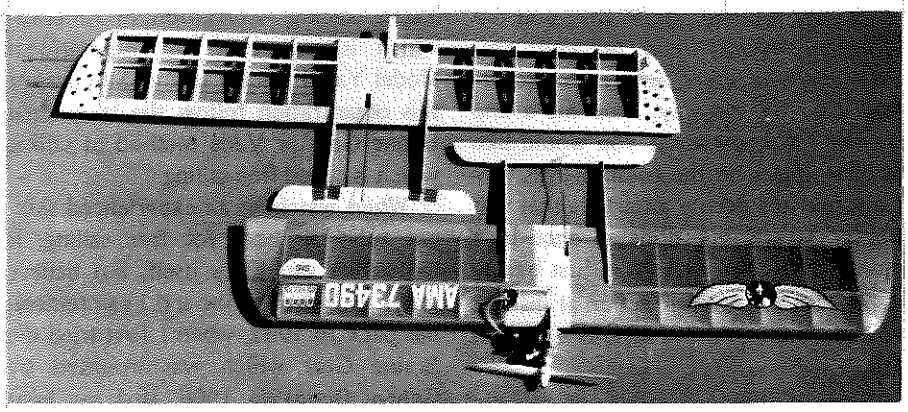
5723



Looks as though Steve is seeking even lighter weight in the unskinned version of "Whetstone," with the swiss cheese tips! Certainly seems like the economical way to keep sharp in combat.

Steve's father Norman, lends a hand so he can yank the clip free once the engine starts.

WHETSTONE II

Story and Photos by Steve Fauble

Here's one that will sharpen your reflexes. It should be like swinging two bats as far as making you ready for the big combat circle.

● Welcome to the fun and glory of 1/2 A combat! I wish I could say that I was the reigning champion in this category of AMA competition, but I'm not. As a matter of fact, outside of England, there is no organized competition for planes of this type.

There are several reasons that you should consider constructing this plane or one like it. It would take two or three 1/4 A's to make as much noise as one combat .35. This, and the smaller circle needed, could open up some of the closer flying sights that you may have discarded because of increased urbanization. However, the real reason for this design is that if you are serious about combat flying, you must practice and fly in competition with an opponent as much as possible. Just going out by yourself with a .35 combat ship and wringing the plane out at 120 MPH won't give you the expertise needed to survive in an actual match. If these informal combat matches are flown using full size AMA combat planes the cost rapidly becomes prohibitive.

The original "Whetstone" used the basic design features of the "Winder" by Terry Prather, but incorporated a diamond airfoil and a different type of construction. A picture of this plane appeared in the February issue of Model Builder.

The airfoil of the "Whetstone II" is one that comes from Phil Granderson and Howard Rush. Howard Rush suggested the longer tail moment in a letter in which he talked about the center of pressure and its relationship to tail length. The high aspect ratio comes from many contemporary designs but I think the one who started the whole swing to this type of design was Wild Bill Netzband and his design, the "Splinter". The wing tip shape comes to the design by a circuitous route. The original idea was published in an article about the "Hoppte" rat racer, M.A.N. 1967. This and other reasons inspired Charlie Sotich, an inventive Chicago Aeronut, to try this type of shape on some indoor models that were very competitive. I in turn got the idea from him. The film can tank comes from the "Fox Feathers" article by Shane and Brownfield in M.A.N. Dec., 1971. The one piece motor mount comes from the "Uranus" free flight design of the middle 1960's. These were made from hard maple but the idea is the same.

CONSTRUCTION: Study the plans carefully and note that the inboard wing is longer than the outboard. The first step in building any design from scratch is to cut out the major parts. You are in effect making your own kit. The ribs should be made from medium 1/16 inch balsa. A template of ribs W1 or W2 should be made out of thick cardboard or 1/16 inch plywood. It helps to push short "L" shaped pieces of pins through the pattern to keep it from moving around while cutting out the ribs. A small piece of 1/4 inch square scrap glued to the top of the pattern as a handle can be quite a help too. A standard paper punch can be used to make the leadout slots in the ribs. This works best on medium or hard balsa and 3/32 inch is about as thick a piece as can be punched successfully. The trailing edge pieces should be made out of medium "C" grain. The rear of the 1/16 inch thick pieces should be beveled (see the plans) for a thinner trailing edge and a better glue joint. A razor plane works best for doing this.

The tank should be made out of an aluminum 35 mm film can, minus top. A 1/16 inch balsa plug covered with Monocoat or other plastic is used to plug the open end. If one of these is not available, a suitable sized section of rocket body can be used but it must be fuel proofed. Cut a hole in the top of the can at one end and install a suitable sized rubber grommet for protecting the fuel line from the sharp edge. I use a 7/16 inch I.D. grommet. The grommet should be available from an electronic supply store. Provisions for a standard type of tank have not been made on the drawing. If you wish to use this type of tank you are on your own. The conversion should not be difficult.

The motor mount is cut out of 1/4 inch, 5 ply plywood, in one piece. It is easier to drill the motor mount holes at this time but be sure that the thrust line is neither up nor down. A 0^{o} thrust

line is very important. Be very careful both now and when installing the mount.

ASSEMBLY: Tightbond or a glue of this type is recommended for all joints unless otherwise noted. The lower portion of the trailing edge has to be shimmed approximately 3/32 inch at the front and 1/8 inch at the rear. This will keep the angle of the ribs parallel to the trailing edge and insure a good glue joint. Pin the lower spar to the table and glue the ribs to this spar and the lower part of the trailing edge. Whengluing the two center ribs, a scrap piece of 1/4 inch square should be used to insure proper spacing and alignment.

The motor should have approximately 2^{o} out-thrust. This can be put in using washers under the front mounting lug holes, but it looks better if the whole mount is glued at this angle.

Install the leading edge while the wing is still pinned to the table. Use rubber bands to hold this in place 'till the glue dries.

Sand the stabilator to an airfoil shape and assemble to the booms, using "L" shaped pieces of wire (.032) and silk or nylon for a reinforcement. A good solid assembly is needed here, so use plenty of glue. Ambroid or other glues of this type are recommended. Rub it into the cloth to get a good joint.

While the glue is drying the bellcrank assembly can be constructed. I recommend Carl Goldberg's nylon 1/2 A bellcrank sets as I have the smoothest action with these parts. The leadouts can be made out of old .35 size control line wire or .020 music wire. Don't forget to put on the short aluminum leadout guides before forming the outer ends.

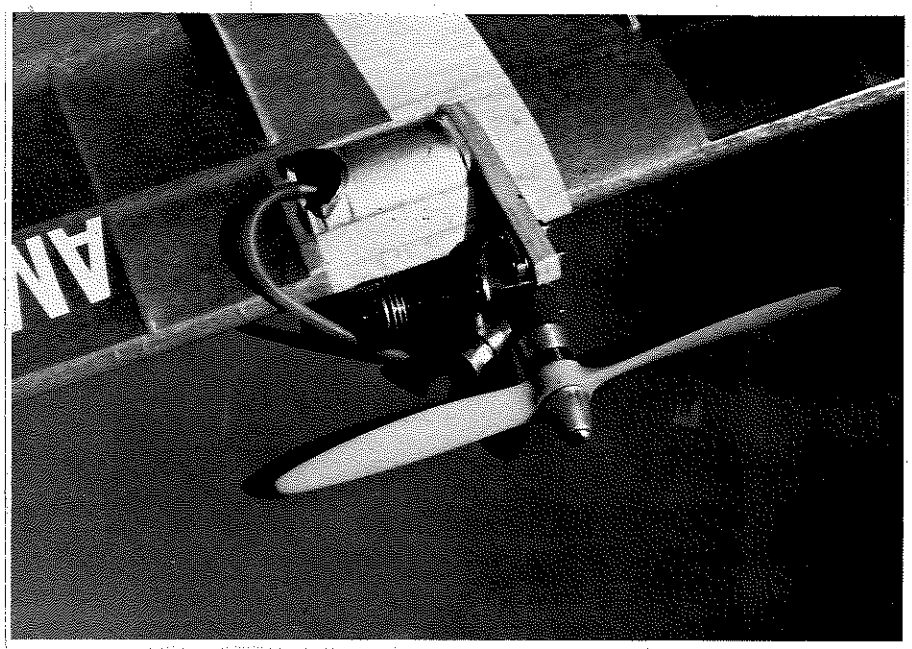
The motor mount and top spar are installed at the same time. Epoxy should be used on the motor mount area. When these are dyr, install the top part of the trailing edge and the wing tips, with braces. Next, install the bellcrank and tank assemblies where shown on the plans. A small wing tip weight should be glued to the outside at this time. When these are dry, install 1/16 inch pushrod wire and plank the center section with soft 1/16 inch balsa.

Cover the plane with light weight silkspan or tissue. I have found that the best way to cover is to sand the framework and then apply two coats of dope that contain about 25 percent model cement to all the outside surface. Then to cover, the tissue is just laid on the surface and thinner is brushed on over the tissue. Install the boom and stabilator assembly using glue generously for a good joint.

The plane should be finished with 4 to 6 coats of thin clear dope. Add AMA numbers and decorate. Use colored dope sparingly as this can add weight quite rapidly.

FLYING: When flying this model you should be on your toes, as it really performs. I would recommend a 5 1/4-4 Tornado prop on a Tee Dee and a 5 1/4-3 for a Cox Medallion. I urge you to use only steel lines when actually flying combat as dacron lines are too easily cut. I fly on 35 foot lines and don't recommend a shorter length. Adjust stabilator movement, using plywood stops glued to the booms, until the tightest turn without stalling is achieved. The crepe paper streamers that I use are 1/2 inch wide and 5 feet long. Use a 2 foot button-thread leader.

Good luck and happy hunting.●



Close-up of the power department, showing the 35 mm film can in which the pen bladder or pacifier fuel cell is enclosed. Opening is lined with grommet to protect tubing from cutting.