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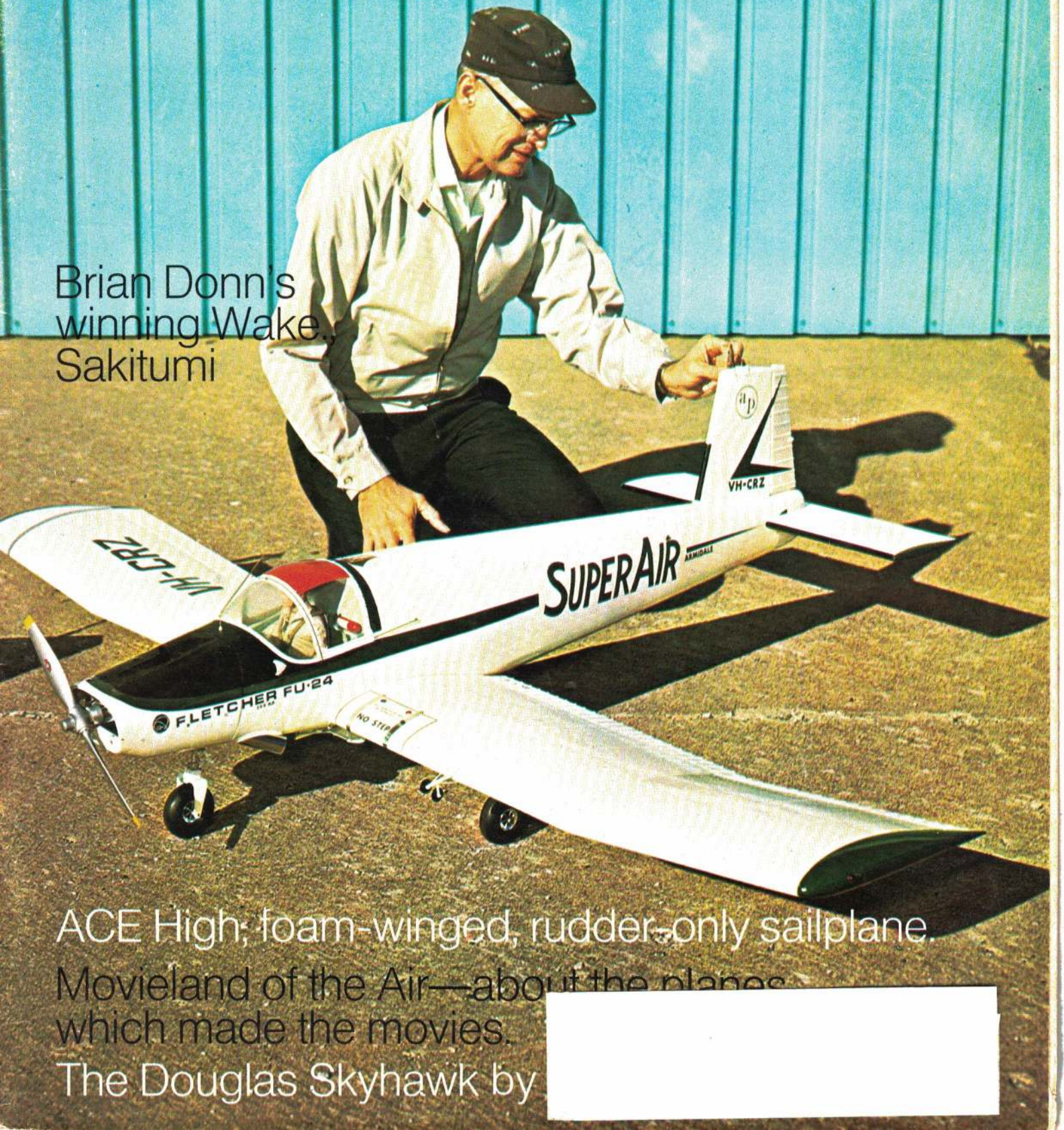
SEPTEMBER 1971
02303

AMERICAN aircraft modeler



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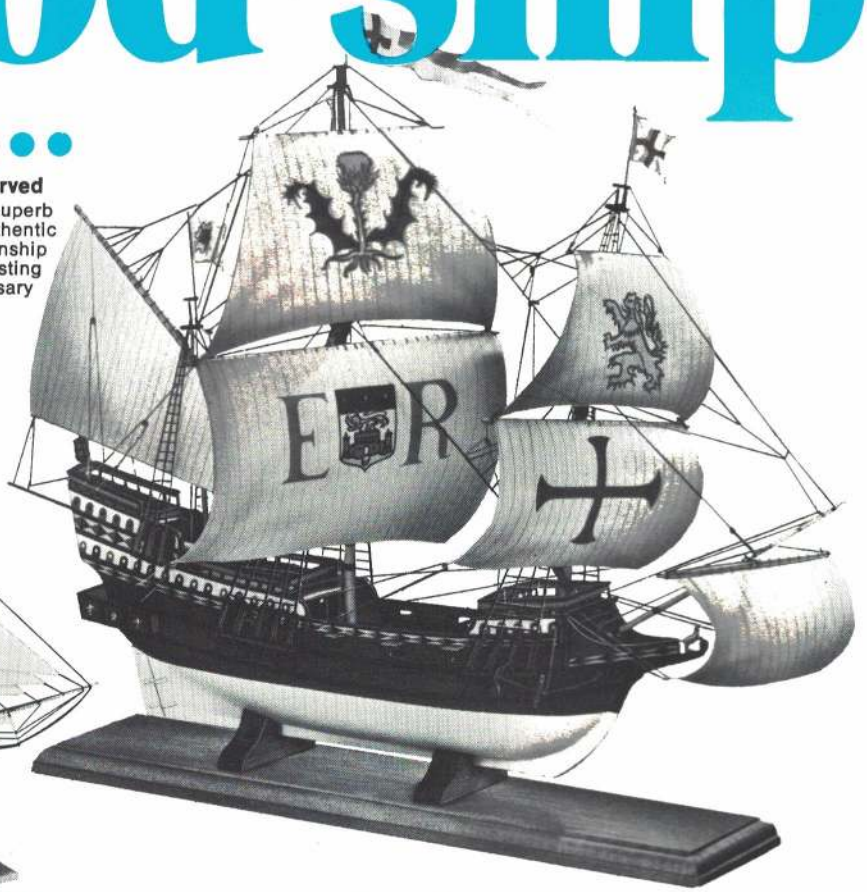

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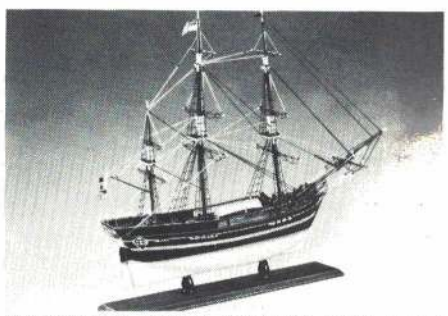

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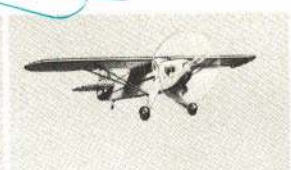

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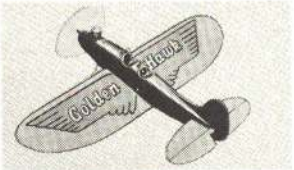

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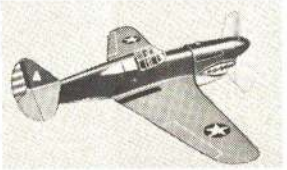

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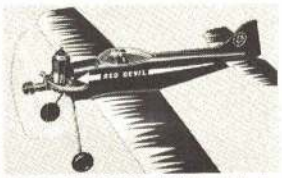

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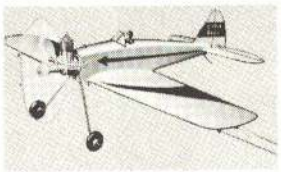

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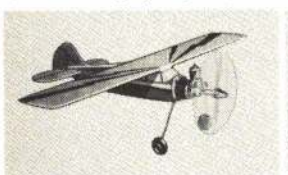

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COVER PHOTO: Claude McCullough, AAM's RC Scale Correspondent in the Where The Action Is feature, poses with his perfectly detailed Fletcher FU-24. Power is a Bantam Twin 60. Plane is easy to fly with generous wing area.

WILLIAM J. WINTER — PUBLISHER EDWARD C. SWEENEY, JR.—EDITOR
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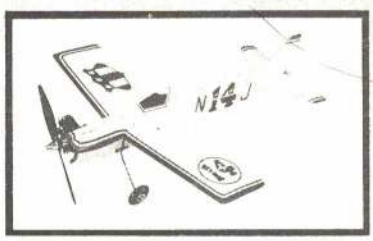

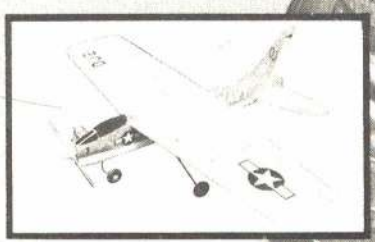

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dumas planes

straight and level

MODEL AIRPLANE HOBBYISTS once were highly sensitive about the "toy" image—real or imagined. While a lot of kids who build stick and paper rubber jobs or dabble gookily with plastics may be accused of playing with toys when the homework gets put off, and off, and off, few adults suffer this stigma.

Stigma? Hardly! Radio control, with its eight-pound speedsters, rather frightening 60 engines, and tiny digital magic boxes implies that our mentality deserves a more special consideration from anyone not bugged by taxes, traffic, or ulcers. This is a day when all sorts of strange things happen, and even the spectacle of a hand-launched glider fiend tossing his sheet-balsa creation around the cul-de-sac may be assumed to be an atmospheric pollution test or preparations for the next protest march.

The 'toy' image is laid to rest—forever, we hope.

We know a model airplane is not a toy. All models have personality—and no toy has that, at least in a living sense. Model airplanes are alive! Now, it is difficult to detect their doing anything while being watched through a crack in the door. However, the writer does remember one that even stared back malevolently. It was a deep-bellied Beam (a Guillow kit of the mid-fifties). But any crate with such pouter-pigeon corpulence probably had a problem. And Hal deBolt's early Live Wire, boxy and purposeful, very likely reflected in its moments of solitude about Mother Nature's whimsy. Not that these—and all the other distinctive fat, thin, long, short, flying barndoors and pencil bombers, of a day when designers prized individuality—did not fly well. It was just that they were endowed with their creator's personality. Like dogs, they resembled their masters.

We've got to explain that! Well, when Hal deBolt sticks a purposeful corncob in his mouth, he looks kinda dedicated. Early day crates did reflect our hidden motivations—maybe. These days, come to think of it, Hal creates some of the most beautiful flying machinery in captivity, and there goes that theory. More likely, unvarnished functionalism once may have been the goal, but years of adding just one more last-minute touch have refined the look of things. The writer is still convinced, however, that these jobbies are not really inanimate. There's just too much funny business.

Why do models always land in trees? Roy Clough once wrote an article on the subject. Tongue in cheek, he even used footnotes. It had something to do with moisture and leaves—a likely story! Serious types wrote in to question his facts. Models did land in trees for discernible scientific reasons, they said, but he had his humidity and air pressure inverted, or something. The writer knows the real reason. So, if you persist in thinking these models have no minds of their own, we can't help you.

We had this big cabin job, see. It went out of control (now you do know these things don't really go out of control, don't you?) and headed for a patch of woods. Flitting glimpses of red and yellow occasionally were had through the dense foliage. As the motor droned on, we thought patriotically (would that help?) of the Star Spangled Banner. (The bombs bursting in air bit—our flag was still there!) Then the crate burst out of the other side of the woods and back under control. What you have to do with these "toy" confrontations is think good thoughts. Try it. For a change! If the thought is good enough—and that depends on you—the machine knows it. With intelligence like that, your dreamship could be gifted with ESP. Undoubtedly.

Thinking un-good thoughts is bad. We took Marvelous Mortimer to a 200-acre farm and parked the car, trunk open, in a safe corner. Mortimer spiral-dived into the trunk with a thunderous kerplam just because we were muttering an objective characterization of its trim servo. The car never got over it. The dizzy spiral had fortunately induced a case of mistaken identity. (Rare for a model plane.) Any crate with its wits about it is as agressive as a Sidewinder missile. Even in its last agony, Mortimer proved a scientific point.

The equipment manufacturer had made national noises about the dependability of his product. The product, a marvel that year, was about the size of a small brick, with rows of big vacuum tubes and heavy sealed relays sticking up like factory chimneys. The battery pack (only mountain men and beaver trappers could appreciate its size and weight) was stuck in the nose. A compound escapement was expected to handle the rudder on the nine-pound monster; a non-neutralizing servo, the trim.

Well, sir, when the plane hit that car, objects continued on their way like the tires off an Indy racer when it hits the wall. A constellation of wires, packs, switches, radio, etc., described a high parabolic arc and landed in the weeds at our feet—you could hear it say, if you listened hard enough, here I am, master. So we pressed the buttons and pushed the stick. Everything worked perfectly. We remember thinking: "How reliable can they get?"

Yes sir, these "toys" know something we don't. They even have laws. Besides all those aerodynamic laws the designers impress each other with—yawn, yawn, yawn—there is Murphy's law. This hurts the writer more than all the other crate-ish pranks. This precept of

(Continued on page 76)

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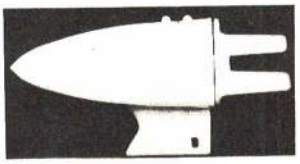

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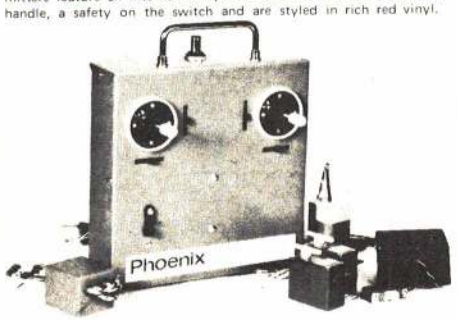

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modeler mail

Convincing case for mufflers

I'd like to comment on an item in the control line section of "Where the Action Is" (June 1971 **AAM**) entitled "Noise Psychology". Public relations are, as we all know, very important. Seven years with model rocketry has shown me that a public demonstration, well planned and with added emphasis on safety, can be just as much fun, and possibly more rewarding, than contest flying. My disagreement lies with the choice of heading for the paragraph, and with the last sentence: "Every new modeler is another person who never will phone in a noise complaint." I don't feel that this is the right attitude regarding the problem of noise.

I have been flying RC (my introduction to larger engines) for four years. I love planes, but, like lots of other people, I find the noise of a 60, or even a hot 049 close up, just plain obnoxious. I guess I'm lucky because I've used a muffler almost since I started flying, and the adjustment to a quiet "buzz" up in the air was quite easy.

As a proponent of mufflers I've heard a lot of people's gripes about them. Some are reflections of the great resistance to change, of which we are all guilty to some extent. Some of the complaints are certainly valid–but no insoluble. A lot of work has to be done by the manufacturers and by individuals. But until engines run better with quiet mufflers than without, as Maynard Hill and others prophesy, somebody has to make a few sacrifices; just try to convince the non-flying public that it's them!

I would like to say one further thing about muffler rules. DCRC is the only club that I'm familiar with, and I know that they have done a lot of work with mufflers. Their muffler rule, enacted in 1969, requires not just a muffler, but a suitable degree of noise reduction. This rule is to the point, but unfortunately very subjective and hard to enforce. As Stew Vance pointed out in his excellent editorial in the September, 1969 DCRC newsletter, a trip to the flying field will show (both visibly and audibly) that more emphasis is put on making flow-through pipes that look like mufflers, but do very little, than on designing an efficient, effective muffler. Who do these people think they're fooling? Who do they blame when good flying fields become off-limits?

As soon as possible I plan to run tests on commercial mufflers and any homemade units that I can borrow or get drawings for, and try a few ideas of my own. I'd really appreciate it if anyone who has done this sort of work, or who has any ideas, would let me hear from him.

Bob Singer, 3304 Shirley Lane, Chevy Chase, Md. 20015

Superlative ship

It seems that every time I pick up one of your competitor's magazines I read, "In this issue: The Ultimate 40-powered RC Stunt & Sport Ship."

Well, whether you know it or not, you published the ultimate 40 RC ship in your article "Flower Power II" (June 1970 **AAM**). Two other Tri-County, N.J. modelers, Frank and Mike Sansone, and I have constructed three. All of them are the same–fantastic!

The plane does everything James Trovillion says it will–and more. Its outstanding trait is linear response to stick movements. My plane was completed last October and since then has been flown approximately 125 times. This airplane flew with no trim changes, straight from the board. It is powered by an O.S. Max H40P engine and equipped with the very good Min-X Astromite 72 four-channel equipment. As Trovillion said, the ship is quite lively. Mine tops 85 mph in level flight and yet you really have to work to make it stall. Landings are beautiful.

Thank you for bringing us this airplane. In my 12 years of modeling, no airplane has given me as much satisfaction and just plain old enjoyment as this one.

M.M. McCormick, South River, N.J.

'Wise' Winner

I recently built the Poullin peanut scale model which was in the June 1971 issue of **AAM**. Putting this model in the issue was a very wise idea, as it is simple, easy to build, and flies just great! I have flown it in two contests and it has already placed first and second. During one flight, it hit the ceiling of a 42-foot building.

I have won the Long Island model airplane high-point two years in a row, and am only 12–I am sure the Poullin will help me win it again.

Bruce Pailet, Glenhead, N.Y.

Ain't what she used to be. . .

I have been an AMA member for several years and have been reading **American Aircraft Modeler**, *Flying Models* and *Model Airplane News* for many more years. I am a control line enthusiast and have an interest in single-channel radio, mostly glider types.

I must agree with John McKenna (June, 1971, "Modeler Mail"). I am also losing interest in the magazine because of the emphasis you are placing on RC. The editor's reply to McKenna was justified with respect to control line designers not coming up with a sufficient number of interesting projects. This can and probably will be remedied with the formation of a NCLS, as proposed by John Clemens.

However, the editor was not justified in saying that there hasn't been a deemphasis on control line. The "Where the Action Is" section is an excellent addition to the magazine, but it does not do service to the thousands of free flight, rubber and control line enthusiasts. Almost every page, editorial and advertising, deals heavily with radio control equipment, models and accessories. Most of this equipment is beyond the income range of the average modeler, especially juniors. There is at least one magazine devoted entirely to RC, so why should those of us who are not interested in RC be subjected to such an overwhelming percentage of RC advertising and articles?

If I want to order a J. Roberts Bellcrank, a U-Reely handle or even a gas tank for a Ringmaster, I can't do it thru **AAM**. The free-flighter can't order dethermalizer fuse or Jap tissue in colors thru your magazine. Where does the single-channel flier go for an escapement, RO servo or replacement part?

Whatever happened to the good old broad-spectrum magazine that a kid or sport flier could leaf thru and find the article or building part he was looking for? You haven't deemphasized control line, you've overemphasized RC. **AAM** is supposed to be a modeler's magazine, not a catalog for sophisticated, expensive equipment.

Speaking for myself and those I have flown with, a lot of our interest and knowledge of aircraft came from articles which explained how and why an airplane worked. Why not rerun Netzeband's articles on control-line aerodynamics from a 1966 issue of **AAM**? A modeler who understands what is going on will be equipped to come up with something interesting and original. The same goes for free flight–why not a basic series on trimming and flying? I haven't seen a Jetex model or a payload for years! Many years ago there was a Modified Ringmaster event that was very popular; scoring was for originality and performance. Why not do it again? Bring your magazine back to the weekend modeler!

I don't want to sound as if I dislike **AAM**–I think it is a great magazine! However, it has gotten too far away from the average, non-competition modeler and overemphasizes things he doesn't need, while not supplying him with the information and equipment he does need. For the average modeler, **AAM** just ain't what it used to be. . .

William T. Geertsen, Ft. Bragg, N.C.

Disappointing response

Since you published my letter requesting club decals and stickers for a fellow modeler in Holland (Feb. 1971 **AAM**), I received 12 replies and I wish to sincerely thank these clubs for their interest.

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I know our friends will be very appreciative; however, I hope we won't be too embarrassed by the number of replies from European clubs he forwards to me. I'm sure the response from them, notwithstanding the difficulty involved, will be overwhelming in its generosity.

May I make another plea for all the clubs of all types out there to please take the time to forward a few of your decals, thereby showing the true spirit of friendship of the American modeler. Come on guys, let's all get together and do this thing right!

Michael Turo, Garden State Circle Burners, 43 Old Orchard Ct., Cedar Grove, N.J.

Help for the novice

Various members of our Freelancer's RC Club have seen numerous letters from beginning modelers published in the "Modeler Mail" column of your magazine. Many of the writers seem to experience great difficulty in obtaining the materials, advice and assistance that would enable them to progress in the hobby.

We feel, from personal experience, that the beginning modeler should select a hobby shop whose owner is an experienced flier and who will take an interest in helping the beginner select the proper equipment and materials to reasonably insure a successful first airplane.

We have been quite fortunate in this respect. We live approximately 150 miles from the nearest hobby shop and at one time found it extremely difficult to obtain supplies. We then became acquainted with Bob Mosley, operator of the Affton Hobby Shop in St. Louis, who was instrumental in enabling us to make a successful transition from control-line flying to radio control. He has been most helpful and cooperative and it almost seems as if we have a hobby shop in our own hometown.

A hobby dealer like Mosley can save the beginner time and money that might otherwise be spent on projects that do not match the modeler's ability.

Robert E. Stagner, Poplar Bluff, Mo.

Another side of the coin

This letter is prompted by the request in **AAM**'s July issue for anyone having views on control-line coverage in the magazine to write in. I am a CL enthusiast above all, so a magazine devoted to nothing but "yo-yos" would tickle me. Never expecting to see such a publication, I'll speak up for adequate CL coverage in the existing magazine. "Where the Action Is" gives all modelers a reason to buy each issue of **AAM**. At least three construction articles in each issue is mandatory—one each for FF, UC and RC. Your magazine has done admirably well.

Please remember its middle name is "Aircraft" and don't get too involved with boats and cars. All branches of aero modelers can benefit from features intended for builders of other types of planes—even to plastic buffs painting desk models per the instructions given for an RC superscale!

A recent issue of another model airplane mag had three construction articles of RC ships; none of a control liner. The construction articles are the meat of a

publication. Exclusion of a "how to" feature on CL, especially when space in that issue is given to boats, cars or to several RC models, renders that issue substandard for a general interest, multi-category model airplane magazine.

Who knows if most modelers fly UC, FF or RC? My guess is that more people buy and fly control-line models than the other types—albeit more money is spent on RC materials. Therefore, if magazine coverage is dictated by reader interest, CL rates a good portion of pages printed each month. It appears to me that you think so too, for which I thank you.

Dave Kingman, Ft. Walton Beach, Fla.

Another site gone

Editorial comment was made recently about models in relation to full-size aircraft. The old Canton Airport, long unused, has been a place in recent years to fly radio control. Not any more.

Sometime last summer, an RC modeler flew his plane in formation with an airplane landing at nearby Norwood Airport. Flying of models has now been completely stopped at this site because of someone's foolishness. The fliers who formerly used the site are now trying to join local clubs in order to have access to a flying site. These clubs are at capacity membership for practical use of their fields, so not everyone will be able to find an alternative.

So. . .back to the display models!

Sears McCorrison, Mattapan, Mass.

Kits 'n' kites

There are all too many facets of modeling that are being hurt by the apparent lack of kits and accessories. Free flight is suffering to some extent because of the lack of a variety of kits, motors and allied materials. How many motors for 1/2A are available to the modeler interested in that phase?

Gliders are my first love and I feel that there could be more plans run for them. American manufacturers could come up with more kits as good as the German ones. Several magazines dabbled in glider columns, but they are not constant features.

May I take this opportunity to ask what has been allowed to happen to model boating in this country? I remember back issues of *Young Men* and *American Modeler* that had some wonderful articles in them on model boating, with excellent plans such as the Super Scooter, Missile Ship, Bunker Boat, Jersey Dragger and several others that were real good plans. Granted, yours is primarily a model airplane magazine, but would it really hurt to occasionally feature the equally fascinating model boats?

I enjoyed Bob Meuser's column on kites in the November issue. Many people have found flying kites a welcome and interesting relief. It is also a very economical hobby. Those readers interested in serious kite flying should contact American Kitefliers Association, Box 1511, Silver City, N.M. 88061, for information on an organization dedicated to the promotion of this sport.

Clifford Osborne, Chillicothe, Ohio

ON THE SCENE

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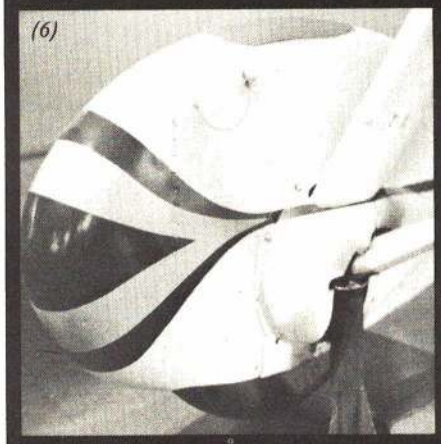
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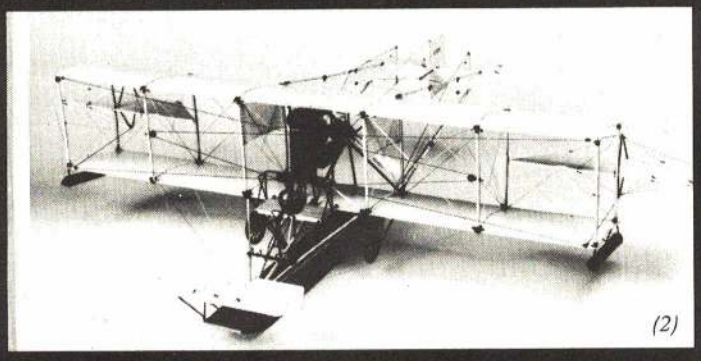
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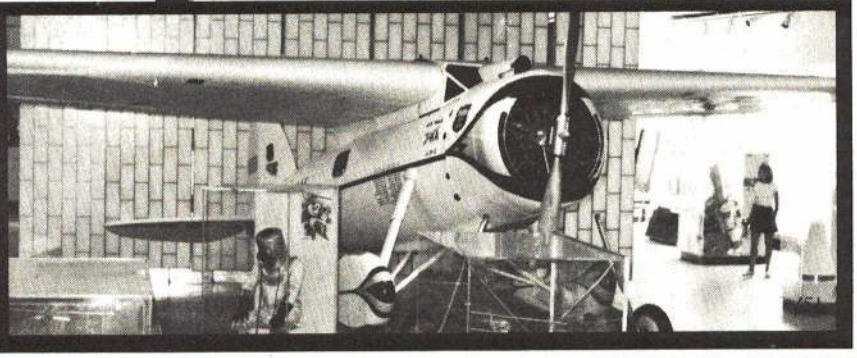
(1) Featured in AAM's August 1970 issue, Monty Groves' RC Winnie Mae as seen by Sweeney and son. (2) Curtiss A-1 model built by R.S. Nevin. (3) Ford Trimotor, 4-AT-52, model built by Herbert Hartwick. (4) Consolidated NY-2 model built by R.C. Mikesh. (5) National Air and Space Museum provides a warehouse of photographic information for the scale-modeler. (6) A close-up shows how to use a camera to answer questions about the real plane's details before the model is finished!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A visit to the Smithsonian in D.C.

by PATRICIA T. GROVES

A REPLICA OF WILEY POST'S durable Lockheed Vega left San Jose, Calif., Airport, April 10, 1971, bound for the Nation's Capital. Less than six flying hours later, the Winnie Mae landed at Washington National Airport, but the record flight caused not so much as a ripple within the hallowed halls of the FAA–since that's just about normal elapsed flying time for a jet freighter.

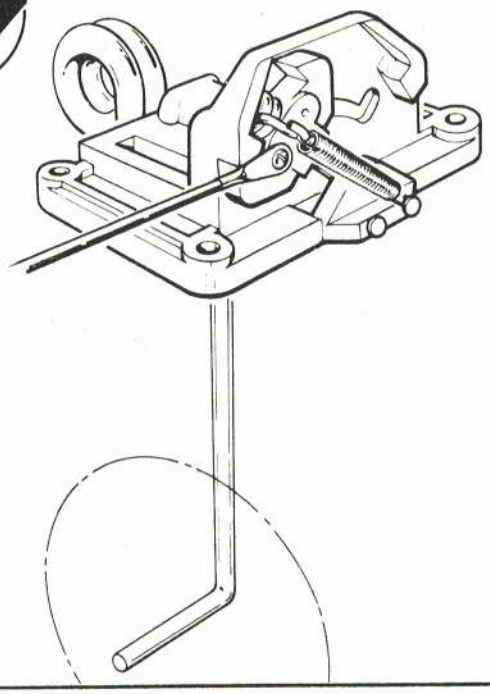
In this instance, the Vega was Monty Groves' one-sixth scale model which was packed securely within a large wooden crate and carried inside the commodious air freighter. Smithsonian Institution's Lou Casey had requested immediate shipment of Monty's accurately detailed radio-controlled Winnie Mae and it is currently on display at the Smithsonian's National Air and Space Museum in Washington, D.C.

As host to many famous record-breaking aircraft, the Museum presents great possibilities for study by the serious scale modeler. Complete photo coverage and existing authenticated plans for the original aircraft are in the museum files and can be obtained for nominal fees. Their records contain accurate and detailed information on all the aircraft they have on hand as well as many they don't have. The full-scale planes housed in the museum can be photographed excepted for cockpit shots. Museum personnel are as cooperative and helpful as possible.

Among other examples of modeling craftsmanship at the museum are R.S. Nevin's Curtiss A-1. The original A-1 was one of the first three aircraft ordered by the U.S. Navy in 1911. Two other outstanding models are Herbert Hartwick's classic Ford Trimotor, 4-AT-52, and Bob Mikesh' Consolidated NY-2. It was in the NY-2 that Jimmy Doolittle flew the first completely hooded instrument flight from takeoff to landing at Mitchell Field, Long Island, Sept. 24, 1929.

When building scale models, it is best to gather all available data and photographs on that particular airplane before starting to build. A large supply of photos from all angles will answer numerous questions which come up during construction. The middle of the job is no time to wonder about the shape of that tail skid or the fairings on the wheel pants. If nothing else, scale modeling teaches the builder to be observant.

CARL GOLDBERG



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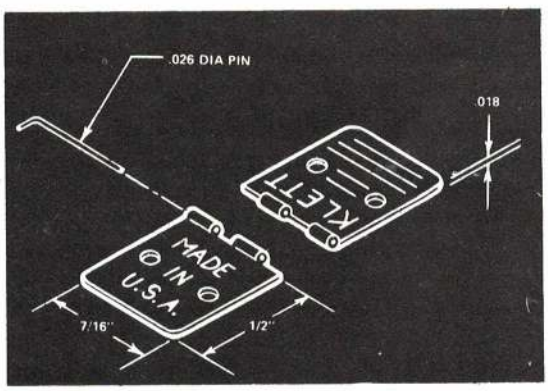

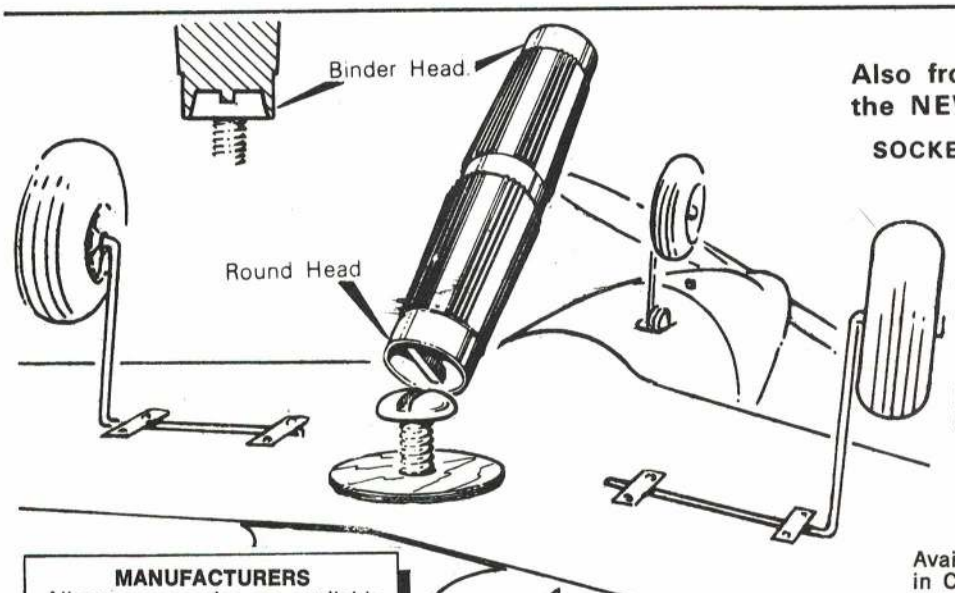

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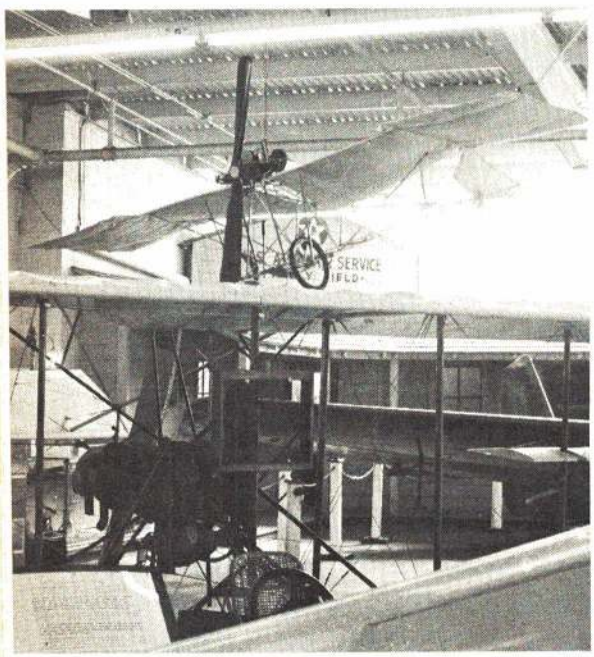
MOVIELAND OF THE AIR

IF YOU THINK the pilots who fly stunt planes in motion pictures, who fly through hangars, who crash planes deliberately and walk away with nary a scratch, are zany, half-drunk kooks, you are wrong. Dead wrong! It takes the utmost flying skill, an uncanny sense of balance and timing, a cool head and a steady hand to do these tricks. Frank Gifford Tallman is such a man and he has a hangar full of planes which have been used in well-known movies, doing stunts, simply "acting", or carrying the camera itself.

Tallman, a retired U.S. Navy Commander, began collecting vintage aircraft for a hobby and did a fair amount of movie flying on the side. He is one of the handful of pilots today certified to fly any kind of aircraft from jets to helicopters or gliders.

Up until 1961 he was in competition with the granddaddy of all stunt pilots, Paul Mantz, who also owned many vintage planes. The two decided to join forces in 1961 and founded Tallmantz Aviation for the purpose of chartering flights and doing flying for movie cameras. Movieland of the Air was founded soon after, when it was found that most of the planes in their collection had been used in one movie or another with resultant wide public appeal.

The famed Movieland of the Air museum is located at the Orange County Airport, about 20 minutes by car from Disneyland, south of Los Angeles. Visitors find a movie marquee beside every plane, explaining where and how it was used. Famous planes from the *Dawn Patrol, Angels With Wings, North By*



Curtiss 1910 Pusher, foreground, was first plane to fly from the deck of a Navy ship. French Voison, hung from ceiling, was featured in movie, Those Magnificient Men and Their Flying Machines.

Sopwith Triplane used by British Royal Naval Air Force stunned the German fighters in WWI prior to introduction of Fokker Triplane (inspired by the Sopwith) and D-7. Note hut and mural terrain typical of conditions at Front in 1916.

The Tallmantz collection of historical aircraft stresses association with famous stars and movies.

by GEORGE SIPOSS

Northwest, Hellfighters, Fate is the Hunter, Carpetbaggers, Catch 22, Spirit of St. Louis, and many, many other films can be seen here.

Most planes are shown in an authentic setting with relics of the Lafayette Escadrille, signed photographs of famous movie stars, as well as interesting objects which have a human interest story connecting them to the planes. Take "the hand" for instance. During the filming of *Catch 22*, a plastic dummy "actor" was standing on a raft and was supposed to be cut in half by a low-flying L-5 Army spotter plane. The stunt went off well but part of the dummy, the hand, broke off and lodged in the elevator of the plane, almost causing it to crash.

For the filming of *Catch 22*, Tallmantz hired and trained pilots and mechanics to take care of no less than 18 real B-25's. For four months, the cameras ground away as the 18 planes acted out their scenes, while three Cessnas, an L-5, and a helicopter did the filming and transporting of freshly shot film daily from Mexico to Los Angeles. Thirty-six mechanics, 36 pilots-copilots, and 20 flight engineers plus six "filming" pilots were engaged in this gigantic enterprise.

Most of the aerial photography seen in movies, TV, or commercials is done by and from Tallmantz planes. One of them has a camera mounted in its nose and flies at 50 mph. They also use B-25's with the camera mounted in the tail and film in reverse so that when the film is projected in the regular manner it looks as though the plane is approaching the subject.

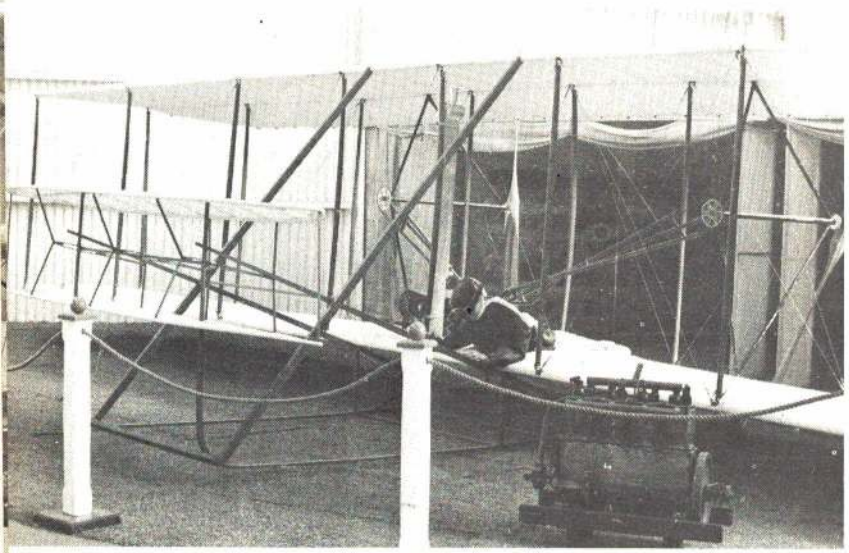
On display are 44 airplanes, some of which date back to the Wright brothers, but most of them are of WW I vintage. Among the most interesting planes are a P-40, one of 18 originally manufactured as a two-seater, and another P-40 which won several cross-country races and set speed records with Paul Mantz at the stick. The replica Wright brothers plane comes from a museum in Niagara Falls, Canada. A Jenny used for the filming of the initial sequences for the *Spirit of St. Louis* is on display. (A replica "Spirit" was built for the film and subsequently flown around the Eiffel Tower on the anniversary of the famous Lindbergh flight) Several bamboo and canvas gliders of pre-Wright brothers vintage are included. Some of the WW I planes, were found in farm barns in orginal stripped and/or

B-25 Valhalla? Eighteen of these WW II North American Mitchell medium bombers were amassed by Tallmantz for movie, Catch 22.

Two-seater Curtiss P-40 was seen in the movie, Tobruk, featuring Rock Hudson, although poster in foreground depicts John Wayne and the movie, Hellfighters.

The Museum, a 20-minute drive from Disneyland, contains 44 planes, some dating back to the Wrights.

Frank Tallman, noted aerobatic pilot, popularized WW II homebuilt movement. Here he poses with Fokker E-3 Eindecker, built by the Museum's curator, Jim Appleby. In 1961 Tallman and Paul Mantz, movie "stunt" pilot, combined collections.



What Museum worth its salt could afford to be without the Wright Brothers' first plane to fly? Movieland resorted to a clever replica, since the original history-making machine is on display at the Smithsonian in Washington.

crashed conditions and are waiting to be restored.

A Curtiss Pusher (equipped with a Lycoming engine) is flown almost daily, as the pilot's legs dangle from the open cockpit–to the delight of the crowds that gather here. Visitors can fly in a barnstorming Waco biplane for three cents per pound. They also can talk to the managers and mechanics who are all very knowledgeable about their airplanes. "It is hard to find mechanics who can service rotary engines and stitch canvas as well as service our helicopters. . .but we have the best," says Jim Appleby, the museum's curator.

Appleby also is the chief pilot for the organization. An old-time model airplane builder, who started in 1935 with rubber and stick models, he graduated to GHQ-powered models and then went on to the first tube-controlled RC. He reminisces about the day right after WW II when he walked through the snow outside a museum in Munich, Germany, and found some old blueprints in the mud. Upon closer examination the prints turned out to be the original drawings for the famous Eindecker. Jim had always wanted to fly this ship. Instead he decided to build a model of the plane from scratch and now proudly claims to be one of the originators of the WW I plane fad. He built other vintage aircraft as well and, being a retired Air Force major himself, he eventually joined Tallmantz.

In 1967, Paul Mantz did the stunt flying for the movie, *Flight of the Phoenix*. When the

This J-1 Trainer from 1915 is a true star among movie-making airplanes, having been featured in Thoroughly Modern Millie, Wings of Eagles, and Wackiest Ship in the Army. **Model in forground is Douglas Navy Skyray.**

Many of the WW I and before craft were found in barns in stripped or crashed condition. Adding human interest to this display are dummy figures of pilot and observer-gunner, with period helmets and goggles. Note drum feed on flexible guns.

last scene was being filmed, the plane broke up in midair, killing him. During the ensuing years the museum almost went broke, many planes were auctioned off, Frank Tallman lost a leg in (of all things) a go-kart accident. But, determination and perseverance have their rewards. Today, Tallmantz and the museum is a bustle of activity with planes being restored or built from scratch (and the wing fabric is still hand-stitched). The charter service is busy, movie engagements keep the pilots occupied and, at this writing, Appleby and Tallman are on a cross-country promotional tour. They fly authentic dogfights with their Nieuport (with Snoopy painted on the fuselage) and Fokker triplane, for Mattel-Monogram.

If you have a half a day or more to spend in this area, visit the Movieland of the Air Museum at the Orange County airport, Santa Ana, Calif. But please do not write for plans or details of planes. The administrative staff is just plain overloaded, and at this time they have no plans service. Mr. Tallman is presently writing a book about "how it feels and smells to fly vintage airplanes." It will describe each famous model in great detail and is based on firsthand experience.

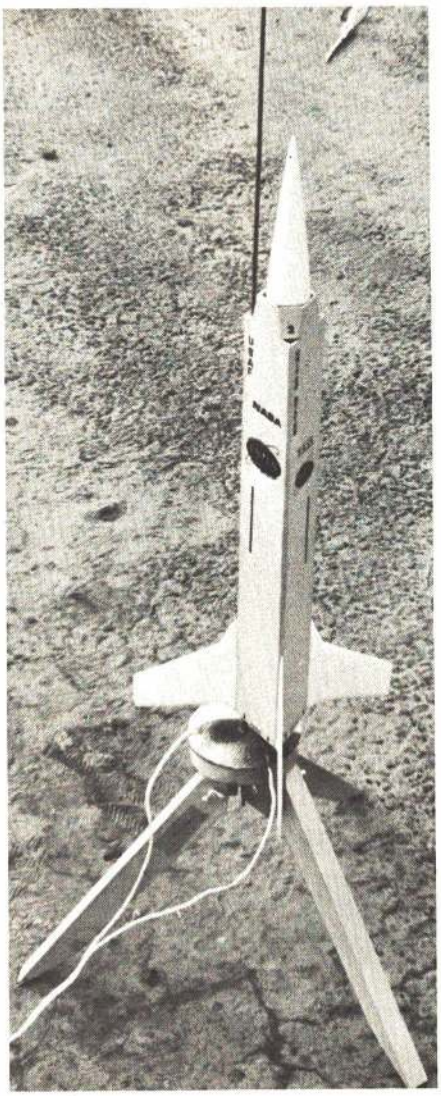
Future plans for the Tallmantz organization include more movie work, although preferably not as strenuous as the scene in *Mad, Mad, Mad World* where a two-engine plane was flown through a huge Coke sign with only three feet to spare. Nice, quiet shots, such as "Fly the friendly skies of

(Continued on page 85)

On its first flight, this rocket's recovery parachute caught a thermal and went out of sight. Plans on next page are dimensioned for immediate construction.

DELTA MARK IV

by DAVID WHITNEY



THE DELTA MARK IV incorporates two significant features in its design. First, and most obvious, it is shaped like a triangle when viewed from the top, hence the name Delta. Second, power is provided by the new Series IV engine manufactured by Estes Industries.

Construction begins with the engine mount. Measure 1/4" from one end of the BT-50J and make a pencil mark. Cut a 1/8" long slit at this mark, parallel to the end of the BT-50J tube. Slip one end of the EH-2 engine holder into this slit so that it runs down the outside of the tube, projecting about 3/8" over the opposite end. Wrap a piece of masking tape around the middle of the tube to hold the EH-2 in place.

Glue the AR-2050 engine block in place. Use plenty of glue, spreading it around the outside of the block. Press the block into the end of the BT-50J tube nearest the slit cut for the engine holder, making sure the block is flush with the end of the tube. While this assembly is drying, take one AR-5055 ring, apply glue to the inside and slip over the end of BT-50J which has the engine block, making sure it is flush with the end of the tube.

Now take the other AR-5055 and cut a slot 1/8" wide, all the way through the ring. Apply glue to the inside of the ring and position it on the end of the BT-50J which is opposite the engine block. Make sure that the slot in the ring coincides with the top of the EH-2 engine holder and that the ring is flush with the end of the tube.

While the engine mount assembly is drying, screw the SE-1 screw eye into the base of the BNC-55AC nose cone. Remove the screw eye and slip three NCW-1 nose cone weights onto it. Be sure to squirt plenty of glue into the hole in the nose cone and replace the screw eye. This assembly must be strong to be able to withstand the forces of ejection at the high air speeds caused by Series IV engines.

Cut three fins, three body shell sides and three body shell fairings from patterns provided. (Note: Patterns of fins and body shell fairings shown here are full size. Follow measurements given on pattern of body shell side for correct dimensions.)

Next sand the edges of each of the three body shell sides of the rocket so that they fit together with a smooth joint. Glue the sides together using pins to keep it from collapsing while the assembly is drying. Sand the fins to a streamlined cross section, rounding off both leading and trailing edges.

Body shell fairings must also be sanded so that they fit in place, as shown, and glued. When the engine mount assembly is dry, apply glue to outside of both AR-5055 rings. Now slip the mount into the BT-55V body tube, engine block end first. Make certain that the rear AR-5055 ring is flush with the end of the body tube.

Test fit the body shell by slipping the body tube inside. Note where the tube contacts the shell and remove the shell from the body. Now apply glue all along the body tube where it contacts the shell. Replace the tube in the shell, making sure that the end with the engine mount is at the correct end of the shell. If, for some reason, the tube should not contact the shell on all three sides, the gap may be filled with scrap balsa.

On each edge of the body shell mark the area where the fin will contact it. Sand this area flat. Now apply glue to the root edge of each fin and to the corresponding area on the edge of the body shell. Align the fins while they dry. This can be done by imagining that each fin is a continuation of the median which runs from the vertex of the triangle to which it is attached.

Take one LL-1A launch lug and cut it in half. Glue one half inside one of the ducts just below the nose cone. It should fit in the notch formed by the joint of two sides of the body shell. Glue the other half of the launch lug just inside the bottom of the shell, making sure it is in at the same joint as the first lug.

Attach the SC-1 shock cord, using the anchor method. Trace the anchor pattern shown onto typing or similar paper. Apply glue to Section 1, align the shock cord on it and fold Section 1 over onto Section 2. Apply glue to Section 3 and fold it over Sections 1 and 2. Now apply glue to the entire assembly and press it to the inside wall of the BT-55V body tube, about 1" from the end. Tie the free end of the shock cord to the screw eye in the nose cone.

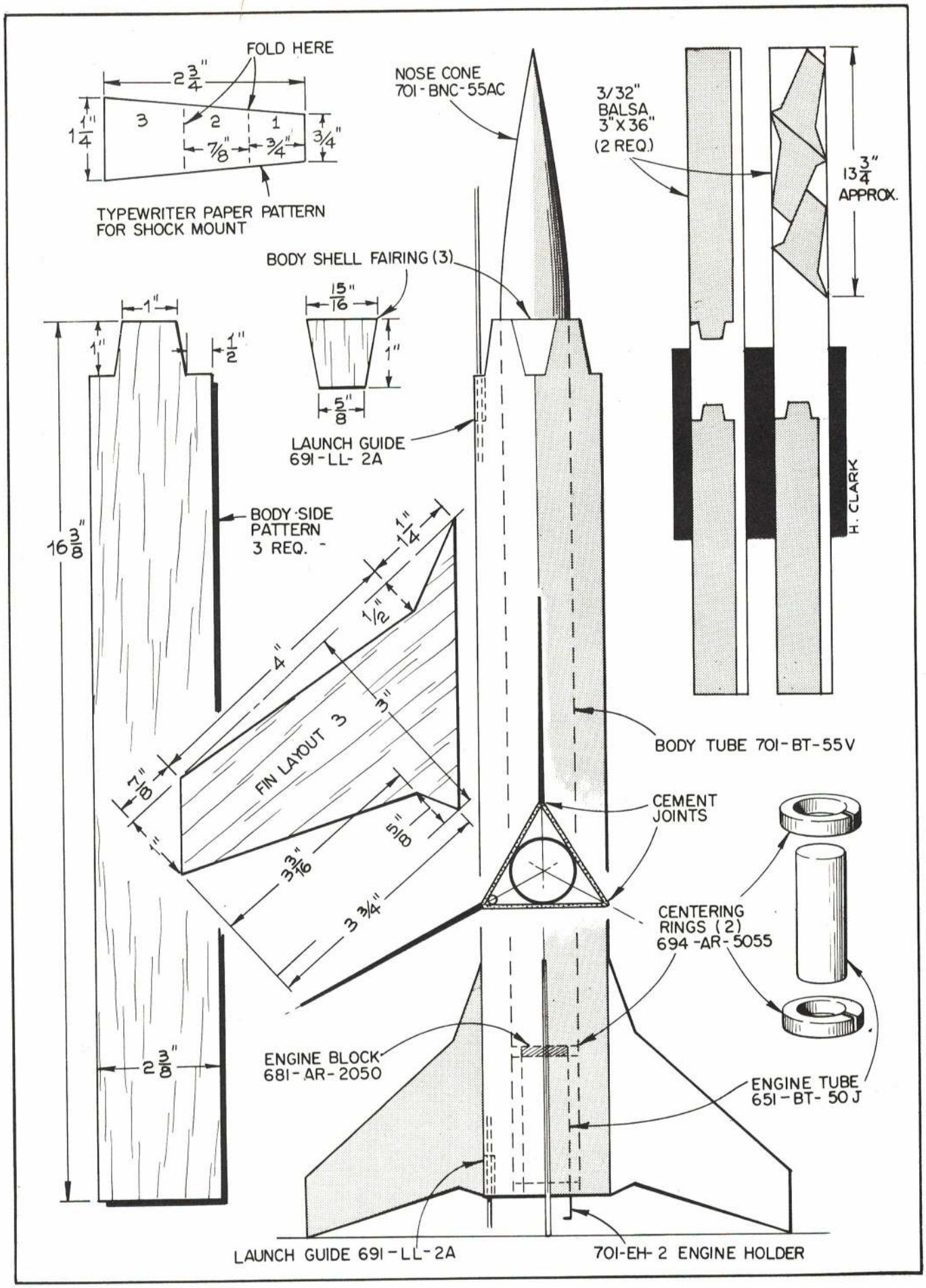
Basic finishing of the Delta Mark IV can be accomplished in either of two ways.

First, seal the nose cone with several coats of Estes Astroseal. The balsa body shell and fins can be finished with Astroseal also. This, however, entails a large amount of sanding which takes a lot of time.

For those who wish to eliminate grain marks, but don't want to spend hours sealing and sanding, here is an alternate method. Cut a piece of paper to the outline of the piece of balsa to be covered. Apply rubber cement to both balsa and paper, according to instructions on the cement bottle, and press together. Cover all balsa, except the nose cone, in this way. (Nose cone must be sealed). The prototype Delta Mark IV was finished using this method.

As for the painting, the prototype was given an allover coat of Testor's gloss white, and the body was then sprayed with Krylon

(Continued on page 86)


FOLD HERE
2 3/4"
1 1/4"
3
2
1
7/8"
3/4"
3/4"
TYPEWRITER PAPER PATTERN FOR SHOCK MOUNT
NOSE CONE 701-BNC-55AC
3/32" BALSA 3"X36" (2 REQ.)
13 3/4" APPROX.
BODY SHELL FAIRING (3)
15/16"
1"
5/8"
1"
1"
1/2"
LAUNCH GUIDE 691-LL-2A
16 3/8"
BODY SIDE PATTERN 3 REQ.
1 1/4"
1/2"
4"
3"
FIN LAYOUT 3
7/8"
1"
3 3/16"
5/10"
3 3/4"
BODY TUBE 701-BT-55V
CEMENT JOINTS
CENTERING RINGS (2) 694-AR-5055
2 3/8"
ENGINE BLOCK 681-AR-2050
ENGINE TUBE 651-BT-50J
LAUNCH GUIDE 691-LL-2A
701-EH-2 ENGINE HOLDER
H. CLARK

FLETCHER FU-24

This down-under duster from Australia offers every desirable feature
a scale modeler could ask. Plenty of details can be added, structure is simple, flies like a trainer.

by CLAUDE McCULLOUGH

Real plane is surprisingly large, using a big 300-hp engine. Even with full load, it gets airborne quickly, works efficiently.

DICK GRAHAM FIRST NOTICED the possibilities of the Fletcher for RC scale when it appeared in a spark plug ad! To find more data, he contacted the FU-24 Project Engineer for the Sargent-Fletcher Co., Gerald M. Barden, who turned out to be a modeler of over 40 years standing and was glad to assist with the project. Design rights for the aircraft had been sold to Air Parts, Ltd., of New Zealand, and Barden had spent some time there helping get it into production and test-flying the first 42 off the line.

Only a few drawings were still available in the U.S. and the "General Arrangement" unfortunately proved to be like many factory drawings of this type—very general, not really meant to be an accurate outline but more a pictorial representation. It was fine for some purposes but not for modeling. In this case, the side view did not match with the top, and Dick became discouraged with the idea of presenting this to a judge as proof of fidelity.

However, I couldn't get the Fletcher's trike gear, generous area of thick wing, and functional lines out of my head and mentioned this interest to a kindred scale enthusiast, Major Langdon Halls. In quick succession, he located FU-24's at Armidale, Australia; photographed and measured them on a bitterly cold day; drew a set of his superb 3-views (subsequently published in *Australian Modeler*); and supplied me with copies. With such friends, it's no wonder scale is a growing fraternity.

Since the Bremen World Champs and the first International RC Scale meet were coming up in a few months, the Fletcher looked like an ideal subject. Its non-complex lines, with no compound curves, would make for speedy building and planking. To meet the FAI 11-lb. limit, I sweat over each piece during construction, but by using restraint with the ply and epoxy and building with Sig Contest balsa wood, the ship eventually turned out just under 10 lb.

Its slim nose proved an ideal test bed for Ben Shereshaw's experimental 60 twin-cylinder engine, now going into production. The Bantam lays to rest old theories that said a twin wouldn't have good power or idle. It pulls a big model around with ease. As for idle, at Bremen I hadn't had time to install brakes but was able to come to a complete stop without them for proto taxi. The Fletcher also made the only touch and go of the meet. Scale has long needed a twin but this engine also should find plenty of use elsewhere, since the vibration level won't shake radio equipment apart. Use of a standard 60 in the model will require extending the head through the cowl, side-mounted or inverted.

The all-moving stabilator of the Fletcher was eyed with a little tredpidation, since some attempts to use these on RC jobs haven't worked out well. However, in this design the control response proved just about right, without any deviation from scale or resorting to servo movement reducing gimmicks. Luckily the plane has a deep enough fuselage under the tail to get in a sufficiently long control horn (make it as long as is possible). Also keep in mind that an adjustment of the clevis has a much greater effect than in a conventional stab-elevator setup. After the last test flight at Frankfurt before the Bremen contest, we applied a little too much correction for a slight nose down tendency and overdid it, causing some trim problems during official flying. (Some time after the International meet, it was discovered that the computer goofed and the Fletcher should have been placed sixth instead of seventh as announced.)

Construction

The only readily available published information on the Fletcher appeared in the May 1962 *Flying Magazine*. It features a pilot report and history on the aircraft, along with photos of the utility version which is equipped with windows and seats for passengers. This would be an interesting modification of the basic model for those who don't want to get into the functional detail of the duster.

Don Halls has loaned me the negatives of his fine pictures in color and black and white

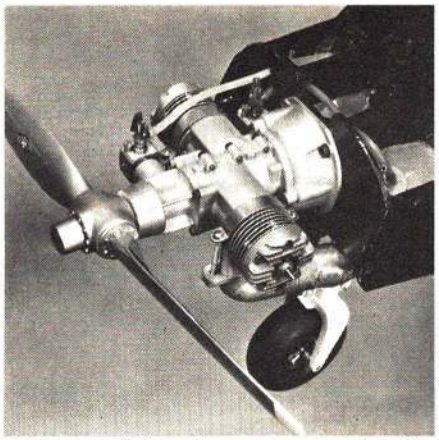
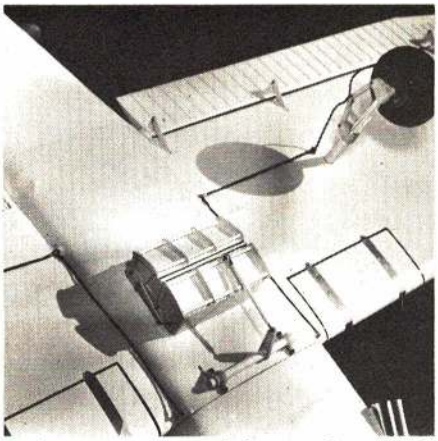


Photo was taken two years ago, but the Bantam Twin engine is just now becoming available. Note mounting structure.



Dusters are not meant for speed, so it all hangs out. Brake line must be easily serviced in the field. Box could open by radio.

Carefully concealed is a stock Breiten nose gear. Fork built up with balsa, shim stock, and Epoxolite. Du-Bro wheel fits scale.

and I'll undertake supplying copies at cost. Send a self-addressed, stamped envelope to Claude McCullough, Rural Route 5, Ottumwa, Iowa 52501, for complete information. There is no substitute for having photos of the prototype for accurate details and this set of shots shows closeups of the landing gear, cockpit, cowl, dust box, etc., as well as views of the complete airplane.

Sig will assist in duplicating the model by providing the big canopy and some small moldings for lights and scoops. Cost is $3.25 plus 50 cents postage. Mark the item: "Attention: Maxey Hester."

Most of the necessary construction information is on the plan. The only unusual area is the nose section which requires some ingenuity to get everything shoe-horned in and still leave some structure. A complete cockpit with reasonably thin walls also must be accommodated. The design worked out well, as shown, but care must be taken to join solidly all joints between the ply and balsa sandwich which forms the sides of the nose and the rest of the fuselage. All the corners in this area should be reinforced with epoxied spruce angles.

Do not omit the cockpit floor since the channel strength formed by the sides and bottom is necessary to keep the structural integrity. Note particularly that F-1 is not attached until after the landing gear, tanks, rear cowl attachment blocks and exhaust augmenter tubes are installed.

One part of the nose construction not shown on the plans depends on the engine being used. Where the mounting bolts for the motor or motor mounts go through the firewall F-1, put a full length 1/8 x 3/8" ply doubler on the rear side. Two pieces of 1/8" ply are then hand-fitted into the area between F-1 and F-2, one end in the corner formed by a side of the mounting bolt doublers and the other end epoxied against F-2 in the area between the tank holes. (See photo of nose with cowling off.) The depth of these pieces is determined by the available space. With the Bantam, one side was full depth, the other only partial because the thrust angle puts one tank in the way. The final result is very strong.

The tanks can be inserted from the cockpit but it is not easy and a few corners may need tapering and rounding. Since the tanks go in easier than they will come out, do painting and any other interior work before putting them in. It is seldom necessary to remove them. A bead of Sig Epoxolite is formed around the tanks on the front of F-2 to prevent fuel seepage into the cockpit.

To avoid a lot of oil and fuel gook in the engine compartment, use mufflers directed right into the exhaust augmenter tubes. Since positioning of the mufflers will depend upon the engine, holes in F-1 to pass them must be custom cut to fit. If mufflers are not used, some holes in F-1 are still needed to allow cooling air to exit.

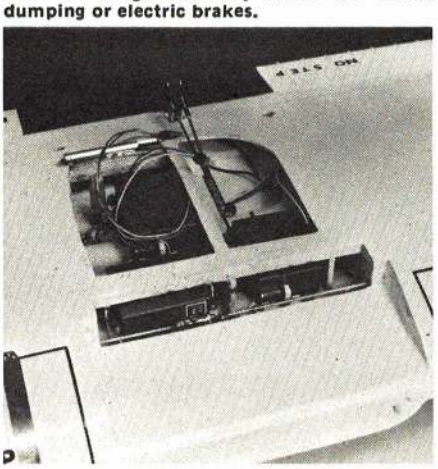
The stabilator hinges were made of telescoped brass tubing so that the unit could be removed for shipment or detached for repair in the event of crash damage. To line up the two outer tubes for imbedding in Epoxolite, run a piece of dowel between them. When they set up, saw a piece out of the dowel so it can be removed. Another long straight dowel should be used between the 1/8" nylon bearings on each side of the fuselage when mounting them to insure the stabilator will go on square.

A female mold for the fiberglass cowl is cast in plaster, using a pattern which is made from balsa block, then coated with resin and polished. For casting, build an open-topped plywood box which is a little bigger than the wooden pattern and may be knocked down easily. Place the pattern in back side down and fill the box with plaster. When it is sufficiently set, turn the box over with the bottom side up and pull out the nails holding it together. This will expose the back of the pattern. Screw a large clothes line hook into it the balsa and pull out, keeping in mind the taper of the sides requires a slight angle. Coat the cast with release agent and paint the

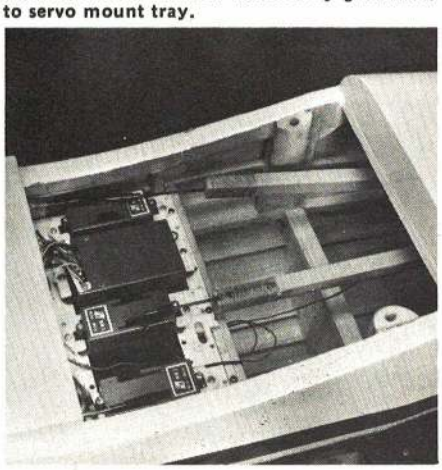
(Continued on page 68)

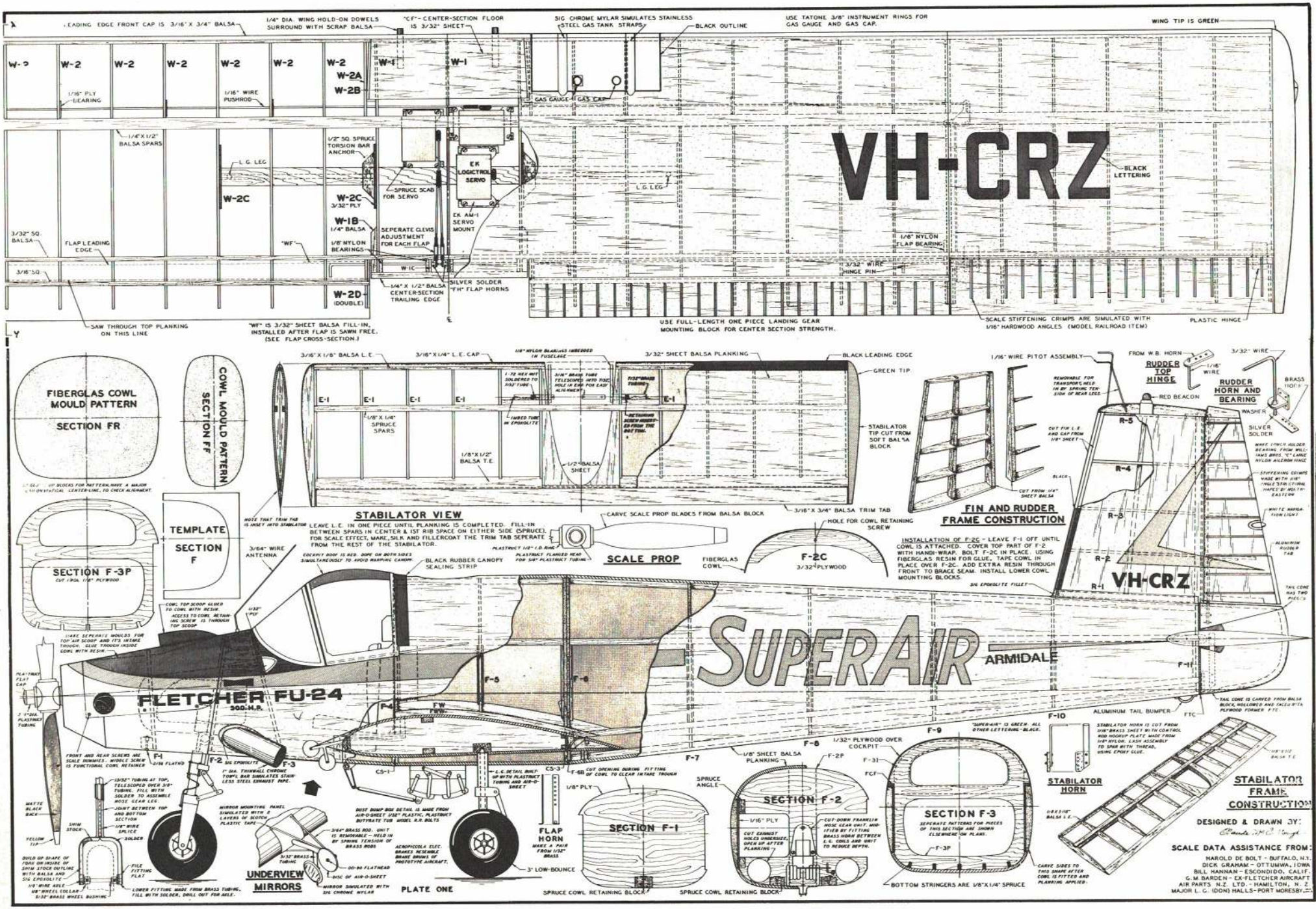
A championship model requires complete interior detailing. Plastic pilot wears hand-made uniform.

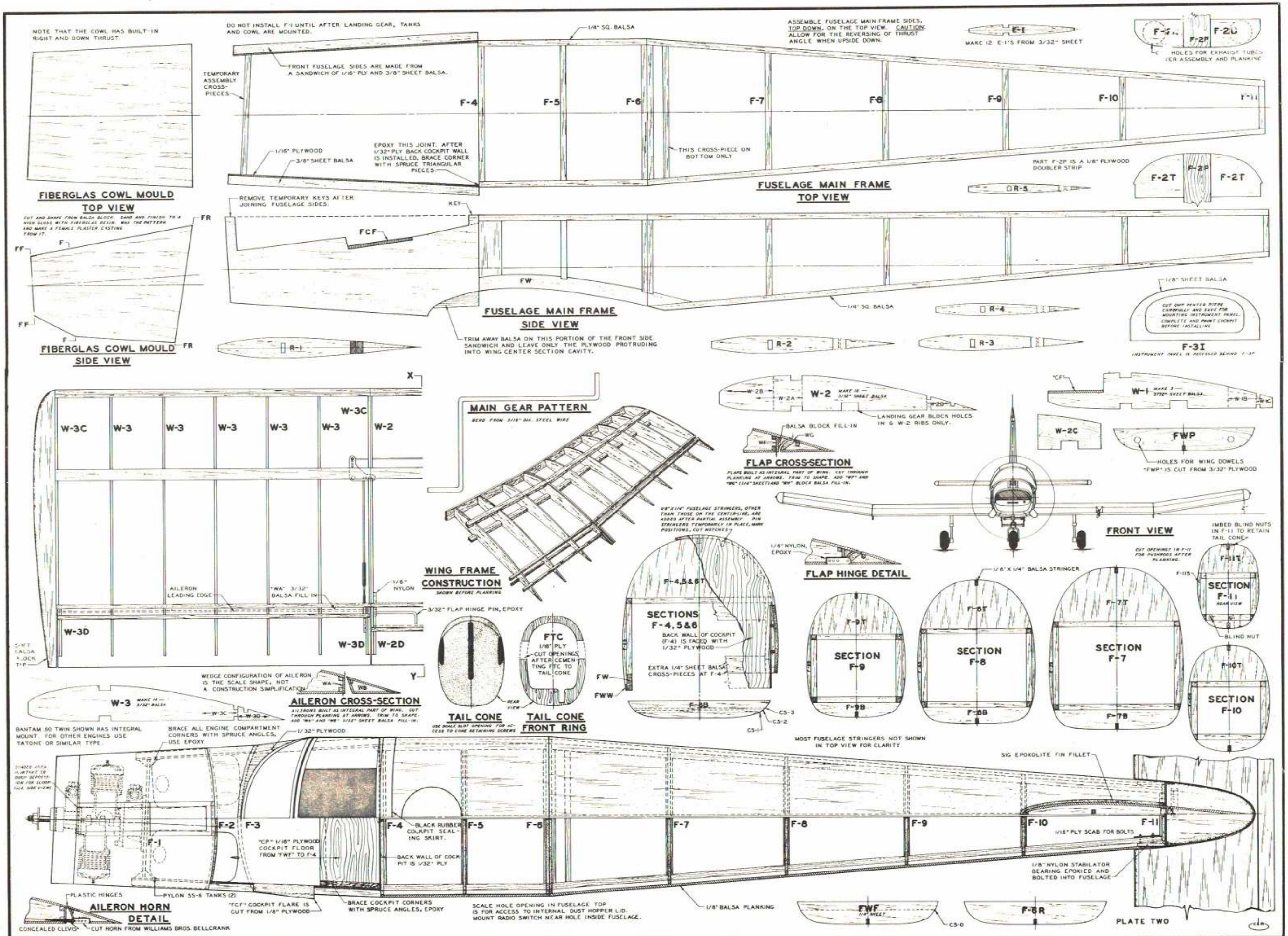
Wide scale fuselages permit several servos to hide in wing. Auxiliary servo for duster dumping or electric brakes.



Cockpit floor at left recesses into wing center section. Radio receiver mounts by grommets to servo mount tray.

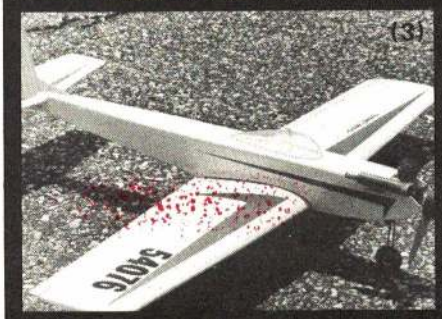



LEADING EDGE FRONT CAP IS 3/16" X 3/4" BALSA
1/4" DIA. WING HOLD-ON DOWELS SURROUND WITH SCRAP BALSA
"CF" - CENTER-SECTION FLOOR IS 3/32" SHEET
SIG CHROME MYLAR SIMULATES STAINLESS STEEL GAS TANK STRAPS
BLACK OUTLINE
USE TATONE 3/8" INSTRUMENT RINGS FOR GAS GAUGE AND GAS CAP.
WING TIP IS GREEN
W-1
W-2
W-2A
W-2B
GAS GAUGE
GAS CAP
1/16" PLY BEARING
1/16" WIRE PUSHROD
1/4" X 1/2" BALSA SPARS
1/2" SQ. SPRUCE TORSION BAR ANCHOR
L.G. LEG
W-2C
SPRUCE SCAB FOR SERVO
EK LOGICTROL SERVO
EK AM-1 SERVO MOUNT
W-2C 3/32" PLY
W-1B 1/4" BALSA
1/8" NYLON BEARINGS
SEPERATE CLEVIS ADJUSTMENT FOR EACH FLAP
3/32" SQ. BALSA
FLAP LEADING EDGE
3/16" SQ.
"WF"
W-1C
1/4" X 1/2" BALSA CENTER-SECTION TRAILING EDGE
SILVER SOLDER "FH" FLAP HORNS
W-2D (DOUBLE)
VH-CRZ
BLACK LETTERING
1/8" NYLON FLAP BEARING
3/32" WIRE HINGE PIN
SAW THROUGH TOP PLANKING ON THIS LINE
"WF" IS 3/32" SHEET BALSA FILL-IN, INSTALLED AFTER FLAP IS SAWN FREE. (SEE FLAP CROSS-SECTION.)
USE FULL-LENGTH ONE PIECE LANDING GEAR MOUNTING BLOCK FOR CENTER SECTION STRENGTH.
SCALE STIFFENING CRIMPS ARE SIMULATED WITH 1/16" HARDWOOD ANGLES (MODEL RAILROAD ITEM)
PLASTIC HINGE
FIBERGLAS COWL MOULD PATTERN
SECTION FR
COWL MOULD PATTERN
SECTION FF
3/16" X 1/8" BALSA L.E.
3/16" X 1/4" L.E. CAP
1/8" NYLON BEARINGS IMBEDDED IN FUSELAGE
3/32" SHEET BALSA PLANKING
BLACK LEADING EDGE
GREEN TIP
E-1
1/8" X 1/4" SPRUCE SPARS
1/8" X 1/2" BALSA T.E.
1/2" BALSA SHEET
STABILATOR TIP CUT FROM SOFT BALSA BLOCK
STABILATOR VIEW
LEAVE L.E. IN ONE PIECE UNTIL PLANKING IS COMPLETED. FILL-IN BETWEEN SPARS IN CENTER & 1ST RIB SPACE ON EITHER SIDE (SPRUCE). FOR SCALE EFFECT, MAKE, SILK AND FILLERCOAT THE TRIM TAB SEPERATE FROM THE REST OF THE STABILATOR.
3/16" X 3/4" BALSA TRIM TAB
1/16" WIRE PITOT ASSEMBLY
REMOVABLE FOR TRANSPORT, HELD IN BY SPRING TEN SION OF REAR LEGS
FROM W.B. HORN
RUDDER TOP HINGE
RUDDER HORN AND BEARING
3/32" WIRE
1/16" WIRE
BRASS TUBE
WASHER
SILVER SOLDER
RED BEACON
CUT FIN L.E. AND CAP FROM 1/4" SHEET BALSA
CUT FROM 1/4" SHEET BALSA
FIN AND RUDDER FRAME CONSTRUCTION
R-5
R-4
R-3
R-2
R-1
VH-CRZ
TEMPLATE SECTION F
SECTION F-3P
CUT FROM 1/4" PLYWOOD
NOTE THAT TRIM TAB IS INSET INTO STABILATOR
CARVE SCALE PROP BLADES FROM BALSA BLOCK
SCALE PROP
PLASTRUCT 1/2" I.D. RING
PLASTRUCT FLANGED HEAD FOR 3/8" PLASTRUCT TUBING
HOLE FOR COWL RETAINING SCREW
FIBERGLAS COWL
F-2C 3/32" PLYWOOD
INSTALLATION OF F-2C - LEAVE F-1 OFF UNTIL COWL IS ATTACHED. COVER TOP PART OF F-2 WITH HANDI-WRAP. BOLT F-2C IN PLACE. USING FIBERGLAS RESIN FOR GLUE, TAPE COWL IN PLACE OVER F-2C. ADD EXTRA RESIN THROUGH FRONT TO BRACE SEAM. INSTALL LOWER COWL MOUNTING BLOCKS.
3/64" WIRE ANTENNA
COCKPIT DOOR IS RED. DOPE ON BOTH SIDES SIMULTANEOUSLY TO AVOID WARPING CANOPY
BLACK RUBBER CANOPY SEALING STRIP
SIG EPOXOLITE FILLET
SUPERAIR
ARMIDALE
FLETCHER FU-24
900 H.P.
F-1
F-2
F-3
F-4
F-5
F-6
F-7
F-8
F-9
F-10
F-11
FW
C5-1
C5-3
ALUMINUM TAIL BUMPER
FTC
TAIL CONE IS CARVED FROM BALSA BLOCK, HOLLOWED AND FACED WITH PLYWOOD FORMER FTC
"SUPERAIR" IS GREEN. ALL OTHER LETTERING - BLACK.
1/32" PLYWOOD OVER COCKPIT
F-2P
F-3P
F-3I
FCF
1/8" SHEET BALSA PLANKING
SECTION F-2
SECTION F-3
SEPERATE PATTERNS FOR PIECES OF THIS SECTION ARE SHOWN ELSEWHERE ON PLANS.
CUT EXHAUST HOLES UNDERSIZE, OPEN UP AFTER PLANKING
CUT-DOWN FRANKLIN NOSE GEAR UNIT, MODIFIED BY FITTING BRASS HORN BETWEEN L.G. COILS AND UNIT TO REDUCE DEPTH.
CARVE SIDES TO THIS SHAPE AFTER COWL IS FITTED AND PLANKING APPLIED.
BOTTOM STRINGERS ARE 1/8" X 1/4" SPRUCE
STABILATOR HORN
STABILATOR HORN IS CUT FROM 1/16" BRASS SHEET WITH CONTROL ROD HOOKUP PLATE MADE FROM 1/8" NYLON. LASH ASSEMBLY TO SPAR WITH THREAD, USING EPOXY GLUE.
STABILATOR FRAME CONSTRUCTION
DESIGNED & DRAWN BY:
SCALE DATA ASSISTANCE FROM:
HAROLD DE BOLT - BUFFALO, N.Y.
DICK GRAHAM - OTTUMWA, IOWA
BILL HANNAN - ESCONDIDO, CALIF.
G.M. BARDEN - EX-FLETCHER AIRCRAFT
AIR PARTS N.Z. LTD. - HAMILTON, N.Z.
MAJOR L.G. (DON) HALLS - PORT MORESBY
PLATE ONE
UNDERVIEW MIRRORS
MIRROR MOUNTING PANEL SIMULATED WITH 2 LAYERS OF SCOTCH PLASTIC TAPE
3/64" BRASS ROD. UNIT IS REMOVABLE - HELD IN BY SPRING TENSION OF BRASS RODS
3/32" BRASS TUBING
00-90 FLATHEAD
DISC OF AIR-O-SHEET
MIRROR SIMULATED WITH SIG CHROME MYLAR
DUST BUMP BOX DETAIL IS MADE FROM AIR-O-SHEET 1/32" PLASTIC, PLASTRUCT BUTYRATE TOP, MODEL R.R. BOLTS
ACROPICCOLA ELEC. BRAKES RESEMBLE BRAKE DRUMS OF PROTOTYPE AIRCRAFT.
FLAP HORN MAKE A PAIR FROM 1/32" BRASS
3" LOW-BOUNCE
SECTION F-1
SPRUCE COWL RETAINING BLOCK
SPRUCE ANGLE
SPRUCE COWL RETAINING BLOCK
SECTION F


NOTE THAT THE COWL HAS BUILT-IN RIGHT AND DOWN THRUST.
FIBERGLAS COWL MOULD TOP VIEW
CUT AND SHAPE FROM BALSA BLOCK. SAND AND FINISH TO A HIGH GLOSS WITH FIBERGLAS RESIN. WAX THE PATTERN AND MAKE A FEMALE PLASTER CASTING FROM IT.
FIBERGLAS COWL MOULD SIDE VIEW
DO NOT INSTALL F-1 UNTIL AFTER LANDING GEAR, TANKS AND COWL ARE MOUNTED.
TEMPORARY ASSEMBLY CROSS-PIECES
FRONT FUSELAGE SIDES ARE MADE FROM A SANDWICH OF 1/16" PLY AND 3/8" SHEET BALSA.
1/16" PLYWOOD
3/8" SHEET BALSA
EPOXY THIS JOINT. AFTER 1/32" PLY BACK COCKPIT WALL IS INSTALLED, BRACE CORNER WITH SPRUCE TRIANGULAR PIECES.
1/4" SQ. BALSA
THIS CROSS-PIECE ON BOTTOM ONLY
ASSEMBLE FUSELAGE MAIN FRAME SIDES, TOP DOWN, ON THE TOP VIEW. CAUTION: ALLOW FOR THE REVERSING OF THRUST ANGLE WHEN UPSIDE DOWN.
FUSELAGE MAIN FRAME TOP VIEW
MAKE 12 E-1'S FROM 3/32" SHEET
HOLES FOR EXHAUST TUBES AFTER ASSEMBLY AND PLANKING
PART F-2P IS A 1/8" PLYWOOD DOUBLER STRIP
REMOVE TEMPORARY KEYS AFTER JOINING FUSELAGE SIDES.
KEY
FCF
FW
FUSELAGE MAIN FRAME SIDE VIEW
TRIM AWAY BALSA ON THIS PORTION OF THE FRONT SIDE SANDWICH AND LEAVE ONLY THE PLYWOOD PROTRUDING INTO WING CENTER SECTION CAVITY.
1/4" SQ. BALSA
1/8" SHEET BALSA
CUT OUT CENTER PIECE CAREFULLY AND SAVE FOR MOUNTING INSTRUMENT PANEL. COMPLETE AND PAINT COCKPIT BEFORE INSTALLING.
F-3I
INSTRUMENT PANEL IS RECESSED BEHIND F-3P
MAIN GEAR PATTERN
BEND FROM 3/16" DIA. STEEL WIRE
W-2 MAKE 16 3/32" SHEET BALSA
LANDING GEAR BLOCK HOLES IN 6 W-2 RIBS ONLY.
W-1 MAKE 3 3/32" SHEET BALSA
BALSA BLOCK FILL-IN
FLAP CROSS-SECTION
FLAPS BUILT AS INTEGRAL PART OF WING. CUT THROUGH PLANKING AT ARROWS. TRIM TO SHAPE. ADD "WF" AND "WG" (1/4" SHEET) AND "WH" BLOCK BALSA FILL-IN.
HOLES FOR WING DOWELS
"FWP" IS CUT FROM 3/32" PLYWOOD
FRONT VIEW
WING FRAME CONSTRUCTION
SHOWN BEFORE PLANKING
AILERON LEADING EDGE
"WA" 3/32" BALSA FILL-IN
1/8" NYLON
3/32" FLAP HINGE PIN, EPOXY
SOFT BALSA BLOCK TIP
W-3 MAKE 14 3/32" BALSA
WEDGE CONFIGURATION OF AILERON IS THE SCALE SHAPE, NOT A CONSTRUCTION SIMPLIFICATION.
AILERON CROSS-SECTION
AILERONS BUILT AS INTEGRAL PART OF WING. CUT THROUGH PLANKING AT ARROWS. TRIM TO SHAPE. ADD "WA" AND "WB" 3/32" SHEET BALSA FILL-IN.
TAIL CONE
USE SCALE SLOT OPENING FOR ACCESS TO CONE RETAINING SCREWS
FTC 1/16" PLY
CUT OPENINGS AFTER CEMENTING FTC TO TAIL CONE
REAR VIEW
TAIL CONE FRONT RING
1/8" X 1/4" FUSELAGE STRINGERS, OTHER THAN THOSE ON THE CENTER-LINE, ARE ADDED AFTER PARTIAL ASSEMBLY. PIN STRINGERS TEMPORARILY IN PLACE, MARK POSITIONS, CUT NOTCHES.
SECTIONS F-4, 5&6
BACK WALL OF COCKPIT (F-4) IS FACED WITH 1/32" PLYWOOD
EXTRA 1/4" SHEET BALSA CROSS-PIECES AT F-4
1/8" NYLON, EPOXY
FLAP HINGE DETAIL
1/8" X 1/4" BALSA STRINGER
SECTION F-9
SECTION F-8
SECTION F-7
CUT OPENINGS IN F-11 FOR PUSHRODS AFTER PLANKING.
IMBED BLIND NUTS IN F-11 TO RETAIN TAIL CONE
SECTION F-11 REAR VIEW
BLIND NUT
SECTION F-10
BANTAM .60 TWIN SHOWN HAS INTEGRAL MOUNT. FOR OTHER ENGINES USE TATONE OR SIMILAR TYPE.
BRACE ALL ENGINE COMPARTMENT CORNERS WITH SPRUCE ANGLES. USE EPOXY
1/32" PLYWOOD
MOST FUSELAGE STRINGERS NOT SHOWN IN TOP VIEW FOR CLARITY
SIG EPOXOLITE FIN FILLET
"CP" 1/16" PLYWOOD COCKPIT FLOOR FROM "FWF" TO F-4
BLACK RUBBER COCKPIT SEALING SKIRT.
BACK WALL OF COCKPIT IS 1/32" PLY
1/16" PLY SCAB FOR BOLTS
1/8" NYLON STABILATOR BEARING EPOXIED AND BOLTED INTO FUSELAGE
PLASTIC HINGES
PYLON SS-6 TANKS (2)
AILERON HORN DETAIL
CONCEALED CLEVIS
CUT HORN FROM WILLIAMS BROS. BELLCRANK
"FCF" COCKPIT FLARE IS CUT FROM 1/8" PLYWOOD
BRACE COCKPIT CORNERS WITH SPRUCE ANGLES, EPOXY
SCALE HOLE OPENING IN FUSELAGE TOP IS FOR ACCESS TO INTERNAL DUST HOPPER LID. MOUNT RADIO SWITCH NEAR HOLE INSIDE FUSELAGE.
1/8" BALSA PLANKING
FWF 1/4" SHEET
F-6R
PLATE TWO

ON THE SCENE

by ED SWEENEY



EAST COAST RC CHAMPIONSHIPS

(1) Stover's slow flying Pietenpole has neatly hidden inverted 15. (2) Paris White's highly detailed DC-3 on a winning flight. (3) Novice winner Tom Carey's nice New Orleanian. (4) The fast smooth-flying Banshee by Jim Martin. (5) Only part of the line-up of beautiful and expertly flown Formula I planes. (6) Tony had help. He'd been crashing. Helper on transmitter kept him flying. (More pictures and captions on pages 72 and 73.)

THE DC/RC CLUB of Washington, D.C. migrated to Dalgren Naval Weapons Laboratory and Space Surveillance Center in Virginia to put on the first Annual East Coast RC Championships. Conditions were ideal for the first contest ever run by the DC/RC, with cooperation from the weatherman–lots of sun and light breezes. The Pattern events were operated on the Shulman System with typical AMA Nats procedures for Pylon. CD was Bob Violett with George Hill on Pattern and Cliff Telford on Pylon. Their expertise and advance planning resulted in a smooth, efficient and enjoyable meet for all.

In Pattern each flier had to qualify by flying a short six-maneuver pattern which was announced at the site. Five experts and five novices were moved into the finals when the full Class D pattern was used. A photo shows these contestants and their final places. Jim Martin flew his Banshee exceptionally smoothly to win Expert and Tom Carey improved steadily to win Novice.

Pylon racing in Formula I and II was unique–two Formula II flights were faster than the best in Formula I. F.T.D. was 1:41 by Bob Violett with his Mid-Wing Minnow Formula II racer. There were multiple plane heats on Saturday and Sunday with all scores counting. Eventual winner in Formula I was Mike Helsel, who achieved the only perfect score.

It was disappointing to have had only two entries in Scale, but they were beautiful and spectacular. Paris White sport flew his magnificent FAA DC-3, so his official flights were marvelous and realistic. In one flight he had to pin the rudder because the rudder horn broke, so he made a fine flight even though one engine stopped during climb out. Landing was still perfect.

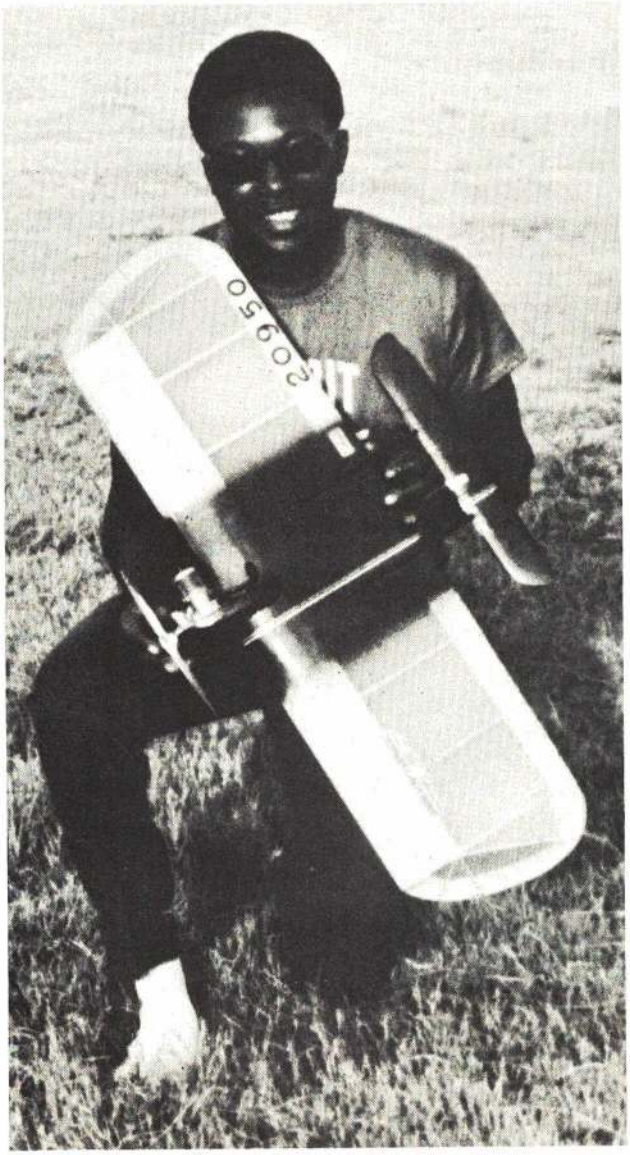
The highlight of the meet was having so many well-known personalities of this great hobby in attendance. They included Phil Kraft, Harold Goldclank, Tony Bonetti, Len Purdy, Vern Smith, Cliff Weirick, the S.O.B.s from N.Y.C., D.C. May and Jim Martin. However, the meet was not heavily attended, owing to contest schedule conflicts in the East Coast AMA Districts.

As luck would have it, George Hill won the Kraft radio raffle and was extremely happy about it–he danced and poured beer on fellow event directors. It was odd, but well deserved. George made sure we all enjoyed the meet and arranged a crab feast Saturday evening. Editor Ed Sweeney won the drawing for the Reddi Flite Dragon Fli kit and was just as surprised as George. Having crashed on Saturday, Sweeney will put the plane to good use.

The same meet is planned for next year–same time and place, so please join us.

killer

Sudden maneuverability comes from balance and airfoil, speed from lightness and cleanness. This mean machine has both.



If you want to win in combat, get the hottest 35 you can find and put it in a Killer.

by MELVIN MATHEWS

DO YOU ENJOY THE THRILL of a flying handle in your hand? Then attach the Killer to the end of your lines and join the winner's circle.

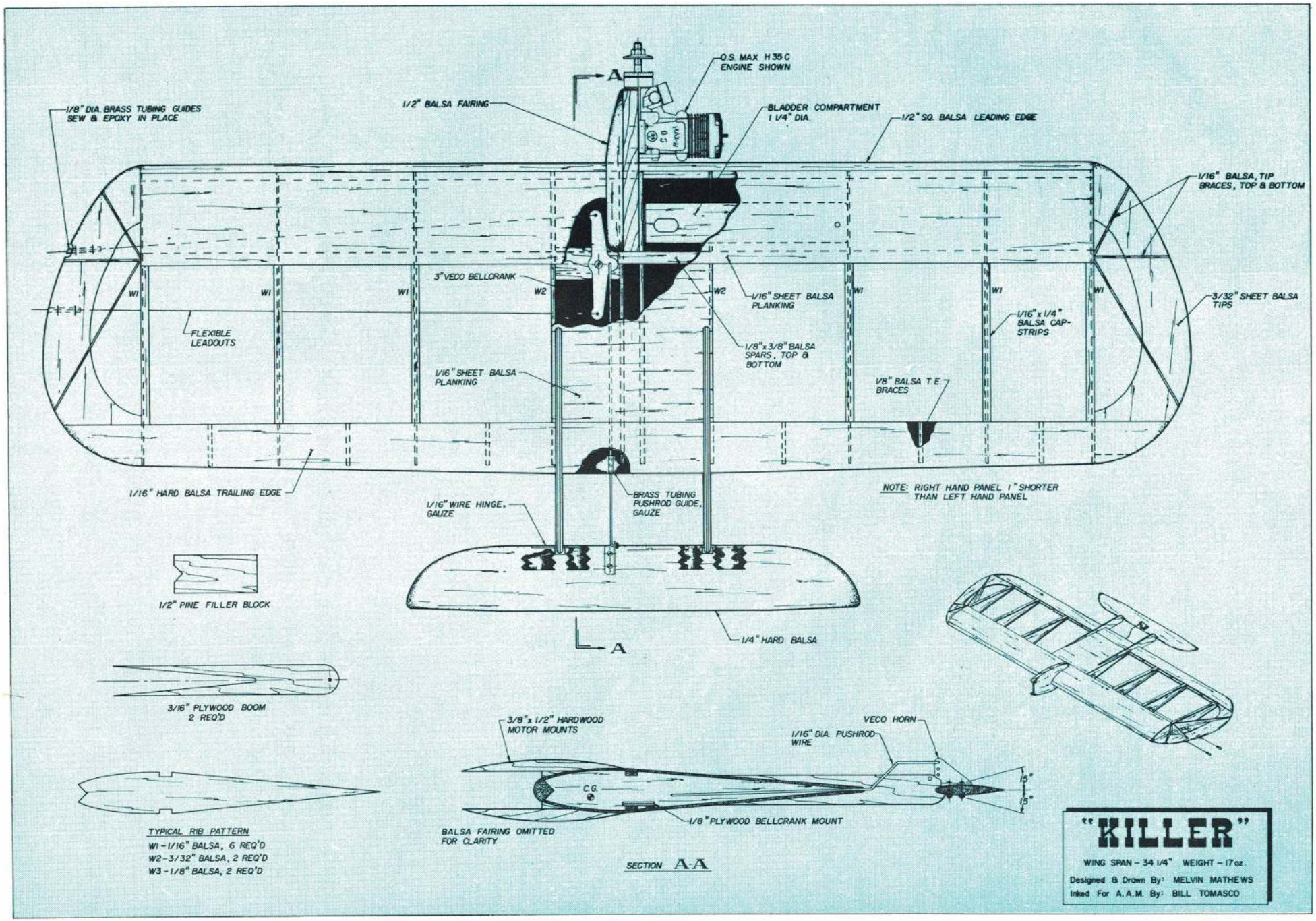
After experimenting for a number of years with tail moments and tail area on this design, I finally reached a good combination. The result is a plane which is much more stable than others of its type. Center of gravity location and elevator movement are not critical.

The Killer flies equally well at all speeds and has been flown with every type of engine from stock stunt engines to the hottest combat specials. Since speed does depend a great deal on the engine, use a good powerplant and the plane's streamlined design will enable it to turn in a performance as good as, and usually better than, the same engine in any other given design. Using a good combat special, the best speed reached by the Killer to date was 110 mph without a streamer and 105 mph pulling a streamer.

The Killer is versatile, too. All the above-mentioned features are musts for beginners, yet an extremely stable plane never hurt the pros either. It is a winner. No offset on the engine or wing tip weight are used, and the right panel is shorter than the left. Beginners, especially on windy days, should put washers under the front mounting bolts to give two or three degrees engine offset. This is also suggested when running a stunt engine at slower speeds.

A plane without offset, such as this one, feels light on the lines at first, and needs some getting used to. Once confidence is acquired, the flier will find that it stays out on the lines, even in the windiest weather and is at home on any side of the circle. All the Killers have been silk-covered and each weighs between 16 and 19 oz.

(Continued on page 76)



"KILLER"

WING SPAN - 34 1/4" WEIGHT - 17 oz.

Designed & Drawn By: MELVIN MATHEWS

Inked For A.A.M. By: BILL TOMASCO

FULL SIZE PLANS AVAILABLE—SEE PAGE 70

hot rod

Compact, fast, and a great load-lifter, Douglas Skyhawk remains a first-line fighter, fighter-bomber, and ground support machine, after 15 years of production.

A WELL-KNOWN PRINCIPLE and a well-worn saying state that "there's nothing new under the sun." Time and time again, some brilliant new idea in aviation has been shown to be little more than a fancy way of doing something which had first been done by the Wright Brothers or one of their contemporaries. At times, there doesn't seem to be much point in trying to come up with an original idea, for some spoilsport will just dig back in the records and show that it actually was invented by some guy who died 50 years ago.

However, this principle certainly isn't true all the time. The delta wing is a prime example. It was created just as WW II was ending, when farsighted designers began to sense the so-called "sound barrier." Prof. Alexander Lippisch came up with a solution to problems which hadn't even been encountered yet and built a wing with a sharply swept leading edge and a straight trailing edge—in other words, a triangle, or the Greek letter delta.

Dr. Lippisch's work was among that discovered by Allied teams studying captured German materiel at the end of the war. His DM-1 delta-winged glider was almost completed as the prototype of the LP-13A coal-fueled(!) ramjet fighter. The glider was finished after the war and shipped to the U.S., where it eventually went on display at the USAF Museum, in Dayton, Ohio, without ever having been flown.

Although the original delta never left the ground, its ideas certainly did. Convair was the first to apply them to its Model 7002, which flew in June 1948. It was the first true delta to leave the ground, but pilot reports were about as negative as any ever written. . .it was a dog! Convair's prototype XF-92 followed, and it apparently wasn't much better. However, it did lead to the quite successful F-102 and F-106 supersonic fighters, so it did its part. Douglas quickly joined in, producing in early 1951 its F4D Skyray carrier-based delta jet which set a world speed record of 753 mph just two years later.

The delta not only was firmly on the scene, it also was established as a shape which would be around for a long time, since it offered great advantages in the areas of structural strength and in resistance to the woes of smashing through the sound barrier.

by DON BERLINER

But that didn't mean the day of airplanes-with-tails was passing. Even the truest of deltas has at least a vertical tail and the tailed-delta soon appeared, this airplane has a genuine delta wing, but a conventional tail is tacked on behind.

Douglas' XA-4D-1, which made its first flight in June 1954, was the first serious attempt at a tailed-delta and easily the most successful. The famed manufacturer of most of the world's airliners had been trying for some time to develop a turboprop-powered replacement for its sturdy AD-1 Skyraider, but the A-2D Skyshark was having trouble with its engine and with its contra-rotating propellers. When the Navy then awarded a contract to Douglas in June 1952, the story of the A-4D Skyhawk really began.

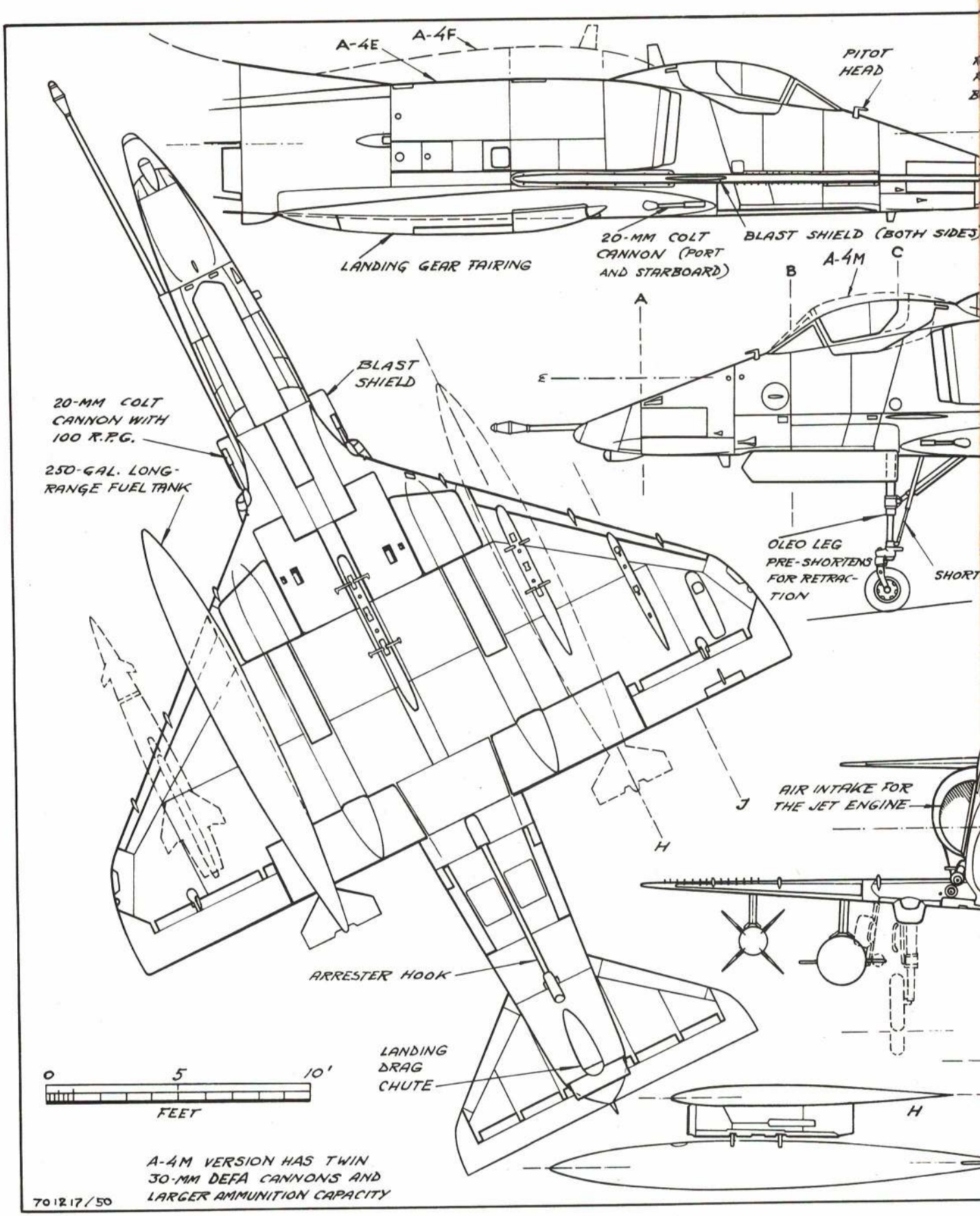
First tailed delta, the Skyhawk has been widely exported. Israel uses it for heavy loads over short distances.

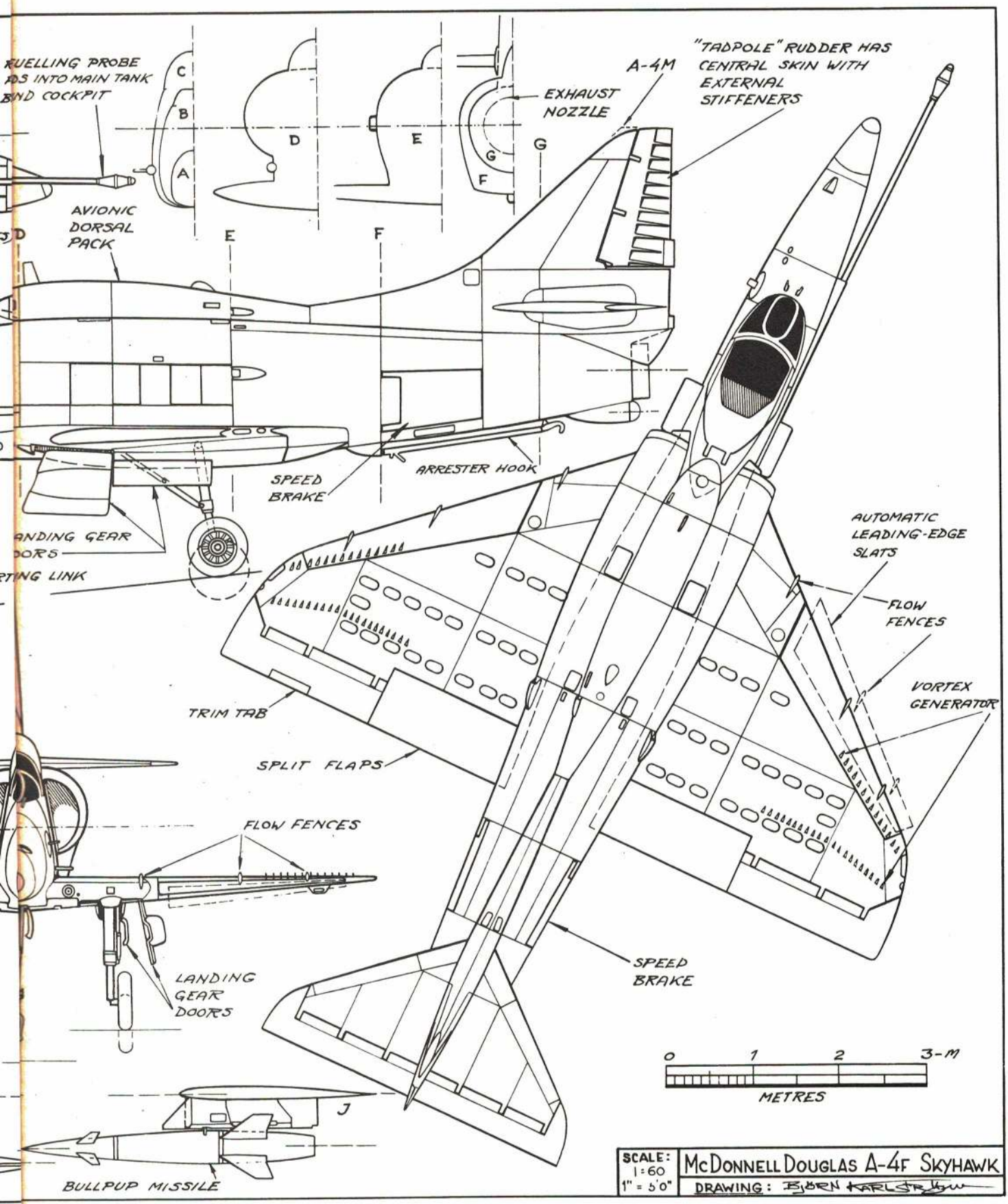
Simplicity and ease of maintenance distinguish the design, considered one of the most important post-war combat types.

The airplane which soon was seen in southern California was small, it was compact and it was fast. . .just what the Navy wanted for carrier operations. In fact, the Skyhawk was so fast that it became the first airplane of its category to hold a major world speed record. In October 1955, it was flown around a 500 km (310 mi.) low-altitude closed course at an average speed of 695 mph. This was in the days when the best fighter planes in Iron Curtain air forces—the MiG-15 and MiG-17—weren't much faster.

The first deliveries of A-4D-1's to the fleet were made in October 1956 and, in short order, Navy and Marine attack squadrons

(Continued on page 87)


A-4E
A-4F
PITOT HEAD
LANDING GEAR FAIRING
20-MM COLT CANNON (PORT AND STARBOARD)
BLAST SHIELD (BOTH SIDES)
A-4M
BLAST SHIELD
20-MM COLT CANNON WITH 100 R.P.G.
250-GAL. LONG-RANGE FUEL TANK
OLEO LEG PRE-SHORTENS FOR RETRACTION
AIR INTAKE FOR THE JET ENGINE
ARRESTER HOOK
LANDING DRAG CHUTE
0 5 10'
FEET
A-4M VERSION HAS TWIN 30-MM DEFA CANNONS AND LARGER AMMUNITION CAPACITY
70 12 17/50


FUELLING PROBE
DS INTO MAIN TANK
AND COCKPIT
A-4M
"TADPOLE" RUDDER HAS
CENTRAL SKIN WITH
EXTERNAL
STIFFENERS
EXHAUST
NOZZLE
AVIONIC
DORSAL
PACK
SPEED
BRAKE
ARRESTER HOOK
ANDING GEAR
OORS
RTING LINK
AUTOMATIC
LEADING-EDGE
SLATS
FLOW
FENCES
VORTEX
GENERATOR
TRIM TAB
SPLIT FLAPS
FLOW FENCES
LANDING
GEAR
DOORS
SPEED
BRAKE
0 1 2 3-M
METRES
BULLPUP MISSILE
SCALE:
1:60
1" = 5'0"
McDONNELL DOUGLAS A-4F SKYHAWK
DRAWING: BJÖRN KARLSTRÖM

ACE HIGH

A touch of lift and away it goes. Long high flights are what this one is all about.

by OWEN KAMPEN

INTEREST IN RC gliders has soared to new heights, with each season bringing new converts to this relaxing yet challenging form of flight. Plans for these slim-winged beauties appear with increasing regularity in model publications, and an ever-growing number of kits are being offered.

Yet far too many would-be soarers remain grounded for reasons such as these: (1) Long wings are built with lots of ribs and other pieces, thus requiring considerable care and skill in assembly and covering to prevent bends and twists. (2) Many parts of the country are unsuitable for slope soaring, and towing devices are expensive and complicated for an individual who flies alone. (3) The need for extra RC gear can be expensive for a fun plane or for a beginner, whose pocket jingle is well below a hundred dollars.

Enter Ace High, the super solution sailplane. Wing construction is simplified through use of both straight and tapered sections of ACE R/C molded foam wings. No ribs, no spars, no warps! The launch problem is handled by a stock Cox Baby Bee engine, which puts the ship hundreds of feet high and allows plenty of minutes for thermal seeking. Purists may object to powered sailplane, but they do provide built-in slope for those who are far removed from coastal and mountain areas.

Finally, this long, lean craft can be remote-controlled with some of the most reliable and inexpensive RC equipment available–namely, the ACE Commander RO Pulse transmitter and receiver, coupled with a standard single Adams actuator. The whole package is available for about $60. Generally overlooked in today's mad rush for digital gear, simple pulse proportional rudder updated to 1971 standards of integrated design reliability is hard to beat. With no motors to wear out or gears to break and operating with but one moving part, this system is the essence of simplicity. And it works and works and works.

The fuselage is a fast-building, modified slab-sided box which holds everything together with minimum drag. As a result, Ace High can be airborne with a minimum investment of time, effort and money. It then stays airborne to a degree which exceeds all expectations. Still air flights of six to ten minutes are common. A touch of lift and away it goes, so keep those batteries charged and ready for long, high flights.

Flight testing assistance was provided by Paul Yee and Tom Runge, who were separated by 500 miles and flew individually-built versions of the Ace High. Their test results were remarkably similar and confirmed the soundness of the basic concept. Changes suggested by each were incorporated in the final plans shown here. My thanks to both of them.

Pretty Jennifer Kampen poses with shining Top-Cote chrome-covered ACE High.

Tom's account of the first flights follows. "George Schwarzer and I flew the first proto design of the Ace High. Knowing that changes had to be made to improve performance, we started with the original numbers and had a fast, but fairly flat test glide. Under power, the plane gained very little altitude, and the glide was a long way from floating. In subsequent flights, we consistently increased wing incidence and moved the CG back by 1/4" increments.

"By the fifth flight, we had moved the CG back to about 35 percent and the wing incidence to about +4 degrees. Under power, the Ace High from launch to engine cutoff maintained about a 30-degree climb with absolutely no lack of control or tendency to drop off or stall–almost as though it were being towed up or high-started. When the engine quit (with good transition), the ship went into a nice flat, slow, almost nose-up glide, with fantastically quick yaw response to the stick and absolutely no stall tendency. We have yet to see the plane stall. It seems to just fly slower and slower while maintaining its altitude.

"We experimented with a built-up empennage to decrease the overall weight. Performance was improved in the glide but wind penetration was impaired because of less weight. The ship flew beautifully in fairly calm weather. To date, when flying we haven't had any thermal activity to see how the Ace High would ride on convective activity, but with the good yaw-type moves we get, the ship should have no problem staying in a thermal and riding it to its limits.

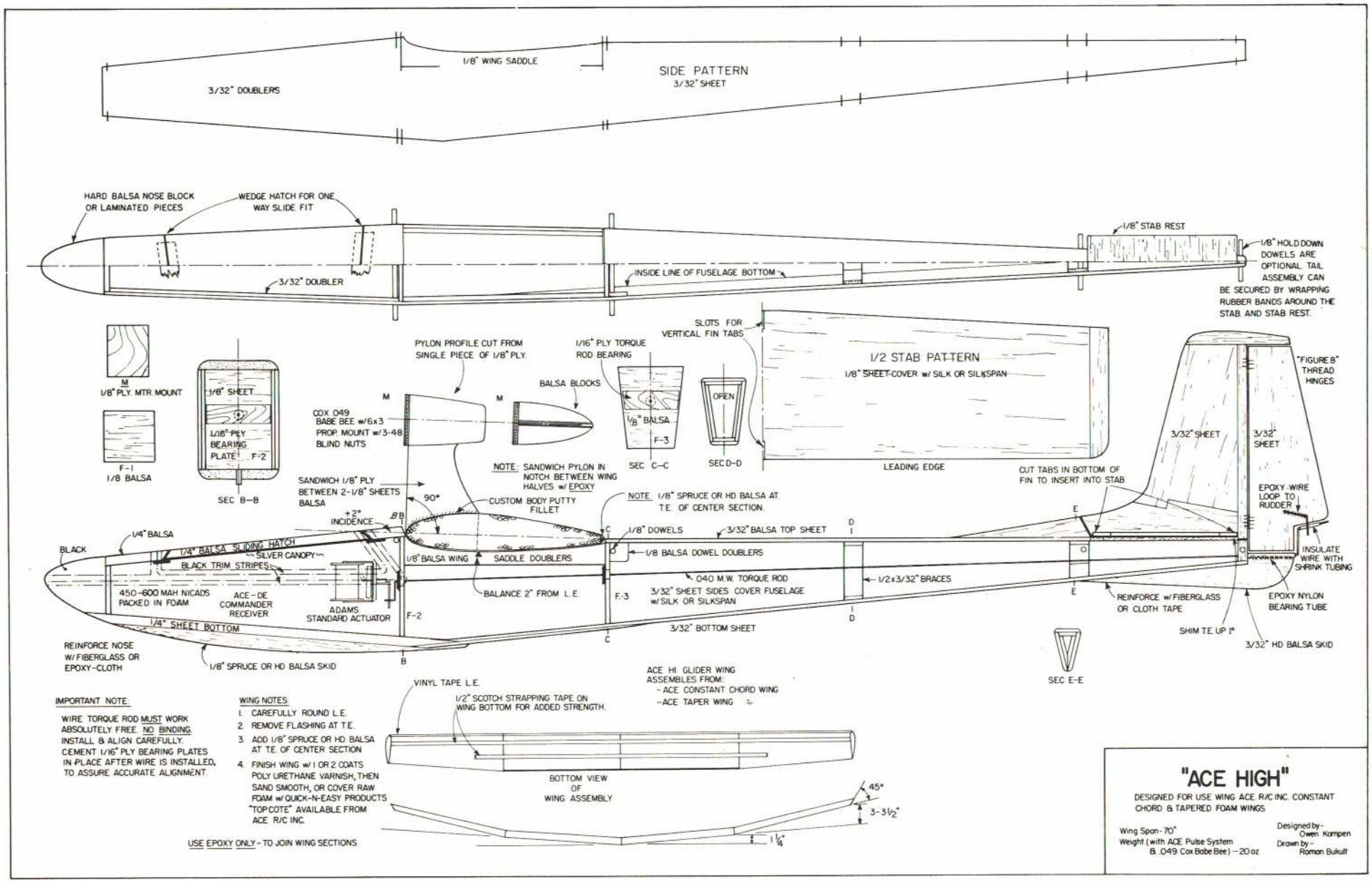
"Our next experiment is trying a T-tail configuration. The Ace High is so inherently stable and maneuverable that we're not afraid to try drastic alterations to change flight or looks. Flying was done with an ACE Pulse Commander. Elevator control was not missed–the plane just doesn't need it."

Paul Yee's comments on trimming and first flight testing will lead to success if these procedures are followed carefully. "Before test flying, align the surfaces as accurately as possible. The model must balance as shown on the plans, and the wing and stab must be straight. Check the angular difference between the wing and stab by first setting the model on a flat table and blocking up the tail until the leading and trailing edge of the stab are the same distance from the table. Now measure the distances from the wing trailing edge to the table and from the wing leading edge to the table. Make these measurements right at the fuselage side and use the faint molding lines at the leading and trailing edges of the foam wing as reference points. The leading edge should be set half an inch higher than the trailing edge.

"When ready for some test glides, block the rudder in neutral and pick a nice grassy area. Run with the model and then gently push it forward with its nose pointed slightly downwards. The model should glide at a shallow angle and then slide along the grass when it lands. However, it should not tend to skim along the top of the grass. If it dives, remove nose weight or shim up the trailing edge of the stab 1/32" at a time. However, be sure the zoom is not caused by launching with the nose pointing upwards or by launching with too much speed.

"When the glide tests look good, some powered test flights can be made. The model first should climb steadily and reach an altitude of 300 to 400 feet by the time the engine quits. Then there should be no more

(Continued on page 86)



IMPORTANT NOTE:

WIRE TORQUE ROD MUST WORK ABSOLUTELY FREE. NO BINDING. INSTALL & ALIGN CAREFULLY. CEMENT 1/16" PLY BEARING PLATES IN PLACE AFTER WIRE IS INSTALLED, TO ASSURE ACCURATE ALIGNMENT.

WING NOTES:

1. CAREFULLY ROUND L.E.
2. REMOVE FLASHING AT T.E.
3. ADD 1/8" SPRUCE OR HD. BALSA AT T.E. OF CENTER SECTION
4. FINISH WING w/ 1 OR 2 COATS POLY URETHANE VARNISH, THEN SAND SMOOTH, OR COVER RAW FOAM w/ QUICK-N-EASY PRODUCTS "TOPCOTE" AVAILABLE FROM ACE R/C INC.

USE EPOXY ONLY - TO JOIN WING SECTIONS

"ACE HIGH"

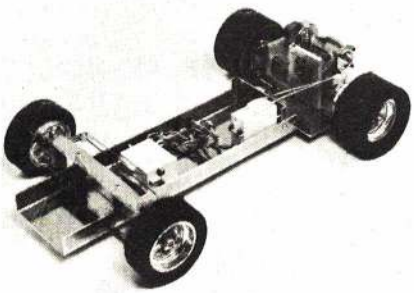
DESIGNED FOR USE WING ACE R/C INC. CONSTANT CHORD & TAPERED FOAM WINGS

Wing Span - 70"
Weight (with ACE Pulse System & .049 Cox Babe Bee) — 20 oz

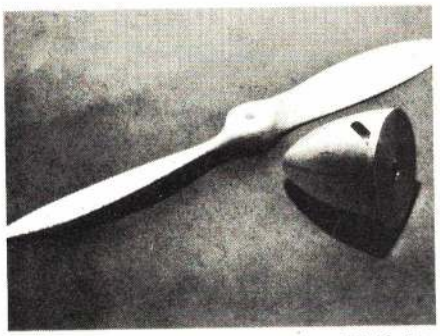
Designed by - Owen Kampen
Drawn by - Roman Bukult

new products check list

by FRANK PIERCE

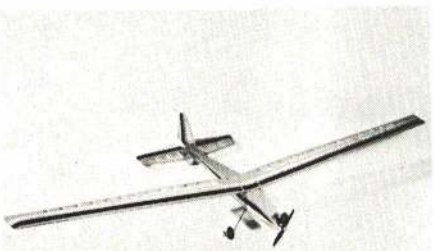


Model Car Enterprises/Pacemaker 71 Series. New expand-as-you-drive modular system allows basic model 2010 Indy ($59.95) to be upgraded as builder becomes more advanced. Four models available: basic 2010 with flat pan chassis, 2020 with U-frame chassis, 3010 (shown) adds engine over axle mounting, 3020 adds internal brakes. Price for 3020 $79.95. Model Rectifier Corp., 2500 Woodbridge Ave., Edison, N.J. 08817



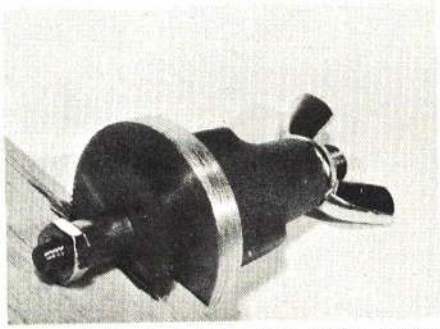
C.B. Enterprises/Precision spinner. Turned on high-pressure tracer lathe, precision machined spinners are formed from aluminum bar stock. Three sizes available, 2", 2 1/4", and 2 1/2". Other sizes and special designs for scale work available on special order. $10.95 to $13.95. For further details, write C.B. Enterprises, 21590 Cloud Way, Hayward, Calif. 94545

Rand Sales Co./Air Wheels. In two styles, regular scale and low-bounce. With removable inner hub for installation of electric brake, regular wheels come in three sizes, 2 1/2" to 3", low-bounce wheels in four sizes from 2 1/4" to 3". Permanently pneumatic. From $1.99 to $2.59 per pair. Rand Sales Co., Box 20059, Columbus, Ohio 43220

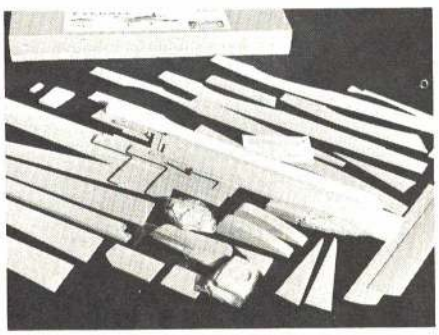


Dumas Planes/Evolution 2. For RC 1-, 2-, or 3-channel low-budget operation on 049 power. ROG or slope-soared by hand launching. Converts from 42" span to 66" by adding outer wing panels. All balsa. $13.95. Dumas Planes, 790 S. Park Ave., Tucson, Ariz. 85716

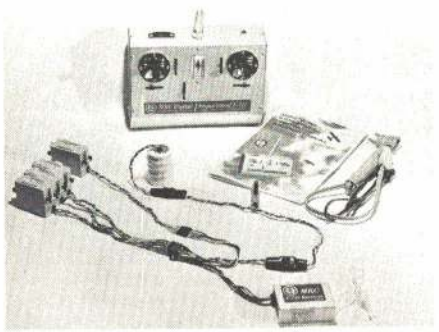
Midwest Products/New free flight. Super Sniffer 300 is scaled-up version of old standard Sniffer design. More than 300 sq. in. of wing surface, designed for 049 power. Kit contains formed wire parts and die-cut wood. Plans include data on engine timer and dethermalizer. For beginner or advanced flier. $8.95. Midwest Products Co., 400 S. Indiana St., Hobart, Ind. 46342



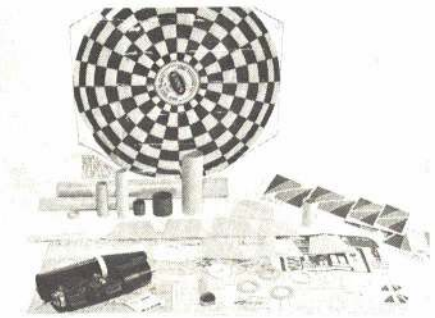
Taran Products/Hinge Grooving Tool. Precision tool allows easy, neat cuts in ailerons, rudder, etc., for installation of hinges. Adjustable hardened steel cutting blade takes guesswork and inaccuracies out of mounting plastic and nylon hinges. $5.95. Taran Products, 466 Giannini Dr., Santa Clara, Calif. 95051



J & J Industries/Eyeball. Winner of 10 trophies, Eyeball is high-performance 60-powered design capable of superior knife-edge flight. Spectacular eye-catching lines, 63" span, flying weight about 6 lb. Quality packaging, top-grade balsa, full-length balsa pre-cut sides, plywood doublers, formed canopy, MonoKote or Silkspan covering, $49.95. J & J Industries, R/C Model Aircraft Division, Oakhurst, N.J. 07755

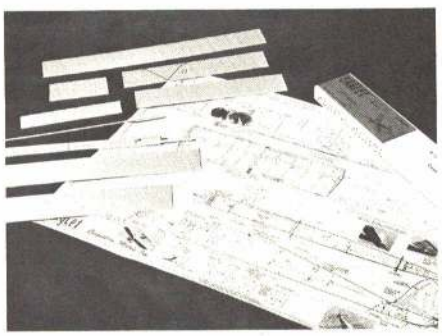


Model Rectifier Corp./MRC F-710. Follow-on to MRC's F-700, F-710 features lower current drain, more efficient RF circuits, improved hardware for smoother control operation. 5-channel output, dual charging cord and selected matched-pair crystals for switching to either of five 27-MHz or three 72-MHz frequencies. With four linear servos, $320; with rotary servos, $300. 72 MHz system, $20 extra. Additional crystals available at extra cost. Model Rectifier Corp., 2500 Woodbridge Ave., Edison, N.J. 08817

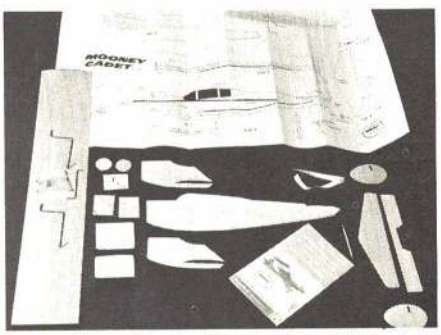


Estes/Omega Cine Rocket. Two-stage rocket kit carries small special-design movie camera as payload. Parachute recovery. Uses D-series booster and upper stage. Balsa fins, colorful decals, 30" rocket weighs 4.8 oz. Price, less motors and camera, $3.50.

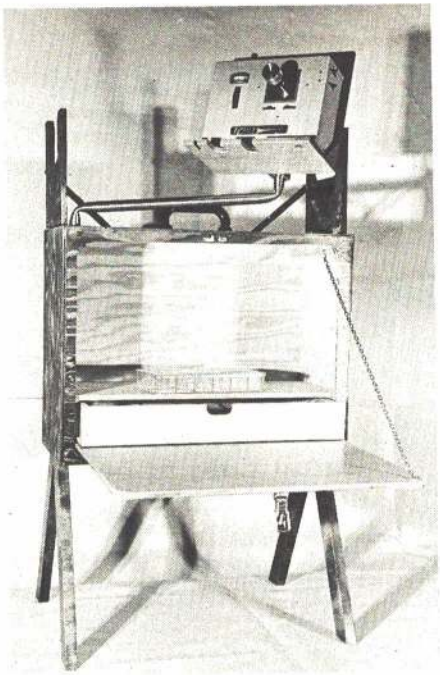
Cineroc movie camera is especially designed for operation with Omega. Provides data for rocketeer obtainable in no other way. 10-mm f-11 lens, 1/500-sec. shutter records 31 frames/sec. Uses Super-8 color film in special cartridge. Nose cone has integral mirror to provide panoramic view, can be adjusted on chute to provide controlled coverage during recovery. Manual provides formulae for determining altitude, acceleration, G forces, etc. from exposed film. $19.95 including film pack. Estes Industries, Inc., Box 227, Penrose, Colo. 81240



Competition Models/Eaglet. New 1/2A sport free flight kit uses built-up wing and elevator, balsa plank fuselage, solid rudder. High wing conventional design. Die-cut balsa, fuse-operated dethermalizer and detailed instructions provide a fascinating, easy-to-build kit. 35" span, $4.50. Competition Models Inc., Box 8012, Long Beach, Calif.



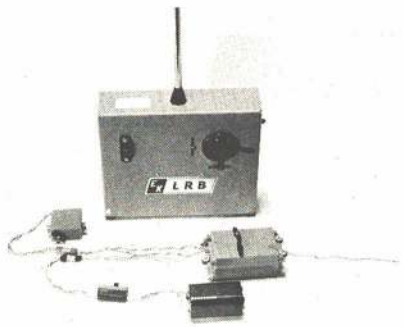
Dumas/U-control Mooney. Based on Mooney Cadet design, kit provides an interesting and easy-to-build fun airplane. 20" span and 049 engine, solid balsa construction with plywood reinforced front end, parts are pre-cut for rapid assembly. Hardware included. $4.25. Dumas Products, 790 S. Park Ave., Tucson, Ariz. 85716

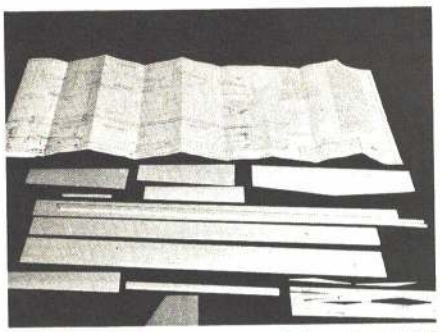


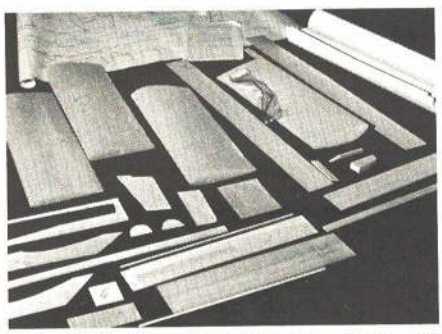
Paksel Mfg. Co./Field kits. A real buy, with rugged construction of plywood and metal fittings, kit provides a great portable base of operations for a day's flying. Hardwood legs detach and store for transit. Holds everything including assembled airplane. $19.50. Paksel Manufacturing Company, Box 662, Herkimer, N.Y. 13350

Williams Bros./Nylon props. Two new nylon propellers, one for CO2 engines, other for rubber. Semi-rigid, not intended for glow plug. Beautifully finished, 5 1/2" dia., 29 cents each. Williams Bros., 181 B St., San Marcos, Calif. 92069

Astro Flight/ Nordic glider. Torrey Pines Contest A 1 Nordic towline-launched glider has 48" span, 32" length, balsa monocoque construction for ruggedness and light weight. Dethermalizer incorporated. $5.95. Astro Flight Inc., 2301 Cheryl Pl., Los Angeles, Calif. 90049



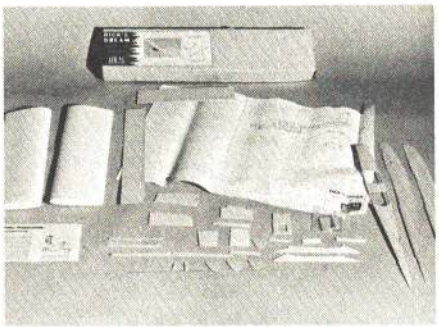


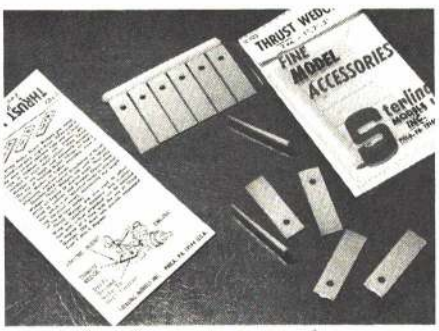


EK Products/LRB Series RC. Basic RC systems for small planes, cars, boats. Available in 2-, 3-, and 4-channel modes. Basic 2-channel system has integrated receiver/servo pack for light weight; 3-channel system (shown) has extra rotary servo for throttle. Uses AA batteries. NiCad battery packs and dual charger also available. $99.50 for 2-channel system, $159.50 for 3-channel, $249.95 for 4-channel. EK Products Inc., 3233 W. Euless Blvd., Hurst, Tex. 76053

Aero Precision/Touchdown. Converts from trainer to performance aircraft by switching wings. Kit comes with foam core semisymmetrical 42" or stable 48" trainer wing. For 3- or 4-channel operation, 15 to 19 power, pre-cut balsa, formed and soldered gear and Aero-Cote covering for wings. $19.95. Aero-Precision, Collins Industries, Box 152, Tipton Ind. 46072

new products check list



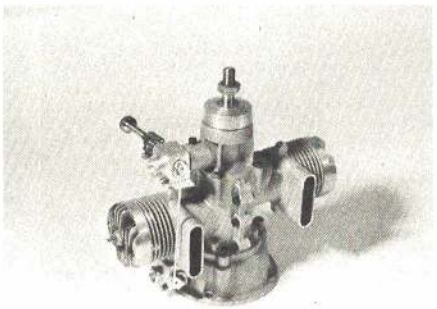


Ace R/C/Dick's Dream. Ideal first RC trainer, designed specifically for Ace pulse proportional Baby Pulse Package (rudder only). Features Ace foam wings, 32" span, 5 1/2" chord. Balsa built-up fuselage is 25", recommended power 020. 12 to 14 oz. flying weight. $5.95. Ace R/C, Higginsville, Mo. 64037

Sterling Models/Thrust wedges. Nylon thrust wedges are precision cut to supply accurate engine offset of 1, 2, or 3 degrees. Can also be used to shim wings or elevators to critical angle of incidence. 1 1/4 x 3/8", wedges come six to a set, with two of each size. In combination, set provides adjustment of up to 12 degrees. 45 cents. Sterling Models, Belfield Ave. and Wister St., Philadelphia, Pa. 19144

Mini-Flite/Inboard power boat. First delivery in June, Big Tee Tri-Hull has length of 29", 11" beam. Wooden frame with plastic hull makes kit easy and quick to assemble. Excellent performance on 15 to 30 engines, stable design throughout. $29.95. The Mini-Flite Co., 48 Princeton St., Red Bank, N.J. 07701

Deans/Car and Boat RC system. Vinyl covered transmitter incorporates wheel-type control for left-right steering. Left-hand mounted throttle and optional third-channel controls are spring-loaded in low-throttle position. Operates on any of six matched color-coded crystals which plug into transmitter and receiver without removing covers. Coil-loaded receiver antenna is only 7" long for realistic scale installations. With 2 servos and rechargable NiCads. W.S. Deans Co., 8512 E. Gardendale, Downey, Calif. 90242



Bronner Eng./Twin 599 engine. Two-cycle opposed simultaneous firing engine has .736 bore, .704 stroke, .599 cu. in. displacement. Twin rotary valve induction uses common control link and common scavenge chamber. Four precision crankshaft ball bearings. Metal-to-metal fittings use no gaskets. 11,300 rpm's on 11-7 1/2 Power Prop. Special mounting designed to fail in crash to protect main casting from shock. Bronner Engineering and Tool Co., 286 Ridgedale Ave., East Hanover, N.J.

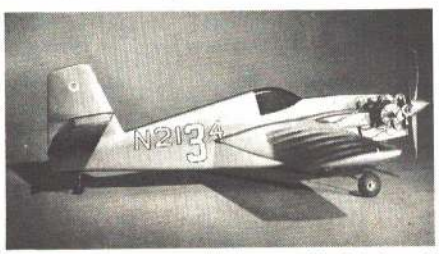
WHERE THE ACTION IS

CONTROL LINE

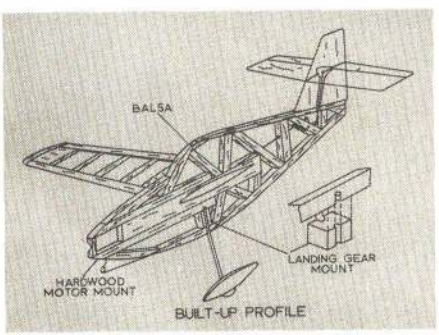
BILL BOSS
SPORT AND SCALE

Hidden Controls and Tank: The answer to hiding the flight controls and fuel tank assembly on profile planes is here in the form of Little Mike.

Little Mike, created by Al Culver, sports a built-up fuselage, which has all the advantages of the full-bodied stunt plane. Al's ship uses the Warren Truss design principle, which provides a strong but hollow fuselage, allowing all flight controls to be enclosed. A little additional fairing in the fuel tank area adds the final touch for a nicely streamlined plane. This type of construction makes for a cleaner looking plane, with better aerodynamics and a little more speed. Al's plane is fashioned after the Goodyear type racers, has approximately 170 sq. in. wing area, and is capable of speeds up to 90 mph with a good 35 engine.



Al Culver's built-up fuselage profile job has all internal controls and is unusually well streamlined.



The basic fuselage can be built of 3/8" or 1/2" sq. balsa stock. Use hardwood for motor mounts and the landing gear block. Build the basic fuselage frame first, then mount the wing, tail section, and landing gear. Install all controls before the fuselage covering is applied.

The nose section is covered with 3/32" plywood in much the same manner as the plywood doublers are applied to the standard profile. Cover the remainder of the fuselage with 1/8" balsa sheet. Sand 1/8" sheeting at the plywood-balsa sheeting joint, blending them into a smooth surface. Add fairing around the fuel tank to provide some streamlining. With a good paint job, this profile plane will be the envy of fellow modelers.

1909 Curtiss: Dave Kingman enjoys his Sunday flying more these days with his version of the Curtiss Pusher plane. While not intended as a scale model, it does follow closely the lines of the real thing. Dave's

This 1909 Curtiss pusher is a semi-scale crowd pleaser. Note doll in the seat.

Flying Machine spans 36", is powered by a Fox 29, and is a very stable flyer. Construction is of hardwood dowel, brass tubing, plywood and balsa. Epoxy was used throughout. A construction article may appear in AAM in the near future.

Building Tips: The Palm Beach Aeronauts Newsletter asks "Did You Know That?" Among the answers: to keep screws from backing out of those 4-40 or 6-32 holes drilled in Tatone type mounts, thread a piece of No. 15 nylon monofilament fishing line through the hole and put the screw back in. It will hold as well as any lock nut.

When using nylon strip or plastic hinges, don't spoil the model's appearance by pinning them. Punch holes from both sides with a fourpenny nail, but don't de-burr the

F8F Bearcat by Paul Sims was best scale model at 1970 Oklahoma Science and Hobby Fair. Don't miss it mid October, 1971, Oklahoma City.

punched holes. Spread epoxy and insert in place. The burrs will give the epoxy something to hang onto.

Scale Detail: When the non-scaler looks at those wonderful scale planes, he often wonders how the builder put on all that detail. A recent issue of the Aero Modelers (San Jose) newsletter has an item which may help to answer this question for the non-scaler as well as the scale beginner. The subject was the Dzus Fasteners which are used on full-scale aircraft to hold access panels in place. These fasteners can be simulated by using ordinary straight pins which come in varying lengths and pin head sizes. A little shopping will turn up the right size to match the scale of the model.

Start by clipping off the heads of several pins, leaving about 1/8" of shank. Now chuck the headless part of the pin in a hand drill with the cut end exposed. This cut end works fine for drilling the necessary mounting holes in the balsa. With care and patience the pin can also be used to drill holes in plywood. Mark fastener locations on the access panel.

Location and spacing are determined by imagining where a panel should be made removable. The key fastener locations will become apparent—at the corners and perhaps several places in between. Good 3-views that show rivet patterns should also indicate the fasteners.

Drill holes at the marked locations with the pin drill, apply a small amount of epoxy to the pin shank (the remaining 1/8") and insert same in hole. Presto—the beginning of some scale detail!

This example is elementary, but it illustrates an approach. The principle here is to look at what the real plane has, then look around for something that resembles, in miniature, the full-size component. A little thought and ingenuity go a long way.

Wanted: Building tips, photos and items of interest covering CL Sport and Scale activities. Your contributions make the column what it is. AAM pays for the items used. Write Bill Boss, in care of AAM.

JOHN BLUM
CARRIER AND STUNT

MO-I Controversy: A recent letter discusses the most controversial model in Navy Carrier and the legality of the Martin MO-I in this event. The writer, Harry Higley, feels that it is legal. This column is not intended as a clearing-house for rules interpretation, but the MO-I is an interesting subject.

The model was processed and awarded bonus points at the 1970 Nats. Arguments against the MO-I for Navy Carrier have been that (1) the 3-view does not show a tailhook; (2) hook or hooks on the prototype were placed between the wheels; (3) prototype did not have the conventional tailhook; (4) model, as produced from magazine plans, does not have the scale radiator; (5) model

The Martin MO-1 as presented in AAM in August 1969. Scale documentation is in article. This one was flown in 1970 Nats. K&B 40.

has no windshield or cockpit.

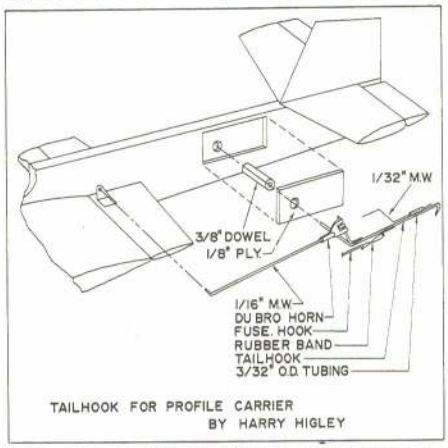
A quick review of the 1971 AMA rule book provides no arguments against the above in sections 20.3 and 20.10, which define model requirements. Rules specify presentation of a 3-view and then proceed to discuss linear dimensions. Rules specify that the model must be equipped with an arresting hook and describe its length but not its location. If the 3-view which locates the hook in the model is considered to be scale, then what of the airfoil thickness and the axle diameter?

Apparently it's a matter of what is not written in the rules, rather than what is. Would this same interpretation permit the OV-10A Bronco which makes Carrier landings without a hook?

The National Archives in Washington can produce a photo of an MO-I landing on the Carrier USS Langley on January 16, 1925!

Profile Tailhook: Harry Higley presents a Profile Carrier model which is not only a competition piece, but also one for experimentation and trial. His idea for a linkage setup allows for adjustable flaps.

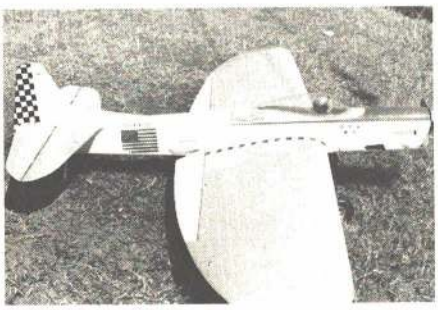
Procedure follows: (1) for strength, a piece of 1/8" plywood is recessed into each fuselage side; (2) a 3/8" dia. hole is drilled to receive a piece of 3/8" dia. dowel, the length of which equals the total fuselage thickness; (3) a 1/8"



TAILHOOK FOR PROFILE CARRIER
BY HARRY HIGLEY

dia. hole is drilled through the dowel to facilitate the pivot portion of a 3/32" dia. tailhook; (4) a Du-Bro horn attached to flap pushrod and connected to the tailhook lever arm permits adjustment; (5) a rod at the flap horn permits even finer adjustment; (6) the 1/32" dia. wire, which is soldered to the elevator, moves from the 3/32" OD tubing, allowing the rubber-band-loaded tailhook to drop.

Vietnam Modeling: SP/4 Michael Ditrich sends photos and information on modeling in Vietnam. Stationed at Long Binh, Mike built the Veco Thunderbird which uses a Fox 35. The wings and stab are covered with MonoKote and the fuselage with dope.



Michael Ditrich's Veco Thunderbird as flown in Vietnam. MonoKoted. Fox 35 power.

Mike says there is a hobby shop on the Long Binh post, but supplies are hard to obtain. His wife sent about half of the materials needed for the Thunderbird. Once a model is built, fuel is extremely hard to get. He and a friend fly on a helicopter pad. At home, he's a member of the Erie, Pa., Model Controliners.

Novice Stunt Flyer: In "Barnstorming," Bill Noyes offers the following advice to the beginner. (1) Dirt is the most common hazard of faulty engine runs. Always use a fuel filter. (2) The tank pickup tube should always be level with the needle valve. If it is higher, the engine will run lean when inverted; if lower, it will run rich when inverted. (3) Vibration causes many problems. The tank should be mounted in foam or rubber to absorb some of this vibration. (4) Cap the tank overflow tube

Al Rabe's version of his bearcat as used at the King Orange. The drag does not seem to hurt, but a big prop is used.

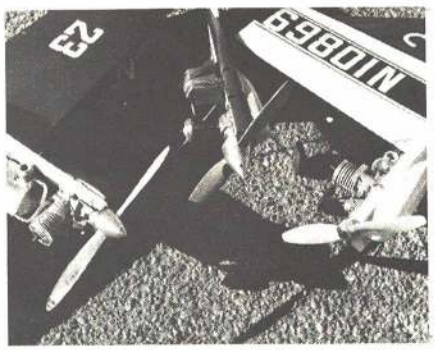
for flight. The end of the filler tube should face the airstream to prevent siphoning in flight.

JOHN SMITH
SPEED AND RACING

Timely Tips: Nick Arpino has some excellent construction hints to pass along. He uses a bushing made of a piece of brass tubing in all holes drilled through aluminum or magnesium pans. Every hole drilled through a pan provides a potential starting point for cracks to develop. Any notch is a starting point for a break, so don't notch pans for needle valves with a file. Instead, rotate the intake to allow the needle to exit between the pan and top. Nick also says every tapped hole should have a screw in it. Using the right size tap drill is important too.

Nick, along with Frank Garzon, manufactures a very nice C pan reviewed in an earlier issue. They now are building a B-sized pan too. For more information, write 301 Wood Acres Rd., East Patchogue, N.Y. 11772.

Fuel Ingredients: E.T. Enterprises, 74 Dickenson, Mt. Clemens, Mich., sells all the makings for home-brew fuel—100% nitro, oils, the works. They also have a fuel concentrate, $7.50 per gallon. Add two gallons of methanol to make three gallons of fuel. This particular mix is only 5%, but for flying sport or stunt, this should cut down on fuel bills. After all, money saved here can be used for speed goodies.



Three mighty fast but different Goodyears, note plane at right has rear exhaust racing engine. Photos by Jerry Farr.

CLCB Making Study: The CLCB is making an in-depth study of lines, connectors, wrapping methods. It is hoped they will go one step farther and look into bellcrank mountings and associated construction. Any information which would be of value in this study can be forwarded to either a district CLCB member or to Jean Pailet, Chairman CLCB, 30 Emerson Rd., Brookville, Glen Head, N.Y. 11545.

Some contestants have questioned what they call "Executive Decisions" and special safety rules asked for at the Nats. But they are needed. A recent advertisement in a national model magazine sells slide-type line connectors. The pull tests given for these connectors are: small, 15 lb.; medium, 22 lb.; and large 49 lb. So please, even though it isn't in the rule book, don't use them. They are not safe.

Still On NCLS: So far, my mail has been running almost 100% for the formation of a National Control Line Society. However, the mailman isn't getting stoopshouldered carrying the replies, so keep those cards and letters coming.

F-R Engine Production Cancelled: Jack Frye says they didn't get enough response for their big record-holding engine to warrant production. Twenty four orders were needed to make it worthwhile. As of early May, orders had totaled 12 to 13. Even the fellow from Japan who wanted three of them didn't help enough. So it looks as though this fine one-of-a-kind will remain just that.

Now the Frye-Roselle team has broken up—no punches thrown. Jerry Roselle says simply, "I'm tired!" Anyone who has seen this team work at contests will know what he means. Their activities over the years paid off with a 197+ record speed that is still on the books.

They will be missed. They are professionals in every sense of the word. I have known these guys for more years than I care to admit and I have never heard a harsh word from them to officials or contestants. Thanks, Jack and Jerry, from all of us, for many exciting flights.

Pictures Please: Now is the time to submit pictures for this column especially since flying has been going on for some months. One suggestion: when sending a picture, please do not send the same picture to another publication. Photographs should be sharp black and whites with lots of action or pretty models. Also, suggestions on what you would like to see covered in this column are welcome.

Coming Contests: The Cleveland, Ohio, Jr. Air Races, Aug. 14-15, are billed as the biggest meet outside the Nats. All CL events—eight circles—great trophies. Also FAI speed, TR, and stunt. On Sept. 4, 5, and 6 at Cleveland, FAI Team Selection, (CL) will be made, also world record attempts for all classes of CL Speed. Don't miss this one.

Support your FAI Control Line Team. Send donations to AMA headquarters.

RADIO CONTROL

DON LOWE
SPORT AND PATTERN

Care and Feeding of RC Gear: Cliff Weirick of Kraft Systems has been visiting clubs and checking the pulse of the RC modelers in many parts of the country this year. He also has been spreading some good advice relative to the care and feeding of RC gear. Some of his comments, as reported in the April (Rapid City, S. D.) Propbusters newsletter, are well worth repeating.

Cliff says that the servos are the biggest problem in present RC gear and the motor is the weakest link. Vibration raises havoc, as a lot of us have learned. Best bet is to mount servos with the rubber grommet mounting provided and to stay away from foam tape. As soft a mount as possible is needed, commensurate with achieving the necessary rigidity for control action.

Batteries should be considered more than a chunk of lead for balancing the plane. Wrap them in foam and gently secure the foam in place with masking tape, not tightly bound

with rubber bands. Place the whole bit in a plastic Baggie to protect from fuel. Battery failure is usually caused by a short or a seal failure. They rarely wear out from normal use. (In my experience, cells that are many years old have been recharged hundreds of times.) When using the usual RC battery-charging equipment supplied with the radio set, damage from overcharging is remote. He suggests charging before every flying session. Check motor mount bolts frequently. Carefully wrap the receiver and batteries with foam.

Cliff's major concern is vibration-induced failure in radio equipment. I certainly concur in this concern. Even though modern radio equipment is pretty rugged and will absorb a lot of abuse, a little care goes a long way toward insuring added life.

Don Lowe fires up RC combat Guillotine while Mr. World Engines, John Maloney, holds on. Real fun flying machine.

Proficiency Program: As was previously reported, various clubs are instituting pilot proficiency programs. The basic objective in all instances is first, to insure that a member can fly safely and second, to establish proficiency goals at various levels to serve as a specific challenge for the flier. The Pioneer RC Club (Sunnyvale, Calif.) May 1971 newsletter, "The Modulator," reports that the following proficiency levels have been adopted.

Level I: Field and safety rules, FCC and AMA licenses, dual training (pre-solo).

Level II: Solo take-off and landing.

Level III: Take-off; straight flight out; procedure turn; straight flight back; figure eight; one inside loop; rectangular approach and landing.

Level IV: Touch and go; three inside loops; three outside loops; Immelmann turn; Cuban eight; spot landing and a three-turn spin.

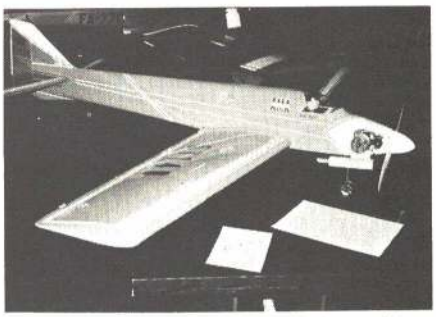
Level V: Double Immelmann; three rolls, slow roll; figure M; Top Hat; stall turn; four-point roll and a 180-degree turn.

There are many ways to set up such a program but the basic idea is an excellent one. Having specific goals creates a greater challenge to become a better flier and may even spark an increased interest in Formal competition flying.

City sponsored RC flying site in Abilene, Texas. Even has spectator grandstands. Nice.

Smithsonian Winnie Mae: "The Modulator" also reports that club member Monty Groves' RC scale Winnie Mae (p. 19, Aug. 1970 **AAM**) is now on display at the Smithsonian National Air and Space Museum in Washington, D.C. This is quite an honor and we extend congratulations to Monty.

Seattle RC Conference: The Rams Club (Seattle) reports on the Sixth Northwest RC Conference, held January 30-31. "More people, planes and products came to the show than in any previous year. Approximately 120 RC models were entered in the various events for airplanes, boats and cars.



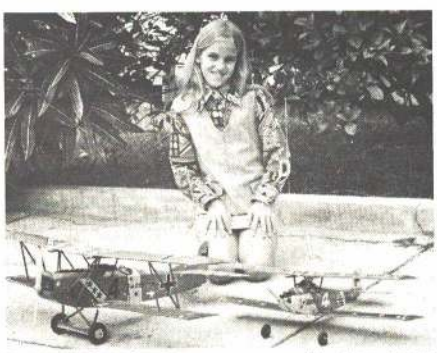
Bob Root calls it the "Ledge"; looks like a fine pattern machine.

"Live RC demonstrations were held in the swimming pool with steam- and electric-powered boats. An RC car race took place in the parking lot on Sunday afternoon. A sport pylon airplane race was held at the local RC field.

"Movies were shown of RC airplanes and boats. Panel discussions of slope soaring, pylon racing, scale and pattern flying were well attended. An excellent old engine display with nearly every production engine ever built from Brown Junior to the latest Wankel was shown. Manufacturers brought their latest equipment to show and tell. At the dinner banquet Saturday night, the agenda included first place trophy awards plus a talk and film of Boeing's airplane flight test program.

"Sunday afternoon, 55 trophies were awarded to the happy winners. A great time was had by all and it was also a financial success."

30,000 Attend MACS!: According to the Orange Coast Radio Control Club newsletter, "Hangar Talk," 30,000 attended the April 24-25 Annaheim Model and Craft Show. The attendance estimate was made by the convention center officials. Paid attendance was 8695 with an estimated 2.5 children admitted for each paid attendee. These shows are getting bigger, better and more professional all the time. A sign of real maturity in this hobby!



Pretty Victoria Sayer poses with her Dad's sport biplanes. Bright colors on models.

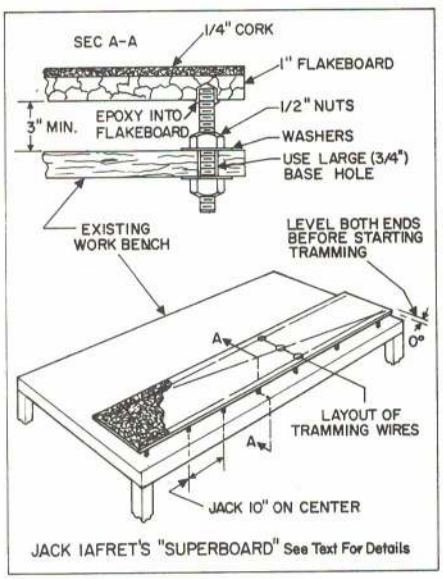
Unique RC Events: Many variations in competition events are in evidence. The Orange Coast Radio Control Club scheduled their third WW II Fly-In. This contest features specialty events such as "California Scale," Bomb Drop and Carrier Landing, and is limited to plane designs created and used for military purposes between September 1, 1939, and September 12, 1945.

The North Jersey RC Club has sponsored an Old-Timers Free Flight RC Contest. Objective here is to achieve engine cut-off and steering to prevent loss of those pre-1941 design free flight models.

Super Board: Jack Iafret came up with a clever idea for a large, very true building board for glider wings. What was needed was a rigid board which would accept pins and be movable for storage when not in use. One-inch flake board and 1/4" cork were obtained at a building supply and the threaded rod and nuts at a hardware store. Some building notes follow:

(1) Use tile cement for the cork—it works well and is inexpensive.

(2) Lay out Jack screws accurately and epoxy into the board squarely.



JACK IAFRET'S "SUPERBOARD" See Text For Details

(3) Level board by stretching a very tight string down the two long sides and one diagonal. Place 1/8 inch spacer under each end of the string to hold it off the board. Now using another spacer, adjust the nuts until the strings are all the same distance off the board at all points.

(4) Staple a covering over the cork to protect it from glue. Use asbestos drafting mylar or polypropolene tablecloth or construction water-proofing plastic.

CLAUDE McCULLOUGH SCALE

Large, Larger: When Robin Lehman attended the full-size World Aerobatic Championships in England last year, he was impressed by the slow and graceful style of flying in which maneuvers were executed one immediately after another, unlike the boring conventional model airplane pattern where one maneuver is done, the plane flies around and then the next stunt is performed. To try to duplicate this example, he is flying a quarter-size C.A.P. 20 and a 1/3 size Smith Miniplane. He says that they are slow but very responsive at the same time—usually these two characteristics don't go together.

Keep Cool: Engine overheating and consequent malfunction, a common problem with scale models, is usually blamed on the cowling. Not necessarily so—a properly laid out cowl can be a help and not a hindrance. It is not enough to have a big front opening. Even a gaping radial engine cowl can cause

Smith Miniplane is 1/3 size. Big and steady.

A 1/4 size C.A.P. 20 homebuilt by Lehman uses O.S. 80, weighs 14 lb. and spans 8'.

trouble if there is insufficient exit air space or if the engine head is jammed up against the firewall. In fact, a large part of the air passing through an open cowl is wasted and the cause of unnecessary drag. If there is insufficient exit space it actually subtracts from cooling. Only the air passing very close to the motor is doing the job.

That being the case, a dummy radial engine can do something more than help scale appearance. Use it to block off all of the air flow through the cowl except for a slot directly in front of the engine cylinder and head fins. Provide baffles on each side as in full-scale practice to direct the air through the fins. The rear exit opening should be at least slightly larger than the opening in the front. Take a look at control-line speedsters and see how little opening is actually needed for proper cooling if the internal setup following it is correct.

Another often overlooked cause of hot powerplants is spewing the exhaust directly into the cowl area to swirl around the engine. A Tatone manifold or similar device should be used to duct the heat to the outside so that only fresh area is present. If the design of the prototype aircraft permits, it's a good practical and authentic touch to route the exhaust gases to the scale stacks.

Scale Racing On Water: Granger Williams, a leading member of the F.A.S.T. Club when they were flying CL Schneider Cup racers, is one of the sparkplugs for a group of West Coast RC fliers which is organizing the same type of event for radio. Russ Barrera of the Russ-Craft Model Museum is digging out reference material, and construction drawings are underway. Lake Elsinore (Calif.) looks like an ideal spot for racing tryouts, the Flightmasters having had two successful ROW scale meets there. Should be a fantastic sight.

Sanding Sticks: Seen on Maxey Hester's workbench, an assortment of spruce sticks, strips and dowels in various sizes with sandpaper glued to their sides or ends. Amazingly handy for enlarging spar holes in ribs or stringer slots in a former, reaching through structure into tight places, or working on scale details buried in a cockpit.

Man From Glad: Greg Malinowski, editor of the Monmouth Model Airplane Club Newsletter, has a handy kink for keeping a spray gun clean. Line it with a sandwich baggie turned over the rim. After spraying remove the baggie and replace it with a clean one.

Scale Data Sources: The Smithsonian Institution, Washington, D.C. 20560, will supply copies of photos in its large aviation collection. Describe photos required and information as to availability will be supplied. 8 x 10's are $1.00, other sizes and color also. Expect some delay, their dedicated staff is overloaded.

CLIFF PETERS
RC BOATING

New Man On Board: A new man starting a new column is always in somewhat of a bind. The writer hopes to turn out material of interest to the reader and acceptable to the editor. The reader wonders if the new writer knows his stuff and whether the column will be of use to him. The editor keeps his fingers crossed that every month he will get the material that he wants and that it will be on time.

So, to begin, here are our basic qualifications: (1) We like boats. In fact, we love everything that floats, even the contents of micro-bikinis. (2) We have been building and sailing boats since, it sometimes seems, Moses took a river voyage and ended up in the bullrushes. (3) We have made every mistake in the book and therefore are intimately acquainted with every pitfall known to model RC boat builders.

AAM has neglected a column on boating too long. With this issue we introduce Cliff Peters. He's been operating RC boats since radio began. Send in your pix and ideas.

We also have a few hangups. We enjoy building and sailing boats and think everyone else interested in the hobby also should enjoy it. We object to the theory that every beginner and would-be boater must be innoculated immediately with the racing virus. Let us make it clear that we are not against racing, per se. In fact, we are very much in favor of it. We just don't believe that RC model boating begins and ends in racing. Not everyone who takes up the hobby is equipped emotionally or financially to build and sail "the fastest boat on the pond." The financial restraints can become embarrassing if a modeler is made to feel that he isn't one of the boys just because his boat can't hold its own. In reality, he may have taken up the hobby for the pure fun and relaxation sailing affords.

Another hangup: We enjoy electrics and believe that we will be seeing more and more of them. They are relaxing and offer a real challenge to the speed enthusiast. This phase has been neglected for too long. The internal combustion engine-driven boat often can be speeded up merely by a better or larger engine, a change in fuel, props, glow plugs, etc. The theoretical limit when speed capability will be greater than our ability to keep the boat in the water may soon be reached.

The introduction of the Sea Wasp electric motor, with its high rpm, high efficiency and light weight, opens up a whole new field for the serious and competent designer. We predict some new and suprisingly fast records will be set this year by electrics, but don't be surprised if the British do it first. As an additional advantage electrics cause no noise, no pollution, no odors and can be sailed in many ponds and lakes where internal combustion engines are not allowed.

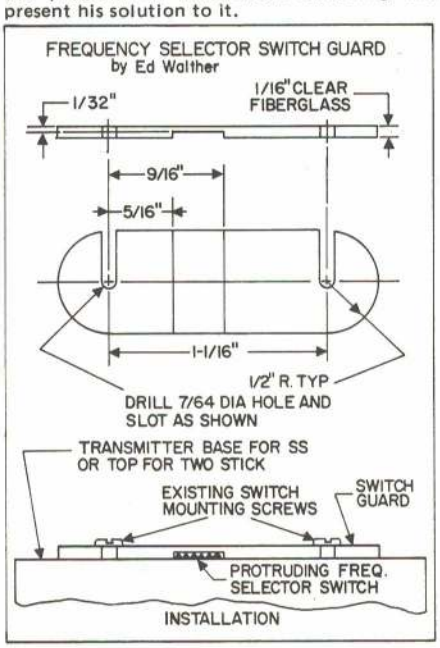
This column can be as good as you, the reader, help to make it. Send us the news about boating and boat club activities in your area, including a photo when possible. If you have a new or unusual gimmick, tell us about it. If the item is printed, it will be paid for—not enough for a new 6-channel RC unit, but perhaps a gallon of fuel.

Get your club secretary to drop us a line about what is happening, and what is planned. If your club sails Saturdays or Sundays, let us know: who, what, where, time, every weekend or only certain weekends in the month.

Do use full names—and don't send a swell yarn about "John's boat last Sunday was clocked over the 1/16 mile at 72.3 mph just before a bolt of lightning struck it and changed it into toothpicks." Do include your name and address. This is not our first writing job and we've seen many good letters come in unsigned, no address, but containing the most interesting and publishable material.

FRED MARKS
AERODYNAMICS, ELECTRONICS

Switchable Frequencies—Boon or Built-In Glitch?: Selectable frequency for digital systems was almost inevitable and, in my opinion, it is a step forward in technology. However, the problem of frequency control is bound to be an unwanted result. The following comments from Ed Walther typify the problem of inadvertent switching and present his solution to it.



"I had just purchased a Kraft 71 Series single-stick system with switchable frequency and, at the flying field, a group gathered to examine the new goodies. The switchable frequency switch on the bottom of the transmitter drew the most attention and wound up in a position other than the one required for the frequency I chose to fly on. This pointed out the need to secure the switch position for the frequency to be used.

"Having the switch in the wrong position is of little consequece to the owner, since he immediately will see that his aircraft will not respond at start up time. But, unbeknown to him, during this same period of time, he may be bringing his pal to the ground.

"The diagram shows the switch guard I now use. Since all of our transmitters are required to be in an impound area, which is frequented by many people, I am relieved to know I have taken precautions to prevent a very nasty experience. The plate is reversible for either frequency."

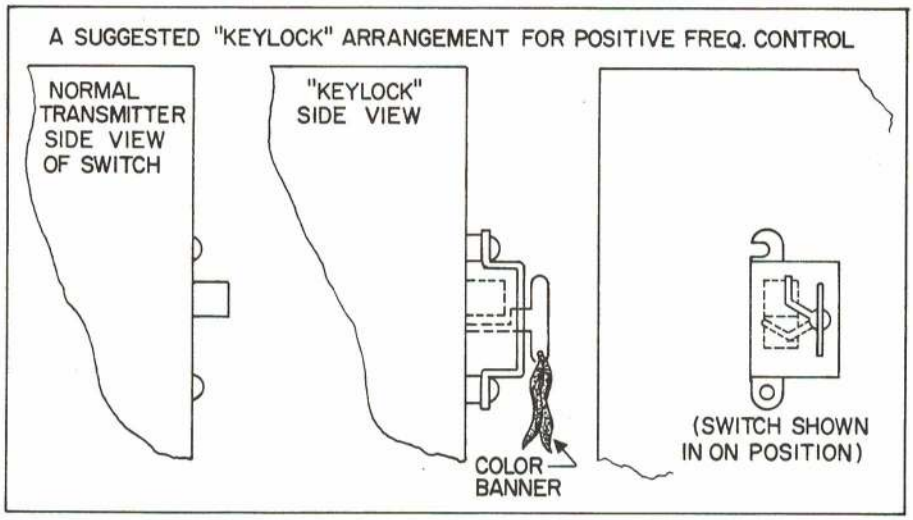
While this switch guard does provide a solution to inadvertent switching of frequency, other problems exist, such as: keeping the proper color flag on the transmitter antenna for those who forget the color code; someone switching to your frequency without telling you (which can happen when the crowd is small and good frequency control may not be in effect); the need to change frequency as the flight line on your frequency builds up; determining who should change frequency; insuring that the gentleman who just switched frequency goes to the end of the flight line; etc. It definitely would be discourteous and dangerous to switch back and forth continuously just to keep getting in flights ahead of fellow fliers.

There are three key elements to proper control when frequencies can be switched. First is the time-proven color coding of frequency flags for transmitters. The system used by the DCRC has been relatively trouble-free. A frequency board with a color-coded clothespin for each frequency is clipped to the matching color code on the board, with the frequncy prominently identified beside that color. The flier must have the clip on his transmitter antenna before he can turn on and, since there is only one clip per frequency, only one can turn on at a time! Right? Wrong! Occasionally someone in the excitement of a prang or interference can put the pin back without turning the transmitter off. In one, instance, a presumably color-blind flier put the orange and white pin on the red and white spot. A second flier, presumably also color-blind, picked it off the board without observing that he had the wrong pin and proceeded to take off while the legitimate holder of the red and white pin was flying. Good old "Crash" proceeded to reduce his Kwik-Fli to a silk bag full of balsa and radio!

The next step is to initiate a transmitter impound area—a good idea but it still leaves frequency control open to chance. Someone still can forget to turn off the switch before putting his transmitter in the impound area. It really isn't the inconsiderate gentleman who willfully or forgetfully turns on the transmitter out of turn that is the problem—it's the flier who forgets to turn the switch off. Analyze the problems at your field and I believe you will reach the same conclusion.

A third practical help is assigning a specific flier to be the custodian of transmitters at the impound area, assisted by a very prominent check list: Do you have the pin? Is it the proper color? Does it match your flag color? Did you turn off before putting the transmitter in impound? What is your selected frequency?

Even with all these precautions, Murphy's law still holds: if it can happen, it will. The only foolproof arrangement is a "keylock" system. A transmitter can't be turned on without the key, the key cannot be removed without turning off the transmitter. The key then remains on the frequency board when not in use, and no one turns on without the key.



The preceding precautions apply to busy fields or to hectic contests. Small groups of informal fliers simply must police carefully to be sure all is correct every time a switch is moved. For those groups who wish to consider a keylock system, a sketch is presented to show how it might be done. There certainly should be some good, simple arrangements submitted.

The rig shown is simply a suggestion; shop tools often have a similar arrangement. The key can be inserted only when the switch has been turned off manually. Note that the slot in the plate is directly over the switch in the "on" position. After insertion, the key may be used to turn the switch "on." It cannot be removed without first turning the switch "off." A slightly more elaborate arrangement certainly could turn the switch on and off with the turn of the key. The "keylock" can readily be swung out of the way for operation at home.

But what about the fellow who can switch frequencies? This still doesn't control that aspect, does it? No, he needs a second "keylock" with a key shaped for frequency selection. All this gets very involved but probably would be necessary to provide a 99.9 percent assurance that an accident won't eventually happen. That probability still means one incident per 1000 flights.

Servo Thrust Versus Torque: Some comments have been received regarding the thrust figures for the Digiace System servos covered in a recent Blue Ribbon Review. The thrust figures quoted appear a little low compared to most and this concerned some modelers. It appears I am guilty of lack of clarity, even though I also stated the output torque of the servo. Output torque, i.e., the "turning power" of the output shaft is determined as follows: the thrust achievable at a radius, R, from the center of the output wheel multiplied by that radius is torque. The dimensions, for our measurement system, are inch-pounds. Thus, a thrust of, say, 2.5 lbs. at a radius of 0.5 inches, yields a torque of 1.25 inch-pounds. Conversely, for a torque of 1.25 inch-pounds, the thrust at 0.25 inches would be five pounds, or double that at 0.5 inches.

The Digiace servo has a rather large output wheel compared to most of our mini-servos, thus, radius, R, is larger. If the user wishes more output thrust, he can drill holes closer to the center of the wheel and obtain the same thrust as for other servos having smaller output wheels. We have suggested to Rand Sales that a smaller output wheel might be appropriate.

HOWARD McENTEE

FAI AND GLIDERS

Gliders Expensive & Complex?: Not always! Jeff Fagg's Dumas kit Mod Pod is controlled by an Ace Commander pulse propo rudder. The craft is adjusted for slope soaring and has flown over half an hour many times. This simple inexpensive plane uses a simple radio system, but a lot of fun is possible with the combination!

14-year-old Jeff Fagg with Mod Pod. Used primarily for slope soaring. Rudder only.

New Gliders, Equipment, at Toledo: The commercial displays were disappointing, for only a few new U.S.-made glider kits were exhibited. The 70-in. span Schweizer 1-26D by Sterling was one, and it appears to be a close-to-scale copy of the real thing. Sterling is pleased with reception of their earlier Schweizer 1-34, so here is one concern we apparently can count on to fill the void in U.S. glider kits.

Dumas Products has a smaller Evolution with a 66-in. span with wing tips in place, 42-in. span with them removed. The craft has a 1/2A engine in the nose. For glider kits in the competition category, we still have to rely on imported kits, which will be distributed to many hobby shops.

Nelson Model Products has several new German kits, including the Graupner Cumulus, an ARF job of beautiful

construction and design that lists at close to $100! Others cost far less, but require more work to build. These have plastic fuselages of various sorts.

Midwest Models showed the E-J-Juan, a West Coast design with simplified lines and all-balsa construction. Aristo-Craft has enlarged coverage of the German Hegi line, including a true-scale Schleicher ASW 15. The plane spans 3000 mm and includes a fiberglass fuselage and a complete set of hardware.

Penford Plastics is importing kits for the 118-in. span Darmstadt D-36 Circe. It also has a fiberglass fuselage, with built-up balsa wings (pine spars). As an interesting feature, the wings do not have the usual tip washout; instead, the same result is achieved by making the tip area leading edge more blunt than the rest of the wing LE.

A beautiful 82-in. span, all-molded plastic, powered glider from the Pilot line was exhibited by World Engines. The powerplant is in a pod above the wing which did not appear to be removable.

Toledo showed much interesting glider-type equipment. Many two- and three-control radio systems were shown. Of even more interest were three two-control bricks—unit assemblies of receiver, decoder and two servos in a single case. These seem ideal for many gliders and are very easy to shift from one ship to another.

The World Engines and EK Logictrol units may be had in three-control form, but the third servo must be external to the brick (EK also makes a basic two-control brick, W.E. makes only a three-control, Kraft has only a two and does not offer three).

The W.E. unit may be of special interest to glider builders, since it incorporates their new Low-Boy servo. These servos may be removed from the receiver section of the brick and mounted separately, if necessary. The servos measure about 3 1/8" in length, 1 3/16" in height, 23/32" in width, including lugs and output arms; both linear and rotary outputs are provided. Some gliders are so long and skinny in the nose area that even the smaller conventional servos are a tight fit, but the Low-Boy configuration might do the job.

GEORGE SIPOSS

RC CAR RACING

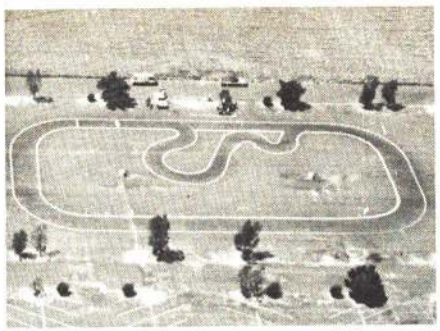
Successful Show: The MACS (formerly MATS) show in Anaheim, Calif., was a huge success. Held in the Convention Center, it attracted more than 10,000 people.

Among the most notable booths with special interest for cars were the following. Dynamic Models showed new bodies made from the unbreakable Dylon and a new type of breakaway steering system. Model Car Enterprises showed their new sidewinder cars, ranging from the very simple to the most complex assemblies. They have a new 5:1 gearset with high-torque clutch and also new foam rear tires.

Line-up at 1970 ROAR NATS. Racing is growing.

Taran Products, Santa Clara, showed a new car, as well as old reliable products such as the breakaway servo mount and ball joints. Kyosho Model Maker showed its very complete car kit and a new 19 engine for cars. The Testor booth had the new 40 engine whose shape is quite similar to the 19 engine presently being developed for cars.

K&B had the new "500" fuel as well as the Perry carburetor-equipped 19 Veco. World



Writer took this pix from an old pre-war Stearman bipe. Scene is great Briggs Cunningham Museum's RC race track.

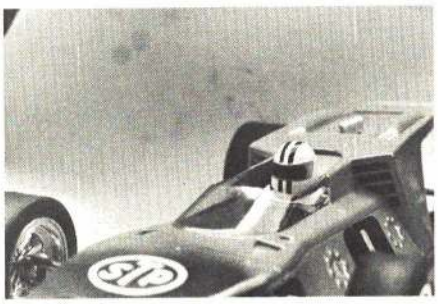
Engines displayed the Supertigre 19 engine which is the engine to beat these days.

Ever-smiling Carl Goldberg showed his new clevis rods, while at the Orbit booth we saw the new trigger type of radio especially developed for car racers who are converts from the ranks of slot racers.

The Heath booth had a beautiful display of cars, radio and accessories. One of the most popular attractions was the Jerobee booth, where people ogled the tiny racers with full radio equipment and Cox engines.

On the new product scene, many items are worth mentioning. Driver painting and mounting problems are over. C&F Mfg. (617-B Fashion Park St., Orange, Calif. 92666) is now marketing a driver with the latest Bell Star helmet. Paint the platform black, give a simple paint job to the driver, and a car looks ten times better.

Fiberglass car bodies with a plastic outer skin now can be purchased from Del Mar Products, P.O. Box 1057, San Jose, Calif.



Driver in Star Bell Helmet from C&F Mfg. displayed at MACS show.

95108. Write for a complete catalog of their many body styles.

Thorp Mfg., 350 E. Commercial St., Pomona, Calif 91766, has a belt-driven sidewinder car kit selling for $99.95, less engine and radio. To go first class, consider an electronic timer system for club races. Built by Petri Enterprises, Rt. 2, Box 90, San Antonio, Tex. 78228, its price is quite reasonable.

As you can see, quite a choice of products is now available. A year or two ago, it was difficult to get even the simplest items; today, snap your fingers and the kits, bodies, radios and engines seem to come out of the woodwork. Don't accept inferior products. It is you, the customer, who dictates which item is popular and stays in constant demand.

Grand Prix: A super Grand Prix d'Endurance will be held in Southern California sometime in late summer. The race will be ROAR sanctioned and will last for three hours. There will be a bridge on the course, as well as other hazards. To top it off, the start will be a real LeMans start with engines stopped and drivers running across the track. Each car must have at least two drivers. We will keep you informed about this race.

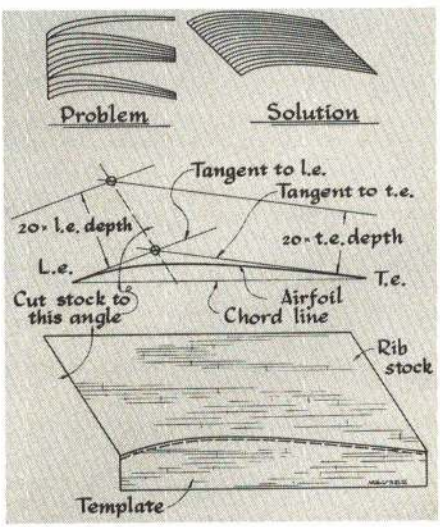
FREE FLIGHT

BOB MEUSER

SPORT

Finding Lost Models: A sighting compass, arranged to indicate the direction

Example of the ideal lost model-finding compass. Is easy to use and accurate.



measurement or bearing of a distant object, is a big help for finding a lost model. Prices range from around $2 for a Japanese version of the Army "lensatic" compass to over $100. Just a notch above the cheapies in price, the liquid-filled prismatic compass, shown here, has some nice features. The oil damps the oscillations of the graduated card, making it easier to get an accurate reading quickly. The prism permits reading the angle scale while sighting on the distant object. This West German-made jewel costs $11.50 plus postage, from the backpacking specialty shop,

Sierra Designs, 4th and Addison, Berkeley, Calif. 94710.

When flying on flat terrain with plenty of landmarks, it is easy to walk a bee-line to the model and a compass is unnecessary. But, if a hill, or a lake, or an irate farmer must be circumnavigated, or if the landmark is one of a dozen identical telephone poles, or if the model has landed beyond the landmark, a $12 compass can save a $50 model.

It's not necessary to dead-reckon your way to the model—it's much simpler than that. When the model goes down, take note of a landmark in line with the model, and measure its bearing with the compass. Later, if the same bearing is measured when sighting on that landmark, you are on the line. Even more

Walt Mooney's delta with removeable CO2 engine mount. Flies two planes with same engine.

useful is a backsight bearing, which extends the line behind you. If the bearing is less than 180 degrees, add 180 to it to get the backsight bearing; if more than 180, subtract 180. Now, whenever the proper backsight bearing is read when sighting back at the launching point, you know you are on line. If you go beyond the landmark, take a backsight reading on the landmark to establish whether you are on the line. In hilly terrain, the compass is especially useful, since it can be used to establish new landmarks accurately as the old ones become hidden. A day in the field with a compass will make you a true believer.

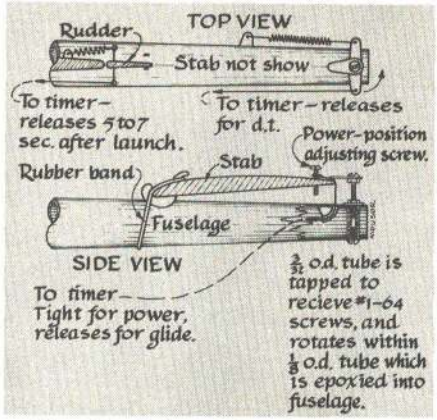
Sliced Ribs, Revisited: Bill Bigge, indoorsman, kite king, and a frequent contributor to this column, scratched his head-bone after reading the item on sliced ribs in the Jan. 1971, **AAM**. He came up with a solution to this problem: since the leading edge angle is greater than the trailing edge angle, sliced ribs of uniform depth tend to break near the leading edge. Therefore, most modelers make them a little thicker toward the front. The trouble is that the angle which the rib makes with the grain of the rib keeps changing as more ribs are cut, making it necessary every so often to shift the template back to its proper orientation, slice off a chunk of rib stock, and start anew.

Solution: By progressing along the rib stock at an angle somewhere between 45 and 60 degrees, instead of the usual 90 degrees, and keeping the template oriented so that the chord line is parallel to the edge of the sheet, the leading edge automatically comes out deeper than the trailing edge.

Bill conjured a way to get precisely the desired thickness at both ends of the rib. First, draw the rib airfoil, a line tangent to (or grazing) the airfoil at the leading edge, and another at the trailing edge. Next, draw a line parallel to the leading edge tangent, and 20 times the leading edge rib depth away from the first line, and a similar line 20 times the trailing edge depth away from the trailing edge tangent. Pay attention to the sketch or you'll get lost.

Next, connect the intersections (circled on the sketch) with a straight line, thus making a certain angle with the chord line. If the template progresses across the rib stock at the same angle, and the template remains parallel to the grain, the rib depths come out just as anticipated. Leave it to a physicist!

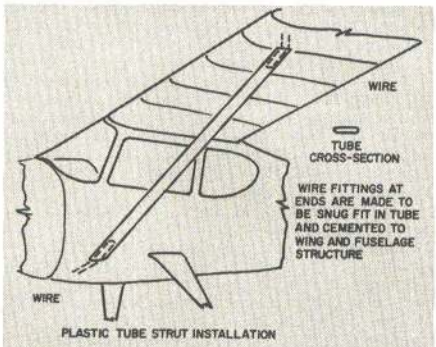
Wakefield Auto-Everything: Southwest Aero Teamsters John Allen and Jim Taylor have developed an auto-rudder, auto-stab, dethermalizer setup, operated from a Seelig 3-function clockwork timer intended for small gas models. Alternatively, the DT could be operated conventionally, by fuse or Tatone DT-timer, and the auto-rudder-stab operated from a modified Tatone engine timer, but the weight will be a bit greater.

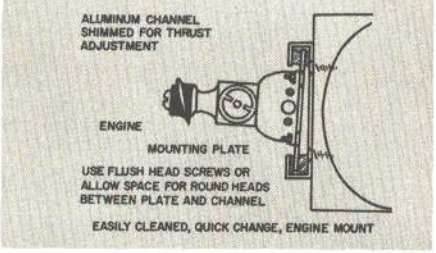


This setup helped Allen place first at the Team Selection Finals at Albuquerque last fall. A three-view of Allen's winning Citadel was presented in the April, 1971, issue of **AAM**, p. 42. When the model is launched, the trailing edge of the stabilizer is down so that the power-position adjusting screw contacts the top of the fuselage, and the rudder is straight ahead. Five to seven seconds later, the rudder line is released, and a spring pulls the rudder over to the right-turn position. At 14 to 16 seconds, about halfway through the power phase, the trailing edge of the stab is released, and raises 1 1/2 to 2 degrees to the cruise-glide position. At three minutes, the third line releases, allowing the stab-stop to rotate, releasing the stab, and allowing it to raise about 45 degrees to the DT position. Auto-rudders and stabs were used on almost all of the power models at the Albuquerque fly-offs, and on about one-third of the Wakefields.

WALT MOONEY SCALE

Scale Detail Sources: Occasionally, the Scale builder will find material for details in the most unlikely places. The plastic revolution has provided polyethylene soda straws which can be turned into lightweight exhaust pipes or Peanut Scale cylinders when wrapped with thread. Recently, placemats and drapes have been made out of flattened plastic tubing. These come in a variety of color combinations and can be used as a source of supply for scale strutting. These struts snap into place and are easily removed and replaced, as well as being





lightweight and already formed to a near scale cross-section.

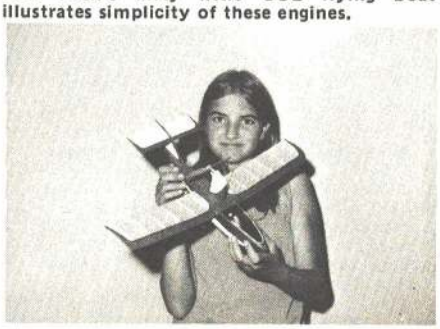
Convenient Engine Mounting: To simplify cleaning the front of a model use the engine mounting shown. It is easily removed and at the same time allows for quick thrustline changes on the field. In addition, one motor set up in this manner can be used on several models with similar channels.

Peanut Scale Prevails: At the San Diego Orbiteers monthly scale contests, Peanut Scale airplanes and Peanut-Scale-size fliers seem to be taking over. Several Juniors are doing quite well. Doug Mooney with a Rearwin, Kenny Hannan with a Porter, and Jill Peck with a Miles M 18 have been flying it out. Nice-looking Open Peanuts are Mather's Jodel, Chief Brook's Cougar, and Bob Peck's Pietenpol. Speedy Diaz turned up with a Tipsy Junior with scale (i.e., very little) and dihedral and astounded all the old hands by flying it very well.

Dihedral Conspiracy: A local conspiracy to educate Walt Mooney on the value of dihedral was afoot. Every time he turned around, some old hand would suggest his models needed a little more. The fact that he was trying to fly a Chanute hang glider as a kite without dihedral kept him from finding out it was a conspiracy for quite a while, much to the amusement of the Orbiteers. He'll have the last laugh yet. His last Peanut is a model of the Ord Hume OH-7 (Best time, 82 sec.), with less than scale dihedral—accidentally!

Seaplanes Away: North American Flightmasters held their annual scale seaplane contest June 13, with most area scale enthusiasts participating. One of the nicest

Bob Peck's nifty little CO2 flying boat illustrates simplicity of these engines.



entries was a scale model of the homebuilt Osprey, a single-seat flying boat by Bob Peck. This has a pusher Brown Junior CO2 for power, and it really flies beautifully. Test flights showed it will provide plenty of competition.

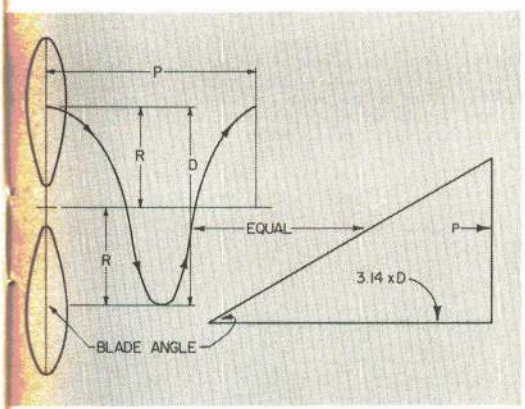
BUD TENNY
INDOOR

Indoor Meet Big Success: The LIAMAC Indoor Championships, announced here in June, had 56 entries in six events. This represents major growth for the twice-annual meet and a vote of confidence for the excellent site. Ray Harlan was Senior-Open High Point Champ and Meet Champ, while Barry Pailet was Junior Champ.

Successful Indoor Season: The Chicago Aeronuts sponsored five indoor meets this spring, holding HLG and one other event at each meet. The average attendance logged by CD Pete Sotich was 28 fliers per meet, with about one-third of these being Juniors. The Aeronuts, an old-time Chicago club whose past membership has included Carl Goldberg and Wally Simmers, are to be congratulated for their effort!

Indoor Props: In response to several questions, this column will present information on indoor props from time to time. Those who have questions about or problems with indoor props are encouraged to send them to Bud Tenny, Box 545, Richardson, Tex. 75080. Using the correct propeller is important on all models, but the prop is the most important single component for a good indoor model. Indoor fliers must understand props and their application if they wish to have top performance.

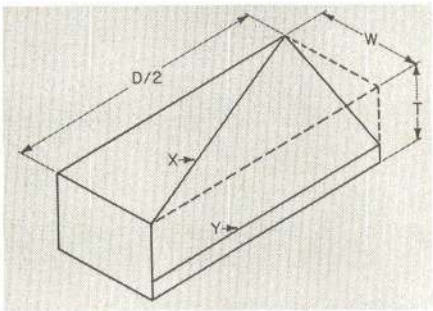
What Is Prop Pitch? Prop pitch is the angle of the prop blade. The sketch shows how pitch is determined on a working prop. First, a prop can be compared to a screw being screwed into wood; a screw moves into the wood just so far each revolution, and a prop moves through the air just so much each revolution. The sketch shows a point on the blade of a prop, which is R distance from the center of the prop. In one revolution, this point moves along a curved line called a helix; it is turning around the center and moving forward at the same time. The triangle at the right shows the relationship between the forward motion and the helix. The bottom edge of the triangle can be drawn to scale representing the circular distance or 3.14 x D.



The vertical line of the triangle repesents the scale distance the prop moved forward in one revolution. The third side of the triangle is then a scale length of the helix.

What Angle? The blade angle (prop pitch) is the angle formed between the third side of the triangle and the base. Note that this is the angle for this one point on the blade only! The angle at each other point can be found in similar fashion; the base of the triangle will be different each time R is changed, while the end height of the triangle will remain unchanged.

Prop Block: Many indoor props are built on a carved block which must be built to the desired pitch. In the pitch diagram discussed above, assume that the prop moved 30"—that is, it had 30" of pitch. The carved block shown can be designed for 30" pitch using this formula: Pitch is equal to (3.14 x D x T) divided by W; where D is the desired diameter of the prop, T is the thickness of the block, W is the width of the block. Assume that a 16" diameter prop is needed, and that a block 3" wide is available. T then works out to be 1.79".



Block Layout: Since the block is used to build one blade at a time, make it one half the prop length or D/2 long. At one end, measure off T and W and draw lines from the front corner of the block to the end as shown (lines x and y in the sketch). Now, carve away the excess wood (shown by dashed lines), being careful to leave the finished surface smooth and level. The result is a platform on which to build the prop. Each part of the block is at the desired angle for that part of the prop blade.

Major Indoor Meet: The D.C. Maxecutors (Washington, D.C.) are sponsoring an indoor meet August 29, 1971. The Third Annual Eastern Indoor Championships will be held in The 98-ft. Cole Field House at the University of Maryland. Events are HLG, Easy B, Paper Stick, Indoor Stick, Indoor Scale and Unorthodox Aircraft. Contact Tom Vallee, 444 Henryton So., Laurel, Md. 20810 for information and rules for Unorthodox Aircraft and Easy B.

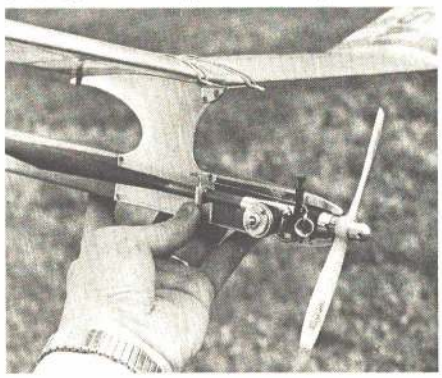
BOB HATSCHEK
POWER

Help! Mayday! SOS!: I've got a problem. You have one, too. So let's work together. My problem is that **AAM** has asked me to write a monthly column about the advancing techniques and technology of free flight power models. Your problem is keeping pace with these same developments. One very pleasant aspect of our mutual problem is that we're going to have fun solving it. I know I will. I promise to try like blazes to make sure you do, too.

No doubt you're wondering who the heck this character is that **AAM** dug up for this job. A straight answer is that I'm a free flight nut, who built my first model airplane (a 10-cent solid balsa scale Fokker D-7 non-flying model) in 1936. In 1937, I discovered model airplanes could be built to fly. In 1938, I bought my first model airplane engine, a .156 cu. in. displacement Brat, and built my first gas job. That was a 50-in. Megow Cadet. You may think that qualifies me to write about Old-Timer models and the joys of retirement. Nope! I'm still a free flight nut. These recent photos should convince you that I'm still with it—even if my retrieving speed isn't what it once was.

Idea Model: The model shown is an idea model, powered by a still-recognizable Cox TeeDee 049—but with a tuned pipe! At the time this model was built, pipes were permissible only on FAI class models so it is an FAI class ship. It weighs the required 9 oz.

Close-up of tuned pipe 049. Really works.



AAM's new FF Specialist, Correspondent Bob Hatschek is an idea and gadget man.

and has only 156 sq. in. of wing area. No sane FAI flier would claim this size of plane is the ultimate for competition, but it is a wild machine to fly!

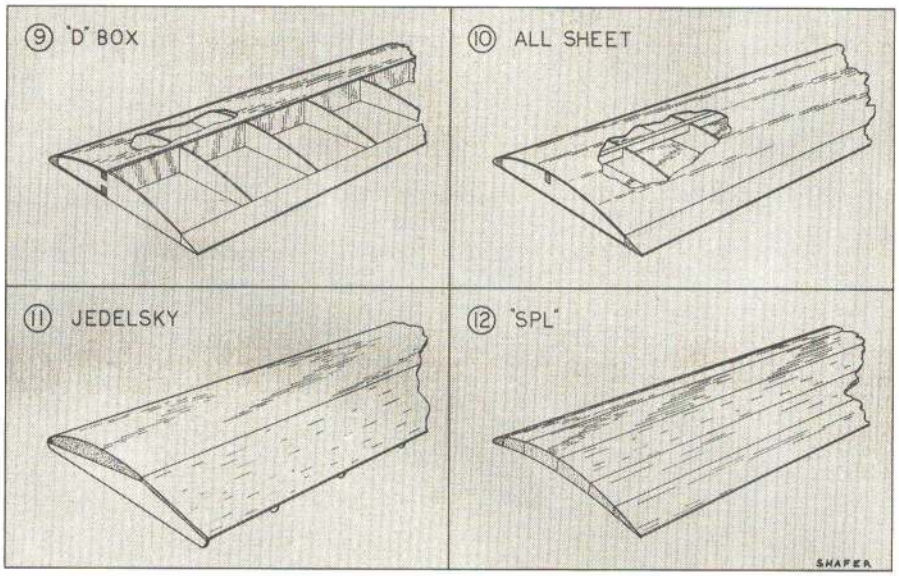
The pipe is made out of brass tubing and .008-in. shim brass and held together with a material known as "commutator solder," which can be used with an ordinary soldering iron (but a hot one). It withstands temperatures up to about 600 degrees F, which is a good 150 degrees above the melting point of ordinary tin-lead solder. This might help handle a heat problem.

Another unusual feature of the pipe is that it trombones for adjustment. Simply slide the telescoping tubing in and out for adjustment while the engine is running. Then, when it resonates, turn a little cam lock (visible just above the thumb) to hold it in position.

The pipe was painted with special dull-finish black exhaust paint. I don't recommend it. Far better is black Hobbypoxy, which is both tougher and considerably more temperature-resistant. When I soldered a cracked pipe back together with commutator solder (over 600 degrees, remember), Hobbypoxy less than 1/16 in. away (I had scraped to bare metal for the repair) was totally unaffected.

In the engine department on this ship, note that a flood-off is used, which means a pressurized fuel system (pressure tap is in the backplate). The flood-off timer, which also actuates auto-rudder and auto-stabilizer, is a modified camera timer, purchased for 50 cents. Engine, tank, timer, and sheet aluminum pylon are all bolted to a single aluminum plate, which is removable as a unit.

Ideas Please: Ideas turn me on, and I hope to make this column a place to find free flight power suggestion in future months. The biggest and best source of ideas is the world-wide free flight fraternity—and you're a member. Please communicate your ideas—or ideas seen on the field—to me, in care of **AAM**. Send newsletters, sketches, photos, anything that will put the idea across. As long as it can be understood, don't worry about neatness, its the idea that counts.



BOB STALICK

GLIDERS AND RUBBER

Wing Construction Techniques: To bring this series to a close, some of the more unusual construction methods currently in use are presented.

(1) The D-box style uses a completely sheeted leading edge top and bottom with a sheeted-off center area between the top and bottom sheets. It forms a closed, or boxed in, structure roughly in the shape of an elongated letter D. Sometimes spars are used in the rib center, many times they are not. This is a rigid, yet flexible and strong section. With good wood selection, it can be a lightweight structure with a very high strength to weight ratio. Since it is a balanced structure, it can be covered with any model covering from tissue to MonoKote. Popular designs using this style are the Dove A-2 and Henry Spence's Suspence FAI Power Models.

(2) The all-sheet structure is essentially a simple wing structure covered with balsa sheet. Sometimes, as indicated in the drawing, a spar and a separate trailing edge are used. Just as often one or the other is not. For maintenance of airfoil section, this construction is difficult to beat. The selection of light (5 or 6 lb.) A grain balsa sheet is essential in order to keep the total weight within reasonable limits. 1/32" sheet is used for Wakefield size wings and 1/16" sheet is used for power and A-2 Nordics. Covering can be tissue, silk or MonoKote, or it simply can be sealed with low-shrink dope or resin. The 1967 and 1969 FAI International Power winners employed this technique on both wings and stabs.

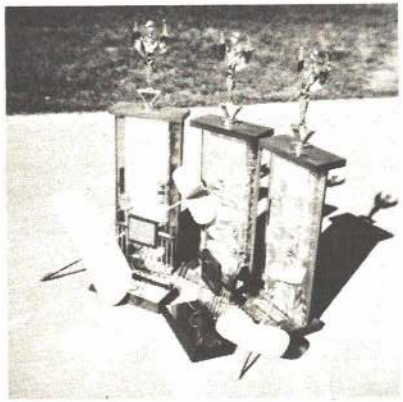
(3) The Jedelsky, named after its Hungarian developer, provides a simple, easily built, yet surprisingly efficient structure. Generally, it is not too rigid, and therefore is used primarily on smaller power models, A-1 and A-2 gliders and rubber sports-type models. Typically, a wing will use a hard balsa or spruce leading edge strip, a medium A grain thick section front and a light C grain trailing section of thin sheet. An A-1 glider would use, for example, a 3/16" square spruce leading edge strip, a 3/16 x 2 1/2" A grain leading sheet with a 1/16 x 2" trailing sheet. Normally, it is left uncovered and sealed with dope or resin. Dave Linstrum's Cutie Coupe and Pay Later Payload models and my A/Wonder all use this technique.

(4) SPL construction is a German development first popularized by the high aspect ratio SPL A-2 Nordic. This is an efficient, rigid and yet flexible structure, which suffers from a somewhat messy and complicated construction system involving gluing together pre-cut and selected balsa strips of various thicknesses and strengths laminated in the general shape of the desired airfoil. This is carved, planed and vigorously sanded to final shape by using preformed sanding blocks. This is not unlike shaping a big hand launch glider or carving a prop blade on a massive scale. No covering is usually used, instead
low-shrink dope or resin. Again, wood selection is critical and weight tends to be more than a similar D-box or other more standard structure. However, airfoil maintenance is guaranteed. Although now used primarily for A-2 wings, this construction, by further experimentation, will demonstrate its adaptability for other types of models as well.

This concludes a three-part series. Please let me know whether you would like more features of this sort for fuselage structures, covering techniques, etc., and I will try to accommodate your requests.

Unlimited Rubber Revisited: Several months ago, a broader and longer look at the problems facing unlimited rubber models was proposed. Since then, three ideas have been presented for Unlimited Rubber. They are: (1) Model size to be limited to that of a Wakefield (proposal FF-71-A). (2) Maximum weight of 100 grams for total of noseblock, prop and rubber motor (proposal FF-71-B). (3) Maximum flights remain constant and maximum turns are reduced 20% per flight (proposal FF-71-E).
Although none of these proposals merits serious consideration because of their short-sightedness or impracticality, they do indicate that some thinking is being directed at the oldest of model events. Readers are encouraged to direct their thoughts and comments to their AMA FF contest board members, whose names appear in the AMA section of this magazine.

Photo from Modeller Reports. **Japanese version of Ritz's Continental.**

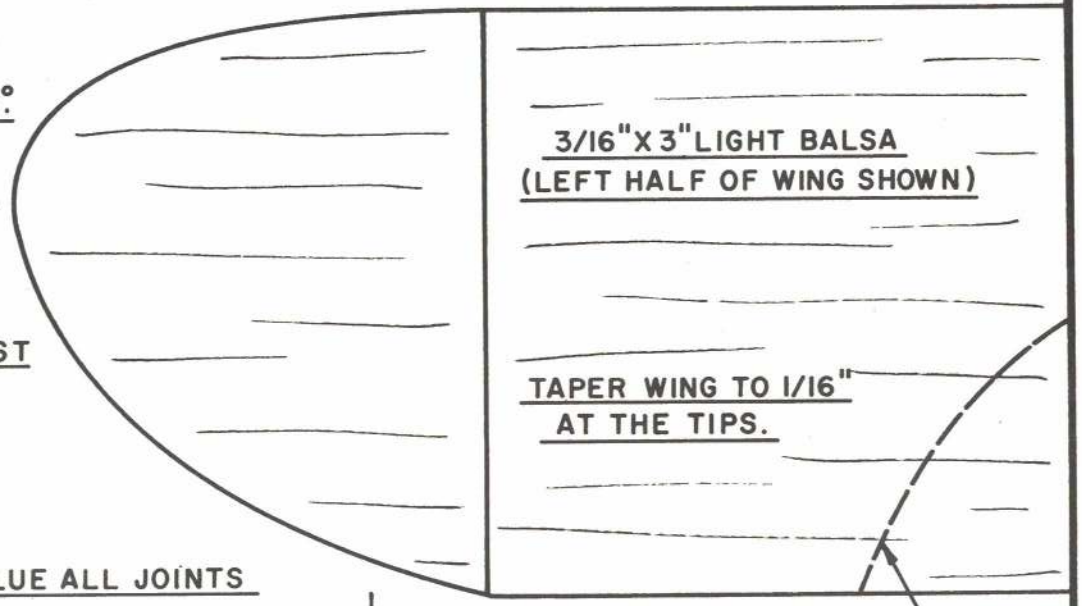


DATA:

ALIGNMENT:
SET ALL SURFACES AT 0°

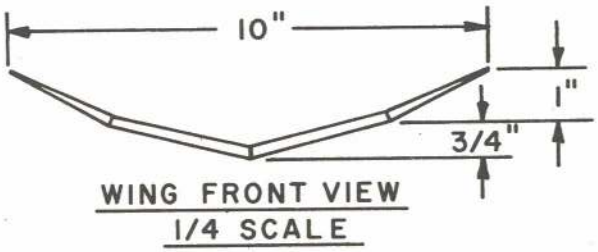
FINISH:
3 COATS 50/50 NITRATE DOPE & SAND SMOOTH. (WING ONLY.)

LAUNCH:
75° TO THE RIGHT. ADJUST RUDDER FOR TURN.



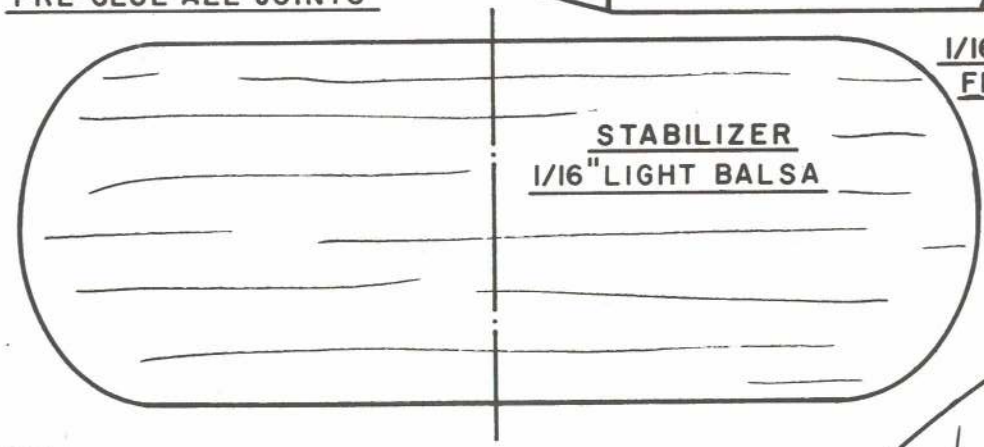
THE DRIFTER

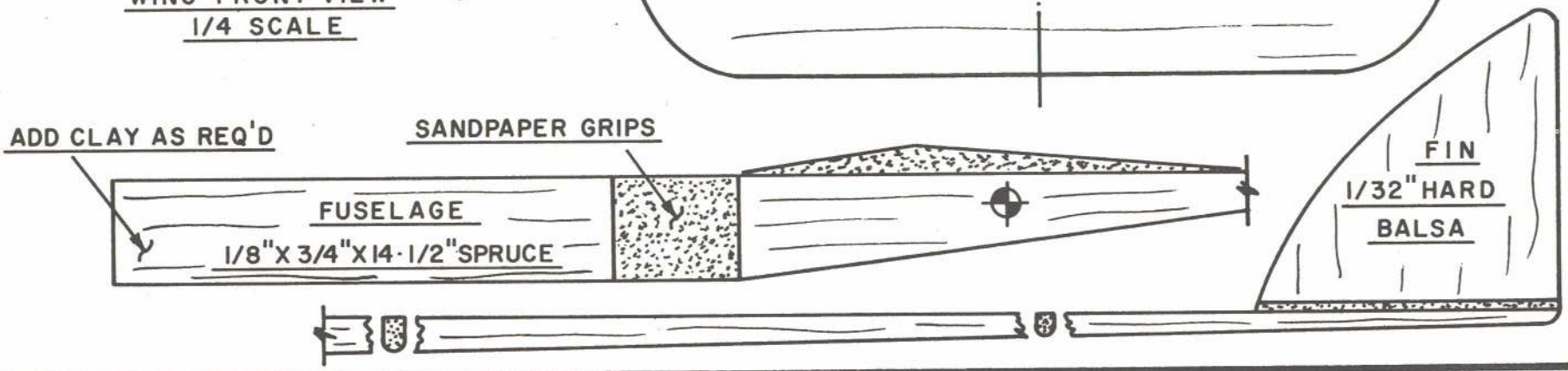
W.A.M. 10" RECORD HOLDER
DESIGNED BY PHIL BORETTO
DRAWN BY GEORGE METZ



WING FRONT VIEW
1/4 SCALE

PRE-GLUE ALL JOINTS





With colorful trimmings, this profile model becomes almost three-dimensional. Catapult launching gives it long flights even in small hands.

by BILL HANNAN

HERE'S A SMALL, simplified model of the famous Czechoslovakian aerobatic aircraft, which has appeared in so many international events. This glider is based on the Zlin 526 AS Akrobat and the information is from a Czechoslovakian aviation publication.

Profile models are easy to build, yet offer a chance to develop techniques which are useful in more advanced models. So "Czech-out" the drawing, grab some wood and get started!

Construction

This model should be constructed from fairly hard balsa, except for the tailplanes, which should be made from lightweight stock.

Fuselage: Trace the outline of the body onto thin paper which, when cut out, will serve as a pattern. Transfer the outline by drawing around it with a very soft pencil, onto a sheet of unwarped 1/8" sheet balsa. Cut the fuselage to size, being particularly careful to keep the wing and stabilizer openings in their correct positions. The section beneath the wing may be removed, to be trimmed and replaced later, after the wing is in place.

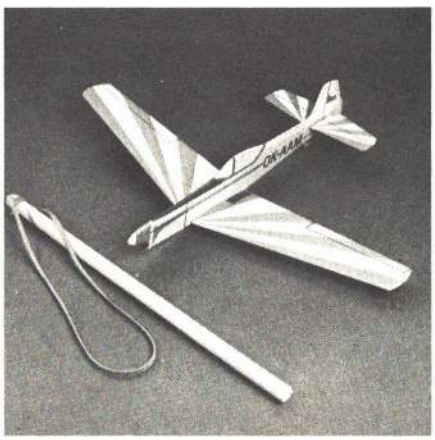
Give the fuselage a thorough overall sanding and gradually taper the aft portion (as viewed from the top) down to 1/16" thickness, where the rudder will be attached. All of the corners may be rounded, except at the top and rear areas where the fin and rudder will be mounted. Cut a slot in the bottom of the fuselage to receive the tailwheel unit, which is cut from thin plywood.

Wing: The wing panels are cut from unwarped 3/16" sheet balsa. Using the pattern system, transfer the outline to the wood and trim to shape. Do a precision job on the notches because they contribute greatly to the strength of the dihedral joint. After cutting the wings to outline, shape them to the airfoil section shown on the plan. A sanding block is the best tool for this operation.

Fit the two panels together at the correct dihedral angle. Probably a little trimming and sanding will be required for a good snug fit. Pre-glue each side by rubbing a small amount of glue into the joining areas. Apply a second coat of glue, place the parts together at the correct angle, and put aside to dry completely. A sheet of Saran Wrap will prevent the wing from becoming a permanent addition to the work table.

Empennage: Patterns of the tails are used to transfer the outlines onto 1/16" sheet balsa. In the fin and rudder parts, note the direction of the grain, which contributes to their strength. Sand the parts to a streamlined section, except for the actual mounting areas.

Wheels: The retracted landing gear strut assemblies are drawn on paper and glued in position. Only a single wheel need be made. Cut and sand it to shape from balsa, then cut it in half to represent the retracted wheel. Paint the tires with Hot Rod Primer. It looks a great deal more like rubber than the usual flat black.



AKROBAT

Colored tissue is used for striped patterns, a ballpoint pen draws the lines. The launcher dwarfs the model.

Decor: Obviously, the model simply could be glued together and be ready for flight. But, nothing looks more unfinished than a plain balsa aircraft. So, take extra time to add the coloring which will really light up the natural good looks of the minature Zlin Akrobat. The easiest way to do this is before assembly, when the parts are still flat on the work bench.

Since Zlins have been employed by aerobatic pilots from various countries, many color schemes are available. Color photos of these machines have appeared in several aviation publications, so select one of them as a guide. Or, invent your own! Ours is an amalgam of East German, Czechoslovakian, and imagination. The OK is legitimate Czech, but the AAM is simply the initials of our favorite magazine!

Finishing: Give all parts a coat of clear dope, applying it quickly to both sides of each part, otherwise warping may occur. The parts must stand on edge while the sides are drying, so lean them against a drinking glass, and sticking will be minimized. Plasticized dopes, such as Sig Litecoat, will also help prevent distortion. After the first coat has dried, lightly sand each part to remove the balsa fuzz. Then apply two more coats of thin clear dope to all surfaces.

The color stripes are cut from Japanese or art store tissue, which is available in a large variety of colors. A sharp blade is a must to obtain clean edges when cutting tissue, and a metal straight-edge is the best guide. By cutting two layers at a time, decorations for both sides can be made at once. Taping the tissue down taut to a sheet of cardboard will help prevent wrinkling and tearing while cutting out the decorations. The markings letters may also be cut from colored tissue or paper.

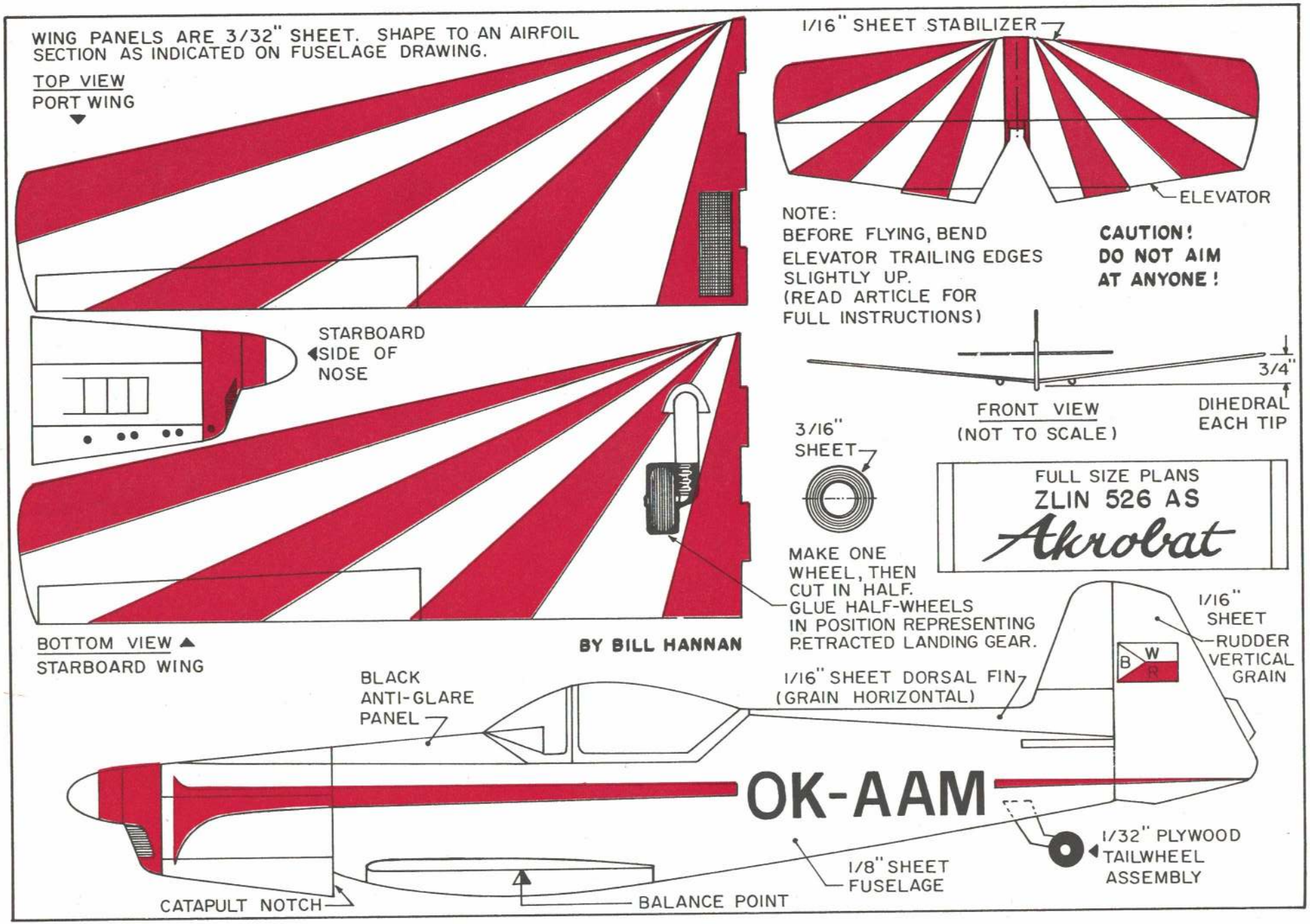
Place each decoration over its correct location on the part, then flow dope thinner right through the tissue. If sufficient clear dope has been applied to the part, the thinner will soften it enough to firmly hold the decoration in place. Sometimes a little gentle rubbing will be needed to snug the edges down, especially around curves. On tight radius corners, a drop of water applied with brush or fingertip will soften the tissue enough to allow it to conform to the shape. Be careful not to over-wet the tissue, or it may tear. The tissue technique may seem a bit tricky at first, but once it is mastered, it will be useful for all sorts of modeling projects.

After all of the decorations are in place, the various outlines, such as the aileron, may be drawn on with india ink and a drafting pen, or applied with chart tape. This very narrow tape may be obtained at art supply stores, or at some hobby dealers, where it is generally known as slot car striping tape.

Assembly: Glue on the tailplanes in their correct positions in relation to each other. Next, fit the wing into the fuselage opening, which may require a bit of trimming or sanding to achieve a good fit. Glue in the wing, being generous with the glue, in this high-stress joint. Fit the lower fuselage piece into place, sanding to fit, if necessary, and glue well. The wheels may be added to complete the model.

Flying: Catapult gliders are a special breed

(Continued on page 82)


WING PANELS ARE 3/32" SHEET. SHAPE TO AN AIRFOIL SECTION AS INDICATED ON FUSELAGE DRAWING.
TOP VIEW
PORT WING
1/16" SHEET STABILIZER
ELEVATOR
NOTE:
BEFORE FLYING, BEND ELEVATOR TRAILING EDGES SLIGHTLY UP.
(READ ARTICLE FOR FULL INSTRUCTIONS)
CAUTION!
DO NOT AIM AT ANYONE!
STARBOARD SIDE OF NOSE
3/4"
FRONT VIEW
(NOT TO SCALE)
DIHEDRAL EACH TIP
3/16" SHEET
FULL SIZE PLANS
ZLIN 526 AS
Akrobat
MAKE ONE WHEEL, THEN CUT IN HALF. GLUE HALF-WHEELS IN POSITION REPRESENTING RETRACTED LANDING GEAR.
BOTTOM VIEW
STARBOARD WING
BY BILL HANNAN
1/16" SHEET RUDDER VERTICAL GRAIN
B
W
R
BLACK ANTI-GLARE PANEL
1/16" SHEET DORSAL FIN (GRAIN HORIZONTAL)
OK-AAM
1/32" PLYWOOD TAILWHEEL ASSEMBLY
1/8" SHEET FUSELAGE
CATAPULT NOTCH
BALANCE POINT

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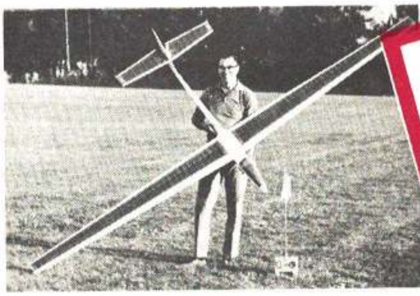
Chuck Broadhurst
Sacramento, Calif.



The ship came in 250 ft. straight down in a radio failure and th... was only a small tear o... derside of one panel...

Har...
W...

In these days o... tising it's a rea... into a product ... everything clai...

I have not "silked" a ... Monokote became availa... Monokote job was regular silv... on an Antic, since then have covered 14 models of my own. 3 Bikes, 1 Tripe & 4 Kwik Fli were included in this total.

Don Johnson
Denver, Colorado

I've been showing it to everyone I know demonstrating how hard it is to damage and the ease with which it can be repaired. Believe me it's all the ad says and more.

Winston Hockenberry
Waterbury Center, Vt.

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Brian McAvoy
Greenock, Pa.

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It's the prettiest finish I've ever had.

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Even Naomi, my wife, loves Monokote because it is odorless, and also I have been able to stop getting paint all over my clothes. I am sold on this item and intend to trade in all of my paint brushes for a new "iron."

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Silver Spring, Maryland

I'm a fairly new modeler and thought Monokote was too expensive until I saw your ads comparing Silk & Dope costs to Monokote. I tried Monokote . . . and you're right—Monokote's cheaper than Silk & Dope, and holds better too!

Marc Hoit
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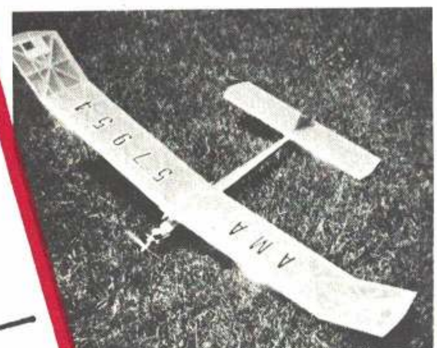

...ired the damage and recov... ...ith a fresh section of trans... Super Monokote. Only a ... eye would ever spot the ... The good old days of ... and wait, then steam it ... again to make adjust... ...e gone forever if Super ...is used.

Richard A. Lape "
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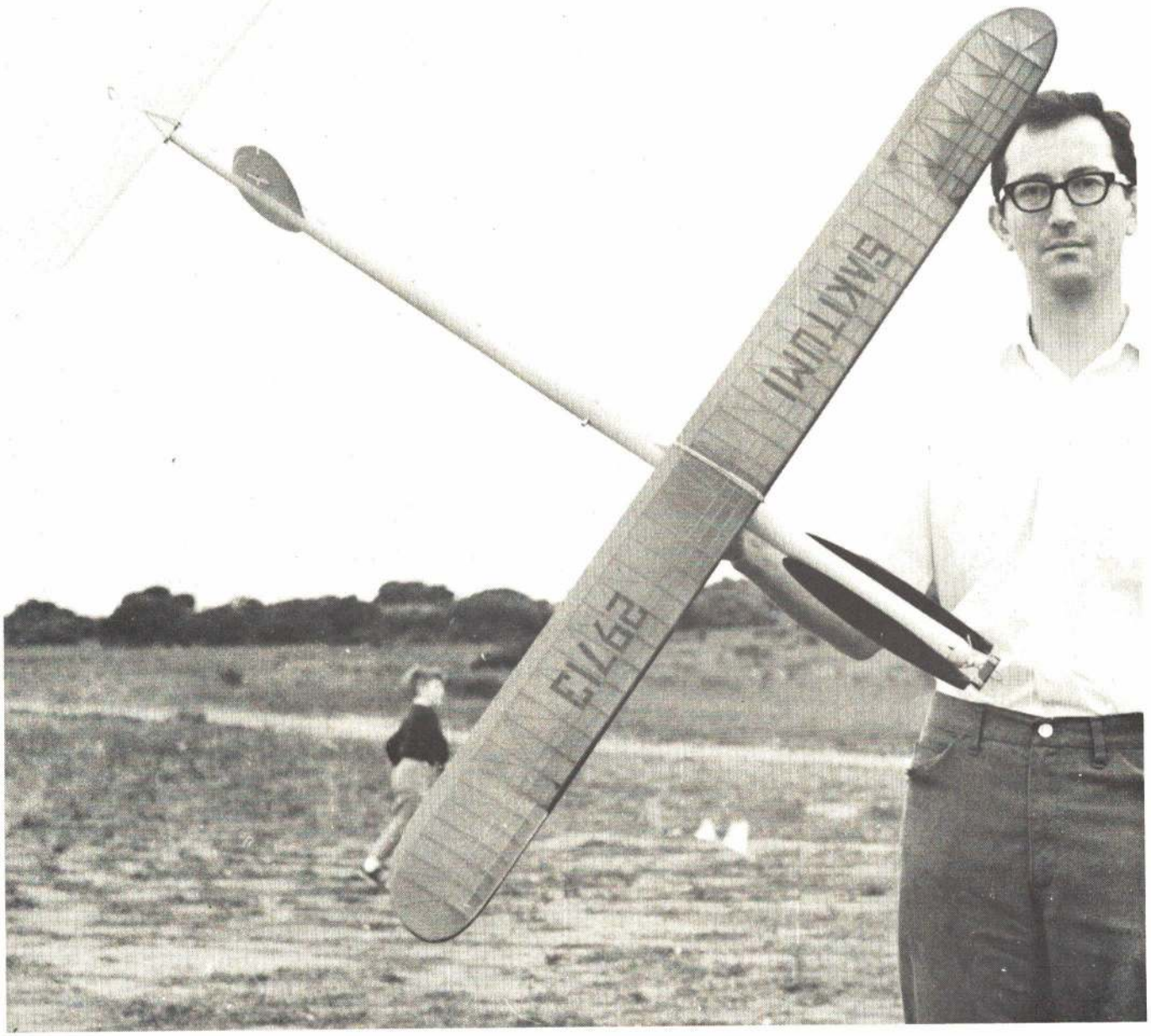
40-gram Wakefield for winning FAI meets uses auto-stab-rudder and DT. Text tells fascinating history of Wakefield design developments.

SAKITUMI



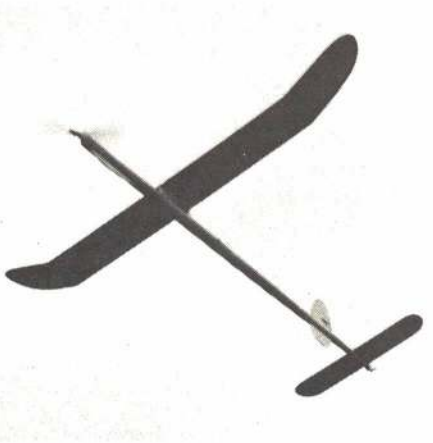
Author with his highly successful plane. Uses an unusual airfoil which won't warp.

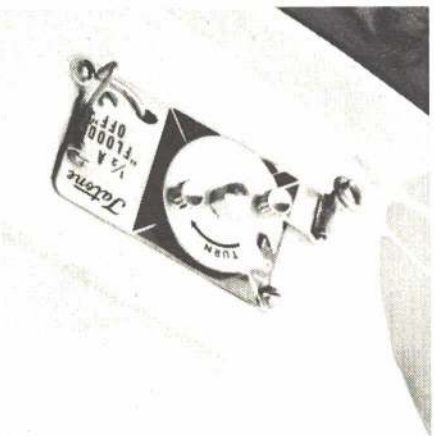
by BRIAN DONN

WAKEFIELDS HAVE CHANGED radically during the last 25 years. Too many builders and fliers were too good, so the rules were changed to make things tougher. The old birds, circa 1940, had unlimited rubber, and the airframe could be made as the builder pleased. However, the bulky big cross-section fuselage had to be dragged through the air, and models were required to ROG.

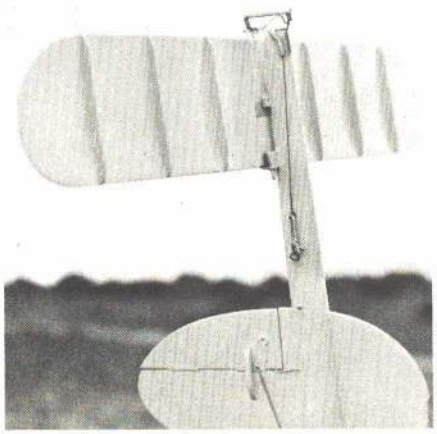
In the early 1950's, rules were changed to limit the rubber allowance to 80 grams (about 2.75 oz.). The airframe now had to weigh about 5 1/2 oz. in order to bring the total minimum weight up to the required 230 grams. Wakefielders viewed this as the end of their favorite event, but they rose to the challenge and soon were stringing out maxes like bubbles from Lawrence Welk's bubble machine. Clearly, this could not be allowed to continue, so the rubber allowance was chopped to 50 grams, or about 1.75 oz. At this point, the ROG rule was scratched, as was the minimum cross section rule.

In the meantime, the Nordics were developing, as the gumbanders borrowed a few ideas about thin airfoils, long fuselages and small stabilizers, and adapted them to their latest designs. With the elimination of





Inverted Tatone timer operates stab and rudder on single line. DT by fuse.



Trim changes by rocking stab on central pivot. Attachment bands must be reliable and uniform. Torsion spring on rudder.

the ROG, fliers no longer had to be concerned about the prop clearing the ground on takeoff. Prop diameters jumped from 16-18", which had been almost universal, to 22", 24" and more. The bigger diameters were felt to be more efficient as well as able to provide a certain helicoptering effect in the near-vertical phases of the initial climb. (A bad stall just after takeoff had wiped out many a crate in bygone years).

The 50-gram models evolved slowly, as old ideas were found to be no longer usable. All possible prop-power combinations were tried. Some models sported high pylons. Other were shoulder-winged. Several low-wing designs were tried with great success. Eventually strings of five maxes became fairly common, aided by the thermal-sniffing techniques developed by the glider set.

The crowning indignity came in January 1966—40 grams of rubber! That's what the new rule book said. Total weight to remain the same. Most of us simply reworked our 50-gram models to accept the smaller motors and to bring weight back up, yet we still managed to get a goodly number of max flights.

But one big problem had to be faced. The uneven power output of rubber motors was increasingly difficult to manage as the rubber allowance was cut and cut again. The discrepancy between the initial burst and the cruise became more marked, as short, tightly-stretched motors now were wound almost to the breaking point. There was no power to waste on acrobatics. Nor could fliers afford to use much downthrust to control the burst, since this could seriously impair the climb in the cruising stages.

Not that this problem has been completely ignored. Several of the leading modelers, including Joe Bilgri and George Reich, have been recommending the flaring type of prop for some time. It helps to make for a smooth, consistent climb with a minimum of gadgetry, and has been widely used in recent years.

Another possibility is some sort of device to change the trim of the model just as the power burst is tapering off into the cruising climb. The first model of this type which I saw (and, as far as I know, the first model of its type to be successfully flown) was designed by Clarence Mather. Dubbed the Flapjack, it featured hinged trailing edges on the wings. By means of a timer-operated cam in the pylon, the trailing edges could be raised about 3/32" for the launch and lowered 8 or 10 sec. later for the remainder of the flight. Under ideal conditions, the model shot practically vertical on the burst and fast and steep until the prop folded. The Flapjack made stunning flights but, for reasons never fully figured out, it was a trifle sensitive and would occasionally put in a disappointing flight just when an extra max was needed.

Although I decided against building the Flapjack, it continued to intrigue me. There was no arguing with the principles Clarence incorporated in this Wakefield, but I felt it would be safer to build a conventional fixed wing and provide for the in-flight change in decalage by means of an auto-stabilizer. Many FAI Power jobs flew safely with less than one degree of decalage, so I had no qualms about reducing it from the normal three degrees to about one for the power burst. In order to get the best possible climb during the cruise, I also decided to use no downthrust.

While roughing out the design, I learned that others who were experimenting with the same idea obtained the best results by also incorporating an auto-rudder to trim for a straightaway initial climb rather than a steep, corkscrew getaway. To keep the unknown factors to a minimum, I patterned this new Wakefield after one of my best earlier designs, Droopy. The only modifications made were a slightly longer fuselage with smaller stab, squeezing a few more square inches into the wing, plus the moveable stab and rudder.

The new model, Sakitumi, performed beautifully from the outset. The climb was all I had hoped for, and the glide showed the same ability as that of the ship's predecessor to handle rough gusty air, and yet be able to ride out a weak thermal in less turbulent conditions.

Construction

With the exception of the auto-stab and rudder, construction is simple and straightforward, therefore, a minimum of detailed instructions are necessary.

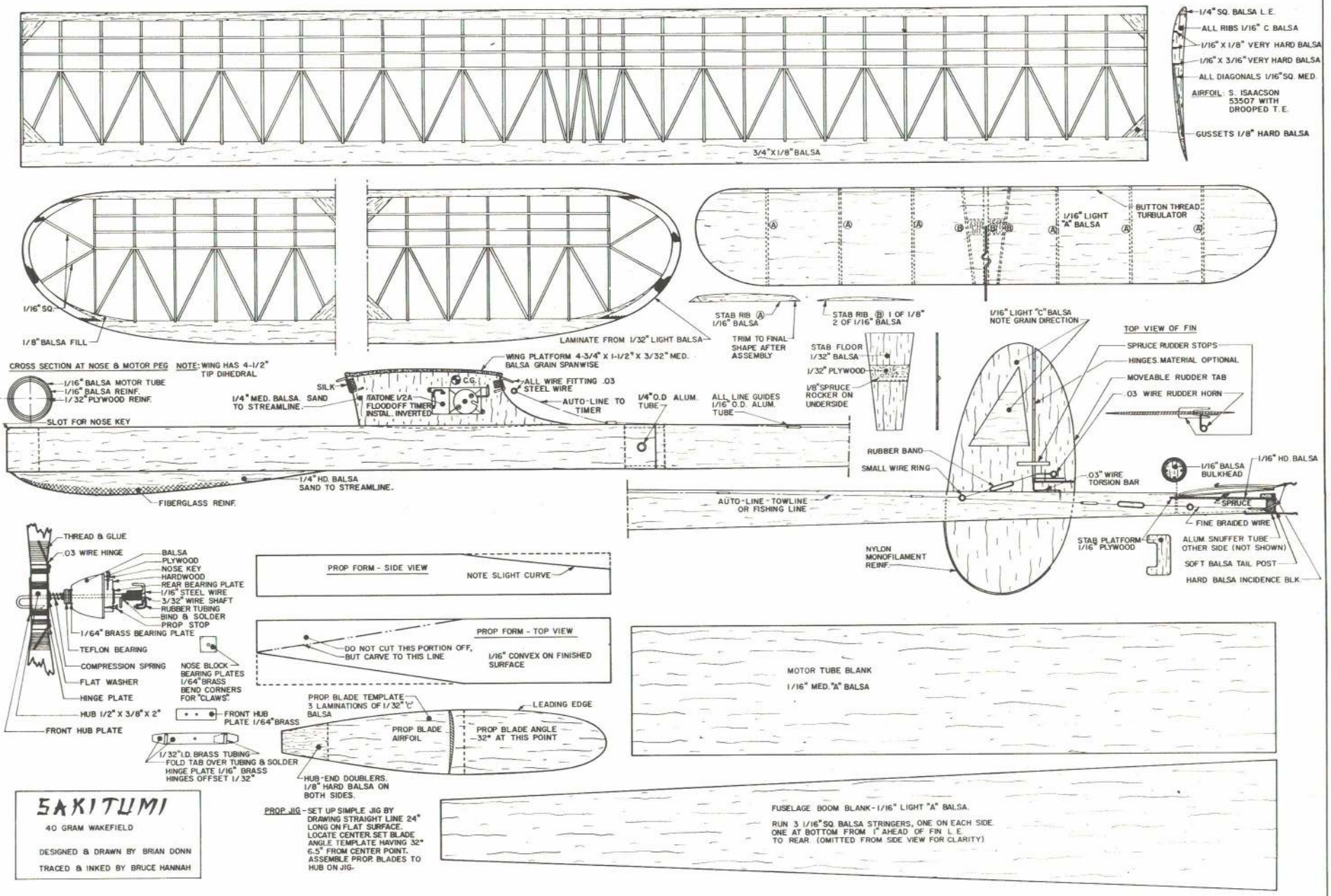
The wing airfoil used on this model and the earlier Droopy is the old Isaacson 53507 with a flapped trailing edge. This particular airfoil is thicker than most near the trailing edge, thus avoiding the typical weak area where the ribs join the trailing edge. Previous models which used this section seemed to bear out the theory that not much undercamber, if any, is really needed, provided there are 10 to 15 degrees of flap on the trailing edge.

When building the wing tips, do not shape the trailing edge pieces until after the ribs, spars, diagonals and curved tip pieces are all in place. When the excess trailing edge material is trimmed away, a little washout is automatically built into the tips. To make the laminated tips, soak the strips in warm water for a few minutes, blot them, and then laminate with a water-soluble glue such as Willhold or Titebond. The entire upper surface of each wing tip panel can be covered with one piece of Jap tissue if it is sprayed very lightly with water first and then attached as silk or Silkspan are.

The all-balsa stabilizer is a carryover from earlier designs which flew well consistently, and it is a natural for the present design where extra strength and reliability are needed. There are no warp problems and, in the unlikely event of damage, this type of stab can be repaired easily. Use very light straight-grained balsa for the tail surface, light C grain for the ribs. Pin the ribs to the plan, placing packing under the center three ribs to make their tops even with the others. Attach sheet surface with white glue or contact cement. When dry, remove and trim the rib tips to their final shape.

Fill in the center section on the underside with firm 1/32" balsa and inset the reinforcement of 1/32" plywood as shown. Without this, the pivot strip on the stab

(Continued on page 78)



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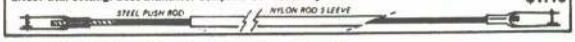

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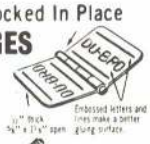

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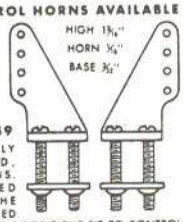

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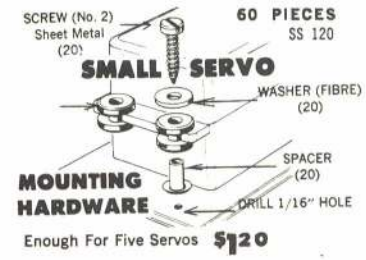

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6 INCH REACH

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LW98, pair . . 98¢

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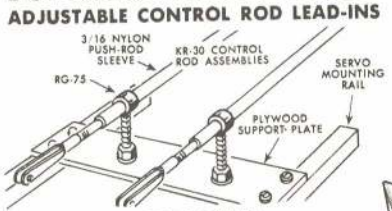

2 NO. 632 THREADED UPRIGHTS
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Installed fuel tank mount. Motor Mount MM1 included. $34.95

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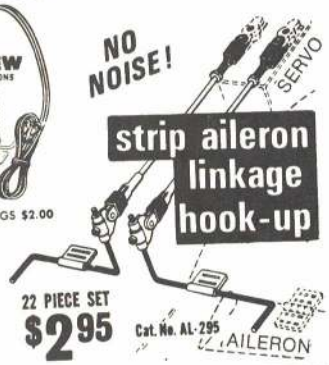

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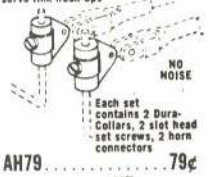

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After years and years of controversy over the so-called beginner problem, but no action, someone finally is doing something about the situation. On November 1, Potomac Aviation Publications, publishers of the **American Aircraft Modeler**, will release an entirely new magazine dedicated entirely to the beginning modeler, whatever his or her age, but focused primarily on the ten- to sixteen-year-old group. A wide range of interesting material and projects, as well as a pioneering, far-ranging policy, should also endear it to the inexperienced sport modeler, and even the expert who wishes to go along for the ride.

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Most magazines today make a token demonstration to the beginner, but nothing substantial can ever be done by magazines whose life depends on radio control readers and advertising.

Entitled the **JR American MODELER**, the new magazine will be a bi-monthly for first six issues, at which point it will go monthly. First issue is November-December 1971, on sale through subscriptions, hobby shops, and other easy-to-find sources. Price will be 60 cents, a subscription for the first six-issue year, $3.00. Contents will emphasize model airplane building and flying but will include appropriate boats, cars, and a variety of interesting projects with educational and scientific value. Special attention will be given to all aspects of how-to-do-it.

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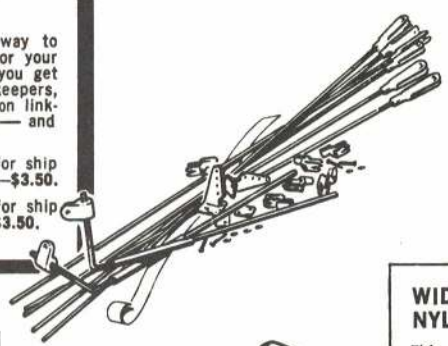

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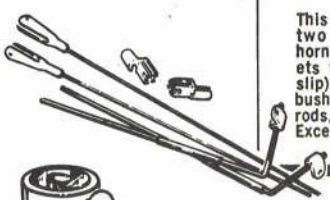

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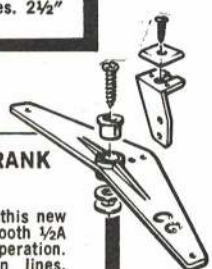

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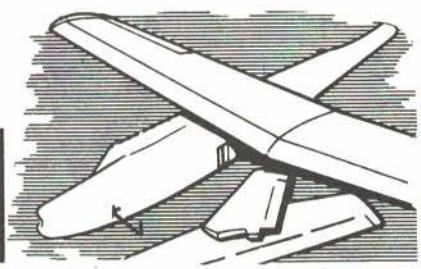

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SEPTEMBER 1971

MODEL AVIATION

Official magazine

A.M.A. NEWS

Academy of Model Aeronautics • 806 Fifteenth Street N.W., Washington, DC 20005

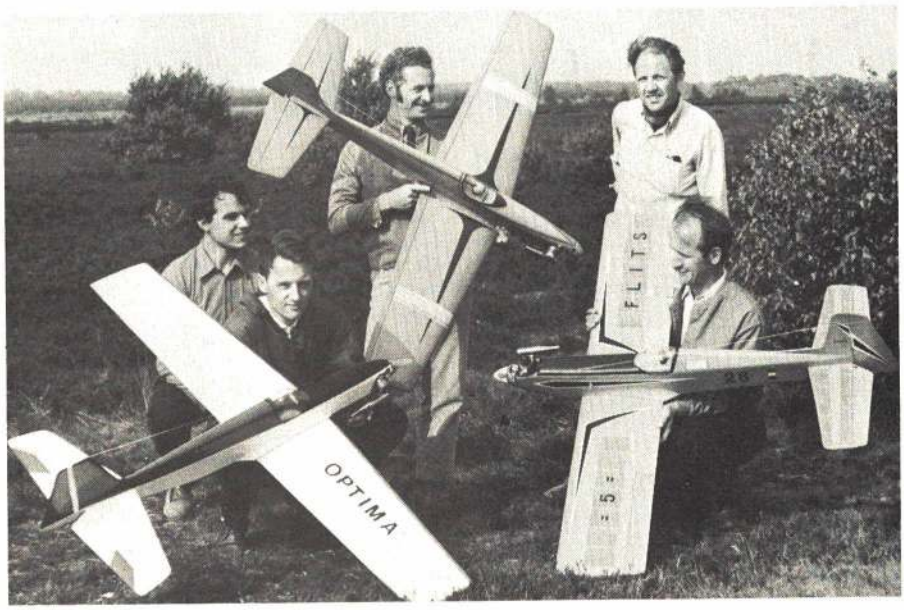
International RC Week

Word received from the office of Commonwealth of Pennsylvania Governor Milton J. Shapp was that a proclamation was forthcoming (probably issued by the time this issue reaches newsstands) naming the period of the RC Aerobatic World Championships as International Radio Control Week. The contest is set for September 15-19 at the Central Bucks County Airport, Doylestown, Pa. The RC/WC is possibly a once-in-a-lifetime opportunity to witness the world's best modelers. Everyone who can should plan on attending.

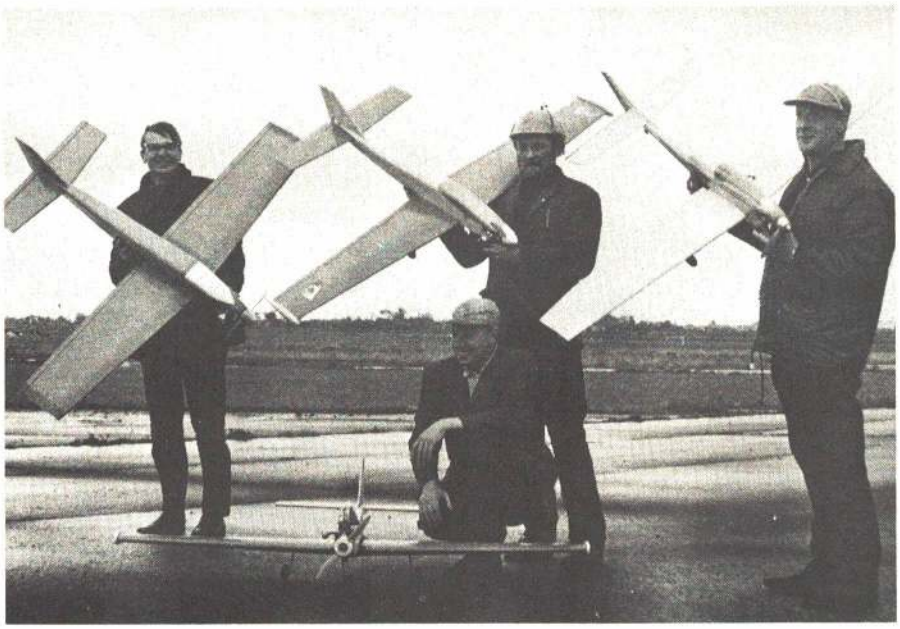
The following team members and managers (the latter indicated by asterisks) from 22 nations were known to be coming as of June fifteenth.

AUSTRALIA: Brian Green, Bob Young.
AUSTRIA: Hanno Prettner, Ferdinand Schaden, Konrad Weixelbaumer, Wilhelm Brand*.
BELGIUM: Gustaaf Cappuyns, Gerard Werion, Edward Vandermeulen, Alois VanderBerghe*.
CANADA: Ronald Chapman, Warren Hitchcox, Ivan Kristensen.
DENMARK: Carl Mollerup, Erik Toft, Jens Jorgensen, Axel Mortensen*.
ENGLAND: Michael Birch, Terence Cooper, David Hardaker, Roger Hargreaves*.
FINLAND: Kari Lautala, Hannu Riihela, Sandy Pimenoff*.
FRANCE: Denis Chabert, Guy Hardy, Pierre Marrot, Jean Claude Lavigne*.
GERMANY (West): Wolfgang Kosche, Gunter Hoppe, Josef Wester, Adolf Brand*.
IRELAND: John Dible, Fred Buick, Howard Menary, Loudon Blair*.
ITALY: Graziano Pagni, Ruggero Pasqualini, Benito Bertolani, Paolo Dapporto*.
JAPAN: Masahiro Kato, Kazuo Shimo, Yasufumi Sugawra, Ritsuri Honda*.
KOREA: Tae Sik Kim, Syung Kil Kim, Il Wan Kim*.
LIECHTENSTEIN: Wolfgang Matt, Arthur Buchel*.
LUXEMBOURG: Pierre Hoffman, Norbert Bertemes, Paul Behm.
NETHERLANDS: Krijn Sliedrecht, Koos Tromp, Jan vanVliet, Claude deVries*.
NORWAY: Poju Stephansen, Knut Aker, Tore Paulsen, Scott Foien*.
SOUTH AFRICA: Ricahrd Brand, Eric Bell, Chris Sweatman, Monte Malherbe*.
SPAIN: Rafael Gomez-Sajardo, Claudio Levi, Andres Aylagas, Jose O'Connor*.
SWEDEN: Christer Giligren, Goran Ridderstrom, Bert-Eric Stovling, John Lyrsell*.
SWITZERLAND: Renato Ragoni, Bruno Giezendanner, Emil Giezendanner, Arnold Degen*.
U.S.A.: Ron Chidgey, Phil Kraft, Jim Whitley, Jim Edwards*.

AMA's Operation Friendlift, a chartered jet flight to help participants coming from across the Atlantic, was fully booked as of



Teams from The Netherlands (above) and England (below) were among the 22 nations known to be planning to participate in the RC Aerobatic World Championships. The Netherlands team (L-R holding models) is comprised of Krijn Sliedrecht, Jan vanVliet and Koos Tromp. Team Manager Claude deVries is kneeling at left rear; Ton Schoourbrook, mechanic, is standing at right rear. British team members shown are Terrence Cooper, Michael Birch and David Hardaker; Team Manager Roger Hargreaves in front. The RC/WC is slated for September 15-19 at the Central Bucks County Airport, Doylestown, Pa. The top modelers from all over the world will be competing, including current RC World Champion Bruno Giezendanner.



The team to represent Ireland at Doylestown, above L-R, consists of Fred Buick, John Dible, Howard Menary and Loudon Blair (manager, kneeling). From Spain, left, is Rafael Gomez-Sajardo. He plans to fly a model he calls Gaviota using Heath controls. Upper right, Germany's Gunter Hoppe will be flying his Sultan III original design powered by a Webra Blackhead, Micro-Prop radio with antenna inside fuselage. The model has a foam wing with 17% thick symmetrical airfoil, KDH retracts. Richard Brand, right, has been four-time South African National Champion and has consistently placed high in RC World Championships. He'll be flying an original design. Austrian Hanno Prettner, below, will be flying a sleek Super Sicroly powered by a Webra Blackhead, retracting trike gear.

June 15–two hundred and fifty two people on a World Airways stretched DC-8, including forty huge model boxes. The jet is scheduled to arrive at the Braniff terminal of JFK Airport in New York on the afternoon of Tuesday, Sept. 14. A huge group of American modelers plans to be on hand to meet the flight and welcome the travelers to the U.S.A. After clearing customs, a bus caravan will take the crowd to world championships headquarters at Doylestown, Pa.

RC/WC Contributions

We are glad to report that contributions to the RC/WC Fund are continuing to build, thanks to the generosity of many AMA chartered clubs, firms and individuals. Such contributions may be decisive in determining the financial success of the event. The following contributions have been received since the previous listing in the July AAM.

WRAMS Club (N.Y.)	$250.00
DC/RC Club (added amount)	216.78
Valley Forge Signal Seekers (Pa.)	100.00
Raffle at RC Masters	89.00
Northern Conn. RC Club	54.00
Gtr. Pittsburgh ARCS (Pa.)	50.00
Al's Hobbies, Norwalk, Conn.	50.00
Mid-Hudson RC Society (N.Y.)	50.00
San Jose Wavemasters (Calif.)	50.00
Gateway RC Club (Fla.)	50.00
RC Club of Jacksonville (Fla.)	50.00
Rockaway Valley RC Club (N.J.)	25.00
RC Club of Rochester (N.Y.)	25.00

Chesapeake Bay RC, Inc. (Md.)	25.00
Nutmeg RC Flyers (Conn.)	25.00
H.C. Waechter, Nashville, Tenn.	20.00
Aero-Guidance Society (N.Y.)	20.00
BARKS, Inc. (Calif.)	15.00
Green Bush Pilots (N.Y.)	15.00
Milwaukee Flying Electrons (Wisc.)	15.00
Middlesex Aero Modelers (Conn.)	15.00
Hill-Hoppers Model Club (W. Va.)	10.00
Ansley East Corp. (Doylestown, Pa.)	10.00
Springfield Sunday Flyers (Ill.)	10.00
Eglin Aero Modellers (Fla.)	10.00
1971 USA Free Flight Team	10.00
Spaceport RC'ers (Fla.)	5.00
Fred Van Keuren, Jr., Media, Pa.	5.00
J. A. Boyce, Bakersfield, Calif.	5.00
Ben Krohn, Salisbury, N.J.	5.00
Craig Huff, N. Chevy Chase, Md.	5.00
Robert Wilbanks, Shreveport, La.	5.00
Ned Dormer, Philadelphia, Pa.	5.00
W. Kenchelob, Monte Sereno, Calif.	5.00

The amounts listed added to the previous total brings the RC/WC Fund to over $6,000 as of June 10; well on the way to the goal of $20,000 set by AMA to underwrite its world championships sponsorship. About half the goal is expected to come from donations, the other half from sales of the RC/WC special booster package described elsewhere in this issue.

Of the amounts donated, the largest single contribution has been from the Toledo Weak Signals Club of Ohio: $1316 from their winter conference raffle. Next highest, and the largest club effort independent of any show or special event, is the total contribution of the DC/RC Club: $416.31.

PRESIDENT'S MEMO

AMA CHARGES AHEAD! More membership than ever before. More chartered clubs. More sanctioned contests than ever before. More district and area gatherings and better area leadership. Better representation of the individual member. More communications than ever before. More services offered to individual members and to clubs. And as sort of a crowning glory, we will host this year for the first time the RC World Championships.

This is truly the New Momentum! And it couldn't happen to a finer bunch of people than the membership of AMA!

BIOGRAPHIES. In our efforts to create a better informed membership we are continuing to publish brief biographies of the leaders in AMA's style of model aviation. The first two groups of biographical sketches were of AMA's district vice-presidents, but we have so many outstanding and devoted leaders that we will offer reports on some of the others. I am personally so impressed with the members of our salaried HQ staff that I feel I should share their life facts with you, along with some personal observations. I am starting the series with Carl Wheeley, our AMA publications director. Also in the group

John Clemens, AMA President

appearing in this issue is a bit of biography on a man to whom AMA has a great debt of gratitude. It is Earl Witt, with whom I have had a fine "working" friendship for many, many years. I sincerely hope that you, too, will be impressed with the service of these fine citizens and AMA officers.

PRIDE! I must indulge in a little "chest pounding" by pridefully mentioning that many of the new actions and directions of AMA's New Momentum are from public relations and "image" ideas that I have wanted for a long time to try out. Putting these in motion took the happy combination of a progressive Executive Council, the excellent business direction of our executive director, having AMA's books in the "black" to give us some financial mobility, and my own election to the AMA presidency.

If you are vague as to just what progress we are talking about, simply look at the past three or four issues of these magazines, our AMA chartered club Monthly Mailing and the Competition Newsletter. We are offering more information and programs to the membership than ever before.

One of our most effective new tools is an excellent working "partnership" developed between John Worth, representing the business phases of AMA as executive director, and myself as the prime representative of the membership, the president.

Another new tool is a thrilling new concern and helpful awareness on the part of the membership. I believe that the members are finding a NEW PRIDE in their membership in such a fine organization.

If you are already an AMA member, congratulations! If not, better hurry and sign up!

John Clemens
AMA President

MURRY FRANK

AMA District VIII Vice-President (Texas, Oklahoma, Louisiana, Arkansas, New Mexico)

Murry Frank was born 47 years ago in Newark, N.J., and grew up in New York. The path to his present home in the northern Texas city of Wichita Falls was greatly influenced by his connections with the military. Previous to World War II he worked with the Navy at Norfolk, Va., and then during the war he served for 3 1/2 years in the Army Air Corps. The U.S. Air Force is Murry's present employer, where he has been associated for the last 22 years. His job title at Sheppard AFB (Wichita Falls) is Civilian Aircraft Mechanic Leader. His responsibility is to lead a work crew in all phases of heavy aircraft maintenance of all types of military aircraft.

Murry's reason for being interested in model aviation is rather unique, as is the fact that he goes through life under two first names. Where most of AMA's officers have risen from the ranks of competition fliers, Murry got into modeling mainly to encourage, finance and "crew" his son's active interest in model flying. The son, Sandy, now age 23, started modeling about 14 years ago, and was one of the southwest's most active Junior modelers–always backed by his dad. The father and son team was, in turn, backed and encouraged by their fine wife/mother, Miriam Frank. The Franks are known for attending contests and meetings as a family. Son Sandy has just graduated from Midwestern University with a BA degree, and is at present serving AMA as District VIII Contest Coordinator.

In his service to modeling and AMA, Murry, with his always pleasant smile, has been an AMA Contest Director for eight years, also serving outstandingly as District VIII Contest Coordinator for 1968, 69 and 70. He has been an official in three National Contests and in many of the contests in District VIII, including the Southwest Championships in Dallas. He originated an AMA sanctioned meet at Kingsville (Tex.) Naval Air Station, with proceeds going to Navy Relief.

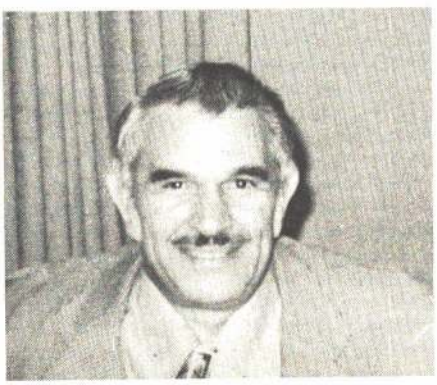
By his own statement, Murry's primary hobby is "All AMA activities", with a secondary interest in photography which also serves his first interest. If he has any time left over, he enjoys fishing.

Murry Frank's enthusiastic service on the AMA Executive Council is, as mentioned before, unique because he did not rise from the ranks of competition fliers, but as a modeling "supporter" and a "family" member of AMA. This adds a new dimension to the wisdom and actions of the Executive Council.

EARL WITT

National AMA Secretary-Treasurer

Earl F. Witt began life July 23rd, 1920, in Seattle, Wash. He grew up in Seattle and southern California, with his education progressing into the study of engineering at the University of Washington. Earl served three years with the National Guard's 148th Field Artillery, and two years in the Army Air Corps. The combination of his education and his service record rather naturally led to his present position of great responsibility as Chief of Facilities Division at the Letterkenny Army Depot in Pennsylvania. In simpler



Murry Frank, District VIII V.P.

Earl Witt, Secretary-Treasurer

Carl Wheeley, Publications Director

language this means being responsible as "city manager" of a very large and complex Army installation. Being a man of great knowledge, experience and responsiblity, Earl for many years has offered his management engineering skills to his favorite hobby through his services in AMA.

Earl lives in the central-southern Pennsylvania community of Chambersburg with his wife, Maxine. He is the father of two daughters and is twice a grandfather. Earl's primary hobby is expressed by his model airplane activities and photography; the flying of man-carrying aircraft fills the rest of his hobby time and needs. He flies his own four-place Cessna, frequently attending the various AMA functions and meetings via this means. He logs still more air time flying in a company plane. Earl is a member of the Chambersburg Modelaires.

Earl recalls entering his first contest in 1925, and from that very young beginning he has become competent in just about every phase of modeling activity, but showing most enthusiasm in the administrative side. His first official connection with AMA began with the Nationals in 1947. In the past he served on the Control Line Stunt Rules Committee, the Radio Control Rules Committee, and as head of the Control Line Combat Rules Committee. Earl has put his experience to work for the past four years at keeping his eye on AMA's financial structure and problems in the elective office of AMA Secretary-Treasurer.

Witt's varied services to AMA are almost too complex to list in a simple biography, but his greatest services are probably in regard to the annual National Model Airplane Championships. Earl has many times served as either Contest Director or Contest Manager for the "Nats" and for many years has headed the very responsible (and mostly unsung!) Nationals Executive Committee. This is the small group of true experts who plan and execute the Nationals with all its complexities and Navy liaison. Earl has also served under five or six presidents as the chairman of AMA's Nominating Committee. Earl's uncorruptible and uncompromising sense of fairness (under a cloak of "hard-nosedness") along with his statistical skill has long kept AMA's affairs on a straight and progressive track.

Earl's apparent lack of emotion makes him difficult to get acquainted with or understand, but those who become friends of Earl through working associations defend his principles, ethics, judgement and the man to the very end! AMA, in its present solid and progressive condition has a great debt to Earl Witt.

CARL WHEELEY

AMA Publications Director
Headquarters Staff

Carl R. Wheeley is employed by the Academy of Model Aeronautics as publications director. He is a key member of the small but excellent salaried Headquarters staff. AMA's offices are in the Shoreham Building on Fifteenth Street, about two blocks from the White House in Washington, D.C.

Carl was born 41 years ago near Durham in North Carolina. He now resides with his wife, Susanne, in their home in Bethesda, Md., where they are raising a three-year-old "future model builder" named Scott. Carl's first eleven years were spent in the area where he was born, but his first exposure to modeling came when he was in the sixth grade in a District of Columbia public school. The class spent an hour or so a week in club/hobby activities, and Carl chose to go off with the modelers. The result of the school offering this excellent extra-curricular activity was to inspire Carl to be active in modeling for the past 29 years, finally making it into a career with AMA.

Communication is the life blood of any organization as geographically scattered as AMA. The total health and well being of the organization is dependent on how well its publications are organized and timed, and what message they deliver. Carl Wheeley meets this responsibility with a fine dedicated awareness of the mechanics and the personalities involved.

Carl is a slender, quiet, scholarly type of person who always seems to be working—with his work always showing great neatness. As publications director of AMA, Carl's duties include editing, some writing and the makeup and layout of the AMA News section of American Aircraft Modeler magazine. This section of the magazine is the official organ of the Academy of Model Aeronautics. He performs the same duties in the makeup of the notable AMA Competition Newsletter. He also puts together the technically complex AMA rule book and other miscellaneous AMA pulications and forms.

Wheeley's background is well suited to his present responsibility. He was on the AMA Headquarters staff from 1947 to 1959, serving as technical director and Model Aviation magazine editor from 1950 to 1959. He was District IV vice-president, 1960-61, and AMA secretary-tresurer, 1962-63. He has been publications director from 1968 to present. During a nine-year absence from AMA Headquarters Carl projected outline perspectives for an illustrator in the architectural field and at the same time attended to business contacts. Carl had even prepared in his youth when, as a teen-ager, he was employed part-time in a hobby shop. Later he furthered his education by attending night courses in English composition and mathematics at George Washington University.

Qualifying Carl as an expert model builder and flier are the facts that he was a member of the Free Flight FAI Power Team in 1953, Free Flight FAI Power World Champion in 1954, and Free Flight World Championship Team Manager in 1956. He was also a charter member of the DC/RC Club.

While answering questions for this biography, Carl offered comments on the present and future of AMA. It is a pleasure to quote him: "As a participant and observer of AMA for many years, I believe the association is much more dynamic and vigorous now than it ever has been before, and all indications point to continued growth and improvement."

FAI AGENDA NOTICE

The annual Plenary Meeting of the FAI Committee for International Aeromodeling is planned for Paris, France, December 2 and 3, 1971. Previously this annual meeting has been the one at which new proposals for international and world championship rule changes are presented and voted upon, but with the current four-year freeze on FAI rules it is thought that the meeting will restrict itself to interpreting any troublesome rules, arranging the calendar of international and world championship events, and conducting other business matters.

Any AMA member who finds an FAI rule unclear, or subject to several interpretations, should contact AMA HQ and request that the agenda include an item concerning clarification. In addition to stating the troublesome rule, a suggested interpretation (with reasons) should also be included. Possible agenda items should reach AMA HQ no later than September 1, 1971, in order to be considered for inclusion.

The CIAM is the aeromodeling arm of the Federation Aeronautique Internationale (FAI), world wide governing body for all sporting aviation. The AMA, aeromodeling division of the National Aeronautic Association, represents U.S. modelers in the FAI by exclusive NAA franchise.

Russell W. Nichols—In Memoriam

A special chapter in AMA's history was closed last May with the news that Russell W. Nichols had passed away. The news came eight years after he left the Academy, in 1963, a relatively quiet period following twenty very turbulent and progressive years during which Nichols was AMA's top man in the Washington, D.C., Headquarters office.

Most of those twenty years Nichols had the title of AMA Executive Director, the highest salaried position in the Academy. But in the earlier years he had various titles and seldom much salary. Even after twenty years the pay wasn't much; financial success was slow in coming to AMA.

Russ Nichols' AMA career began in 1942, immediately following Pearl Harbor. In those days the Academy served as the technical section of the Air Youth Division of the National Aeronautic Association. In early 1942 Nichols was appointed Acting Director of the NAA Air Youth Division and also Headquarters Director of AMA. It was a confusing mixture of duties and responsibilities which typified the interrelationship of AMA and NAA at the time.

But it was the beginning of a long period of meritorious service for Nichols. It followed twelve years of being a modeler, AMA Leader member, Chairman of AMA's Education Committee and president of the D.C. Association of Model Airplane Clubs. He had also conducted radio programs on model aviation.

In the early days at Headquarters Russ had many duties and little help. Included was the position of editor of the AMA publication, Model Aviation. On top of everything else he was named to be secretary-treasurer in AMA's election of officers for 1943.

It wasn't until after the war, in 1946, that Nichols got a more clearly definded job and took on the title of AMA executive director, which he retained until retirement. Those early postwar years also saw the emergence of AMA as a more independently operating division of NAA, with its own offices and staff.

Despite limited personnel and facilities, great progress in model aviation was achieved in the late forties and throughout the fifties. Those were the years of the great air youth meets sponsored by the Plymouth Corporation, more than a decade of Navy-hosted National Model Airplane Championships, fourteen years of PAA (Pan American Airways) sponsored Payload and Cargo competitions and regular participation by U.S. teams in World Championships events.

It was a period of sponsorships by national organizations. Besides those mentioned, there was major support by the American Legion and the National Exchange Club. A major achievement was the 1954 sponsorship, by the Convair division of General Dynamics, of the Free Flight World Championships at Suffolk County Air Force Base on Long Island, N.Y. During this period there were also the Air Youth State Championships sponsored by the Hobby Industry Association of America.

With all this activity the Academy growth was rapid, with over 22,000 members by the early 60's. But this apparent success turned out to be only a step away from bankruptcy. The earlier years with plentiful sponsorships hid a need for a better financial base. Dues were too low for services rendered, and expenses depended upon outside support. When the era of plush sponsorships faded in the late fifties, the real problems and needs of AMA came to light. Nichols was caught in a crossfire of internal politics resulting from a basic change in AMA decision-making. AMA members had previously voted directly on all major issues but this gave way to representation by an elected board of directors, which became known as the Executive Council. In the transition many confusing demands and policy decisions were produced which made life hectic for the still tiny Headquarters staff.

After twenty years of service and great progress, Nichols saw the organization floundering into the sixties. What was previously an organization dominated by youth participation had turned into a largely adult activity. Many of the former programs and policies proved to be obsolete in this new atmosphere, and there was much searching for solutions to the growth problems. The total impact of all this took its toll on Russ' spirit and ability to keep up.

He grew tired and discouraged. He also had health problems, compounded by a physical disability. There were also personal difficulties at home. Finally, in early 1963, it all came to a head and Nichols ended up in a hospital and stayed there for several months. When he left he retired from the Academy in order to seek a quieter and less demanding position. He finally went to work for the federal government in Washington, and little more was heard from him until the news of his passing last May.

Because he left AMA during a crisis period, Nichols did not get the recognition to which he was entitled for twenty years of service. The timing simply wasn't appropriate. Since that time the Academy has revived and gone on to new spectacular achievements. During this period of new progress the past was left behind, and the old AMA was largely forgotten.

But those who remember the old days know that what AMA is today it owes to what was done during Russ Nichols' twenty years of service. Much of what has been recently accomplished is a result of the lessons learned from the past. Nichols is gone but not likely to be forgotten by those who knew him best. His early efforts are constantly recalled to guide and influence the decision-making of today's AMA officers.

AMA today reflects what Russ Nichols contributed before. That in itself is a lasting memorial and tribute. Russ has paid his dues. His friends now wish him the calm he didn't have to enjoy while in the hot seat of AMA Headquarters. His was a turbulent tenure, but it is fitting that his time is remembered best for what was accomplished rather than the problems involved. Russ Nichols deserves our thanks and the chance to rest in peace.

AMA was in a grand era when this photo was taken in 1952. With Nichols are Plymouth International Meet Manager Warren Bartlett, left, and AMA President Frank Bushey, right.

The U.S. Navy's hosting of the annual National Neet began while Nichols was in office, continues today. Russ and Rear Adm. McKechnie at 1961 Nationals.

Russ Nichols wore many hats during his tenure with AMA, shown here in 1958 reviewing rules procedures with Walt Good, left, and Bob Hatschek, right. Walt was AMA president, Bob was CB chairman.

AMA News Bits

On Display

The immaculate Winnie Mae version of the Lockheed Vega, constructed by Monty Groves, member of the AMA chartered Pioneer RC Club (Calif.), is now on display in Washington, D.C., in the National Air and Space Museum of the Smithsonian Institution. It's a big one-sixth full size RC Scale model, accurately detailed.

Visitors to Washington should be sure to include the museum in their intineraries. Not only is there a fabulous display of perfectly detailed models (mostly non-flying), but there are also many full-size aircraft which are excellent subjects for modeling. On top of this, museum files contain accurate and detailed information, photos and drawings, on most of their display aircraft plus many others. Copies of museum photos and drawings are obtainable for nominal fees.

Newsletter Teamwork

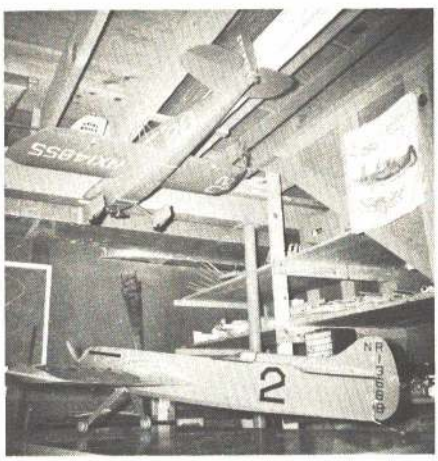
An interesting experiment was expected to take place in July–the joint publication of a newsletter by the AMA chartered Eugene (Oregon) RC Aeronauts and the Top O' N.J. RC Club. This cross-country joint effort was suggested by Roger Breedlove, editor for the Eugene Club, to Charles O'Donnell, editor for the Top O' N.J. Club, when he learned that the latter would be in Oregon for most of July and part of August. O'Donnell plans to take along his mailing list plus other club goodies he has, leaving only club meeting and flying field activity notes to be forwarded to him by another member.

Luck in RC Soaring

RC Glider flying doesn't take a special skill beyond that had by anyone who flies a powered RC aircraft, but Soaring entails a degree of luck. This was part of the commentary by Gene Fuller in the Printed Circuit newsletter of the AMA chartered North Jersey RC Club. Contrawise, Pattern requires sheer skill and nerves, he said; Soaring does not, even when up against those using thermal sensors. The main things one needs to have a contest winning chance with an RC Glider is a little bit of luck and a well trimmed ship that handles easily, he related. "This degree of luck is what makes it interesting."

Best of Show

The Hobby, Camping and Fishing Show put on last April by the Westchester (Ill.) Park District saw the AMA chartered Aero Telemechanics take the top display award, thanks to the efforts of a number of members. Jack Burns, Dick Yelm, Dick Vogt, Dick McCann and Dave Zahalka each had one or more models to show while others, such as Rich Tichy, answered many questions from visitors to the show. But special commendation goes to Bill Schultz for making a huge stage-length sign bearing the club's name and to Jack Burns for his continuous slide show of flying field shots.



Upper Left: Chuck Kotica (left) and Peter Lewis (right) winding a rubber-powered plane in Aycmer, Ontario, at the annual spring meet put on by the Toronto group. Submitted by Hardy Brodersen. Left: Mike Dornheim prepares Craig Kaufman's CL Bird Dog for flight in Taipei, Taiwan. Photo by Waldo Fargsworth. Above: Photo by Fred Steffen, Broadview Heights, Ohio, showing his Wittman Buster (suspended) and original semi-scale Wittman D-12 Bonzo (on table). The Buster, built from a Sig kit, has an O.S. H40P engine, Super MonoKote covering and Kraft radio. The Bonzo, circa 1938, meets Formula II, FAI and Sport Pylon specs.

WHALON WEBB

It is with great sadness that we report the death of Whalon Webb on May 22, 1971, following a lengthy illness. Whalon had served for the past several years as Control Line and Free Flight Contest Coordinator for AMA District VI.

NEW APPOINTMENT. District VI Contest Directors and neighboring Contest Coordinators should make note of the appointment by Vice-President Al Signorino to fill the post of CL and FF Contest Coordinator for District VI: Merrel Booker, 15711 Dixie Highway, Harvey, Illinois 60426. (Al Signorino continues as the Dist. VI RC Contest Coordinator.)

New A.V.P.'s

Since publication of the most recent AMA officer directory (July AAM, page 60), three new Associate Vice-Presidents have been named: Joe D'Amico, District II AVP, 9224 Rost Pl., Brooklyn, N.Y. 11236; Mark VanZant, District VI AVP, 7512 Arlington St., Raytown, Mo. 64138; and Dick Carson, District XI AVP, W. 3029 Hoffman, Spokane, Wash. 99205. D'Amico joins the Dist. II AVP team consisting of Art Schroeder and Jim Moynihan. Van Zant is added to the Dist. VI AVP force consisting of John Blum, Dave Burt and Glenn Lee. Carson is the first AVP for Dist. XI.

Associate Vice-Presidents are an important link in the AMA officer network. As the right arm of the elective Vice-Presidents, they provide the closest contact between the AMA policy makers and the general AMA membership. They seek ideas, suggestions and constructive criticism for improving AMA policies. Use them to advantage!

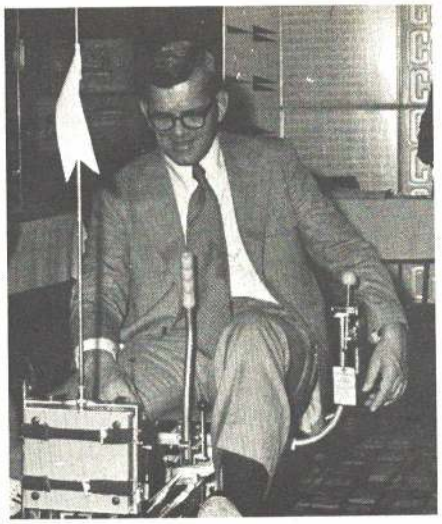
No Junior Problem

One of the main objectives of the AMA chartered Everett Line Kinkers (Wash.) is to give Junior members a chance to participate, and to assist them. According to a report by Tiny Wilson in the club's Line Kinker News, this is the likely reason the club is bucking the national trend by having approximately 60% Junior members. The club's primary interest is Control Line, but members also enjoy Indoor and Outdoor Free Flight and Radio Control.

The club's interest in young modelers was an important factor in obtaining use of a model flying field from the Air National Guard. A notable example of this youth interest was a learn-to-fly clinic conducted by the club over a 10-week period last fall. Over 100 enthusiastic boys and girls were taught.

Power of the Purse

With nearly 100 members, the AMA chartered Valley Forge Signal Seekers (Pa.) has considerable economic strength, probably more than members realize. This was stated in a report by President Jack Salmon in the club's Hear Ye newsletter. Assuming that the average member has invested about $400 in equipment; the club as a group has put something like $40,000 into the RC hobby–most likely within the past two or three years. Add to this an average each member spends each year on fuel, supplies



Left: Ed Henry's RC Fly Seat helped bridge the gap between model and full-scale aviation at the Missouri Pilots Assn. Convention in Jefferson City last May. The Fly Seat was part of the booth manned by the Greater St. Louis Modeling Assn. Shown is John Baker, Assistant FAA Administrator for General Aviation. Photo submitted by Bob Underwood. Center: A. K. "Andy" Anderson of Norfolk, Va., is shown receiving his AMA Distinguished Service Award from Executive Director John Worth last May. The occasion was the initial meeting of the newly reorganized Virginia Model Association. Anderson was recognized for over 20 years of leadership in model aviation activities in the Hampton Roads area of Virginia. Bill Conkling photo. Upper Right: The Dallas RC Club has many contests. Here in the process of scale judging at the club's May event are Johnnie Casburn and Bill Aaker. Murry Frank photo. Lower Right: RC Scale P-51D Mustang patterned after full-scale plane in background was built by Terry Edmunds, former Nats FF winner. Mrs. Edmunds holds. Bob Person photo.

and maybe a new kit, say $50, for an annual spending rate of about $5,000.

Salmon suggests that a way to take advantage of this purchasing power is to let the manufacturers, suppliers, etc., know what club members think, want and need. An excellent way for members to do this, Salmon says, is by writing an article for the club newsletter–not just gripe articles. If something particularly good or useful is found, fellow members should be advised of it as well as the manufacturers.

Dope Fume Extractor

Many modelers who live in private homes have ready-made exhaust fans if they have an electric clothes dryer with a no-heat setting. This information was brought to the attention in the newsletter of the Boeing Hawks (Wash.) newsletter. Editor Homer Smith says that having a plesant smelling house (who said dope smells bad?) is a good way for a modeler to keep peace at home.

In Smith's situation, the dryer is in in a 9' x 12' laundry room with loose fitting door. He simply takes into the room a table and chair, turns on the dryer blower, and dopes away to his heart's content. This is not recommended for gas dryers or dryers without a no-heat setting.

RC Field Improvements

To have been overly worried about renewal of the RC flying field lease of the AMA chartered San Jose Wavemasters RC Club might have resulted in never spending any club money on field improvements. This was Ken Wilson's response, in the club's newsletter, to critics of additional proposed field work. "Had we waited originally with our $900 expenditure on the field, we would still be mowing the strip every weekend before anyone could even get off the ground," he said. According to the information he provided, the Wavemasters have spent $1,330 during the past two years for such things as fences, weed killers, oiling the runway, etc.

Winches Galore

With five electric winches in use, it would seem that the AMA chartered Harbor Soaring Society has plenty, but a recent newsletter report indicated that more will be operational soon. That's real activity! Several have voltages ranging from 4 to 12, giving them the capability of handling virtually any sailplane under any condition fit to fly.

Oily Rubber Bands

The "tip of the month" award of the AMA chartered Aero Telemechanics Club (Ill.), consisting of a gift certificate from Lee's Hobby Shop, went to Ed Grosser for his idea to de-oil wing rubber bands in order to prolong their useful life. His tip is simply to halfway fill a small bottle with sweeping compound (the kind used to absorb oil and grease on garage floors and driveways), add rubber bands, and shake. Apparently this reconditioner may be an improvement over mild detergent and warm water as it has been noted that this latter method sometimes causes the bands to lose their elasticity.

Win Your Wings

Officers of the AMA chartered Monmouth Model Airplane Club (N.J.) have decided to recognize the achievement of novice RC flyers by awarding embroidered AMA wings to members who successfully solo their airplanes. A solo flight by club rules consists of ROG takeoff, flight to a reasonable altitude (no maneuvers required) and successful landing. This information was reported by club President Joe Friend in the MMAC Newsletter.

Embroidered AMA emblems, lapel pins, contest score forms, model airplane books, and magazines at discount rates are available to AMA members and clubs through the AMA Supply and Service Section. Price list and order blank available upon request–send pre-addressed, stamped return envelope.

CL Kits for Small RC

With the trend being to smaller Radio Control models, Jim Steinbrecher suggests the possibility that members of the AMA chartered Flying Robots RC Club (Livonia, Mich.) may want to adapt some of the Control Line Kits to RC–possibly at a lower cost. In addition to the notable examples published in this magazine and elsewhere, Steinbrecher indicates that he personally has had good success with CL designs in RC. He notes that present day multi controls and good engine power allows most models that are halfway balanced correctly to fly "right off the board" with only slight trim needed, which can be done in the air. Steinbrecher doesn't maintain that everything will fly, but the spectrum of flyability is so broad that all sources of design should be considered. This information was contained in the club's paper, Robots Roving News.

Play Equipment Wanted

That was the appeal printed in a recent issue of Airflow, newsletter of the AMA chartered Radio Control Club of Rochester (N.Y.). The club was seeking an old slide and swing set, sand box and other items from club members to furnish a central play area at the flying field. This would be an aid in keeping children, who accompany parents to the field, out of harm's way.

CONTEST CALENDAR

Official Sanctioned Contests of the Academy of Model Aeronautics

AUG.1—MENTOR,OHIO August Quarter Midget RC Races. Site: Club Field, Tyler Blvd. R. Penko, CD, 21151 Westport Ave., Euclid, Ohio 44123.

AUG 7-8—FLOSSMORE, ILL. (A) 4th Annual S.A.C. RC Meet. Site: Flossmoor Rd. Central Ave. J. Grier CD, 8001 South Morgan, Chicago, Ill. 60620. Sponsor: Suburban Aero Club of Chicago.

AUG. 7-8—WHITTIER, CALIF. Formula I Beginners RC Race. Site: Whittier Narrows. J. Bridi CD, 23625 Pineforest Ln., Harbor City, Calif. 90610. Sponsor: F.A.S.T. Club.

AUG. 7-8—SAYRE, PENNA. Fun Fly & Hobo Meet. Site: Valley RC Club Field. C. Knowles CD, 124 Ridge Rd., Horseheads, N.Y. 14845. Sponsor: Valley Radio Control Model Club.

AUG. 8—SAGINAW, MICH. (B) AMRCC Fun Fly RC Meet. Site: SVRCC Field. G. Gill CD, 2020 Lone Rd., Saginaw, Mich. 48623. Sponsor: Saginaw Valley RC Club.

AUG. 8—PIKE, N.Y. (AA) Western N.Y. FF Society FF Meet. Site: Pike. D. Evans CD, 175 1/2 S. First, Bolivar, N.Y. 14715.

AUG. 8—LOCKPORT, N.Y. (A) United Pylon RC Racing Circuit. Site: Lockport. H. DeBolt CD, 49 Colden Ct., Cheektowaga, N.Y. 14225. Sponsor: Niagara County Model RC Club.

AUG. 8—HADLEY, MASS. (AA) Hampshire Showdown RC Air Races. Site: H.C.R.C. Flying Field. B. Sparrow CD, 418 Meadow St., Agawam, Mass. 01001. Sponsor: Hampshire County RC'ers.

AUG. 8—VAN NUYS, CALIF. (AA) Valley Circle Burners FAI CL Meet. Site: L.A. Model Airport. W. Netzeband, Jr. CD, 580 N. Holliston, Pasadena, Calif. 91106.

AUG. 8—WAUKEGAN, ILL. 1st Annual Prop & Wing Club CL Contest. Site: Little Fort Shopping Center. J. Fruit CD, 2258 Heathercliff, Libertyville, Ill. 60048.

AUG. 8—PONTIAC, MICH. (AA) Pontiac Open CL Contest. Site: Pontiac Mall. H. Hackett CD, 3780 S. Shimmons Cir., Pontiac, Mich. Sponsor: Pontiac Model Airplane Club.

AUG. 8—FORT WORTH, TEX. (A) Fort Worth Thunderbirds Pylon RC Races. Site: T-Bird Field. J. Simpson CD, 5709 Wharton, Fort Worth, Tex. 76133.

AUG. 8—CALDWELL, IDAHO (AA) 6th Annual Idaho State FF Championships for Cat. I. Site: Caldwell. D. Walton CD, Rt. 2, Caldwell, Idaho. 83605.

AUG. 8—LANCASTER, OHIO (AA) F.O.R.K.S. Annual RC Pattern Meet. Site: F.O.R.K.S. Field. F. Slater CD, 809 Forest Rose Ave., Lancaster, Ohio 43130. Sponsor: Fairfield Ohio Kontrol Society.

AUG. 10-11-12—DENVER, COLO. (A) 5th Annual Old Timer Championships. Site: E. Colfax Airport. R. Combs, Jr. CD, RR 1, Box 712, Morrison, Colo. 80462. Sponsor: Model Museum Club.

AUG. 14—WARREN,OHIO (AA) TCRC Pattern RC Contest. Site: Club Field. B. Waterman CD, 812 Kenilworth, S.E., Warren, Ohio 44484.

AUG. 14-15—MINNEAPOLIS, MINN. (AA) TCRC 15th Annual RC Meet. Site: Club Field. J. Miller CD, 10730 Nesbitt Rd., Minneapolis, Minn. 55437. Sponsor: Twin City Radio Controllers.

AUG. 14-15—ENDICOTT, N.Y. (AA) 16th Annual Aeroguidance Society RC Contest. Site: Tri—Cities Airport. R. Noll CD, 96 Pine Knoll Rd., Endicott, N.Y. 13760. Sponsor: Aeroguidance Society, Inc.

AUG. 14-15—WYANDOTTE, MICH. (AA) Indian City 18th Annual RC Meet. Site: Penns. & Allan Rds. E. Lynn CD, 3167 22nd, Wyandotte, Mich. 48192. Sponsor: Indian City Radio Control Club, Inc.

AUG. 14-15—CLEVELAND, OHIO (AAA) 36th Annual Jr. CL Air Races and CL FAI Team Selection. Site: Cleveland Model Flying Field. B. Sargent CD, 1694 Wright Ave., Rocky River, Ohio 44116.

AUG. 14-15—WICHITA, KANS. (AA) 4th Annual Wichihawks Fall FF & CL Rally. Site: 13th & Webb Rd. L. Woolard CD, 1558 N. Battin, Wichita, Kans. 67208. Sponsor: Wichihawks Model Airplane Club.

AUG. 14-15—TULLAHOMA, TENN. (AA) 12th Annual Air Foiler FF Meet for Cat. II. Site: AEDC Field. A. Mansfield CD, 621 Glendale Pl., Tullahoma, Tenn. 37388. Sponsor: Coffee Airfoilers.

AUG. 15—CORPUS CHRISTI, TEX. First Annual CC Bee's Fun Fly. Site: Waldron Field. J. Hanway, III, CD, 464 Ohio St., Corpus Christi, Tex. 78404. Sponsor: Corpus Christi Bees.

AUG. 15—LAKE ELSINORE, CALIF. (AA) Thunderbugs Small Field FF Meet. Site: Lake Elsinore. E. Kelley CD, 4202 W. 172nd St., Torrance, Calif. 90504.

AUG. 15—STREATOR, ILL. Illinois Valley RC Fly for Fun. Site: Lentman Airstrip. A. Annis CD, 1203 Madison St., Streator, Ill. 61364. Sponsor: Illinois Valley RC.

AUG. 15—LAKEHURST, N.J. (A) North Jersey RC Club/ECSS Soaring Meet. Site: Lakehurst N.A.S. G. Fuller CD, 340 Godwin Ave., Midland Park, N.J. 07432. Sponsor: North Jersey RC Club.

AUG. 15—ST. LOUIS, MO. (AAA) Midwestern CL Championships. Site: Buder Model Park. A. Schaefer CD, 4206 Virginia Ave., St. Louis, Mo. 63111. Sponsor: St. Louis Yellow Jackets, Inc.

AUG. 15—HASTINGS, MINN. (AA) Silent FF Meet for Cat. II. Site: Webers Air Strip. H. Langevin CD, 4854 Aldrich Ave. S., Minneapolis, Minn. 55407. Sponsor: Minneapolis Model Aero Club.

AUG. 15—LEVANT, N.Y. Flying Rebels RC Fun-Fly Meet. Site: Blanchard Rd. E. Ecklund CD, 75 Benson St., Jamestown, N.Y. 14701. Sponsor: Flying Rebels.

AUG. 15—WESTFIELD, IND. Fly for Fun Special Meet. Site: Westfield. H. Vandiver CD, 28 Wilson Dr., Carmel, Ind. 46032. Sponsor: Hamilton County RC Modelers.

AUG. 15—GREEN BAY, WISC. Summer Invitational RC Meet. Site: 2600 S. Gross Ave. R. Cowles, Jr. CD, 2424 Ducharme Ln., Green Bay, Wisc. 54301. Sponsor: Green Bay R.U.F. Club.

AUG. 15—EASTON, PENNA. (AA) BAM FF Bash for Cat. II. Site: Easton. R. Gutai CD, 334 West St., Bethlehem, Pa. 18018. Sponsor: Bath Area Modelaires.

AUG. 15—FLUSHING, N.Y. (AA) Assoc. of M.A.C. of Greater N.Y. CL Meet. Site: Flushing Meadow Park. W. Boss CD, 77-06 269th St., New Hyde Park, N.Y.

AUG. 15—OHIO CITY, OHIO (B) SHOO Flyers Club RC Contest. Site: Club Field. D. Kraner CD, RR 1, Ohio City, Ohio 45874. Sponsor: SHOO Flyers MAC, Inc.

AUG. 15—MOUNDSVILLE, W. VA. (A) Valley IFO's 4th Annual RC Fun Fly. Site: Fallen Timber Ln. S. Sturm CD, Box 5234, Vienna, W. Va. 26101. Sponsor: Valley IFO's Model Airplane Club.

AUG. 15—CEDAR RAPIDS, IOWA Skyhawks Fun Fair Meet. Site: Cedar Rapids. J. Finn, Jr. CD, 368 Hampden Dr., N.E., Cedar Rapids, Iowa 52402.

AUG. 21-22—CLOVERDALE, ILL. (AA) 9th Annual AMA RC Contest. Site: Cloverdale. H. Mosquera CD, 361 N. Arrowhead Trail, Carol Stream, Ill. 60187. Sponsor: West Suburban RC'ers, Inc.

AUG. 21-22—ORANGE, MASS. (AA) 18th Annual New England RC Championships. Site: Orange Municipal Airport. C. Piper CD, Highland Rd., Atkinson, N.H. 03811. Sponsor: New England RC Modelers, Inc.

AUG. 21-22—OMAHA, NEB. (AA) Omahawks 17th Annual RC Contest. Site: Omahawks RC Field. O. Olson CD, 1120 Loveland Dr., Omaha, Neb. 68124.

AUG. 21-22—FARGO, N.D. (AA) Red River CL Championships. Site: FM Skylarks Flying Site. M. Olson CD, 305 27th Ave., N., Fargo, N.D. 58102. Sponsor: F.M. Skylarks.

AUG. 21-22—COURTLAND, ALA. (AA) Decatur 6th Annual RC Meet. Site: Old Courtland Air Base. J. Ray CD, 1304 Fletcher Ave., S.W., Decatur, Ala. 35601.

AUG. 21-22—NEDROW, N.Y. Aero Radio Control Club of Syracuse Fly for Fun. Site: A.R.C.S. Field. E. Izzo CD, 3950 Highland Ave., Skaneateles, N.Y. 13152.

AUG. 21-22—SALT LAKE CITY, UTAH (AA) 9th Summer RC Fiesta. Site: Saltair Modelport. C. Pannier CD, 1781 Mountain View Dr., Salt Lake City, Utah. 84106.

AUG. 21-22—PONTIAC, MICH. (AA) 2nd Annual RC Championships. Site: Club Field. J. Frazer CD, 1980 Beverly, Pontiac, Mich. Sponsor: Pontiac Model Airplane Club.

AUG. 22—DALLAS, TEX. (AA) Annual Pearl Bash FF Picnic. Site: Samuels Park East. T. Spangler CD, 4509 Bel Clair, Dallas, Tex. 75229. Sponsor: Cliff Cloud Climbers of Dallas.

AUG. 22—BRIGHTON, WISC. (B) Chicago Aeronuts-N.I.A.M.A.C. FF Contest (Cat. II). Site: Bong Field. P. Sotich CD, 3851 W. 62nd Pl., Chicago, Ill. 60629. Sponsor: Chicago Aeronuts.

AUG. 22—LAKE ELSINORE, CALIF. N.A.R. Flightmasters R.O.W. Scale Meet. Site: Lake Elsinore. C. Hatrak CD, 3825 W. 144th St., Hawthorne, Calif. 90205. Sponsor: N.A.R. Flightmasters.

AUG. 22—CLEVELAND, OHIO (AAA) Junior FF Air Races. Site: Richmond Rd. L. Miller CD, 5986 Park Ridge Dr., N. Olmsted, Ohio 44070. Sponsor: NOFFA.

AUG. 22—MIDLAND, TEX. (AA) Second Annual Midland Model Airplane CL Meet. Site: Air Park. F. Morgan CD, 4613 Thomason Dr., Midland, Tex, 79701. Sponsor: Flying Chaparrals.

AUG. 22—WHEELING, ILL. (AA) Red Baron's 1st Annual CL Meet. Site: Wolf & Palatine Rds. H. Cain CD, 525 Weidner Rd., Buffalo Grove, Ill. 60090. Sponsor: Red Barons Model Airplane Club.

AUG. 22—MANSFIELD, OHIO (AA) Electronic Flyers RC Meet. Site: Mt. Zion Road. M. Kalish CD, 235 Cline Ave., Mansfield, Ohio 44907.

AUG. 22—FAYETTEVILLE, ARK. Fayetteville Aeromodelers RC Fun Fly. Site: Younkin Fly Service. R. Hall CD, 1830 Old Wire Rd., Fayetteville, Ark. 72701. Sponsor: Fayetteville Aeromodelers RC Club.

AUG. 22—ALBANY, ORE. (AA) Northwest FF Championships for Cat. II. Site: Parker Field. B. Stalick CD, 1120 Shady Ln., Albany, Ore. 97321. Sponsor: Williamette Modelers Club, Inc.

AUG. 28-29—TULSA, OKLA. (AAA) Tulsa Glue Dobbers 22nd Annual FF, CL & RC Meet. Site: Glue Dobbers Field. W. Salnikov CD, Rt. 1, Box 130-C, Coweta, Okla. 74429. Sponsor: Tulsa Glue Dobbers, Inc.

AUG. 28-29—EUGENE, ORE. (AAA) Eugene Model Aero CL Meet. Site: Mahlon Sweet Field. R. VanDell CD, 869 Armstrong Ave., Eugene, Ore. 97402. Sponsor: Eugene Prop Spinners.

AUG. 28-29—SO. EL MONTE, CALIF. (AA) San Gabriel Annual RC Pattern Contest. Site: Whittier Narrows. J. Garabidian CD, 909 N. 3rd St., Montebello, Calif. 90640. Sponsor: San Gabriel Valley RC Club.

AUG. 28-29—LIVERMORE, CALIF. (AA) LSF 1971 RC Soaring Tournament. Site: Hummingbird Haven Glider Port. R. Andris CD, LSF-Box 2606 Mission Sta., Santa Clara, Calif. 95051. Sponsor: South Bay Soaring Society.

AUG. 28-29—JAMESTOWN, N.Y. (A) Flying Aces Inc. Annual RC Pylon Races. Site: Jamestown. W. Johnson CD, 62 Widrig Ave., Jamestown, N.Y. 14701.

AUG. 28-29—ST. CHARLES, MO. (AA) McDonnell Fourteenth Annual RC Meet. Site: McDonnell Douglas Conductron Plant. W. Feldmeier CD, 2955 Clearview Dr., Normandy, Mo. 63121. Sponsor: McDonnell RC Club.

AUG. 28-29—BENTON HARBOR, MICH. (AA) Whirlwinds Second Annual RC Meet. Site: CLub Field. C. Ellis CD, 3383 Valley View Dr., St. Joseph, Mich. 49085. Sponsor: Whirlwinds of Southwestern Michigan, Inc.

AUG. 28-29—BABHOAD, FLA. (AA) N.W. Florida Autumn RC Championships. Site: Old Babhoad Naval Flying Field. W. Davison CD, 4422 W. Jackson St., Pensacola, Fla. 32506. Sponsor: Northwest Florida RC Modelers.

AUG. 28-29—BILLINGS, MONT. (AA) Billings Flying Mustangs RC Meet. Site: Club Field. C. Hutchinson CD, 3126 Laredo Pl., Billings, Mont. 59102. Sponsor: Billings Flying Mustangs.

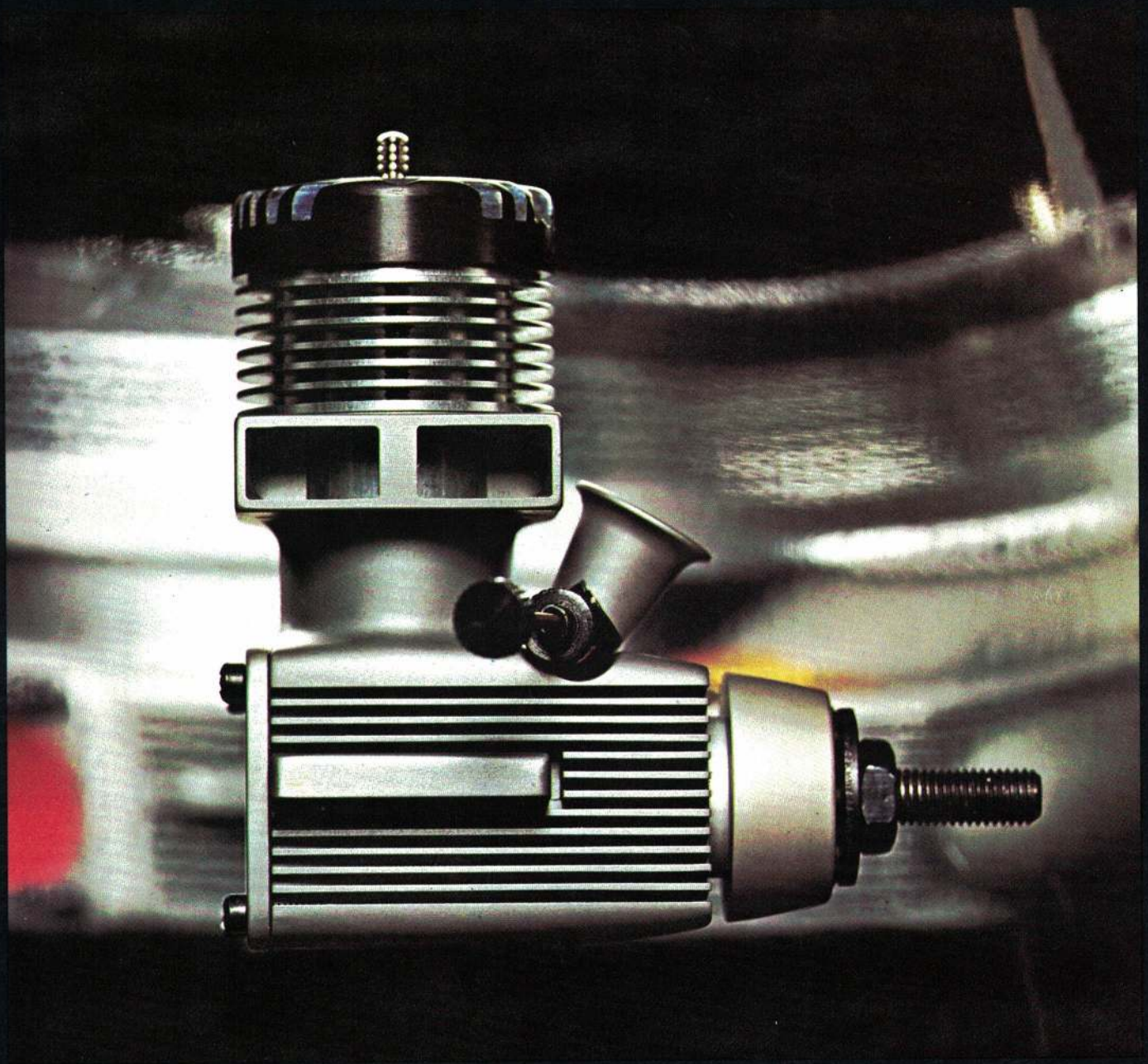
AUG. 29—W. SUFFIELD, CONN. (AA, Nor-East RC Air Races. Site: NCRCC Field. R. Bernier CD, 761 Mather St., Suffield, Conn. 06078. Sponsor: Northern Connecticut Radio Control Club.

(Continued on page 92)

AMA OFFICER DIRECTORY

The most recent complete directory was published in the July AAM, page 60.

TERRIFIC!...BUT LOOKS AREN'T EVERYTHING



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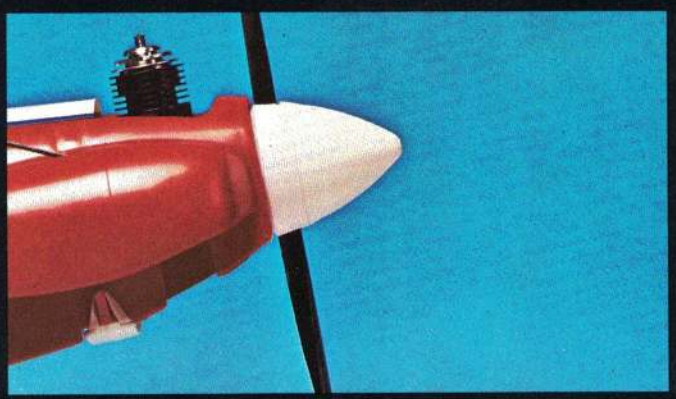
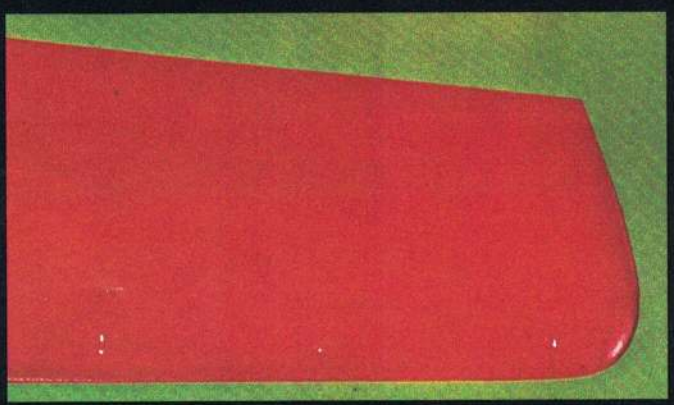
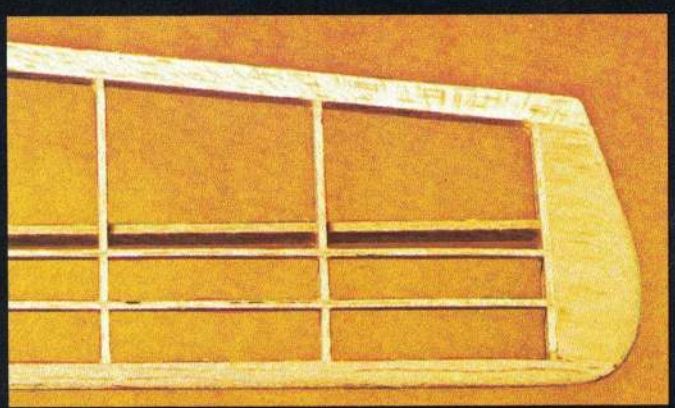
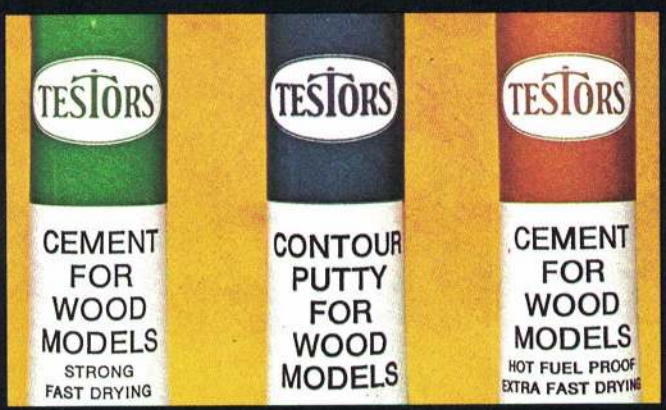
FROM START... TO FINISH... AND EVERYWHERE IN BETWEEN









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SERVICE EXPERTS

The service experts listed in this advertisement are, for the most part, people who have been working with Digitrio and other kit systems in the various areas mentioned. They have all put together an M.A.N. System from a raw kit and have agreed to stock parts that are compatible with World Engines Systems. They have been given schematics of World Engines Systems and current OS Digital Proportional Systems. Many of these service experts service other makes of equipment other than our own. Consider these people for repair work or for help in matching up our flight packs.

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Fletcher FU-24

(continued from page 22)

inside with one coat of resin. When dry, add another coat. When tacky to the touch, lay in a layer of fine cloth and give it another coat of resin.

I've ruined too many cowls trying to get them out of deep molds, so I no longer try. Plaster is cheap and a mold easy to make. Cut into all four sides with a saw nearly to the cowl and split the mold open with a hammer and chisel. Carefully sand the cowl to remove the release wax.

The number of stringers used in the fuselage are limited to keep the weight down. As the covering ages, the planking sinks in a certain amount. The stringers shown in the plan are used on the model but, for the negligible weight gain involved, the number could be increased, particularly on the fuselage top. Key stringers could be made from spruce to insure retaining a more accurate and attractive shape.

In a day of quick coverings and finishes, it is still hard to beat the quality of a silk and dope application for a scale model. I covered every part with silk and filled the grain with two heavy coats of Sig Sanding Sealer, sprayed on and sanded between coats. Spraying prevents brush marks and other uneven spots and gives a perfectly smooth base for the color dope. It also requires less fillercoat because there are fewer ups and downs to level.

Before the color dope is applied, much of the surface detail (rivets, panel lines, stiffening crimps, etc.) should be added. Panel lines were scribed into the fillercoat surface with a replaceable-point scribing tool, using a new, sharp point. For information on the rivet method, stiffener crimps and other fine detailing techniques, see the RC Scale section of the "Where the Action Is" in AAM for the past several months, as well as future columns.

Only two sprayed coats of Sig Supercoat White dope were necessary to cover the white surface of the Sanding Sealer fillercoat base. Supercoat has a low-shrink base which helps control warping and planking distortion. Colors of the markings and lettering are shown on the plan.

Most of the lettering was done with Letraset rub-on dry decals obtainable from art supply stores. A little practice is necessary to get these on the model without rubbing so hard as to make an indentation in the wood. Try them out on an old model. I got good results with a ball point pen as a tool, using very closely spaced, actually overlapping, strokes and light pressure. Don't be in a hurry for the letter to separate. Take some additional care with the larger letters so their shape is not distorted during application. It helps to work from center to ends, following the letter and not going across open spaces to another part of it. So does pressing down on the letter firmly with a finger before beginning to rub. Although decal directions specify using the entire sheet intact, it seemed easier to cut out each letter with as much border of mounting material as possible, especially in the larger sizes. Spray clear dope over the decal letters with great care, using only a haze at first and allowing each coat to dry until some coverage is built up.

The following Letraset sheets were used: 26-60CN, fin numerals; 6-96L, "ap" trademark; 26-36CLN, No Step on gas tank;

Rear quarter view shows off the simple lines. Flaps down for quick takeoff and steady slow flight when working.

26-30CLN, No Step on flaps; 54-36CN, Fletcher FU-24 on nose; 75-42CLN, Armidale on fuselage. The large wing registration letters were marked on the wing with a soft pencil from paper patterns, outlined with a ruling pen filled with black dope and filled in by hand.

Balance point for the model is between 3 1/4 and 3 1/2" back from the leading edge of the wing. Setting the stabilator angle is too critical a job to be done by eyeball. Get a big, flat piece of corrugated cardboard and make a template from the side view of the fuselage. The template can be placed against the flat bottom of the scale NACA 4415 airfoil and provide a cradle back at the tail that will fit the profile of the stabilator to push it into the correct relationship. Then give the clevis an extra half turn of up trim for good luck. It's better to have a little too much up than down on a test flight.

I'd be glad to try to answer any questions about construction and would like to see some photos of other Fletchers.

If you haven't yet made a scale model, there's no excuse—Now!

Our new Radio Controlled P-51 Mustang is a *Standoff Scale* model. You can build it in about the same time a Kwik-Fli takes, but when you're through, you've got a model that only a ruler can tell from a true scale plane.

This means that in the same building time of your next sport or pattern R'C, you could have instead *this Mustang* . . . an authentic looking plane that flies like a sport model — no tricky handling.

Designed by Scale Champ Dave Platt, wing span is 60″ for .40 to .60 engines and full house R'C. The flaps can be stationary or operable. And like all Top Flite kits, it has exciting new features and time saving ideas.

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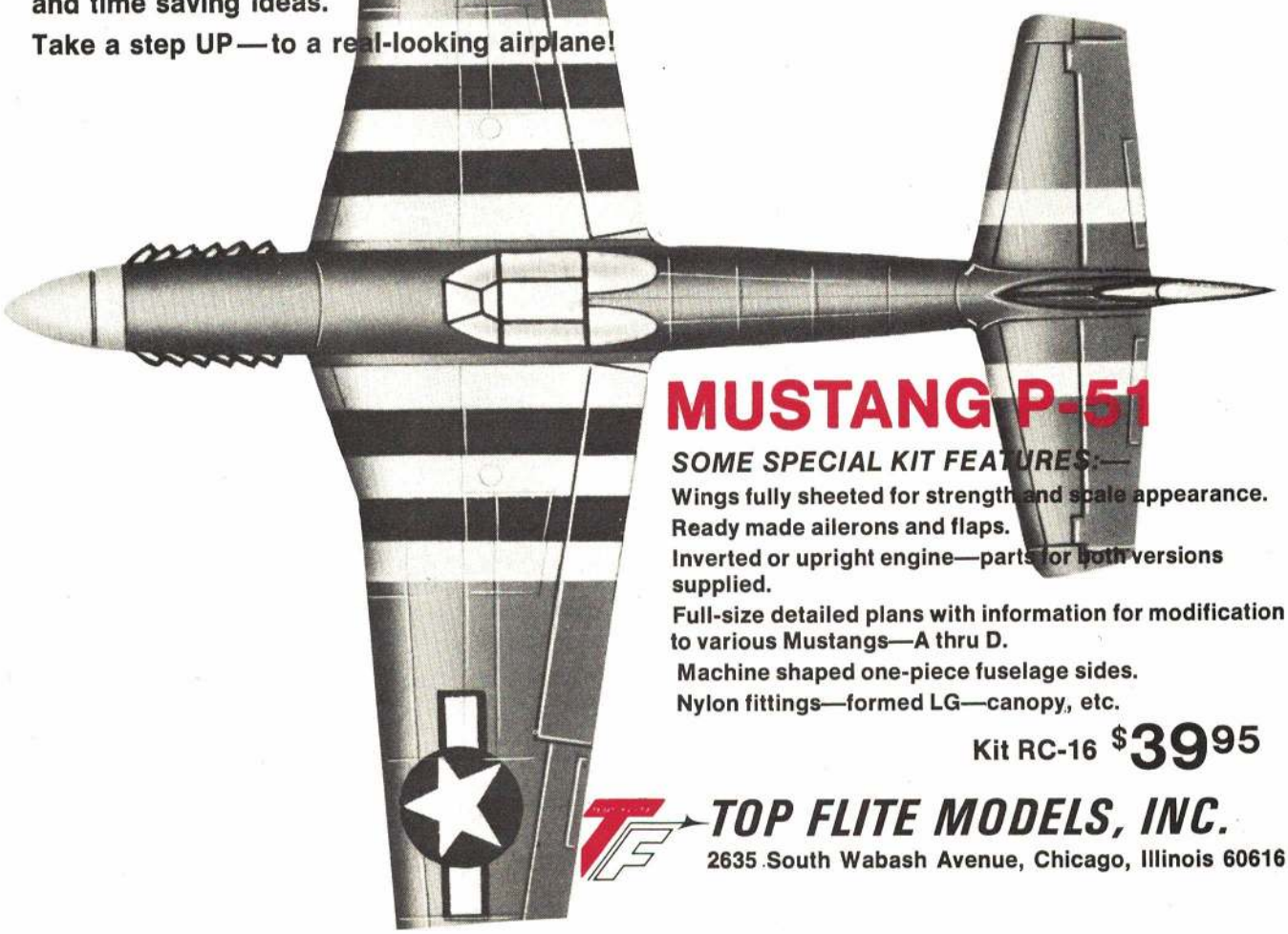

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Fletcher FU-24

(continued from page 22)

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Take a step UP—to a real-looking airplane!

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No. 0714, Helldiver—Semi-scale CL model of WW II torpedo bomber builds fast and is rugged. **$1.50**

No. 0811, Douglas Mailplane—Large FF scale of Western Air Lines M-2 bipe. For 09 power. Could fly with light radio. **$3.00**

No. 0812, Hot Canary—Unique Formula II/FAI racing biplane by Bob Sigelkoff. Although unusual-looking, it is fast and quickly built. **$3.25**

No. 0813, Pogo—Model of Owl Racer for Formula I features midwing, low stab, non-cheeked cowl. Very stable and plenty fast. By Bob Morse. **$3.50.**

No. 0814, Flying Fortress—Not a scale plane, but a novelty CL flying medieval castle for a 19. **$2.75**

THIS MONTH'S PLANS

No. 0911, Fletcher—McCullough's magnificent tri-geared, low-wing crop duster scale job for 60's. Generous area and moments. All balsa. Highly-detailed plans on 2 sheets. **$7.50**

No. 0912, Killer—Fast, responsive combat plane. All-balsa for 35's has many wins. **$3.00**

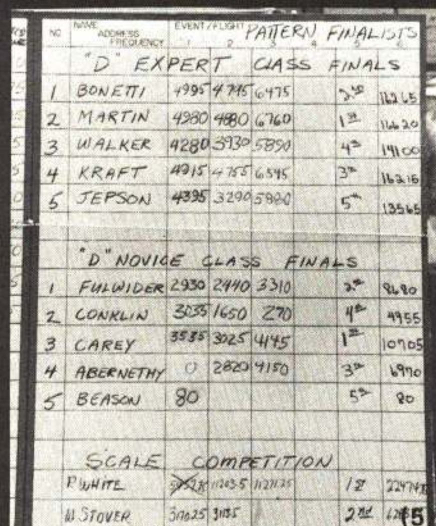
No. 0913, ACE High—Featherweight 049-powered RO glider uses a set of ACE R/C foam taper and constant chord wing sets. **$2.25**

No. 0914, Sakitumi—Highly-developed 40-gram Wakefield plane by Brian Donn features latest trends in gadgets and design. Well-detailed plan. **$3.00**

ON THE SCENE

(6)

(1)



NO	NAME / ADDRESS / FREQUENCY	1	2	3	4	5	6
	PATTERN FINALISTS						
	"D" EXPERT CLASS FINALS						
1	BONETTI	4995	4795	6475		2nd	11265
2	MARTIN	4980	4880	6760		1st	11620
3	WALKER	4280	3930	5890		4th	11100
4	KRAFT	4915	4755	6545		3rd	11216
5	JEPSON	4395	3290	5980		5th	13565
	"D" NOVICE CLASS FINALS						
1	FULWIDER	2930	2440	3310		2nd	9680
2	CONKLIN	3035	1650	270		4th	4955
3	CAREY	3535	3025	4145		1st	10705
4	ABERNETHY	0	2820	4150		3rd	6970
5	BEASON	80				5th	80
	SCALE COMPETITION						
	R WHITE	[illegible]	11203.5	11211.25		1st	[illegible]
	M STOVER	30025	3135			2nd	[illegible]

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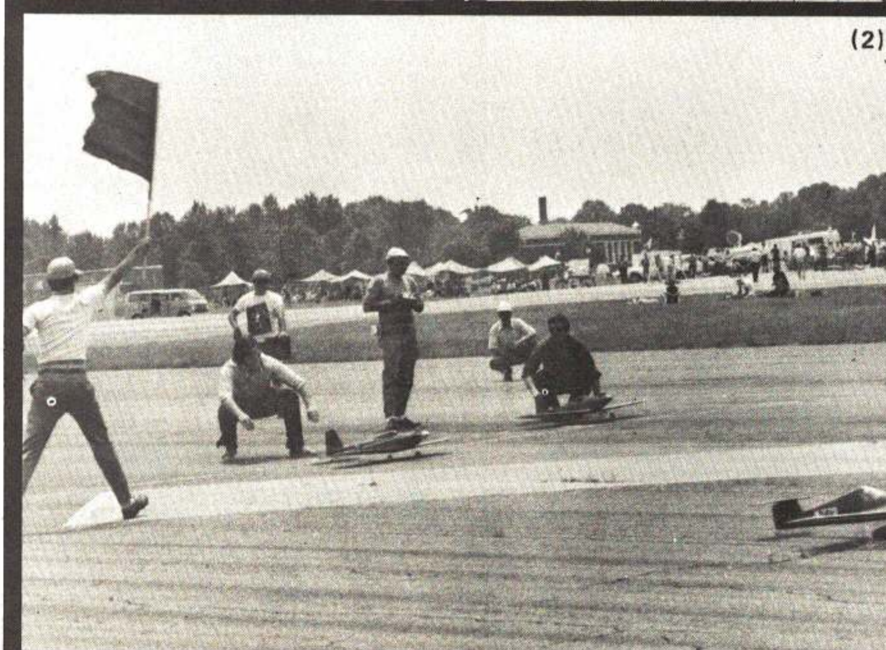


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(3)

(1) Len Purdy assembles one of his pretty Colts. Nice detail mouldings on fuse. (2) Sweeney flags them off on another heat. (3) Home brew plane flew well which seems to be a middish wing New Orleanian. (4) Bonetti's TroubleMaker. (5) Shulman System keeps things working smoothly. These are Sunday flights showing winners. (6) Pylon winner Mike Helsel accepts DC/RC medallion. (7) Walt Good awards medallion to pattern winner Jim Martin. (8) Cliff Weirick carries Kraft's new ARF model back after another fine flight.

A BEAUTIFUL COMBINATION!

Jennie Kampen proudly displays her father's Ace High Glider--this makes a beautiful combination. The third part of the combination is contained inside of the airplane and consists of the Commander R/O Standard Pulse Rudder-Only outfit. Beautiful, beautiful, beautiful!

ACE HIGH SAILPLANE KIT

Kampen Designed--
For Rudder Only Pulse

The Ace High kit features a matched set of foam wings. The constant chord section forms the center, and the taper section forms the outer panels for a graceful, easy to build, strong but flexible, high aspect ratio, wing. This method of construction overcomes the biggest single stumbling block for the beginner to the fine art of soaring. The polyhedral span is 70".

Fuselage and tail assembly is straight forward construction. Balsa and plywood is precision band sawed, and dimension sanded of the highest quality wood available.

Parts for power pod are included (Cox Babe Bee .049 recommended). Those living in the soaring areas of the country can leave off the power pod and locate hooks for high start or tow line launch.

The kit also contains step by step assembly details, matched foam wing sections, hinge material, torque rod and link parts, nylon tubing, and installation hardware for Rudder-Only Pulse Commander. (Standard Commander 10G16 recommended).

Extensively test flown for well over two years.

No. 13L104—Ace High Sailplane Kit $14.75

September Release

Ace High Matched Foam Wing Set

For the scratch builder we're making available separately the foam wing sections matched and selected for the Ace High kit. Consists of two constant chord sections and two taper sections.

No. 13L204—Ace High Matched Wing Set $5.50

ACCESSORIES

Check our catalog for full line of Cox, Solar Film, TopCotE, Dixon tools, and many other items ideally suited for all types of modelling.

Dear Friend:

Finally it has happened! The Ace High Glider which has been shown at many a trade show, on which we have run teaser photos in our advertising for some time, is at a point where we can answer the questions that we were asked about it. Number 1 - Plans are available in an article appearing in the September issue of American Aircraft Modeler; Number 2 - A kit for it will be ready featuring our foam wings, for September delivery.

So all of you who have asked about it now have your answers. This comes after an extensively period of two years of design and evaluating and testing, and this should prove a good model for both the beginner and the expert, AND it was designed for Pulse Rudder Only--our 10G16 is recommended.

Bud Atkinson dropped by the other day with an .020 powered Micro Cat. This is a scaled down version of his famed Aristo Cat series, and he says on rudder only with a Baby and a Pee Wee it is an outstanding performer. He says it is fun of an evening to step into a vacant lot next to his house and get in 15 to 20 minutes of flying and just plain fun and relaxation.

Yours sincerely,
Paul
Paul F. Runge

P.S. We've also heard the comments that maybe the little plane should be called the Aristo-Kitten, or "Putty-Cat".

ACE R/C INC.

HIGGINSVILLE, MO. 64037

DICK'S DREAM PLANE KIT
For the Beginner or Expert!
(Designed especially for pulse)

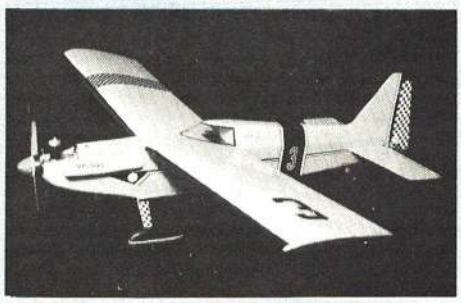
This kit of the Dick's Dream, designed by Owen Kampen, has been extensively test flown in various parts of the country. It has several innovations which are for the small breed of airplane specifically, and with the foam wing the beginner is assured of overcoming a big drawback to success. Features crutch type fuselage construction to assure line-up and accuracy.

Full step by step instructions to assist in building this gem of a kit. AND ultra simple installation shown for the Commander R/O Baby or Baby Twin!

Span is 34" (cut from the Ace taper wing foam sections), 5½" chord, length is 25 inches. Weight with R/C gear is 12 to 14 ounces.

With a Pee Wee .020 and a Commander R/O Baby you have a docile performer and excellent trainer. If you want something hot, Tee Dee .020 with the Commander R/O Baby Twin will do the job--it'll do everything in the Rudder Only book!

No. 13L100—Dick's Dream Foam Wing Airplane Kit $5.95



KAMPEN'S 1/2 A RACER UPSTART CUSTOM KIT

The Upstart by Owen Kampen is the first in a series of 1/2 A Midget Race-for Fun Airplanes! Featured in RCM, this event is catching on like wild fire.

Upstart has 34" span, 6" chord, 200+ sq. in., an overall weight of 20 to 26 oz., designed specifically for two channel R/C systems or two servos of any digital set. For use with rudder and elevator only. Rudder response is so effective that ailerons are not required! Motor control is not used.

The Ace kit contains our constant chord foam wing, and is a deluxe Custom kit with all of the balsa and ply-wood parts band-sawed and precision-sanded from prime Micro-Cut.

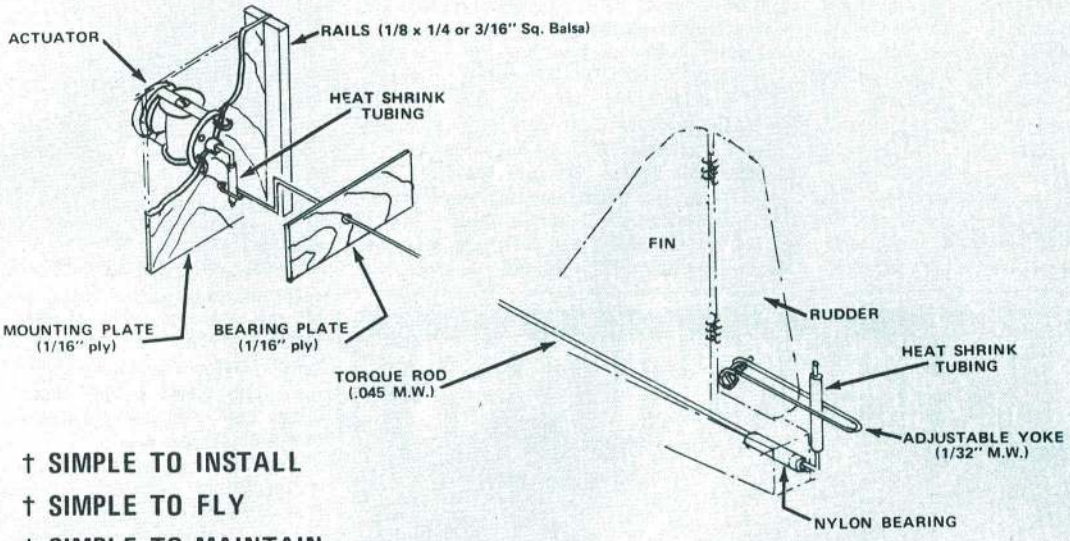
This means that this is the highest quality possible and assures you of a kit that will go together accurately and quickly.

Does not contain wheels, linkage, covering material, optional spinner, or other accessories.

No. 13L102—Kampen's Upstart Custom Kit 10.95

PULSE PROPORTIONAL .. Best Choice for You!

THE SIMPLE SYSTEM--



† SIMPLE TO INSTALL
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† SIMPLE TO OWN – (Prices begin at $59.95)

Designed for the new small PRACTICAL flying machines. These designs really fly--and fly well; not in the novelty class. Easy to build, low in cost, inexpensive to fly. Fly in limited areas.

RUDDER ONLY PULSE IS:

* FULLY PROPORTIONAL

* LIGHTEST WEIGHT--2.5 oz. for the Baby w/225 ma nicads.

* LOWEST COST--begin at $59.95! (less batteries and charger).

* SIMPLEST--only one moving part, easily serviced and maintained; noise free.

* VERSATILE--Arrange to suit your particular installation. You can go up or down in size without obsoleting your receiver or transmitter. Simple changes of battery packs and actuators allow change at will. Or add Motor Control to Standard or Stomper--using same battery pack.

* GREAT for Beginners--FUN for Experts.

ALL UNITS ARE COMPLETELY WIRED, TESTED, GUARANTEED

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Our Commander R/O Pulse Combos are available in 4 sizes for most sporting needs from the smallest to the larger aircraft--or boats.

The Baby is for .010 to .020 jobs. Has two 225 ma Nickel Cadmiums and the regular Baby Adams. Airborne weight is 2.5 oz.

The Twin Baby is for hot .010 to .020 jobs. As above, except uses Twin Baby actuator. Airborne weight is 2.9 ounces.

The Standard uses the Single Adams for more power for .049 to .07 size. Uses larger capacity nickel cads. Airborne weight is 4.5 oz.

The Stomper uses the Twin Adams actuator for up to .15. Airborne weight is 4.9 oz.

No. 10G15—R/O Baby Combo	$69.95
No. 10G15T—R/O Twin Baby Combo	72.95
No. 10G16—R/O Standard Combo	71.95
No. 10G17—R/O Stomper Combo	74.95

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Don Dewey says: "This should be in the library of every modeller!" Walt Schroder says: "An exceptionally well done job."

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Killer

(continued from page 26)

Construction is simple, light, and rugged, with a minimum of parts. Begin by cutting all the required pieces, as specified on the plans. Mark the rib locations on the bottom trailing edge piece and cement the ribs into position. The top is added later. Build with the straight part of the rib, from the spar back, flat on the workbench or building board. Cement the leading edge in place and allow to dry.

Shape the motor mount and glue it into place. Spreading the center ribs slightly, force in plenty of glue because a good joint is needed here. Make the wing tips and glue them in place. When dry, add braces on the top only. The bottom braces are added later.

Make a three-inch bellcrank, complete with pushrod and leadouts to the bellcrank mount, and glue this entire unit in place against the bottom spar. Add the top trailing edges and trailing edge spaces.

Put the pen bladder compartment in place and then glue the top spar in position. Use 1/16" balsa to plank the center section. When the tips are dry, sew and glue the leadout guides in place. Plank the wing and add cap strips. Round off the leading edge as shown in the side view and sand the engine wing.

Give the framework one coat of dope, then sand lightly. Cover with silk for maximum strength, using several coats of glue on and around the booms. Slip the engine between its bearers and hold it in place with a rubber band. Slide the engine back or forward until the plane balances as shown, then mount in this location. Shape the nacelle fairing and glue it in place. Fill in around the shaft for a more streamlined nose. For maximum strength, this area can be covered with fiberglass.

Give the model from six to eight coats of clear dope, sanding very lightly between every two coats. Finish with color if desired, but keep it light. The controls are hooked up so that the elevator has about 15 degrees movement in each direction. Hold the pushrod with a keeper.

Instant-built combat models often sacrifice performance, yet a winner does not need to be complicated. Build several to win.

On the first flights, adjust the movement so maximum turns are obtained without a stall or excessive slowing in maneuvers. To get the most from a model, take a little extra time to trim it properly. The lighter the model, the tighter it will turn, which permits getting inside your man and killing him quickly.

A Killer flown by Gary Arnold (Wayne Model Club) placed sixth in Open at the 1969 Nats.

Straight and Level

(Continued from page 6)

aero jurisprudence should have been named after him. Why do props snap back when you haven't had a pop in five minutes? Why do we think death dives are due to a dead cell? Don't believe it. With some of those flying techniques, many a sensitive crate prefers the sudden way out. It is so sad.

There was the guy we knew who had a particularly disobedient plane–it was a nut on sightseeing. Finally hit a ship mast four miles at sea. So help us! Some crates aren't that smart. All they know is to hide, like a dog under a couch when he hears the bath water running. The most stubborn we ever had, hid in the nearby woods for six months as Sunday strollers and hunters devoted themselves to finding it (her?). Twelve years later, and 100 miles away, some guy–he'd bought it from a guy, who'd bought it from a guy, who'd bought it. . . .Read about one that got away for 16 years, so we didn't even break a record.

Unconvinced, you say? Tell us this, oh brother: how can one of these introverted things sit there and petulantly warp its wings–if it is a Toy?

–Bill Winter.

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Three generations of meticulous craftsmanship have led to the birth of this new series of Merco engines. Characterized by the ultimate in quality and reliability, this hand-crafted British engine excels under the most exacting standards. Highlighting the Black Streak generation is a unique concept in carburetion that not only increases power, but responds to fine tuning with just the touch of a finger. Truly a crowning achievement!

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DEALERS' INQUIRIES INVITED

Sakitumi

(continued from page 54)

platform will crush the balsa after a few flights. Then add the pivot stop made of dowel or spruce. Epoxy the hold-down hook in place. The stab can be finished with several coats of thin dope or sanding-sealer. Sand lightly and spray on a thin coat of some bright color which will show up well against typical flying terrain.

The fuselage structure is one which is standard for almost all my recent Wakefields. As with the stab, it combines strength, ease of construction and simple lines. Use medium weight A grain balsa for the motor tube. For extra strength, dope silk on one side of the blank. Give several more coats of dope and allow to dry for a few days. The drying and shrinking process will cup the blank, which is okay.

Soak the blank in warm water for 15 min. Remove and blot. Next, hold the blank on a 1 1/4" dia. dowel or pipe with one hand and bind it in place with the other, using an elastic bandage. When dry, remove from the form and glue the seam. Cover with silk and apply several coats of dope. Reinforce the nose end, as well as the rear end where the motor peg will be, with an additional lamination of balsa, followed by one of 1/32" plywood. This will not be difficult if the plywood is soaked first. White glue is best for the laminations. Be careful not to distort the round cross section in the process.

When installing the reinforcements at the rear end, let them protrude 1/4" to form a sleeve for the tail boom attachment. When dry, drill the rear end to accept a 1/4" aluminum tube motor peg, and saw a small slot at the nose end to accept the nose-block positioning screw.

The tail boom is rolled from light 1/16" balsa. Apply several coats of dope to one side of the blank. When dry, soak in warm water, as above, and wrap on a tapered form. The diameter or taper of the form need not be exact. An old pool cue or a tapered round table-leg such as is used for do-it-yourself furniture works fine. When dry, remove the balsa from the form, glue the seam, cover with Jap tissue and apply several coats of dope. Keep the weight of this unit as light as possible.

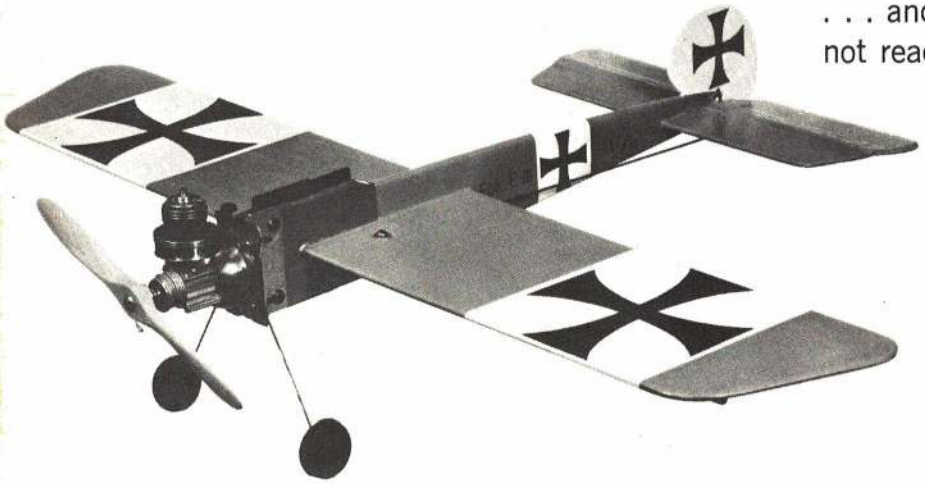
Make the fin next. It is worth the extra trouble to insert the triangular piece with the grain perpendicular to the remainder. This way very light wood can be used without

if you want some fun

. . . then go out and get yourself one or more of these nifty little Control Line models. And are they simple! Kits contain from 6 to 9 die-cut Balsa parts as well as the metal engine mounts, complete Control System (less lines and handle), Landing Gear, Wheels, authentic Decals, etc., all ready to use, which makes assembly a cinch IN ONLY MINUTES!

KIT S-35 BEGINNERS THUNDERJET 2.95

Almost any .049 Engine can be used and the flight performance is just great. . . . and if you bash the ground "when you're not ready to land," they're so light and strong that they're practically damage-free. By the way, Engines from most ready-to-fly plastic models can be used, so if you have one, don't waste it. It might require a little modification to install, tho.



KIT S-37 BEGINNERS EINDECKER 2.95

Plans are easy to read and complete. They even have a run-down on beginners' first time flights. There are six models at $2.95 and one Bipe (double winger) at $3.50, all about 21" wing span; and all the tools you need are generally found around the house.

. . . so get over to your dealer's and take a look . . . at $2.95, you'll find they're the MOST . . . for your fun . . . for your money.

KIT S-36 BEGINNERS SUPER CUB 2.95

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creating warps. Sand the fin to a thin airfoil, cover and dope. Cut the tab and install the hinges of wire and tubing or whatever material is preferred. Glue nylon monofilament or soft wire to the underside of the fin to prevent its being chewed up on landings. Glue on all the fittings except the torsion bar.

Going back to the tail boom, cut the step for the stabilizer platform. Install three hard 1/16" sq. balsa rails on the inside. These are important, because the weakest areas on booms of this type are just aft of the fin and just in front of the stab. Since I started using reinforcements a few years ago, I have had almost no repairs on tail booms.

Add the soft balsa tail-post, the round bulkhead, the plywood saddle, and the rock-hard 1/16" balsa stab platform. Trim and sand where necessary. Place the stab in position on the platform and mark the location of the pivot. Glue the hardwood pivot in place on the stab platform.

Slot the boom to receive the fin and cement securely. Add the torsion bar or substitute a rubber band arrangement on the fin. Add the line guides, snuffer tube and tail hold-down wire. The lines could be routed through the fuselage rather than on the outside if desired. Make and install the nose skid. Some reinforcement such as fiberglass ribbon is recommended for the bottom edge of the skid. If the pylon is built at this point, do not attach it to the fuselage until the center of gravity has been located. I found that a Tatone 1/2A Flood-off timer installed inverted in the pylon worked perfectly without any modifications.

At the mention of front end or propeller assembly, most potential Wakefielders freak out and say "No way!" This is understandable in view of the intricately engineered front ends on many contest-winning designs. However, I have had excellent results with ultra-simple, but strong and well-assembled, units. The nose block is basically hard balsa backed up with ply and a hardwood plug with positioning screw. The hole is drilled well oversize so that the shaft will touch only the brass bearing plates. Since this model uses almost no thrustline offsets, the radial load on the bearings is practically zero, and no fancy bearings are needed.

The propeller itself also is more simple than most. Simply carve the form, which is one quarter the amount of work needed to make a regular hand-carved prop. Then laminate the blades one at a time. Moderately light C grain balsa should be used. Three laminations of 1/32" make finished blades about 1/8" thick, since most of the wood sold as being 1/32" is in fact closer to 1/20".

Cut the blanks to shape, moisten them, coat the center lamination on both sides with a water-soluble glue, assemble and bind in place on a form waxed to prevent sticking. When dry, remove and add the reinforcements near the hub. The latter is made from hard balsa or spruce and drilled exactly for the shaft. Assemble the blades and hub on the jig. Glue the blades securely to the hub with white glue. When dry, remove, carve the reinforcing pieces to fair into the blades and hub, razor-plane and sand the blades to finished airfoil, being sure that the prop is well-balanced. Install a lubed 40-gram rubber

motor and the propeller assembly with the blades folded flush against the sides of the fuselage. Determine and mark the balance point on the fuselage. Glue the pylon to the fuselage so that the leading edge is 3" ahead of the balance point. This puts the CG at 62% of the wing chord. Roughen up the portion of the fuselage where the pylon is to be attached in order to make a strong joint.

Check the pylon for alignment with the stab and rudder while the glue is setting. No stab tilt is used in this design, although some Wakefields do use it. My observations indicate that on models with very small tails, such as most modern rubber jobs and gliders, stab tilt has little or no effect on the glide pattern. Nor have I found that wing warps are necessary or desirable, except on gas free flight.

The method for rigging the control lines from the timer to the auto-rudder and stab is detailed on the plan. However, there is plenty of room for variation. The setup shown uses a single line starting at the timer, branching into a Y with separate lines and rubber bands going to the stab and rudder. The rudder is set for a right-hand glide. (Use about 1/8" offset for initial testing.) When the auto-line is hooked up to the timer, it pulls the rudder tab over against the stop to straighten out the flight pattern. For final adjustments, the fin was dead straight ahead with the auto-line hooked up, but adjustments will vary on individual models.

The stabilizer setup is somewhat more involved but not really difficult, and there will be several more items to keep in mind and check before each flight. The rubber bands used to hold the front of the stab to the saddle, and the rear hold-down, which also wraps around the dethermalizer fuse, must be carefully selected so that when the auto-line is hooked up to the timer, the pull of the auto-line will overcome the tension of the stab front hold-down band and pull the trailing edge of the stab down to reduce the decalage. But at the same time, the stab front hold-down band must be tight enough to snap the leading edge back down after the timer releases. And the rear hold-down band must not be so tight that it prevents the front band from doing so. This is not difficult, but it does pay to check out timer and the auto-stab operation before each flight. At the same time, make sure that the stab is properly seated.

To test-fly, begin by hand-gliding in an open area. Use only rudder adjustment to get a medium right-hand glide, and shim the

stabilizer as needed under the leading edge or at the pivot. As can be seen from a close examination of the stab setup, any time the leading edge is shimmed up or down, the trailing edge is adjusted at the same time by an equal but opposite amount. Therefore, any adjustment made has twice the effect that it would on a conventional arrangement.

When everything looks about right, start power testing with about 75 winds on the motor. Do not hook up the auto-lines to the timer. The model should start climbing in a definite right pattern. Keep an eye on the glide as testing progresses and adjust as needed. Adjust the climb pattern with sidethrust. Downthrust should not be needed. Gradually increase the number of winds until 75% capacity is reached. To determine maximum capacity, make several motors from one batch of rubber. Lube and break them in, then take one and wind it outside of the model until it breaks. For safety, consider 95% of the winds it took to blow the motor as the maximum.

If all goes well, hook up the auto-line to the timer. For the first high-power test, the trailing edge of the stab should be lowered 1/16", and the trailing edge of the rudder set at 3/32" to the left of their respective positions during previous testing. Shim as needed. Wind to 85% capacity, set the timer for 4 sec., and launch. It is well to have some close friends at hand as witnesses. Ideally, the model should climb away with just a hint of right turn. On full winds, the timer should be set for about 7 sec.

If the jazzed-up rudder and stab, and the nervous strain of first tests with all the gadgetry in gear are too much, this model will also perform beautifully as a conventional Wakefield, using downthrust and possibly a little more sidethrust to handle the power burst. But if you have already built and flown one or more regular types, why not go all-out and sock it to them with the Sakitumi?

Akrobat

(continued from page 48)

and require extra care in preparation if they are to perform efficiently. Briefly, the problem is the very great difference in speed between launching and gliding. Thus, tiny adjustments which may have little effect when the model is hand-glided, may have quite drastic effects when the model is catapult-launched.

Be certain that none of the surfaces is warped. If warps are found, they may be removed by holding the offending part over a steaming teakettle, bending it a bit beyond the desired location and then allowing to cool. Keep in mind that changes in temperature at the flying field may cause the warps to reappear, so check on them if the model behaves strangly after having been adjusted.

The model should balance near the point indicated on the plan. A single finishing nail was sunk into a drilled hole in the nose of our model. Final minor changes in ballast are made with modeling clay. For the first flights, it is a good idea to put a small glob of clay on the lower nose, where it can serve as a shock absorber. A few hand glides should establish the need for addition or subtraction of weight. Also, if necessary, the elevators may be adjusted by slight bending. If the model should persist in falling off on one wing, a small lump of clay added to the opposite wing

elevator setting. More up elevator means more nose weight (assuming the model is already correctly balanced). As the elevators are lowered, a slight amount of nose weight usually can be removed. In order to achieve consistent results, test flying should be performed on a calm day. Once the launching and adjustment techniques are learned, the model can be flown in wind also. If possible, do test flying over grass or weeds, which will help compensate for any pilot error.

You may want to experiment for best results, but our system is as follows. The catapult is a hardwood dowel 10" in length, 3/8" diameter. Smaller diameter sticks are not recommended, because they may break at exactly the wrong time–which really smarts! To the dowel tie both ends of a piece of 1/8" flat rubber about 16" long.

Our model is adjusted to glide in a gentle left circle, by means of wing tip weight or very slight left rudder bending, or both. The tip should cure the problem.

Adjustments made with clay ballast are safest, since their effect is virtually constant regardless of speed, as compared to surface bending, which causes distinctly different effects with speed changes. Ideally, the model should be flown with the elevator at 0 degrees in relation to the wing. However, this setting allows almost no margin for error in launching. That is to say that the model will be unlikely to pull out of a steep dive at low altitude. On the other hand, if too much up elevator is warped into the tail, the model will simply loop and will not gain enough altitude for good duration flights. Therefore, we suggest starting with a small amount of up elevator. Bend the trailing edges up perhaps 1/16" or so; then, as test flying and launching practice proceeds, the trailing edges may be lowered slightly.

A direct relationship exists between the amount of nose ballast required and the

model is launched in a fairly steep banked attitude to the right, and upward at perhaps a 30-degree angle. The model is gripped directly above the tail wheel with the right hand, while the launching stick is held with the left. Pull back and release. Not pulling back far enough can be hard on the model until it has been adjusted, since it may stall at low altitude, without time to recover. Conversely, if the model is badly out of adjustment, too hard a luanch may cause it to loop over and into the ground at balsa-crunching speeds. Try for a happy medium at first and increase the amount of stretch as you go along. A banked model may loop horizontally, which is less apt to do damage than the same model launched with the wings level. When flying on windy days, we have had best results when launching across the wind, rather than directly into it.

We think you will enjoy catapult gliders, and if you would like to participate in postal contests with other Tenderfoot modelers in other parts of the country, full details plus a delightful newsletter are available free from: Richard Whitten, P.O. Box 176, Wall Street Station, New York, N.Y. 10005.

Movieland of the Air

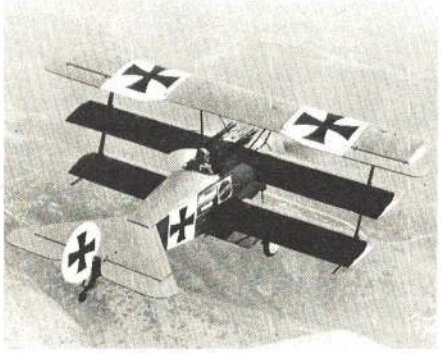
(continued from page 17)

United" with the plane slowly disappearing in the sunset, are preferred!

The Museum is planning to expand with the acquisition and/or building of vintage aircraft. WW I Camels, Fokkers, Nieuports and other planes seem to have the widest public appeal.

With dyed-in-the-wool enthusiasts like Tallman and Appleby, the organization is bound to prosper...to the delight of us all.

The caption reads that Snoopy's Sopwith Camel was decorated to resemble the model kit. Perhaps Snoopy looks so perplexed because he is seated in a Nieuport 28. Many other WW I ships are to be found at Movieland--an SE-5 as an example.



The "Red Baron" pilots Fokker enroute to New York during Snoopy/Red Baron Transcontinental Air Race sponsored by Mattel/Monogram; 21 cities visited. Valued at $30,000, this Tripe has 160-hp Warner engine.

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Delta Mark IV

(continued from page 18)

Fluorescent Red-Orange. The whole rocket was sprayed with Krylon Clear Spray.

Decals on the original model were from Estes Model Markings (651-D-12), and Gold Mine Special (651-D-5) decal sheets.

The recovery system is of the conventional parachute type. Either an Estes 18" (PK-18) or 24" (PK-24) parachute is suitable, depending on wind conditions. Use the 24" 'chute only if there is little or no wind. Assemble the parachute according to instructions provided with it, making sure that it is tied securely to the screw eye. It is imperative that the parachute be attached securely and that the screw eye is firmly imbedded in the nose cone.

The reason for the above instructions was demonstrated in the first flight of the Delta Mark IV. The rocket climbed with perfect stability, powered by a D-13-7. But, because of the considerable weight of the rocket and the long delay charge, it was descending rapidly before ejection occurred. At this point, the snap swivel which attached the parachute, apparently broke from the additional strain, causing the rocket to fall to the desert and land on its side. Upon recovery of the rocket, it was discovered that the only damage was a loose fin/body shell joint, which certainly says something for the strength of the structure. Meanwhile, the parachute was caught in a thermal and was out of sight in no time.

To remedy this situation, use either a heavier snap swivel, or tie the shroud lines from the 'chute securely to the screw eye without using a snap swivel.

Launching the Delta Mark IV is the same as for any other rocket. Select either a D-13-5 or D-13-7 engine. The D-13-5 will give greater altitude because of its shorter delay. Follow the instructions which come with the Series IV engines and there should be no problem.

Ace High

(continued from page 32)

than one or two gentle stalls as the model transitions into a nice lazy glide.

"Make any necessary corrections to the transition and glide. If the model abruptly drops its nose when the engine quits and goes from a short dive into a steep fast glide, shim up the stab trailing edge or remove some nose weight. If the model keeps stalling after the engine quits, shim up the stab leading edge or add nose weight. "Only after the transition-glide is adjusted properly should corrections be made to the powered flight. If the climb is too slow, it can be increased a little by adding engine upthrust. This is done by putting washers under the bottom engine mounting lugs. If the model climbs in steps, alternately climbing and leveling out, add engine downthrust. Finally, the model may tend to turn slightly to the left under power. This can be corrected by adding engine right thrust."

Construction

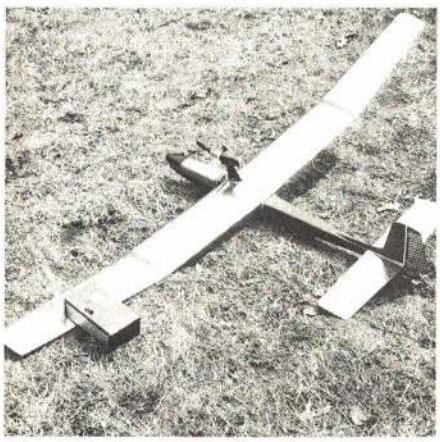
The idea of building from plans often appears too formidable for most members of the die-cut set, but a few suggestions will simplify and speed up the process. (1) Buy a set of full-size plans–don't scale up from the magazine. The time saved and accuracy gained is well worth the price. (2) If you don't want to cut up plans, buy two sets. Use one and save one. (3) Rubber cement patterns directly to the balsa sheets (the cement rubs off afterwards).

(4) Use a steel straight edge for all straight cuts. (5) Use a sharp cutting tool. (6) Follow

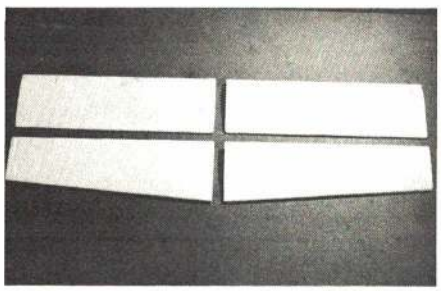
the wood grain direction indicated. (7) Check-fit pieces before gluing. (8) Laying out the pieces carefully conserves balsa by reducing waste. (9) Use the parts as patterns to trace for a second model.

Use contact cement to glue fuselage doublers and braces in place for both a left and a right side. Formers F-2 and F-3 go in next–keep them square. Then add the other side, holding in place with weights. Clamp the tailpost in place, making sure the fuselage is evenly tapered and true. (Here is where unwanted turns get built in.) Use rubber bands or masking tape to hold F-1 in place and then add the bottom braces at the back part of the fuselage. Top and bottom sheeting come next. The nose is carved from hard balsa–either a block or laminated from sheets. The skid is glued to F-1 and F-2 before sheeting the nose bottom.

It is recommended that fiberglass reinforcements be used at the nose and tail and the whole body covered with silk or Silkspan for added strength. Use epoxy at all high stress points and especially to fit the pylon to the foam wing. Wing notes are on the plans and further information comes with the foam wings from ACE R/C.



Big rudder really wheels this glider around with the Adams actuator flapping away.



ACE High uses ACE Minifoam wing sections.

While a variety of wing finishing methods have been tried, the use of polyurethane varnish is the simplest and lightest. Sears Hi-Gloss spray works very well. For a more finished look Top-Cote covering is recommended. The silver metallic variety was used on the model pictured and provides excellent visibility when it flashes in the sun. However, it tends to wrinkle under stress. Clear, transparent Top-Cote can be used as is or doped any desired color.

Install all RC gear forward of the wing and balance should not be a problem. Other details are covered in the plan notes and should be self-explanatory.

Hot Rod

(continued from page 29)

were rapidly re-equipping with their first jet aircraft. Meanwhile, a much more sophisticated version was heading for production–the A-4D-2. This one could operate as both an in-flight refueler or receiver of fuel; it had a much fancier electronic navigation system; and it carried Bullpup air-to-ground missiles. It was also the first version to have the "tadpole" rudder, with its stiffening ribs on the outside.

As the Skyhawk continued in large-scale production, still more sophisticated versions were in the works. The one built in the greatest numbers, the A-4D-2N, offered, in addition to all the equipment of earlier A-4's, a low-altitude bombing system and terrain-clearance radar. The Skyhawk was proving its ability not only to do its job, but also to take all sorts of modifications without paying too great a price in performance.

By the late 1950's, the need had become apparent for an airplane which could carry a bigger load on more conventional ground-support missions. To meet this need, Douglas came up with the A-4D-5, which could carry a ton of bombs to a target 700 miles away. This ability to go long distances was soundly demonstrated by a pair of Marine Skyhawks which covered the 2082 miles between El Toro, Calif. and Cherry Point, N.C., non-stop, without even in-flight refueling, in less than four and one-half hours.

The A-4D-5 (later changed to A-4E) became operational in 1962, and 500 of them rolled off the assembly lines. In 1965, it was

joined by a very different looking Skyhawk, which was over two feet longer and had a long bubble canopy, permitting a student to accompany the pilot. A combat trainer, the TA-4E was the first of a new series. The technique obviously worked, for every subsequent version of the Skyhawk has had its two-seat trainer version. Starting with the A-4F, there was an awkward but meaningful bulge on the top of the fuselage, immediately behind the canopy, into which was crammed all manner of avionics equipment.

More than 10 years have passed since the first Skyhawks entered service with the Navy and Marines, and the airplane has remained highly successful. While other designs were heading in the direction of even greater complexity—a route which led to the overly complicated F-111—the A4 remained basically simple—and effective.

As was to be expected, other air forces were interested in such an airplane. The first to be exported were the A-4G and TA-4G to Australia. They were followed by a large batch of A-4H's and TA-4H's for the Israeli Air Force, which found them highly useful for carrying a heavy load over a short distance, deliver it with precision and then get away at high speed. The Skyhawk's simplicity and ease of maintenance were found to be especially valuable in the Middle East conditions. Other versions of the airplane were destined for New Zealand and Argentina.

If a machine is to carry an ever greater load, its development must include steadily increasing power, or performance will surely suffer. The Skyhawk started out with the 7700-lb. thrust Curtiss Wright J65 engine, a license-built Armstrong Siddeley Saphire which was used in the A, B and C models, of which some 1350 were built. Starting with the E model, a switch was made to the Pratt & Whitney J52, originally rated at 8500-lb. thrust and gradually increased to more than 11,000 lb. Well over 1000 have been built with these later engines.

The Skyhawk was designed for a variety of attack bombing and ground support missions. To handle such assignments, it had to be capable of carrying all sorts of weapons. A single 20-mm cannon is mounted as standard

equipment in either wing root, while there are three attach points for weapons under the wings of early models, and five for later models. These can carry nuclear or conventional bombs, air-to-air and air-to-surface missiles, additional guns or electronic counter-measures equipment. The central attach point can support up to 3000 lb., while the wing points can carry 1000 lb. each.

With more than 2500 Skyhawks having been produced in the exceptional long 15-year production run, the airplane long ago established itself as one of the most important combat types of the post-war era. Marked by notable simplicity and versatility, it continues to fill a major need in the U.S. Navy and Marine Corps, as well as in the forces of many friendly powers.

A-4—first flight of prototype at Edwards AFB, June 22, 1954.

A-4A—entered service in 1957; 166 built with Wright J65 engine.

A-4B—entered service in 1957; 542 built with J65; 25 re-manufactued for Argentine AF and Navy in late 1960's; first flight, March 26, 1956.

A-4C—entered service in 1960; 638 built with J65; first flight, Aug. 21, 1958.

XA-4D-1—original designation for A-4 prototype.

A-4D-1—original designation for A-4A.

A-4D-2—original designation for A-4B.

A-4D-2N—original designation for A-4C.

A-4D-3—4 ordered with P&W J52; cancelled.

A-4D-5—original designation for A-4E.

A-4E—entered service in 1963; 499 built with J52-P6; first flew July 12, 1961.

TA-4E—first two-seat trainer; first flight June, 1965; first delivered Feb. 1966.

A-4F—first flew Aug. 31, 1966; first delivery June 20, 1967; 146 built with J52-P8A, 9300 lb. thrust.

TA-4F—two-seat A-4F; first flight June 30, 1965; first delivery May 19, 1966; about 350 built with J52-P6 or 8A.

A-4G—10 for Australia, delivered in 1967; as A-4F, less provision for air-to-ground missiles and nuclear weapons.

TA-4G—two-seat trainer version of A-4G, for Australia.

A-4H—for Israeli AF.

TA-4H—two-seat trainer version of A-4H, for Israeli AF.

TA-4J—first delivery June 6, 1969; as TA-4F less weapons launchers. A-4K—10 for New Zealand; first delivery Jan. 1970. A-4K—10 for New Zealand; first delivery Jan 1970.

TA-4K—two-seat trainer version of A-4K, for New Zealand.

A-4L—re-manufactured A-4C's for USN Reserve training; first delivery Jan. 1970.

A-4M—first delivery Nov. 3, 1970; P&W J52-P400, 11,200 lb. thrust.

AMA Contest Calendar

(continued from page 66)

AUG. 28-29—CHATTANOOGA, TENN. (B) Tennessee Valley RC Fun Fly Meet. Site: To be announced. J. Wyatt CD, 502 Young Ave., Chattanooga, Tenn. 37405. Sponsor: Tennessee Valley RC Club.

AUG. 29—APPLETON, WISC. Valley Aero Fun Fly Meet. Site: Club Field. J. Schmieding CD, 2118 N. Division St., Appleton, Wisc. 94911. Sponsor: Valley Aero.

AUG. 29—RIVERSIDE, ILL. Chicago Scalemasters 3rd Annual All Scale FF, CL & RC Rally. Site: Miller Meadow. D. Platt CD, 104 Talcott Ct., Bolingbrook, Ill. 60439. Sponsor: Chicago Scalemasters.

AUG. 29—COLLEGE PARK, MD. (AA) Maxecuters 3rd Annual Indoor Meet. Site: Cole Field House. E. Violett CD, 3737 Marlbrough Way, College Park, Md. 20740. Sponsor: D.C. Maxecuters.

AUG. 29—GARDEN CITY, N.Y. (AA) LIDS Annual RC Meet. Site: Mitchel Field. Dr. W. Furori CD, 28 Fernwood Dr., Commack, N.Y. 11725.

AUG. 29—VALLEY PARK, MO (AA) 15th Annual AA CL Model Contest. Site: Buder Park. G. Frost CD, 22 Glynn Dr., Florissant, Mo. 63031. Sponsor: Hot Heads Model Airplane Club.

AUG. 29—RIALTO, CALIF. (AA) T-Bird Annual CL Meet. Site: Rialto Park. R. Seale CD, 214 So. Riverside Ave., Rialto, Calif. 92376.

AUG. 29—CHARDON, OHIO (AA) C.R.C. 9th Annual RC Pattern Contest. Site: Club Field. F. Vidmar CD, 26500 Zeman Ave., Euclid, Ohio 44132.

AUG. 29—HUNTSVILLE, ALA. (AA) Heart of Dixie CL Meet. Site: Old Huntsville Airport. L. Baker CD, 701 Esslinger Rd., S.E., Huntsville, Ala. Sponsor: Model Airplane Club of Huntsville.

AUG. 29—DAVENPORT, IOWA (AA) Fall Annual CL Model Airplane Meet. Site: Davenport Airport. J. Kroeger CD, 1218 So. Zenith, Davenport, Iowa 52802.

SEPT. 4-5-6—MEMPHIS, TENN. (AA) Memphis RC Annual-1971 Meet. Site: MRCC Field. K. McClure CD, 3465 Powers, Memphis, Tenn. 38128. Sponsor: Memphis RC Model Club.

SEPT. 4-5-6—ANNVILLE, PENNA. Keystone RC Society Invitational Fun Fly. Site: Indiantown Gap. W. Maidl CD, 5 Berkley St., Middletown, Penna. 17057. Sponsor: Keystone Radio Control Society.

SEPT. 4-5-6—CLEVELAND, OHIO FAI CL Team Finals. Site: Cleveland Model Flying Field. J. Smith CD, 960 Brenner Ave., N.W., Massillon, Ohio 44646.

SEPT. 4-5-6—BRIGHTON, WISC. 1973 North-Central FAI FF Semi-Finals Meet. Site: Bong Field. P. Sotich CD, 3851 W. 62nd Pl., Chicago, Ill. 60629. Sponsor: Chicago Aeronuts & Illinois Model Aero Club.

SEPT. 5—PETTYVILLE, W. VA. (A) Vienna Skysharks Annual RC Fun Fly. Site: Vienna Sky Sharks RC Field. S. Sturm CD, 2709 14th Ave., Vienna, W. Va. 26101. Sponsor: Vienna Skysharks Model Airplane Club.

SEPT. 5—CHICAGO, ILL. (AA) I.I.A.A. Annual CL Contest. Site: Forest Preserve. G. Johnson CD, 6260 N. River Rd., Rosemont, Ill. 60018.

SEPT. 5—BUFFALO, N.Y. (A) United Pylon Racing RC Circuit. Site: Buffalo. H. DeBolt CD, 49 Colden Ct., Cheektowaga, N.Y. 14225. Sponsor: Erie County Model Aircraft Assn.

SEPT. 5—NEW CASTLE, PENNA. (A) Skylarks Funtastic RC Meet. Site: P.O.R.K.S. Flying Field. G. Ehnot CD, 415 S. Crescent Dr., Sharon, Penna. 16146. Sponsor: Skylarks of Sharon, Penna.

SEPT. 5—ORANGE, MASS. (A) 17th Annual New England RC Championships Part I. Site: Orange Municipal Airport. C. Piper CD, Highland Rd., Atkinson, N.H. 03811. Sponsor: New England RC Modelers, Inc.

SEPT. 6—MIDDLESEX, N.J. (AA) Middlesex CL Modelers Annual CL Meet. Site: Mountain View Park. S. Shaw CD, 2200 Woodbridge Ave., Edison, N.J. 08817. Sponsor: Middlesex Modelers.

SEPT. 11-12—FORT WAYNE, IND. (AA) Flying Circuits 16th Annual Mid-State RC

Contest. Site: Smith Airport. P. Gieseking CD, 1212 Delta Blvd., Fort Wayne, Ind. 46805. Sponsor: Fort Wayne Flying Circuits.

SEPT. 11-12—FISKDALE, MASS. 6th Annual New England Hydro Radio Plane Championships. Site: Brimfield Dam. J. Ross CD, 19 Sterling Dr., Dover, Mass. 02030. Sponsor: New England Radio Control Modelers, Inc.

SEPT. 11-12—ATLANTA, GA. (AA) Atlanta RC Pylon Races. Site: Club Flying Site. H. Coleson CD, 3360 St. John Dr., East Point, Ga. 30344. Sponsor: Atlanta Radio Control Club.

SEPT. 11-12—RHINEBECK, N.Y. (AA) World War I RC Jamboree. Site: Old Rhinebeck Aerodrome. G. Buso CD, 11 Maple Ln., Hyde Park, N.Y. 12538. Sponsor: Mid-Hudson RC Society.

SEPT. 11-12—DAYTON, OH (AAA) Dayton Buzzin' Buzzards CL Jamboree. Site: Municipal Flying Circles. J. Martin CD, 551 Aberdeen, Dayton, Ohio 45419. Sponsor: Dayton Buzzin' Buzzards.

SEPT. 12—FORT WORTH, TEXAS (A) RC Pattern A, B, C, CX Meet. Site: Fort Worth. B. Lutker CD, 6029 Walraven, Fort Worth, Tex. 76133.

SEPT. 12—NORFOLK, VA. (AA) Norfolk Aeromodelers Annual CL Meet. Site: Industrial Park. Capt. J. Klause CD, USN, COMFAIRESWINGLANT, SP-65, NAS Norfolk, Va. 23511. Sponsor: Norfolk Aeromodelers.

SEPT. 12—CHAGRIN FALLS, OHIO Second Annual Midwest Scale FF Meet. Site: Savage Road. L. Reichel CD, 3301 Cindy Ln., Erie, Pa. 16506. Sponsor: Erie Model Aircraft Assn.

SEPT. 12—FELTON, DELA. (A) East Coast Soaring RC Championships. Site: Killen Recreation Area. B. Gottorf CD, P.O. Box 336, Dover, Dela. 19901. Sponsor: Dover Mosquitoes RC Club.

SEPT. 12—DENVER, COLO. Old Timer Fun Fly. Site: E. Colfax Airpark. T. Dannels CD, 1265 Yates St., Denver, Colo. 80204. Sponsor: Model Museum Flying Club.

SEPT. 12—RAPID CITY, S.D. Propbusters 3rd Annual Fun-Fly. Site: Propbusters Flying Site. J. Selila CD, 243 E. Nevada Dr., Rapid City, S.D. 57701. Sponsor: Rapid City Propbusters RC Club.

SEPT. 12—ALLIANCE, OHIO (AA) Carnation City 1st Annual RC Pattern Meet. Site: Barber's Airport. G. Villard CD, 3301 23rd, N.W., Canton, Ohio 44708. Sponsor: Alliance Balsa Bees.

SEPT. 12—BRIGHTON, WISC. (AA) 28th Annual Midwestern States FF Championships. Site: Bong Field. P. Sotich CD, 3851 W. 62nd Pl., Chicago, Ill. 60629. Sponsor: Chicago Aeronuts.

SEPT. 12—RIVERDALE, ILL. (AA) Chicago Model Masters Annual CL Meet. Site: Kickapoo 144th & Halsted. W. Webb CD, 15722 Vine Ave., Harvey, Ill. 60426. Sponsor: Chicago Model Masters.

SEPT. 15-19—DOYLESTOWN, PENNA. (AAAA) Seventh World RC Aerobatic RC Championships. Site: Central Bucks County Airport. M. Hill CD, c/o AMA HQ, 806 Fifteenth St., N.W., Washington, D.C. 20005.

SEPT. 19—HASTINGS, MINN. (A) 11th Annual FAI Little FF Internats (Cat.II). Site: Webers Air Strip. L. Stockstad CD, 2648 Carison Dr., Coon Rapids, Minn. 55433. Sponsor: Minneapolis Model Aero Club.

SEPT. 19—MUSCATINE, IOWA (AA) M.M.A.C. 2nd Annual CL Meet. Site: Muscatine Airport. F. Brewer CD, 706 Walnut, Muscatine, Iowa 52761. Sponsor: Muscatine Model Airplane Club.

SEPT. 19—ALBANY, ORE. (A) Northwest Old Timer FF Championships. Site: Parker Field. J. Shafer CD, P.O. Box 322, Dallas, Ore. 97338. Sponsor: Willamette Modelers Club, Inc.

SEPT. 19—VAN NUYS, CALIF. (B) San Valeers Small Field FF Meet (Cat. II). Site: Sepulveda Basin. L. Polansky CD, 865 W. Huntington-1, Arcadia, Calif. 91006. Sponsor: San Valeers.

SEPT. 25-26—NEAR KERMAN, CALIF. (AA) Fresno's 31st Annual FF Gas Meet. Site: Near Kerman. F. Gallo CD, 1725 Kenmore Dr., W., Fresno, Calif. 93703. Sponsor: Fresno Gas Model Club.

SEPT. 25-26—DENVER, COLO. (AA) 6th Annual Rocky Mountain FF Championships. Site: E. Colfax Air Park. B. Schliem CD, 8984 W. Warren Dr., Lakewood, Colo. 80227. Sponsor: Magnificent Mountain Men.

SEPT. 25-26—W. SUFFIELD, MASS. (AA) NorEast RC Air Races '71. Site: Peterson Farms. B. Williams CD, 347 Southwick Rd., Westfield, Mass. 01085. Sponsor: Northern Connecticut Radio Control Club, Inc.

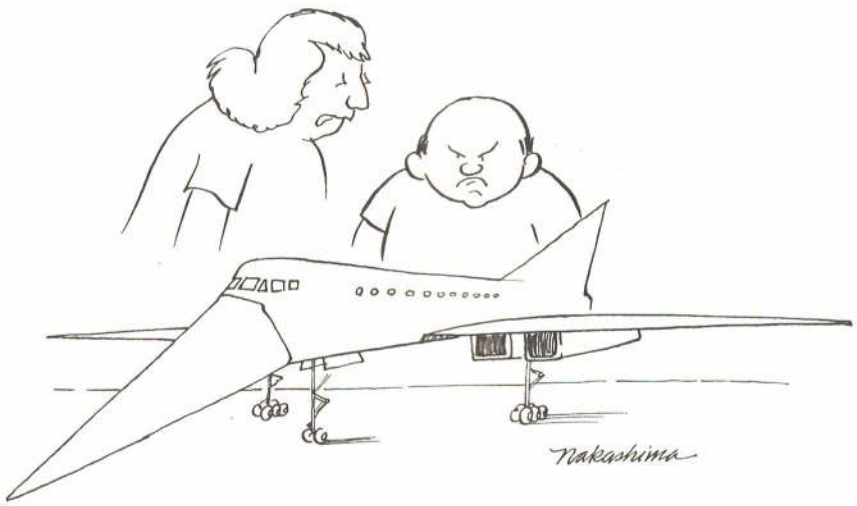
SEPT. 26—FLUSHING, N.Y. (AA) Assn. of M.A.C. of Greater N.Y. CL Meet. Site: Flushing Meadow Park. J. Condon, Sr., CD, 8909 247th St., Bellrose, N.Y. 11426.

SEPT. 26—QUEENS, N.Y. (A) Eastern States Second Annual RC Championships. Site: Riis Park. J. D'Amico CD, 9224 Rost Pl., Brooklyn, N.Y. 11236. Sponsor: Penn. Ave. RC Society, Inc.

SEPT. 26—ST. CLARSVILLE, OHIO RC Fun-Fly. Site: Alderman Airport. A. Grimes CD, 115 Glenwood Rd., Wheeling, W. Va. 26003. Sponsor: Hill-Hoppers Model Club.

SEPT. 26—BRIGHTON, WISC. (AA) 9th Chicago Aeronuts Fall Old Timers' FF Contest. Site: Bong Field. P. Sotich CD, 3851 W. 62nd Pl., Chicago, Ill. 60629. Sponsor: Chicago Aeronuts.

SEPT. 26—OHIO CITY, OHIO (B) SHOO Flyers RC Club Contest. Site: Club Field. D. Kraner CD, RR 1, Ohio City, Ohio 45874. Sponsor: SHOO FLYERS MAC, INC.



"It'll never fly."

11

Eleven facts that prove COVERITE IS BETTER than Silk.

	Coverite	Silk
1. Can be ironed on	**Yes**	**No**
2. Can be finished to any color	**Yes**	**Yes**
3. Time to cover 60″ wing	**29 minutes**	**65.3 minutes**
4. Price per yard unfinished	**$2.95**	**$1.50 to $2.25**
5. Weight per yard unfinished	**1.2 ounces**	**½ to 1 ounce**
6. Unfinished appearance	**Semi-gloss, non-porous**	**Dull, porous**
7. Finishing coats needed	**3 to 4**	**10 to 15**
8. Price per yard to finish	**$0.85 to $1.25**	**$2.50 to $3.75**
9. Effect on structural strength of model	**Great**	**Slight**
10. Receives decals—all types	**Yes**	**Yes**
11. Type of covering	**Woven Dacron fabric**	**Woven Silk fabric**

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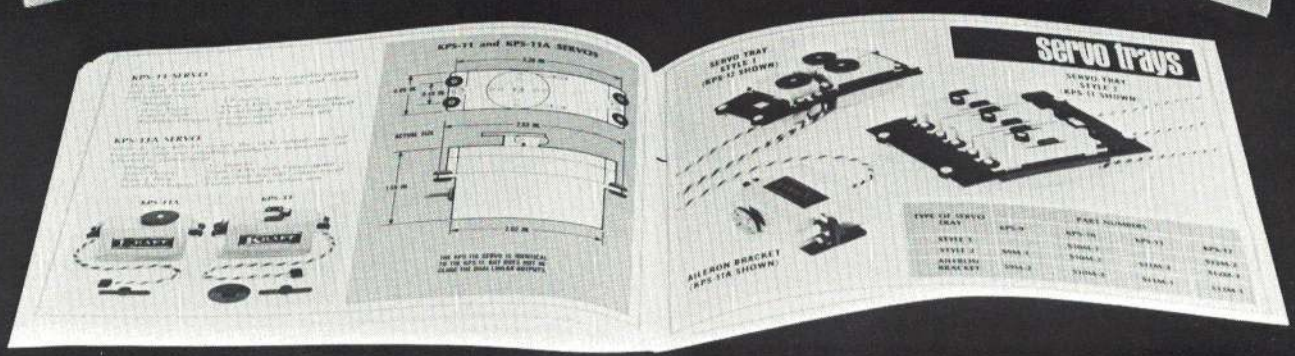

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