We are pleased to introduce the new DP-2 OS radio equipment. This is an economy line equipment when compared to the more custom type DP-3 and DP-4. The selling price of a complete DP-2 system with charger and nickel cadmium batteries for the receiver is only $139.98. The DP-3 is $199.98. World Engines has a nice stock of parts from OS to service these systems. We have also sent diagrams of the OS Proportional System to all World Engines Service Expert Program people. A list of these Service Experts appear in March, 1969 Model Airplane News. We are very pleased to announce that we have sold a substantial number of DP-3 rigs and very few of them have come back into the plant for service. OS Max 10 R/C—$11.98. This is one of the finest and most popular engines that OS makes. We are very pleased to state that we have a substantial inventory of Max 10 R/C, OS Pet 9 R/C—$6.98, and Max 15 R/C—$15.98. These are just the engines for the small radio rigs available today.
America’s Finest Airplane Model Series—New Kits—New Excitement!

1/48 Scale (Quarter Inch)

America's Finest Airplane Model Series—New Kits—New Excitement!

P-39 Airacobra
World War II Cannon-Firing Fighter - Assemble in Any of 4 Versions
ONLY $1.50

What the modeler wants the modeler gets from Monogram. Now it's the WWII Airacobra, the most asked-for model by aircraft builders and collectors everywhere. It's the 23rd model in the most popular aircraft series of all time. An unusual airplane, far advanced for its time, with mid-ship mounted Allison engine, long drive shaft and a 37mm cannon firing through the nose spinner. Used by U. S., British and Russian forces, it was a devastating “tank buster” and ground attack machine. The true-to-scale model features removable access panels to reveal engine, machine guns, cannon and ammo magazines. Fully detailed cockpit with control stick, instrument panel, gun sight, pilot seat and door open or closed. Extra parts included for assembly in any of four different versions. Get an Airacobra and other models in this series at your favorite store now.


Now 23 Superb Model Kits in This Popular Continuing Scale
$1.00 - $1.50 - $2.00

P-39 Airacobra
Typhoon MK 1B
P-47 Thunderbolt
OS2U-3 Kingfisher
P-51B Mustang
Mosquito Bomber
Huey Combat Helicopter
Huey Rescue Helicopter
FW190 Focke-Wulf
T-28D Viet Nam Fighter
P-40B Tiger Shark
Hawker Hurricane
Japanese Zero
Me109 Messerschmitt
British Spitfire
F4F Wildcat
F4U-4 Corsair
P-51B Mustang
P-51C Mustang
SB2C-5 Helldiver
SBD Dauntless
SB2C-3 Helldiver
SB2C-4 Helldiver

American Aircraft Modeler 3
7 ISSUES FOR ONLY $2.75!

- Save $1.45! And have your copy delivered to your doorstep, hot off the press.
- American Aircraft Modeler is the world's largest model airplane hobby magazine—jam-packed with plans and construction features.
- Is radio-control your thing? Free-flight your dish? Or control-line? Every issue includes a wide spectrum of types, features and articles.
- For the scale fan: the latest on plastic model techniques, four-color centerspreads of historically famous aircraft painted by Bjorn Karlstrom.
- Keep up with competition modeling, contests, rules, important developments, through Model Aviation, the official magazine section of the Academy of Model Aeronautics.

Articles:
- FOR THE TENDERFOOT – TAIL FIRST, Kenneth and William Hannan
- THE BIG ‘NATS’
- SCIMITAR, Joe Foster
- THE SILVER HILL STORY, Frank and Nancy Pierce
- RYAN M-1 MAILPLANE, Vic Harden
- TENDERFOOT CONTEST RESULTS, Nancy Pierce
- 1969 R/C WORLD CHAMPIONSHIPS, Howard McEntee
- MIG 21d, Roland H. Bailes

Features:
- SCALE TECHNIQUES FOR THE PLASTIC MODELER, Frank Pierce
- RUSSIAN MIG 21F – CENTERSPREAD
- CONTEST GAS MODEL, Frank Ehling
- GETTING STARTED IN R/C, Howard McEntee

Academy of Model Aeronautics:
- 38th NATIONAL CHAMPIONSHIPS
- NATS RESULTS, PHOTOS
- AMA NEWS EXTRA
- AMA ELECTIONS, CONTEST CALENDAR

Departments:
- EDITORIAL – STRAIGHT AND LEVEL, William J. Winter
- YOU SAID IT—LETTERS TO THE EDITOR
- NEW PRODUCTS CHECK LIST
- QUALITY HOBBY SHOPS

November 1969
Flying Models

For those who insist on the

Very best!

Super Form

Preformed Fuselage Shells
For Fast Sturdy Construction

TFLITE MODELS

Control Line Scale Models

Winner of the

1962 Nationals

Taurus... Span: 70" Eng.: .45 Kit RC-7
Taurus Wing Kit: Wing 7-W 13.95
Taurus... Now includes ailerons & fittings. Multi channel trainer. Span: 57" Eng.: .15-.45 Kit RC-4 23.95

Single Channel R/C Compacts

Build 'Em Small and Have a Ball

Top Dawg... Galloping ghost and proportional gear. Includes T.A.C.—Ready made fuselage. Span: 39.5" Eng.: .049-.15 Ready made fuselage. Span: 39.5" 49.95

Schoolmaster... Single or multi channel with rudder, elevator and engine control. Span: 39" Eng.: .049-.090 Kit RC-8 7.95

Schoolgirl... Span: 32" Eng.: .020-.049 Kit RC-9 6.95

Schoolboy... Span: 29" Eng.: .010-.024 Kit RC-6 4.95

Rascal... Span: 27" Eng.: .010-.020 Kit RC-2 3.95

Zero... Span: 18" Kit S-20 3.95

Hellcat... Span: 18" Kit S-21 3.95

Thunderbolt... Span: 18" Kit S-22 4.95

If not available at your dealer... order direct. Add 10% postage and handling. (35c minimum.) Outside U.S. 15% (60c minimum.)

Top Flite Models, Inc. 2635 S. Wabash Chicago 16, Ill.
A silly little airplane is a smash-hit with the kids. But how do we keep 'em turned on?

FRIEND, what are you doing at 8:35 on Sunday morning, August 3? I'm meeting a deadline — but that's because of putting off until tomorrow what should have been done today. And, if you will pardon the editorial "I," I don't know how I can do justice to a very important subject. It has to do with this "beginner problem" which we all have beaten to death for the past ten years. But something is new and different this time. We do see much being done, but it is only a starter. What is different now is that this starter may have given us the key to something bigger and better than anything ever dreamed of. But the mind dodges the problem of how best to tell it.

Staring out the window, I half-see a sign which says "Wig Shop." Dan Boone (surely not an old Indian-fighter from Kentucky) has a sign which says "Jeweler." Sandwich Shoppe, Transcaribbean Airways, and a bank "authorized by Congress on January 22, 1867," also are in view. So let's just tell it, like it is.

Well, first of all, it would be right handy if the AMA would stop changing the name of that Delta Dart thing, or Cub, or whatever the heck it is. To me, it is a Delta Dart, and it surely is mixed up in this "message." A Nationals ended just two weekends ago. And there was the most unique contest in modeling history recently held on the Mall in front of the nation's Capitol — the physical symbol which ties us all together. View for a moment the pictures on pages 16 through 19, in the October issue story "It Happened in D. C." Now think of 3,200 kids at the Nationals — that holy of holies of the ultra-sophisticated designs and expert flyers — building and flying successfully, every darn one, their very first airplane.

There have been many of these "Delta Dart" affairs — and one can hardly call them contests, and maybe that has something to do with the phenomenal success of the demonstrations. They are demonstrations. SIG alone has made well over 100,000 of these special kits. He first viewed it as a helping hand and now he has a tiger by the tail. It is big, this whole thing.

Model airplane building and flying is a national hobby. But for years we've all felt something wrong at our competitive level. Why did we keep talking about Juniors otherwise? We can amuse ourselves with models, now that we have it made, and let it go at that. Why even think of anything else? But it bothers, and it hurts, if we can count ourselves out because the problem is just too vast, too vague, and maybe think it isn't even there. It's there all right. We've proved it by some of the things we did about it.

Frank Ehling conjured up a crazy little crate, fighting leaders like Dick Meyer from Pittsburgh, and even R/C clubs, helped bring it to the kids. A do-or-die guy like John Worth, who puts flesh and blood into making these things come together for the good of kids everywhere, you never will be thanked. That's his job. The program is big enough now that we have trouble remembering those who make it go, bigger and bigger.

Well, there were all those Nats — from the days of tent cities and rented buses to motels, barracks and, now trailer camps. Always changes. Rubber to gas, Free-Flight to Control-Line, Control-Line to Radio. And practically everything was kept, including Indoor models — but not those twin-pushers and CO-2 jobs. And all the time, the constant prophets of doom, and the talkathon crusaders with the panaceas, never really changed. Until the Navy threatened to lower the boom on what was becoming an old-man's picnic, and said where are the kids, we knew nothing but frustration in renewing the hobby, or sport, at a grass-roots and youth level. We may have the answer staring us in the face by luck, by dedication, by argument, through these years of bitter effort.

But all we really know now, is that North lies that way. We have the key. Kids will build, and fly airplanes — given exposure and help. This is fact. And only the first step. What is the next step?

We've gotten this far — rather we've been led by the nose — with a few individuals, a bit of industry interest, some magazine help. The Navy is a factor. And now we see something. There's a fuse and a match.

We need help, bigger, more effective help. Financial backing on a grand scale. A plan or system for hanging onto more of those kids who enjoy this one-time demonstration and then fade away to whatever they ordinarily do. Hanging around street corners maybe. Model airplanes bridge that stupidly named "Generation Gap." So do all sorts of things. We now have something big enough, important enough, healthy and socially significant enough, to be a shining sales package, to sell a coordinated, national program. What it takes is basic material, the tools, and the right way to put those tools to work. Using the tools properly won't be easy.

At the Nats, there were guys who, when asked to help the throng of kids who went all the way out to Willow Grove, to make their first airplane, who said, "I'm busy, don't bug me." For each of them there are 100 who would drop everything to help. You can help.

There are guys at higher levels who can push this to the top, if you'll do the spadework. Brilliant manufacturing minds, grand industry people, who know it can be done.

There's a flickering sign outside another window which flashes: "This is It?"

—The Publisher

THE 1969 NATIONALS STORY

THE BIG NATS, pages 14 through 17, gives the broad picture of what occurred at Willow Grove — a coverage tied in with the AMA's detailed account in their Model Aviation section.

Follow-up articles will be published in near future issues. Jerry Nelson will cover what happened in R/C; Chuck Broadhurst, the Free-Flight round-up; and Bill Boss will look into Control-Line. All are in-depth reports. Don't miss them!
CARL GOLDBERG MODELS INC.
2545 WEST CERMAK ROAD • CHICAGO, ILLINOIS 60608

CARL GOLDBERG MODELS INC.
2545 WEST CERMAK ROAD • CHICAGO, ILLINOIS 60608

New! RANGER 42

The Versatile Almost-Ready-To-Fly Fun Model

For Single or Multi-Channel
Radio Control; Also Free-Flight

Can be flown 6 ways:
1. Single Channel Radio, Rudder Only
2. Single Channel Radio, Galloping Ghost
3. Two Channels, Rudder and Elevator
4. Three Channels; Rudder, Elevator, Engine Throttle
5. Four Channels; Rudder, Elevator, Engine Throttle, and Ailerons
6. Free Flight
Full explanation of each method given on plan.

FEATURES:
- One-piece molded Wing, high-HiL
- One-piece molded Stabilizer
- One-piece molded Vertical Fin
- Moulded Fuselage, completely assembled with firewall, nose gear, plywood floor, side rails, and main landing gear block already installed
- Complete fittings—nylon links, horns and keepers; nylon hinges, material, screws, blind nuts, washers, eyepieces, retaining springs, etc.
- Complete plans, with step-by-step instructions
- Instructions on Operating Radio Control Models

SKYLANE 62

Semi-Scale Beauty in A Great Flying Model!
DELUXE — Includes New Fittings

1/2 A SKYLANE $2995
For Single Channel — Escapement, Servo or Pulse
Span 32” Area 240 sq. in. Weight 26-36 oz.
Length 32”
For .049 engines

World’s FIRST Single or Twin Engine R/C Models

Send 10c for 4 pg. Illustrated Catalog with “Recommendations on Starting in R/C.” Basic Explanation of R/C Equipment, and Radio Control Definitions.
Ott and Stahl plans

In the "You Said It" column in the Aug. '69 issue, Andrew Cottle of Brooklyn, N. Y., wrote inquiring about Ott and Stahl rubber-scale plans. I would suggest that he and any one else who is interested in plans of yesterday write to The Father of the Old-Timer Movement: John Pond, 2192 Ashland Ave., San Francisco, Calif. 94116.

One of John's hobbies is collecting plans and making copies available to modelers interested in building these older models. The last time I looked at John's plans collection, he had about 200 rubber flying-scale plans.

Martin H. Schindler, Vienna, Va.

Backyard Flyer his dish

In your June '69 issue I read about a fellow who was building an R/C plane. He said that he thought you should have more on single-channel jobs. I was 13. I'm 13 and I can't afford to buy the plane, let alone the engine and the R/C stuff. I earn some money by doing odd jobs and stuff, but R/C is kind of steep! I like it more when you include something I can afford to make. For instance, the bits of info on rubber jobs. I made the Backyard Flyer and wish you would have more articles of that type.

Philip Feist, Cincinnati, Ohio

Thanks to Chuck

There have been several write-ups in the various model magazines, organizational, and club publications about the 2nd Annual West Coast Free-Flight Championships held in Taft, Calif., in March.

Charles Broadhurst, Exec. Dir. of the National Free-Flight Society, wrote many of the accounts which have been published. Chuck is also a member of the Capitol Condors, Inc., who in cooperation with the Oakland Cloud-dusters, co-sponsored the West Coast Championships. Chuck was very generous in expressing appreciation to the many organizations, manufacturers, and newspapers which gave us prizes, publicity, and provided refreshments at the contest. I have never seen such outstanding response to our needs.

But there is something that Chuck didn't mention in any of the articles, and knowing Chuck, this is understandable. What he didn't mention were the many phone calls, letters, and the personal time and money he spent to promote this contest.

The publicity given us by the Fresno, Bakersfield, and Taft newspapers; the Grand Championship Trophy from the Taft District Chamber of Commerce; and the prizes from the many hobby manufacturers: these were there mainly through the efforts of Chuck Broadhurst, on behalf of free-flight modelers everywhere.

I am sure that all free-flighters will join me in saying: "Thank you, Chuck, thanks very much."

A Free-Flight Modeler, Sacramento, Calif.

Dealer point of view

This letter is in response to a letter in the Aug. '69 issue by Phil Melanson. As a hobby dealer, I am irritated by a couple of Phil's statements. As for the super-regen receivers (Phil didn't say if it is tone or not), if we could get people to invest $2 in an R/C book they would learn the limitations of this equipment. The super-regen receivers are limited, but not useless; use them in inexpensive expendable aircraft and operate in a rural area, or put them in a boat, run them on a farm pond and have a ball!

A lot of people will buy from mail-order ads without ever opening a book or talking to a reputable dealer. They seem to have the idea that the dealer is only trying to sell them something they don't need, and they don't think the dealer knows what he is talking about. This is especially true of beginners who are trying to make each dollar count.

For the 4-H model building project, more power to Phil! But I have an opinion on youth organizations. Kids today have so many diversified activities that they are too busy to take a hobby seriously and do a decent job. If the parents for the past 25 years had been doing their duty as parents, we would have no need for all the youth organizations.

Now let's talk about the dealer that Phil so thoughtlessly kicked in the face. There isn't a dealer, distributor or manufacturer in this "good old USA" who is cutting a "fat hog" with model airplane supplies. Most dealers know of put in 60 to 70 hours a week and don't come close to taking home the pay that a laborer takes home in 40 hours. If we don't earn enough money to purchase the essentials plus a few luxuries, we can't protest or go out on strike. We must close down our business and join the rest of our sick society which is demanding something for nothing.

As for the price of model building merchandise, let's "tell it like it is." The manufacturers have done a commendable job of keeping prices in line; a Fox 25 stunt engine is $1 higher today than it was when first introduced, while a cup of coffee, or a new suit has doubled. I don't think you can show me a hobby manufacturer who has a union shop, yet they must buy their raw materials from unionized sources.

And just who do you intend to boycott? The manufacturers? He has the know-how and equipment to turn to other products. The distributor? He can turn to toys besides, the dealer needs him. I can't imagine making up about 60 small orders a week to manufacturers. The dealer? He is operating on a shoestring now, you will just eliminate your local source of supply. "Coal it" Phil. Model airplane merchandise is one of the best values you can get for your dollar today.

I do have a gripe about retail selling of R/C. The public walks into a hobby shop and expects the dealer to have $400 radio equipment on his shelf to show him. R/C equipment brings a small profit margin for the money invested by the dealer, and it will be obsolete in nine months. The customer still wants information (which he doesn't pay for) which might total an hour or more. He then either goes home and orders it from a manufacturer or forgets the whole idea because it is either too much money or the dealer didn't have the equipment to put in his hands and close the sale. Even when the dealer has the equipment, the man can get it cheaper from a friend who is a club member. Why should the dealer put his money in R/C equipment when he can put it in plastic kits at a higher mark-up and move them before they are stale?
Why can't R/C manufacturers let qualified dealers have an R/C set for a period of time on consignment? Even a small deposit would be all right. This method would expose more R/C equipment to more people and I'm sure more equipment would be sold and just maybe the model airplane business would lose the "toy plane" image.

Robert S. Pease, Bobby's Hobby Lobby Westminster, Md.

Turbulent airflow

In the article on Aerodynamics in the May '69 issue, very little reference was made to the great difference in Reynolds number between full-scale aircraft and models. The article called for a very smooth finish and laminar flow for best results.

In your photo section on FAI competition models, two methods of increasing turbulence were shown, their purpose to increase lift and delay stall. J. S. Luck commented on this years ago.

As I understand it, at model speeds, an airfoil does not become efficient until the flow over it becomes turbulent. Laminar flow separates from the surface at lower angles of attack causing a loss of lift and early stall. Artificial turbulence tends to cause the flow to follow the surface better resulting in increased lift and stall at a higher angle of attack.

Sears R. McCorkism, Mattapan, Mass.

Many an old-hand has wondered why some beat-up crate with random patches and frayed edges sticking up in the breeze flies so much better, and longer, than when it was new and sleek. And so many "dirty" looking crates glide like angels — while dream ships sink like bricks. One way to prove this turbulator thing is to put a thread or thin string, doped in place, spanwise at an appropriate chord point — but only one wing! If a turn develops exhibiting more lift on the turbulated side, you are onto something!

Publisher

Has personality

A bouquet of roses to you for your fine article on rubber-powered scale. Every word was true and such models do have a personality.

Model yachts are a parallel perspective. Here too, when such craft have been designed, painstakingly built, hopefully, all parts are pre-formed. Wings and stabilizers have foam cores. R/C gear mounts easily in roomy semi-scale, high impact, reinforced fuselage.

Other New Du-Bro Items Now Available...

Du-Bro NY-STEEL Kwik-Rod Assembly KR30
No shrink, no stretch, free-running, micro-adjustable at control horn. Great strength, simple and easy to install. Hot, wet or cold days won't affect trim setting. Best available. Complete 31" assembly with Kwik-Links.

DU-BRO PRODUCTS, Inc.
480 Bonner Road, Wauconda, Illinois 60084

American Aircraft Modeler
My roommate and I just started. Score so far: three gliders dead, one control-line wrecked several times, in order to learn how to fly. R/C is coming next month.

We have learned and are still learning the hard way because the nearest club (not yet formed) is 170 miles away. But we feel that once we learn, we are going to try to pass our knowledge on to other beginners.

Our own visiting will start as soon as we can. We are halfway decent. Probably gliders, rubber, control-line and maybe R/C. But to keep their interest, we want to be good enough to help, not just demonstrate.

Richard Stephens, Missoula, Mont.

Police officer seeks help

Please, if you can, send me the name of any radio-control clubs in my area. I am very interested in R/C, but am having difficulty meeting anyone who can help me. I think this is the major problem confronting beginners. Although I am 27 years old, I put myself in the same category as “junior.”

I am also a beginner in modeling, so I need help anyway I can get it. I am a police officer, and my fellow officers have been ribbing me. I think this is a challenge to myself.

Charles F. Goffen, Brooklyn, N.Y.

AAM gave Charlie a useful contact. All those requiring such help should write the Academy of Model Aeronautics, 1239 Vermont Ave. N.W., Washington, D.C. 20005. It is their job to help. They do so.

Ed.

These finicky troublemakers

Just what is a kid about 12 years old supposed to do with spare time? You get a hobby or something else to do. Well, you try model airplanes and everybody complains that engines make too much noise, that paint smells horrible, and they say “close that can immediately.” These same people that complain about a kid’s hobby, are the first to make you give it up. And nowadays when these people read a paper about kids getting together to smoke pot, they think: “What is going to become of the world? What’s the matter with today’s youth? Don’t they have a hobby?”

These people are the real troublemakers. They are never happy unless they can complain. That is a good reason for today’s youth not taking interest in model planes.

Another reason is it costs too damn much money. With prices going up, club membership is going down.

I fly ½A control-line, which I think is a lot of fun. Others think ½A airplanes are damned annoying. I get chased off fields all the time, so does the rest of my club. What’s a 12-year-old supposed to do to keep out of trouble?

You have a great magazine—keep it that way.

Joseph Flannery, Bergenfield, N.J.

We appreciate

You are to be congratulated on your excellent magazine. I have turned to it in many tight spots, and built a few models from your plans. I plan to build Down-
Tail First

Many great planes have flown backwards. So does this little rubber job.

KENNETH AND WILLIAM HANNAN

DON'T feel backward about building this "wrong-way" flyer, because some of aviation's most important pioneers started off in this direction. For example, many of the Wright Brothers' machines featured forward-mounted "nails," as did Santos-Dumont's Bis-14 (one of the first heavier-than-aircraft to fly in Europe). Even the famous channel-crosser, Louis Bleriot, built at least three canards, as tail-first aircraft are called.

The North American Aviation XB-70 Valkyrie is one of the more recent examples of the type. Incidentally, the forward surface on a canard is usually referred to as a "leading plane," rather than a tail, which latter is all supposed to be on the rear of anything that flies.

Much of the design effort and test-flying of our model was carried out by Tenderfoot Kenneth Hannan, who first became interested in canards while watching one being flown indoors by Walt Mooney, of San Diego, Calif.

Construction: First, take a good look at our plans and illustrations to be sure you understand how the various parts fit together. The model will perform best if it is light, so carefully select your balsa wood. Sight down each piece to be certain that it is straight. Heft several pieces of wood, to tell which is the lightest.

Obtain a piece of Celotex, soft wood board, or even a flat sheet of corrugated cardboard, on which to build the wings and leading plane panels. We suggest you start with these parts so that they will have plenty of time to dry while you are working on other items. Since the plans are printed full size in the magazine, you can work directly over them. To protect the plans from glue, cover them with Saran Wrap or waxed paper.

Wing: Select straight 1/16" sq. balsa strips, and cut the two longest ones first. Pin them in place over the plans so that they will be held flat while drying. Do not pierce the wood with the pins, but instead, put pins on each side at a slight angle, so that the wood will not be weakened.

Next, add the shorter pieces of 1/32" sq. strip which serve as ribs. Note that there is no sharp edge, so it will not be weakened. Do not put on the glue at once, but wait until the wood is dry. Try to avoid getting too much glue on the joints, for this looks messy.

Model has naturally correct balance point with balsa prop. If you substitute a plastic prop, add weight at nose to compensate. Tenderfoot arrow shows flight direction.

Continued on page 61
"Welcome aboard," was the greeting contestants heard. These arrivals camped; others used Navy barracks, some stayed in motels. Navy men together with AMA members taught youngsters how to build and fly AMA Cub rubber models—most were new to modeling. Scale models (Form I) and semi-scale models (Form II) both raced.

Mike Waldron, just 4'-5" height, celebrated his ninth birthday by placing 6th in Junior C/L Rat Racing. Lean needle valve setting slowed him down for first part of race. Dad, Ron, pitied.

The National Contest of today would not be possible without the assistance of the U.S. Navy in manpower and facilities. Shown is Dave Adamisin making C/L Stunt flight before Navy judges.
Big entry list, good weather and many flights combined to make long waiting line for timers in the Nordic Towline Glider event. Only the Open winner, a Canadian, made a perfect score.

Larry Leonard, Canoga Park, Calif., became R/C Champ by placing first in both Aerobatics and Form. 1 Pylon. Aerobatic model ready for takeoff is Kwik Fli III, Lee Veco 61.

AMA's 22nd year of U.S. Navy-hosted National Model Airplane Championships. Over 1500 modelers took part this year at Willow Grove Naval Air Station, Pennsylvania—and over 3000 more kids got started on their first airplane.

Concentration is intense as Hewitt Phillips, Hampton, Va., observes the flight of microfilm-covered Indoor Stick model. Event flown in Lakehurst blimp hangar, top time over 8 mins.

F/F Gas entrant Doug Adams, Grand Rapids, Mich., chose HL over ROG even though this allowed him three seconds less engine run. Three-minute flight max used this year was mostly well received.
Five-month-old Danny West, son of Mr. and Mrs. James West of Keego Harbor, Mich., had better keep watch on his pacifier — there might be a Combat flyer about wanting a new fuel tank!

It is as interesting to watch the pilots as it is the models in C/L Combat when top flyers such as Peter Puchyr (L), Acton, Canada, and Richard McGarrigle, Trumansburg, N.Y., cut up the air.

Spotter for R/C Pylon Racing is essential as pilot must keep constant model watch.

Leonard Martin's dad, Henry, does spotting.

Left: The contestant hangar is a center of Nats activity especially in evenings when models are readied for next day's events.
Few flyers could have survived the mostly hot week without the refreshments at each of the flying areas—a welcome relief.

Two days for indoor flying allowed indoor Scale to be added as an official event. Judges P. Kastory and D. Didelot at work.

Tail-first canard A-1 Towline Glider by Carl Taylor flew well but did not place in combined event with larger A-2 models.

With FW 190 R/C Scale model this year, Dave Platt had high Fidelity and Craftsmanship scores. Realistic appearance was stressed. Model has WW II Hawker Typhoon features.

Readying for a C/L Stunt flight to place him first among Juniors is Dennis Adamisin. Model has WW II Hawker Typhoon features.

C/L Stunt models lined up awaiting flights represent many outstanding examples of the art. Models not only were extremely flyable, but workmanship, detail and finish were outstanding.

Flagman Glen Spickler points to the second plane as the P-51 Formula II model of the Telford-Violett team streaks down the runway during R/C Pylon Racing Qualifying Heats early in week.
SCIMITAR was designed with one basic thought. That was to try to solve a design deficiency that is prevalent in many of the small, high-speed stunt ships that are flown these days. This problem is the apparent difficulty high-speed airplanes have in tracking through the most basic maneuvers, such as loops, Immelmann turns, etc. We feel that this problem is created, at least in part, by small aerodynamic flaws that are exaggerated at high speeds.

How many ships have you seen that would track through three consecutive inside outside loops without correction? I have flown only two. In the past we have always rationalized that hidden warp was the culprit, even though we took great pains to check the strength of the flying-surface and fuselage. A close examination of the flying characteristics of these crooked flying machines revealed that the heading was being lost at one spot in a loop. This was not the constant change of heading that would result from a warp. We concluded that aerodynamic nonsense was taking place when the airplane reached a certain speed and attitude.

For example, I am sure you have seen many ships that wiggle in straight and level flight at a certain speed, or that wiggle when they are in a banked turn, or at certain headings relative to the wind. These are all exaggerated cases of the aerodynamic flaw that will cause a seemingly unexplainable heading change at the top or bottom of a loop. It is our opinion that it is the uneven flow of air over the top of the fuselage, and its effect on the fin, that causes the wiggle and the resultant tracking problems.

To resolve this deficiency we incorporated into the Scimitar design, three fairly obvious features. First, our wing leading edge is highly swept back. In our opinion, this improves the directional stability at all speeds. Second, we used a streamlined turbo-back fuselage design. This was done to smooth out the flow of air as it moves across the fin. Third, we kept the entire configuration as streamlined as possible, within practical limits.

Our first flights with Scimitar were very satisfying. We found that, not only had we accomplished our goal of correcting the wiggle and greatly improving the tracking problem, but we had derived two additional very desirable flight characteristics. The ship flies at a constant speed through the pattern maneuvers. This, along with its smoothness, gives it a very graceful appearance in the air, even though it is very fast. Additionally, Scimitar exhibits practically no visible dynamic overshoot about the roll axis. She does beautiful, constant-speed rolls with only a whisper of elevator correction, and stops rolling the instant you release the control.

Unusual planform and Rivets-like appearance is result of engineering to correct flying problems of other stunters. Handles gusty weather like hot knife slicing butter.
Lack of hangar space makes necessary a temporary use of storage crates to protect some specimens from the elements. Large crate on this photo houses a dis-assembled Japanese bomber from WW II. Museum hopes to erect additional hangar space but funding is slow-coming.

Fokker D VII, right, will be returned to factory-new condition. Yards of silk-screened fabric in the original camouflage are contracted for, rather than resort to authentic hand-painting. Museum frequently prefers a restoration in weathered operational condition.

WILL CONGRESS ACT IN TIME?

The SILVER HILL Story

With a handful of dedicated experts and a tiny budget the Smithsonian wages a desperate struggle to save many of aviation’s treasured historic aircraft.
FOR those who hold a deep-seated affection for the glory and excitement of aviation history, there is perhaps no place on earth quite like the National Air and Space Museum's Preservation and Restoration Facility in Silver Hill, Maryland. Few people know of its existence. There are enough sights and smells and memories of historic aircraft at Silver Hill to relive in one day the entire chronology of flight.

Housed in and around a group of metal hangars, the Smithsonian Institution has gathered a collection of some of the world's most important aircraft. The Silver Hill collection lies fenced off from the world, a sort of aircraft limbo until the final authorization for the new National Air and Space Museum building becomes a reality. When? Perhaps next year, the following year, maybe ten years. No one can say.

Don't mark Silver Hill on your itinerary for your trip to Washington. Surrounded by fencing, its gates are permanently closed to the public. No one enters unless he has specific permission from a senior Museum official. Once in, a guard escort is assigned to you. Freedom of movement is as carefully controlled as it is at a U.S. nuclear-weapons station. These precautions are essential. The Smithsonian is the custodian of an aircraft collection of such size and significance that it cannot be evaluated in cash values.

Through the dedication of a small staff and the stretching of a very small budget, the Silver Hill Facility has managed to preserve a state of suspended animation nearly 200 aircraft, and find enough money left over to restore some items in the collection.

With few exceptions, most of the aircraft are preserved but not restored. "We are holding our own, at least for the time," one official told me. Their primary task is to keep time from taking further toll. Older, fabric-covered aircraft are stored partially disassembled as large dry hangar-like sheds. More recent and more rugged aircraft must be left outside, protected only by sheets of plastic covers over vital areas. As fast as funds and personnel become available, new hangars are constructed, or large packing crates are built to partially protect the aircraft from the weather.

Our escort opened the padlocked door of the largest hangar. Saturated by a ghostly green light filtering down from the few plastic skylights, stood a double row of aircraft, stripped of wings, and covered by the accumulated dust of years. The sensation was that of meeting an old friend after many, many years. I recognized them immediately, but could not help being struck by what the years had done. The fact that they were older did not decrease the pleasure at all.

The clean, sleek beauty of a Northrop Gamma comes through, even with its wings removed. A familiar curve of a fuselage, the recognizable lines of cockpit and radome, a characteristic nudge which you have known since you were a boy. Though covered by a plastic sheet, how could anyone fail to recognize the massive, but somehow arrogant fuselage float of Grover Lom-
French Version, one of group of aircraft received in 1914, is considered restorable. Needed is a 100-hp Renault engine with 12 cylinders. A Peugeot engine is a legitimate substitute but would require new hardware, which would detract from the authenticity, considered so important.

A SPAD XIII occupies one corner. Tires and wings, but endowed with a magical grace and beauty which years cannot take away. I remember this SPAD when.

The SPAD was flown by a young AEF officer when it was returned to the States to spearhead a Liberty Bond drive. When he saw the old SPAD on display, he caused consternation among the guards at the old aviation building, when he crossed the railing and climbed into the cockpit! Then he signed autographs, to the delight of visitors.

A German ME 262, stripped of its wings and jet engines, is a dead gray shark, just as it had been shipped from Europe. Scratched, dirty, the black Balkaner: insistent peeling and flaking from its fuselage; it was one of WWII's secret weapons. The dirt on the cockpit floor, bits of trash and litter, left there by some unknown Luftwaffe pilot. When the Smithsonian restores this aircraft, something will be lost in the process—that bit of litter.

In another building, almost hidden behind a fully assembled Grumman F9F, was a fuselage. I had known personally. I hadn't expected to see it in the collection. The feeling of nostalgia and recognition was particularly strong. Suspended awkwardly atop its single center-mounted mast was the fuselage of one of the N9N-3 "Yellow Peril" trainers from the NAF training squadron at the Naval Academy.

During the Korean War, I was stationed at the Air Facility across the Severn River from the Academy. Even then we took a certain pride in naming the last operational squadron of biplanes anywhere in the world (in dubious claim, but we believed it). Hero was number 44 from the original group of 45, old, crippled, but a plane which had fueled, hosed down, mounted from the hangar for morning flights, and washed waist-deep in the Severn to recover at the end of a day's flying.

I went from one hangar to another, taking photographs where there was room to focus. Nowhere was there really enough room because space at Silver Hill is so premium. Some aircraft were buried so deeply that photography was impossible. A DeHavilland Mosquito fuselage was an example.

In spite of the crowding, there was order. Fuselages, wings, and component parts were all marked with a catalogue number. But here, as in space around each aircraft, nowhere did two aircraft touch in such a way that either would be damaged.

You must know where to look. Sometimes a DeHavilland Mosquito fuselage had withstood storage. But toward the rear of the hangar was Amelia Earhart's Lockheed Vega.

This was a premium aircraft! The quality of construction still shows through the dust. In the early G-4, plywood skin and smoothness of the paint, the beautifully constructed fillets, the solid, plywood fuselage had withstood storage. But toward the rear of the hangar was Amelia Earhart's Lockheed Vega.

This was a premium aircraft! The quality of construction still shows through the dust. In the early G-4, plywood skin and smoothness of the paint, the beautifully constructed fillets, the solid, plywood fuselage had withstood storage. But toward the rear of the hangar was Amelia Earhart's Lockheed Vega.

With the large collection, there is space around each aircraft. Nowhere did two aircraft touch in such a way that either would be damaged.

You must know where to look. Sometimes a DeHavilland Mosquito fuselage had withstood storage. But toward the rear of the hangar was Amelia Earhart's Lockheed Vega.

This was a premium aircraft! The quality of construction still shows through the dust. In the early G-4, plywood skin and smoothness of the paint, the beautifully constructed fillets, the solid, plywood fuselage had withstood storage. But toward the rear of the hangar was Amelia Earhart's Lockheed Vega.

Silver Hill also maintains aerospace hardware. Some of the Mercury and Gemini spacecraft are stored there in a hangar similar to those which house the aircraft collection. These are part of my own time, however. The burned and charred remains sitting mutely on wooden pallets couldn't recapture the grandeur of the moment at Cape Canaveral. Some hardware is designed for an alien environment, not in

A prize from WWII is this Messerschmitt MEII rocket-powered interceptor. It was extensively tested at Edwards AFB after 1000 trips. One of the most dangerous aircraft ever built, the Komet often exploded on a mild bounce-landing, or on over-running field, after touchy glide to earth.

Spandau was built in 1913 - war, was sent to the U.S. for engine and structural evaluation in 1918. The missing LeRhone rotary engines were replaced from spare-parts stock. Interesting French plane was an exhibit for years, but removed to make room for another exhibit.

Continued on page 50
Dowhilland DH4 is one of the few reproductions at Silver Hill. It was constructed from parts of DH, which crashed in 1922 in the Rockies. Plane helped wreck 80 years later. Rebuilt plane flew Coast to Coast in 1968 to commemorate U.S. Airmail Service 50th Anniversary.

First aircraft to do non-stop coast-to-coast (East to West in that order) was Fokker T. It is now fully restored. Thanks to Fokker's dream genius, it still holds record for greatest weight per horsepower. Engine was warbird Liberty 12P-6. It still has flight groundspeed of 132 mph.

New undergoing complete restoration is Douglas DST World Cruiser "Chicago" flagship of round-the-world flight in 1928. Liberty V-12 engine will be sent to Australia this year for Australia Centennial Anniversary. Plane stopped there no flight. Restoration and display will follow.

Messerschmitt ME262 twin-jet-powered recon served during last days of WW II with Jadingenwader 7. It was one of 14 captured at end of war. Its nose and machine guns were removed by a souvenir hunter after plane shipped to this country, making identification and history difficult to track down.

Gull-winged F4U Vought Corsair of Pacific Theater fame in WW II is typical of complete series of naval aircraft donated by Navy at war's end. Unfortunately, from Museum's viewpoint, log books were destroyed and individual histories lost. Nevertheless, these are historic aircraft meeting Museum criteria.

Messerschmitt ME262 twin-jet-powered recon served during last days of WW II with Jadingenwader 7. It was one of 14 captured at end of war. Its nose and machine guns were removed by a souvenir hunter after plane shipped to this country, making identification and history difficult to track down.

Gull-winged F4U Vought Corsair of Pacific Theater fame in WW II is typical of complete series of naval aircraft donated by Navy at war's end. Unfortunately, from Museum's viewpoint, log books were destroyed and individual histories lost. Nevertheless, these are historic aircraft meeting Museum criteria.

Northrop Gamma is in excellent shape. Ellsworth was reluctant to donate aircraft, thinking hill would use it again. Museum agreed to store craft, even preserving battery charger. Photo will be preserved, not restored. Rough-landing wrinkle in fuselage will remain as is.

American Aircraft Modeler
From this design the Spirit of St. Louis was developed. Rubber-powered model has details galore for the expert and clear instructions for the beginner.

Before 1926 few people had seen an airmail plane up close. But about that time the government began to award contracts to private firms to carry the mail. This was the real beginning of our present day airline companies.

Along with designs by Douglas, Boeing and others, was one built by the Ryan Airlines School of San Diego. The aircraft performed well even with lower horsepower and a heavier Hispano-Wright engine, in place of a Wright J4 engine originally specified. Known as the Ryan M-1, the plane later became the M-2. Some were built with the Hisso, some with the J4, for airline companies in the West.

Then Lindbergh picked Ryan to build his airplane. As history records he was successful in 1927 on a long and lonely trip from New York to Paris. His Ryan number 29 was a descendant of the M-1 and M-2. The similarity was evident between the M-1 and the NYP Ryan used by Lindbergh.

Our rubber-powered model is the Hisso-powered version. It provides more nose length, giving a graceful and smooth appearance. A number of photographs exist of this version of the M-1 and M-2 as well as the J4 version. The American Airman Magazine, Vol. 4, No. 7, of July 1961, shows two M-1/ M-2 Hisso versions. General Aviation News Monday, March 24, 1969, carries a picture of the M-1 now on display in San Diego.

You can build a full-detail-scale type, or a scale-outline type. Both types require about the same effort and both will perform well. My model was a scale outline variety used to develop a larger diesel-engineled job. The amount of detail will affect the final weight.

Start with the wing since it is the most difficult part. Using the patterns for the spars, front and rear, aileron and flaps and centerline splices, each cut from 54", straight-grain sheet, make two of each except the centerline splice-pieces. The rib template is cut from light gauge aluminum or tin. Use the template to cut 20 upper rib caps from 54", straight-grain sheet. Each rib should be 54" wide. In addition, cut 1/4" x 1/4" strips for the lower caps from the same material. The leading edge is 5/8" thick and the trailing edge is 1/16" x 1/4".

Trace the shape of the tip on a piece of cardboard about 1/4" thick. Cut out the inside line and use it to bend the 1/4" x 54" laminations to shape. Soak the wood in hot water a few minutes and bend it around the cardboard form, holding the strips in place with pins pushed into any soft material used as a flat base. Use an oven at 125°F to speed up the drying time to a half hour.

Two sets are required. The wing structure can be set up over wax-paper-covered plans. Trim the forward ends of the lower rib caps to a 45-degree angle and assemble them in place with the spars, trailing edge pieces and leading edge strip. The upper rib caps are trimmed to match at the leading edge with a 45-degree angle cut, and as far at the trailing edge on the lower rib cap. Build the wing, including the ailerons, as a single unit. Cut away the ailerons after...
the tips are completed. This assures alignment.

Now for the horizontal and vertical surfaces. Make up the cardboard forms (same as for the wing tips) and bend the V-shaped laminations into place on the forms and dry as before. By now your wing tips should have dried and those laminations can be glued together holding them in place on the form to fix their shape. When the glue dries on the tips set them up in place to face with the leading and trailing edge pieces, blocking up in position. Glue all the contact positions with spars and other structure while still over the plans.

Cut out the rib and spar strip material for the tail surfaces from sheet stock; also the fuselage material can be cut to required sizes. The tail surfaces now can be laminated up on the form with glue and set aside to dry.

The wing halves can be taken up and checked for size and condition. If OK, set them up on a level surface with approximately a "2" block under each tip, adjusted so the center section of the spar stubs lay flat and each tip is raised the same amount. Adjust so that the splice webs will fit between the ribs with the leading edge in a straight line tip to tip. Check everything for alignment and position and then glue the splice webs into place on the spar stubs.

Now the tail surfaces, horizontal and vertical, can be assembled. Shim up the outline bow shapes so they center on the rib and spar depth. Cut the spars and glue into place over the plan. The rib material is trimmed to fit each location and glued in place. Set the assemblies aside to dry. The wing is now completed with the lower rib caps at the tip locations cut and glued in place. Install the center rib caps and two center section trailing edge ribs with the false spar at center. Cut and fit the gussets and fairing blocks, gluing them in place as shown. Now the wing assembly can be sanded smooth, leading and trailing edges and tips faired and contoured to shape. Refer to the rib sections for contour. Install the filler blocks at rear spar for fix strut attachment point.

The wing covering starts by attaching light bondpaper from the leading edge back to the front spar top and bottom. I use Titebond glue to attach the bondpaper; a very light film on the structure does just fine. The whole wing is covered complete, using your favorite method and tissue. Watershrink and block down to prevent a warp. Also hold down for final drying of dope finish. The ailerons now are cut away, then reinstalled, using thin-aluminum sheet strip for hinges glued in slots. Aluminum pop cans are a good source of the thin aluminum.

The final finish color is silver or aluminum with black lettering on the underside of the wing as shown on the plan. (More on color methods later, but remember the degree of finishing is up to you.)

Take up the tail surfaces and fair in the ribs, spars and edges to the typical section shown on the plan. Sand the assemblies smooth, cover with your tissue and watershrink. Hold the parts in position to prevent warping. Cut the control surfaces away, install the aluminum strip hinges if you choose, then set aside.

The fuselage is the usual box-frame-type

Continued on page 69
May 15 will be remembered a long time. For that day the exciting Tenderfoot Contest came to a close. All sorts of fascinating envelopes, letters, and even packages had been trickling in for weeks — faster, and faster, and faster, as the deadline drew near. Late arrivals returned to air-mail special delivery and ever bigger red-printed exhortations to the Post Office to Rush — PLEASE!

The editors had started this thing. They'd asked for it. Now they'd found out! Do you guys, and gals, go for these Tenderfoot models? Do you really dig model airplanes? Is this your thing? Does the hobby have a growing future? So here we were, swamped, and frightened by a mass of wonderful pictures of fascinating models, each seemingly better than the one before it. Was there an end?

Somehow the job got done. The judges argued for their favorites. We sat up at night, and finally the scores were tallied. The winning selections emerged to cries of, "Bee, I told you so." Telegrams of congratulations went out. The cash prizes! Do you know, one chap bought a trumpet with his loot? Maybe we'll all get to hear him play some day! It was wacky. From beginning to end.

The April issue which announced the contest included Flying Funtrique plans by Bill Hannan (with a thanks to K. Sykora), and instructions down to the last drop of glue. Suggestions for the finishing left to the individual, evoked memories of great names in aviation history. A "Sopwith Pup," "Curtiss Racer," a "Bleriot," a "Curtiss Cabin," a "Fokker Triplane," or the entrant could go way-out on his own. No holds barred. Plans would be piloted by the likes of, "Baron von Phinque," "Pierre Blearyeye," "Jimmy Doocat," or any hero-type the modeler imagined.

Rules required each entrant to build his, or her, own model, and furnish photos for judging. The basis for judging was: A) Does the model conform to plans? B) Appearance of surface finish? C) Amount of detail? D) Neatness of detailing? E) Originality and special effects — bracing wires, armament, machine guns, exhaust smoke, bullet holes, patches, insignia and wheel-pants for examples. Age classifications were ten years and younger, 11 through 13, and 14 through 16 years.

There were three first prizes: one $50 award to the top winner in each age classification, plus Tenderfoot hats and T-shirts. Three runner-up prizes: $10 plus Tenderfoot T-shirts in each age category. All winners would be awarded certificates of achievement and their story in AAM. Judges picked four Grand Winners (there was a tie in one age classification).

The young lady entrant named Jennifer landed a spot in the runner-up category. In the spirit of fun, some entries used such names as, "Rumpled Tub," "Grand Winner model from David Barbour," and "Maison Du Chien" (dog house) from runner-up, Kelly Pike. You can see by the photos that these young modelers are as much interested in craftsmanlike work and attention to detail as older hobbyists.

Questionnaires were sent to the Grand Winners. What were they like? What were their interests? You know! Four highly competitive winning types of hobbyists are not, of course, an accurate analysis of the general readership. But, it might be fun to discover how much you have in common with these winners, as how they differ from each other.

Here are the 17 questions and some of the answers from Billy — age 8, Neal and Mike — both 13, and David — 16.

1. How did he get started? Billy's mother had been a teen-age modeler! His brother started with a hand-launched glider; Mike's and David's fathers included them in their own model work.
2. What does he want to be as an adult? David will have music.
3. What school does he attend? All seem to attend public schools according to their age levels. (Like lots of other people.)
4. Other hobbies? Seems as though you could be interested in anything and still be a good modeler. Mike builds "things" out of any bits of wood he can find, is serious about rocketry and astronomy — especially related to moon flights. Mike also builds model railroad. Name the sport and Neal likes it. David enjoys books and music.
5. Does he have a pet or pets? Billy a guinea pig. Mike has "one dog," David a Basset Hound. Neal tops them all with a dog, two cats, a collared lizard, and a guinea pig.
6. What will he do with his prize money? Billy plans to spend some aspect of aviation as a first choice, while Mike owns a piano and would have a dog if it were allowed in the apartment.
CONTEST RESULTS

account, bought a few toys, tennis shoes, and wood to repair a model. Mike bought more models and accessories, while Neal purchased a jig-saw and saved the rest. David invested in his future by buying a new trumpet!

7) Where does he build his models? Billy's workshop is wherever he can put a big piece of beaver board. The Meeks' hobby room is now Mike's bedroom too. Neal and David both use home workshops.

8) How long did he take to build winning models? Billy took nearly a week to build his Fokker. Mike and David needed only two and three days to produce prize winners. Neal took no chances and spent two weeks.

9) Does he have a job, such as paper route or chores? You must note the ages of the boys. Billy helps out around the house, and does a lawn or two. Mike adds car washing to his list of chores. Neal, the one who enjoys everything in model aviation, uses judgment in the selection of materials, especially the wood.

10) What does he like best about model aviation? Billy's big thrill in modeling comes with the final test flight. Mike loves radio-control most of his efforts in building and planning. Neal likes everything while David picks radio-control as his favorite feature.

11) Does anyone else in the family build models? We'll repeat that Billy's mother was a teen-age modeler. Mike and David have dads to work with them; David also has two younger brothers to tag along. Neal shares his hobby with a brother and sister: a real aeromodeling family.

12) What is his favorite feature in AAM? They are individuals. Billy and Mike turn to the Tenderfoot features and plans. David read 'Model World' on the international scene, and Neal would like to see more free-flight articles.

13) Does he like to read? Billy's tastes reflect his interests as do Mike's, while Neal and David expressed no particular preference.

14) Does he like to enter model contests? Billy finds contests a real challenge. After winning in this one you can bet he will have many more chances.

15) How many brothers and sisters? It means anything; all these boys have one sister. There you go—Ed. Maybe that's enough! But Neal and David also have two brothers-apiece.

16) Does he prefer to build from plans or kits? These, remember, are winning modelers, so their preferences should be significant. Eight-year-old Billy builds from both kits outnumbering plans at this point. The other boys, who are older, use plans. Neal—the one who enjoys everything in model aviation—uses judgment in the selection of materials, especially the wood.

17) Does he like to enter model contests? Billy finds contests a real challenge. After winning in this one you can bet he will have many more chances.

18) Do you work for a job, such as paper route or chores? You must note the ages of these boys. Billy helps out around the house, and does a lawn or two. Mike adds car washing to his list of chores. Neal, the one who enjoys everything in model aviation, uses judgment in the selection of materials, especially the wood.

19) Does he like to enter model contests? Billy finds contests a real challenge. After winning in this one you can bet he will have many more chances.

20) Does he prefer to build from plans or kits? These, remember, are winning modelers, so their preferences should be significant. Eight-year-old Billy builds from both kits outnumbering plans at this point. The other boys, who are older, use plans. Neal—the one who enjoys everything in model aviation—uses judgment in the selection of materials, especially the wood.

21) Does he like to enter model contests? Billy finds contests a real challenge. After winning in this one you can bet he will have many more chances.

22) Do you work for a job, such as paper route or chores? You must note the ages of these boys. Billy helps out around the house, and does a lawn or two. Mike adds car washing to his list of chores. Neal, the one who enjoys everything in model aviation, uses judgment in the selection of materials, especially the wood.

23) Does he like to enter model contests? Billy finds contests a real challenge. After winning in this one you can bet he will have many more chances.

24) Do you work for a job, such as paper route or chores? You must note the ages of these boys. Billy helps out around the house, and does a lawn or two. Mike adds car washing to his list of chores. Neal, the one who enjoys everything in model aviation, uses judgment in the selection of materials, especially the wood.

25) Does he like to enter model contests? Billy finds contests a real challenge. After winning in this one you can bet he will have many more chances.

26) Do you work for a job, such as paper route or chores? You must note the ages of these boys. Billy helps out around the house, and does a lawn or two. Mike adds car washing to his list of chores. Neal, the one who enjoys everything in model aviation, uses judgment in the selection of materials, especially the wood.
Mike Stewart has 3-D pilot, exhaust, and head rest. Nice work. Spencer Steckroth, age 16, entered only biplane. Nifty, too.


Jumpin Dooalot flies Tre Twilligear’s plane. James Hale used unique exhaust stack. Wheel-pants, racy colors on Fred Zink’s flyer.

Jennifer Everett entered passenger-type plane. David Lewis has flying wires and cables on Model 1915 Pfalz-EV.

28 November 1969
Authentic “Warpaint” for Ordnance

SCALE modelers who go to extreme lengths to duplicate all markings and details on modern U.S. military aircraft are often handicapped by lack of accurate information on the color and markings of current externally carried bombs and rockets.

The following is a summary of body colors and code markings as currently authorized by military regulations:

**High-explosive bombs:** Olive-drab body and fin, light yellow 2”-band approximately 1/3 back from nose. Yellow lettering. New low-drag bombs (streamlined tear-drop shape) have dark red or dark green nose fairings. If a fairing is present, nose fuse may be either aluminum or brass color.

**Chemical bombs:** All gray body with 2” red or green band, 1/3 back from nose. Matching lettering. Chemical bombs are shaped like conventional bombs.

**Fire bombs:** No fins, olive-drab body, light red band 1/3 back from nose.

**Rockets:** Motors, if exposed, dark brown, forward airframe olive drab with yellow band to indicate high explosive. White also authorized for motor. Many publicity photographs show aircraft armed with white, bright orange, or blue bombs. These indicate training or dummy rounds and would not be installed on a combat-ready aircraft. Scale kit manufacturers have frequently used these publicity photos as the basis for their color and marking data.

McDonnell-Douglas A-1 loaded with low-drag general-purpose high-explosive bombs. If these were a color photo, the basic olive-drab color of the bombs would be evident, as would be the yellow identifying bands which signify the high-explosive loading. Dark-green nose fairing indicates specific type of internal weapon fuzeing. Controlled colorizing tells pilots and ground crews at a glance the exact characteristics of each piece of ordnance—which can be dropped simultaneously or individually.
HOWARD McENTEE

FOR a World Champs, at least five countries must be represented. This had 25, with 87 pilots in Stunt.

Overall Director (like our CD) was Bertold Peterson. The German Aero Club was the sponsor. These bi-yearly affairs are held under the auspices of the FAI, the modeling division of the FIA. AMA is the U.S. representative of the FAI.

Under the direction of Dr. Helmut Ziegler of Switzerland, the Scale event was run as a World Championship concurrently for the first time on an unofficial basis.

The airfield was ten miles north of Bremen. One large hangar housed planes, provided processing, transmitter impound, Scale judging, etc.

Two flight circles about quarter-mile apart were on a wide runway—the first time a meet of this size had been held in Europe with more than one flight circle.

Each circle had a tent for officials, a small computer to help scoring—which later proved less accurate than hand tabulation—a flight dispatcher, etc. At each circle a large electric clock, visible to judges, officials and flyers on the runway, marked for both starting time (three minutes to get a plane into the air) and for maximum total flight time. A loud buzzer signaled the beginning and end of these periods.

On the first day of official flying, scale models flew all afternoon, following a morning practice session for Stunt teams. Each team had 45 minutes practice time allowed at this site. Bull-horns were handed in each team manager as one of his team members went out to fly. This allowed the manager—or the flyer’s mechanic—to call out to the judges each maneuver, and its beginning and end. Thereafter, compact, portable transmitters, and receivers with loud speakers, allowed officials and spectators to know just what maneuvers were coming next.

Each stunt flyer was allowed four flights, the lowest dropped before totaling. Five judges on each circle remained at the site. Five judges on each circle remained at that circle for the entire meet. Contestants were shifted back and forth after each round. High and low scores from each group of five judges were dropped, and the remaining scores were totaled to obtain the score for each individual flight.

Maximum possible score for a flight is 2000 points. The highest score by any flyer was 1444 by first-place winner Giezendanner on his third flight.

Many fine competition flyers are developing around the world—and it’s going to take plenty of hard work and a very good team-selection system if the U.S. hopes to get back the first place trophies. Our Phil Kraft took second in Stunt and the U.S. second in Team.

In Individual and Team, top places were fought over until late Sunday afternoon. A check of the scores by rounds of the top flyers shows this shifting around. Even if all four rounds were counted, the top five winners would have still been the top five, and in the same order. With three rounds counted, they were: 1) Giezendanner, Switzerland, 4356 points; 2) Kraft, U.S., 3965; 3) Wester, W. Germany, 3947; 4) Marrot, France, 3921; 5) Schoenfeldt, W. Germany, 3921.

At the end of Round 1, the order was Schoenfeldt, Giezendanner, Matt (Lichtenstein), Brand (S. Africa), Marrot. After two rounds we had: Marrot, Schoenfeldt, Wester, Kraft, Brand. With three rounds complete: Schoenfeldt, Marrot, Kraft, Giezendanner, and Wester. At the end of four rounds, counting all four: Giezendanner, Kraft, Wester, Marrot, Schoenfeldt. U.S. team member Jim Kirkland was ninth, with 3551 points; and Jim Whitley, 10th, with 3437 points. Team Manager Ron Chidgey did a creditable job.

Since FAI judges favor large sweeping moves, many flyers in the U.S. are having trouble getting high scores. It’s going to take plenty of hard work and a very good team-selection system if the U.S. hopes to get back the first place trophies.

1969 R/C WORLD CHAMPIONSHIPS

Fine competition pilots from many countries are becoming so expert, this contest was decided in the last exciting round.
First-place winner, Bruno Giezendanner, Switzerland, flew retract landing gear equipped design with Digi Fli radio and new style Webra 61.

Flying same Quick Fli at past Internats, Phil Kraft, here with Mrs. Kraft, placed second. His own radio of course, Enya 60.

Josef Wester of Germany using Graupner Varioprop radio and ST 60, placed third. In large FAI maneuvers, strip ailerons are favored in Europe.

Phil Kraft with Jim Kirkland. Jim flew Lanier plastic version of his Citron design.

German Nats winner Heinz Elsaesser placed 6th at Internats. Used Robbe Digital, ST 60G.

Foster of Great Britain with model called Equalizer, used (Spreng-Brook radio, Merco6).

Like winner, W. Schonfeld uses retract gear on "Prestige." Radio is Simprop, S. T. engine.

Belgian flyer, Haegemann, and compatriot flew "Zimeken" design with Radio-Pilote and Dirigent radio in "Flippor II." Rossi engine.

Sekirnjak, of Austria, used his country's Dirigent radio in "Flipper II." Rossi engine.
Marrot of France (Number 2) placed 4th. Model is Styz. Radio-Pilote.

British team and Manager. Their models have very long tails.

Hangar full of all kinds of planes. Here are the Italian models.

South African team used Logictrol (U.S.) radios and S. T. motors.

Italian flyer Pagni used S. T. engine (of course) and Logictrol.

W. Kaesenberg kept rain away when flying record speed model.

November 1969
R/C MULTITESTER

A designer for RC. This Multi- tester is distributed by Graupner for the European countries and is especially for those who want to build R/C planes in Europe. The identical meter now is made for Ace R/C for distribution in the United States.

DC milliammeter ranges of 100 and 500 MA; DC volts of 3.5, 7, 14, and 250 volts. Measures resistance in 2000 ohms and 200,000 ohms. 2,000 ohms per volt.

Handy pocket size. Measures 3 1/2 by 5 1/2 by 1/2 inches. Complete with test leads.

No. 22K5—Ace Multitester. $13.98

ACE VARI-CHARGER

IN KIT FORM OR ASSEMBLED

Will charge nickel cadmium batteries—20 mils to 150 mils. provides a range of voltage from charging 12 volt packs. Complete instructions. Price includes FIRST-CLASS MAILING.

No. 22K31—Fokker D-VIII Profile Plans. $13.98
No. 23K32—Nieuport 17 Profile Plans. $13.98
No. 24K291—Mini-ot Profile Plans. $13.98

MICRO FLEX HOOKUP WIRE

You need a lighter weight wire than ordinary hookup when building the miniature jobs. We have #30 PVC insulated with 7 strands of silver. Packaged in a six color pack. Each length is three feet long.

No. 35K3—Six Pack hookup wire #30. $13.98

VOGТ THROTTLE RESTRICTORS

These restrictors are used when you want to tame the Cox .010 or .020. Simply set to position for desired RPM and they will give you a smooth power curve. Price includes FIRST-CLASS MAILING.

No. 16K12—Vogt Restrictor for .010. $1.98
No. 16K173—Vogt Restrictor for .020.
Ace R/C has achieved the ultimate in single channel pulse proportional guidance systems in our new Commander series.

The backbone of the systems is a transmitter design by Don Dickerson to meet the requirements of all forms of pulse proportional radio control. Prime design objectives were high RF output, coupled with reliability, and expandability. These goals have been met.

Has extra high RF output, and the exact same RF section is used in all three versions. This output is equal to, and in a number of cases exceeds, the highest priced types.

For each of the three transmitter versions (rudder only, galloping ghost, dual ghost) the pulser is different. Because the requirements of each type of flying is different, it was felt desirable to design a pulser to fit each particular need, and not attempt to adapt with a simple "hi-lo" switch or other shortcuts.

Exhaustive tests in the field by a number of R/C flyers have proven this concept to be valid. For each of the three versions of the transmitter offered, the pulser is designed to perform its specific function only!

R/O requires a pulse width ratio of 95-5, with a pulse rate of approximately 6 pulses per second. To this may be added high pulse rate change up to 80% for the inclusion of motor control.

COMMANDER R/O PULSE PACKS

Ideal for Beginners and Sport Flyers

Rudder-Only has been proven to offer the most fun and satisfying experience per dollar invested of any of the R/C systems available today. With the new Commander R/O Pack you are assured of the fact that you can start with simple rudder only, and at a later date upgrade your equipment to Galloping Ghost or Fast Rate Decoded systems.

The R/O Paks feature the Dickerson transistors described above with the Rand single axis stick, and the Commander 2.4 volt superhet receiver. Has Adams actuator of the size of your choice, depending upon your aircraft, with nickel cadmium batteries wired with an on and off switch. AND each pack will serve you $10.00 if you bought the individual items separately.

The R/O Baby is for .010 to .020 jobs, has two 225 MA nickel cadmiums, and the regular Baby Adams actuator. The airborne weight is 2.8 oz.

The R/O Standard uses the LV single Adams actuator for more power for .040 to .07 jobs. Uses larger capacity nickel cadmiums. Airborne weight is 4.5 oz.

The R/O Stomper uses a twin Adams actuator for up to .15 or can be boosted for use with .19 or larger engines. Airborne weight is 4.9 oz.

Important: For overseas delivery on catalog or literature please add 20% for airmail postage. Mailed Airmail covers 2000 grams. Add 80.00 for overseas delivery of catalog or literature.

ACE RADIO CONTROL • BOX 301 • HIGGSVILLE, MO. 64037

NEW HANDBOOK-CATALOG

For the Fun Flyer and Tinkerer

The Most Exciting News in RC!

PULSE PROPORIONAL COMES OF AGE --

Adams actuators or Rand devices, to provide the most dependable combination of components.

The Commander Pulse series is offered in three basic versions: Rudder Only, Galloping Ghost, and High Rate Dual Actuator. This is a concept that has been much talked about, but has never before been achieved. It offers complete expandability between systems. It is a logical approach meant for the beginner and the sport flyer.

If you purchase the RO Commander, you can go to GG or Fast Rate. Once you gain confidence and experience, and want to move up to the next level, you may return your RO unit to the factory for conversion, and move up to Galloping Ghost or Fast Rate as a minimum expense. The same receiver is used, with a change in actuator, and batteries.

For more on expandability features with prices, watch our next ads. Also, watch for details in our 1970 catalog.

The entire Commander series features ready-to-fly custom-wired and guaranteed equipment, including airborne batteries. See below for full description of each of the versions.

COMMOMANDER R/O PULSE PACKS

Ideal for Beginners and Sport Flyers

For Galloping Ghost a change in Pulse Rate PERIOD is required as opposed to a linear change in Pulse Rate FREQUENCY.

For High Rate pulse systems with dual actuators perfect linearity of the pulse width and pulse functions is required. An additional feature is the throttle arrangement for use with "go-around" actuators that permits retention of full control of the pulse rate function during throttle command. This arrangement is used with dual adapters with special provisions. Beside the obvious advantage of retaining elevator control during throttle command, this arrangement permits the change of stops on the elevator actuator to prevent go-around. This permits a wide pulse rate change for more elevator power to hold the model in outside loops, etc.

The transmitter is housed in a two-tone vinyl case, has a voltage regulated circuitry, not found in other equipment in this price range. The Rand stick assembly is in all modes.

Airborne units for the series incorporate the time-proven Commander DE Superhet receiver which is backed by three years of production and design and successful operation in field. This receiver is coupled with the proven

NEW HANDBOOK-CATALOG

For the Fun Flyer and Tinkerer

The Most Exciting News in RC!

PULSE PROPORIONAL COMES OF AGE --

Adams actuators or Rand devices, to provide the most dependable combination of components.

The Commander Pulse series is offered in three basic versions: Rudder Only, Galloping Ghost, and High Rate Dual Actuator. This is a concept that has been much talked about, but has never before been achieved. It offers complete expandability between systems. It is a logical approach meant for the beginner and the sport flyer.

If you purchase the RO Commander, you can go to GG or Fast Rate. Once you gain confidence and experience, and want to move up to the next level, you may return your RO unit to the factory for conversion, and move up to Galloping Ghost or Fast Rate as a minimum expense. The same receiver is used, with a change in actuator, and batteries.

For more on expandability features with prices, watch our next ads. Also, watch for details in our 1970 catalog.

The entire Commander series features ready-to-fly custom-wired and guaranteed equipment, including airborne batteries. See below for full description of each of the versions.

COMMOMANDER R/O PULSE PACKS

Ideal for Beginners and Sport Flyers

For Galloping Ghost a change in Pulse Rate PERIOD is required as opposed to a linear change in Pulse Rate FREQUENCY.

For High Rate pulse systems with dual actuators perfect linearity of the pulse width and pulse functions is required. An additional feature is the throttle arrangement for use with "go-around" actuators that permits retention of full control of the pulse rate function during throttle command. This arrangement is used with dual adapters with special provisions. Beside the obvious advantage of retaining elevator control during throttle command, this arrangement permits the change of stops on the elevator actuator to prevent go-around. This permits a wide pulse rate change for more elevator power to hold the model in outside loops, etc.

The transmitter is housed in a two-tone vinyl case, has a voltage regulated circuitry, not found in other equipment in this price range. The Rand stick assembly is in all modes.

Airborne units for the series incorporate the time-proven Commander DE Superhet receiver which is backed by three years of production and design and successful operation in field. This receiver is coupled with the proven

NEW HANDBOOK-CATALOG

For the Fun Flyer and Tinkerer

The Most Exciting News in RC!

PULSE PROPORIONAL COMES OF AGE --

Adams actuators or Rand devices, to provide the most dependable combination of components.

The Commander Pulse series is offered in three basic versions: Rudder Only, Galloping Ghost, and High Rate Dual Actuator. This is a concept that has been much talked about, but has never before been achieved. It offers complete expandability between systems. It is a logical approach meant for the beginner and the sport flyer.

If you purchase the RO Commander, you can go to GG or Fast Rate. Once you gain confidence and experience, and want to move up to the next level, you may return your RO unit to the factory for conversion, and move up to Galloping Ghost or Fast Rate as a minimum expense. The same receiver is used, with a change in actuator, and batteries.

For more on expandability features with prices, watch our next ads. Also, watch for details in our 1970 catalog.

The entire Commander series features ready-to-fly custom-wired and guaranteed equipment, including airborne batteries. See below for full description of each of the versions.

**NEW PRODUCTS CHECK LIST**

Write the manufacturers for more data; tell them, "I saw it in American Aircraft Modeler."


**Scientific Models/Cutty Sark**. Beautifully carved wooden hull, precision-cast metal work, brass chain, cloth sails, characterize Scientific's lovely model of famous Clipper ship. Price including wood display stand, $9.95. Also, detailed replica of 1910 Maxwell auto, accurate in all respects, $12.95. Write Scientific Models Inc., 113 Monroe St., Newark, N. J. 07105.

**EK Products/XL-3 R/C**. Ideal for beginners and for mini-sized planes. XL-3 is lightweight and low-cost approach to proportional control. Includes single-stick transmitter, 3 Mini-Mite servos, 500 mah Nicad battery, receiver, switching harness. Price approx. $220. Write EK Products Inc., 3233 W. Euless Blvd., Hurst, Tex. 76053.

**Technisales/Retract-Gear System**. Scale, pylon and pattern flyers want reliable retractable landing gear systems. This German unit is powered by an auxiliary channel rotary-output servo. Self-locking movement, counter-balancing spring. Prices $25.95 pair main gear, $23.95 nose gear. Technisales, P. O. Box 2233, Alhambra, Calif. 91803.
Monogram/Bell UH-1B. Monogram introduces 1/4 scale Huey in fully transparent plastic skin to show off interior construction of prototype. Main, tail rotors powered by hidden electric motor. Kit includes 184 parts in authentic colors, plus details. Retail under $1. Write Monogram Models, Inc., Morton Grove, Ill. 60053.


Octura Models/New motor mount. For motors between 60 to 80 in ski boats, hydroplanes, etc. Octura "6-60" can be used in hulls having minimum 6" spacing between engine bearers. High-strength aluminum. Price $6.50. Write Octura Models, Box 506, Park Ridge, Ill. 60069.


Williams Bros/Lewis Machine Gun. Detailed scale model of Lewis scar-mount machine gun, standard for Allied multi-place WW I aircraft. Kit easy to assemble, 2" scale now available; 1/2" and 1" scales to come. 2" scale, price $1.25. Write Williams Bros., 6719 Salt Lake, Bell, Calif. 90201.
How many control-line flying models of jet aircraft have you seen lately? Very few, if any. The jet age has been with us for some time but the modeling of jet airplanes has not kept pace. The reasons for this are varied and interesting. Probably the biggest contributor is the lack of a suitable jet engine. The pulse-jet type around for so many years has not been what many modelers want. Not until somebody markets commercially the necessary fans will this become common.

So what we are left with is the glow-plug engine and propeller combination. Egads, you say, a propeller on a jet? But this is really nothing new. Look at many of the current control-line stunt designs and the jet influence is quite noticeable. True in radio control where the building and flying of jet-type models have been the increase. Besides, it even was prototype practice in the early jet days to test airframes with piston engines with props.

Obviously, I'm trying to justify the use of the prop on my MiG-21, that the real MiG ever used one are almost nil. But how many real planes have you seen that used a rubber band for a motor, or were flown at the end of some wires?

We selected the MiG-21 only just because we liked it, and also because it had several features which were very desirable, such as: a fair amount of wing area, a radome that could be disguised with a spinner, and a simple fuselage. We also had a good set of views and pictures. The real MiG-21 is in service with many of the Communist countries and apparently available to any country that has money to buy it.

The model we decided on goes under the NATO codename “Fishbed D” and can be distinguished from the earlier “C” models by the larger hump behind the canopy and the nose probe on top of the fuselage. The model is built to a scale of 1” equals 1’, which is a good-size model. Ours weighed 4 lbs.

This brings up a little problem which can be easily overcome if you plan ahead. The model most likely will be nose-heavy when built. We therefore used plywood quite liberally in the rear. No sense building a flimsy model, then having to add lead weight. Common sense should be used in building the front end strong but light. The lightest but most powerful engine available should be used. We show a K&B 40 on the plans but other 40’s work. By now you may be wondering about the flying characteristics of the model. We were somewhat dubious ourselves, however the first flight — which lasted less than a lap — did demonstrate excellent ground handling qualities. After a little more weight was added to the tail the subsequent flights were very realistic, which means that it does take another 5 lbs to the tail. Continued on page 50.

ROLAND H. BALTES

In constructing your version of the MiG, the Karlstrom centerspread drawings on the following pages will provide the scale details for a championship job. Fast and stable, the MiG also will gain high flight points.

38 November 1969
RUSSIAN MiG-21F (NATO Code: Fishbed-D)

A cleaned-up MiG-21 fitted with all-weather radar, increased fuel capacity. Two Air-to-air infra-red homing AAMs in service.

MiG-21PF in Russian AF markings
Frank Ehling's 1937 Contest Gas Model

From the pages of 1937 Air Trails, a vintage design in modern form... drawn for American Aircraft Modeler by David W. Jones, May, 1969.
HALF-SIZE VERSION OF A GREAT OLD-TIMER

‘Contest Gas Model’

"A proven design that has been a consistent winner at many meets," said this magazine over 30 years ago.

FRANK EHLING

(Publisher's Note: In 1937 editors weren't much for dressing up titles and it is a shame we don't have a great name, say like Starduster, for this great ship which won so many meets for Frank Ehling. So we say it like it was, "Contest Gas Model." This article probably makes Frank the first designer in history to have the same craft published twice—but 32 years apart. And by a coincidence your present publisher was then the editor of this same magazine—and couldn't think of a decent name apparently. Anyway, these things flew like birds. Build it, enjoy it—but by gosh don't let it fly away. It wants to. The following text is taken from the inscriptions on the Egyptian pyramids of prewar days.)

A gas model must be fundamentally sound in design and construction to withstand the wear and tear of flying. The fact that this model is recommended by Frank Ehling, its designer and builder, is proof that it fulfills this foremost requirement. His many years of experience with gas models has taught him what features to incorporate in a successful design.

Other than simplicity and durability of construction, Ehling makes the following recommendations for gas models: The wheels of the model should be placed forward of the propeller, to prevent damage in the event of bad landings resulting from poor adjustment or from hitting an obstacle and diving to the ground.

A moderate-thick wing section should be used. It produces a slower flight under power and a better glide than excessively thin or thick airfoils. The ignition system should be carried in the bottom of the fuselage for a low center of gravity position and it should slide backward or forward on track inside the bottom of the fuselage for easy balancing. The model should be finished with clear dope to give a transparent wing, with color dope used for the outline or scallops on the wing. This color combination will keep the model in sight the longest possible time.

Flying: The model weighs 3½ lbs. The wing area is about 7 sq. ft., making the ship rather lightly loaded. Test flying should be easier under these conditions. The model will suffer less from bad landings than a heavier model. Balance the model at the mid-point of the wing chord. The stabilizer has zero-incidence setting. The wing has

Continued on page 56
How Servos Function

HOWARD McENTEE

WHILE servos are a simple matter to the R/C expert, they can be a source of mystery to the novice. Let's dig into the matter. Generally, the term "servo" indicates a control mover which is powered by an electric motor. "Actuators" refer to proportional surface movers based upon permanent magnets (no motor as such). What are generally referred to as "single-channel servos" are motor-driven control movers that operate in a sequence manner. They have also been termed "motor-driven escapements." Depending upon the number of pulses they receive, they will move a rudder, for example, to right, left, or neutral. Most also have a third position that can trigger a second and similar (but not necessarily exactly the same) servo to operate an engine throttle, or possibly an elevator. These servos have a motor with a gear train to reduce output disc speed and boost torque, and a set of electrical cam contacts.

When the modeler sends one pulse, the motor rotates, drives the gear train and output disc, and also moves the cam at the proper interval, an open spot (no contact) is reached on the cam and the servo stops there. It draws no power as long as you hold the turn position (nor does it in neutral). When you release the transmitter button, the receiver relay returns to its "normally open" position, and another circuit is closed on the servo which drives the output disc until it reaches neutral. Since the spinning electric motor has lots of inertia, it would always run past any desired stop position after current to the motor was cut. So ingenious circuitry applies a brief instant of reverse polarity voltage to the motor (this tends to try to drive it backward). This "electrical braking" brings the motor to a precise stop, just where you want it.

We mentioned a relay on the receiver to control the servo, but transistor circuitry will also do the job, and is widely used today.

Getting into simple proportional systems, the simplest servo is the spring-centered style. The transmitter of such a system includes a pulser (also called an "encoder") that sends a continuous string of pulses — generally on half the time, and off the other half, to produce neutral, or a centered rudder. Sophisticated receivers and systems utilize electronic decoders (which are also known as pulse-length detectors), but in the simplest systems the servo itself is the decoder. It detects the changes in pulse length obtained at the transmitter by varying position of the control lever or knob and moves the rudder accordingly. It stops when the voltage it is receiving, and its particular spring tension balance out with the average pulse length coming from the transmitter.

The motor is fed alternate pulses of voltage from the two sets of batteries, positive on a given motor terminal might drive the armature clockwise, while negative on the same terminal would produce counterclockwise rotation. At neutral, therefore, the armature just wiggles back and forth, making perhaps several revolutions each direction. Speed reduction gearing is always used with such servos today, and if the reduction is great enough, the rudder will just have a slight back and forth wiggle in neutral.

Such servos always have a centering spring. This need not be very strong. In fact, it shouldn't be, for excess spring tension simply absorbs servo output power that would better be used to move the rudder. Tension should be enough to drive the servo toward (but not necessarily exactly) to neutral, if the servo is deflected to its limits with power off. In flight, air pressure on the deflected rudder tends to drive it back to neutral (and also increases the load on the servo, of course).

Spring-centered proportional servos are relatively inefficient; they draw power from triangular disc on top. One servo for elevator (left) and one for rudder AND throttle. 4. Two-servo installation of older, larger servos with elevator and rudder operated from rotary arm output. Linear push-pull output not used. 5. Another modern miniature feedback servo with two reciprocal push-pull outputs.
1969 National Model Airplane Championships

BIG. That was the 1969 Nationals. It was so big that questions were heard about whether this one was the biggest ever. Complete historical statistics were not available at press time, but some comparisons are possible from recent records: the 1968 Nats at Chicago was the biggest in the last five years, and the 1969 meet was about the same in number of contestants registered — but a record number of AMA members (over 400) registered as mechanics, running the total registrants to an all-time high, over 1,500!

The 1969 meet, held at Willow Grove Naval Air Station, near Philadelphia, was bigger than the last National Contest by the same location in 1968 by about 200. The 1969 meet was also bigger than last year’s Nats at Olathe, Kansas. A tremendous late entry surge at Olathe resulted in a total registration of almost 1,100. This year there were more than that many advance entries by mail, and about one hundred and twenty contestant entries were added at the meet, besides several hundred mechanics.

There were more events than ever at the 1969 meet — 38 separate events, most divided into the three AMA age classes. There were 17 Control Line events, 12 Outdoor Free Flight, 5 Indoor Free Flight and 4 Radio Control. RC Pattern had a staggering 144 entries compared with 100 in 1968. RC Pylon Racing, which had been predicted to have as many entries as Pattern, ended up with considerably less — just over 80 — reflecting the fact that the event is not yet as popular in the east as it is in the west, although the new Formula II event drew a respectable 21 entries. RC Scale took a big jump — 45 entries.

Free Flight had some awesome event entries: 355 in 1/2A Gas, 283 in A Gas, 319 in HL Glider, and over 200 in Nordica Glider. Control Line activity was generally up from last year, including an incredible 135 in Combat Profile Carrier, a brand new event this year, drew 58 entries. Encouraging to FAI control-lineers, who have been worried about declining activity, were increases in entries for FAI Speed and FAI Team Racing. The latter event had 30 entries this year as compared with only 8 in 1968, and FAI Speed this year had 37 entries.

Indoor buffs this year had more activity than ever before. Besides two days of Nats flying instead of the usual one, there was a third day of FAI team selection flying. In the Indoor Team Finals Sunday, July 11, the top players (who comprise the U.S. team for the 1970 Indoor World Championships) were Jim Richmond, Bensenville, Ill.; Pete Andrews, Scranton, Pa.; and Clarence Mather, San Diego, Calif.

Indoor Scale was flown for the first time as a Nats event, and there were 62 entries — more than the traditional Stick, Paper and "Snoopy’s Dog House" in the foreground.

"As a former model airplane builder and contestant at the Nats, I applaud your endeavors and wish you God speed," concluded the telegram to Astronaut Neil Armstrong and the crew of Apollo 11 which was sent at the time of blast-off for the historic flight to the moon. Glenn Godden, 15, the Junior AMA-HIAA-NAVY Regional Meet winner from Seattle, Wash., signed the message on behalf of all Nats entrants. John Worth, AMA executive director, and Captain Nicholas Brango, Commanding Officer of Willow Grove Naval Air Station, witnessed the event.

Grand National Champion Trophy was awarded to Buck Servaites by Admiral Bernard Strean and Miss Model Aviation for 1969, Chris Gorman.
**NATIONAL CHAMPIONS**

**Grand Champion**
Buck Servaites, Dayton, Ohio

**Junior**
Mark Kerr, Philadelphia, Pennsylvania

**Senior**
Gary Myers, Miami, Florida

**Open**
Buck Servaites, Dayton, Ohio

**Radio Control**
Larry Leonard, Canoga Park, California

**AMA Club Team**
Golden Eagles, Brockway, Pa., and Esso Aircraft Model Co., Inc. (Fred Gathright and Donald Reed.)

**Nats Team**
U.S. Air Force Team (Bert Dugan, Larry Miller, George Brown III, Philip Bayley and Charles Stiles.)

**SPECIAL AWARDS**

**Nordic A-2 Glider:** Peter J. Allnutt, Toronto, Canada, Muhilhi (High time regardless of age, Unlimited Rubber): Michael Bailey, Smyrna, Georgia

**Junior Radio Control Open**
Buck Servaites, Dayton, Ohio

**Grand Champion**
Gary Myers, Miami, Florida

**Buck Servaites, Dayton, Ohio**

**National Champions**

**Hoffman Memorial (High time regardless of age. A**
Karl Schubert, Moore, Okla., and Charles Stiles.)

**Tulsa Glue Dobbers (High time regardless of age, Outdoor H. L, Glider): Philip Klintworth, Troy, Mich.**

**PERPETUAL TROPHIES & SPECIAL AWARDS**

**Dallas, Texa**

**Sam Fly, Dallas, Texas**

**Art Chester (Best scale model, RC Pylon For**

**World Engines, Inc.; World Wide Radio Control.**

**1968 NATS SPONSORS**

Approximately 350 awards were provided through the contributions of the following:

**Ace R/C, Inc.: Adel Division, DeLaval**

**Turbo, Inc., and American**

**Airplane Modeler; Andrews Aircraft**

**Model Co., Inc., Arista-Craft Distinctive**

**Miniatures; Burgess Battery Company;**

**Carl Goldberg Models, Inc.; Citizen-Ship**

**Radio Corporation; Comet Model Hobby**

**Craft Corporation; Jasco; K and B Manu-**

**facturing; Kraft Systems, Inc.**

**Lanter Industries, Inc.; Micro-Avionics, Inc.,**

**Midwest Products Co., Model Rectifier**

**Corporation; Orbit Electronics, Inc.; Pacific**

**Chemical Co., Inc.; Paul K. Guillow, Inc.;**

**Perit-Hobbyshop; Progress Manufacturing**

**Co.; Rand Manufacturing, RC Modeler Mag-**

**azine; Rotary Pen Corp.; Russell, Marsh and**

**Kennedy, Inc.**

**Science Models, Inc.; Sig Manufacturing Co., Inc.;**

**Sterling Models, Sullivan Products;**

**Tatone Products; The Testor Corporation;**

**Top Flite Models, Inc.; Western Model**

**Distributors; Williams Brothers; World**

**Engines, Inc.; World Wide Radio Control.**

**1968 NATS ENTRIES**

**Entries by Event**

<table>
<thead>
<tr>
<th>Event</th>
<th>Jr.</th>
<th>Sr.</th>
<th>Open</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Free Flight</strong></td>
<td>10</td>
<td>4</td>
<td>16</td>
<td>26</td>
</tr>
<tr>
<td><strong>A Gas</strong></td>
<td>45</td>
<td>15</td>
<td>28</td>
<td>88</td>
</tr>
<tr>
<td><strong>B Gas</strong></td>
<td>17</td>
<td>14</td>
<td>15</td>
<td>46</td>
</tr>
<tr>
<td><strong>C Gas</strong></td>
<td>165</td>
<td>12</td>
<td>28</td>
<td>205</td>
</tr>
<tr>
<td><strong>FAI Power</strong></td>
<td>11</td>
<td>10</td>
<td>21</td>
<td>42</td>
</tr>
<tr>
<td><strong>Portland Rubber</strong></td>
<td>7</td>
<td>3</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td><strong>Unlimited Rubber</strong></td>
<td>15</td>
<td>4</td>
<td>19</td>
<td>38</td>
</tr>
<tr>
<td><strong>Nordic Glider</strong></td>
<td>21</td>
<td>6</td>
<td>27</td>
<td>54</td>
</tr>
<tr>
<td><strong>Rocket Power</strong></td>
<td>10</td>
<td>6</td>
<td>16</td>
<td>32</td>
</tr>
<tr>
<td><strong>Helicopter</strong></td>
<td>10</td>
<td>6</td>
<td>16</td>
<td>32</td>
</tr>
<tr>
<td><strong>Radio Control</strong></td>
<td>12</td>
<td>12</td>
<td>14</td>
<td>30</td>
</tr>
<tr>
<td><strong>A Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>B Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>C Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

**NAT'S ENTRIES**

**Junior**

<table>
<thead>
<tr>
<th>Event</th>
<th>Jr.</th>
<th>Sr.</th>
<th>Open</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>B Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>C Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

**Senior**

<table>
<thead>
<tr>
<th>Event</th>
<th>Jr.</th>
<th>Sr.</th>
<th>Open</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>B Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>C Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

**Open**

<table>
<thead>
<tr>
<th>Event</th>
<th>Jr.</th>
<th>Sr.</th>
<th>Open</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>B Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>C Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

** Junior-Senior**

<table>
<thead>
<tr>
<th>Event</th>
<th>Jr.</th>
<th>Sr.</th>
<th>Open</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>B Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>C Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

**Jet Speed**

<table>
<thead>
<tr>
<th>Event</th>
<th>Jr.</th>
<th>Sr.</th>
<th>Open</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>B Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>C Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

**FAI Speed**

<table>
<thead>
<tr>
<th>Event</th>
<th>Jr.</th>
<th>Sr.</th>
<th>Open</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>B Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>C Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

**Control Line**

<table>
<thead>
<tr>
<th>Event</th>
<th>Jr.</th>
<th>Sr.</th>
<th>Open</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>B Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>C Speed</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

**Trailer park was an ideal housing solution for a number of modeling families at NAS Willow Grove — not available at all Nats. In background is Hangar 80 which housed AMA HQ, scale model judging, Navy Displays, Delta Dorl building and contests, and entry processing for which those below (who arrived ahead of time) are waiting.**

**November 1969**
Avro Lancaster of Linton Keith attracted many photographers. Navy Carrier models are judged by factors full-size planes must excel in—high speed, slow speed and carrier landing. Edwin Peterson, Jr., pull-tests.


Navy Carrier models are judged by factors full-size planes must excel in—high speed, slow speed and carrier landing. Edwin Peterson, Jr., pull-tests.

Practice flights by Dennis Adamisin, Taylor, Mich., before start of Junior CL Stunt event, paid big dividends as he won first place. Older brother, David, took fourth in Sr.
Huge crowd at RC area gathered daily. Golf cart has portable loudspeaker which was manned by Bob Lutker. He toured all activities and described events to uninstructed.

Hale Wallace inspects Bell P-63A Kingcobra that placed him second in RC Scale. The twelve-pound model has operable flaps and dropable tanks.

"Pappy" deBolt pilots while Ed Keck signals turns and Gene Stiles times. Hale Wallace inspected Bell P-63A Kingcobra that placed him second in RC Scale. The twelve-pound model has operable flaps and dropable tanks.

Left: Curtiss JN4-D Jenny of Walt Moucha has graceful flight characteristics, placed 3rd in RC Scale. Model weighed 12’s pounds, powered by OS Max 80, controlled by Micro-Avionics. Lower photo shows landing approach being watched intently by flight judge Rudy Black. Above: RC Scale Achievement Award winner Dr. Norman Evans with DeHavilland DH-2. Young observer is his son.

U.S. Navy photo
Larry Leonard gets some pointers from Cliff Weirick, a former RC winner. Leonard went on to win Pattern as well as Formula 1 Pylon Racing.

Larry Leonard gets some pointers from Cliff Weirick, a former RC winner. Leonard went on to win Pattern as well as Formula 1 Pylon Racing.

Larry Leonard gets some pointers from Cliff Weirick, a former RC winner. Leonard went on to win Pattern as well as Formula 1 Pylon Racing.

Larry Leonard gets some pointers from Cliff Weirick, a former RC winner. Leonard went on to win Pattern as well as Formula 1 Pylon Racing.

Larry Leonard gets some pointers from Cliff Weirick, a former RC winner. Leonard went on to win Pattern as well as Formula 1 Pylon Racing.

Larry Leonard gets some pointers from Cliff Weirick, a former RC winner. Leonard went on to win Pattern as well as Formula 1 Pylon Racing.

Larry Leonard gets some pointers from Cliff Weirick, a former RC winner. Leonard went on to win Pattern as well as Formula 1 Pylon Racing.

Larry Leonard gets some pointers from Cliff Weirick, a former RC winner. Leonard went on to win Pattern as well as Formula 1 Pylon Racing.

Larry Leonard gets some pointers from Cliff Weirick, a former RC winner. Leonard went on to win Pattern as well as Formula 1 Pylon Racing.

Larry Leonard gets some pointers from Cliff Weirick, a former RC winner. Leonard went on to win Pattern as well as Formula 1 Pylon Racing.

Larry Leonard gets some pointers from Cliff Weirick, a former RC winner. Leonard went on to win Pattern as well as Formula 1 Pylon Racing.

Larry Leonard gets some pointers from Cliff Weirick, a former RC winner. Leonard went on to win Pattern as well as Formula 1 Pylon Racing.

Larry Leonard gets some pointers from Cliff Weirick, a former RC winner. Leonard went on to win Pattern as well as Formula 1 Pylon Racing.

Larry Leonard gets some pointers from Cliff Weirick, a former RC winner. Leonard went on to win Pattern as well as Formula 1 Pylon Racing.

Larry Leonard gets some pointers from Cliff Weirick, a former RC winner. Leonard went on to win Pattern as well as Formula 1 Pylon Racing.

Larry Leonard gets some pointers from Cliff Weirick, a former RC winner. Leonard went on to win Pattern as well as Formula 1 Pylon Racing.
Dick Colonna sets dethermolizer fuse in his A-2 Towline model as Edward Ham engages line – placed 2nd.

Free Flight model by Alan Vollmer looks like a low wing, but down angle of surfaces should give high-thrust pylon forces.

B GAS

Jay Gass

C GAS

Jay Gass

FAI POWER

Ralph Biggs

WAKEFIELD RUBBER

Michael Bailey

UNLIMITED RUBBER

Robert Sifteet

November 1969
1969 FREE FLIGHT WORLD CHAMPIONSHIPS - AUSTRIA - AUGUST 12 - 17

Nordic: 1st - Russia; 2nd - Czechoslovakia; 3rd - Italy; 6th - U. S. A.

<p>| | | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Pataki, G.</td>
<td>Hungary</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>177</td>
<td>1257</td>
</tr>
<tr>
<td>3.</td>
<td>Prochazka, O.</td>
<td>Czech.</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>175</td>
<td>176</td>
<td>180</td>
<td>1251</td>
</tr>
<tr>
<td>4.</td>
<td>Czerny, P.</td>
<td>Poland</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>165</td>
<td>180</td>
<td>180</td>
<td>1245</td>
</tr>
<tr>
<td>5.</td>
<td>Grigorasch, A.</td>
<td>Russia</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>168</td>
<td>180</td>
<td>173</td>
<td>1241</td>
</tr>
<tr>
<td>29.</td>
<td>Taylor, Jim</td>
<td>U. S. A.</td>
<td>105</td>
<td>180</td>
<td>180</td>
<td>130</td>
<td>180</td>
<td>180</td>
<td>1133</td>
</tr>
<tr>
<td>31.</td>
<td>Xenakis, George</td>
<td>U. S. A.</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>127</td>
<td>152</td>
<td>153</td>
<td>1132</td>
</tr>
<tr>
<td>34.</td>
<td>Klintworth, Phil</td>
<td>U. S. A.</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>176</td>
<td>167</td>
<td>167</td>
<td>1123</td>
</tr>
</tbody>
</table>

Wakefield: 1st - Russia; 2nd - E. Germany; 3rd - U. S. A.

<p>| | | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Oschatz, A.</td>
<td>E. Germany</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>1260</td>
</tr>
<tr>
<td>2.</td>
<td>Martin, H.</td>
<td>Austria</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>171</td>
<td>180</td>
<td>180</td>
<td>1251</td>
</tr>
<tr>
<td>3.</td>
<td>Silberg, I.</td>
<td>Russia</td>
<td>180</td>
<td>170</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>1250</td>
</tr>
<tr>
<td>4.</td>
<td>Loffler, J.</td>
<td>E. Germany</td>
<td>180</td>
<td>180</td>
<td>161</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>1241</td>
</tr>
<tr>
<td>5.</td>
<td>Gard, John</td>
<td>U. S. A.</td>
<td>180</td>
<td>180</td>
<td>160</td>
<td>171</td>
<td>180</td>
<td>180</td>
<td>1231</td>
</tr>
<tr>
<td>17.</td>
<td>Xenakis, George</td>
<td>U. S. A.</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>96</td>
<td>180</td>
<td>180</td>
<td>1176</td>
</tr>
</tbody>
</table>

Power: 1st - Italy; 2nd - Hungary; 3rd - U. S. A.

<p>| | | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Baumann, F.</td>
<td>W. Germany</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>1260</td>
</tr>
<tr>
<td>2.</td>
<td>Rieke, K. H.</td>
<td>W. Germany</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>1260</td>
</tr>
<tr>
<td>3.</td>
<td>Spence, Henry</td>
<td>U. S. A.</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>130</td>
<td>180</td>
<td>180</td>
<td>1260</td>
</tr>
<tr>
<td>4.</td>
<td>Friis, H.</td>
<td>Sweden</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>1260</td>
</tr>
<tr>
<td>5.</td>
<td>Spring, P.</td>
<td>Switzerland</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>1260</td>
</tr>
<tr>
<td>6.</td>
<td>Koster, T.</td>
<td>Denmark</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>1260</td>
</tr>
<tr>
<td>7.</td>
<td>Fiegl, B.</td>
<td>Italy</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>1260</td>
</tr>
<tr>
<td>8.</td>
<td>Krycer, B.</td>
<td>Czech.</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>1260</td>
</tr>
<tr>
<td>10.</td>
<td>Savini, S.</td>
<td>Italy</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>1260</td>
</tr>
<tr>
<td>24.</td>
<td>Sifleet, Bob</td>
<td>U. S. A.</td>
<td>156</td>
<td>158</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>1214</td>
</tr>
<tr>
<td>25.</td>
<td>Norton, Sandy</td>
<td>U. S. A.</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>179</td>
<td>177</td>
<td>145</td>
<td>1201</td>
</tr>
</tbody>
</table>

By special arrangement with the publisher this page is produced at the very last minute, just before the magazine is printed, to bring you the latest news concerning current Academy of Model Aeronautics events of national significance.
Within the next month each AMA member should receive a ballot listing the names of the certain AMA officers to serve the 1970-1971 term. The expiring terms to be filled are for the offices of national secretary-treasurer, regional vice presidents for AMA Districts I, III, V, VII, IX and XI.

When the Nominating Committee met during the 1969 National Contest it operated by procedures promulgated by the Executive Council earlier in the year. Among other things, these procedures (detailed in the AMA News section of the June 1969 AAM) call for the names of possible candidates to be submitted in writing prior to the beginning of the Nominating Committee meeting.

Fortunately it seems that membership interest in the election is minimal as only one nomination per officer position was received by the published deadline of 12 p.m. on Wednesday, July 16, except for District III. Therefore, most candidates will run unopposed except for possible write-in votes (for which space will be provided on the ballot). The 1969 election slate is as follows:

**Secretary-Treasurer**
- Earl Witt, Chamber of Commerce, 105 E. Main St., Annapolis, Md.

**District II V.P.**
- Robert Stilich, Albany, Ore.

Represented in the Nominating Committee meeting were AMA Districts I, II, III, IV, VII, IX and XI.

**New District II V. P.**

During the 1969 Nats Art Schroeder, District II V.P. (New Jersey) AMA Vice President, announced his resignation to be effective at the conclusion of the contest. Schroeder indicated his inability to continue representing his area and also do other chores he has recently taken on.

The Executive Council regretfully accepted the resignation but was pleased with Schroeder’s recommendation of William Boss to fill the unexpected term. The Council officially installed Boss in office.

Boss is president of the New York Association of Model Airplane Clubs and was runner-up in the 1968 AMA election for District II V.P. His address is 145-24 22nd St., Laurelton, N.Y. 11413.

**CONTEST CALENDAR**

Official Sanctioned Contests of the Academy of Model Aeronautics


**The Nats “Delta Dart” event outwore all the others — over 3,000 entries Philadelphia area youngsters on four days to first build AMA Cub rubber models and then fly them in competition. Bob Lopshire, AMA Junior Committee chairman, organized building and flying sessions.**

**AMA Elections for 1970-71**
Oldest producer of digital systems.

Welcome to our 5th Anniversary

SELL-A-BRATON!

Two stick, 5 channel digital systems

$369.95 Hurry, limited time only!

Similar savings on all Logitrol systems

See your dealer Tell him to write for attractive new dealer plan!

SALES and SERVICE CENTERS

Los Angeles Area
EK WEST (213) 926-7733
23625 Pineforest Lane
Harbor City, Calif. 90710

San Francisco Area
NELSON MODEL PRODUCTS, INC
6053 Dougherty Road (415) 828-4350
Dublin, Calif. 94566

Kansas City Area
KEN'S R/C (913) 631-3158
10915 W. 59th Terrace
Shawnee, Kansas 66203

Northeast Area
NEW ENGLAND R/C, INC (617) 343-4827
340 Broad St. R. O. Box 437
Fitchburg, Mass. 01420

In Mexico
AEROMODELISMO
Calz. Guadalupe 602-A
Mexico 14, D. F

Chicago Area
RADIO CONTROL CENTRAL
Box 449 Elmhurst, Ill. 60126
Service (312) 541-3192
Sales (312) 532-4908

Southeast Area
TATES MODEL ELECTRONICS
6275 S. Expressway, Box 73
Jenksboro, Ga. 30736
(404) 361-8098

American Aircraft Modeler
ALL SYSTEMS GO...
COUNTDOWN FOR SERVICE

Immediate off-the-shelf delivery of Orbit Systems and accessories at all Service Centers.

Seven day or less guaranteed repair service.

Personal attention by guys in-the-know.

ORBIT NORTHEAST:
3833 Harlem Road
Buffalo, N.Y. 14215
Phone: 716/836-6680
Hal DeBolt, manager

ORBIT EAST:
P.O. Box 184
Lavonia, Ga. 30553
Phone: 404/356-3232
Doss Steed, manager

ORBIT SOUTHWEST:
118 Rhonda Drive
Universal City, Texas 78148
Phone: 512/658-2633
Rex O’Conners, manager

ORBIT CANADA:
Box 126 Station “E”
Hamilton, Ontario, Canada

ORBIT MEXICO:
D. Jimenez y Muro
No. 17 Col. Periodista
Mexico 10, D.F.
Luis Brunner, manager

ORBIT EUROPE:
Comptoir Commercial & Industrial Tenco Division
Ave. de la Couronne 358-362
Brussels 5, Belgium
Phone: 49-91-40
Phil Cohen, manager

ORBIT WEST FACTORY:
11601 Anabel Avenue
Garden Grove, Calif. 92640
Phone: 714/534-0170
John Elliot, manager

© 1969 Orbit Electronics.
Sig’s semi-scale D.H. CHIPMUNK won Senior C/L Stunt at the 1969 National Model Championships!

One of America’s most popular C/L stunters is a Sig’s semi-scale CHIPMUNK, designed by Paul and Mel Stoltz and built to be competitive. The Chipmunk’s sleek, narrow fuselage and high wing is a throwback to the era of the 1960s. Now, with new parts, the Chipmunk can be reassembled from the original kit in less than 24 hours. Sig now has new parts and a complete set of replacement parts available for the Chipmunk.

The Chipmunk’s wings have been redone and its fuselage is a throwback to the era of the 1960s. The Chipmunk is now available in a new color scheme, and new parts are available for the Chipmunk.

**New BALSA**

<table>
<thead>
<tr>
<th>Name</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birch PLYWOOD</td>
<td>10'</td>
<td>1/8&quot;</td>
<td>1/8&quot;</td>
</tr>
<tr>
<td>Birch DOWELS</td>
<td>10'</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
</tr>
<tr>
<td>Birch LAMINATE</td>
<td>10'</td>
<td>1/8&quot;</td>
<td>1/8&quot;</td>
</tr>
<tr>
<td>Birch PANELS</td>
<td>10'</td>
<td>1/2&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>Birch SHEETS</td>
<td>10'</td>
<td>1/16&quot;</td>
<td>1/16&quot;</td>
</tr>
<tr>
<td>Birch STRIPS</td>
<td>10'</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
</tr>
</tbody>
</table>

**New BALSA**

<table>
<thead>
<tr>
<th>Name</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birch PLYWOOD</td>
<td>10'</td>
<td>1/8&quot;</td>
<td>1/8&quot;</td>
</tr>
<tr>
<td>Birch DOWELS</td>
<td>10'</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
</tr>
<tr>
<td>Birch LAMINATE</td>
<td>10'</td>
<td>1/8&quot;</td>
<td>1/8&quot;</td>
</tr>
<tr>
<td>Birch PANELS</td>
<td>10'</td>
<td>1/2&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>Birch SHEETS</td>
<td>10'</td>
<td>1/16&quot;</td>
<td>1/16&quot;</td>
</tr>
<tr>
<td>Birch STRIPS</td>
<td>10'</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
</tr>
</tbody>
</table>

**New BALSA**

<table>
<thead>
<tr>
<th>Name</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birch PLYWOOD</td>
<td>10'</td>
<td>1/8&quot;</td>
<td>1/8&quot;</td>
</tr>
<tr>
<td>Birch DOWELS</td>
<td>10'</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
</tr>
<tr>
<td>Birch LAMINATE</td>
<td>10'</td>
<td>1/8&quot;</td>
<td>1/8&quot;</td>
</tr>
<tr>
<td>Birch PANELS</td>
<td>10'</td>
<td>1/2&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>Birch SHEETS</td>
<td>10'</td>
<td>1/16&quot;</td>
<td>1/16&quot;</td>
</tr>
<tr>
<td>Birch STRIPS</td>
<td>10'</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
</tr>
</tbody>
</table>

**New BALSA**

<table>
<thead>
<tr>
<th>Name</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birch PLYWOOD</td>
<td>10'</td>
<td>1/8&quot;</td>
<td>1/8&quot;</td>
</tr>
<tr>
<td>Birch DOWELS</td>
<td>10'</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
</tr>
<tr>
<td>Birch LAMINATE</td>
<td>10'</td>
<td>1/8&quot;</td>
<td>1/8&quot;</td>
</tr>
<tr>
<td>Birch PANELS</td>
<td>10'</td>
<td>1/2&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>Birch SHEETS</td>
<td>10'</td>
<td>1/16&quot;</td>
<td>1/16&quot;</td>
</tr>
<tr>
<td>Birch STRIPS</td>
<td>10'</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
</tr>
</tbody>
</table>

**New BALSA**

<table>
<thead>
<tr>
<th>Name</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birch PLYWOOD</td>
<td>10'</td>
<td>1/8&quot;</td>
<td>1/8&quot;</td>
</tr>
<tr>
<td>Birch DOWELS</td>
<td>10'</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
</tr>
<tr>
<td>Birch LAMINATE</td>
<td>10'</td>
<td>1/8&quot;</td>
<td>1/8&quot;</td>
</tr>
<tr>
<td>Birch PANELS</td>
<td>10'</td>
<td>1/2&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>Birch SHEETS</td>
<td>10'</td>
<td>1/16&quot;</td>
<td>1/16&quot;</td>
</tr>
<tr>
<td>Birch STRIPS</td>
<td>10'</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
</tr>
</tbody>
</table>

**New BALSA**

<table>
<thead>
<tr>
<th>Name</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birch PLYWOOD</td>
<td>10'</td>
<td>1/8&quot;</td>
<td>1/8&quot;</td>
</tr>
<tr>
<td>Birch DOWELS</td>
<td>10'</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
</tr>
<tr>
<td>Birch LAMINATE</td>
<td>10'</td>
<td>1/8&quot;</td>
<td>1/8&quot;</td>
</tr>
<tr>
<td>Birch PANELS</td>
<td>10'</td>
<td>1/2&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>Birch SHEETS</td>
<td>10'</td>
<td>1/16&quot;</td>
<td>1/16&quot;</td>
</tr>
<tr>
<td>Birch STRIPS</td>
<td>10'</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
</tr>
</tbody>
</table>

**New BALSA**

<table>
<thead>
<tr>
<th>Name</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birch PLYWOOD</td>
<td>10'</td>
<td>1/8&quot;</td>
<td>1/8&quot;</td>
</tr>
<tr>
<td>Birch DOWELS</td>
<td>10'</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
</tr>
<tr>
<td>Birch LAMINATE</td>
<td>10'</td>
<td>1/8&quot;</td>
<td>1/8&quot;</td>
</tr>
<tr>
<td>Birch PANELS</td>
<td>10'</td>
<td>1/2&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>Birch SHEETS</td>
<td>10'</td>
<td>1/16&quot;</td>
<td>1/16&quot;</td>
</tr>
<tr>
<td>Birch STRIPS</td>
<td>10'</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
</tr>
</tbody>
</table>

**New BALSA**

<table>
<thead>
<tr>
<th>Name</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birch PLYWOOD</td>
<td>10'</td>
<td>1/8&quot;</td>
<td>1/8&quot;</td>
</tr>
<tr>
<td>Birch DOWELS</td>
<td>10'</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
</tr>
<tr>
<td>Birch LAMINATE</td>
<td>10'</td>
<td>1/8&quot;</td>
<td>1/8&quot;</td>
</tr>
<tr>
<td>Birch PANELS</td>
<td>10'</td>
<td>1/2&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>Birch SHEETS</td>
<td>10'</td>
<td>1/16&quot;</td>
<td>1/16&quot;</td>
</tr>
<tr>
<td>Birch STRIPS</td>
<td>10'</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
</tr>
</tbody>
</table>
Kit 172 BALTIMORE CLIPPER, 22" Deluxe kit, printed cloth sails, metal fittings, $18.95.

Kit 164 BLUENOSE, 24" Authentic sleek trim lines, fine detail metal fittings, printed cloth sails, $18.95.

Kit 165 SOVEREIGN OF THE SEAS, 23" 1852 model, Collector's model, Kit has finely detailed parts, $18.95.

Kit 170 U.S.S. CONSTITUTION, "Old Ironsides", 23" exactly as she was, $9.95.

Kit 171 SEA WITCH, 24" Printed cloth sails, realistic metal fittings, $18.95.

Kit 163 CUTTY SARK, CLIPPER SHIP, 23" exact scale replica of world's fastest ship, Printed cloth sails, $18.95.

SCIENTIFIC MODELS, INC.
111 MONROE STREET

November 1969
A Veco 14" needle-nose spinner is used for display and flying. The rockets are made from wood dowels with plywood fins. Pylons are made from balsa.

I fly my model on 60' lines. A paved flying surface is a must!

**R/C Championships**

Continued from page 30

maneuvers, many planes designed for FAI competition are larger than average U.S. contest designs. Some would fare poorly in the intricate and rather sharp maneuvers required in the U.S. Class-C schedule. Our team felt we should get closer to the FAI stunt schedule, or adopt it outright for top competitions. It is tough to have to master two flight patterns, and in different in style. A top competition pilot in the States must be equally adept at both.

Almost everyone used digital proportional equipment. (The percentage of U.S. prop systems is dropping as more overseas equipment is developed.) Our count shows that only of the 67 flyers used U.S.-make gear, and some of this may have been manufactured overseas under license.

Engines were all 60's or 61's. Our count showed 21 Supertigre, 11 Rossi, 7 Mercia, 6 Webra, and smaller numbers of other makes.

Other than generally larger size for the sweeping FAI maneuvers, many models featured considerable fuselage side area, to help in clean rolling maneuvers, especially Slow Roll.

Innovations were seen. Several flyers had working flaps. Marrot had unusual flaps hinged in the middle, at the wing trailing edge near the fuselage. When actuated, they projected both above and below the wing surface, to provide drag. The flaps were used only for landings and Tail Slide. Several flyers had in-flight trimmable needle valves, several others retractable landing gears. All models were equipped with mufflers since Germany has a mandatory muffler rule. Some, however, were pretty loud—maybe gutted to reduce back-pressure?

A variety of frequencies were available: spots near 12, 27, 32, 40, 72-75, 144, 433 MHz as well as the 50-MHz band. Official tally shows that all were on 27 MHz (using the spots standard in the U.S. plus 27.12 MHz.) except for six on 72-75 MHz and two = 32 MHz.

Every World Championships has had its good and bad points. U.S. modelers used to meet with 60 to 70 contestants, more than one flight line, with half a dozen events, may think it odd a World Championships has so many problems. Transmitter impounding was a sore point, no "reserve time" was al-

---

**EVERY GOOD GUY GIVES THE UNITED WAY**

---

**CONTROL-LINE PLANES**

Gas Powered Models for Small 1/2A. Engines: .020 to .12-.25.

---

**EVERY GOOD GUY GIVES THE UNITED WAY**

---

**SCIENTIFIC MODELS, INC.**

111 MONROE STREET NEWARK, N.J. 07105

---

American Aircraft Modeler
SCHWEIZER 2-32
A truly magnificent 42½" reproduction of the Schweizer 2-32 sailplane. With the tremendous popularity of sailplane flying today, the Schweizer is a must for every modeler. Faithfully reproduced, the flight performance of this giant 42½" beauty is truly amazing. It performs like a real competition tow-line glider. $2.98

SOPWITH CAMEL
This is the "super-famous" fighter which constantly flies over the front lines looking for the "Red Baron." Our kit is an authentic reproduction of this classic World War I bi-plane; and an excellent flyer. $3.98

AERONCA C-3
This marvelous airplane trained many thousands of pilots in the early 30's. It is especially dear to the hearts of all scale model builders because it is so well suited to great model flying with its large wing and tail, and low center gravity. $3.98

THE BEST MODEL PAINTING IS DONE WITH AN AIR-BRUSH
More natural, more authentic painting and finishing. Mix your own colors. Fogging, blending, custom finishing without brush marks.

ECONOMY MODEL ONLY $6.98 RETAIL
BADGER PAINT-SPRAY AIR-BRUSH
PROFESSIONAL TYPE
BADGER hobby & touch-up AIR-BRUSH

Getting Started
Continued from page 40
The batteries of the transmitter, even when they are at neutral, however, are still left with plenty of output power and are of simple construction. Well-designed servos of this type are surprisingly precise, move rapidly, and have ample power for control purposes in small planes. Their high capacity battery drain is no problem in these days of nickel-cad batteries.

Feedback servos are sophisticated, draw much less current (they draw very small power except when they are actually moving) than spring-centered types. The motor of a feedback servo also has a reduction gear train linked to the output disc (or to push-pull output, and sometimes to both). There is also a potentiometer linked directly to the gear driving the servo output shaft. This is the "centering pot." At neutral, the moving arm of this pot is at such a position on the resistance element that there is no (or very little) current going to the motor. An incoming turn signal from the transmitter (in simple propo systems, this could be a pulse-width or pulse-rate change reaching the servo transistor amplifier, "unbalances" the amplifier circuit to which the centering pot is connected. This results in current in proportion to polarity reaching the motor to drive it in the desired direction. The motor turns, and the pot turns with it — until a balance is again reached under the new conditions. Whereupon drive power to the motor is cut off, and the servo stops. It stays at that deflected position until the transmitter stick is moved to neutral or to any other off-center position. When no deflection is repeated.

In the past the pot has been the real problem of feedback servos, due to wear and becoming dirty. This trouble has just about been licked currently. The control pot in the transmitter gets just as much movement as the corresponding centering pot in the servo, of course. But it isn't subject to constant and heavy vibration as is the servo pot, so has a much longer and more peaceful life.

Digital servos are also of the feedback style, but they have added circuitry not required in the simpler feedback pots found in analog propo systems, and we won't go into these extra complexities now.

BADGER AIR-BRUSH CO.
2020 CAPE AVENUE - FRANKLIN PARK, ILLINOIS 60131

PROFESSIONAL TYPE
BADGER hobby & touch-up AIR-BRUSH
they're the GREATEST!

1 THE SERIES! 24 OTHER RUBBER POWERED FLYING MODELS — $1.49 to $3.98
ALL EASILY CONVERTED TO GAS POWER FOR CONTROL LINE, FREE FLIGHT OR RADIO CONTROL (EXCEPT KIT A-27).

PRECISION MADE for Easy ASSEMBLY
Kits made of selected wood. Parts die cut accurately for easy, trouble-free assembly... plus all this: detailed plastic parts, plastic prop, rubber wheels, finished nose parts, authentic scale decals, full-size plans with simple instructions!

STERLING MODELS - BELFIELD AVE. and WISTER ST. PHILADELPHIA, PA. 19144

If no dealer available, direct orders accepted — with 10% additional charge for handling and shipping. (50c minimum in U.S., $1.25 minimum worldwide U.S.)

Catalog of entire line of airplane control line model kits, R/C scale and Trainer kits, land and sea kits, accessories; etc. 10c enclosed.

"Secrets of Model Airplane Building," including design, construction, covering, painting, adjusting, control systems, etc., 25c enclosed.

"Secrets of Control Line and Carrier Flying," including preflight, launching, shunting, Carrier rules and regulations, Carrier flying hints and control line installation instructions. 25c enclosed.

Name
Address
City
State
Zip

BELLA AVENUE & WISTER ST
PHILADELPHIA, PA. 19144

CUTS-GRINDS-DRILLS-DEBURRS-BUFFS-POLISHES-ROUTS-SHAPES....
A rugged electric motor runs at a slower 3000 RPM for safe, fine and precision work on plastic, wood and metal hobby materials.

SEND FOR FREE BROCHURE
AT FINE HOBBY STORES

ALL ELECTRIC BENCH TOP POWER TOOL
FLEXIBLE SHAFT

ONLY $19.95 RETAIL
WITH ACCESSORY ASSORTMENT

KAE German Schleicher Sailplane Company's glider, by Nelson Model Products, a quarter-scale fiberglass model designed for winch tow. Ispophthalic polyester resin and polyvinyl chloride plastic foam used for shell structure in the flight surfaces; fiberglass cloth each side of 1/8" layer of foam plastic. Fuselage multi-layer glass cloth with bulkheads. Price $299.50, packaging, shipping extra.

American Aircraft Modeler
**Valkyrie Rockets!**

Close to the real thing!

Now you can build and launch a rocket that flies off like Saturn! Only Valkyrie has liquid fuel to give you authentic blast-off and performance. Control separation with special timer system. Metal construction, electric firing, parachute recovery, aerospace engineered realism.

Non-flammable, non-explosive. Available anywhere in the U.S.A. See your hobby dealer today, or send 25¢ for illustrated catalog.

**Graupner**

The World's Finest RC Kits

IMMEDIATE AVAILABILITY

Available Now*

New Super

G4629

Designed by Phil Kraft

KWIK FLY INC.

1967 World's Champion in Multi Radio Control

Featuring: Molded and Laminated Balsa-Plywood Fuselage Sides • Stripped Wing Tips • No carving required • Complete full-size plans. All hardware included. 

Price $4.95

Distributors - write to

AHM 621 E. Cayuga St., Phila., Pa. 19120

MAIL ORDERS: Try your AHM dealer first. If he cannot supply items, send his name and address with your order. Add 5% for handling and shipping charges. Add 10% outside U.S.A.

CS 1967

**Contest Gas Model**

Continued from page 39

one-degree positive incidence setting. The model was adjusted to fly against the torque (to the right with a righthand propeller) and was adjusted to glide in the opposite direction.

This was accomplished by offsetting the motor a slight amount to the right. The rudder was set at neutral and the left wing washed in a slight amount. This allowed the model to turn in a smooth flight without any hair-raising banks and turns that accompany so many gas-model flights.

**Mistaken**

Continued from page 18

aileron stick. That's a big help.

You will notice when you examine the airplane closely, that the percentage of thickness progresses in reverse from the tip to the root sections. It's an NACA 0018 at the root and an NACA 0015 at the tip. This airfoil progression, plus the high percentage of taper, requires a foam type of construction to make a practical to build. Incidentally, wing cores and, we think, completely assembled wings, can be purchased from Foam Crafts, P. O. Box 336, Campbell, Calif. We highly recommend the quality and accuracy of their wing cores. Construction is not difficult and, because most of you who would take on a project of this type are experienced modelers, we will not go into laborious detail.

The fuselage is a good place to start. We used the crutch method of construction which makes it almost impossible to build a fuselage that is not true. Start with a flat board to build upon. Pin the 1/4 x 1/4 crutch longerons to the plan so that the nose end hangs slightly over the end of the building board. This will make it possible for you to install No. 1 plywood bulkhead without removing the crutch from the plan. Our objective here is to construct the entire lower half of the fuselage without removing it from the building board. Glue the 1/4 x 1/4 cross pieces and the No. 1, No. 2, No. 3, and No. 4 plywood lower bulkheads into position. Cut the doublers from 1/4-inch sheet, warp them to conform to the fuselage side curvature, and glue them into position. The 1/4-sq. bottom longerons now can be fitted with the uprights and glued into position with the bottom cross pieces. The lower box now is ready for its sheet covering.

When the assembly is thoroughly dry, remove it from the building board and install all the top bulkheads. Sheet cover the turtle deck and plank the forward portion of the fuselage back to the No. 4 bulkhead. Epoxy the lower engine mount to the cowling block and glue the block to the fuselage. The engine bolted to the lower mount, will act as a jig to hold the upper motor mount and cowling block in position while the glue dries. The cowling is from Rivets and can be obtained from K&K Fiberglass, Campbell, Calif.

The tail surfaces are quite typical, and need no explanation, except use light-weight wood throughout and keep them as light as possible.

The wing is of foam-core construction. Many good articles have been written ce-
The perfect gift for a friend, the family, or yourself...

HOLIDAY OFFER

SUBSCRIBE NOW FOR BIG SAVINGS

One-year only $5.00
12 big issues...

Two-years only $9.00
24 big issues...

Nearly 40 years of leadership the world over—wherever model planes are built and flown. Plans and designs of all kinds. Great features. Full-scale articles and drawings. Enough Radio Control for the most ardent hobbyist. And those wonderful 4-color center spreads of historic aircraft by the incomparable Bjorn Karlstrom.

GIFT CARD
sent in your name

Be sure to mark the coupon right with your name as donor. We will immediately send an attractive gift card signed in your name—to the person you designate.

And a Merry Christmas to you too.
micro-avionics QT service centers

QUICK TIME, quick turn-around authorized service centers are ready to help you NOW! QT Service technicians are factory trained; have all necessary parts, assemblies and test equipment on hand. And 1969 XL-IC Systems are available from all Micro-Avionics Service Centers.

MICRO-AVIONICS QT EAST
Bill Northrop, Hockessin Prof. Bldg., Hockessin, Delaware 19808.

MICRO-AVIONICS QT SOUTH
Ray Davis, 4 Avondale Road, Avondale Estates, Georgia 30002.

MICRO-AVIONICS QT CANADA
Tom Evans, Tyg-Aire Enterprises, 19122 129th Street, Edmonton 44, Alberta, Canada.

MICRO-AVIONICS QT WEST
Phil Hatch, 530 S. Mountain Ave., Ontario, California 91762.

AMERICAN AIRCRAFT MODELER LIBRARY SERIES

Getting Started in R/C?

START TODAY—order Howard McEntee’s “GETTING STARTED IN R/C.” Nineteen chapters of this informative series are now in a single volume at the low price of $1.25 ppd. Use this book as a firm foundation for a start in Radio Control.

Interested in Control-Line?

START OFF with Howard Mottin’s “GETTING STARTED IN CONTROL-LINE.” It’s Vol. II in AAM’s library series for the novice and the expert. Chapters cover all aspects of C/L—where to start, how to build, trim and fly plus a thorough review of competition events. $1.25 ppd.

$1.25 each or Order Both for only $2.00

AMERICAN AIRCRAFT MODELER
733 Fifteenth Street, N.W., Washington, D.C. 20005

I’ve enclosed $... for... copy(s) of Mottin’s GETTING STARTED IN CONTROL-LINE, (Price: $1.25 each).
I’ve enclosed $... for... copy(s) of McEntee’s GETTING STARTED IN R/C, (Price: $1.25 each).
I’ve enclosed $... for... sets (One each of above), at $2.00 per set.

RUSH TO:}

ADDRESS:

CITY __________________________ STATE ______ ZIP ______

58 November 1969
Billing Boats

DENMARK's
FINEST MODELS

Planked Hull Construction
Turned Brass Fittings
Authentic Replicas

"Boat Show"

JYLLAND Frigate, 39¾" long; 24½" high.
Complete with fittings. $62.00

WASA Warship from 1628, 23" long; 23" high. Complete with fittings. $39.00

North Sea Cutter, 21" long, 16" high. Complete with fittings. $29.00

BLUENOSE

WALL MARIA, 21¾" long; 17¾" high; 5" beam. With fittings. $22.00

North Sea Cutter, 23¾" long; 16" high. Complete with fittings. $29.00

Elbe I Lightship, 39½" long; 16" high; 6¼" beam. With fittings. $55.00

BLUENOSE, 35" long, 22" high. Beam 3½". With all fittings $52.00

ZWARTE ZEE Tugboat, 20½" long; 11½" high; 5" beam. With fittings. $50.00

Lille Dan, 26¼" long, 4¾" wide, 19½" high. Complete with fittings $38.00

DANMARK Training Ship, 35½" long; 23½" high; 5½" beam. With fittings. $72.00

All BILLING BOATS Scaled From Originals

See Hobby Dealer... or send $1.00 for
Colorful Catalog. Dozens of beautiful models; some
advertised in recent issues of this magazine. If
dealer does not stock, send check or money order
for direct, prompt shipment. California orders must
add 5% sales tax. Satisfaction guaranteed.

KAYEFF, INC.
511 Campeau
Arcadia, Calif. 91007

American Aircraft Modeler
SUDDEN SERVICE PLANS

Full-Size Plans — Shipped First Class Mail Within 15 Hours — No Extra Charge

No. 1191, Scimitar— Unusual-looking contest R/C stunter, Designed for high-speed maneuvers, clean tracking and 60 engines, Has low-tail Rivets appearance. By Joe Foster, $3

No. 1194, 1937 Gas Model — High-size O4D-powered copy timer,

No. 1492, Ryan Mallplane— Buoyant, light, P/F with plenty of scale details For rubber power, and Indoor or outdoor flying Plan lias scale too, $1.50

No. 1093, Hooptes 11 — Record-breaking ratracer developed over years of competition, 'Takes hot 40 engine, $1.00

No. 1092, Slo-Poke — Exotic tail-or-wings-first F/F for tow-tine or power. 'Takes .02 engine on removable pylon. Excellent flyer. $1.60

No. 0791, Pusher Galore — Bill Han nan's allsheet, rubber-powered pusher for Tenderfoot is wild flyer. Looks ike Supersonic transport. $.50

No. 0794, Vogtswagen — Trainer and stunter by Marsh for electric tether lying with slot-car motors, Plans for the pylon included. Great elub activity, $1.25

No. 0891, Jungster— Realistic IT/C stunter by Leake with swept midwing. 60 powered model is smooth flyer through all maneuvers. Plans two sheets. $3

No. 0892, Biceps—Don Yearout's show Control-Line bipe spectacular performer. .60-powered, flies relatively slow, very maneuverable. Two sheets. $3.50

No. 0592, Messerschmitt Bf. 1096 — R/O, semi-scale design by Munning- Lol with lean and mean lock of efficient fighter. Plans two sheets.

No. 0694, Montana Duster — 1/0 Class-© stunter by Simon Dreese, semi-scale appearance, Foam wings and simplified structure cut assembly to 6 hrs, Two sheet plans. $3

No. 0491, EAA Biplano— Nick Ziroli's flyingscale, T/C model uses -40 engine and full-house gear, 38° span wings, semisymmetrical foil, box- and stringer type fuselage. Two sheets, $2.50

No. 0693, Manta— Howard Kuhn's Boost Glider for model rockets easy to build from sheet balss. Hot performer, a winning design. $.50

No. 0792, 14A Sky Squire — Small-scale version of famous Sky Squire. Fits 1/0 R/C stunter only or rubber, Miniature and motor, via Galloping Ghost. Only 2% sq. $1.75

No. 0993, Mustang—Al Kube's great, small ship built for nationals. Plans for competition with extra, $7.74. Wing spans over 2'. $1.75

No. 0893, Montana—Bill Leaton's great, small ship built for nationals. Plans for competition with extra, $7.74. Wing spans over 2'. $1.75

No. 0992, Lady Maxley— U.S. Women's A/2 Nordic towline glider. Davis is a little with a .15-type construction. $1.80

No. 0894, Dwarf Dip III — Easystar, rubber-powered Contest III glider design by Charles Evertz is a winner! Great fun for training, Wing-section structure. $1.60

No. 0991, EAA Biplane— Nick Ziroli's flyingscale, T/C model uses -40 engine and full-house gear, 38° span wings, semisymmetrical foil, box- and stringer type fuselage. Two sheets. $2.50

AMERICAN AIRCRAFT MODELER
733 Fifteenth St., N.W.
Washington, D.C. 20005

Please send the following plans by First Class mail, at no extra charge. I enclose $ for payment.

Name
Address
City State Zip

PLAN NO. COST

Total: $
in the wing instead of the 90-degree bell-cranks shown on the plan. We prefer using the wheel servo output because this gives a great deal of adjustment latitude so that you can obtain the roll rate andailer differential you prefer. Use whatever hinge you have the most experience and good luck with. We have always had success with nylon two-piece hinges. I like them because you can disassemble the control surfaces for finishing.

Finish the ship to suit yourself. We have always used the Hobbypoxy No. 2 finishing method with great success and we find it to be durable and light in weight as well as any we have tried. However, we do not recommend that you use any epoxy paint without good spray paint equipment.

Finish the ship to suit yourself. We have always used the Hobbypoxy No. 2 finishing method with great success and we find it to be durable and light in weight as well as any we have tried. However, we do not recommend that you use any epoxy paint without good spray paint equipment.

The total weight, dry, should be right at 6 lbs.

Oh, yes, it does look like the low-tail Rivet, doesn't it?

Tail First
Continued from page 13

A stronger and neater appearing job.

After the two leading edge panels are thoroughly dry, remove them from the building board. Using a sandpaper block, bevel the two ends as shown on the drawings. Sand with a gentle pressure so that the structure will not be damaged. Next, apply glue to both beveled edges, place the parts on waxed paper, and elevate one edge 2° to achieve the correct dihedral (up-tilt) angle. It is important that this joint be allowed plenty of drying time.

Fuselage: Choose a light but stiff piece of 1 x 4" balsa strip, and cut it 9" long. An- other piece of the same stock is cut 1 1/2" long to serve as the bearing block. Cut a shallow notch in one face as shown on the drawing. This angled notch offsets the thrust line, and locates the prop-shaft bearing, which is cut from aluminum tubing.

Roll the tube back and forth under a sharp blade to score a groove around it. Then snap it apart, and use sandpaper to smooth the end. Roughen up the outside of the tubing with a knife or sandpaper, so that glue will be better able to adhere. Glue the bearing block onto the fuselage. add the tube bearing, wrap the whole assembly with sewing thread, and apply a thin layer of glue over the thread.

NAVY

THE BOLD ONES

American Aircraft Modeler 61
Specifically designed by Jim Kirkland and engineered by Dumas, the only really new full house competition R/C plane to come along in recent years, the Triton was built to meet the demands of today's R/C contest flying. From its fiber glass nose and cowl, providing a neat, clean, light and rugged engine enclosure, through its durable foam wing for ease of maintenance and long life, the Triton is a competition plane for winners.

Its advanced aerodynamic capabilities allow it to fly the complete stunt pattern with unbelievable reliability and precision, including those tough maneuvers.

The true R/C competitor will find no match for its silky smooth and reliable maneuverability.

Suggested engine .45-.60. Get the Triton . . . another new high performer by Dumas, only $49.95.

---

Using needle-nose pliers, bend the wire hook for the nose to shape, and apply it to the fuselage with thread and glue binding. While you are bending wire, bend the propeller shaft to the shape shown.

Cut out the leading plane mounts and wing mounts from 1/32" balsa sheet. Make paper patterns of the items to be sure that they are the right size and shape. Mark their positions on the fuselage with a pencil. 

Propeller: This little prop is not difficult to make, but take your time for best results. The hub is made from two pieces of 3/16" x 1" glued together, or if you happen to have a scrap of 1/4" balsa strip, use that. The wood for the hub should be medium hard, not soft. Find the center of the prop, and a straight pin through it. This is easier said than done, and you may have to try it more than once to get the hole properly centered. It might help to push the pin halfway through from one side, then halfway through from the other, until the holes merge. The object, of course, is to achieve a true-running propeller that will not wobble.

Next, measure and mark the portions of the hub which will be cut away to receive the prop blades. A diagonal line drawn on each end of the hub will help establish the depth of each cut. Amt speaking of cutting, watch out for your fingers while working with small pieces like this. Sawing in from the wood a chip at a time is safer than trying to hack out the entire corners at once.

The two prop blades are cut from 1/16" sheet balsa. It is well to use a paper pat-
tern as a guide for accuracy. Round the blade edges slightly with sandpaper. Glue the blades onto the hub, making every effort to center them properly. When the blades have dried, pivot a thin wire through the hole in the hub, and see if the prop balances. If one blade drops to the bottom, sand it to reduce its weight. Time spent on this operation will result in smoother flights.

Slide the propeller shaft through the bearing tube and add a couple of glass "seed beads" to serve as thrust bearings. Place the prop on the shaft and check that there is enough clearance between the blades and the end of the fuselage. It may be necessary to use an extra bead or two to provide the proper spacing. Using needle-nose pliers, bend the end of the prop shaft into a "U" and force it into the prop hub. Apply a film of cement over the area to keep the wire in position.

Covering and decor: Select the lightest grade of tissue that you can find for covering. Only the tops of the leading plane and wing are covered. The original was covered with red, white, and blue tissue, which is quite effective. The leading plane is red, and the wing is white with blue tip panels. Another interesting scheme would be all-white with red and blue "racing stripes." The small "Tenderfoot arrow" may be emblazoned on the side of the wing mount if desired.

Have your mother, sister, or girl friend iron out the tissue prior to using it to make it as smooth as possible, since it will not be water-shrunk on the model. Allow the tissue to cool to room temperature before applying it. With care a tight job will result, since there are no curves involved.

We obtained good results using Sig "Lite-coat" as a tissue adhesive; it is heavily plasticized (prevents over-shrinking) and resists warping. It is also possible to use rubber cement to attach covering material, and you may wish to try it. By experimenting with different approaches to model building, you will soon discover the system that works best for you. Trim the excess tissue off with a sharp razor blade.

After the wing is covered apply glue both sides of the center rib and insert it between the wing mounts. Press down until the wing mounts touch the underside of the wing's tissue covering. The leading plane may be glued in place. Check that it is correctly aligned as viewed from both the front and side of the model. Add a drop of oil to the prop-shaft bearings and you are ready to go.

Flying: Since this model is small and light, it should be flown only under calm conditions. Indoors, or under dead-calm conditions, the model may be flown by radio control!

Race Cars by radio control!

We have parts you need to make fast reliable GT or Indy cars. 12" wheelbase, 1/2 scale. Bodies, clutch, gearbox, chassis, suspension, engines and accessories in kit form assembled. Use 2 or 3 channel radio. 25 cent brochure tells full story. Race clubs are forming now!

Race Cars by radio control!
I told you to keep an eye on that thing!

How was I to know the Fox 74 R/C was darned powerful?

FOX 74 R/C

The Fox 74 R/C — the finest big motor of them all.
No vibration — no worry.

This big willing just what you want it to.
The 74 features: Ball Bearing - Piston Ring

Bearing Con 6811

Allen Screws, Jet Carburation.
Anodized Head, Dial Glo-Plugs.
Fox 74 R/C...the powerful assemblies.

$49.95

Latest in the AIRTROL R/C fleet of quick-built planes...

AIRTROL'S J3 PIPER CUB

Has all the stability, easy handling and long glide of the original. Designed for the beginner.

Vacuum-formed fuselage. Foam wing

Pre-cut parts. 48" wing span. Kit 100-110-cu. eng. Wt. 30-60 lbs. (less 5 & 60%) Bep it with our Galloping Ghost GL-100 and any small prop set.

Piper Cub J3 Kit—less eng. & equip. $15.95

Piper Cub J3 RF—ready-to-fly with Airtrol's GL-100 Galloping Ghost & .09 or .15 eng. Wt. 202 lbs. (less eng. & equip.)

Piper Cub J3 RF—ready-to-fly with Airtrol's GL-100 Galloping Ghost & .09 or .15 eng. Wt. 202 lbs. (less eng. & equip.)

Look for the Following at Your Dealer...

Albatros AB-1 Kit—less eng. & equip. $10.95

Albatros AB RF kit with GL-100 R/C & .09 Max engine 13.50

Marine-Stallion MS-1 Kit—less engine & equip. 15.50

Marine-Stallion MS RF Kit—less engine & equip. 15.50

Cessna 150K Kit—less engine & equip. 15.50

Cessna 150K RF Kit—less engine & equip. 15.50

Eagle AB-100 with GL-100 R/C & .09 Max engine 15.50

Eagle AB-100 RF Kit with GL-100 R/C & .09 Max engine 15.50

Messerschmitt ME-1 Kit—less engine & equip. 15.50

Messerschmitt ME RF Kit with GL-100 R/C & .09 Max engine 15.50

Airtrol GL-100 Galloping Ghost R/C 35.95

Airtrol RF-1 Rudder-Only R/C 65.50

Airtrol MP-1 Max-Prog 4 Channel Digital R/C System 295.25

Parts Package PK-1—less eng. & equip. 5.00

Parts Package PK-1—less eng. & equip. 5.00

Suggested tools list: Pencil, ruler, single-edge razor blade, modeler's knife, wire cutters, needle-nose pliers.

Miscellaneous supplies: Sandpaper (No. 00 or 600), sandingpaper file, Celotex or equivalent building board, Saran-Wrap or waxed paper, glue, straight pins.

AIRTROL of ADRIAN

P.O. Box 392 360 Michigan Ave. Adrian, Michigan 49221
American Aircraft Modeler

**TOOL OF THE MONTH**

**STARTING CELL**

#3 Nickel-Cad Cell with Glo Plug Clip

$5.55 Value .......................... 4.95

- 4 AMP. NICKEL-CAD CELL .......... 2.25
- KOH PELLETS ....................... 1.95
- ACE HEAVY DUTY CHARGER ....... 1.95
- CART-CHARGER ..................... 1.95
- 500 MA. CELLS USED & GUARANTEED ........ 1.95
- LUBRICON N 1.4 OZ. CAN ........ 0.75
- DEPLO PLASHERIZER TOP 4 OZ. CAN .... 0.98
- 3M SPRAY ADHESIVE ............... 3.95
- HOBBYPOXY I GLUE ................ 1.00
- HOBBYPOXY II GLUE ............. 2.00

INCLUDE $2.00 DEPOSIT ON ALL ORDERS. $1.00

**WANTED**

We buy and trade used engines and RC gear. Send us a list today of what you have.

**AMERICAN AIRCRAFT MODELER**

* Back Issues * Back Issues * Back Issues *

We've got 'em!

Check off issues desired; enclose remittance. No minimum order!

1963 (75¢ each)
- January-February
- March-April
- May-June
- July-August
- September-October
- November-December

1964 (75¢ each)
- January-February
- March-April
- May-June
- July-August
- September-October
- November-December

1965 (75¢ each)
- January-February
- March-April
- May-June
- July-August
- September-October
- November-December

1966 (75¢ each)
- January-February
- March-April
- May-June
- July-August
- September-October
- November-December

1967 (75¢ each)
- January-February
- March-April
- May-June
- July-August
- September-October
- November-December

1968 (60¢ each)
- January-February
- March-April
- May-June
- July-August
- September-October
- November-December

MAIL TO: American Aircraft Modeler

733 Fifteenth St., N.W., Washington, D.C. 20005

I have enclosed $ for the issues checked above.

NAME

ADDRESS

CITY

STATE

ZIP

Foreign orders (other than Canada, FPO's and APO's) 10¢ per copy for postage.

**THIS CAN BE YOU**

IN YOUR OWN ONE-MAN BENSEN GYROGLIDER

So stable it flies hands off!

Enjoy the thrill of really flying in the craft you build— advance to this full-size man carrying whirlibird. The only homebuilt ever to win 12 official aviation World Records, all sanctioned by NAA and FAI. Fun to build with ordinary hobbyshop tools at no more cost than a U-control job. Simplest and safest aircraft to fly. Wheels interchangeable with floats. Start with the Gyroglider, later add an engine and make it a self-propelled Gyrocopter. Ideal way to qualify for a pilot's license. Complete construction plans and factory kits available. Get 3-View Drawings, specs, photo of the Gyroglider $2, or the Gyrocopter $3. Order today!

SEND TO: BENSEN AIRCRAFT CORP. Dept. A.D.I.

Raleigh-Durham Airport, Raleigh, N.C. 27602

NAME

ADDRESS

BENSEN GYROGLIDER $2

IN YOUR OWN ONE-MAN BENSEN GYROCOPTER $3

American Aircraft Modeler 65
MUFFLERS

TATONE "PEACE PIPE" MUFFLERS

STANDARD $4.95
EXTENDED $5.95

This new Peace Pipe muffler extended to provide 1" of clearance between the exhaust stack and muffler. Designed to fit 1" hose radius to exhaust.

TATONE PRODUCTS
Dept AA-4
4319 Mission St., San Francisco, Calif. 94112

Materials: Two .75 sq. x 2-5/8" balsa strips.
One 1/8 x 2 x 36" balsa strip.
One piece made wire (0.255-0.315 diameter). One piece 1/2", outside-diameter, aluminum tubing. Lightweight tissue paper. Sewing thread. One piece 1/4" flat brown rubber, or 1/4" Pirelli. Two or three glass "wee" beads.

Note: except for the .75 sq. balsa strips, enough material will be left over to build additional models.

Ryan M-1

Continued from page 25

construction, using 1/8" sq. longerons, forward fuselage uprights and diagonals. The rear section uprights and diagonals are 1/16 x 1/8". Build two wide frames on the lower side and then round on top. Use the glue thoroughly. Meanwhile, cut out the required bulkheads, nose former, and wing root on the plan from the tissue paper. When the side frames are dry, take them up and join together with the former F-1, F-2 and F-3, cross members and C-1 and C-2. Locate the foils on the plan top view to keep the foils aligned. Complete the installation of the diagonals. When all the elements are dry, glue the 1/8" wide panel sheet from the forward upright to the cloth block former C-1 and against the horizontal web C-2. The cylinder block formers C-3 mount on top of the web C-2. The cylinder block sides C-4, glue-each to C-3 and along their lower edge to C-2. After the wing root panels are in place and the glue is dry, the lower cover of the sheet block can be fitted and formed to match the cylinder block former C-4. Glue on the 1/8" sq. cloth between the two C-3 formers and add the 1/8" sq. cloth to the cloth block heads to the length shown, then rounded on top.

Check alignment of the formers and the fuselage. Place a straight-edge or straight-edge block along 1" forward of the center line of each plane of each stick, just above the center of the fuselage. Also place one stick across the area where the horizontal will attach to the fuselage and sight to check the balance. Correct any out-of-balance condition. This will affect the model's ability to fly well when completely assembled.

To complete detailing add the aft rubber support, and its reinforcement—made from 0.10 or 0.15 plastic—glued to the inside of the support to each end of the fuse, the top of the support, and its in mate, made from 0.10 or 0.15 plastic. Also the top longerons, vertical and diagonal members above the fuse, formers F-2 and F-3, are also glued to a round section as these will be exposed on the completed model.

Assemble the nose block unit from N-1, N-2, N-3 and N-4. Check its fit into former C-1 and the alignment with the cowling and cylinder block sides, Curved and sand N-5, N-6, N-7 and N-8, and form the cement in these and with the cowling sides and bottom. Also from the profile or side shape shown on the plan. Note that the N-1 1/8" ply forming disc is set at an angle to give both right and left thrust. Hold these angles as correct by you can and drill a propeller shaft hole 1/16" dia. in the center of the disc and square to it. The propeller and thrust bearing will be held at the angle of the face of N-1 disc when the rubber motor is wound.

Changing Address?

Please let us know in advance—five weeks notice would help!

WANT TO SUBSCRIBE OR RENEW?

ATTACH LABEL

Your subscription label helps to quickly identify your records. Enclose it when writing to us about your subscription.

WANT TO SUBSCRIBE OR RENEW?

Check correct box—

- One year $6
- Three years $15
- Two years $11
- Renewal

OFFER LIMITED TO

U.S. AND CANADA

Name

Address

City

State

Zip

AMERICAN Aircraft MODELER

69

733 Fifteenth St. N.W.
Washington, D.C. 20005

November 1969

December 1969
WING SPAN 42"
WING AREA 336 sq. ins.
ENGINES .19 to .23

HOBBY HELPERS
FULL SIZE PLANS

Group Plan #166 6 a. $1.10

"Interceptor Plane" by Frank Albright. Latest in famous Albright's series of outstanding R/C Multi-Plane plans. Span &.75", length 96", weight 64".

Group Plan #346 6 a. $1.10

"Reaper-Cat" by Bill Albright. For Class IIA, radiolned, events. Span 81", length 275", tail 45-45-45 wing. Wingspan 26".

Group Plan #860 4 a. $3.85

"Vector Director" by Stanley H. Miller's remote control model for Class II. A free-flight competition with 400 or 600 power. Span 81", length 60".

For Special Handling of Plans only
6% per oz. 1st Class
10% per oz. Airmail

MODEL ROCKETS!

...been wanting one to build and fly?

FIND IT HERE... In model rocketry's most complete catalog and rocket manual. 47 exciting kits to build and fly. Helpful 32-page technical section. Beginners' kits, scale models, rocket aerial camera.

ESTES INDUSTRIES, Dept. 4
Box 227, Penrose, Colorado 81240

For Special Handling of Plans only
6% per oz. 1st Class
10% per oz. Airmail

$2.00
$2.00
$0.75
When the fuselage wood work is done and sanded glue in place on each side of the wire stub. Form the 1/8" wire axle and 3/32" wire rear strut to the pattern shown on the plan. Solder the 1/8" dim. brass tube cross-bars to the axle. Locate and bind the axle wire assembly to the fuselage cross member at the centerline.

Position the rear strut wire at the cross member and bind in place with thread. Align and insert the rear strut ends into the axle cross-bar tubes. Check for position of the complete assembly to the fuselage. Solder the rear strut ends to the cross-bars. Cover the fuselage with your tissue over all areas except the forward upper cowling section. Join the wing mount, the cockpit, and the wood covered area of the engine covering. Warm the thin foil and place on each "V" shaped tuck. Spray the assembly with silver acrylic lacquer (spray type will cover well). Using silver Christmas paper, cover the fuselage with silver acetate. Solder the rear strut ends to the cross-bars. Align and insert the rear strut ends into the engine cowl covered area of the engine. Make up the exhaust piping from the engine to the tail section, fuselage lettering and door outlines. Make the model patterns to follow the fuselage shape and lay flat and smooth on the fuselage frame. Proceed making one section between formers at a time. Glue as you go. You can also cut panel sections to cover the engine-cowl section, simulating the cowling divisions. Cover these directly over the wood nose-section structure as far back each side as the main gear forward-strut point.

Add the tail skid, inverted vee braces shown at wing mount to cowl top, cockpit and tail surfaces. Fold up the radiator from silver acetate straws and bind in place. Make the firewall gear strut fairings on the side. Make up the exhaust piping from the plastic seams straws and bind in place. Now you can choose the amount of detail you wish. Finish the cylinder blocks and heads with the exhaust system silver and the fuselage. All lettering is black. With covering complete on the wing and tail surfaces, spray finish the same as the fuselage with silver acrylic lacquer. The wing and rudder can be lettered with black as shown — the rest of the details are up to you.
CIRRUS
Graupner's new high-performance sailplane. Injection molded ABS “Novodur” plastic fuselage, an engineering marvel. Wing span: 118".

$45.95

SCHWEIZER
232
Giant 114" span glider in exact scale by Fliteglas Laminates. NRCSS Open Class Winner at West Coast Soaring Championships. Fiberglass fuselage. $54.95

EMIR
110" wing with prefabricated Terlaran Plastic Fuselage. Deluxe Schuco Kit

$42.50

CLOU
Features two wing sizes: 74" and 96". Material for both included, an excellent ship for any lift conditions. New price $42.95

BJORN
86" semi-scale glider. Recommended for a first R/C glider. Excellent performance at reasonable cost. $25.00

SUSI
An inexpensive 60" span beginners glider. Great for the tiny proportional sets or "galloping ghost" rigs. $16.50

DANDY
63" glider for small multi-channel radios. Good for beginners. $19.95

WRITE FOR FREE GLIDER CATALOG

Leading distributors of specialized imported and domestic modeling supplies.

Nelson Model Products, Inc.
Box 2037 - Dublin, CA 94566 - (415) 626-6350

WRITE DIRECT IF NOT AVAILABLE FROM YOUR DEALER

California residents add 5% sales tax. COD'S LESS THAN $190.00 WILL BE HONORED

We ship prepaid domestic orders.

All orders must be prepaid. We do not ship COD's.

We export. Write for further detailed information.

Look for the NYROD trademark on every Push Rod!

NOW BETTER THAN EVER!

"THE Flexible PUSH ROD"

Plainfield ILL 60544

SLIM PAK - packaged straight & COIL PAK AVAILABLE

70 November 1969
block, using a good thrust-washer assembly as a bearing for the best flights.

Check the balance point indicated on the plans. Some people are lucky. Most of us have to put a glob of clay or some other mass to get the point to work out in the correct location. You try that glide test. Hopefully all goes well and a few winds are put into the motor for an added thrill.

There she goes! Everything looks OK. Now for that real try: a couple of hundred thunder turns and a minor adjustment and away she goes for a few hundred turns by herself. The fun is just beginning. Since with the normal name this job won't destroy itself, many happy hours can be had learning all that the model can do under various conditions both indoors and out. Good luck and may fair weather be yours!

CONTEST CALENDAR

Continued from page 48


American Aircraft Modeler 1968 Annual
NOW AVAILABLE BY MAIL-ORDER

Features:
- Little Stinker R/C
- Grumman Gulfhawk U/C
- Church Mid-Wing FF
- Man-Powered Flight/New Construction Techniques/Scale/Plastics/Rocketry/

... and MORE!

Just $1.00 per copy, postpaid ($1.25 if outside U.S. and Canada)

AMERICAN AIRCRAFT MODELER
733 Fifteenth Street, N.W., Washington, D.C. 20005

I've enclosed $ for American Aircraft Modeler 1968 Annual(s).

RUSH TO

ADDRESS

CITY

STATE

ZIP

You Said It

Continued from

Draft Dodger which appeared in your March '69 issue. I hope you always publish AAM. Keep up your superb work.

I'm 13 years old.

Joe Keenan, Albany, Oregon

Stoney indifference?

Read your editorial in the March '69 issue with mixed emotions. I heartily endorse your efforts to promote modeling enthusiasm among the youngsters. However, I object strongly to your one statement, as follows: "They ask for help at the flying fields where they meet stoney indifference."

I feel that a few moments' reflection and a look at the other side of the coin, may change your mind on this subject.

Very few clubs are affluent enough to own a flying field. Most clubs have invested considerable time and effort in convincing someone that a two- to 12-lb. R/C model, thrashing noisily through the air at speeds near 100 mph, is not really a dangerous, lethal missile, but rather is a carefully supervised, controlled, safe form of recreation.

The landowner will normally require an assurance that he will incur no liability.

DMECO'S LIVE WIRE

"NEW CHAMP" TRAINER

W.S.: 57
W.A.: 600°
15 - 29 ENG.

QUICK ASSEMBLY KIT
ONLY

$21.95

COMPLETE CATALOG 25¢ PP
3635 Harlem Road
BUFFALO, N.Y. 14215 U.S.A.

loal Electronics Corp.
5310 E. Pacific Pl.
Box 22204
Denver, Colo.
who's handicapped?
not me!

THE PRESIDENT'S COMMITTEE ON EMPLOYMENT OF THE HANDICAPPED, WASHINGTON, D.C.

a result of allowing R/C flying at his site. This assurance will normally take the form of an insurance policy, either in the form of individual liability policies held by each flyer, or his parents, or a club policy of one form or another. These policies have a nature of being quite restrictive in their application. It is no wonder that the majority of the hard-won R/C flying sites are very carefully supervised and controlled by the model clubs. And, it is also no wonder that the clubs will insist on all flyers being members of the club to insure that all restrictions and liability requirements are met. It takes only one hotshot flyer making one low pass over the owner's head to close a flying site.

Again, many congratulations on your efforts to encourage the juniors. You may be pleased to know that at least one R/C club is making a successful effort to attract 8 out of 9 NATIONAL CHAMPS

E-Z JUST CONTROL MANDREL

"Hot-Rock", ideal for everything from 1/8" to 1" wood. Pre-formed for quick hook-up. Use for 150 lbs. wood, etc. has heat-resistant plastic handle. 4" long. 

$1.25

E-Z-JUST TEST STANDS

Quick, sure lock-up for any engine.....$2.25

At All Leading Dealers

PHIL-LEYS
BUFFALO 25, N.Y.

SCALE • SPORT • RACING ACCESSORIES

FUEL TANKS
EQUIPPED WITH NEW POLYPROPYLENE CAP FOR BETTER FIT AND SEAL

1 oz. ....$1.25
2 oz. ....$1.25
4 oz. ....$1.35
8 oz. ....$1.55
12 oz. ....$1.65

SCALE PILOTS

MILITARY

1" Scale ............................... $7.95
1 1/2" Scale ........................... $7.95
2" Scale .............................. $8.95

SCALE PILOTS

STANDARD

2 1/4" Diameter .......................... $1.45
2 1/2" Diameter .......................... $1.55
2 3/4" Diameter .......................... $1.55
3" Diameter ............................ $1.45
3 1/4" Diameter .......................... $1.45
3 1/2" Diameter .......................... $1.45
4" Diameter ............................ $1.45
4 1/4" Diameter .......................... $1.45
5" Diameter ............................ $1.45
5 1/4" Diameter .......................... $1.45

SCALE PILOTS

RACING

1 1/4" Diameter .......................... $1.25
1 1/2" Diameter .......................... $1.25
1 3/4" Diameter .......................... $1.25
2" Diameter ............................ $1.25

SCALE WHEELS

VINTAGE AIRPLANE

1 1/8" Diameter .......................... $1.25
1 1/4" Diameter .......................... $1.25
1 1/2" Diameter .......................... $1.25

SCALE PILOTS

PILOTS

WHEELS

TYPE STANDARD

1 1/2" Diameter .......................... $1.45
2" Diameter ............................ $1.45
3" Diameter ............................ $1.45
4" Diameter ............................ $1.45
5" Diameter ............................ $1.45

SCALE PILOTS

VINTAGE AIRPLANE

1 1/8" Diameter .......................... $1.25
1 1/4" Diameter .......................... $1.25
1 1/2" Diameter .......................... $1.25

All Williams Bros. Accessories have been developed in the field by modelers for modelers. They are made of the best materials available for the purposes and to meet the standards of the Miniature Goodyear Event.

See your local dealer for these other superior Williams Bros. Accessories:

NyloN Ballast Bags - .85¢ each
60" 90" 120"

NyloN Control Surface hinges
Small Set of four - .39¢
Large Set of four - .59¢

NyloN Adjustable Clevis - .59¢ each
PUSH Rod Fittings - .50 each
Nylon Spinners (4 sizes) - 79¢ to $1.99

DIET ME TO re- Yeasts Aiea - SCALE - SPORT - RACING ACCESSORIES

FUEL TANKS = SCALE
Equipped at 1 pilots
ConToUR 4 TYPE STANDARD

$1.45 $1.25 $1.65

2 oz. 2 1/2" Diameter 2 oz. 2 oz. 2 1/2" Diameter 2 1/2" Diameter

3 oz. 2 3/4" Diameter 3 oz. 3 oz. 2 3/4" Diameter 3 1/4" Diameter

4 oz. 3" Diameter 4 oz. 4 oz. 3" Diameter 3 1/2" Diameter

5 oz. 4" Diameter 5 oz. 5 oz. 4" Diameter 4 1/4" Diameter

6 oz. 5" Diameter 6 oz. 6 oz. 5" Diameter 5 1/4" Diameter

The simple rig and large (1/4" = 1 ft.) scale gives a 14" hull and makes this an excellent starter-model on which to "teeth," to learn the ropes of wood working, principles of rigging and ship nomenclature.

Kit contains machine-carved pine hull, wood materials, spars, cordage, white-metal parts, plans and instructions - $14.50 postpaid.

For beginners we recommend Geo. Campbell's JACKSTAY, 80 pages, 8 1/2" x 11", half sketch and half text. Of value to starters and experienced hands - $2.95 postpaid.

Send 50¢ for our 1969 catalog showing many kits, fittings, books, tools, plans, etc.

Virginia Pilot Boat
KATY of Norfolk, c. 1800

A "Baltimore" type, a fine-lined schooner of graceful proportions and rig.

The simple rig and large (1/4" = 1 ft.) scale gives a 14" hull and makes this an excellent starter-model on which to "teeth," to learn the ropes of wood working, principles of rigging and ship nomenclature.

Kit contains machine-carved pine hull, wood materials, spars, cordage, white-metal parts, plans and instructions - $14.50 postpaid.

For beginners we recommend Geo. Campbell's JACKSTAY, 80 pages, 8 1/2" x 11", half sketch and half text. Of value to starters and experienced hands - $2.95 postpaid.

Send 50¢ for our 1969 catalog showing many kits, fittings, books, tools, plans, etc.
STUKA
SPEARHEAD OF 1940
GERMAN BLITZKRIEG
KIT 1002
JUNKERS JU 87-B
STUKA DIVE BOMBER

WING SPAN: 34 1/4"

MAGNIFICENT
3/4" SCALE
Guillow's

INSTRUCTIONS AND MATERIALS INCLUDED
FOR THESE OPERATING FEATURES

OPERATING BOMB TRAPEZE (JU 87-B)
MOVABLE DIVE BRAKES/FLAPS (JU 87-B)
MOVABLE TAIL SURFACES (BOTH)

WORLD WAR 2 BALSAL FLYING MODEL KITS
SUPER DETAILED — SUPER VALUES!

MULTI-PURPOSE MODELS — BUILD FOR DISPLAY OR FLYING FUN — RUBBER POWER, U-CONTROL (.09), FREE FLIGHT (.049), OR SIMPLE R/C

The first two in a brand new series of World War 2 flying model kits that are destined to set a new standard of excellence and authenticity. From the "working" landing gear to the movable flying surfaces, these kits will delight the dyed-in-the-wool "scale bug". For the average builder, these models are as easy to assemble as any in the Guillow scale kit line — the intricate working details can be incorporated while building — just refer to the special Guillow "Action" Plans included in each kit. Or, build just as a regular flying model if desired. Either way, you'll have yourself a beautiful scale job.

SPECIAL CUSTOM KIT CONTENTS AVAILABLE
ONLY FROM GUILLOW

In addition to the regular quality contents expected in a Guillow kit, consider the following goodies: Special full color decals, printed cockpit interiors, complete armament groups, 34 1/4" dia. carved wood propellers, ample rubber thread, scale 3" plastic wheels and plastic combat figures — all these plus materials for gas power and U-Control installation (motors and liquids not included). For building adhesive, choose either regular wood cement or white glue. Both are suitable and both are available at your local hobby kit outlet.

PAUL K. GUILLOW, INC.
Department A, Wakefield, Mass. 01880

See your local hobby kit outlet for these and all Guillow kits — PreOrder:

OPERATING BOMB MOVABLE DIVE BRAKES, MOVABLE TAIL TRAPEZE (JU 87-B) FLAPS (JU 87-B) SURFACES (BOTH)

OTHER 3/4" SCALE MODELS AVAILABLE — $6.00 each
MESSERSCHMITT BF-109, MUSTANG, SPITFIRE, ZERO, WARHAWK, FOCKE-WULF 190

JUG!
AMERICAN FIGHTER AND BOMBER ESCORT
KIT 1001
REPUBLIC P-47D THUNDERBOLT
$10 ea.

To our model building friends: Thank you for your suggestions for new Guillow releases. The "JUG" and STUKA are the ones most called for in your replies to our request for this information. Others will follow in order of preference.

To our model building friends: Thank you for your suggestions for new Guillow releases. The "JUG" and STUKA are the ones most called for in your replies to our request for this information. Others will follow in order of preference.

WING SPAN: 30 1/4"
**MRC-ENYA ENGINES**

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>.60II Ball Bearing TV</td>
<td>$47.95</td>
</tr>
<tr>
<td>.60II Ball Bearing Regular</td>
<td>$43.50</td>
</tr>
<tr>
<td>.60II TV Marine</td>
<td>$50.95</td>
</tr>
</tbody>
</table>

Conversion nuts and prop nuts included with .60II Regular and TV.

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>.45 Ball Bearing TV</td>
<td>$36.50</td>
</tr>
<tr>
<td>.45 Ball Bearing Regular</td>
<td>$32.50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>.35III TV</td>
<td>$21.50</td>
</tr>
<tr>
<td>.35III Ball Bearing TV</td>
<td>$24.50</td>
</tr>
<tr>
<td>.35III Regular</td>
<td>$17.50</td>
</tr>
<tr>
<td>.35III Ball Bearing Regular</td>
<td>$22.50</td>
</tr>
<tr>
<td>.35III TV Marine</td>
<td>$22.95</td>
</tr>
</tbody>
</table>

**MRC-ENYA MUFFLERS**

- For the .15 IV—$3.50
- For the .29 IV—$3.50
- For the .35 III, .45—$3.95
- For the .60 II—$5.95

**MRC-ENYA THROTTLE VALVES**

- For the .09 IV, .15 II, .15 IV—$4.50
- For the .29 IV, .35 III—$5.85
- For the .60 II—$6.85

*The .29 IV Regular and the .35III regular engines come equipped with a 7.5:1 compression head. Also included is 9:1 special Hot Head, plus three separate Venturies for variable gas velocities. A pressure fitting is also included.*

---

**CONSISTENT WINNERS**

**BEST SELLING**

Each of these Engines are available without Throttle Valve (Regular) as listed above. ALL MRC-ENYA Engines are Hand Crafted in Japan with Precision not possible in automated and mass produced products.

FEATURING New Concepts of Performance—Reliability and Long Life—Exceptional Power—Consistent, Easy Starting—Sturdy Construction—SEE YOUR DEALER NOW for your choice of these superb Engines. ALL MRC-ENYA ENGINES & PARTS ARE AVAILABLE THROUGH YOUR DISTRIBUTOR FROM MRC-ENYA COMPANY INC.

**PARTS AND SERVICE AVAILABLE AT YOUR DEALERS**

**MODEL RECTIFIER CORPORATION, EDISON, NEW JERSEY 08817**