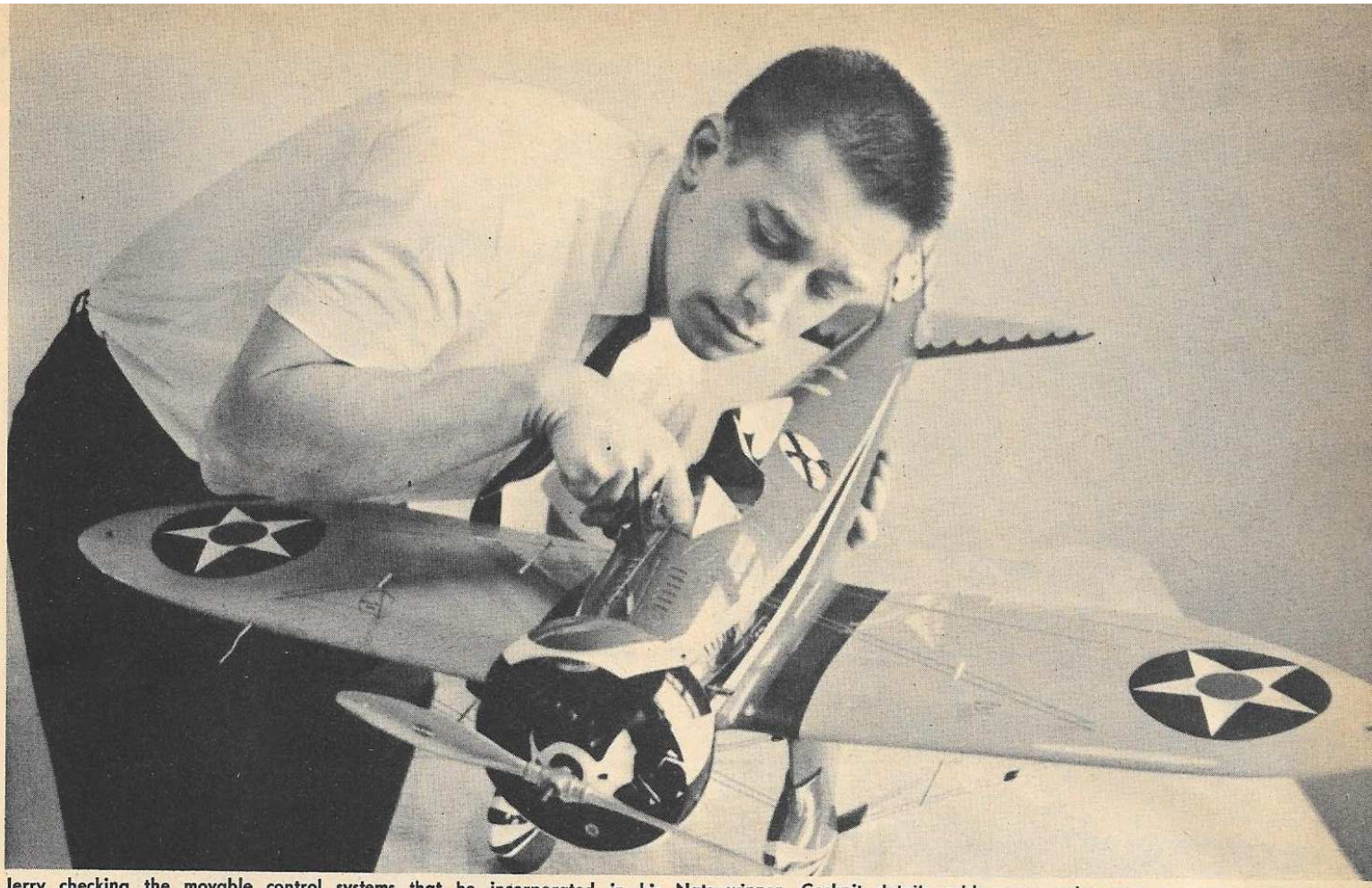
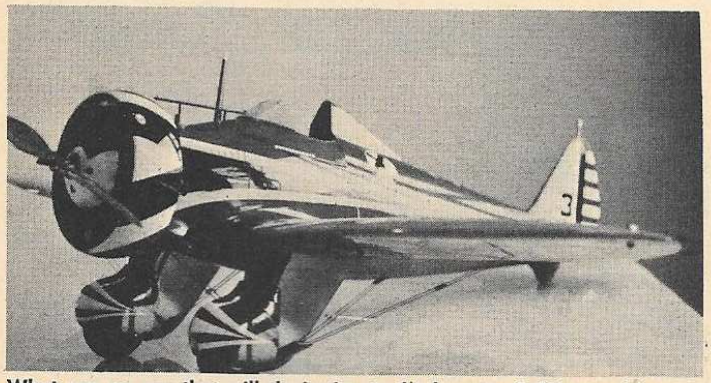


Jerry checking the movable control systems that he incorporated in his Nats winner. Cockpit details add many scale points to winning total.



What can we say that will do justice to the beauty of this superbly conceived and executed model airplane? Winning Open Scale tells the story.

BOEING P-26A

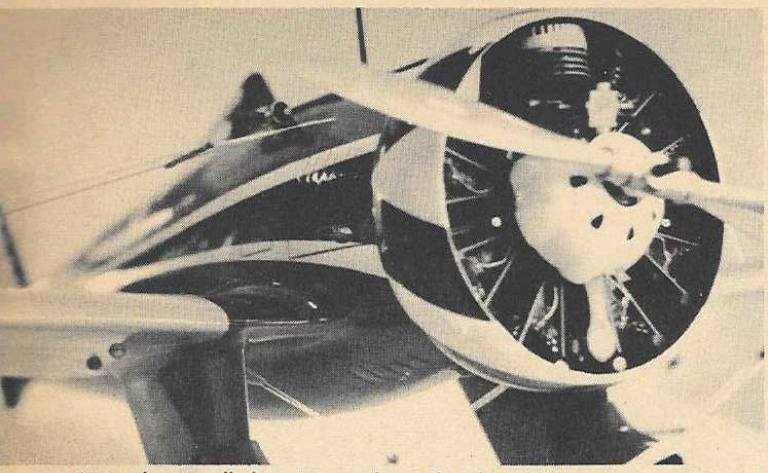
By JERRY WORTH

'64 NATS SCALE CONTROL-LINE WINNER IS THE MOST SUPERBLY DETAILED AND FINISHED MODEL FEATURED ON OUR PAGES.

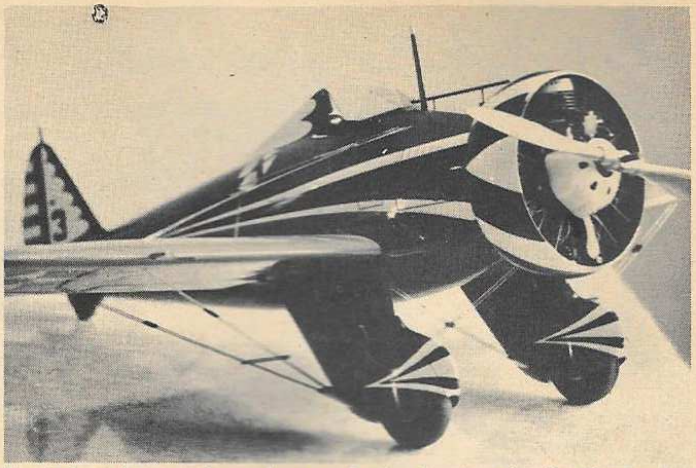
Here the proof of the winning. Trophy, at left, is '64 Nats Open Scale; Testor's Perpetual Best Finish award center, at right, we don't know.

►Remember when we were kids? We sat at our desks at school looking at the window, day-dreaming and doodling. It seems as though we were always drawing a side profile of some racy-type airplane, (these were the days of the Thompson trophy racers) or some Bill Barnes style military ship. Keep remembering now, weren't these ships always low-winged, big huge cowling around a brute horsepower mill, open cockpit, and fancy wheelpants? Yes, I think you're geting the picture now. These were also the days of great changes taking place in military aviation. While we were sitting in the school-room doing all this doodling, weren't we supposed to be doing an arithmetic assignment? Yeah! Yeah! Yeah! I guess that's why I haven't become an astrophysicist as yet.

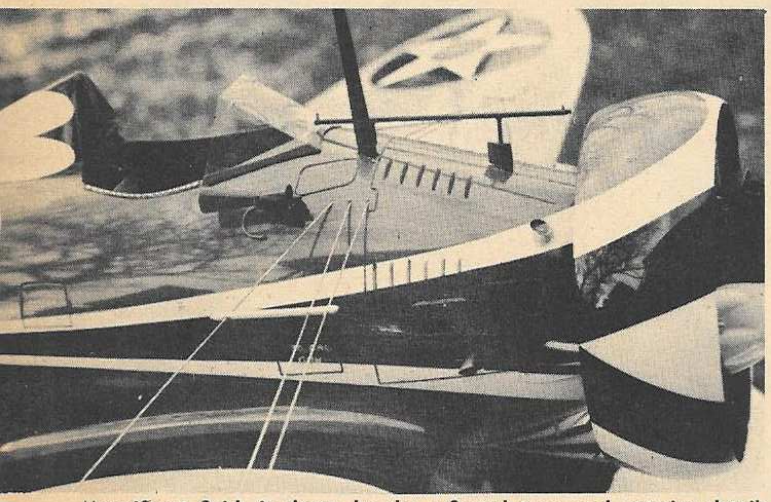
A great change in military aviation was definitely taking place. These Thompson racers and others similar planes were setting all sorts of records around the country, and were "opening the eyes," of the military powers that be. Planes, such as the old Travel Air mystery ship, piloted by Doug Davis, in 1929, averaged (*Continued on next page*)



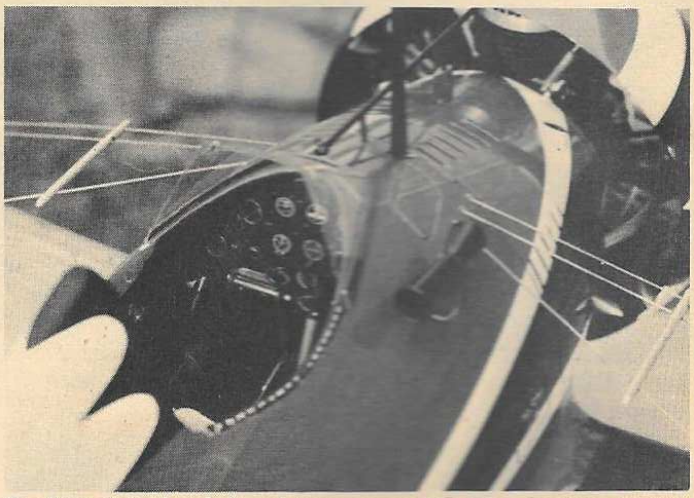
Note that in all the pictures shown for the P-26A, scale propeller was used. This prop only for scale judging, standard prop used for flying.



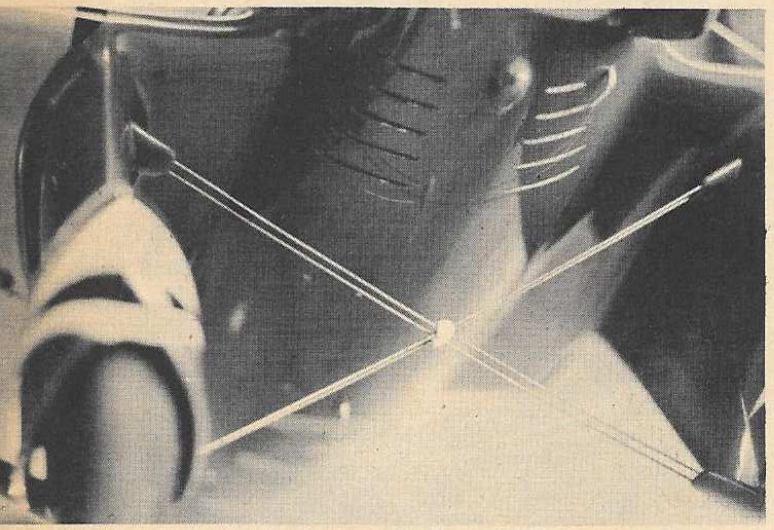
Front view shows undercarriage and wing bracing details. The engine cowling, plus dummy motor detailed on drawings. Paint trim is authentic.



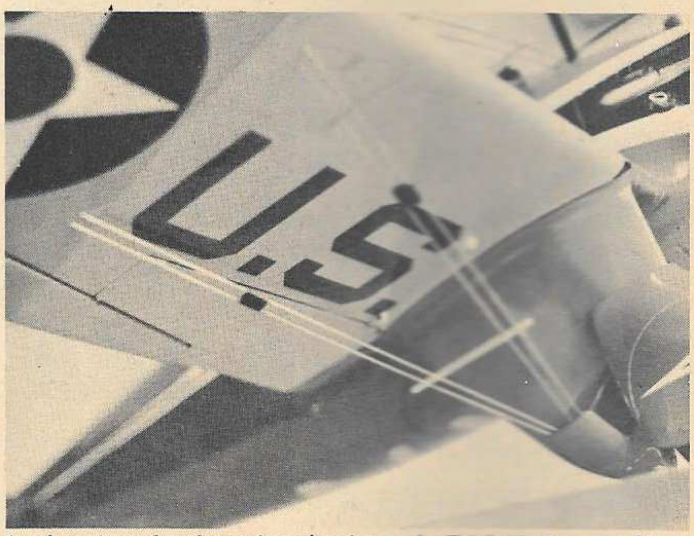
Magnificent finish is shown by the reflected trees and exterior details on side of fuselage and cowling ring. Airspeed indicator beneath cockpit.



Excellent view of cockpit and instrument panel. Wing bracing, antenna, machine gun, airspeed indicator, cooling vents also in good details.



Undercarriage bracing between landing gear legs and cooling vents.



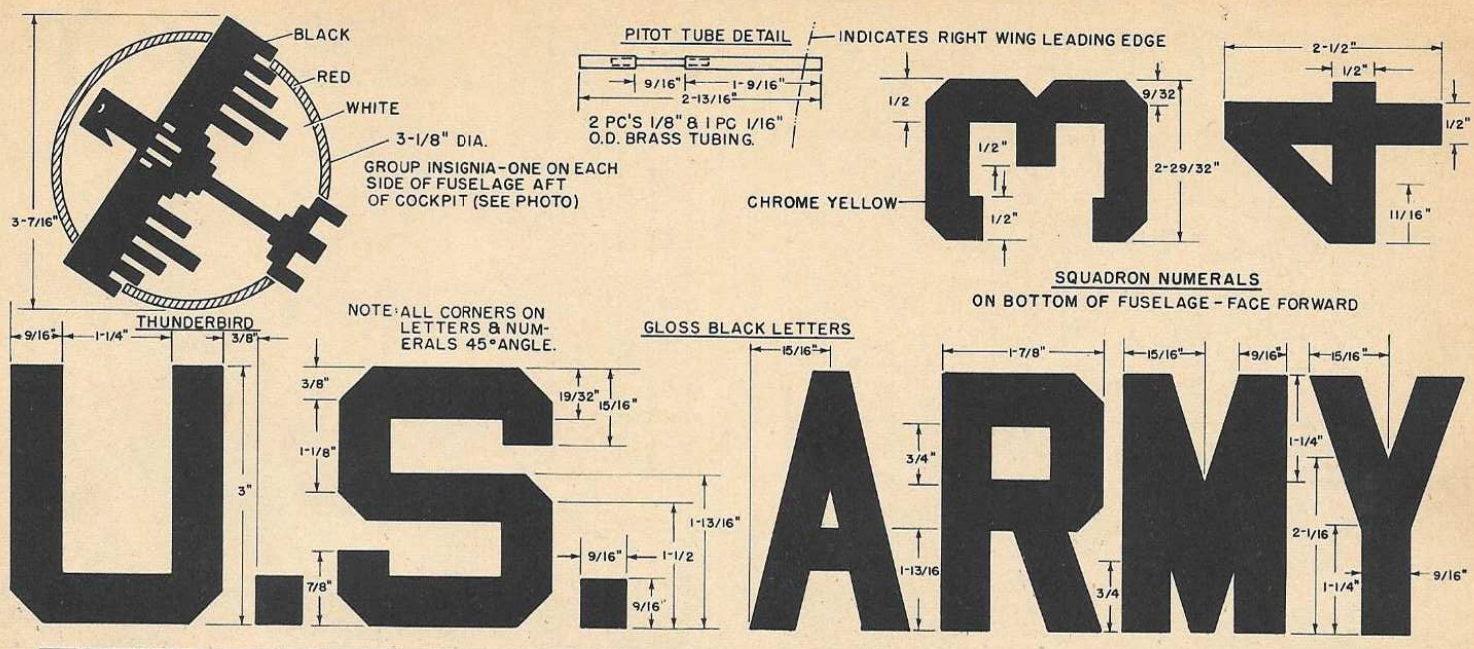
Another view of undercarriage bracing and official Air Force markings.

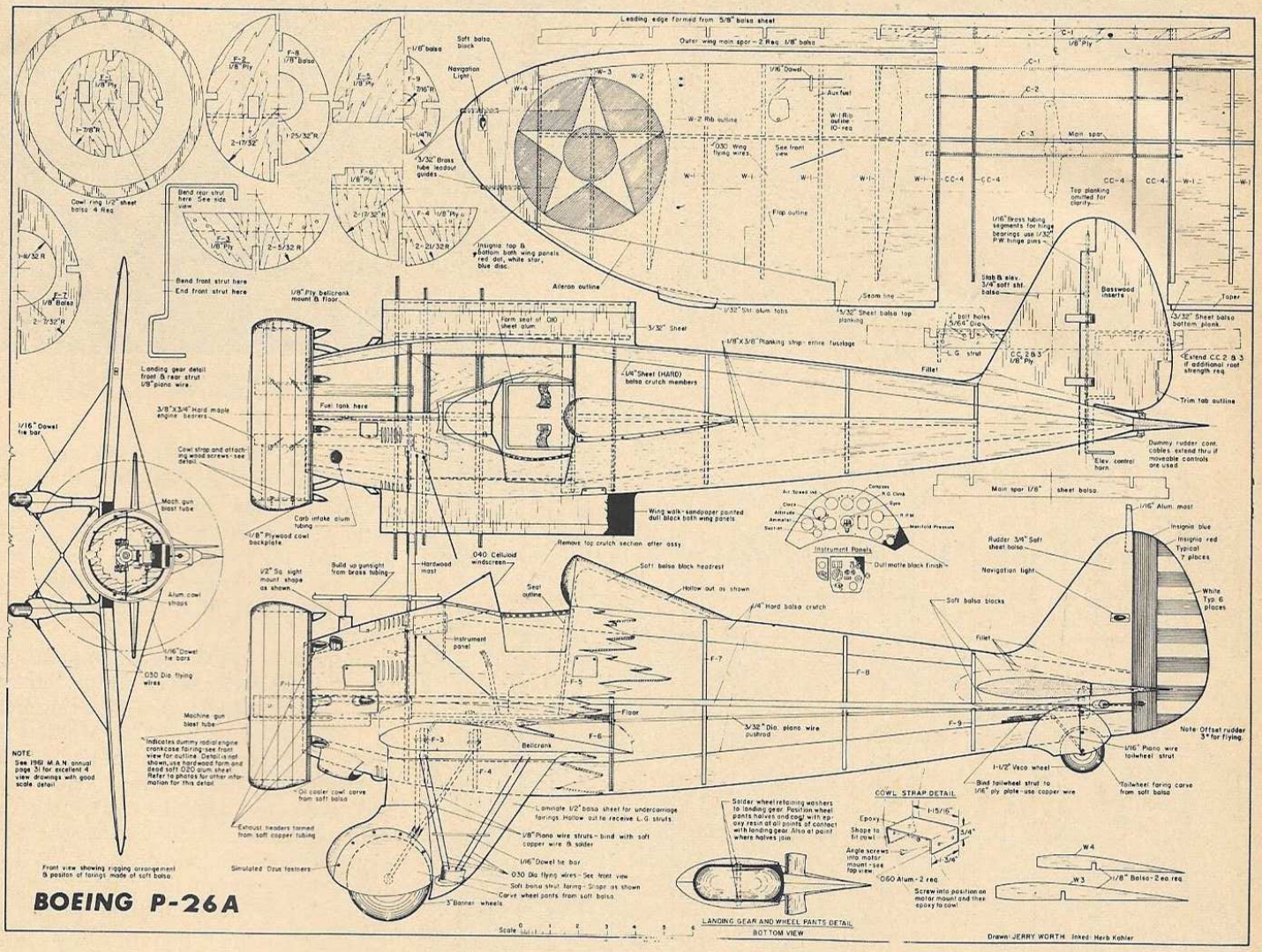
BOEING P-26A

200 mph over a closed course at the National Air Races. This was event #26 on the program that day, and for the first time, a civilian craft had beaten a military one in a wide-open competition. The die was cast. Military aviation, from that day on, was to be forever dedicated to low-winged, all metal aircraft.

The Army Air Corps began looking for aircraft manufacturers to design and build a fighter to their new specifications. Boeing Aircraft Company was in a good position to deal with the army on this project, as they had definite ideas as to what was essential for three such planes; these were the prototype XP-936 airplanes. Ironically, it seems to be these airplanes, with *incorrect color and markings*, that modelers seem to always build.

The first XP-936 was delivered in March 1932. The first flight of this radical new fighter was on March 20, 1932. I would like to mention, that prior to building this model, I obtained from the Air Force Museum copies of the original test flight report. The original flights were made without any undue difficulties, the test pilot's report was very satisfactory; all this being an indication that the original design was very sound. It also speaks well of Boeing Aircraft's ability to design and build a radical type aircraft without





FULL SCALE PLANS AVAILABLE — SEE PAGE 55

the common faults plaguing many manufacturers at this time. Here was this little plane: low-winged, all metal, thick chord wing; low A.R., very smooth flowing lines from the large N.A.C.A. cowl, all the way to the rudder; wheels all encased in smooth pants; landing gear struts shrouded in extremely large, streamlined fairings; tail wheel also faired in; large root section fillets around the empennage; two forward firing 30 cal. machine guns protruding from between the cylinders of the large Pratt Whittney R-1340-27 of 570 H.P., headrest a little enlarged now, to enclose a roll bar; Bendix wheel brakes, now; landing flaps added, slightly offset vertical fin (3 degrees) to counteract engine torque; wing span at 27′ 4-53/64″; speed 222 mph; landing speed—66 mph; gross weight—2,740 lbs.; the same plane we drew in the school room, the Boeing P-26-A.

I can't remember at any time, ever talking to anyone that did not like the lines of this ship; short, chunky; a bulldog looking sort of toughness. This was always appealing to us, somehow. I had always built models as a kid, but as much as I liked the P-26-A, I never did get around to doing anything about it until 1962, about twenty-five years later.

There are two examples of (*Continued on page* 39)

Boeing P-26A

(*Continued from page* 13)

P-26-A airplanes in the U.S.A. One is at Maloney's Air Museum, Ontario Airport, California; and another, at the Air Force Museum, Wright, Patterson A.F.B., Dayton, Ohio. It was the latter aircraft, at the AFM, which was used as a *basis* for my model. This airplane came from Guatamala to the Smithsonian Institution, but the museum, cramped for space, put the aircraft on loan to the AFM, where it is now on permanent display in the colors and markings of the 17th attack group, 34th pursuit squadron, which was based at March Field, California. I did say *basis,* above, when I spoke of the original ship's relationship to my model. I did not wish to model this particular craft, because the airplane had been altered in several ways The tail wheel did not have the full fairing that I liked so much. The wing flaps have extensions that are not characteristic of the majority of operational planes. It would have been advantageous to model this *exact* airplane in order to do it right, (which is the only way for scale), but I would have to make concessions that I didn't care to. Therefore, I used this airplane for 95% of the research, but modeled another aircraft of the 34th squadron, 17th group. For obvious reasons, this decision was made before construction started.

Control line flying scale: Where do we make concessions in scale? What are we going to do with our scale model after we build it? (This is not a silly question, although, as I write it, it does sound idiotic.) It is important that the model of a plane we build be appealing to us. Don't decide that just because you wish to build a scale ship, you must purchase a kit of a plane that doesn't really appeal to you. Without proper research and background, it will only be another plane. I realize that all of us enjoy building a scale ship, going to the flying field whenever we can; but this is not the kind of flying scale we are talking about in this article. *By all means, please! Let's not stop building scale types for sport flying,* but this article is intended to encourage contest type, or competition scale. After we decide on a plane that suits us, we have to decide whether it is within our capabilities to build it. By this, I mean, if we decide to build a W.W.I Sopwith Pup, we will have to make wheels, struts, rigging, etc. This is very difficult work and would mean giving up the project halfway because we got in over our heads. Be certain to select a design that you are sure that you can complete *properly*. I do not mean that the airplane has to have the best workmanship, because we do not all have the same abilities, but the color, markings and all the detail work should accurately represent a particular airplane. If you can get close enough to inspect and photograph your real specimen, fine! One photo is worth everything to a scale judge as far as proof of scale is concerned. Accurate dimensional, three-view drawings, which are *required* by the rules, are necessary for scale fidelity, but true perspective scale detail cannot be judged accurately without photos to back you up. I have judged models extremely well constructed and detailed, but the builders did not furnish proof that the detail incorporated on their models was authentic, or just a "gypo gimmick" to make it look professional. It may be a good idea to exclude details such as those that cannot be documented by photos or good authorized drawings, rather than "dummy" up.

Most judges are somewhat critical and sometimes will assume that the model is all wrong to start with, and it is up to the builder to prove that the model is a correct replica. I judged a scale contest recently here in Illinois, where only one contestant, out of the entire scale contingent, had proper three-view drawings.

If we fly speed, we must know the rules before we even build a model, much less fly it. The same holds true for stunt, carrier, rat race, combat, in fact, all the A.M.A. events, including flying scale; yet, here was a group of, I assume, serious modelers, or they wouldn't have spent a buck to enter the show, that spent hours of building time to construct their scale birds; drive miles upon miles to enter a contest; display their models all day with great pride, and they didn't even read the AMA rule book, the bible of the event. The model we build must be judged by a qualified person, who is himself, using the rule book as a guide. Points are awarded according to this book, therefore, it is to our distinct advantage to use this book as a guide when building a model. If you read the rules and put yourself in the judge's place and award your own model points as per the rules, you will be surprised how accurately you can judge your ship, for better or for worse.

(*Continued on page* 42)

Boeing P-26A

(*Continued from page* 39)

It is very likely that you may find putting retracting gears on a model will be more work than your capabilities will allow, but you decide that you can make up the point difference with sliding canopy, lights, flaps, etc., any or all of which can give you extra points.

Where do we draw the line on scale fidelity? In order to be a consistant winner, *no* deviations should be made. This dictates choosing a flyable design that requires small amounts of adjusting trim, shifting CG, etc. but there are only a small percentage of scale builders obsessed with winning. Most scale men build because it is a labor of love and winning a trophy is only an added bonus. True, they build to win, because it would defeat their purpose not to, and the models, when completed *properly*, are automatically capable of winning. There are times when we might want to build a scale model that we know will not fly properly, but we then may be willing to forsake a little scale fidelity in order to achieve proper flight trim: such as adding stabilizer area, rudder area, etc. This type of thinking is more justifiable now, since the new scale rules have been affected. These new rules give flight points. This means we can recover what may have been lost in scale fidelity points, by proper flying characteristics. The new rules, incidentally, are very fair and a definite improvement and gain for control line flying scale. Let it be understood that these are all my own observations and do not reflect, necessarily, the views of all scale builders, but it is food for thought.

Plans presented are accurate and are the same plans as per layout and general arrangement used in the original P-26-A. I have, many times in the past, come across plans of winning models, only to find upon close scrutiny, that the plans offered were only an approximation of the planes they were to represent. I am not refering just to scale types, but other types, also. Now this should not be blamed on the modeler who drew the plans for his model the best way he knew how, as there are definite reasons for altering or deviating from the original model when drawing construction drawings. It is apparent, therefore, that some plans offered to us are excellent plans, and although they may seem lacking in some respects, it is only because the original builder felt that certain areas of construction he left up to the discretion of the duplicator of his model. What does irritate us sometimes, though, is when we know someone is pulling a fast one on us and shows a drawing which is a deviation, and we know it, but no explanation is given as to why. With all of this in mind, I will explain the difference between my original plane and the plans presented here. It is in other areas that I feel that the changes in construction were necessary in order to make it possible for a greater number of builders to construct this model. On the original model, the landing gear is fully shock absorbing, built up with a steel cage brazed together containing rails and bushings to guide the main gear shaft with a 7 lb. spring fastened to it. All this is encased in a formed aluminum strut fairing. Sound complicated? Sure it is, for the average builder who just wants to build this plane for flying sport or for the junior building this as his next contest rig. That's why a simple piano wire gear set-up is shown. The cowl on the original was formed from 24 Brinnell hardness aluminum pipe. A six inch section is *$8*. It had to be turned down on a lathe. The tail wheel shroud was formed from. 010 aluminum sheet. The engine mounts are cut from solid brass

bars, drilled and tapped. It should be apparent, by now, that it would be foolish to show things like this on a plan. Most builders may think I am crazy. Although this may well be, I don't want everybody else to be aware of it.

There are other items omitted here, but which were incorporated on the original model; such as movable control surfaces operating from the cockpit, operating landing flaps, throttle hook-up and cockpit door hinging. They are all items that may only confuse some modelers but can be easily incorporated into the model by any experienced contest modeler. It would be useless to have complete drawings showing an engine, but a little info here would not hurt. The original engine had a crankcase built up from basswood, with cylinders made of polystyrene plastic; pushrod tubes were of brass tubing and the rocker covers were basswood. This whole assembly was cut to accommodate the engine used to power the model.

The engine used, when the model was first flown at the 1962 Nationals, was an O.S. Max. 49 R.C., but the model weighs 6 lbs. 9 oz. and the O.S. had to work to pull this high wing loading. I flew the model for two years this way, and prior to the 1964 Nationals, I installed a Super Tigre 56 R.C. Plenty of power now, but as hot as it was on the runway at the air station, I had set the engine a hair too lean. I wound up with less power from my .56 than I would have obtained from the O.S. 49. The Super Tigre 56 is still a good bet, though. This engine is a real bear and is more than adequate for a heavy model like mine; but it also has a fine ability to throttle low enough, dependably, for landings and taxi laps.

The plans appearing here are A-O.K. for scale, but the construction is greatly simplified to accommodate a greater percentage of builders. However, the door is wide open for anyone who wants to go the whole route with a P-26-A. The fuel tank used must be one that will allow fuel feed until the tank is empty, even while the model is not flying; this means a square or rectangular tank. There is plenty of room for fuel tank placement indicated on plan, top view. I ran the filler tube and vent out of the front of the plane so that they are positioned within the cowl, between and to the rear of the engine cylinders. Center section of the wing, with the landing gear struts, is put in place the same time that the bulkheads are installed on the crutch. The fuselage is completely planked with 1/8 x 3/8 strips. The fuselage has no unusual shape or contours, so the planking goes on easily.

All the controls and internal construction must be completed before the last planks go on.

My original model carries the 34th pursuit squadron coloring, with 17th attack group insignia. These colors are as follows: fuselage is olive drab, wings are army chrome yellow, as are the elevators and stabilizer; the vertical fin is white; the rudder has the red, white and blue recognition pattern, common to all pre-World War II army aircraft; the scallops on the vertical fin and stabilizer are gloss black; the wing walks are dull grain surface; all the lettering is black. The fuselage scallops are white outer with black inner; the landing gear fairings are olive drab with scallops that match the fuselage.

The insignia and lettering are incorporated in the plans. I hope this will be a help to those of you who decide to build this model. All trim, lettering and insignia were painted on the original, but decal material can be substituted in place of this.

The tail section should be kept as light as possible, because of the short nose moment although model will require nose trim to balance it properly. The model *should not be flown* unless it balances *at least* 5 degrees nose down when balanced 1¼" from the leading edge of the center section.

Finish: I recommend that you pull out the May 1964 issue of Model Airplane News where the plans for my Electra X-35 stunt ship appeared, and where I gave complete finishing procedure which I recommend for the P26-A, *except, instead of enamel use dope* (*Butyrate*). In this article, I mentioned the use of synthetic enamel for stunt plane. I still do, but we are now dealing with a scale model, and there is scale fidelity to reckon with, and the latter falls under the rules category of color and markings. The real airplane has a dope finish, so our model must have a dope finish also. Give six coats of color dope over the prepared surface. Then mask the outer fuselage scallops and mask the area where the black centers will be. Paint the white and after it has completely dried, take off the tape where the black is to go and mask the white. Seal all the edges of the tape with clear dope first, to prevent

the paint from creeping under. The black is now painted on and when dry, tape is removed. It should be apparent now, why I did not sandwich the colors on top of one another instead of making the butt joints with the colors. In case you missed it, here's why: the fuselage is olive drab, right? The white goes on top of this, but if black is put over the white, and rub out after sanding the whole airplane with 600 wet or dry paper (used with water) the black edges will rub through into the white, leaving a mess to be touched up with resulting roughness. Try to get rid of any ridge between colors, and black is very soft when rubbing out and cuts very easily. It takes a little more time to butt the colors, but it is worth it. Many builders prefer putting several coats of clear dope on entire model after wet sanding with #600. This is fine for a high depth finish, but in scale work it is not necessary. Remember, the original plane does not have a clear overcoat and depends on the natural gloss for luster and color tone. It is very necessary to duplicate as close as possible the finish of the full scale subject.

I hope that if you build this P-26-A, you will get as much enjoyment and pleasure from your replica as I have had from mine.