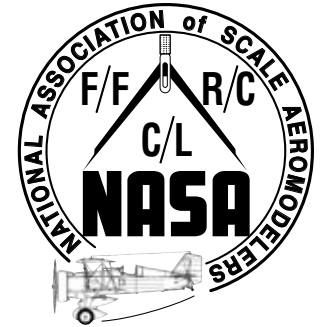
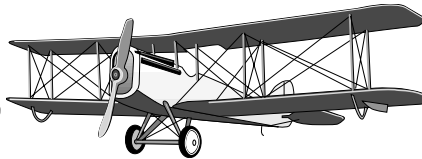


# REPLICA

NOVEMBER  
DECEMBER  
2004

Newsletter of the National Association of Scale Aeromodelers (NASA)

## PRESIDENT'S NOTES



Where has the year went? It seems that I've just turned around with the Nationals being over and now we are out buying Christmas presents. I only have one item on my wish list but it's a new engine so I'll hope Santa thinks I've been extra, extra good this year.

Well NASA has had success as well as change this year, as has the whole scale community. Many of our members who make up the core of scale competition here in the United States as well as our extended family of modelers over seas have been working longer and longer hours, personal and family losses have combined to also slow things down for many of us, myself included. But next year is just around the corner, and I'm looking forward to competition at the Mint Julep, as well as the National Championships too.

### A TIME OF THANKS!

It's at this time of the year I like to stop and thank all of those in NASA who work behind the scenes and make the organization work for the membership. These of course include the officers as well as the what I like to call Team Replica with *Mark Lanterman* and *Ellis Kaster* (our Production Editor) out there in Wyoming who is probably knee deep in snow now! *Ed Clayman* has continued to work on the Scale Road Show and is working on other NASA projects which we will announce early next year.

Other NASA members who should be mentioned include, *Gary Parenti* with the Scale Resource Guide, *Ed Terry* (Event Director 2004 Nationals), *Mike & Elaine Welshans* (Event Director 2004 Nationals), all of the judges, officials and tabulators who made the Nationals a success and the many other NASA members and contributors.

But also equally important are the manufacturers who support the National Championships, NASA and all of our endeavors: *SkyShark RC*, *Pacer Technology*, *ZAP Gang*, *Flite Metal*, *Airborne Media*, *Great Planes*, *Powermaster*, *Aeroplane Works*, *Airtronics*, *SIG Mfg. Inc.*, *Brodak Mfg.Co.*, *Jack Stafford Models*, *Balsa*

*USA, Experimental Aircraft Models, RC Report, Testors Corporation, Model Airplane News, Nick Zirotti Plans, Aces Videos, Skyways&WWI Aero, Northeast Screen Graphics, Vintage RC Plans, Dynamic Balsa, Micro Fastners and Master Airscrew*

### SCALE RESOURCE GUIDE

It's been a long dry spell for modelers waiting for the Scale Resource Guide but with the dilligance of Gary Parenti the finished product is worth the wait I believe and we think you will too. You should receive it sometime around Christmas this year!

### NEW NASA WEB SITE

As I write this the NASA website is being worked on and we hope that you will see a new site that you can appreciate as well as contribute too. The site is up now and we hope everyone will take a look. Our new URL is: **[www.NASAscale.org](http://www.NASAscale.org)**. *Mark Lanterman* has volunteered to take the site and work with it now, so please send him photos, we now have the space to put them in!

Look for AMA scale score sheets on the NASA website soon. *Dale Arvin*, *Mark Lanterman* and *Mike Welshans* are working on these to make the look more uniform for all. Then you will be able to download the sheets and practice with the score sheets that will be used at the Nationals - as well as for any FAI Events you may attend. The FAI score sheets will appear sometime after the first of the year, as the sheets will change with new K factors and rules. Keep Posted!



### 2005 SCALE NATIONALS

Planning is underway for the 2005 Scale National Championships and we have a report by NASA Vice President, *Dale Arvin* who attended the planning meeting on October 23rd. Hard to believe but that's a

*President's Notes - continued on page 2*

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year long process! Dale was also supported by 2005 Nationals Event Directors *Mike & Elaine Welshans, Jim & Bonnie Rediske*. So we were well represented.

I'm sure that Dale will have a full report as to the dates, events and so forth so I won't waste space here.

### CONTROL-LINE SCALE

We have a new columnist for CL Scale with *Chuck Snyder* who represented the USA in Poland this year. Chuck can be reached at sbetty354@aol.com. Chuck's first column should be in this issue and we are looking forward to some pearls of wisdom for CL scale modelers.

### LOOKING TOWARDS 2005

I can't stand it! For the first time in YEARS!!!! The entire Scale Nationals will be together in one week. **RADIO CONTROL, FREE FLIGHT and CONTROL LINE SCALE- ALL TOGETHER!!!!** That's something to shout about.

Ok now that I have that off my chest, what else is in store for NASA and our members in 2005? NASA will attend the 2005 AMA Convention in Ontario, California this January, as well as Toledo in April. For all of those members on the west coast, this will be a good time to touch base with our officers and membership. The Convention is held January 7th-9th.

We plan to have our booth next to or as close as we can to the Scale Squadron of Southern California along with NASA member Sam Wright there too. Look for the Scale Road Show too. We're working on that aspect of the convention at this point and *Ed Clayman* who has done such a great job obtaining guests for the Road Show as well as hosting it in Toledo for the past several years now will now expand the seminars.

### SCALE JUDGES- NASA SCALE JUDGES THAT IS!

For a long time now we have felt that NASA has the best scale judges here in the United States without a doubt. But to make sure the rest of the scale community knows and understands what it means to be a Scale Judge at the National Championships, we will undertake a comprehensive judging evaluation and a license for any and all judges who pass the test! If they do pass they will receive a license that will be credit card sized as well as a certificate of accomplishment with space for the judge to keep up with contests that he's judged if he or she likes.

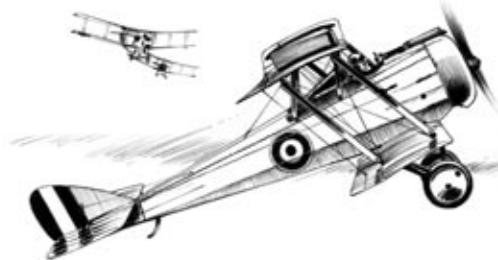
I'm sure there will be several questions which will be S.A. types not just the usual true and false questions or open book deals.

### INDOOR AT MUNCIE, INDIANA

As I write this we don't know if we'll be back at the Horizon Center or at the Ball State Basketball facility. If it's the later site we will have not one but two days of indoor scale and static judging. More on this next month and check the website for updates too.

**Merry Christmas to all  
and pray all of our soldiers get home safely...**

Happy Holidays  
*Stan Alexander*



# 2005 SCALE NATS

The Nats planning meeting for 2005 was held on Oct 23rd at AMA headquarters in Muncie, Indiana. In attendance for NASA was: *Dale Arvin* (NASA Vice President), *Jim Rediske* (R/C Scale Event Director for 2005), *Bonnie Rediske* (NASA Treasurer), *Mike Welshans* (Control Line Event Director) and *Elaine Welshans*.

- **The R/C and Control line Scale Nats will be held on August 5-7, 2005.**
- **Static Judging will be on Aug. 5th with flying on the 6th and 7th** - but the location has not been determined yet.
- **The Free Flight Nats will be August 1-5.**
- **The Scale portion of Free Flight will be August 4-5.**
- **A banquet will be held on the 6th** - time and place to be announced later.
- **Entry fees will be the same as last year** - but late registration will be extended until July 25th.
- **New this year will be Control Line Fun Scale.**

Since R/C Scale is the only R/C event being held during this time we will have all frequencies available. This may not be true in future years.

In an effort to correct some problems with future frequency splits it was decided that R/C Scale will give up channels 18, 24 and 30 but will pick up channels 14, 17, 20, 23, 26, 29, 32, 38, 47, 53 and 58. This is a net gain of 9 channels.

If, in the future we go back to having to share channels, the above will be the Scale frequencies.

If you arrive early enough you should go to NATS Headquarters (farm house) to pick up your contestant packet. If you arrive on Friday morning you can pick up your contestant packet at the Static Judging Site. If you did not pre-register you will be able to register at the Static Judging Site this year.

Trophies this year will be a little different. The emblem in the center of the plaque will be in color.

This year will be a Scale Team selection year. The Scale Team will be selected from those entering F4C and F4B that have designated they want to try for the team. No extra fee will be charged for trying for the team. F4C will be flown from one of two lines and will all be judged by the same judges designated just for the team selection.

Happy Holidays  
*Dale Arvin*

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# CONTROL LINE SCALE

In the March/April issue of Replica, Stan Alexander made some pretty strong comments regarding the lack of participation in control line scale and challenged all of us to try to promote more interest in the event. After talking to Stan at the Nats I volunteered to author a column in Replica. I warned Stan, and I'm warning all you readers, that this column ought to be on the Editorial Page because it is going to be filled with my OPINIONS. I will write about what works for me, and how I feel about issues. If you have had success with a different method please share it with the rest of us. If you have a differing opinion on some issue let's kick it around, maybe we'll stumble on to something that works for all of us.

I wanted to write this column because I have had a lot of fun with control line scale and have made a lot of good friends in the scale community. Perhaps getting some more information out in this publication will help you do the same. Competition has also focused my efforts to improve my building and flying skills. If I am not challenging myself I lose interest and get bored. So if improving your skills, having fun, and making new friends are three of your modeling goals, then competition is probably right up your alley (there's one of my opinions already). My phone number, email address, and snail mail address are at the end of the column. Contact me and I'll do my best to respond. My objective here is to offer whatever help I can to overcome any barriers, real or imagined, that might hinder your potential enjoyment and success in this hobby.

That last sentence is aimed at Stan's comment that the control line scale guys have secrets that they won't share. I don't have any, and I don't think I've met the guys who do keep the secrets.

To the best of my recollection I have built seven C/L scale models. This does not include the Scientific or Berkeley models I built as a kid. Nor does it count the Guardians and Hellcats I built for the Carrier event back in the 70's. I have followed the **Logical Progression** that our rules provide. First there was a Profile Grumman F-5-F Skyrocket which was followed by Sport Scale Focke Wulf 190 from the Royal/Marutaka kit. They were learning experiences and won some trophies at local events. The F-5-F got trashed when a repair job went south; the 190 crashed at a contest in New Albany, IN. As a replacement for the Skyrocket I built a deHavilland Hornet. It was the first plane that I took to the Nationals. There was a long learning curve with that model, but after I figured out how to fly it, I won

two first place trophies at the Nats. A construction article for my Hornet was published in *Flying Models*. When the 190 crashed I needed a Sport Scale model quickly. I had a Top Flight P-40 flying as an R/C model. It was converted to control line in less than a week. It did very well at local contests and put in some very high flight scores at the Nats, but low static scores kept it out of the Nats winner's circle. Local clubs were running Fun Scale so I built a Typhoon from a 1/12th scale R/C combat kit for that event. A big Typhoon for Sport Scale followed. It was built from Brian Taylor plans and a Bob Holman short kit. It took the first place trophy at the 2002 Nats. I finally worked my way up to the FAI class (F4B) with a Henschel 129. I won a spot on the U.S. Scale Team with this model and just returned from the World Championships in Deblin, Poland where the Henschel placed in the middle of the pack.

Did you pick up on the fact that I fly R/C? Truth is I fly more R/C than C/L, but have not flown R/C scale competitively for several years. (I've been having too much fun with C/L). So it doesn't bother me at all to use all sorts of R/C equipment, hardware, and techniques in my C/L endeavors.

I have read comments to the effect that C/L scale has gotten too complicated and you have to have sophisticated electronic systems and lots of mechanical options to be competitive. **I don't believe it!** (Except for FAI) If you look at the planes that have won at the Nats over the last several years you will see that it is not true. Now that I have publicly disagreed with what other columnists think is necessary I'll go out on a limb and state what I think winning planes have in common:

1. **They match their documentation.**
2. **They fly well.**
3. **They are reliable.**

I'll address each of these factors in the future.

Well now you have seen my C/L scale résumé and have some idea of where I am coming from. How about some feedback! Let me know where your interests are. What would you like me to cover here? If I can help I will.

Chuck Snyder

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## AMA SAFETY/TRAINING VIDEO



Attention members of the AMA special interest groups.

As you may know, a committee has been set up to produce a Safety/Training video in hopes of educating newbies and reminding us older modelers that safety is no accident. I am a member of the committee and I am asking all the disciplines for their input. I would appreciate it very much if you have comments or suggestions that you would relay them to me.

Thank you very much.  
Bill Oberdieck

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# Getting Started in Control Line Scale

## PROFILE, SPORT, DESIGNER AND F4B-FAI

Control line scale was at one time a very specialized event, but with today's available hobby equipment and supplies these highly detailed models can be built and flown successfully by anyone interested in the flying in the scale categories. If entered in a contest the models, in all categories but F4B FAI, are static judged for realism from a distance of 15 feet. In the F4B FAI international rules the judging is quite a bit more complex.

### PROFILE SCALE

Profile Scale is the CL Scale event in its simplest form and is well suited for beginners in the event or for young people just starting out. The fuselage and often times the tail surfaces are a balsa sheet surface. In most cases the wing will be a built up construction.

The models are normally flown with a 3-line throttle system for realism in flight and can include other options such as bomb drop, etc.

### SPORT SCALE SPORT

Scale models are just profile models that have grown up. These models have a full fuselage and flying surfaces. In many cases these models are built from an available kit (Brodaks kit #CLB-51 Ryan PT-21 Recruit for example) but can also be built from plans or scratch. Also flown with a throttle, either 3 line or electronically controlled for realism in flight, the models can incorporate multiple options such as retractable landing gear, flaps, bomb and fuel tank drops, etc.

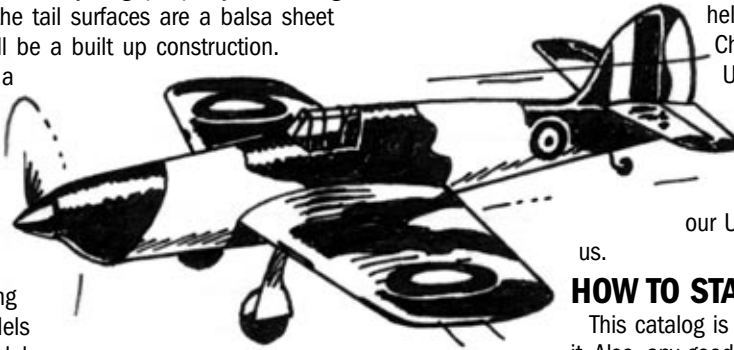
### DESIGNER SCALE

Designer Scale models are just what it says. In this event you must design and draw the plans yourself, and then build the model from scratch from your plans. These models again have a full fuselage and flying surfaces and other than the design and build stipulation they are the same as the Sport Scale category. Also flown with a throttle, either 3 line

or electronically controlled for realism in flight, the models also incorporate multiple options such as retractable landing gear, flaps, bomb and fuel tank drops, etc.

### FAI F4B SCALE

FAI F4B Scale models are models that have been built for world class competition. The models can be built from a kit, a set of plans, or from scratch from your plans. Again the models have a full fuselage and flying surfaces and are also again flown with a throttle for realism in flight. Multiple options are available to the builder. Every second year (odd number years) a US Scale Team Selection Trials is held at the US National Aeromodeling Championships. The three top placing US Contestants are named to the US Scale Team. On the alternating years a World Championships is held is held somewhere around the world (for example 2004 is in Poland) and our US Scale Team is sent and represents



US.

### HOW TO START

This catalog is a good place since you already have it. Also, any good local hobby shop should carry these and/or similar products or they should be able to order them from here or other distributors. A simple 3 line throttle system is best for beginners as they are easy to install and work well. Pick a low wing model with a wide gear track for a beginner as they handle much better on the ground. -Available Help The AMA Special Interest Group for Scale (Control Line, Free Flight, and Radio Control) is NASA or the National Association of Scale Aeromodelers. Membership inquiries can also be sent to the following;

NASA Secretary/Treasurer (Bonnie Rediske)  
128 Darnley Drive, Moon Township, PA 15108

CL Scale Event Director - AMA Nationals (Mike Welshans)  
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## ENGINES AND PROPELLERS

Having the right engine and prop combination is a great benefit when trying to learn even simple aerobatics. My second airplane was a Great Planes® Super Sportster 40 powered by an O.S. .40FP. I can vividly remember how difficult it was trying to fly a simple round loop. No matter how many times I seemed to try, they always came out egg shaped. Granted, technique is important even for a simple loop, like letting off the elevator a little when the model goes over the top, but what I didn't realize then was that the plane was underpowered. It was losing too much airspeed (thrust) when called upon to do even a basic loop. If I had only put a .60-sized four-stroke in that model!

You want to have enough engine for great vertical in order to pull through those maneuvers that have the nose pointing skyward. I feel that four-stroke engines are so well-suited for not only aerobatics but sport flying as well because they generally provide for slower straight line speed while producing lots of thrust under load (like a vertical climb). Now certainly, two-stroke glow engines can give you wonderful aerobatic performance as well but one thing's for certain: shoot for the high end of the suggested engine range for a given model so the performance is there when you need it.

The right prop for aerobatic maneuvers is one with a diameter on the large end of the suggested range and a pitch that is roughly half of the diameter. For instance, a 16 x 8 prop has a diameter of 16 inches and a pitch of 8 inches. An excellent source for suggested props for a wide range of both two-stroke and four-stroke engines is the two pages detailing this information in each SIG catalog.

Beware of the suggested prop ranges listed in the instructions you get with many engines. In these instructions I've seen a number of bizarre recommendations for small-diameter, high-pitch props. As far as brands go, I highly recommend APC props. I've tested different brands of props side-by-side and have found that APCs are very efficient (high thrust) as a result of their unique blade shape.

## READING MATERIAL

If you want to fly good aerobatic routines, you've got to read and learn the proper technique. Try photocopying useful articles from RC magazines and storing them in a binder. Another tip is to buy old modeling magazines at swap shops and look them over for more articles. On occasion, I've even picked up free RC magazines at swap shops. You'll be surprised at how many articles you'll collect once you get started and it's so convenient to have copies of them all in one place. RC Report magazine now has a great column on aerobatics so check it out if you haven't already.

Next, look on the Internet. You'll be amazed at what's available online. I look for information on full scale as well as models. Just keep clicking those Internet links and you'll find some real interesting sites. Again, print the good stuff and put it in your binder.

## THE THREE P'S

The three Ps stand for practice, practice, and more practice. As with most everything else in life, you've got to practice to improve. Try to make a point of setting aside some time for practice each trip you make to the field. I suggest you have an idea of what you want to practice before you begin flying for the day. You don't want to make this work but a little structure to your practice time will speed the learning process. After all, when most of us first learned to fly RC we were on a structured practice schedule although we may not have thought of it that way. When you first try new maneuvers, make sure you're an extra mistake high. It's easy to get disoriented when you try something new and the airplane doesn't come out the way you expect. Next try to string those new maneuvers together

in a sequence. You'll find a new level of difficulty when you try to perform those advanced maneuvers together in a sequence. To be really proficient you'll want to practice those maneuvers with both stick movements; i.e. left turns with left rudder and left ailerons as well as right turns with right rudder and right aileron. Next, you'll want to practice them with a left to right flight path and then a right to left flight path. And if that's not enough, repeat all of that on windy days for even more practice.

## T.R.A.P.S.

T.R.A.P.S. is an acronym I made up that stands for Throttle, Repeatability, Accuracy, Placement, and Symmetry. Each of these are important elements of well-flown aerobatics.

**Throttle management** means you don't push the throttle stick to full blast after takeoff and drop it back to idle only when you are ready to land. It means you continually regulate the throttle position to strive for a relatively constant speed through maneuvers like loops and Cuban 8's and that you slow the airplane down when flying straight line in between maneuvers. This again is where four-strokes are at their best by allowing you to roll into the throttle as you enter a climbing maneuver rather than having to use momentum (speed) to get you through as is more true with two-strokes.

**Repeatability** means you can perform a maneuver each time you try (nearly each time is okay too) whether it's with left or right stick movement, a left or right approach and on windy or calm days.

**Accuracy** is performing maneuvers the correct way (i.e. a model that veers left or right or does not track in a straight line through the sky would not be performing an accurate roll).

**Placement** is locating a maneuver just where you want it and where it looks best from a judge's standpoint. Once you can fly a new maneuver consistently and safely you'll want to think about placement. Many maneuvers, like a loop, look best when performed front and center. The altitude you fly at will depend upon the maneuver being flown, your skill level, and safety considerations. A fly-past looks best when flown the length of the field so you need to get into position before reaching the field and climb out just past the other end of the field.

**Symmetry** is when you see a mirror-like image between the first and second half of a maneuver. The portions of a figure 8 should be of equal diameter and they should be symmetrical as well. In short, both halves should scribe identical patterns in the sky.

## COMPUTER RADIOS

Finally, computer radios are a terrific aids but in my opinion, they won't make it any easier to initially learn to fly complex maneuvers. If you can't fly a knife edge pass then you won't know what percentage of rudder-to-aileron mix or rudder-to-elevator mix to program in or even know if those mixes are needed. You'll want to learn to fly the knife edge pass manually and learn how to apply those aileron and elevator corrections yourself. After that, you will realize how you can make this maneuver a little easier to fly accurately by mixing out those unwanted side effects.

This isn't to say one cannot make immediate use of some of the nice features of computer radios like storing set-ups for multiple models or using the end point adjustment feature but don't buy one thinking you'll learn aerobatics quicker. That takes practice.

I hope these ideas help you with your scale aerobatic endeavors and keep in mind that enjoyment is the primary goal of this great hobby. See you at the field!

Mark Immonen

# Poland FAI F4C (RC Scale) & F4B (CL Scale) Report

Dear Friends,

We had a great time in Poland at the FAI F4C (RC Scale) & F4B (CL Scale) World Championships.

Everything was extremely well done by our hosts. It was run so much like a formal Olympic event with each detail flawlessly attended to that, at times, it was hard to think of it as a model airplane contest!

After decades of invasion, brutality, and repression at the hands of the Nazi's and Russians, Poland seems fifty years behind the West. Life is simple and the economy poor. Their suffering plainly shows in the faces and bent bodies of the elders, but the youth seem bright and cheerful. Young or old, however, everyone was very friendly and helpful.

The opening ceremony had all the uniformed Teams marching onto the field behind a military marching band with our national flags past applauding crowds in the stands. Very low over us, a W.W.I Polykarpov biplane made repeated passes. Many formal speeches were made by high Polish and FAI officials. Following the opening ceremony, was a performance by a very colorful Polish folk dance troupe.

Static judging and flying took place at the hangars and runways of the Polish Air Force Academy. We were royally (though lacking some amenities) housed adjacent to the 1928 Jablonowski Palace which was conveniently within walking distance to the hangars, flight line, and the excellent "Casyno" dining hall.

We were relieved to find that our models had arrived undamaged when we unpacked in a hangar with dedicated areas for each Team with tables, electricity, and 24/7 security.

There were 18 countries entered in RC Scale and 8 countries in CL Scale. Daily bulletins announced individual flight schedules, static judging, and standings. Static judging and flying began simultaneously. Everyone flew the first round before being static judged - thankfully without model damage.

Under FAI rules, a contestant flies no more than once per day, and only one model is flown at a time, so we each had lots of time off between the three flight rounds. We found the open skies and relaxed pace a very welcome change from our US stampedes.

Weather conditions were "variable," to say the least. Some days were in the high 80's, while others were in the low 60's and gave us a chance to wear our Team jackets. There was a steady drizzling rain for two days - which we flew in! Other days were marked by high winds with considerable turbulence.

Since FAI rules specify takeoffs and landings into the wind, we thankfully did not have to contend with the crosswinds normally encountered at US contests.

So how did we do? The US CL Scale (F4B) held up their end with a third place finish. Unfortunately, the RC Team did not fare as well. Charlie Baker had an unexplained loss of control on the second round with his beautiful Rawdon T-1 which was damaged beyond repair. Nevertheless, we finished in eleventh place.

Surprisingly, the beautifully built and detailed W.W.I "kites" (biplanes) were also beautifully flown in some pretty unfavorable wind conditions, though only one of them finished in the top ten places. For the second time in a row Andreas Luthi (Swiss) was the RC World Champ with his

Bucker Jungmeister.

Max Merckenschlager of Germany was second with his F7F Tigercat, and Hanns Amman (Swiss) was third with his Curtiss Jenny, followed by an Antonov AN-2, another Jungmeister, an FW-190, and the only turbine "Vampire" in 7th place.

FAI is scored by adding the static score to the average of the two best of three flights. Since my Cadet is not all that well built and is a comparatively simple airplane, where static scores are multiplied by "complexity" factors, I was below the middle of the pack, while my two team mates Al Kretz's "Dauntless" and Charlie Baker's "Rawdon" did quite well in static scoring.

Al's Dauntless flights suffered from its low number of previous flights. My flights were consistently good - however, NOT considered excellent or outstanding by the judges! All this, with Charlie's crash, put our RC Team in eleventh place.

The Swiss were first, Czech Republic second, and Austria third. One afternoon, the President of Poland flew in on his jet for a tour of the models in the hangar. That same day, the Italian Team came to us to tell us how much they appreciated the USA for our efforts to make the world free!

Another afternoon we were treated to an outstanding airshow by Poland's equivalent of our Blue Angels. The Polykarpov WWI biplane was flown in formation with an excellent 1/3 scale RC replica of it!! Something you will surely never see permitted in the US!

On the last day we were bussed to tour a palace and attend a very nice picnic - with unlimited beer, wine, vodka, and food - complete with a polka band.

Next was the Closing (awards) Ceremony, where we again marched onto the field with the band and biplane overhead for many more speeches. The awards were presented on three tiered stands a la the Olympics - with many more speeches. My old Navy pal, Vic Larsen, with whom I began RC modeling in 1958, attended as a Team supporter. Never in our wildest 1958 dreams did we ever think we would be standing in a stadium in Poland at a world championship model airplane contest so formally and perfectly done. Indeed, considering all the US model events we have attended, it was hard to comprehend that this was treated as a major occasion.

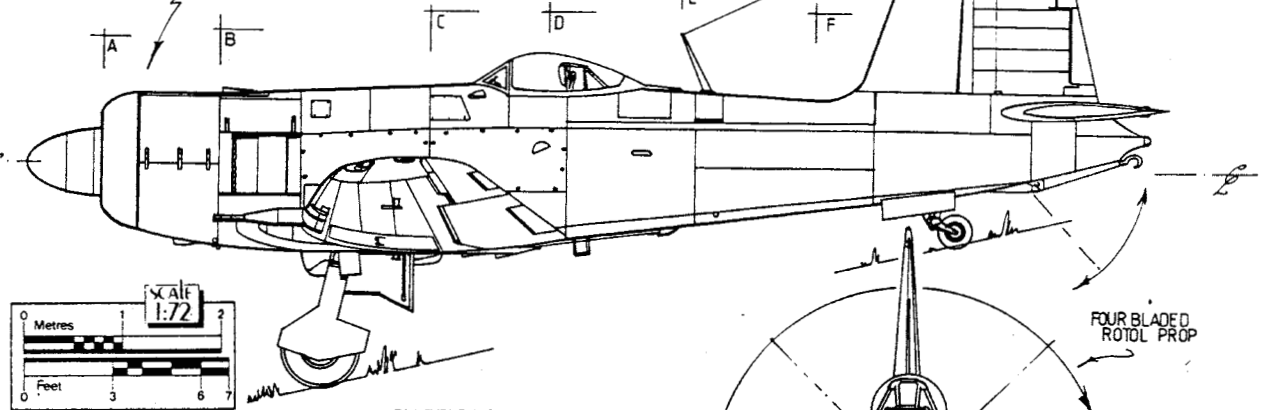
That night, the closing banquet was held in the palace ballroom. The Italian Team wore Stars and Stripes ties!!!! Entertainment included more awards, a performance by a Polish folk dancing and singing group, a string quartet accompanied three outstanding Polish opera stars (it was then that I knew for sure that we were "not in Kansas/Muncie anymore"). Finally a rock band played for those who chose to dance -- until 4AM - just about the time when we began our drive back to Warsaw for our nine hour flight to Chicago - and 15 hour drive to Gulf Breeze.

Although I had been less than wildly enthusiastic about making this trip, I must now say that it was an event of a lifetime. I feel extremely fortunate, proud, and honored to have represented the USA in an event which, for me, went far beyond being a model airplane contest.

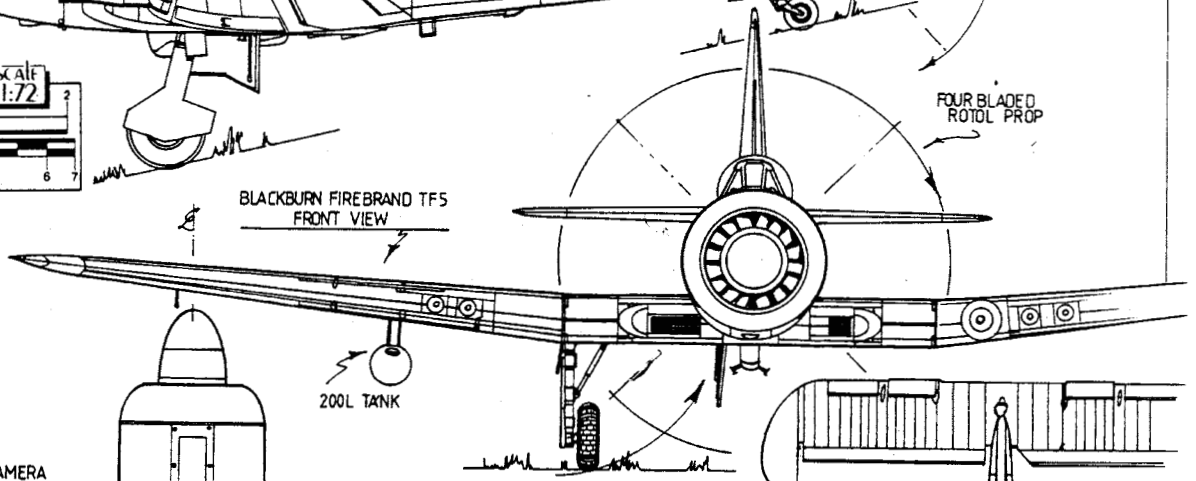


Manny Sousa  
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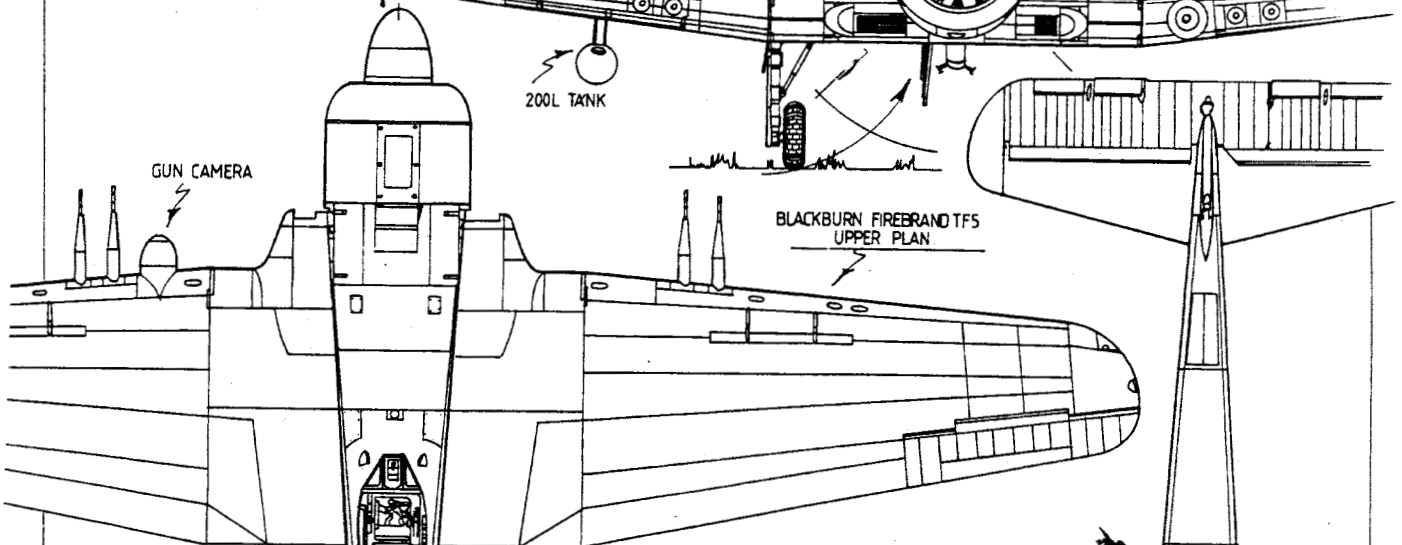


FOUR BLADED  
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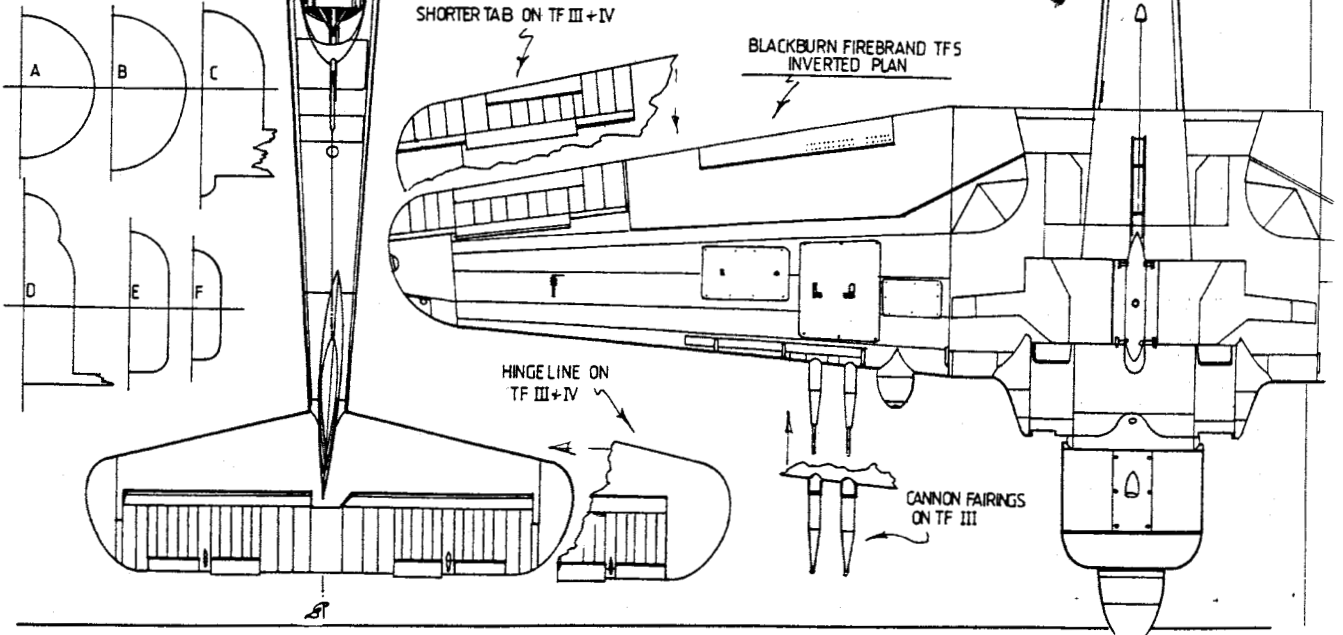
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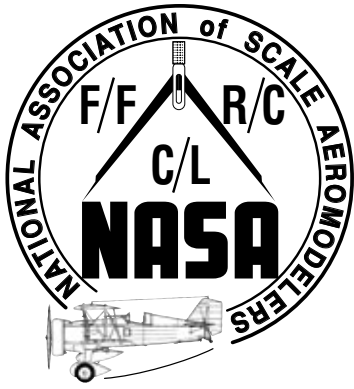
SHORTER TAB ON TF III+IV

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INVERTED PLAN



HINGE LINE ON  
TF III+IV

CANNON FAIRINGS  
ON TF III



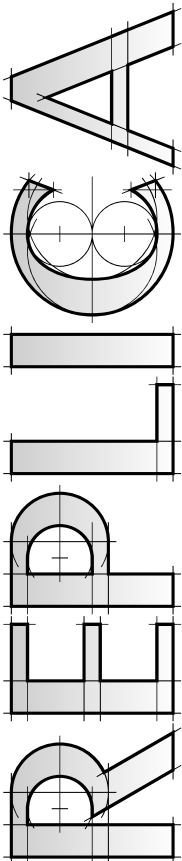
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