

MIDWEST AEROSTAR

by RON FARKAS

.40

Ron seems pleased with his rendition of the Aerostar.



WHAT I LIKE MOST about the Midwest Aero-Star is that it is not only a good trainer, it is also really distinctive-looking. While its configuration and force arrangement must have come right out of a standard trainer-design specification, the rakish slope of the forward fuselage gives it a unique appearance. It also features a flashy color scheme and simulated window decals.

The overall impression is that it could be the latest Cessna high-wing commuter airplane.

Despite its modern appearance, we find the traditional cabin-style fuselage with the wing located well above the thrust line. The fuselage dimensions are such that there is a long nose and tail moment which improves pitch stability. The horizontal stabilizer is mounted low where it benefits from being right in the wing downwash. Both the horizontal and vertical tail surfaces are adequately large for stabilization and control authority. The large constant-chord wing uses a thick high-lift flat-bottom airfoil for good, slow flight characteristics and a moderate amount of dihedral for self-righting ability. It is apparent

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A nifty entry-level airplane with a refreshing "non-trainer" appearance...

Midwest Aerostar 40

Type: Trainer

Power: .40-.45

Span: 62"

Wing Loading: 15-17 oz./ft.²

Weight: Avg. 5 lbs. (80 oz.)

Channels Req'd.: 3 minimum

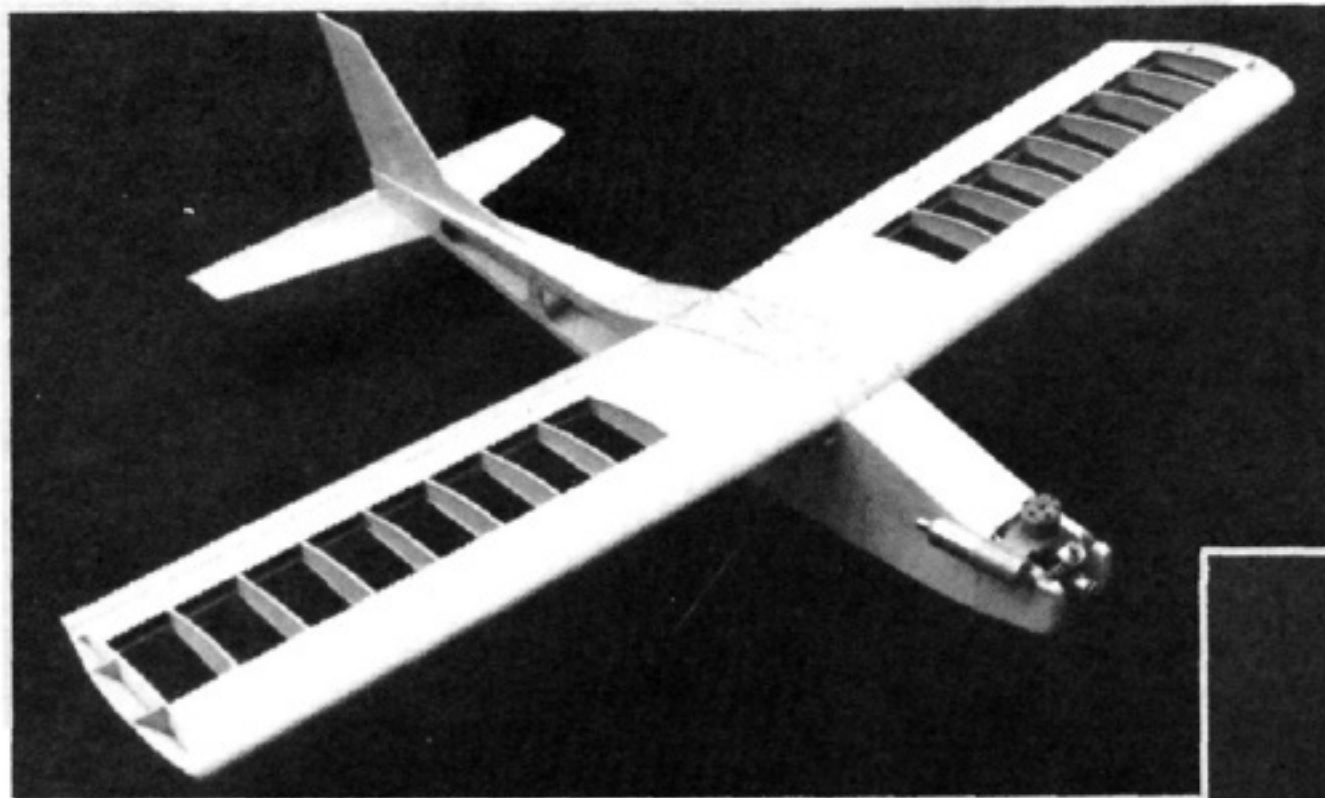
Suggested Retail Price: \$84.95

Features: Micro-lite ply and balsa conventional construction.

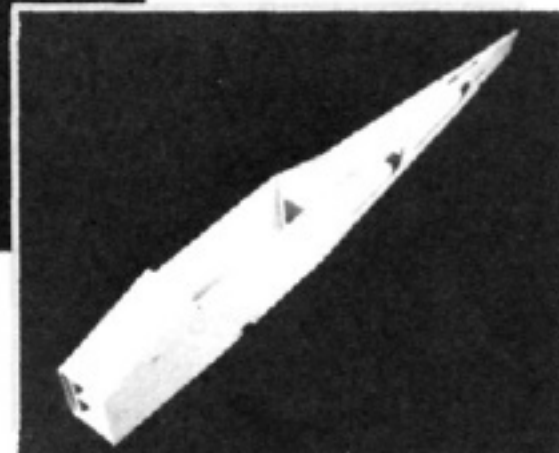
Designed for newcomer to R/C.

Construction manual is excellent and well illustrated.

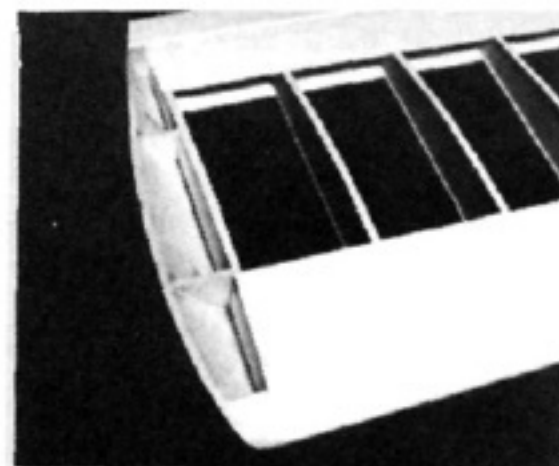




Completed airframe before covering.



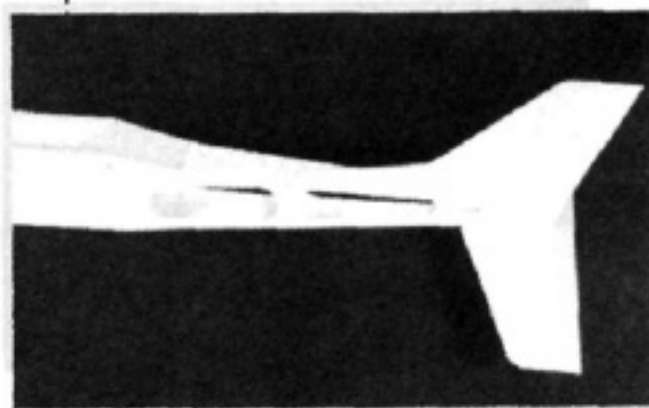
Nearly completed fuselage, showing the fit of the die-cut light plywood parts.



Close-up of right wing tip showing its built-up construction.



New Webra Sport .40 was remarkably docile for a brand-new, out-of-the-box engine. Excellent idle.



Fuselage aft section showing installation of tail components.

one hundred pages or so which includes hundreds of clear illustrations.

The Aero-Star comes in two sizes—for engines in either the .40 or the .20 class. The .40 size, as reviewed here, has a 62-inch wingspan with 675 square inches of area and a weight in the 5 to 5½-pound range. Specific engine recommendations are from .30 to .40 cubic inches for two-stroke engines or .40 to .45 for four-strokers. For comparison, the .20 size Aero-Star has a 52½-inch wingspan.

Midwest has approached the issue of using three or four channels by giving the builder the option. The instructions and the plans show wing construction either with or without ailerons and all of the required materials are included for aileron operation. However, both versions call for the same amount of dihedral—which is rather moderate—leading this reviewer to believe that the designer favors the use of ailerons.

It looks like Midwest has made a big investment in the Aero-Star trainer and by doing so has provided the R/C beginner with the best possible model to start with. The design is well thought out, the kit is well engineered, and the material quality and parts fit are excellent. The plans, instructions and

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that the Aero Star was designed by someone who knows what factors make an airplane a good trainer.

The wing assembly consists of the time-honored rib-and-spar construction with leading edge sheeting, spar webbing and full capstrips. The structure is often referred to as a D-tube because a cross section of the wing looks like the letter D. The tail surfaces are simply built from balsa sheet parts. For the fuselage, Midwest chose the modern technique of using die-cut interlocking light plywood parts that go together in a jiffy and produce a very rigid box structure. The ease of construction is further enhanced by the excellent instruction manual of

phenomenon was not detected at any time in the course of our tests of the Laser. Nevertheless, it is always a good idea to check the prop nut for tightness before starting the engine, even though, in the case of the Laser, a Nyloc type nut is employed which, even if it should loosen, is unlikely to come off.

Our test model Laser 75 was supplied with a standard Super-Tigre long-reach glowplug and this obviously suited the engine very well. A second plug of the same type was used as a check during the tests, to make sure that no loss of performance occurred through deterioration of the plug element.

The Laser responded well to the Super-Tigre Mag type carburetor and we experienced safe idling down to around 2,200 rpm on a 14x6 prop, with immediate response to the throttle and steady intermediate speed operation.

Any reader who is interested in acquiring a Laser engine can obtain full details and prices from the manufacturer at the address shown in the data table at the beginning of this article. Incidentally, the demand for Laser engines is such that every motor is sold before it is built. Be prepared, therefore, to have to wait a short while from the date of placing an order. Don't write to us on this! Please check with the factory. ■

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even the packaging are all also first-class. Let's take a closer look.

By far, the most innovative feature of the packaging is the use of sealed poly bags that contain all of the parts for a particular assembly step—an approach that has been used for some time in helicopter kits. Each bag is numbered and the instructions tell the builder when to open the next bag in the building sequence. Both the wood parts and the hardware are bagged; the only exceptions are the two large, light ply sheets with the die-cut fuselage sides which are placed in the bottom of the box to keep them flat.

Through the clear bags, one can see that the balsa is of good quality and of straight grain. He will also find that the densities are well chosen for their respective purposes. The tail components are machine-cut from the 1/4-inch-square spruce. The ribs are machine-cut 1/16-inch balsa and pinned together in a stack. Just about all of the fuselage parts are die-cut from Midwest Micro- I found that they could easily be pushed out of their sheets and only a few strokes with a sanding block to square required be spruce. The ribs are machine-cut 1/16-inch balsa and pinned together in a stack. Just about all of the

fuselage parts are die-cut from up the edges. This step is shown in the instructions.

A reasonable selection of hardware is provided, including pushrod ends, landing gear, nosewheel bracket, nylon engine mount and an assortment of screws. The 1/4-inch-ply firewall is pre-drilled with all holes necessary for the mount, bracket, pushrods and fuel lines. The decal sheet is in a class by itself; it includes self-adhesive windows with the simulated appearance of a cabin interior.

Three rolled plan sheets are provided. One shows both wings, another shows the fuselage side and top views, including the tails, and the third illustrates the optional installation of a four-stroke engine. Two alternate radio installations are also shown. These plans are really well done and incorporate cutaway views, phantom lines and cross-section views for clarification of the structural elements.

The instruction manual is profusely illustrated with exploded views and isometric drawings. It describes the assembly process in a logical sequence of many small and understandable steps. The instructions also thoroughly explain finishing, control linkage hookup, balancing and flying for a new modeler. The book is outstanding.

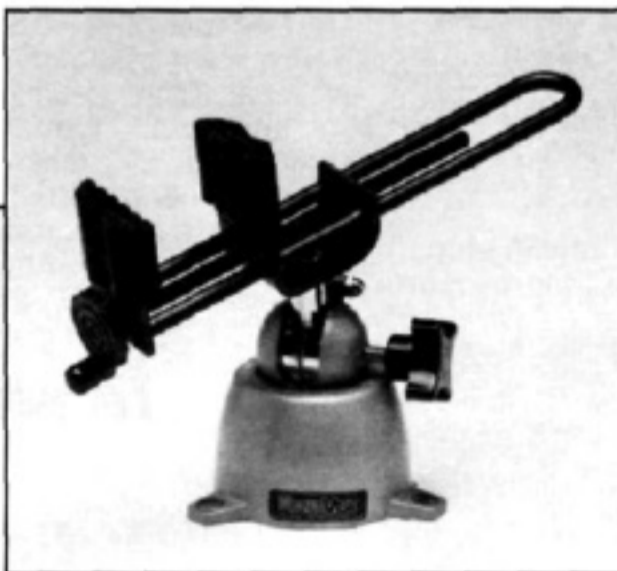
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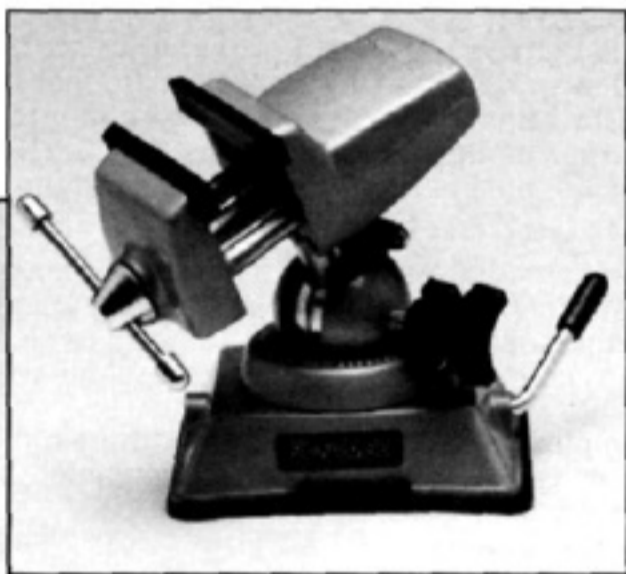
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Almost all construction steps reference the use of cyanoacrylate adhesives. I used PIC Stick brand by Penn International Chemicals* in all three formulas: quick cure, medium cure and slow cure. For making glue fillets I applied the slow cure and sprayed on PIC Pronto accelerator. I also should mention that their Skin Shield protective hand cream really does keep your fingers from getting glued to the airplane.

The instructions take you through the tail, fuselage and wing in that order. The stabilizer has two main parts plus tips which are installed with the grain running chordwise to prevent warping. The fin has three main parts plus an alignment tab on the bottom which will fit into a matching slot on the fuselage top for perfect alignment.

The die-cut light-ply fuselage sides, top and bottom parts and the formers have locating tabs and slots for accurate alignment. The assembly process requires fitting most of the parts into position prior to applying any glue. At this stage the pieces are only being held together with tape. Then, thin cyanoacrylate glue is

applied to all of the joints and seams to make a permanent bond. For extra strength I applied a second coat of thick cyanoacrylate and accelerator to form glue fillets. Installation of the firewall is next. All of the required holes are pre-drilled, and the builder only has to trial-fit the motor mount and nosegear bearing and then seat the blind nuts with a little cyanoacrylate glue for security.

I glued the firewall in place with a 4½-minute PIC Poxy (also from Penn). This epoxy was also used to glue the main landing gear block in place. The block is keyed into a recessed cavity in the fuselage bottom and a separate cover plate is used to retain the wire gear legs. This is perhaps a bit more work than is warranted on a trainer, but it results in a very secure installation with a clean exterior appearance. During the final assembly stages the tail surfaces and cowl blocks were installed onto the fuselage.

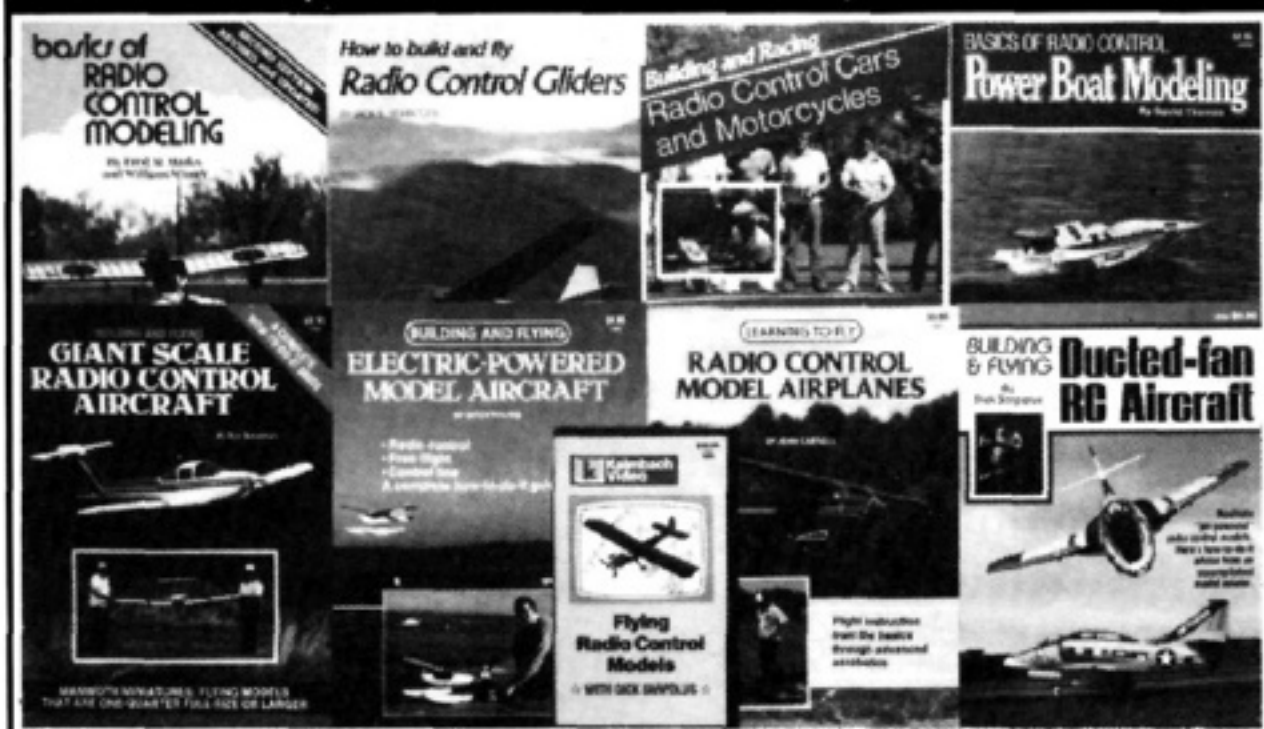
The D-tube wing construction is quite straightforward. However, considering the modern simplicity of the fuselage, I was a bit surprised that the wing construction was so conventional. My only criticism of the Aero-Star kit stems from Midwest's choice of 1/16-inch balsa for the ribs and all of the sheeting. I think that a

1/16-inch sheet is a bit delicate for beginners to work with. I would have preferred 3/32-inch, which is more robust and can take a little more sanding without getting too thin in spots. Admittedly, the wood quality was very good, the parts fit was excellent, and the finished wing quite strong; but a first-time builder might break a few pieces if he is not careful during construction.

The wing uses a flat-bottomed airfoil so it can be built directly over the plans on a building board. The first step is to pin and glue all of the bottom sheeting and capstrips in place. This is followed by gluing the lower main spar and all of the ribs into position. Next, the top spar and the leading and trailing edges are installed as well as the pre-cut shear webs. Note that the full-width shear webs are packaged together, while the shorter ones are loose. After this, the top sheeting and capstrips are added and the wingtip parts are glued into position.

At this time the builder must decide whether to install operating ailerons or to glue on the tapered trailing edge stock permanently. The ailerons are of the full-span strip variety and are actuated by torque rods. The rods are captured by a torque-rod box which is milled into the

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hardwood center section trailing-edge pieces. Typically a torque rod rotates in a plastic sleeve which is glued into the trailing edge. Midwest, however, has taken the approach of installing the bare wire into a slightly oversized rectangular channel. The builder must oil or grease the wire and be careful that excess glue does not bind the rod from rotating after assembly. Even so, this method produces somewhat more play in the linkage than is desirable, but it has not proven to be a problem in flight.

The completed wing panels are then epoxied together with a plywood dihedral brace that fits between the upper and lower spars. Fiberglass tape is also wrapped around the center section and adhered with cyanoacrylate glue. The fairing, which mates the wing leading edge to the fuselage top, is made from several pieces of triangle stock. This proved to be a lot easier than the old fashioned method of carving a block to match the airfoil contour.

I decided to finish my Aero-Star with the new Carl Goldberg Models* Ultracote plastic covering material. I have been impressed by the demonstrations at trade shows and had already heard favorable comment from fellow modelers.

Ultracote stretches well around curves and the wrinkles really disappear when shrunk with a hot iron or heat gun. The exterior surface of the material has more of a luster than a super-high gloss. It is possibly a bit more scale looking but it's a matter of personal taste.

My Aero-Star is powered by a Webra Silverline .40 imported by Circus Hobbies*. This is a nice, loop-scavenged (intake porting) sport engine, but it is manufactured with the same West German craftsmanship that has made Webra high-performance engines so popular. It has moderate power, and very easy handling characteristics that sport modelers will appreciate. It is a good choice for this airplane and can be used again when the pilot moves to a more advanced model.

For trainer models I usually install one of my simpler radios—this time it's an old Kraft* seven-channel system with four KPS-14 servos. As shown on the plans, I used a plastic servo tray in the fuselage and made up the elevator and rudder pushrods from the square spruce stock and wire ends that were provided. The No. 1x72 screws provided for horn installation did not bite securely in the backing plate so I replaced them with No. 2x56 screws. I was able to use the solid-wire pushrod for nose-gear steering, but I had to substitute braided cable for the throttle in order to eliminate binding. With the



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airborne components located as shown, the model balanced at the correct center of gravity.

FLYING. As I said earlier, this is an excellent trainer. For one thing, it has very good hands-off stability. This means that you can easily get it straight and level and it will stay that way by itself. Also it has respectable self-righting capabilities. This means that when you get it all sideways and crossways, the airplane will tend to come back to straight and level flight by itself by throttling back and releasing the sticks to neutral. Although this characteristic is not as strong as in some three-channel aircraft with lots of dihedral, it does provide adequate time for a beginner to take corrective action. The Aero-Star always reacts gently but positively to the controls.

The model has a pretty wide speed range, and really great low-speed handling characteristics. What little stall I could induce was simply a straight mush rather than a clean break, and it never dropped a wingtip. All controls were effective, even when the airplane was in a nose-high attitude. Landings and touch-and-go's were a cinch. At high speed the Aero-Star can do enough aerobatics to

keep an advanced student interested. Loops, rolls and inverted flight were accomplished, but I couldn't get it to spin.

This airplane's principal duty is basic training, and it does that very well. It is easy to build and the result is a model that the student can be proud to bring out to the field. It's nice that an established company like Midwest would be so responsive to the needs of the beginner.

**The following are the addresses of the companies mentioned in this article:*

Midwest Products Co., 400 S. Indiana St., Hobart, IN 46342.

Penn International Chemicals, 943 Stierlin Rd., Mountain View, CA 94043.

Carl Goldberg Models, 4732 W. Chicago Ave., Chicago, IL 60651.

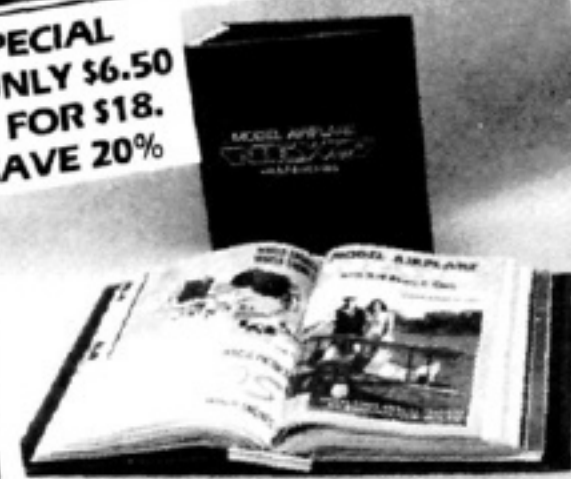
Cirus Hobbies, 3132 Highland Dr., Las Vegas, NV 89109.

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