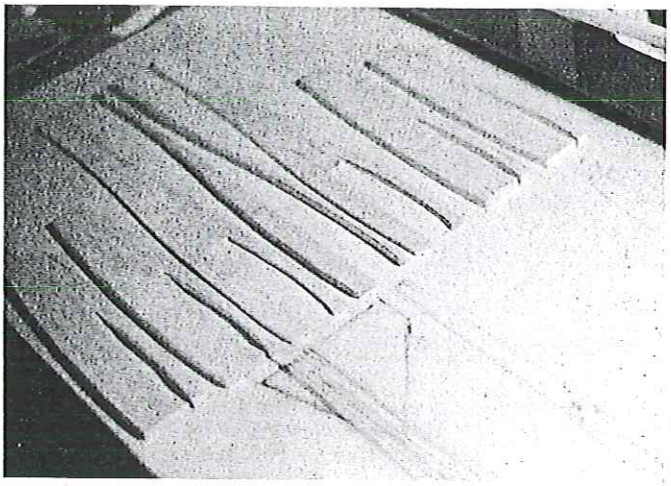
Control Line modeling began with simple tethered Free Flight models. In the 1930s, the Victor Stanzel Company produced a series of models designed for tethered flight called the Sharks. Control for these airplanes was simple—one line and a long bamboo pole. For *down,* the flier lowered the pole. Not very effective control, particularly if any wind was present, but it was a beginning. Later on Jim Walker developed and patented U-control using two lines and a bellcrank—the control system we know and use today.

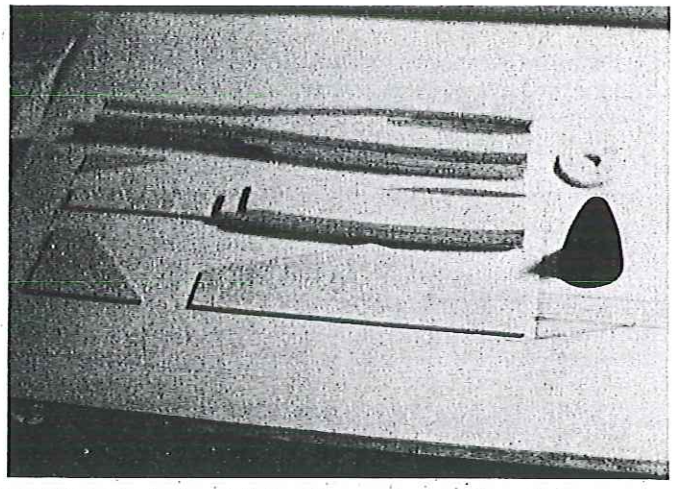
Stanzel, however, did not give up on single-line control. He developed the Monoline system. Monoline control is achieved by rotating or twisting the single line. The control unit utilizes a twisted pair of steel wires which are rotated by a control knob, thus providing twist to the in-model unit which translates the torque into fore-aft pushrod motion. Monoline is usually rigged so that *up* is button-back, and *down* is button-forward. I have heard that expert fliers are able to fly even the CL Precision Aerobatics pattern with Monoline.

Despite the requirement for a heavier wire, Monoline control is more efficient from a drag standpoint than a two-line bellcrank system even today. Monoline is still used in Speed flying.

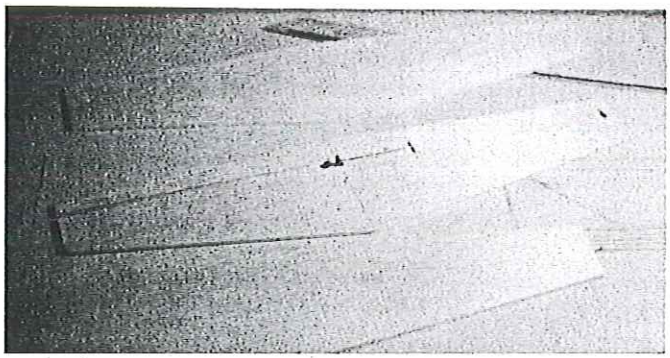
Flying Monoline is fun. With a stable model like the Streak, transition from two lines to one is quite easy. Keeping the control unit straight is very important to friction-free and responsive controls.

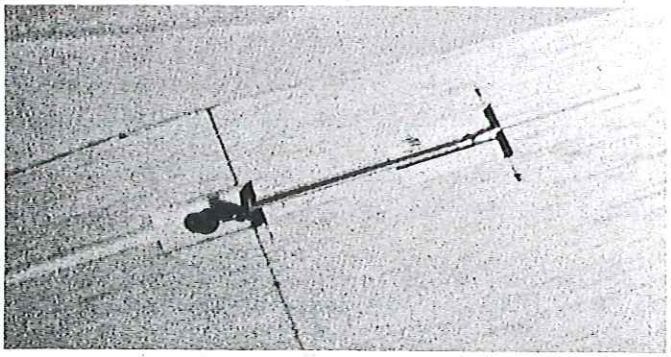
Monoline in-model torque-type control units and articulated handles are available from Ned Morris, 9044 Rushmore Blvd. S., Indianapolis, IN 46234. Original Stanzel Monoline control handle units are available from Dale Kirn, 283 N. Spruce Dr., Anaheim, CA 92805.





Left: Construction of the model is quite simple. Follow the plans and information in the text, and it should present no problem. Here you see the fuselage cores laid out and ready for assembly with white glue. The ⅛-in.-thick parts are made from hard balsa. To save weight, all other parts can be made from soft balsa. Right: The fuselage and tail parts ready for assembly. Also shown is that neat Fourmost engine mount.





Left: The ⅛-in. balsa wing sheets showing the center core cutout for the Monoline unit. The cutout near the tip is for the solder tip weight. Cores are bonded with white glue. Right: Details of the Monoline torque unit installed in the wing. Note that hardwood reinforcements are also inset into the wing. The button is where the control line attaches to the Monoline torque unit. Monoline control is normally set up so that button back is *up* and button forward is *down.* Don't use braided or Dacron lines. *Only* solid metal lines (source in text) will work in Monoline.

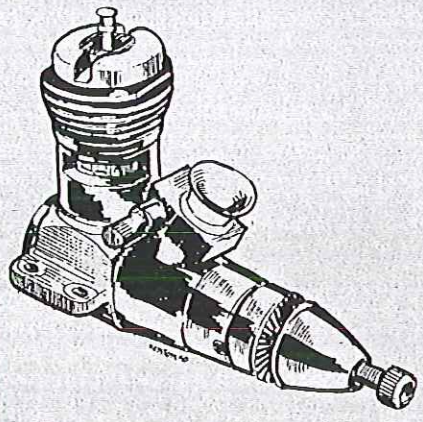
70.0-ft. lines, 1.41-sec. lap time.

To get some idea of how difficult this is, go to your local schoolyard and try swinging around the basketball backstop post 12 laps or so in under 1.25 seconds per lap.

Continued on page 175

High-Performance ½A Engines

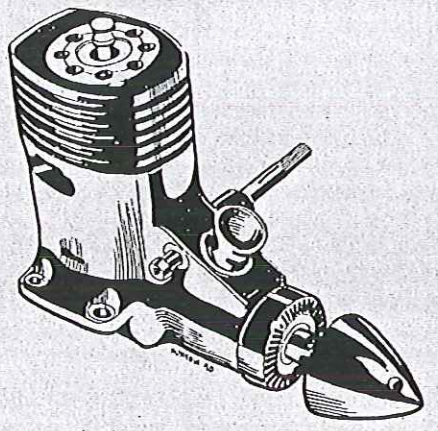
The Cox Tee Dee has long been the standard of the ½A engine class, for very good reasons: It's readily available, it's economical, and performance is good. However, new ½A engines incorporating present-day technology have recently become available. The BV Shuriken and the Chinese CS are beginning to push the Cox in racing events. What are these new engines? Where do we get them? What about the Cox?



The most advanced form of the Cox engine that's commercially available is marketed by Kustom Kraftsmanship (see ad in this magazine). This is a remanufactured engine. The transfer ports have been remachined, a pressure tap added, and a larger venturi is available. A precision needle valve assembly is included, and the crankshaft has been mated. Most important, the engine has been dimensionally optimized.

Optimization is accomplished with a set of brass shims between the crankcase and the cylinder. These shims have become the identifying mark of a KK engine. KK makes a remachined Cox high-compression glow plug which boosts performance considerably. The company also sells the Glow Bee ½A glow head, which adds additional rpm if you know how to work with it. The basic mistake most modelers make with Cox engines is to use a racing fuel other than Cox (available from Tower Hobbies). Other commercial fuels don't lubricate properly, producing irregular mixture settings. For racing purposes, the Cox's only disadvantage is that it uses a steel piston with a ball joint. While they're quite durable at speeds under 20,000 rpm, the piston and connecting rods simply do not last at speeds over that threshold, where the Cox develops more power.

The Shuriken engine by BV Competition Engines employs all the most advanced technology in engine design, including a new porting concept and a lightweight piston. The ABC piston/sleeve system reduces reciprocating



mass in the engine, which increases efficiency. The lightweight piston also allows the engine to operate at higher rpm for increased horsepower.

This powerful little package has been extensively tested in prototype form in a variety of applications. The Shuriken will run at over 20,000 rpm very happily, and even turn up to 30,000 rpm when necessary.

The design of this engine is unique, functional, and creative. Especially original is the Shuriken engineers' approach to exhaust stack styling, traditionally something of a fixation with engine designers. The Shuriken exhaust just occurs—and it works. A planned production version will be fitted with an exhaust outlet to which a resonating pipe or muffler can be attached.

The Shuriken is nicely filleted, completely anodized, and faired. The engine has no screws; all necessary seals, such as the crankcase and head, are threaded. A spanner wrench is provided with the kit. The Shuriken weighs only 2.25 oz.

The engine has a .400 stroke and .3999 bore, which results in .0500 cu.in. displacement (it's also available at .0608 cu. in.). The crankcase width is slightly larger than that of the Cox, but the mounting hole span is the same (with a little Dremel toolwork, it'll fit your Fourmost mount).

The Shuriken has twin ball bearings. Unfortunately, the AMA rules prohibit engines equipped with ball bearings in ½A RC Pylon Racing.

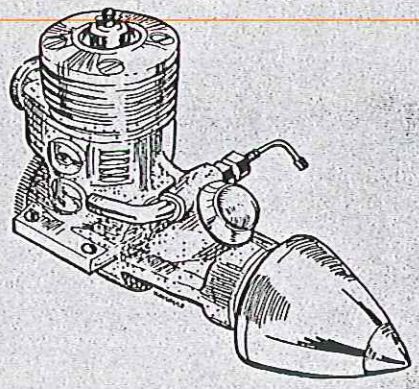
For optimum performance, the manufacturer suggests a high-ratio nitro fuel formula that will produce 24,000 rpm on a stock 6 x 3 Cox gray prop. I have run a prototype at 25,000 rpm on a Cox 5 x 3 prop with Cox racing fuel. These are very good numbers.

With its advanced design, look for the BV Shuriken to be the future of ½A engine technology. For sport fliers, this means no more marginally powered models. For the Speed flier, it means new record-setting potential. For those like myself, it simply means a strong and powerful engine that will last and last.

To inquire about the Shuriken engines, write BV Competition Engines, 1163 Country Club Rd., Indianapolis, IN 46234.

The CS is another new ½A engine from China. You won't find it at your local hobby shop, but with a little patience it's possible to acquire it. The CS is an engine of modern design with dual ball bearing, Schnuerle porting, and ABC technology. It runs well in the 28,000-40,000-rpm range, velocities suitable for competitive Speed flying.

The garbage pail-sized venturi and stock spinner of the CS are both highly polished and contrast nicely with the cast aluminum crankcase, which is coarse appearing but functional. The CS is bigger and heavier than the Cox or Shuriken. It's taller (though the small head makes it appear shorter), wider, and longer. The rear exhaust isn't easily accommodated in most model airplanes. You can't just drop a CS into a Taperwing with a Fourmost mount. (See my article "RC Taperwing ½A Pylon" in the



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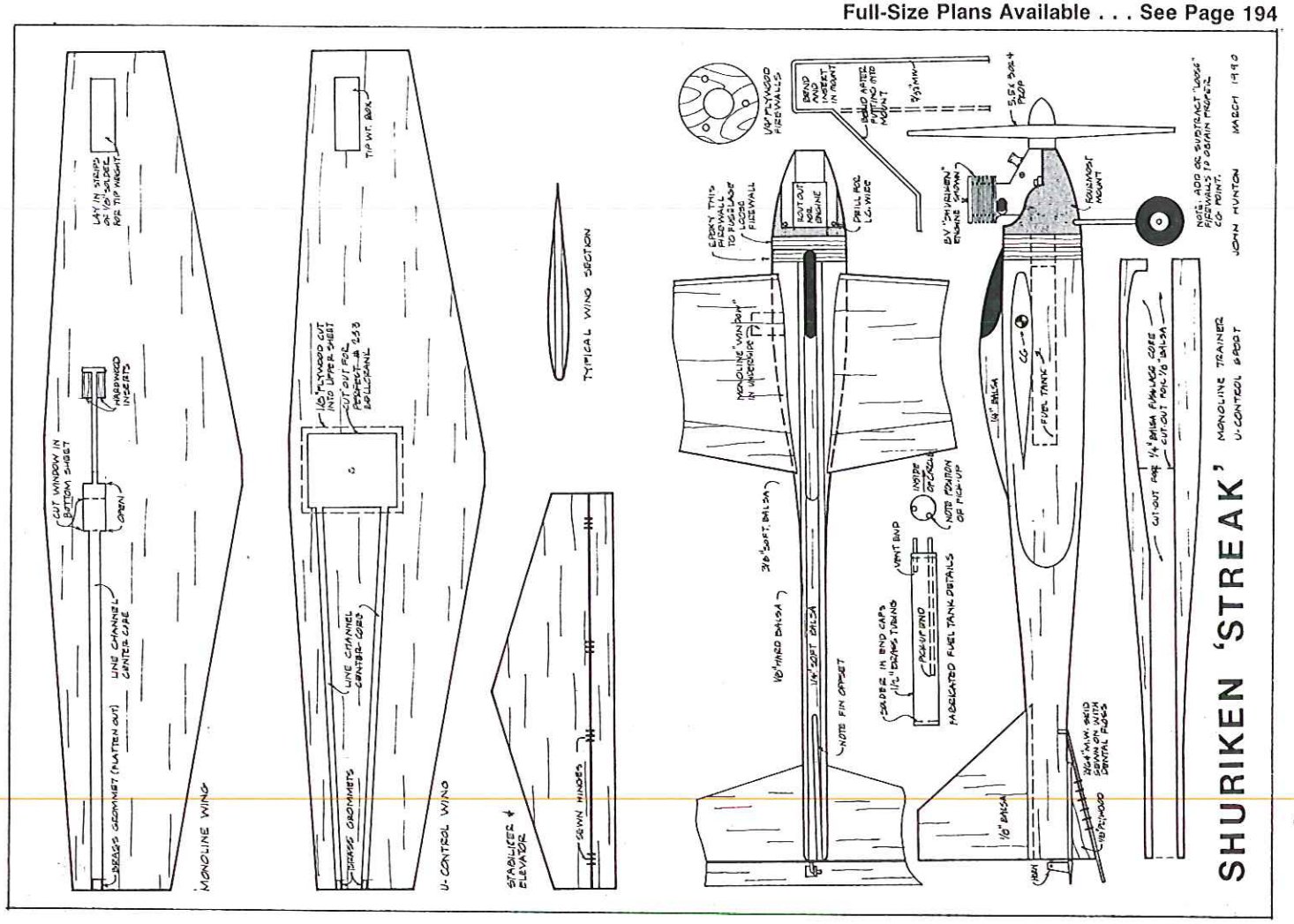
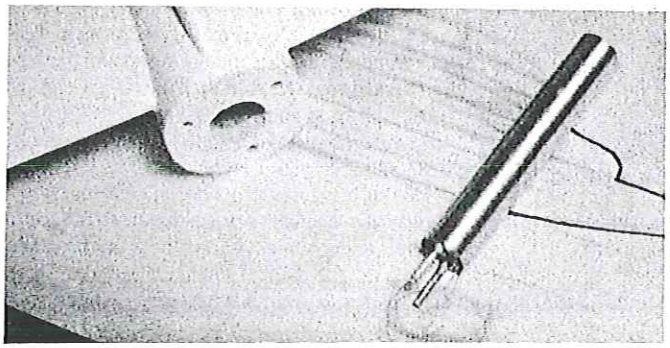
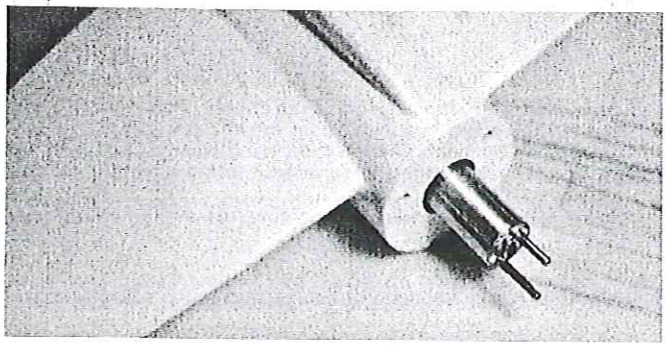
A friend, Larry Hutson, has worked extensively with the CS, creating special head and pipe designs. With optimized timing, his modified CS puts out considerable horsepower at over 40,000 rpm.

Inquiries about the CS may be addressed to CS Engines, No. 444 Guang Zhong Road, Shanghai, China. The CS engines come in normal and Speed types. The Speed version is timed for a pipe, which adds considerable power. The pipe is also available from CS. *Speed Times,* newsletter of the North American Speed Society, reports that at least one person (Nick Sher) thinks the CS .049 engine is capable of record setting in Control Line Speed.

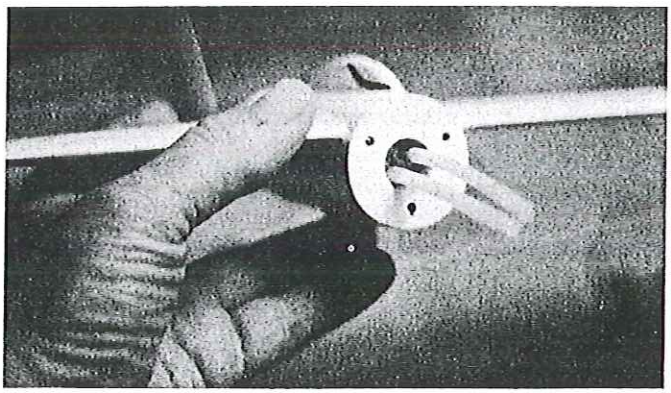
The ½A scene is growing more competitive and exciting as newer technologies in engine design come into use. With more power and options available, we can expect to see greater and greater interest in this category of flying.

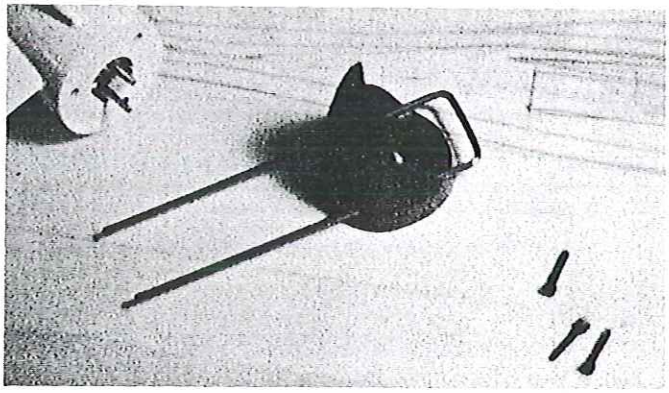






Left: The homemade fuel tank (as detailed in the plans). It's made from ½-in. commonly available brass tubing. A commercial tank will also work, but the narrow fuel supply from this tank will feed consistently throughout the flight. Right: As you can see, this narrow fuel tank slips neatly into the fuselage. Remember that for proper fuel feed, the fuel pickup must be in the lower left quadrant as you face the model.





Left: The fuel tank and firewall are installed. Gasket material or silicone caulking is used to seal the fuselage before the engine is installed. Right: The plastic Fourmost engine mount has been drilled for the landing gear wire. The 3/32 music wire landing gear is first preformed at the top bends and inserted into the engine mount. It will later be bent to final shape. This assembly has proven to be nearly indestructible.

fuel fed from a one-ounce tank. Flying lines were 52 ft. long and .015 thick. Competition was spirited, and in the 15-minute time interval winner Don Stewart put in 194 laps!

I can hope that the "old retreads" and new blood in the club will generate some serious racing competitors. It is good to see a club, fliers, and community come together as the result of a successful national event.

John Thompson of the Eugene (OR) Prop Spinners also wrote a letter. It concerned the 1990 Northwest Regionals meet. The contest is billed as the West's biggest Control Line model event and is scheduled for May 26-27 at Mahlon Sweet Airport, Eugene, OR. I noticed by the contest flyer that all typical Racing events will be held, as well as Northwest Goodyear, Northwest Sport Race, and Northwest Super Sport. In addition there will be all Speed events, as well as some Junior-only events. For more information contact Contest Director Morris Gilbert, 1170 Formac, Eugene, OR 97404 (tel. 1-503/688-4357).

Charging the GloBee battery: I have been asked on several occasions if I could augment the rather limited information concerning charging the two-volt gel-cell battery supplied with the GloBee Fireplug glow starter.

This particular battery is easily charged in approximately 12-20 hours using the GloBee recharger. Unfortunately, this type of battery is prone to acquiring a "charging memory." When the battery is slowly charged, during use it will act as if it were fully charged and go along fine for a period of time—then all of a sudden it drops off rapidly. One can correct this by allowing the battery to discharge almost completely before giving it a full charge.

In several cases I have seen on the field, competitors will find that their battery was "plenty hot" for a few starts, but suddenly appeared weak. Several competitors take corrective action by keeping an extra battery or two complete Fireplug units. They merely transfer the battery clips to a fresh cell after approximately a half-day of racing. They then recharge the batteries all night for the next day's competition.

I have been using a voltmeter/ammeter to check the condition of my battery prior to use. Nothing is more frustrating, especially on cool or inclement days, than to have a battery go flat and cause starting problems.

I'm always thankful to receive your photos, ideas, and comments. I like to share them with our readers.

Shuriken Streak/Hunton

Continued from page 66

To employ the Streak as a Speed trainer, shorten the line(s) to match the desired lap time by using the following formula: The model's actual speed multiplied by the line length of class to match, divided by the speed to match. As an example, take Charlie Legg's record flight: Desired line length equals 85 mph times 42 ft. divided by 144.17 mph. The numbers are LL = 85 x 42/144.17, or 24.7 ft. Since the line tension, like the speed, will be proportional to a Speed model, it's recommended that you pull-test your line to AMA specifications.

Construction

Wing. The wing is laminated from three layers of ⅛-in. balsa sheet. All layers should be relatively firm balsa. Cut the center core to suit your control system. If making the Monoline version, install wood bearings prior to fitting in the Monoline unit.

Use white glue for laminating, and weight the assembly with heavy books. After the glue has set, carve and sand the wing to shape, block sanding to the approximate airfoil profile.

Empennage. Cut the tail surfaces from ⅛-in. firm balsa sheet. Use ⅛-in. ply for the tail skid. Sand these surfaces to shape, making good, sharp edges. Drill for hinges and the tail skid attach wire.

Fuselage. Here we're creating a built-up structure, not a profile. A built-up fuselage ensures good firewall structural support, provides for smooth engine fairing, and looks attractive.

You may use a commercial fuel tank, but the homemade version detailed in the plans is designed so that its narrow fuel supply feeds very consistently throughout the entire flight. It's made from ½-in. brass tubing, available in most hobby shops.

The center fuselage core can be made from ¼-in. soft balsa sheet. Cut it to clear the fuel tank, wing, and pushrod.

Hard balsa should be used for the ¼-in. laminates. The outside laminates can be soft balsa. Cut these to clear the wing.

Glue the fuselage slabs together using white glue. The fuselage builds up to be