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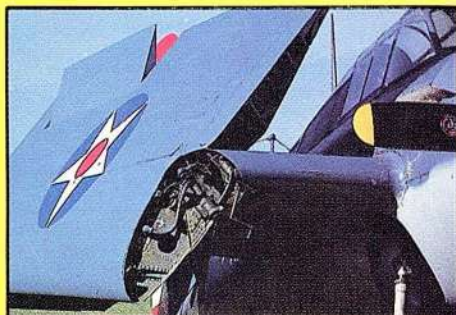
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VOLUME 12, NUMBER 8

NOVEMBER 1986

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# EDITORIAL

AS I R/C IT . . .



## THE DAY SUPERMAN FLASHED THOUSANDS!

Or, How The Cloud Dancers Show Team Became Re-Acquainted With The Laws Of Physics.

BY NORM GOYER

I've been attending airshows, and enjoying a **wide** variety of acts, for about forty years now, and up until last month, I thought I had seen just about **everything**. I was, however, **totally** unprepared to see SUPERMAN, the hero of the oppressed, flying around over the skies of Ida Grove, Iowa in his birthday suit. Fortunately for the middle-America audience, the mannequin's fiberglass body had not been cast in West Hollywood, and was therefore not **completely** anatomically correct, or the outcome of his flight might have been quite different somehow. Interested? Well, here's the true skinny:

It all started **last** year at Byron's Jet Rally when, as part of the intermission show presentation, the fabulous Cloud Dancer Show Team from Kissimmee, Florida brought out a 40-powered, R/C model of Superman, which they hand-launched, and proceeded to fly around, much to the delight of the children in the audience.

(By now, I think that most of the regular readers of this magazine are aware that I don't care much for R/C models of flying stop signs, witches and lawnmowers; and I'm especially un-fond of the flying Snoopy model . . . maybe because, as a youngster, I owned beagles, and I found that all that they were good for was chasing rabbits and the neighbors' cats . . . what's more, they usually howled at imaginary burglars during the night. I feel that they were definitely sleeping behind the pucker bushes when Mother Nature passed out the brains to the animal department.)

Now, to be perfectly fair about this latest creation of the Cloud Dancer Team, Superman is sort of scale, and their design **was** modeled after a flying object of sorts. Let's face it, stop signs don't fly, but Superman does . . . sort of.

4 scale r/c modeler



The Cloud Dancers perform at a great many airshows during the course of the year, and when their first Superman model proved to be such a success, they decided to introduce a 1/2 scale version of their hero at the Byron's Jet Rally 86.

So, on Saturday afternoon, after a great day of flying, Byron Godbersen, himself, gave a very moving tribute to the veterans of the wars, then deciding that his speech had left the crowd in a patriotic but solemn mood, re-introduced the Cloud Dancers Show Team. A man looking a lot like Clark Kent, dressed in a dark business suit, wearing the familiar horn rimmed glasses, raced from the crowd. To the music from the theme for the movies Superman I, II, and III, Clark Kent raced behind the hill, center stage, and soon, from behind the hill, there appeared Superman (the model), racing along (on his dolly) his beautiful red and blue silk costume fluttering in the breeze (of the big OS 108 2-stroker

attached to his twelfth vertebra). Faster and faster he raced across the grass . . . but the mighty Superman never took flight . . . he ran right down the slope at the other end of the runway.

The determined Cloud Dancers Team raced after their Superman, dragged him back before the crowd, tweaked the OS, and launched him **again** . . . **this** time with a great shove which, instead of providing takeoff power . . . caused the mighty man of steel to go sliding on his nose! The crowd roared!

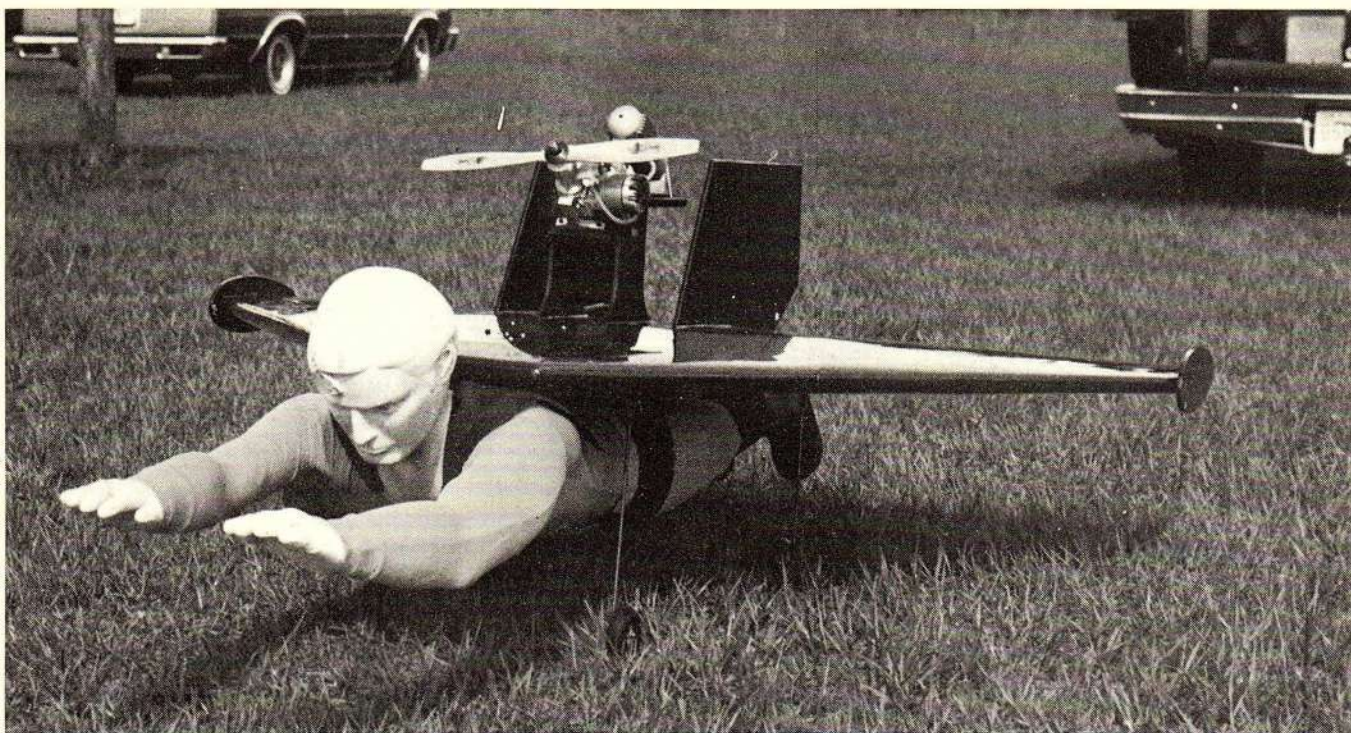
Undaunted, the Dancers dashed forward to recover their man from Krypton. This time, they placed him on the hard-surfaced runway. After a quick start-up, off he went again . . . right down that runway, cape flying, and . . . right over the end, down the hill, out of sight . . . the retrieval squad on his tail . . . the crowd yelling encouragement. So the Dancers brought him back to the runway once more.

It was then, out of sheer desperation probably, that one of the team was seized with a sudden inspiration . . . right there, in front of Byron Godbersen and everybody . . . he and his Cloud Dancers team mates stripped Superman of his costume . . . and that, folks, was when Superman did his thing . . . he took off, and **flashed over 5,000 middle-Americans in the bright afternoon sun of Ida Grove, Iowa!**

The crowd **loved** it . . . they screamed, yelled, applauded, and shouted for more! (Although I later heard a report that one distraught soul had rushed to the phone and called Moral Majority for help.)

After their Saturday afternoon fiasco, the boys from Kissimmee spent Saturday **night** carefully spray-painting some semblance of decency on their Superman's fiberglass body. (Some of our talented graffiti artists could have done the job much fast-





er, judging from the look of some of our freeway overpasses), but those Cloud Dancers really worked hard on their model, even though they **weren't** faster than a speeding bullet.

The next day (Sunday) was warm and sunny with only a slight breeze blowing. Another great day of flying was enjoyed by pilots and spectators. Again, after Byron Godbersen's moving tribute to the war veterans, Clark Kent appeared, and peeling off his business suit as he raced across the field, he disappeared behind the hill to the strains of his famous theme song. From the same spot, out came Superman in his beautiful red and blue painted body. To the dismay of the Cloud Dancers, the scenario of the day before repeated itself! Did they give up? No sir, they didn't. After five or six attempts, the man of steel finally took to the skies to the roar of the crowd!

I really believe that the crowd had more fun, and got more genuine laughs **because** of all the mishaps . . . it was so funny just the way it happened! But pity the poor Cloud Dancers . . . nothing like falling on your face **two** days in a row in front of over 5,000 people. That famous team has some of the very best R/C pilots in the world; their show is terrific . . . jet formation, parachutes, aerobatics, etc., etc. . . and, they're great . . . but, this time, they were the unwitting victims of physics and aerodynamics.

When someone asked what happened with Superman . . . one of

them said: "Gee whiz . . . I don't know . . . it worked **great** at rehearsal this morning!"

Well, what happened was that the laws of aerodynamic drag, rolling friction, lubrication, density altitude and the inclined plane had demonstrated their separate and combined effects as follows:

At rehearsal on Saturday morning the air was cool and the grass was damp. Also, in order to keep Superman's beautiful, colorful silk costume clean, the leaper of tall buildings took off "sans suit," . . . without any problem at this non-dress rehearsal.

At **Sunday** morning's rehearsal, although more modestly attired in his "suit" of paint, because the day was cool, and the grass was still laid down with a light coating of dew, Lois Lane's boyfriend was able to take right off again!

So let's look at those laws of physics and aerodynamics as they applied to Superman:

1. **Drag.** When Superman was dressed in his costume, the drag coefficient was greatly increased. For example, you've all seen a flag which is being flown trying to rip itself apart . . . that's drag . . . and it's destructive to efficiency. And we'll also mention the added drag added to the already high "cape" loading.

2. **Rolling friction.** On both days, when the boys from Kissimmee test-launched their model early in the morning, the grass was damp, and this light coating of water supplied

just enough lubrication to cause the wheels to slide enough to cut down on the rolling friction from the model's four-wheel dolly.

As for the rest . . . the temperature was at least 15 to 20 degrees cooler in the morning than when it was flown in the show late in the afternoon; and that means that the big OS engine was not operating at full power because it just couldn't (unless it were turbo-charged), as the amount of air passing over the model was less, causing an in-efficiency in the aerodynamics of the model.

The least of the team's problems (although I'm sure it contributed to some degree) was the inclined plane. The dolly, made of white plastic pipe, was rolling on four rather small wheels. The takeoff on the grass was difficult because those small wheels literally had to "climb" the blades of grass which had been dried by the day's sun and had become stiff and "tall." The reason why "bush"-type aircraft use large wheels and tires is that low-pressure tires absorb some of the small objects in their path on the ground, thereby offering a lesser angle for the wheels to climb, because, before a wheel can move **forward**, it must first climb any surface irregularities.

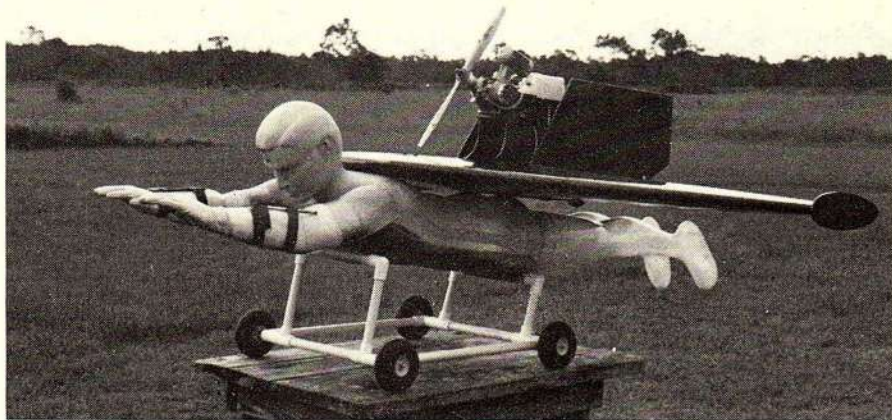
Before anyone yells at me . . . yes . . . the team did try to get the model off the runway, but were not successful because a small amount of crosswind and the lack of much directional stability of the model actually made grass the better choice.

The first full-scale taildragger air-  
scale r/c modeler 5



craft really **were** taildraggers with only a tail-skid. This skid would dig a groove in the grass, and because the line of least resistance was straight ahead, the plane would track in a line, since the skid did not want to move sideways. On landing, the skid also acted as a brake. This also clears up the original of the term **airfield** . . . because most early airports (right up till the 1940s) were mostly square, and all takeoffs and landings were made into the wind. Runways, tailwheels and crosswinds make the taildragger a difficult aircraft to control for all of the above reasons.

The real culprit, though, was probably Superman's power-to-weight ratio, and I believe that a steady diet of pasta, in the form of a Super-Tigre 3000, would solve all of the above problems . . . it's the old rule . . . if all else fails, **double** the horse-



power! You can always throttle **back**.

The very professional Cloud Dancers Team members are Johnny Davis, Tommy Veloskey and Don Muddiman. Thanks, guys, for adding a whole lot of fun and laughs to the Byron Jet Rally '86 weekend. Be-

cause, after all, isn't that what airshows should be all about . . . having fun!

For Airshow information, contact Tom Veloskey, Cloud Dancers Airshow Team, 2024 Ketch Dr., Kissimmee, FL 32741.

Joseph S. Ott, popularly known as **JOE OTT**, the "Father of Model Aviation in America," passed away on June 25, 1986. He was 86 and a resident of Niles, Illinois for 38 years.

Joe Ott was the most widely known designer and largest manufacturer of model airplanes in the country. He was a member of the National Free Flight Society Hall of Fame and the Academy of Model Aeronautics Hall of Fame.

He gained his reputation in the 1930's as a model editor for Popular Aviation Magazine and also as the author of **MODEL AIRPLANES—BUILDING and FLYING**. During those Depression years, he offered his readers full-size plans for featured models. The response was overwhelming and he realized the possibilities in marketing model airplane kits. He formed partnerships with Donald F. Duncan (of Duncan Yo-Yo fame) and the Whitman Publishing Company to market Joe Ott model airplane construction kits.

In the 1940's, he formed the Joe Ott Mfg. Company located in Chicago. At its peak, the company employed 600 workers and turned out

more than 50,000 rubber-band propelled model airplane kits a day.

Joe Ott served in the U.S. Army Air Force for three years at Kelly Field, Texas; and after World War One, he became an army instructor in aeronautics at Texas A. & M. college. For a time, he worked for the government, converting DH-4s into mail carriers. During World War Two, he joined the Civil Air Patrol in the Chicago area, piloting his private plane on all assignments.

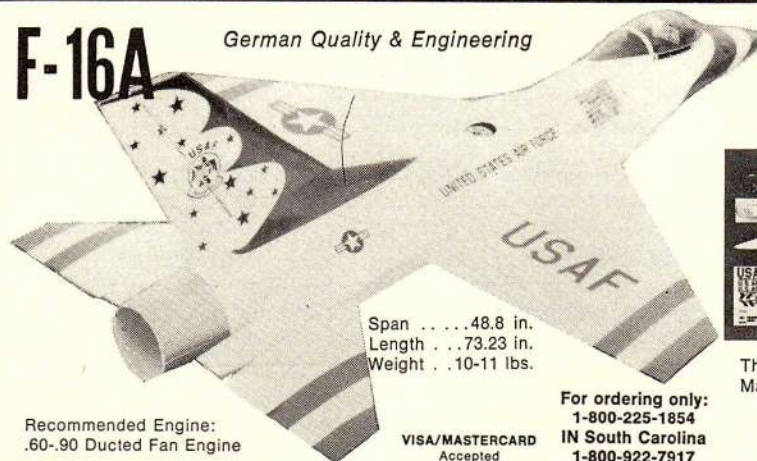
After retiring from the manufacturing industry, he spent several years as a design engineer for many major corporations across the country. At the age of 81, he briefly re-entered the model plane manufacturing business, this time designing and producing the more sophisticated models with radio control.

Joe Ott's contributions in designing, writing and manufacturing have spanned the entire history of model aviation.

For anyone wishing to send her condolences: Mrs. Joe Ott, 8323 N. Oriole Ave., Niles, IL 60648; (312) 967-7773.

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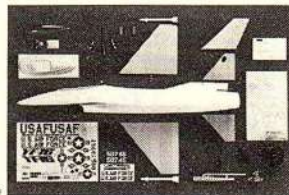
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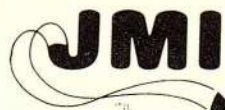


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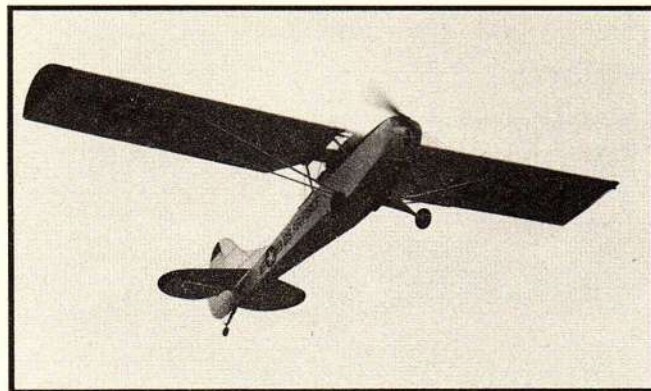
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# Letters

Dr. Mr. Goyer,

In the July 1986 issue of your fine magazine, I was fascinated with the account of the "History of the Mystery Ships." In your article, you included an account of Mr. Cedric Galloway, a now retired employee of the Lockheed Company. My purpose in writing is to obtain, if I might, the present address of Mr. Galloway, as I would like to get in touch with him. My modeling interests are pretty much confined to plastic scale models, and for many years, I have been interested in the Lockheed Lodestar airliner. I have begun some research on this aircraft, and I've been in contact with the Lockheed Company which provided me with some details; also, fellow members of IPMS/USA have been very helpful. Mr. Galloway apparently worked at Lockheed during the time that Lodestars were produced, and having worked there, plus being a model builder himself, he may be able to provide additional information. Thanking you very much for your attention. With all best wishes, I remain

Sincerely,  
Warren J. Kiel

**Editor: Mr. Galloway would love to hear from modelers with similar interests. You may write: Cedric Galloway, 14624 Willow, Hesperia, CA 92345; (619) 244-2696.**

Dear Sir:

I enjoyed your article on The Jim Bede BD-4 so much that I want to build the model.

I want to know how to buy the plans. I couldn't find Bill Wendt's address in the article. Will you give me the address?

Yours very truly,  
Charles J. Delisio  
1419 Brainard Road  
Lyndhurst, OH 44124

**Editor: Sorry, Mr. Delisio, here is Bill's address. His model has generated a great deal of interest. His plans as well as his instructions are excellent. Bill Wendt Plans, 325 Buccaneer Lane, Lake Havasu City, AZ 86403; (602) 453-3211.**

Dear Mr. Goyer,

I would refer to your article in the July issue on the History of the Mystery Ships which I enjoyed reading.

As I live close by a fairly large lake, my interest was aroused by the pictures of the Supermarine, and the Macci Racers.

Would you know of anyone who has plans for either of the aforementioned planes, as I feel I would like to build one.

More articles on float planes would be more than welcome.

Sincerely,  
Bill Henry  
Maple Road, Box 308  
Spofford, NH 03462

**Editor: Any of our readers out there able to help Bill Henry find plans? We'd both appreciate your help.**

Dear Norm,

I just finished reading your article on Quarter-scale in **Sport Pilot**, which I enjoyed. Not to mention the Er-coupe story, which brought back some memories . . . it is interesting to see a writer able to spread his wings comfortably in both real historical aviation and R/C. Keep up the good work, and same to your publisher in general. I buy most of the magazines published in the line, to show the kids what airplanes used to look like!

A couple of personal questions and maybe an opinion I've got on my mind, I'm sending to you because of your versatility. My Dad was a Navy flight instructor (John Glenn was one of his students); he went in late in 1942, trained at NAS Corpus Christi, then NAS Dallas, then NAS New Orleans, etc. In all the good "yakkin" we had through the years about flying, I never thought to ask what kind of aircraft the Navy used for primary flight training during World War Two. Do you know what he would have started his training in? Surely, not the "Yellow Peril" biplane! Didn't the Navy use the PT-19, like A.A. Corps did? I've written Navy Training Command, but no

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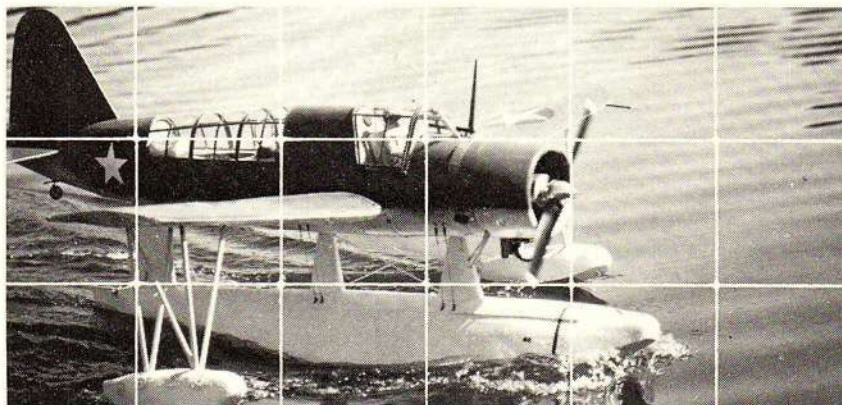
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answer. Do you know? What did you start in? In my day, in the 1950s, Navy used the Beech T-34, but that's much later.

Next question. Since the late 70s—or since Bud Nosen and Byron Godbersen—etc., we've seen the magnificent growth of Quarter-Scale, Vegas, IMAA, T.O.C., etc. Truly this is a wonderful thing and a reason for being for the magazine you edit, and the columnists in the other model aircraft publications. But I have not seen, since my re-entry into R/C in 1979, any true effort on behalf of the "Non-Scale" (in contrast to Scale) "giant-size" or "big-size" enthusiast or neophyte—the guy who gets thrilled by what you experts do and tell us about, but does not feel he is ready yet for scale building and flying, or the guy who is coming in new and has enough sense to realize he needs basic training before he goes further. Wherever I look or read, I find the assumption that people interested in Quarter-Scale are already seasoned, experienced modelers. This is not so, if we include "giant" or "big" size. True, there is fear and trepidation, but it isn't being addressed by the R/C writing segment of the large-scale advocates, nor by any other group in the hobby. Yeah, I know, there is a big one called the "Robinhood," and there are big "Tele-masters," and there is the Bud Nosen "Trainer." But there is no emphasis on these in the writing press of the hobby. Further, there is no consciousness so far as I know of graduated, step-by-step progression and training. Either you start out with a Quadra gas engine type or no. Or you get a great big beautiful and expensive Japanese 4-cycle.

Tell me I'm an aerodynamic idiot, if you must: But I have to ask—why shouldn't there be encouragement to start into big model aircraft

with an 8 ft., light, 10 lb., high-wing trainer, run it on an inexpensive American Fox or K & B .60, find out if you like it with an easy-to-build trainer (like the Bud Nosen Trainer or variation thereof?)—then go further into it, etc. If then, you find you want to go to the Masters, tour the world in tournaments, and publish fabulous articles—fine! But, how to get the basic training? In .40-size "whizzers" that you can't even see for orientation at more than 300 feet, or .60-size pattern jobs that fly proportionally faster than jets/rockets? I don't think that's the way, anymore. All you guys say that "bigger flies slower," more realistic, giving more reaction time. But nobody in the press pushes **Entry, Training, and Trainers**. Why?

Final question. Heat is the enemy of NiCad batteries. Why don't we rig up sun-tents or portable shade-tents, over our models when they are sitting on the ground baking in the hot sunlight? The temperature inside a fuselage sitting in the sun (enclosed with wing on) must be 150 degrees at least. Not so good for batteries, not to mention soda and sandwiches in the cooler!

Thanks,  
Brad Scott  
521 S. Sawyer  
Shawano, WI 54166

P.S.—I tried to keep the letter short, but I failed to do so. I can't help but think how much I agree with you that R.C. can be a "Memory Trip" for the older pilot or young admirer. So much can be done in re-creating warbirds, rare planes, etc., now that the equipment is more dependable. I lived in Oshkosh, 1970-81. Before that, I used to go see EAA fly down in Rockford, Illinois. While in Oshkosh, I became a volunteer then a member. Hope to see my name on that brick in the museum as con-

tributor to the Foundation. Over the years as I wandered through crowds of thousands and hundreds of thousands I couldn't help but notice the number of "old-timers" who can't get their medical ticket or whatever, and wonder—"What if you could learn to fly a Pitts or an Eagle in the aerobatic pattern, or a big ol' warbird, etc.—with a nice big R/C model?"

I would want to add, however, flying R/C with models of general aviation of the 20s and 30s (esp. in the shift from biplanes to low-wing aircraft). I take no glory away from the great piston-driven warbirds of the war, but I'd like to see more interest in the craft of the 30s that led to that, and more emphasis on aircraft used in training, civilian and military. As trainers, I mean. I'm not knocking the J-3 or any of that, for sure, in fact, the opposite. I'd like to see cub-type R/C trainers in giant size, -vs- your scale cub. Nothing wrong with your scale cub, but it should be built **after** the R/Cer experiences and understands ground orientation, radios, engines, hook-ups, and aerodynamics. A Q-scale cub is fully equal in a low pass, pull-up and barrel roll to the real thing at a grass field in the 30s or 40s. But, start simpler and less expensively, in R/C. My Dad bought a J-3 for \$700 in 1937; I've spent over \$1000 getting back into the R/C in the past month.

What you guys in the R/C model press are presenting is a great show of scale and 1/4-scale, like EAA does for a week in August. What you are not doing, is showing how to get into R/C giant-size, economically, properly, and wisely. Manufacturers are not helping at all, advertising is horrendous. Nobody's showing how to do it big, safe, slow, and effective. Everything is oriented to contests, publicity, and a small Elite.

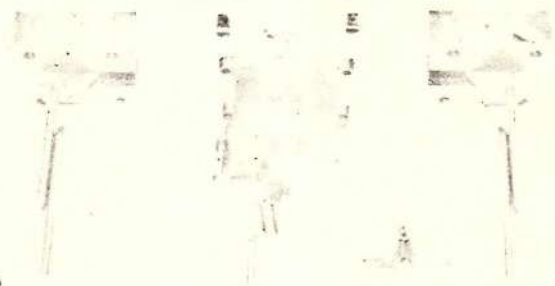
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## BYRON ORIGINALS' F-15 "EAGLE"

**M**arc Jensen, of Byron Originals, called me recently, and he told me that he was shipping one of their new F-15 "Eagle" Kits to Skip Ruff in the Bakersfield, California, area for building and flying, but he wondered if we at *Scale R/C Modeler* would like to do a kit evaluation on it first. I quickly agreed.

A short time later, we found our UPS lock-box filled to overflowing with three huge boxes . . . Byron's "Eagle" kit.

Now, why did Byron pick a complicated aircraft like the F-15 to kit? Certainly, there are many other great jets flying all over the world which wouldn't be as complex. Well, maybe because it's one of *ours*, and because the F-15 "Eagle" is considered to be the most *agile* tactical fighter ever produced, and probably also because it sure has a distinctive look and *can* be made scale since, unlike many of the new swing-

wing fighters, it has a *fixed* wing. Probably for *all* of the above reasons (besides some that only Byron knows)!

In its August, 1972 issue, *The Air Force Magazine* reported the following:

The F-15 Eagle, USAF's advanced air-superiority fighter and the first to come along since the F-86 in 1948, was described as "the top development program of the Air Force" by Grant L. Hansen, Air Force Assistant Secretary for Research and Development. Mr. Hansen was speaking at roll-out ceremonies for the F-15 at the McDonnell Douglas plant at St. Louis, Missouri, June 26. "It will outclimb, outmaneuver, and out-accelerate any fighter threat in existence or on the horizon," he asserted.

Maj. Gen. Benjamin N. Bellis, F-15 Systems Program Director, was

outspokenly enthusiastic, terming the Eagle "better than anything the Soviets now have." He pointed to maneuverability as the key to success in aerial combat and defined maneuverability as the ability to perform a change, or combination of changes, in altitude, airspeed, and direction. The fixed-wing F-15 is a single-place aircraft in the 40,000-pound weight class. It is sixty-three feet, 9.75 inches. Titanium is used in 26.7 percent of the structure, aluminum in 35.5 percent, and composites and other materials in 37.8 percent. (A composite wing, utilizing graphite, boron fibers, and glass fiber, is under test and may be utilized on future models. It promises further and "dramatic" savings in weight.)

Power for the F-15 is furnished by twin, fuselage-mounted F100 advanced turbofan afterburning engines, built for the Air Force by Pratt & Whitney Division of

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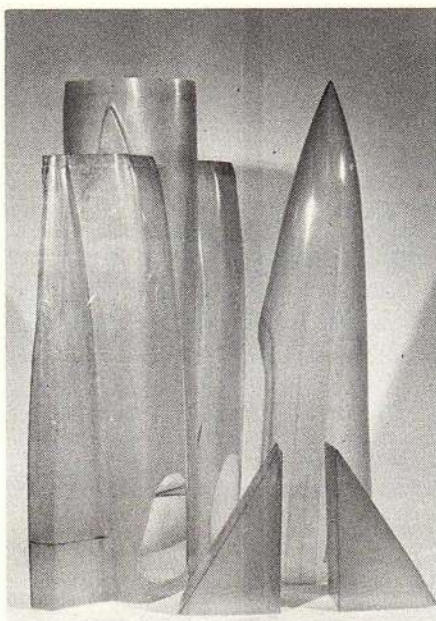
**THE UNITED STATES AIR FORCE'S "EAGLE" IS THE MOST AGILE TACTICAL FIGHTER EVER PRODUCED. POSSESSING THRUST IN EXCESS OF ITS WEIGHT, ITS VERTICAL PERFORMANCE IS OUTSTANDING. BYRON'S F-15 KIT WILL BECOME THE BENCHMARK OF TWIN JET FIGHTERS.**

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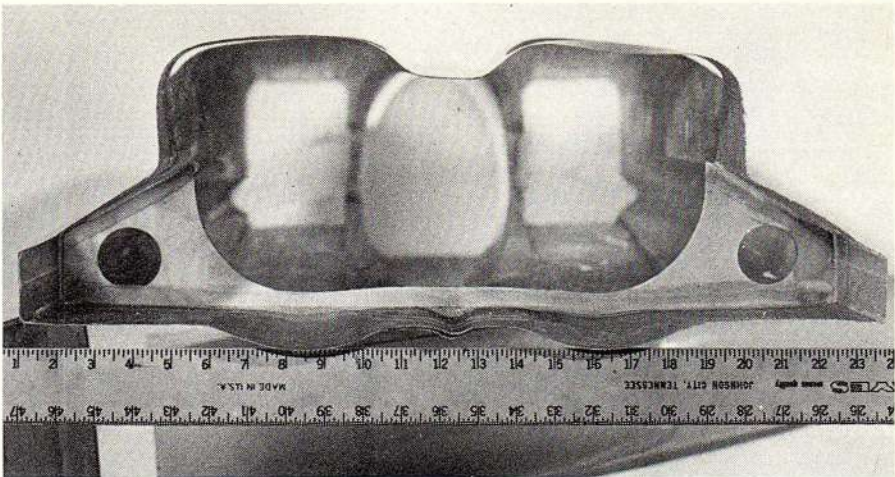
By Bob Celeste







The nose and center glass sections with the intakes look like modernistic sculpture. The glasswork is very detailed and well executed.



Interior of the F-15's fuselage shows its width, and the already-installed plywood formers.

United Aircraft Corp., East Hartford, Connecticut, as government-furnished equipment (GFE) to McDonnell Douglas. Each engine furnishes approximately 25,000

pounds thrust and utilizes advanced technology and lightweight materials. The engines provide a thrust-to-weight ratio for the F-15 of better than one-to-one, and this factor, coupled with low wing loading, is the key to the Eagle's high maneuverability.

In this connection, General Bellis pointed out that the same combination of attributes holds promise of a "tremendous air-to-ground capabil-

ity" for the F-15, and he called the potential fallout in this area "dramatic." "It can take a lot of battle damage," he said. General Bellis foresaw a big growth potential for the F-15 and termed it "viable and competitive into the mid-1980s."

It is the air-superiority mission, however, that is paramount to the F-15's capabilities. Mach 3 in continuous high-altitude flight is one thing, maneuverability at low altitudes is quite another. The F-15 will be able to operate in a five-G environment on a sustained basis,



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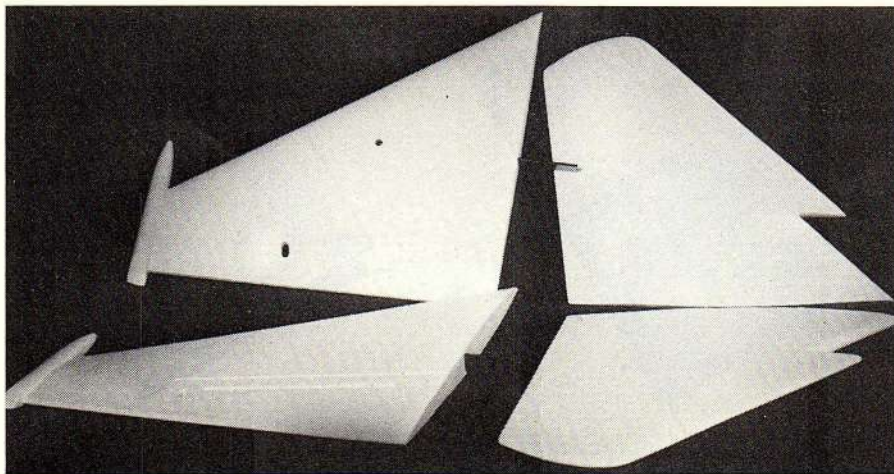
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The tail feathers are foam-molded and ready to cover. Lightness in most models is essential. These are also removable for ease of transportation.

with a constant speed of Mach 2.3 and a dash capability of Mach 2.5. Most air-to-air combat will occur at transonic speeds and under 45,000 feet altitude. However, General Bellis did say that the high G forces expected may mean that we are approaching the physical limit for the fighter pilot.

"We are going to make long, lean pilots into short, squat ones,"

General Bellis said, and the sustained G forces "are going to pull their socks right down around their ankles."

Spectators at the roll-out ceremony were struck by the sky-blue paint on the F-15, called "air-superiority blue" by General Bellis. With the airframe color blending into the sky background, and with the smokeless F100 engines providing no visual clues, an enemy pilot "won't be able to take his eyeball off it for a second."

The F-15's attack radar is the

primary sensor in its avionics system. Built by Hughes Aircraft Co., it permits long-range acquisition of targets and enables the pilot to make computations and flight maneuvers needed to down enemy aircraft in bad weather.

Eventually, the F-15 will be armed with a 25mm GAU-7/A cannon, firing caseless ammunition and being developed by Philco-Ford Corp. Meanwhile, it will be armed with General Electric's proven 20mm M-61 Vulcan Gatling gun. Four medium-range Raytheon AIM-9L missiles currently under development by Raytheon.

Unit cost for the F-15 is estimated at \$10.5 million, based on a buy of 729 aircraft. This could be reduced if ground-support versions are built or if export is permitted. Several foreign nations have expressed interest.

Now, remember, this was written 14 years ago, and the F-15 continues to be the top Air Force fighter. The F-16 Falcon is a small, lightweight, single-engine aircraft with a mission profile very different from the more powerful, twin-engine F-15. I'm just

(Continued on page 29)

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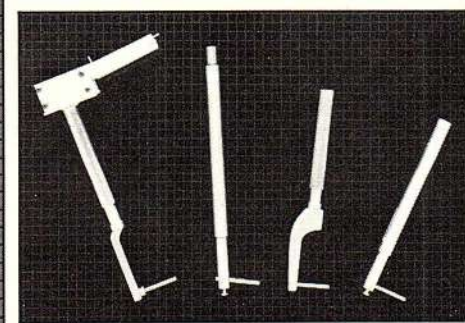
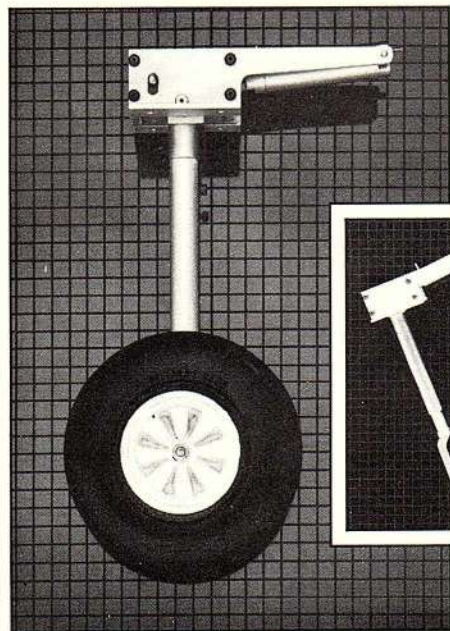
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# TRANSMITTER CRISIS

## Interference? Maybe Yes...Maybe No

### OVER 30 PERCENT OF ALL TRANSMITTERS AT ANY ONE GIVEN LOCATION COULD BE OUT OF WHACK!

By Norm Goyer, with the help of Fred Marks, Chairman AMA Radio Frequency Committee

**T**he pattern is definitely here . . . we saw the evidence at the IMS Show in Pasadena . . . at Toledo's Exposition put on by The Weak Signals, and in June at Byron's Jet Rally in Ida Grove, Iowa.

At the IMS Show in Pasadena, the AMA set up a transmitter testing booth, staffed with qualified radio technicians to test (on a volunteer basis) any hobbyist's transmitter. Fully one-third of all transmitters presented for testing were so out of their frequency range that they did not pass the minimum requirements. Were they *old* transmitters? Not all of them . . . and that's the sad part of the story . . . some of the rejected units were brand new, top-of-the-line, exotic sets, with all the "whistles and bells," for which those modelers had paid *many* hundreds of dollars. Some of the tested sets had just been returned from factory (and other types of) repair shops, but even some of *them* did not work properly.

At Toledo's Exhibition, it was the same story . . . voluntary submission of modelers' transmitters to the AMA folks for testing . . . with over 33-1/3 percent not passing. The test they failed was the band spread, or how far from the frequency of the crystal, was the transmitter putting out a signal. With the closer frequencies now in operation, an improperly-transmitting unit can not only cause interference on adjacent frequencies, but can also affect the correct action of the receiver in the model.

Because both the IMS and Toledo were static display shows, with this testing, if a modeler's transmitter were not working properly, he had the opportunity and time to have it repaired, since there was no flying being done there. *One* participant at both shows, however, was keenly aware of the transmitter problems . . . but for a special, very different reason. It was Byron Godbersen, of BYRON ORIGINALS, and he resolved to ensure the safety of not only the expensive R/C models which

would be flying, but especially that of the huge number of spectators which would be attending his BYRON ORIGINALS 1/5 AIR FORCE JET RALLY on June 21 and 22, 1986. Byron's goal was to make his meet as safe as humanly possible, so he decided to eliminate crashes which might be caused by radio interference.

How? Well, with the cooperation of Tom Runge and Fred Marks, of ACE R/C, Byron built a copper-screen-lined testing booth in the large tent where the Jet Rally participants' radios were impounded. The experts from ACE brought all of their testing facilities with them, and they started testing transmitters. Incredibly, of 150 transmitters submitted to the technicians, 50 of them failed the test, and in this case, if your transmitter failed . . . you didn't fly. There were protests . . . but, yes, Byron knew that you had driven over 1,000 miles to get to his contest . . . and yes, you told Byron that you just had your transmitter tested by the "Zippitty-Doo-Dah" testing labs . . . and yes, you told Byron that you had just paid almost \$1,000 for a brand new, state-of-the-art unit . . . but, if your radio was not on frequency, *you didn't fly!* Some of these modelers were allowed to fly if they had two pins.

Not that they didn't try to help you. Tom Runge and Fred Marks used every tuning trick in their book to try to get each modeler's radio back on frequency or within specs. Fortunately, in many cases, they were able to re-tune the transmitter to minimum requirements, but quite a few of the units just *couldn't* be tuned, and therefore were not allowed to be released for flying. As a result, some modelers were quite upset because they couldn't fly, but nobody could quarrel with the outcome of Byron's successful Jet Rally . . . *over 1,000 flights achieved without any interference problems!* Which proved that Byron was absolutely correct in insisting that all transmitters be checked.

But what causes the original trans-

mitter problems? All I can do is try to second-guess the situation, but, having had quite a bit of experience with the quality control and avionics in *full-size* aircraft, here is my opinion of the facts which contribute to the predicament:

First . . . the rush to the marketplace. The manufacturers of the crystals used in our R/C units are the same ones who make them for R/C cars and boats, and that market is booming too. In some cases, crystals are being rushed to the manufacturers of radios before they (the crystals) are *aged*. Aging a crystal takes time, and time is money, so when the crystal suppliers receive an order for, say 1,000 crystals, and they know they won't get paid until they deliver the crystals, the temptation is great to hurry (or even bypass) some of the quality control procedures. After all, the name of the crystal maker won't be printed on the unit . . . only the name of the radio manufacturer. So the radio factory gets its batch of crystals pronto, having every reason to believe that the components are as specified in their order. And because many radios are already back-ordered . . . without any further testing . . . in goes the crystal so that they can fill those orders. Certainly, each set gets a final tuning with a little tweaking on the test stand, and they're off to a hobby shop, distributor, or a discount house . . . within days, probably, one of those radios is sold, taken home, installed, and soon in the air, controlling a model plane, flying around and over people and property at speeds of up to 100 mph. "Big deal," you might say . . . "it passed the test . . . so what could go wrong?" Well . . . plenty!

Without proper aging (and, unfortunately sometimes *with* aging), crystals can drift. Now, if the crystal was dead on when it was put in the radio, and it drifts a little . . . it will still fall within acceptable tolerances, but if the unit was at the *bottom* of the acceptance range, and *then* drifted a bit . . . it could drift



right out of the acceptable frequency range, even after the transmitter controls had already been tweaked as far as they could go. Result? That transmitter with that particular crystal is off frequency, and the crystal had better be replaced and the unit returned, or there *will* be interference caused by it at the flying site. Some poor, unsuspecting modeler will yell, "I've lost it!", and down will come the plane, hopefully causing no damage to any person or property, except certainly to the modeler's pride and pocketbook. And the modeler really thinks that it was some errant television signal or personal paging system which "shot him down"; he never suspects that the trouble was caused by his modeler buddy, standing next to him, moving the sticks on his brand new, expensive "Hooterville Special" transmitter from Shanghai . . . with a drifted frequency.

As for the full-scale aircraft, any avionics set which is to be installed in a plane must have passed the stringent FCC and FAA tests for aircraft radios. These tests include operating the radio for hours at a time at many different voltages. After days of testing, if the transmitter does not drift, *that* test is considered passed. Then the unit is placed in a freezer and similarly tested. When that test is over, the unit is placed in an oven, and the test is repeated. The unit is then attached to a shaker, and aircraft vibration is simulated for hours, during which time the set is in operation, being monitored all the while for quality transmission and frequency stability.

Would you care to run the above tests with your 18-Channel "Megaphone" Special? When you think about it, though, what's the difference . . . getting hit on the head with a spinner on an eight-pound model going 100 mph . . . or getting squashed by a full-scale aircraft making an ILS landing in the wrong place because of a bad radio? The results are the same: Pine Box City!

As an example: I live in the desert where summertime temperatures reach into the lower 100s on a daily basis, and the temperature in the van (which I use for my R/C model equipment and aircraft) often hits 140 degrees. So last week, before I went flying, while I was still in the house, I checked all of my newly-charged radios for proper workability, checked all batteries, then I drove to the flying site about five miles away. As I was approaching the field, our local radio announcer quoted the

temperature at 105 degrees. After about half an hour of preparation (and fiddling around), I was ready to fly, so I started by flying my AT-6 with my four-year-old, well burned-in Futaba. After that, I flew my big Cub with my ACE R/C Silver Seven, another old faithful which *never* gives me a bit of trouble. I was having such a good time, I decided, what the heck . . . so I took out my CAP 21, with a brand new FM set. I fired her up, checked the controls, then launched. Wow! . . . cardiac arrest time . . . the CAP 21 was all over the sky . . . almost uncontrollable. Luckily, I was flying at a dry lake with an almost unlimited landing area, so, on the right side of an aileron roll close to the ground, I was able to get it down without damage to person or property the only damage being a bent landing gear and prop. I blamed the television station, the Air Force, the personal pagers, even the cement plant on the side of a nearby mountain. After I stopped shaking, I packed up and brought the unit home, and a few hours later when I checked it, it operated perfectly! So I hung it up in my storage (read: Garage) where the temperature that day was 120 degrees. I decided to check it again ten minutes later, I had absolutely no controls. I checked the batteries; still no action. Something told me to try putting the whole unit in the refrigerator, so I did. Five minutes later, it was working. My diagnosis? Problem was caused by a temperature-unstable FM module. At exactly 110 degrees, the FM module was inoperable, with trouble starting about 105 degrees.

Realizing that this was probably quite an important finding, I phoned the importer of the unit and told him of the problem. His response? "Gee, thanks . . . that's good to know . . . we'll look into it." They're a reputable firm, so I'm sure that they *will* check it out. But it sure made me wonder: Why didn't they check it *in advance*?

I now realize that I have a nice FM Set which I have to check out with a thermometer before I dare fly it. This seriously leads me to suggest that all R/C modelers check their own sets for temperature instability before they fly . . . it might just save a valuable airplane or more!

Second . . . another problem which could cause you trouble is the quality of the workmanship of some products coming from various countries. We all know that *some* have a better reputation than others . . . but I

believe that, if the modelers knew how some of these countries keep their prices down, they'd be better able to understand these problems. Example? Our workers in the United States receive an average of \$8.00 an hour for bench-type electronic assembly. In some countries, the rate is \$6.00 *a day*, with some work performed by women, in their homes, on a piece-work basis. Now, with proper supervision, quality control, and extensive testing before (and after) shipping, this system could work just fine. It makes it possible for some of us "shallow-pocket" modelers to buy some of those more complicated sets. However, if there's a big order to get out before closing, so that this shipment can be made to the States at a prevailing lower rate, the big temptation is to get it on the boat now!

So it remains the responsibility of the importer of these radios to perform their own quality control tests on them, and that importer, as an American corporation, to put their seal of certification on them. Because, in case you didn't already know it, if an accident happens, and the lawsuits start flying, only the *American* connection will get sued . . . not the original manufacturers of the radios, because being out of this country, they're not readily available to be sued, so in some instances, they could care less.

There are many reputable firms who are marketing radios in this country, and most of them do all the right things to protect you (and themselves) from bad products. I, personally, own four radio units . . . two ACE R/C radios, one Futaba, and one which doesn't like the heat. And I like the ACE and Futaba radios because if I do have a problem, I can call them up, and they're *there*, and they can solve my problem right now! Futaba has a huge complex close by in Compton, California, and they're very professional. And while ACE R/C is slightly farther away, in Higginsville, Missouri, I have only to pick up the phone, and Tom Runge, the owner, or one of his technicians, will solve my problem pronto! It's rather nice to be able to talk to the very man who designed your equipment, in person. Some other companies are as efficient as ACE and Futaba, but you'll just have to check them out for yourself to be sure . . . these two, I can vouch for!

In fact, I have a proposal: Let's make it mandatory for all transmitters to be checked every two years



for drifting and other problems. Once a transmitter ages for a few years, it seems to become a very stable instrument. I found this out, as it refers to television sets too (just another piece of electronic equipment). When I decide to buy a television set, I usually go to a large store and choose a floor sample model which has been on and playing for some time. I'm convinced that, if these transistor-powered electronic gadgets get past a few hundred hours without problems, they seem to run forever. As a result of my observations (I think), I've never had to have a T.V. set repaired in fifteen years. They gradually fade away (or get ripped off by one of the local junkies for a quick fix . . . in Southern California, they call it "urban equipment renewal").

At the Byron Jet Rally 86, I spent several hours watching Fred Marks working in the ACE R/C booth, checking transmitters, and he and I had this conversation:

**SRCM:** "If a modeler flies twice a month, how often should he have his radio checked?"

**MARKS:** "At least once, every two years. If he flies weekly, or several times a week, he should ship it in to the manufacturer or repair shop to get it serviced during the winter when he's not flying so often."

**SRCM:** What should a modeler do if he flies in a high-heat area?

**MARKS:** I would suggest he keep his plane in a well-ventilated area, covered with a white sheet which will keep the receiver and aircraft much cooler. Also, a white, or light-

colored transmitter is less prone to heat build-up and is easier to hold. Excessive heat will affect the aging of the crystals.

**SRCM:** Is there a point when old rather than repaired or updated? rather than repaired or updated?

**MARKS:** The transmitters which are hard to work on are the ones which don't have the modular RF section which can be unplugged and another installed. This makes it almost impossible to update or narrow the band with a modern RF unit. Plug-in modules will definitely extend the length of the useful life of your transmitter. For example, on the unit I designed for ACE, "The Silver Seven," even if it's ten years old, you'll still be able to buy an updated FM module for about \$25. Receivers with the 1991 requirements will be about \$75. So, for about \$100, you should be able to extend the life of your equipment for a long period. Most of what goes wrong with a radio, in fact, about 80 percent of all failures are due to bad batteries.

**SRCM:** I've noticed that many of the new radios imported from Korea, etc., have the FCC stamp on them. Does that mean that the modeler is sure that the unit has been thoroughly tested?

**MARKS:** No, that means that the radio meets the current FCC requirements. Now, all that these FCC requirements cover are: The transmitter, and the radiation from the receiver, and that radiation from the receiver doesn't mean a thing to us. The transmitters that they're bringing in are accepted, and that means

that they are down by 50 db at 20 kilohertz out, actually 25 kilohertz, and that they're only off frequency plus or minus by roughly .002 percent. Their power output is under 750 milliwatts, and the second harmonic will be down by 50 db. And that's all that the FCC sticker means. What we're looking for is contained in a set of guidelines at the end of this piece. On behalf of the AMA Frequency Committee, I've written this set of guidelines for event organizers, clubs, and individuals. They tell all involved parties exactly what we're looking for (and they're better than what the FCC requires). The important points are:

The transmitter cannot exceed 750 milliwatts and must be down from peak 60 db when you are out 20 kilohertz, and most of the transmitters here today do that, and that's the sideband. It also says the second harmonic must be down by 43 db plus 10 log of the power which equates, at full power, to 53 db on second harmonic. Today, we're holding them to .002 percent and plus-or-minus 1400 hertz, but the important point in the guidelines is to ask each manufacturer to provide the AMA, in addition to the data required by the FCC on the transmitter sticker, data on the receiver, and this section has two key items:

First . . . the band pass on the receiver should be no more than plus-or-minus 7 kilohertz for 60 db down. Now, the radio which you mentioned earlier (which I won't name) is 25 kilohertz wide, 35 db down, and this is a long way apart from the guidelines.



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Second . . . there's a key term which I would like people to know: It's "Third Order Intercept Point." This is a non-dimension measure of how well a receiver will handle a situation when someone down the line with the next channel, and the next one up . . . turn them on. Because there is this simple formula:

Let's say you're flying on Channel 50, and there are two other transmitters on two other frequencies . . . Channel 52 and 54. If you multiply 52 by 2, it equals 104. If you then subtract Channel 54, you're right back on your frequency of Channel 50. 104 minus 54 equals 50. Now, if a receiver is not designed to *withstand* that third order product, with an acceptable third order intercept point, it will not function properly in that environment. What we're looking for is about plus 2 db in. So, when you're buying new equipment, just don't accept any other numbers.

**SRCM:** *How can people like me, who have been flying for many years, but AREN'T radio men, go out and buy a new set and get what we're paying for and what we need?*

**MARKS:** Well, if you were going to get it from me, I'd tell you that your receiver will have an intercept point of 2 db in.

**SRCM:** *But the specs don't say that on new equipment.*

**MARKS:** Well, I know that, but if my equipment didn't meet these guidelines, do you think that I'd be telling you this? These are voluntary guidelines, and therefore cannot be enforced, but if I were going out to buy a new radio, and its manufacturer wouldn't tell me what these figures were, including all of the above, I'd certainly look elsewhere. And reliability is another story.

**SRCM:** *The "Silver Seven" you designed for ACE years ago STILL has a great reputation for reliability and unwanted signal rejection. Why?*

**MARKS:** Well, this design works better than most for two reasons: First, the output of the transmitter is very powerful, at about 600 milliwatts out, where most are only about 300 milliwatts . . . that's about double. The current receiver design is very successful . . . people have been flying this unit all over the country without any problems. It has an excellent decoder in it. And this seven-year-old design has had the third order intercept point in it from day one because we use a double balance mixer in the front

end. For example . . . several popular Japanese radios use bipolar transistor RF amplifier and bipolar transistor mixer, and that's the worst possible combination for third order intercept, so that's why they've had so many problems with the FM units which they brought into the country. In order of problem designs, the worst you can use is the bipolar transistor and mixer . . . the next best is the FET, and third is a dual gate FET. The fourth is a double balanced mixer. The very best is what I use in my designs, and I'm not going to tell you what it is. Your magazine is too well-read overseas for me to reveal trade secrets!

**SRCM:** *So, if you COULDN'T purchase your own radio design from ACE R/C, whose radio set would you buy for your own use?*

**MARKS:** I'd probably purchase a German "Multiplex," because the design is very similar in nature to the "Silver Seven." Next to our radio, this is the best you can buy, in my opinion.

**SRCM:** *So far, we're talking about very expensive radios.*

**MARKS:** As most of us know . . . in the long run, these are *not* expensive radios. On the lower end of the price scale, it's hard for me to say . . . I've tested them all, and they sort of fall into other categories. One radio which is good, if you're not interested in 1991, is put out by ACOMS. It's a single-conversion receiver, has reasonably good properties, and isn't expensive.

**SRCM:** *Do you think that we would avoid some of our problems if we went to loaded antenna in our larger aircraft?*

**MARKS:** Yes . . . I've been studying this with a friend who was having trouble with his equipment, including the most expensive PCM you can buy. We placed a "Silver Seven" receiver in his aircraft, and then we tuned the receiver in its environment (inside the model). It turned out that, in the model, you changed the counterpoise of the antenna when you string all of these wires out, so it changed the tuning by  $2\frac{1}{2}$  turns on the front end coil. Now the reason for this is that you've got a 36 to 39-inch antenna on the receiver which is tied to one end of the coil; and the *other* end of the coil is tied to ground potential (which is minus). That goes to the battery, receiver, and every servo, and if you put in 36-inch leads out to the wing, it also makes that long trip. And

now you have changed the counterpoise.

If you took just the receiver to the factory, with just the battery and no servos, then the counterpoise at this time would be about 12 inches of black wire. When this receiver is re-installed back into this aircraft, you immediately change the counterpoise from 12 *inches* to 12 *feet*. Obviously, this significantly changes the tuning. If you use a balanced dipole on the front end, then you don't have to tie the other end of the coil to ground, then nothing you do in the plane changes the counterpoise. This forms the other half of the dipole. This isn't anything new . . . it's been done on full-scale aircraft right along . . . but it's especially effective in models. For example . . . with the ACE "Thermal Snifter," the transmitter is *in* the airplane, so you can only operate with a miniature amount of power . . . 10 microwatts per meter at 2 meters . . . and this is a *tiny* fraction of the power we use in our R/C transmitters.

And we use a balanced dipole on that unit at 49 megahertz. This signal can be detected from the airplane on the ground at a *mile and a half*. Now reverse that for 1/4 scale aircraft. Place a balanced dipole in the airplane with our 600 milliwatt transmitter on the ground, and you are not going to have many problems. A balanced dipole is very simple: It's a 39 inch piece of wire with a tuning coil or capacitor in the middle, and a 39 inch piece of wire on the other end.

**SRCM:** *What about using loaded antenna on the transmitters?*

**MARKS:** Loaded antenna on the antennas are about 25 percent *less* efficient than base loading, because you have trapped some of the energy in the loading coils. When folks use center loading on an aircraft, it's usually done to use a shorter antenna. The thing to remember is that, when you are radiating or receiving, the energy you take in is directly proportional to the length of the antenna. So, if I use an 18 inch antenna with a loading coil, it will look the same to the receiver in tuning . . . but the energy I receive at max range will have minus 108 db or 1 microvolt per meter. Now, if I only have a 1/2 meter, I'm going to have 1/2 microvolt of energy . . . so you can't use base loading as a solution in the airplane. What you *could* do, is to use a trailing antenna . . . you could go from 1/4 wave length at 72 megahertz up to a full



wave length. You could have a center-loaded 2 meter antenna, which would make it look like a full wave length antenna. You will have improved the performance then, but that doesn't help you whip the problem of the change in counterpoise.

**SRCM:** Do you think that, if a modeler knows WHAT to do, and WHERE to do it, he could tune his receiver while it's installed in his model?

**MARKS:** If he has a good oscilloscope, he could; that is, if he knew the receiver. He would have to know where to go in for the tuning slugs, and in what order to go in. For instance, when you get a radio from ACE, you can get a full technical manual with all the information on tuning, etc., for only \$3.00. (If you purchase a radio from overseas, nobody can get hold of a set of schematics for it!). This may sound self-serving . . . but it's true! For only \$3.00, a modeler can learn all about his ACE radio. Your receiver can be tuned with a voltmeter from the the instructions in this manual, or, if you knew where to tune, from the directions in the manual . . . you can do it by having your wife or a friend keep moving away as you tune the slugs. The trick is in knowing where, and in what order to do it.

**SRCM:** Do you like the direction that the hobby is taking, as regards to electronics, particularly the radios?

**MARKS:** Well, it's no secret to anyone that it hurts me, the AMA, and everybody when a manufacturer or distributor comes in and claims that

his new "Barnburner" is compatible with the 1991 specifications. When they hear or see this claim, many modelers rush right out and buy one . . . paying from \$800 to \$900 for it. And when it doesn't work, they'll come to the AMA Committee and ask: "How come you sold me a radio for \$900 which doesn't work?" And it doesn't work because it's no better than the one which was built five years ago. And that disturbs me. So, through the AMA Committee, I've provided a set of guidelines for the industry. If they'll design their radios to conform with these guidelines, then present these specs of their radios to the modeling public so they can be judged, then, we will have reached a plateau which would satisfy both the committee and me.

**SRCM:** If Scale R/C Modeler publishes these guidelines, will it help educate our segment of the modeling public to know what they should look for when they buy a new radio?

**MARKS:** Yes, we'd be very pleased if you'd spread the word. You would be helping modelers to be more knowledgeable of the problems, and therefore, how to protect themselves and their investment through selective purchasing.

## REPORTER'S NOTES

Mr. Fred Marks is the designer of the ACE R/C "Silver Seven" radio, and is Chairman of The AMA Frequency Committee (an all-volunteer committee). Also serving on this vital group are: Pete Walters (owner of Kraft Midwest); Jack

Albrecht of Airtronics; Bill Hershberg (now retired after 40 years with Voice of America as an RF Engineer); Dave Brown, a VP with the AMA; Bob Underwood, who spends 80 percent of his time on these problems; George Myers and Jim Odino of RC Modeler. Dr. Walter Good is a consultant to this committee; and although Bob Aberle is no longer on the committee, he is still always ready to give us his respected input.

This dedicated group of engineers and modelers are determined to solve the so-called interference problem.

And at Byron's Jet Rally '86, as a result of the transmitter check insisted on by Byron Godbersen, over 1,000 R/C flights were made, without interference problems. And isn't that the way all contests and fun fly events should be managed?

The members of the AMA Frequency Committee are very aware of which brands on the market are causing problems. What's really needed is an independent testing organization to monitor the output of the radio manufacturers, and to certify all repair services. Professional shops, with trained and certified technicians are needed.

Fred Marks told us that the committee had come across some little R/C car radios, purchased recently, which were 3 kilohertz off frequency, and several PCM sets which were 2 kilohertz off frequency.

So, radio buyers, beware . . . there may be a litigation lawyer behind the nearest bush, taking notes . . . and none of us can afford to cause any damage, however slight!

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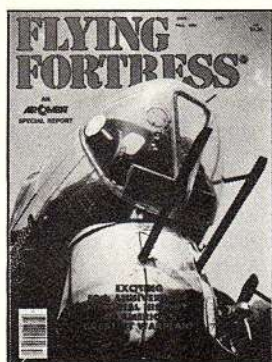
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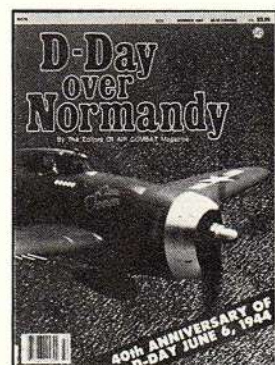
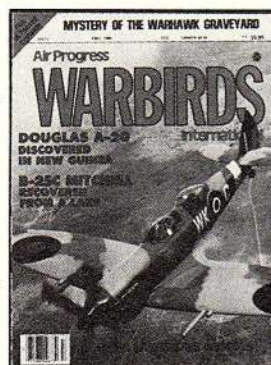
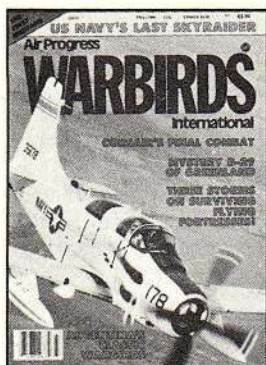
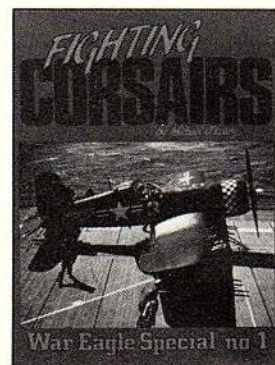
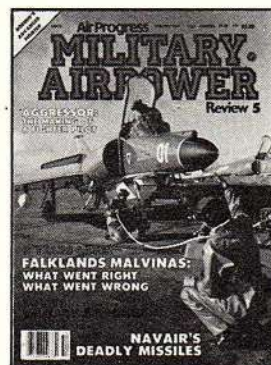
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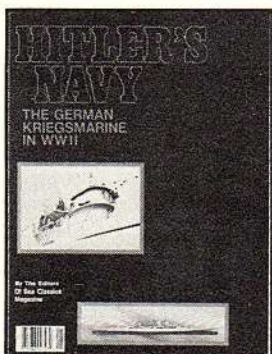
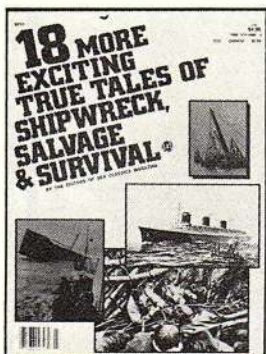
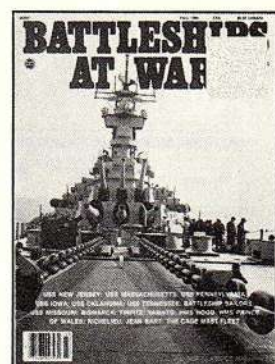
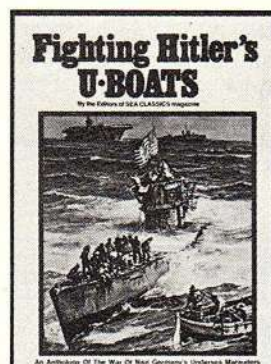
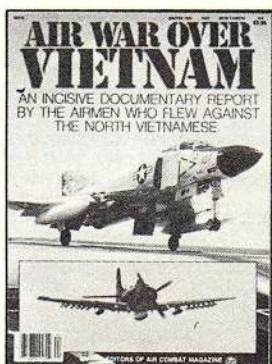




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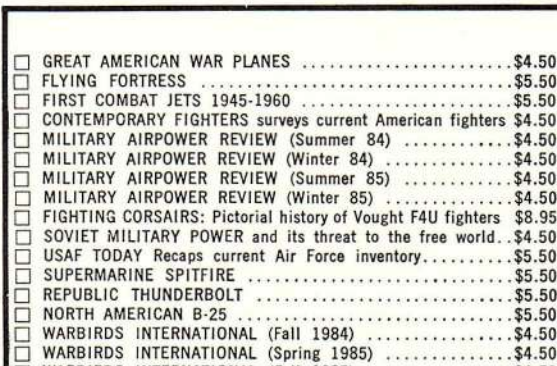
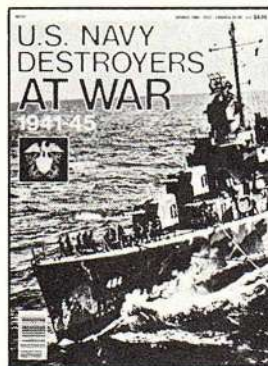
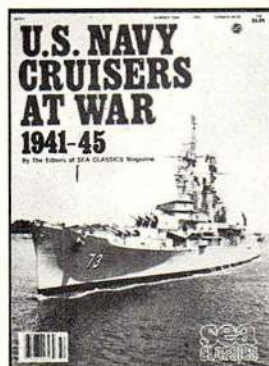
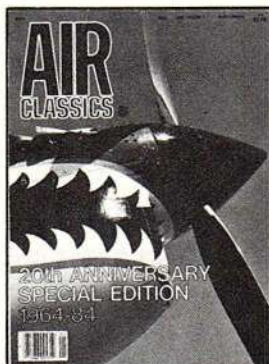
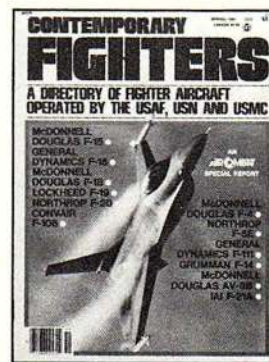
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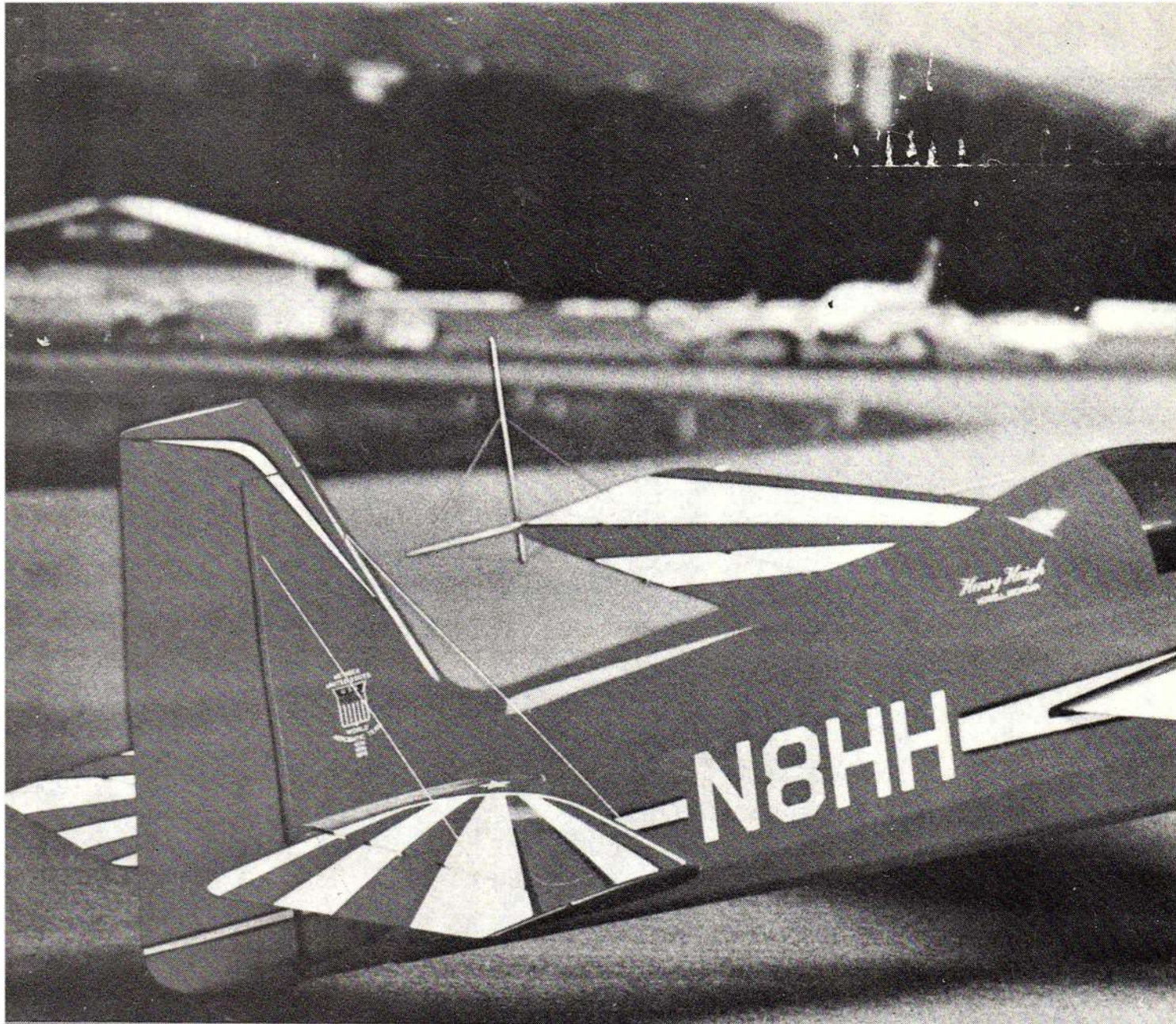
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## ANOTHER SUPER KIT FROM GERMANY FEATURES ONE-PIECE GEL-COATED GLASS FUSELAGE

By Roger Edwards

**T**he editor of *Scale R/C Modeler* asked me to do a kit review on the new Super Star Kit from Gleichauf Modellbautechnik of the Black Forest in West Germany.

JMI of Sumter, South Carolina has imported three Rolf Gleichauf Kits so far, and this will be the third one we've reported on this year.

Gleichauf Kits feature one-piece, gel-coated fiberglass fuselages and balsa-covered foam surfaces. There

appear to be carbon reinforcements in areas to handle stress points in some areas of the interior. Jim Meroth, of JMI, tells me that, if the Super Star is powered with a Super Tigre 2000, it will qualify for International Scale FAI events.

The quality of the glasswork is bulletproof. It's also finished. All you have to do is to cut a few holes with your Dremel and insert the spar (a very large-diameter aluminum tube which slides into each

wing panel). Fiberboard tubes to insert into the wing are also supplied. This is more an assembly process than a kit building one. The surfaces are pre-covered with balsa sheets, so a small amount of work to the leading edge, tips, and other minor chores, and the wing is ready for glassing. Even gear, wheels, fairings and a very large spinner are included. Drawings show how to route the tuned pipe and exhaust through the fuselage for exit under and be-



The Gleichauf "Super Star" is shipped from JMI in South Carolina via Federal Express in ONE HUGE BOX. Model is well-packaged, and it arrived without any exterior damage to the box, and all contents intact.



# Super Star

hind the wing. Make no mistake about it . . . this is a *class* kit!

But why *another* of the same type of aerobatic aircraft? (Mid-wing . . . large rudder . . . slab fuselage?) The answer may surprise you, and I'm not sure just how much is conjecture, but this is the story I've heard and read about:

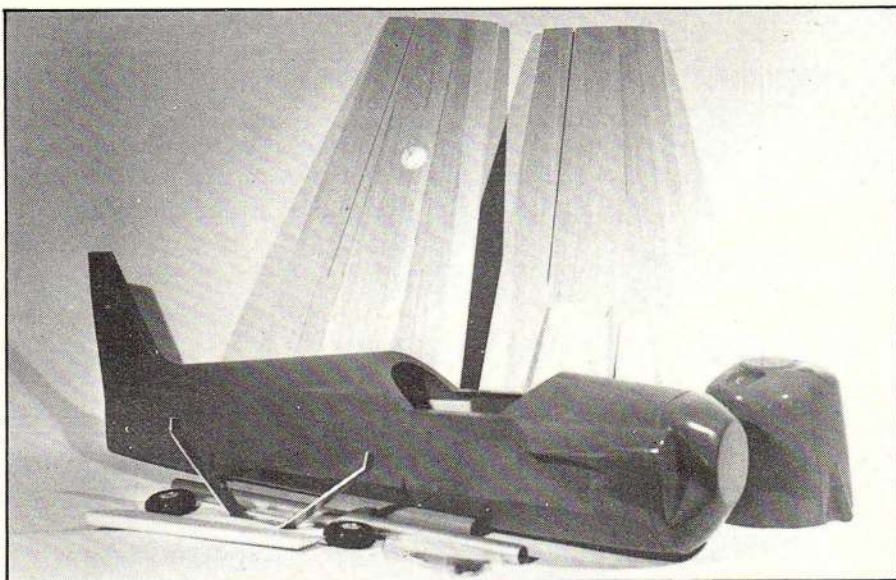
Full-scale aerobatic competitions are judged by a method named the Aresti system, which was devised and developed by a Count Jose L.

Aresti, a very able Spanish aerobatic pilot. Aresti's shorthand, called the Aerocryptographic system of noting and scoring aerobatic contests, consists of a series of symbols of each aerobatic maneuver. When an aerobatic pilot "composes" his "score" or the aerobatic program which he will follow, it's in the shorthand of the Aresti symbols. He presents one copy to the judges and posts another copy on the instrument panel of his aircraft. In order

to attain a high score, the pilot must conform to this sequence which the judges are following.

Now for the interesting and pertinent part: Each maneuver is rated according to the degree of difficulty and complexity which this Count Aresti decided it was worth . . . if the good Count thought that a particular maneuver was easy, it was awarded a small number of points; and if a difficult sequence was performed, then higher points would be





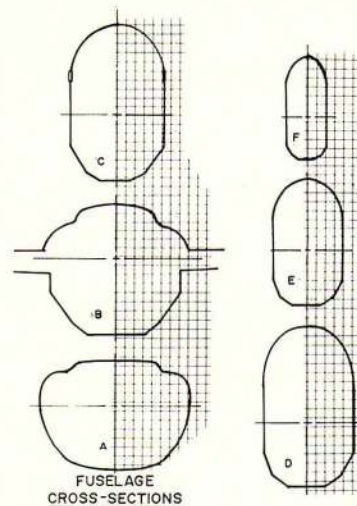
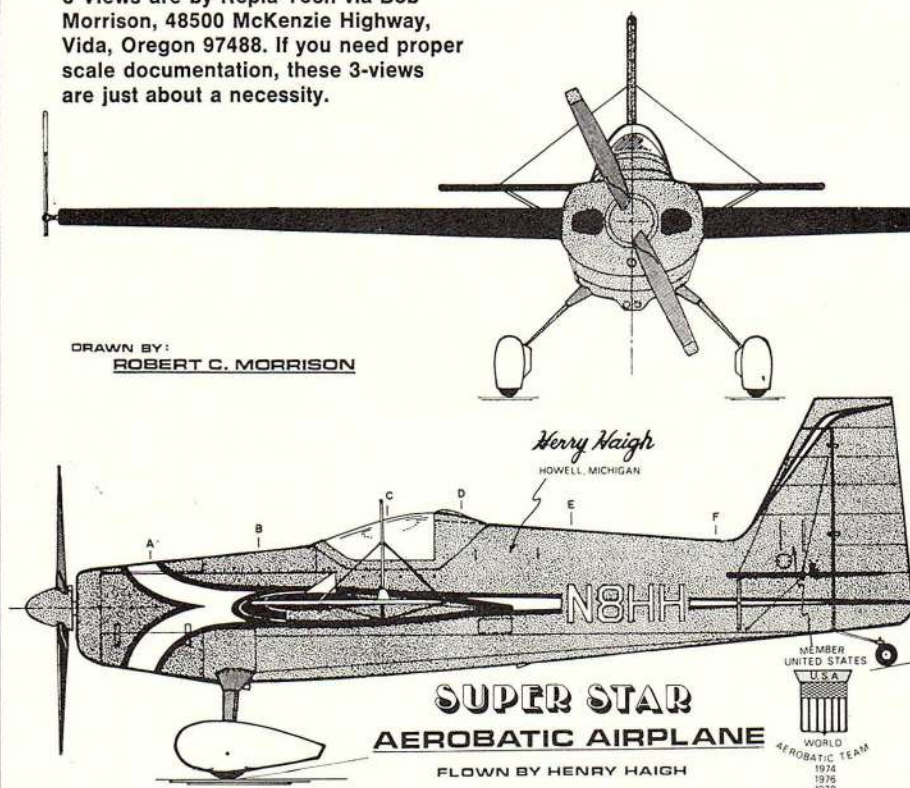
The gel-coated fiberglass work is one of the best I've ever seen. The one-piece fuselage has been reinforced with space-age materials inside the wing-attach area. All detail lines are molded in, and the color is INSIDE the gel-coating.



The cowl is of the same construction as the fuselage, and it's light, strong, and gel-coated bright red.

3-Views are by Repla-Tech via Bob Morrison, 48500 McKenzie Highway, Vida, Oregon 97488. If you need proper scale documentation, these 3-views are just about a necessity.

DRAWN BY:  
**ROBERT C. MORRISON**

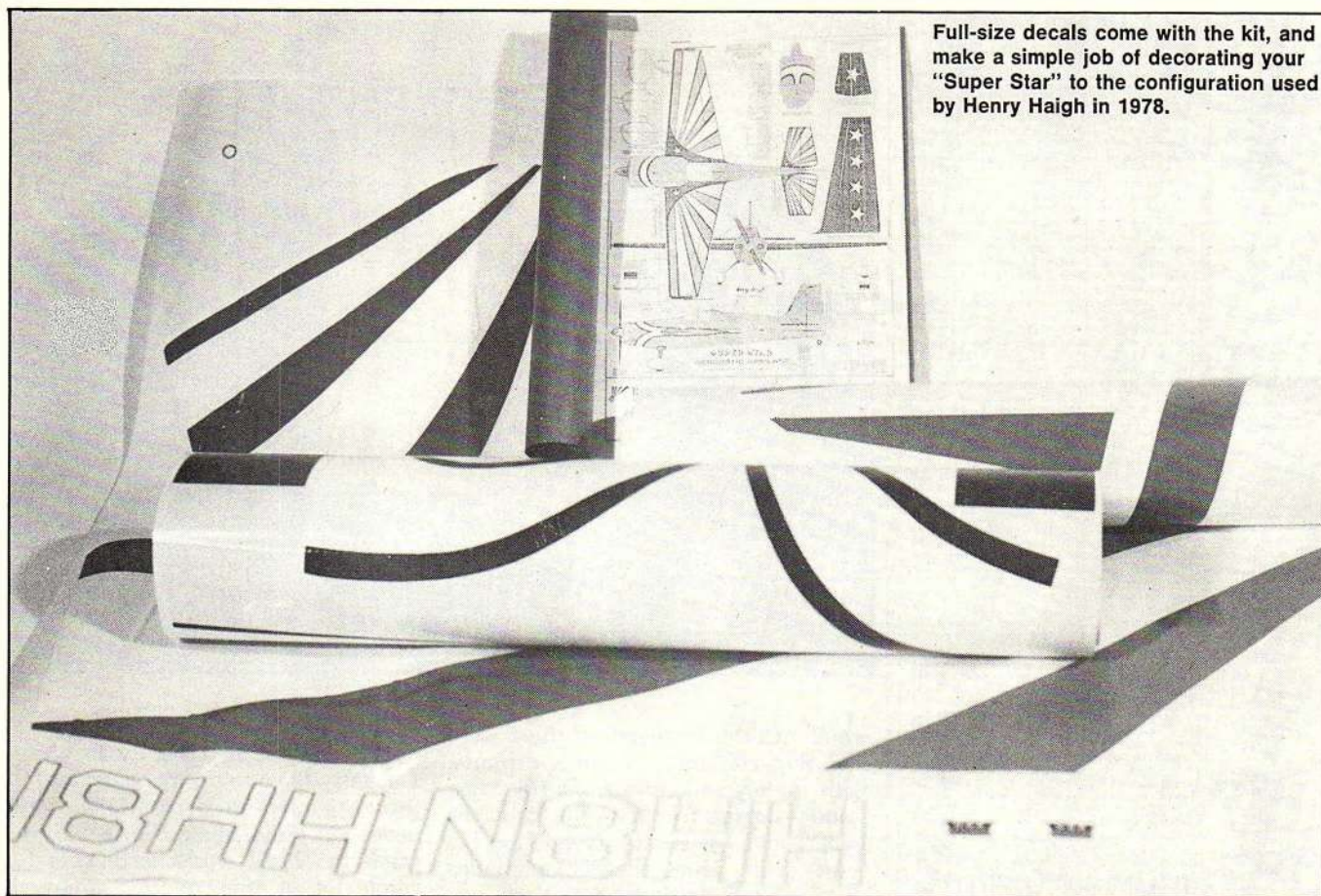


SHEET 1 of 3

222-RCM

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Full-size decals come with the kit, and make a simple job of decorating your "Super Star" to the configuration used by Henry Haigh in 1978.

awarded. That's fine, you say? Well, the problem is that Count Aresti flew Bucker Jungmeisters, which, like the Pitts, are snapping and rolling whizzes; all their pilot has to do is to *think* a roll, and the airplane *does* it! In other words, the Count figured that rolls were a very simple maneuver to accomplish (and in a Bucker, Pitts or an Eagle, they *are* . . . as all three of those airplanes have a very similar plan form). Rumor has it that Pitts designed the Pitts S-1 after watching a Bucker perform in an airshow in the United States. There's an amazing similarity in wing design, sweepback incidence *and* airfoils, so they fly very much alike in the roll maneuvers.

So, as the years went by the aerobatic pilots who were flying their little biplanes, with all of their struts and wires, were getting whipped pointwise by the foreign pilots in their very cleanly-designed, strutless, low-drag, plank-sided fuselage aircraft. You see, the Count's system awarded higher points to the vertical maneuvers because, in the high-drag Bucker or Pitts in which he devised his scoring, they *are* harder to perform since these aircraft run out of steam pretty rapidly because of their relatively extra drag.

Now, take a look at the CAP 21s, the Dalotels, and the Stephens Akros

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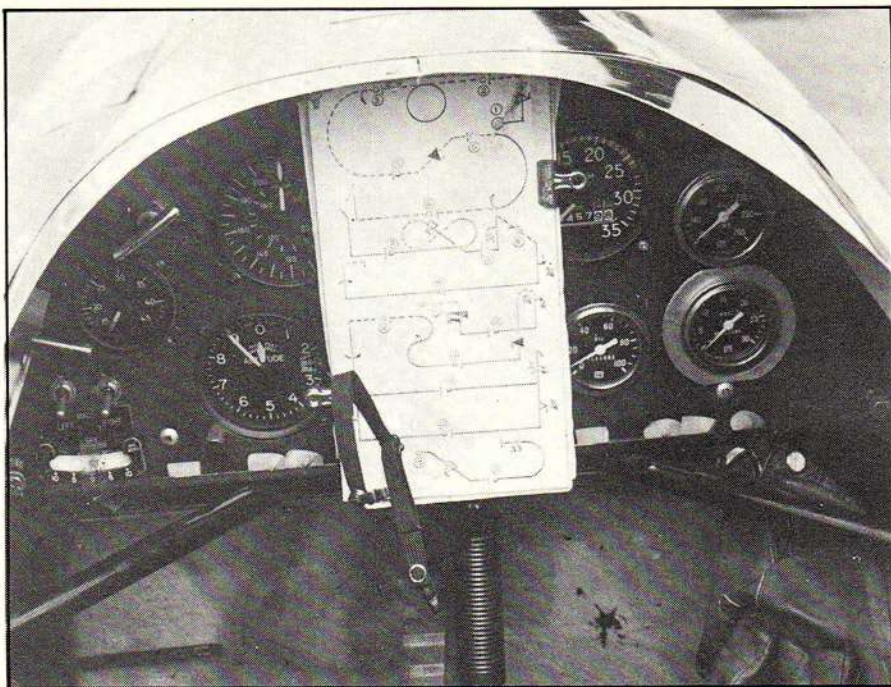
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which are the "fathers" of the Lasers and Super Stars . . . same airplane, with a few modifications by Leo Loudenslager for his Budlight or Laser; and by Henry Haigh for his Super Star. Now, these monoplanes have very little drag, and they can go straight "upstairs" in a hurry . . . therefore they really clean up on those high-point maneuvers. So, at least in international competition, the little biplane is on its way out, only because of the way points are awarded to the different maneuvers.

Wow, is that fair? Well, no, not particularly, but then just think about the Indianapolis racing cars of even fifteen years ago . . . they all had to change a whole lot, just to remain competitive . . . and that's just what happened to aerobatic aircraft. We'd like to think that, in the years to come . . . they'll have biplane aerobatic championships, and monoplane aerobatic championships . . . this way, the "apples" are flying with the "apples," and the "oranges" are competing against the "oranges."

Meanwhile, back to our Kit Review. . . . In 1978, Henry Haigh flew a full-scale modified Stephens Akro, which he called the Super Star, and this is the origin of this beautiful kit by Rolf Gleichauf. And like the full-size Super Star, this plane should go straight "upstairs" in a real hurry!

One of the features of this kit is the full-size, full-coverage decals. The fuselage and vertical stabilizer are already gel-coated red, so paint the wings and elevators white, apply the full-size decals, and your plane is finished. I would rather have "paint-

ed-on" decorations on my models, but, because I'm basically lazy, and I usually have to do the work myself, those painted-on decorations would never get done, since I'm usually always too busy working to spend a whole lot of time on my hobby. It has always disturbed me somewhat when my work interferes with my hobby. . . . This is America . . . and that should be unconstitutional!

This super Super Star Kit has a sale price of \$323.96, with shipping of \$20 additional. The kit comes in one large box via Federal Express. The cost of shipping it from South Carolina (where JMI is located) was \$30.00 but, JMI absorbs \$10.00 of that, so max shipping price is only \$20.00. Because the manufacturer insists on shipping the fuselage in one piece (a very good idea) the box exceeds UPS size regulations, hence the need for Federal Express, or truck shipment. As for the price, as I've said more than once, you get what you pay for, and I'm perfectly willing to get more for my money, such as with this terrific kit. It's sure worth it.

A full "We Fly" report will follow in a future issue, but I thought you'd like to see what this super kit looks like right now.

### Specs:

Wingspan: 2060 mm

Length: 1560mm

Motor: ab 20 ccm, 2-stroke  
ab 40 ccm, 4-stroke

Weight: 6.3-6.8 kg.

The kit is available from: JMI, Inc., 3632 Broad Street Extension, Sumter, SC 29154, (803) 494-3457.

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# F-15 "EAGLE"

(Continued from page 13)

really happy that *both* the F-15 and the F-16 are on *our* side!

Now about the kit:

This is a complex kit, but because of all the prefabricated parts, excellent illustrated instructions and full-size detail sheets, Byron has made the construction of this humungous kit well within the ability of any craftsman who has had experience with fiberglass-and-foam materials techniques. The fiberglass fuselage is in three pieces, and the foam-wings are sheeted with balsa. The flying stabilizers are molded foam. With an aircraft of this size, added weight in the form of glassing the wood and the foam would *not* adversely affect the flying qualities of this agile aircraft.

With this kit, Byron Originals has introduced several new options including *pneumatic landing gear brakes* (a mechanical version is also available for those who prefer it), and a *pneumatic speed brake* which functions much like the speed brake on the full-size "Eagle." This will look great on landing approach.

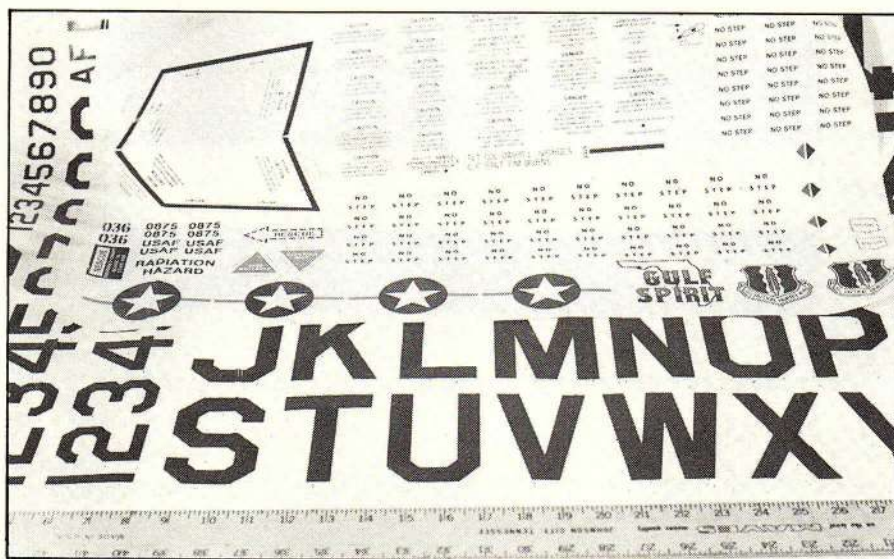
Byron claims a takeoff distance (on a paved runway) of 250 feet.

Total thrust available, from the twin Byro Jet Fans, is *in excess of 24 pounds*. Engine-out performance is outstanding, compared to most other twin-engine aircraft; only very slight trim changes are needed to enable achievement of hands-off straight-and-level flight. After take-off, the aircraft can be safely flown with only one engine operative. Scale judges will have a field day trying to stay with all of the working options on this huge 28-pound model.

To facilitate packing and traveling, the Eagle has plug-in wings, tail, and vertical fins; just retract the gear, and you have a long, but narrow, package.

Byron Originals' technicians have already installed and glassed in the two critical fuselage formers. Finished, this is a *very* impressive aircraft. The plane (yes, the model) has been tracked with radar, on *only one engine, at over 100 mph*. This reporter saw the F-15 perform at Byron's Jet Rally '86 a few weeks ago. It looks great in the air, and the sound of those two fans, turning *in excess of 22,000 rpm*, is *awesome*.

This year, however, awesome is *not* cheap. If you purchase all of the options, including the two needed engine-and-fan packages, and exclusive of finishing, you will spend about \$1,700. Add a good, well-



Multiple sheets of mylar decals, including all of the necessary markings, PLUS

many extra squadron markings so you can individualize YOUR aircraft.

tested radio, a little paint, etc., and you've got yourself one gorgeous radio-controlled model aircraft worth about \$2,500 invested (not counting your time, but then, no modeler counts time anyway)!

Is it worth it? *You bet your bippy it is!* When you roll your new Byron F-15 "Eagle" out of the van, the entire population of the flying field will crowd around asking a million questions. Let's face it . . . 2500 bucks isn't that much anymore. Oh sure, it'll buy a cheap motorcycle, a small sailboat or fishing boat, or even a divorce lawyer (whom you'll probably need, if the little woman doesn't wholeheartedly approve of your choice of toys).

Now, with an investment of this magnitude, you must be super careful . . . *everything*, including the weather *and* your horoscope, has got to be "in the green" before you launch that "Eagle." However, if you've checked all your aircraft systems . . . with those two close-coupled engine and fans, even if you should lose one after takeoff, you can still make that power approach which heavy aircraft like the F-15 seem to enjoy.

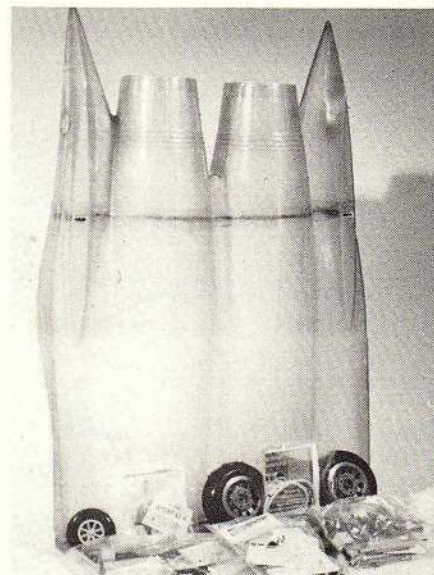
So, with the life expectancy of Byron's "Eagle" being around four or five years . . . the cost pro-rates to about 500 bucks a year, or only about \$1.35 a day. You could quit smoking . . . or stop drinking beer . . . and your Byron F-15 costs you nothing! Now, how's that for rationalization? Show this paragraph to your wife, and she will place the call to Marc Jensen at Byron Originals herself! Area code: (712) 364-3165.

Readers of magazines who have never seen the contents of a Byron Originals kit are in for a pleasant

surprise. We have printed the contents list here so that you can see for yourself everything that goes into the most expensive kit on the market today. And they're selling way beyond the projections of the sales folks at the factory, which goes to show that there are discriminating modelers out there who are willing to pay for a superior, well-designed, well-manufactured, creative, well-packaged, radio-controlled model aircraft.

In conclusion, just as soon as Skip Ruff gets the big "Eagle" finished, we'll run a construction article on it, and then a flying report. Watch for them!

See next page



The aft glass section of the fuselage is shown here with some of the many packets, numbered and labeled in typically great Byron fashion. This Eagle Kit is about the biggest on the market.

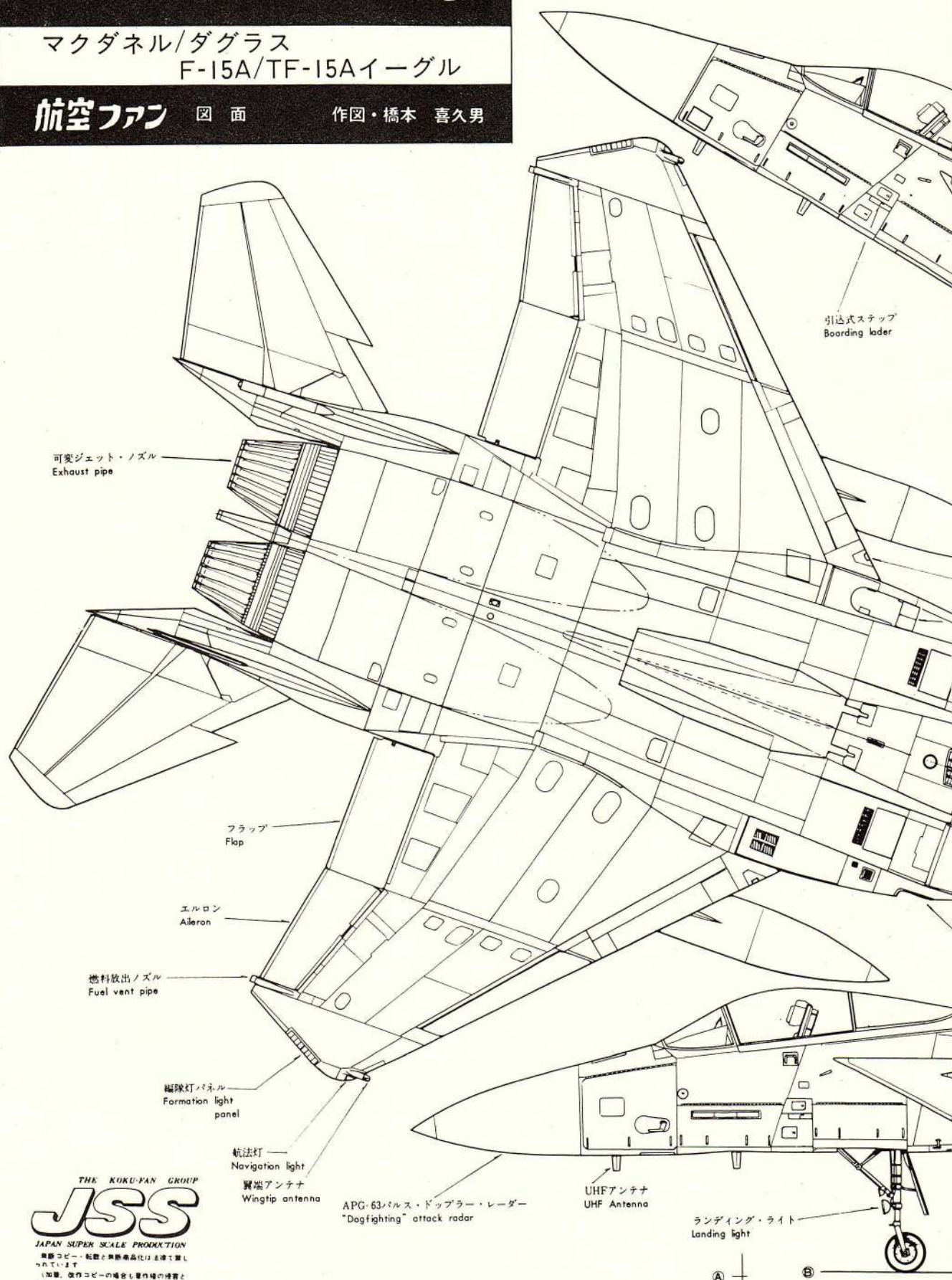


# McDonnell/Douglas F-15A/TF-15A Eagle

マクダネル/ダグラス  
F-15A/TF-15Aイーグル

航空ファン 図面 作図・橋本 喜久男

DRAWING No. 50-60 ( 1 )

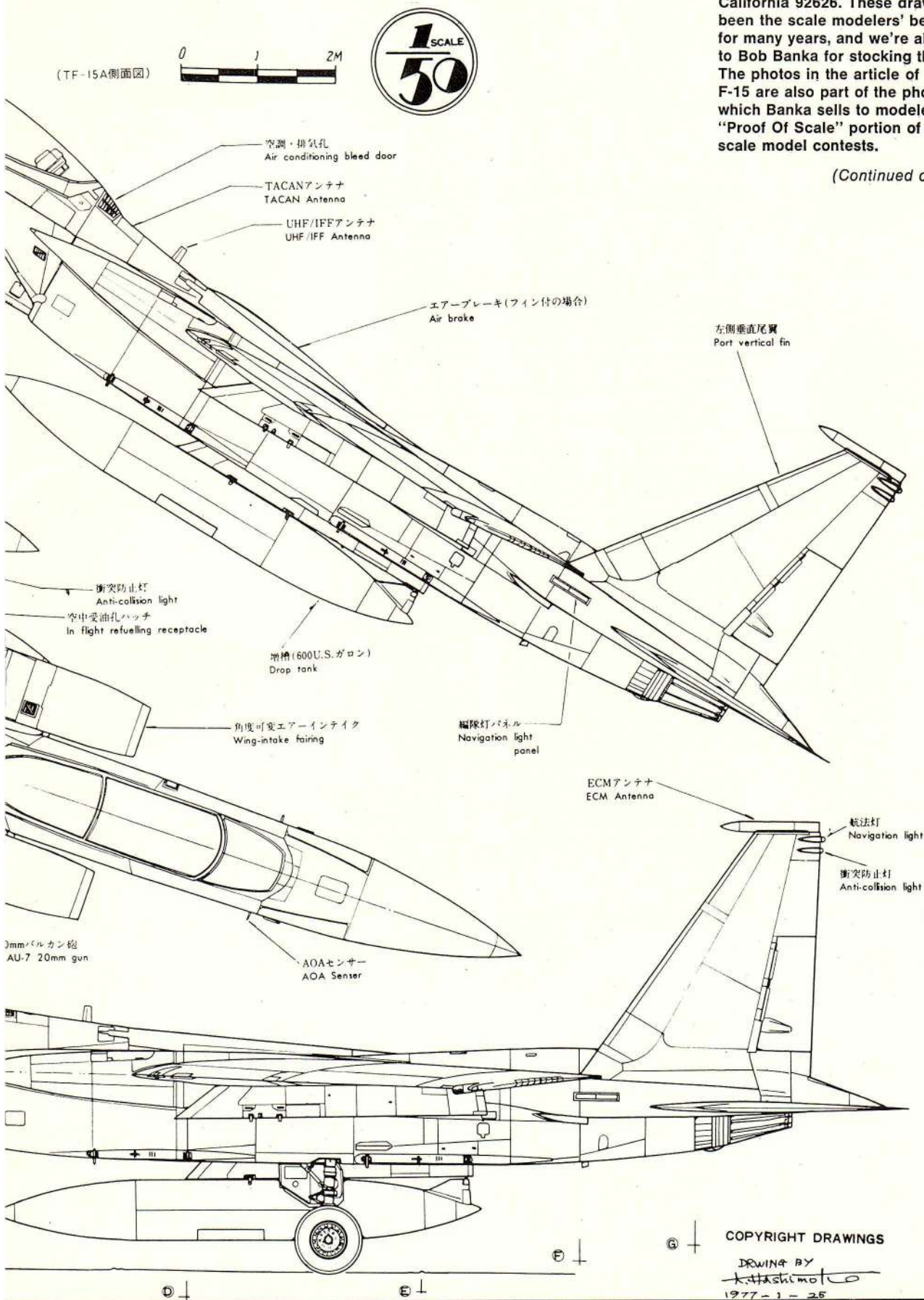


THE KOKU-FAN GROUP  
**JSS**  
JAPAN SUPER SCALE PRODUCTION  
真鍮コピー・転写と印刷商品とは違っており、  
（加筆、改作コピーの場合は製作時の様子を  
示します。）



Koku fan drawings are available from Bob Banka, Scale Model Research, 2334 Ticonderoga Way, Costa Mesa, California 92626. These drawings have been the scale modelers' best friend for many years, and we're all grateful to Bob Banka for stocking them for us. The photos in the article of the full-size F-15 are also part of the photo-pack which Banka sells to modelers for the "Proof Of Scale" portion of judging at scale model contests.

(Continued on page 70)





# *1938 TO 1940 — THE GRUMMAN XF4F AND XF5F*

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**WHEN GRUMMAN WENT FROM BIPLANES  
TO MONOPLANES—AND TO TWINS FROM  
SINGLES, ALL DID NOT GO WELL.**

---

By Norm Goyer, Bob Holman, Eldon Wilson  
and Bob Morrissey







In 1936, the U.S. Navy put out the word that they were interested in acquiring a new series of monoplane fighters to equip their two new, new aircraft carriers. In fact, the XF4F-1 was to be a *biplane*, but because the Navy liked the *monoplane* fighter design, the XF2-2, as submitted by Brewster, they ordered fifty-four of the F2As. This order almost terminated the Grumman factory's fighter production right there. Brewster's design used the single-row nine-cylinder Wright R-1820 Cyclone engine, and the new design by Grumman had the double-row, *fourteen-cylinder* Pratt & Whitney R-1830 twin *Wasp* powerplant.

The new Grumman XF4F-2 retained the *barrel-shaped fuselage* of

the biplane fighter, the F3F, which had been in the Navy's inventory for many years, and also kept the *landing gear*, but the new fighter was all-metal, except for its fabric-covered control surfaces. The first XF-4 did not have folding wings, and, during the fly-off tests of the new model, they were seriously threatened by crankshaft failures. This kept the Wildcat on the ground for long periods of repair time, while testing on the competitor Brewster Buffalo, and Seversky's NF-1 (a Navy version of the Army's successful P-35 pursuit fighter) advanced. And, during one test flight on February 14, 1938, while flying at 10,000 feet, a fire occurred in the aft fuselage. The aircraft landed safely, and

damage was light, with the plane back in the testing within a few days. On April 11, misfortune struck the Cat once more . . . while on landing during a simulated deck approach, the engine quit, and the XF4-2 made a forced landing which severely damaged the landing gear, cowlings, prop, right wing and tail. The bent bird was shipped back to Bethpage, Long Island factory, repairs were rapidly made to the prototype, and it was flying again in less than two weeks.

Because the Seversky lacked sufficient speed, being able to attain only 250 mph (much short of the requirements of the Navy) that air-

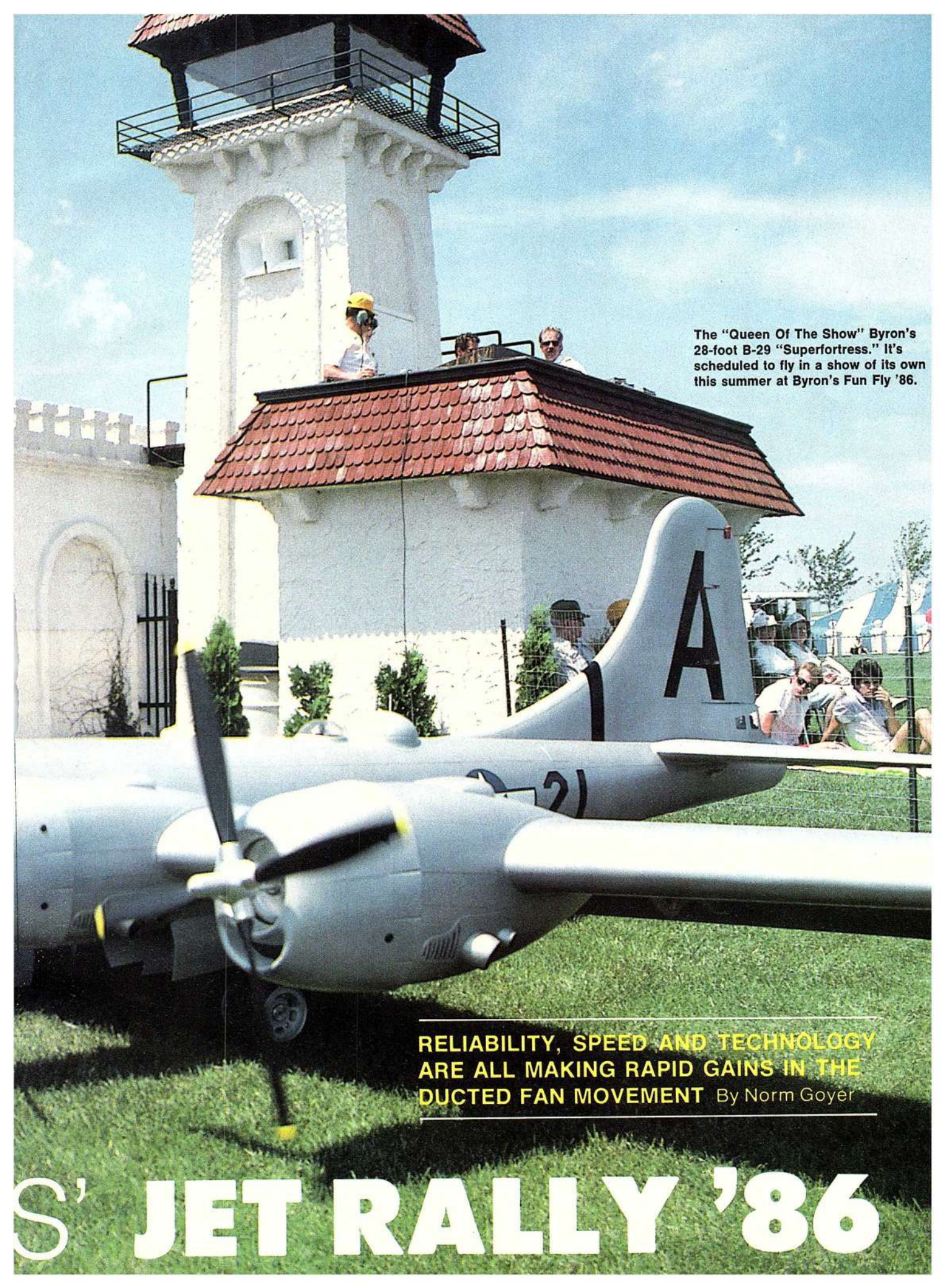
(Continued on page 59)





BYRON ORIGINAL



A large-scale model of a B-29 bomber is displayed on a green lawn. The aircraft is white with black propellers and a large black letter 'A' on the vertical stabilizer. The number '21' is visible on the fuselage. In the background, there is a white lighthouse with a red-tiled roof and a balcony. Several people are standing on the balcony and near the aircraft. The sky is blue with some clouds.

The "Queen Of The Show" Byron's 28-foot B-29 "Superfortress." It's scheduled to fly in a show of its own this summer at Byron's Fun Fly '86.

**RELIABILITY, SPEED AND TECHNOLOGY  
ARE ALL MAKING RAPID GAINS IN THE  
DUCTED FAN MOVEMENT** By Norm Goyer

**S' JET RALLY '86**





This Byron F-16 was but one of the most popular jet models manufactured by Byron. This light blue camo color scheme is very pretty, but it must be really difficult to see against a summer sky.

Gloster "Javelin" resplendent in dayglo orange, as used at Bascomb Downs for chase-and-rescue duties. Plane is three years old, and is powered with two Rossi 81s with ByroJets.







I really enjoyed my second trip to Ida Grove, Iowa . . . this time for BYRON ORIGINALS' JET RALLY '86. As usual, the trip was well worth the effort because of the great show put on by the boys from Byron for their fans and customers.

On the previous weekend, I had covered the Merced Airshow for another Challenge Publication, *Sport Pilot*, and I was looking forward to a nice quiet model airplane show to calm my nerves. HA! Byron's full-size airshow was even better than the one at Merced. The Coors "Silver Bullet," a sleek Hyperbipe, a Pitts S-1 and a J-3 "clown" act had every one of the over 5,000 spectators riveted to their seats, and the FAA threatening to write citations.

The 1/5 scale Model Airport is located on top of a plateau surrounded on all sides by rolling hills. The BD 5J would come from below one of the hills and appear just inches over the grass, doing slow rolls until it was almost out of sight. The J-3 landed on the model airstrip, using only about 100 feet, much better than most of the models.

Then the "Fighting Back" sequence started. All of the World War Two aircraft were launched and the afternoon came alive. The two B-25s are looking more and more realistic each time they fly, and the beautifully-detailed C-47 took off and was able to make its parachute drop without getting shot down by those dastardly Zeros. Huge speakers augmented the two-stroke sounds with engine and ordnance sounds



A lineup of the very popular Tom Cook "Star Fire," designed to make best use of Tom's Dynamax fan unit. Bob Violet has a similar plane, the "Sportshark." Many of both types were in evidence here.

The famous Cloud Dancers Show Team, from Kissimmee, Florida's stars, Johnny Davis, Tommy Veloskey, and Don Muddiman. They put on a great lunch-break show as expected from experts such as they are.



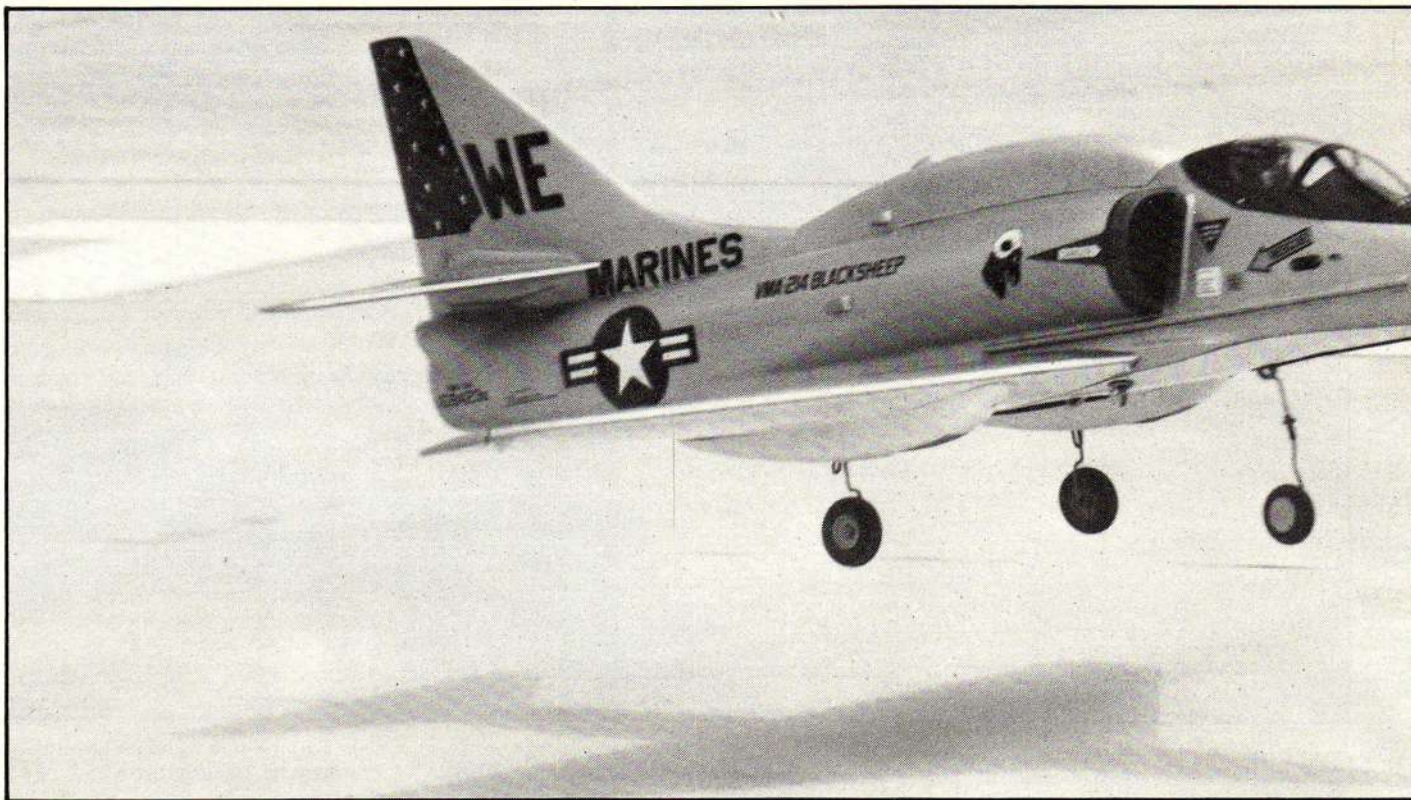
This Byron Eagle waits its turn to crank up its Twin Byrojets and take to the skies over Ida Grove. This F-15 is a stable, realistic flyer.

which are extremely authentic. Byron's show is so action-oriented, with the audio and visual involvement so thorough, that it's really hard to describe accurately, but it's one you're sure to enjoy to the utmost, and you'll never forget.

Byron outdid himself again this year, this time with a *twenty-nine-foot, six-inch* B-29 "Superfortress." This huge beauty was completely "manned," in each and every position with "crewmen" dressed in authentic flight suits. Although it did not fly this time, it is scheduled to do so at the Ida Grove "Fun Fly" in August. For obvious reasons . . . its awesome size, and exquisite complexity, for openers . . . the B-29 will not be kitted, but it sure is a tremendous show piece. Impressive!

The model which *will* be kitted





A Byron A-4 lifts off the runway on its way to another thrilling flight. This is yet another very popular model in Byron's extensive jet line.

The Byron crew prepares two of their new F-15 Eagle Jets for demo flights. This kit is now ready for shipping. Look for our Eagle Kit Review elsewhere in this issue.

by Byron is a P-38 "Lightning" (108 inches) which was shown in its pre-painted condition. While P-38s have always been popular with modelers, because they have three fuselages and two rudders to build, they weren't very often built. But now that there will be a P-38 *Byron* Kit, I predict that we'll be seeing many more of these beautiful R/C models in the winners' circles at contests all over the country. P-38s also fly extremely well, for the simple reason that they have one rudder per engine, and their *tricycle gear* make takeoffs and landings much more easily than most other styles of gear on the rest of World War Two aircraft fighters. Last year, I was criticized because I didn't stick 100 percent to reporting on ducted fans, because, after all, this was a "jet" rally, but as a lover of *all* aircraft, large, small, full-size, and models, it is my editorial prerogative to report on what I saw and what I especially liked!

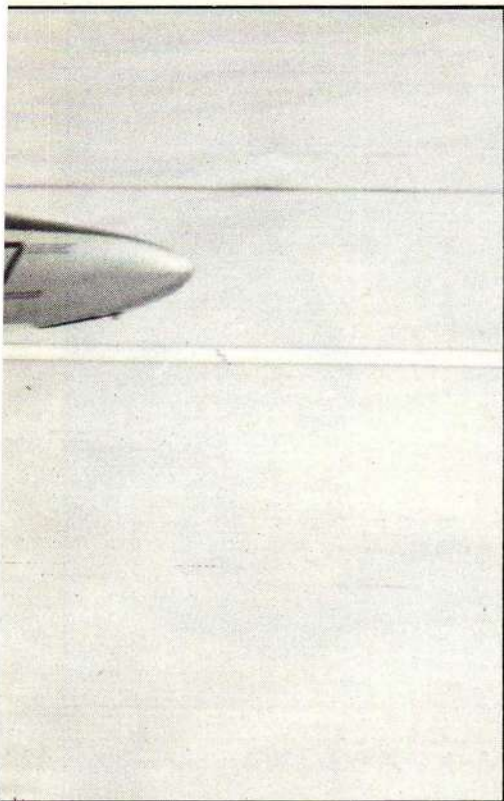
One of the aircraft which was new to me caught my eye . . . it was an English Gloster "Javelin." The model was patterned after one of the 38 scale r/c modeler



aircraft which was a combination of the Mark 2 and the Mark 7, used at Bascomb Downs, England, as a research-and-chase aircraft. (Bascomb Downs is England's counterpart to our Edwards Air Force Base). The big delta weighs in at 27 pounds, is powered by two Rossi 81s, spinning Byro Fans . . . producing a combined thrust of 24 pounds! Equipped with Dave Platt Competition Retracts and C&B Tires, control is via a Kraft Mark 7 Radio. Construction is fiberglass and foam covered with 1/16 balsa sheet. Surfaces are covered with Solartex, painted with K&B primer, followed by Randolph high visibility orange

(dayglow orange). This finish was then topped with a coat of K&B semi-gloss clear for fuel-proofing. Fuel used is K&B 100, which Rossis seem to run well on. The engines are topped with OPS Gold glow plugs, which are good for three or four runs per set of plugs. As the Gloster "Javelin" is over three years old and has been flown at least *one-hundred times*, it is beginning to show a bit of "hangar rash," a condition which is certainly expected of such a "veteran" model. Because this Delta design is not very often modeled, I had some trouble gathering data about it, and I'd like to thank all of the folks who





sent in information about it, some from as far away as Canada, and even England, and for the photos and drawings of this interesting bird. The size is 1/8 scale. Owner and builder of the "Javelin" is Mark A. Frankel of Philadelphia, Pennsylvania, who is a Chevrolet dealer there.

From Austin, Texas, Tom Sewell brought two BD-5Js which had a very simple plan form and looked extremely easy to build. Construction made the installation of radios, engine and fans seem quite *uncomplicated* (for a change). To simplify the structure, they used a wing from a Kaos 40. One of the models was designed as a fun-fly jet plane for a 40-size engine and an inexpensive Turbax Fan. The other BD-5 had a Dynamax Fan, but the smaller one is the better-flying aircraft . . . the other one seems *overpowered*. Tom



This is all that's left of the Zero which went "down in flames." For those who always wondered what that is, this is a genuine "smoking hole."

Sewell told us that he built the plane to be an every-Sunday-fun-fly-type model. He says that it flies very nicely for about seventeen minutes with the 24 ounces of fuel, and that it flies *just like* a Kaos 40. He designed his aircraft for ease of installation, and it can be dismantled in minutes.

Last year, we photographed a "Meteor" which was still under construction by Mike Kulszyk. Well, this year, Mike had it finished and flying. His Meteor looked great and it flew very well. Mike had to make a high-speed approach, and literally fly it onto the ground, but, in the air, it was *very* realistic looking. Fortunately, both engines on the Meteor kept running, because if one engine went out, it would probably be a bear to fly, since it has very wide thrust differential. It was one

of the more unusual ducted fan models I saw at the Jet Rally.

Byron's "F-16" is *still* one of the most popular ducted fan models ever produced, and this one, by Scott Foster, had a very detailed cockpit, complete with ground accessories for pilot and crew maintenance. It's endlessly fascinating to me just how different the very same kit can look as modeled by different modelers. Scott hails from Middlebury, Vermont, and (maybe during those long, snowy, Vermont winters) intricately detailed the cockpit, using photos, diagrams and drawings from a multitude of books and magazines on the F-16. In addition, the pilot was handmade, as was all of his clothing. Head is from DGA; with a Williams Bros. helmet.

But the visual "Star Of The Show" wasn't a jet at all—it was



Kerry Sterner and helper ready the P-80 for flight. This aircraft was very popular with the crowd. Background shows large number of modelers attending.

Byron's newest kit will be the Lockheed P-38 "Lightning." Span will be about 10 feet, and power two Q-35s.

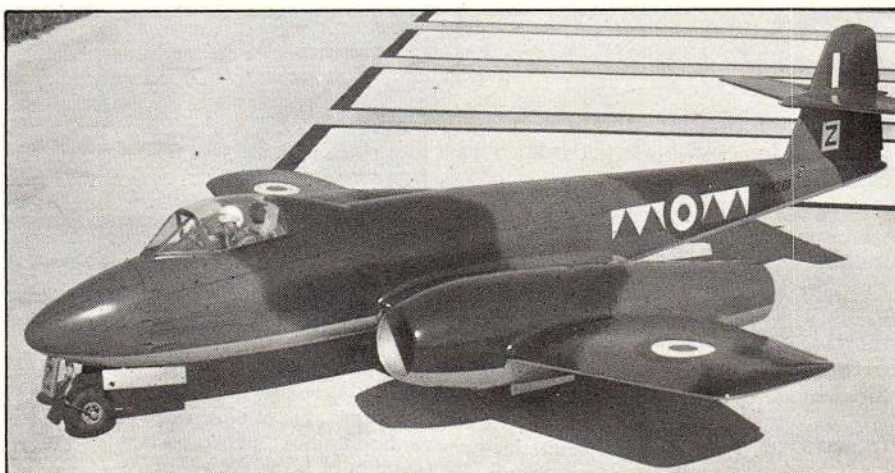






F-16, anyone? This line-up shows the great popularity of Byron's Falcon. It flies fast . . . flies slow . . . and is a joy to land Great design!

Gloster Meteor, owned by Mike Kulczyk, made several very fast flights, and some even faster landings. Realistic in the air, it looked like a bear to land safely, but Mike did it just great.



Byron's massive B-29. Construction was of foam blocks, carved to outline, then a mold was made from the finished carved foam blocks. Panel lines and other minute details were added to the plug. The plug was then attached to the parting board and a mold is made from the plug. The wings were wire-cut foam, fiberglassed, then attached together. The landing gear from Thumper is entirely custom-machined to scale dimensions, including its pneumatic brakes. The four-bladed props are powered by four special Quadra 100s, geared down with belt drives to turn the large props. All engines will have remote starting capability, and each will have a smoke system to simulate realistic start-up "belching" appearance. Each and every interior crew station, from tail gunner to bombardier have been detailed; even the flight engineer had a work table in front of him. Current plans call for the installation of rotating gun turrets and operational bomb bays. Thumper is scheduled to be flown at BYRON ORIGINALS' Fun Fly in August. It should be a show in itself! Thumper is 1/5 scale, has a span of 28 feet, 6.5 inches; length 40 scale r/c modeler

of 19 feet, 6 inches; and weighs 400 to 450 pounds!

An interesting trend which surfaced this year at BYRON's Jet Rally, was the emergence of a sport-type ducted fan—the "Starfire" by Tom Cook, and the "Sport Shark" by Bob Violet. Both these aircraft were matched in size, dimension and weight to each particular maker's brand of fan jet. While, in some instances, these matched units do perform better than some scale aircraft, personally, this is *not* the way I would go. But modelers from all over the country had taken these two planes and put Blue Angel, Coors Silver Bullet, and F-16-type paint schemes on them, and they did have a ball flying them—in fact, this year, their numbers almost matched that of the scale jets. Bob Violet and Tom Cook are both very dedicated scale modelers, but their marketing research showed them that there were a great many sport modelers out



Another new Byron Kit is the BD-5J. Very aerobatic, and easy to build and fly. It should sell very well.

there who were itching to graduate from Ugly Sticks to jet models, so there they were. I suppose it is wishful thinking on my part to think that something as dramatic and beautiful as a jet fighter can be bypassed in favor of a sport-type model airplane.

Byron has started to ship his F-15 "Eagle" Model! (Look for the Kit

(Continued on page 56)





Scott Foster, of Middlebury, Vermont, must have spent many of the long, cold winter nights detailing the cockpit of his Byron F-16; his dedicated attention to details should add many points to his static judged scores at contests.

Another super detailed cockpit shot of a Byron F-16. The trend is toward more and better scale detail, as modern fans and engines will definitely pick up this minor amount of extra weight which super-scaling entails.





# JODEL F12

INTRODUCED TO THE HOMEBUILDERS  
WAY BACK IN 1948, THIS 1/3 SCALE  
MODEL IS A GREAT PERFORMER

By Jerry Van Heeswyk of Louisville, Colorado





I suppose that there are about as many reasons why each of us participates in model aviation as there are modelers enjoying the hobby. For me, the challenge is to duplicate the appearance and flight characteristics of a full scale aircraft as closely as my skills will allow. I generally build a couple of planes a year and am a typical "Sunday Flier." Consequently, my models must be relatively simple, rugged, and functional. And, although I have tremendous respect for those who build true precision scale, I personally lack the patience, time, and skill to join their ranks.

When I began looking for a subject for a new project I had several criteria to satisfy. The first and possibly most important requirement for me was that the aircraft be unique. No matter how well done, models of J3 Cubs, P-51s, and Lasers rarely excite me any more. Simplicity of design was also important to permit ease of construction, and airworthiness was certainly high on the list.

While looking for a subject I was extremely pleased to learn that my next door neighbor was the proud owner of a rare Jodel F12 home-built. You can imagine my reaction

when I learned that he also had access to the original plans. After researching the history of the Jodel, studying the plans, and flying the F12 I was confident that this plane would meet my every objective.

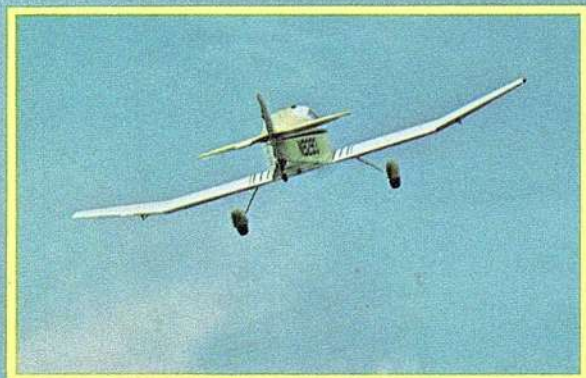
The only thing left to decide was the scale. The way I see it, there are only three things a modeler can do to achieve truly realistic flight; build an overpowered subject, build very, very light or build very large. I was not interested in the first alternative, was incapable of the second, so I have opted for the third. The project presented here, at 1/3 scale, has absolutely scale perform-



The model F12 sits on the ramp in the shadow of the full-size Jodel after which it was patterned. Isn't it great when you can make your model look just like a big one in your home area?



In the air, the Jodel F-12 shows its very pleasing lines. The design has been a favorite of European Homebuilders for many years, and rightly so.



ance. It will do large slow loops, slow rolls, slow snap rolls and scale landing approaches, steep and (you guessed it) slow. The full scale F12 has done each of these maneuvers and is capable of many more.

The Jodel was introduced to the world, innocently enough, in the countryside near Beaune, France, in January, 1948. It was the creation of Edouard Joly and his son-in-law, Jean Delemontez. Hence the name Jodel which was derived from the last names of the designer/builders. Joly and Delemontez were partners in an aircraft repair business and designed their first craft to utilize some old surplus covering and a used 26-hp Poinard engine. This aircraft performed very well and word of its flight capabilities spread throughout Europe. The two builders, who had intended to design only for their personal use, were soon deluged with requests for plans and information. That first design, which was later to become famous as the D9 BEBE JODEL, was largely responsible for the birth of the Jodel movement. To this day the International Jodel Club, headquartered in England, has a large, active membership of those who either own or just have a soft spot in their hearts for this "bent winged" little airplane and its descendants.

A two-seat version of the Jodel



The small French Homebuilt lifts off the mile-high runway in Colorado with power to spare.

was designed at the request of the French government. This aircraft, the D11, first flew in 1950 and was the forerunner of the F12. The "F" designation is given to the homebuilts which were built from plans marketed by Chris Falconar in Canada. There are seven of these aircraft now flying in Canada and approximately a dozen in the United States. The aircraft presented here (N9293) was completed in Cheyenne, Wyoming, in 1974 and is now owned by Jim Douglas of Louisville, Colorado. As

with any homebuilt there are no two which are identical. N9293 was modified from the original plans to incorporate a Cessna-type spring steel landing gear, a Swift windscreen, and a fiberglass cowling to encase the 130 hp Franklin engine.

There are numerous other variations of the D11, similar to the F12, now flying in Europe. Some of these were homebuilt but many were certified and manufactured by one of several different European companies.



Flight performance of N9293 is excellent. The cruise speed is 125 mph with a stall speed of only 41 mph. The Jodel has a semi-symmetrical airfoil and a distinctive polyhedral wing which is a Jodel trademark. The polyhedral provides excellent stability but does not interfere with aerobatics. The tail comes up quickly on takeoff and ground handling is very good, even in a stiff crosswind.

I chose to model the Jodel F12 because of its fine performance and very unique appearance. The fact that it is a taildragger and that construction presented no serious problems assisted in my decision. This 1/3 scale model is built from the original plans with measurements taken from the full scale aircraft. The only significant deviations from scale are the greater width of the gear leg to support the 32-lb. weight and the increased thickness of the wing tip to simplify construction and to resist tip stalling. I have had the pleasure of flying the full scale Jodel and believe that this model duplicates the appearance and flight characteristics in every way.

## BUILDING INSTRUCTIONS

Space does not permit a detailed description of the building process but I will cover some general information about construction of the Jodel. Construction materials consist primarily of 1/8-inch Philippine mahogany plywood, 1/8-inch balsa wood and spruce. Balsa may be substituted for the 1/8-inch plywood but it is much more expensive. A 4-foot by 8-foot sheet of 1/8-inch plywood costs less than \$10 and you can make a whole lot of airplane parts from one sheet. Other required plywood (1/4-inch and 1/2-inch) is heavy enough so that ordinary construction grade will be adequate.

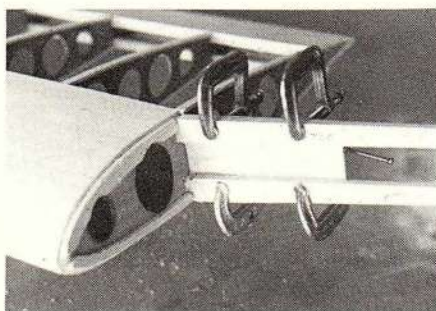
In general, Titebond or a similar adhesive is recommended. Epoxy glue, silicon rubber cement, or polyester resin are required for specific applications.

## FUSELAGE

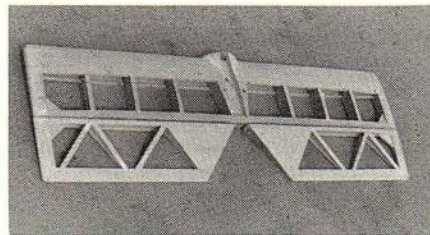
Begin construction of the fuselage by laying out the sides on a sheet of 1/8"x48"x96" mahogany plywood. If you are unable to obtain mahogany plywood in your area you can remove the skins from interior hollow core doors as an alternative. Doors with minor damage are usually available from building supply centers at very reasonable prices. Clamp the sides together for final sanding to ensure that they are identical. The prototype was built with



The cockpit interior is very nicely detailed. With the wide-opening canopy, it's almost a must to detail the interior in order to get the best static score possible.



Construction of the wing tip begins by gluing the tip spars to the center section spars. Laminate polyhedral joint with 1/8 inch mahogany plywood. Note false rib to provide base for sheeting.



Stabilizer detail. Note notch for mounting fin.

the aid of a Dremel scroll saw. This tool proved invaluable for working with these materials.

Next, the bulkheads are traced onto the appropriate plywood and sawn to proper shape. The firewall is made from 1/2-inch plywood. F2B and F10 are made from 1/4-inch plywood. All other bulkheads can be cut from 1/8-inch mahogany. One method that works very well to transfer the bulkhead shapes to the plywood is to make a copy from the plans on a dry-process photocopy machine (IBM, Xerox, Kodak, etc.). The copies are then placed facedown on the wood and using a very hot household iron and firm pressure, the toner image is transferred from the paper to the wood. Copies can be taped together for large parts. Dark copies work best and you should ensure that there is no significant enlargement or reduction.

All of the bulkheads are made in two pieces to permit the fuselage to be assembled upside down on a flat surface. When built over the plans this will ensure a straight and true

structure. Lay the top view of the plans over a 3/4-inch plywood building board and nail 1-inch wood scraps tangent to the fuselage outline at each bulkhead location. The 3/8-inch by 3/4-inch longeron should be glued to the fuselage side in the jig to hold the proper shape. The fuselage sides are then held against the jig by clamps and the bulkheads. Pins are not of much use when working with plywood so "C"-clamps and masking tape are used as substitutes. The cabin frame bulkheads are made by laminating a layer of 1/8-inch plywood on each side of 1/4-inch by 3/4-inch spruce. If the grain of the spruce is laid according to the plans the frame will be very strong. The 5/16-inch by 5/16-inch spruce center stringer is then glued in to brace the bulkhead tops prior to sheeting. The sheeting is 1/8-inch plywood forward of the instrument panel and 1/8-inch balsa on the cabin and turtle deck.

After sheeting the turtle deck and cabin area the door openings and rear cabin windows are cut to shape. Leave 1/2-inch of sheeting inside of



the door openings to act as a jig on which to build up the doors. The door frames are made from four laminations of 1/32-inch plywood and are built up right on the fuselage side. This method ensures a good fit and produces a very strong and light structure. When the doors are completed the cabin openings are cut to proper size and a strip of 1/32-inch plywood, 1/8-inch wider than the balsa sheeting, is glued inside to act as a door stop and to reinforce the door hinge area. The door is held to the fuselage by two 1-inch brass hinges available from most hardware stores. The door windows are made from .030-inch butyrate.

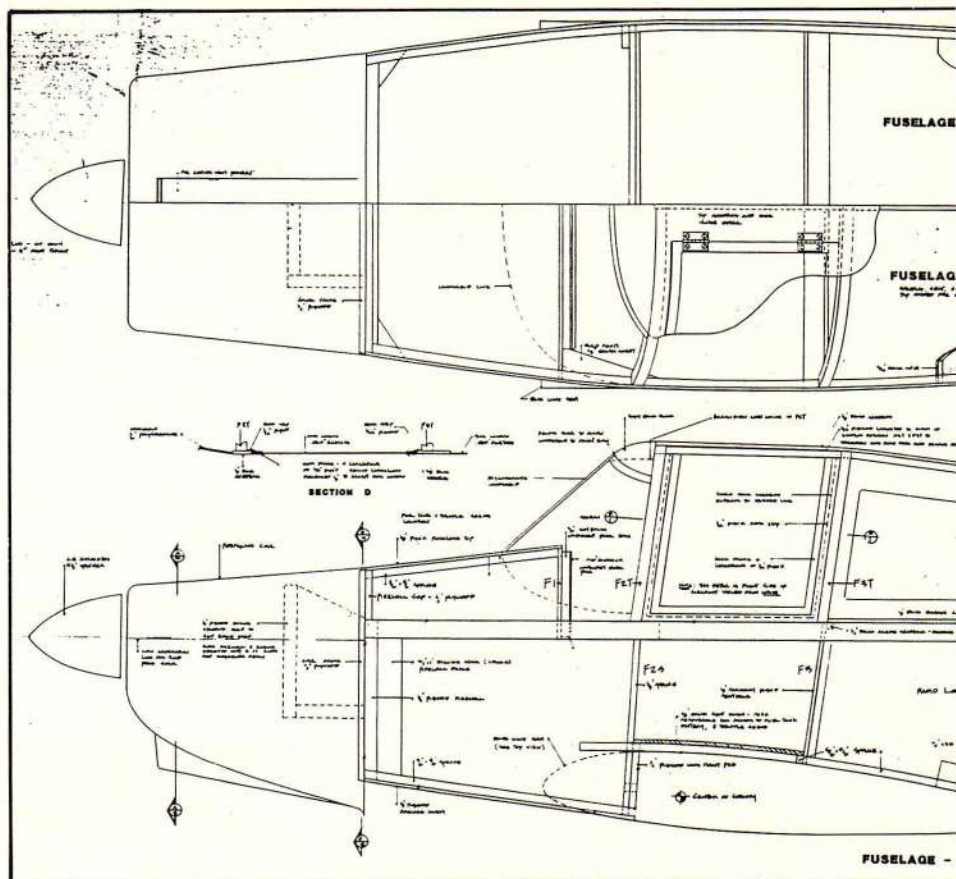
The windscreen is made from 1/16-inch polycarbonate available from plastic supply stores. Don't use plexiglass because it is brittle and subject to damage from bending and chemicals. Epoxy is a suitable adhesive if the edges are roughed up slightly.

The battery, fuel tank, throttle servo, and choke servo (if used), are mounted in the forward fuselage between the instrument panel and the firewall. The balance of the radio is installed behind the seat in the baggage compartment.

## ENGINE INSTALLATION

The engine is mounted to a standoff which is made of 1/2-inch plywood and fiberglassed to the firewall. The standoff should be constructed to suit the engine you choose to use. The original was powered by a Sachs Dolmer 3.7 cu. in. engine. This proved to be more than adequate power even compensating for the high Colorado altitude and a very effective but restrictive muffler system. An engine in the 2.6 to 3.2 cu. in. range will provide scale-like power. I recommend that the engine be mounted on a shock absorbing mount to help protect the radio from vibration. On the prototype this was accomplished by running the engine mounting bolts through a length of rubber hose inserted through the front of the standoff.

A 32-oz. rectangular solvent can was used for the fuel tank. It is mounted in the top of the fuselage between the instrument panel and the firewall. This is the full scale location and easily permits the scale gas cap to be functional. The manual choke was routed to the mixture control knob on the instrument panel via a Nyrod pushrod. The engine kill switch is mounted on the front of the firewall and is also operated



from the instrument panel. It is wise to use Nyrod for these applications because steel cable can carry interference from the ignition system back to the radio compartment.

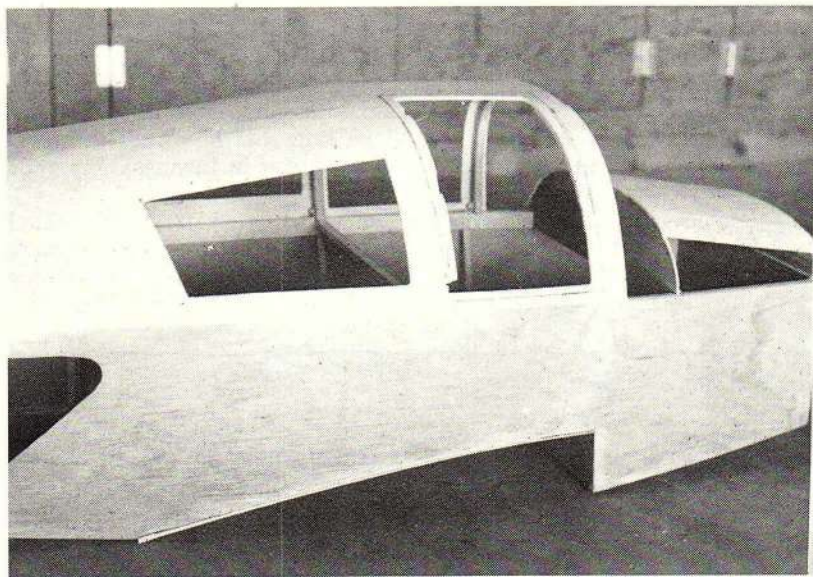
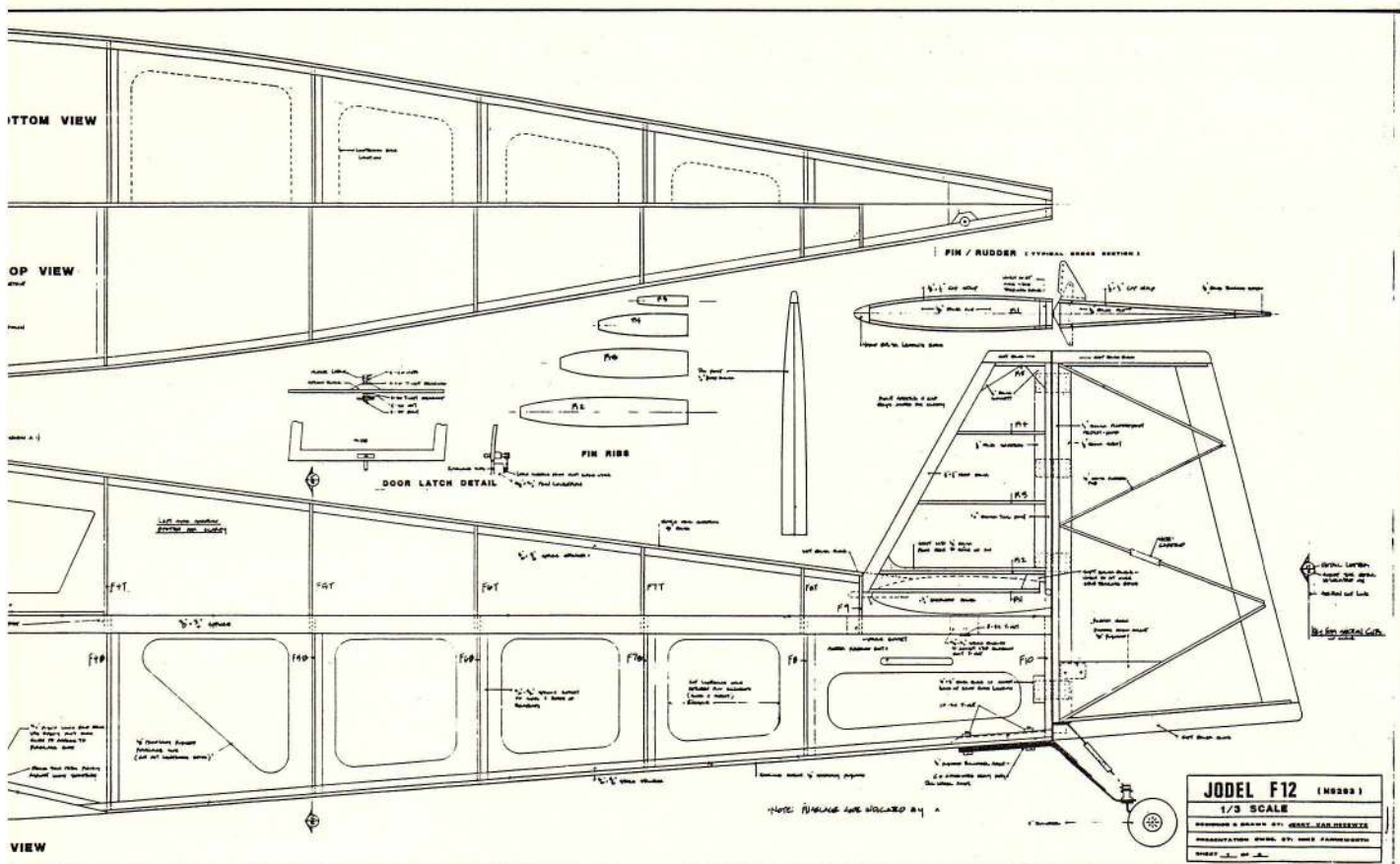
## WING

The wing is constructed in one piece with the center section built first and the tips added on later. The left wing will be built over the plans while the structure is duplicated for the right wing. Begin by laying the four wing spars out on the plans parallel to the main spar location. Ensure that at least 3 1/2 inches of the main spars extend beyond W4 to be used for the polyhedral joints. Using a combination square mark the centerline location and each rib location on the left wing spars. Rotate the spars 180 degrees, align the centerlines, and mark the rib locations for the right wing using the left wing plan. These marks will be used to position the ribs during construction of the center section. When all of the ribs have been cut out, clamp with "C"-clamps for final sanding and drilling of the lightening holes. The notches for the spars can also be cut at this time using a band saw or radial arm saw. Position each center section rib using the marks on the spars. Before gluing the ribs in place build up the trailing edges from 1/8-inch balsa wood.

When the trailing edge assemblies have dried, slide them into position to ensure that the ribs are in alignment and glue everything. Before the glue dries it's important to add wash-out. Place a 1/2-inch scrap of balsa under the rear spar at the centerline and a 3/4-inch shim under the rear spar at each W4 location. Weight the wing down to hold everything in position and allow to dry thoroughly before proceeding. The leading edge and top sheeting can then be installed. Next, remove the wing from the building board and add the landing gear mounts, shear webs, and bottom sheeting in that order. NOTE: The shear web behind the landing gear mount should not be installed until the landing gear is fitted and the T-nuts are installed. A little epoxy on the T-nuts will prevent them from coming loose when servicing the gear.

The wing tip sections are built directly onto the wing center section. They are built in one piece to ensure proper alignment and then the aileron portions are removed and framed up. Begin by cutting out the ribs, tapering the main spars and marking the rib locations on the spars. Glue the main spars to the center section main spars, add the polyhedral braces to both sides and clamp until thoroughly dry. Position rib W8 in place to ensure the





proper taper for the main spars. The remainder of the ribs, rear spars, and trailing edges are added as was previously done with the center section. The leading edge and leading edge sheeting are added next. NOTE: There is no additional washout from W4 to W8.

To build the ailerons, cut them off of the tip section just behind the rear spar. Glue 1/8-inch balsa across the top and bottom rear spars with the grain vertical. This balsa sheet is inadequate to support the aileron hinges so a block of soft balsa is

ing, cap strips, and wing tips are glued in place.



# THIS SOUTHERN CALIFORNIA ANNUAL EVENT CAN ALWAYS BE COUNTED ON FOR THE INTRODUCTION OF SEVERAL NEW SCALE CONTENDERS

By Edward "Pete" Chaput

One of the regional contests I always look forward to is the Riverside, California R/C Club's Annual 4-Stroke Contest. Don Lien, the club's guiding leader, is very scale-oriented, and many of the west coast scale competitors try out their new models at this contest before going on to the Scale Masters Qualifier at Fountain Valley in July. Some of the judges at this 4-Stroke Contest also work at the Qualifier, so the scoring results help the contestants find the areas which they might correct in the next few weeks in order to improve their static or flying scores for that Qualifier.

In order to enter this contest, your aircraft must be 4-Stroke-powered, and many of the civilian/sport scale models (like Cubs, Cessna 310s, etc.) which are entered in the Masters are 4-Stroke powered, but *very few* of the "heavy iron" World War Two fighters and bombers *are*, as those who model *these* aircraft prefer the more powerful, less finicky, large 2-Strokers which are now pouring in from Super Tigre and Italy. But no matter, for all intents and purposes, this was a very nice, quiet show *because* of the quiet mode of the 4-Strokers.

The highlight this year was the lunch-break show put on by two of

our recent World Champions, Mr. Yoshioka from Japan, and the celebrated Hanno Prettner from West Germany. Both these gentlemen flew pre-built, pre-finished aircraft imported from Japan by Global Hobby Distributors of Fountain Valley, courtesy of Bruce McAviney. An interesting note: When 4-Strokers were used in those E-Z Models, those engines were the largest ones which could be fitted into the cowl. Flown in formation by the two champions, the FW 190s had .90 4-Strokes in the 54-inch wingspan aircraft. (Their other pattern-type E-Zs had large 2-Strokes in them.) After their brilliant demonstrations of aerobatic proficiency, Hanno Prettner flew a very small model of an American flag which repeatedly performed a series of snaps *so fast* that you could even hear the *whir* of the air. The speed at which those maneuvers were performed was mind-boggling! But on Sunday, poor Hanno crashed the American flag plane in front of a very patriotic audience, and just days before Liberty Weekend, and the Fourth of July holiday. Hanno escaped with his life, however, because everybody was aware of his love and respect for our country, and anyway, it was only an accident after all. (*Nobody* crashes their R/C plane on purpose!)

As expected, there were several new aircraft at the Riverside R/C Club Meet; many of them potential contest winners:

The first was a Monocoupe 90 A by an old friend, Pete Spinuzzi. No stranger to readers of *Scale R/C Modeler*, Pete's airplanes and superbly-designed paint jobs have often been featured on these pages. This year, Pete's ship was a kit from Executive Models Company of New York. Pete used Solartex as the covering material, with a lacquer undercoat for a quick seal. He then applied Formula U Polar White, and trimmed it out in Fiery Orange. The Monocoupe is powered with an Enya 120, Model R, with an 18-8 prop at 7200 rpm. Control is via a Futaba 7-Channel, J Series. Pete tells us that the aircraft flies very much like the full-size plane and has all of the scale stitching. As the original big bird was designed for grass field operation which often necessitates quick takeoffs, this is also the way this model flies. Pete bought two of these kits, and likes both of them, but he said that he didn't think that company was in business any more. Too bad.

The next aircraft which caught my eye was a Culver "Dart" entered by Jim MacDonald of The Golden Era Plan Service fame. Located at

## Here are the contest results:

Position	Name	Score	21. Ferron Green	143.375	4. Ethel Cleis/Cleis	161.0
1.	Jim MacDonald	178.875	22. Tom Hamm	139.375	5. Shannen/Walt	158.625
2.	Don Westergren	177.875	23. Bill Stullick	134.628	6. Pete Spinuzzi/ Jack Tidball	158.125
3.	Jerry Kitchin	175.375	24. Dean Perra	106.25	7. Russ Utz/David/Deiss	153.375
4.	Ron Karwacky	174.5	25. Dick Mattie	91.25	8. Frank Salas/Bergeron	140.375
5.	Jim Morrow	173.0	26. Cedric Galloway	89.0	9. Rod Smith/ Betty Smith	137.125
6.	Dick Skoglund	168.5	27. Dick Tichenor	88.5	10. J. Riccio/C. Fondalaro	128.75
7.	Bob Upton	166.375	28. Bill Racen	87.375	11. Roman/Collins	119.0
8.	Ken Turner	164.625	29. Rick Mattie	86.5	12. Kevin Stiles/Eaton	105.625
9.	Mike Morrison	161.5	30. Don Nelson	79.825	13. Robert Henson/Byrns	103.5
10.	Cliff Bruce	161.0	31. Felix Alvarez	77.25	14. Warren Cross/Carroll	96.125
11.	Robert Sumoski	160.625	32. Jim Snyder	77.125	15. Olsen/Mead	86.5
12.	Joe Zimmerman	158.7	33. Robert Sone	38.0	16. Cumins/Pyeatt	66.5
13.	Bob Price	156.625				
14.	Dick Smith	153.625				
15.	Jerry Howell	151.0				
16.	Bob Richards	150.5				
17.	Brad Pope	148.925				
18.	Lou Proctor	148.0				
19.	Dave Lane	147.0				
20.	Marke Sparks	146.625				

## TEAM SCALE

1. Ron Dickson/ Ralph Knight	173.00
2. Robert McClung/ Bob Innes	166.00
3. Mel Santmeyer/ Clarkson	161.75

(Editor's Note: Because we got the names of these contest winners and their scores through the kindness of a friend, we apologize for any errors or omissions in their spelling, names, or scores.)



# ***RIVERSIDE R/C CLUB 4 STROKE CONTEST IS A GREAT SUCCESS***



Ralph is a Gee Bee lover. This is the second year in a row that Ralph has competed with a Granville-designed plane. This Model Y is from Haffke

drawings, and won First Place in Team Scale. This gifted modeler tells us that Gee Bees fly great, but they are a bear to get back on the ground gracefully.

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Woodland, California, Jim (whose partner is John Eaton, another gifted designer and engineer) has had several other prize-winning aircraft featured in *Scale R/C Modeler*, including the Aeronca LC and his Vickers "Jockey." Jim's "Dart" was the overall winner at this Riverside Meet, with its superb finish, and fine-flying qualities. (*Scale R/C Modeler* will be running these plans in our next issue. . . . Watch for them!) Jim's "Dart" is 1/4 scale, and the plans were drawn using the *original* factory drawings which Jim obtained from Lloyd Washburn, President of the Dart Owners Association, so you

know that all of the outlines are completely accurate, taken as they are, from the original factory drawings. Molds for the fiberglass cowl-ing and pants were made, and these will be offered with the drawings. The large wing fillets (or fairings) are polyurethane foam overcovered with lightweight glass. Jim says that there are only *seven* "Darts" still flying, and the one which he elected to model was a completely restored one done by an attorney in Pennsylvania, David Foulke. Jim said: "Mr. Foulke was kind enough to send me a complete set of photographs of his aircraft, and his is the very best

restoration of a Culver "Dart" I've ever seen. I didn't copy some of the errors in his restoration; for instance, the shape of the wheel pants is more like that of the Smith Miniplane wheel pants, rather than the original "Dart" shape. Also, the original "Dart" had a smooth, not a bump cowl-ing; but otherwise, it's quite a close adaptation of the original "Dart." This has been a real bear of a project, as I was somewhat concerned with the short tail-moment-arm of the tail. But with the CG all the way forward to the 25 percent mark . . . well, it just handles like a dream. . . . It really surprised me





that it flies so well. The biggest problem is the ground handling because of the wide chord, the plane doesn't want to settle down past ground effects . . . you have to make a very scale, 3-point stall landing to get it down where you want it, rather than in the next county! I used Coverite with K&B SuperPoxy, and the color was mixed to match the color in the photos I received from David Foulke. By the way, when the restoration was made, Mr. Foulke hadn't painted the rivets, so I didn't either . . . I used pin heads to duplicate the look of the rivets he used. He also left the paint off the cowling-

attach screws, so I had to do the same. It does set off the black, and I do like the way it looks." (Editor: Obviously, so did the judges; Jim MacDonald's "Dart" received the highest static score of any aircraft at the Riverside R/C Club 4-Stroke Contest.) Jim even installed a servo motor with a small prop to simulate the wind generator. The engine in the "Dart" is an OS Single 120 4-Stroke, with a JR Century Seven Radio. At the present time, with only about 20 flights on it, Jim says that his "Dart" is an even better-flying airplane than his Aeronca LC of the same Era (little pun there), or his

Vickers "Jockey" early English fighter.

No contest would be complete without at least *one* Gee Bee, and the Riverside Meet was no exception. Ralph Knight of the hosting club, who also lives in Riverside, flew a very nice Gee Bee Model Y. It weighs 20 pounds, was built from Henry Haffke drawings, and is powered by an OS 240 4-Stroke. Cowling and wheel pants are all balsa wood. Control is by JR PCM. Ralph's Gee Bee is covered with Solartex and painted with Randolph acrylic lacquer, and is the same as the original colors of the full-scale aircraft made in the

Jim MacDonald's Culver "Dart" won "all the marbles!" This beautifully-designed-and-built mid-thirties sport aircraft flew as well as it looked. This model will be prominently featured in next month's Scale R/C Modeler.







Robert McClung enjoys building Proctor Neuport 28s. This is his second from that kit. Not for beginners, but if you build them according to the plan, you get a great-flying aircraft which is totally scale. The Proctor Neuport 28 won Vegas last year, and came in second to Knight's Gee Bee in team scale. Competition is getting stronger every year.

Would you believe that this is a pre-built, pre-painted FW 190 as flown by World Champion Hanno Prettnner. It flew great with an OS 90 4-Stroke. For one of your very own, see Bruce McAviney of Global Hobby Distributors, or they should be available soon at your local hobby shop. Retracts are optional, and the ship will assemble in a mere few hours.



Pete Spinuzzi's Monocoupe 90-A is always a popular subject with modelers. Pete is renowned for his great covering and paint jobs. Pete earns his living

as a professional painter and knows all the tricks. Look for an in-depth article by Pete, on painting scale models as soon as we can get it.





Warren Cross works on his Saito 270 converted to ignition. He reports that there's more power now, and more reliable idle. He also likes the inexpensive fuel.



MacDonald's "Dart" lines up on the runway for another of its floating landings. Wide chord makes the Culver a real floater which must be stalled in.



The nose of the Monocoupe 90A shows off the acrylic lacquer paint job, lovingly applied by Pete over automotive lacquer undercoating.

early thirties in Springfield, Massachusetts by the famous Granville brothers. The lacquer colors are Sunset Red and Tucson Cream. The original Model Y had been modified and repainted many times. Ralph Knight regaled us with an interesting story about the original full-scale aircraft: "The original plane was built for the E. L. Cord Company, and they wanted the plane built so that they could test a Lycoming radial engine in it before they put one in one of their Cord autos. Finally, the airplane was finished, and when the Granville brothers brought the plane to Cord, they couldn't come up with the money to pay for it. Fortunately, two gentlemen who were aware of the Granvilles' plight came forward and bought the plane. The new owners re-engined the bird, changed the wheel pants, and put a long, sloping windshield on it. And, in order to accommodate the larger engine, they put a "bump" cowl on it and, once completed, they entered it in the Chicago Air Races of 1933. There are actually *three* Model Ys . . . two are similar, but the *other* one is very different . . . *that's* the one with the large speed-ring-cowl which is larger than the diameter of the fuselage (which is quite narrow). It also has two cockpits with Stearman-type windscreens, and while the aircraft *looks* quite different, the *main structure* is basically the same. Well, back to the 1933 Chicago Air Races: Florence Klingensmith was

flying the plane in the race, when as she was flying the first few laps, the fabric between the second and third wing rib was seen to bulge. As she rounded the pylon on the seventh lap, that fabric popped with a loud explosion, and the pilot pulled off the race course, making a gentle turn toward a nearby hill. The plane hit the hill, and the pilot was killed. As the other Y-Model Gee Bee with three feet clipped from the wings was also in that race, and *that plane* had no problem, the consensus of opinion about the cause of the first Gee Bee's crash was that the pilot had "frozen" on the controls, because, in spite of the fact that some of the fabric had parted company with the frame, the aircraft was still quite controllable.

Last year, Ralph Knight campaigned a kit of the Gee Bee *E* Model from Haffke. This *E* Model was also a great-flying airplane and Ralph said that it was a lot of fun to fly. As a matter of fact, both Gee Bees were great *flying* airplanes, but their *landing* qualities were really poor. When I built Gee Bees, I tried every taildragger trick I knew: I moved the landing gear *back*; I used toe *in*; I used toe *out*; I tried just about everything, but I still couldn't get them to land easily. In this particular case, I think that part of the problem is the amount of incidence that Haffke put into the wings (which came out a little smaller than the diameter of the fuselage, but, other than that, everything worked

out fine. The model wasn't difficult to build, but with all of those markings, it was pretty time-consuming to decorate. He used Solartex, then sprayed on *five coats* of clear dope, two coats of automotive primer, then the color coat of acrylic lacquer. All in all, a very beautifully-done model.

Another outstanding model was that of Robert McClung, a BIRD Member from Downey, California. His World War One French fighter, a Proctor Neuport 28, was powered by a 270 Saito 4-Stroke, controlled by a 7-Channel Futaba Radio, and weighed 18 pounds. Covered with Solartex, it was painted with Aero-Gloss and trimmed with Monokote. There was no *overcoating*, but, like the original, the *bottom* of the wings were shot with clear dope. Robert took First Place in World War One Category in 1985 at the Las Vegas QSAA *plus* First Place in the same category at the *IMS Show* in Pasadena *this year!* Robert McClung says: "This is the second Proctor 28 I've built, and last year I *placed* with the *other* kit." On a scale of 1 to 10, Robert rates this Proctor Kit *an 11!* He hastens to admit that this kit is probably somewhat too complicated for beginners, but, if it's built according to the plans, it always comes out good. Well, take a bow, Mr. Proctor!

Apart from the fact that everyone from the Riverside and other local R/C clubs are so congenial and friendly, one of the other reasons why this meet is probably so well attended is the approximately \$5,000 worth of beautiful prizes donated by local merchants and the hobby industry to the winners, and for the raffles. (My wife bought me several chances, but I didn't win either the 19-inch television set, the VCR or the Microwave Oven . . . oh well, better luck next time?)

Sadly, there may not *be* a next time . . . at least at *this* particular old Riverside Raceway flying site. The raceway is being forced to close and move because of the encroachment of housing developments which, even as this is being written, now almost completely surround the flying site and raceway. It seems that "racing noises," which are perfectly acceptable to car racing fans, are very annoying to the *non-hobbyists*; and this also seems to hold true for R/C engine noises; even though these 4-Stroke engines are remarkably quiet and shouldn't even be able to be heard from a short distance away. Too bad the complaints kept coming. Let's just hope that this great bunch of guys finds another site real soon!



# BYRON'S CORSAIR TAKES WING

AFTER SIX MONTHS OF (PART TIME) WORK,  
LEE BYERS TEST FLIES THE BYRON CORSAIR

By Norm Goyer



In the air, the Byron PurrPowr Muffler sounds great . . . throaty but quiet. The bird didn't require any great amount of trim . . . it literally flew off the boards.

I just returned from Calico Dry Lake, located at the foot of Fort Irwin, near Barstow, California. The day was cloudy, with thunderstorms still threatening. After a series of earthquakes, Mother Nature decided we needed a little electricity to keep us alert, I guess. The altitude at Calico is about 2100 feet, and the temperature today was 85 degrees. Wind was gusting from 15 to 25 knots, but its direction was not a problem as we had unlimited runways in all directions. It may shake, rattle and roll out here, but you can't beat our flying conditions.

The engine, a Quadra 50, with Byers' head modification which lowered the profile to keep it completely within the cowling, had already been broken in, and after a small amount of choke, started right up. Byron's PurrPowr Muffler System was very quiet.

About ten of the professional modelers from Continental RPV which manufactures target drones for the U.S. Army (all friends of their fellow worker, Lee) had gathered around to cheer us on. Taxi tests had been done the previous Sunday, and a range test, with engine idling, was conducted with no problems noted.

54 scale r/c modeler

This is where one of my philosophies seems to work: I removed the complete control system; batteries, servos, switches, everything . . . because I knew that this Futaba AM Gold system works well in large, ignition-powered aircraft. Maybe I'm a chicken, but I don't like using new, untested radio equipment in an expensive new aircraft . . . I like to work with something I know.

The servos were Futaba S-30s which have about 55 ounces of thrust, and have always been a reliable, strong-enough servo for our 1/4-scale applications. We used two on the flaps, two on the ailerons, one on the elevator, and one on the rudder. We used an S-28 on the throttle.

The Corsair weighs in at about 26.5 pounds, and it isn't quite finished, because we don't have the automatic wing-fold or the tail-hook hooked up yet. We put on a Zinger 20-6-10 prop. and had to throttle back to 1/2 throttle after takeoff.

Lee had worked about two or three degrees of toe-in, and had installed different springs in the Robart castings to furnish a more level "scale" attitude while at static and taxiing. The big Corsair was straining at the leash during the run-up, and it ran

very smoothly. Idle was right on, and mid-range wasn't juicy.

Lee gave me the signal which meant: Turn the bird loose and grab your trusty Pentax! (Both of which I did, pronto!) Lee had been waiting *six months* for this moment, and he didn't waste time with preliminaries now. He firewalled it, and the Corsair rolled about 25 feet, straight as a die, the tail lifted, and she climbed away at about a 15-degree angle. The dark sky made orientation difficult because the bird had only been painted its base color, dark blue, not decorated yet. It still wasn't too hard to see until the Robart pneumatic retracts did their job and neatly sucked up the gear, and *then* Lee had to call for help to keep him posted on the direction and the attitude of the aircraft. Everybody pitched in to help (you see, *this* team of professional modelers is used to doing this almost every day as they fly their target drones past hundreds of young troops trying to shoot those model MiGs out of the sky with Vulcan Gatling guns, tanks, etc. Those drones move out at about 125 mph after being air-pressure-launched in seconds, so you just know those modelers are right on their toes, and quick with their





The big Corsair starts its takeoff. No directional stability problems were encountered. Proper balancing and landing gear geometry usually takes care of taildragger directional problems.



Six months after starting the project, Lee Byers poses with his creation.

fingers).

After about six circuits of the field, Lee signaled for a landing, and dropped the gear. He didn't use flaps, as we had about 20 knots of wind and a runway about 15 miles long. (Eat your heart out, New Yorkers.) The Corsair settled in without floating; Lee fast-taxed it back to the pits; and *everyone* let out a cheer and a sigh of relief. Test flights on big birds are very exciting for everybody!

If you'll pardon the expression, here's the post mortem:

We must install restrictors in the airlines to give the gear a more "scale" type speed . . . now, it's so fast that you can't even see it retract. Corsair wheels retract to the rear, so that balance must be determined with the wheels retracted. This bird needs four more ounces in the nose, bringing the total to 2 pounds, 4 ounces. Trim was not required, and coordinated control was not needed. Ailerons were scale-like, and produced very scale rotation speeds. Elevator was a little touchy because of the slight tail heaviness. Fiberglass wheel fairings will be replaced with metal ones, as the glass bends too easily. At this time, it appears that another servo will have to

be used to actuate the gear doors. The next step is final cockpit detailing, tail hook, and decorations as they pertain to the aircraft from which this 1/6 Navy aircraft was modeled.

Next month, we'll have all the details of the wing hinges, flap actions, metal wing surfacing, cockpit canopy rails, landing gear modification, and engine mods.

This has been a great learning project for both Lee Byers and me, as neither of us had gone this road before.

Kit manufacturers like Byron cannot be expected to produce "Scale Masters Right Out Of The Box" Kits. What they *do* is to put in all of the excellent quality basic ingredients and hardware, and *then* it's up to the individual modeler to make the airplane just as "scale" as he wants it.

Got any questions which can't wait until the next issue? If so, Lee has said that you can write to him: Lee Byers, International Fighters, 27828 Church Street, Barstow, CA 92311, and be sure to enclose a stamped, self-addressed envelope, or call him; (619) 252-5630 after 6 p.m. California time, and he'll be glad to answer your questions.

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# JET RALLY '86

(Continued from page 41)

Review elsewhere in this issue.) In the air, this is a dramatic, stable, and great-sounding jet scale model. The other new model introduced by Byron is their new "Coors Silver Bullet" Bede 5J. After seeing the full-size Silver Bullet tear up the countryside, modelers should rush out in droves to buy one of these super Byron models.

The Byron "Mirage KFIR" will be back on the market soon. Changes are being made to the prototype to improve its flying characteristics even further. As a matter of fact, the Cloud Dancers Show Team will be switching to Byron KFIRs, so they can use engine/jet combinations other than those they're currently using in their Jet Hangar Hobby KFIRs.

To recap, new this year were the Gloster Javelin, BD-5Js, Convair 102 prototype and the beautiful, fast Meteor by Mike Kusczyk, among the most outstanding.

Byron Godbersen's Master Plan next year is to combine the Jet Rally and the Fun Fly to make almost one whole glorious week of flying; both giant scale and ducted fans. If you've ever been to one of

Byron's shows, you can appreciate the humungous amount of work which he and his dedicated staff put into the effort. By blending both shows into one, it will enable those modelers who enjoy *both* kinds of flying to do so, bring their family along, and make it a real vacation. And because Byron is planning to set the date of the unified show to occur right after the big EAA "Oshkosh" show, those aviation fans who have *more* than a week's vacation can have a great two-week feast of enjoying all of the airplanes they could possibly handle.

This issue's editorial, containing the interview with Fred Marks, of the AMA Frequency Committee, was inspired by my wild weekend at Ida Grove, Iowa.

Thanks for inviting me, Byron—I always enjoy the hospitality of the kind and gentle fold of central United States. What a welcome relief from the wackos of Southern California (myself included). ●

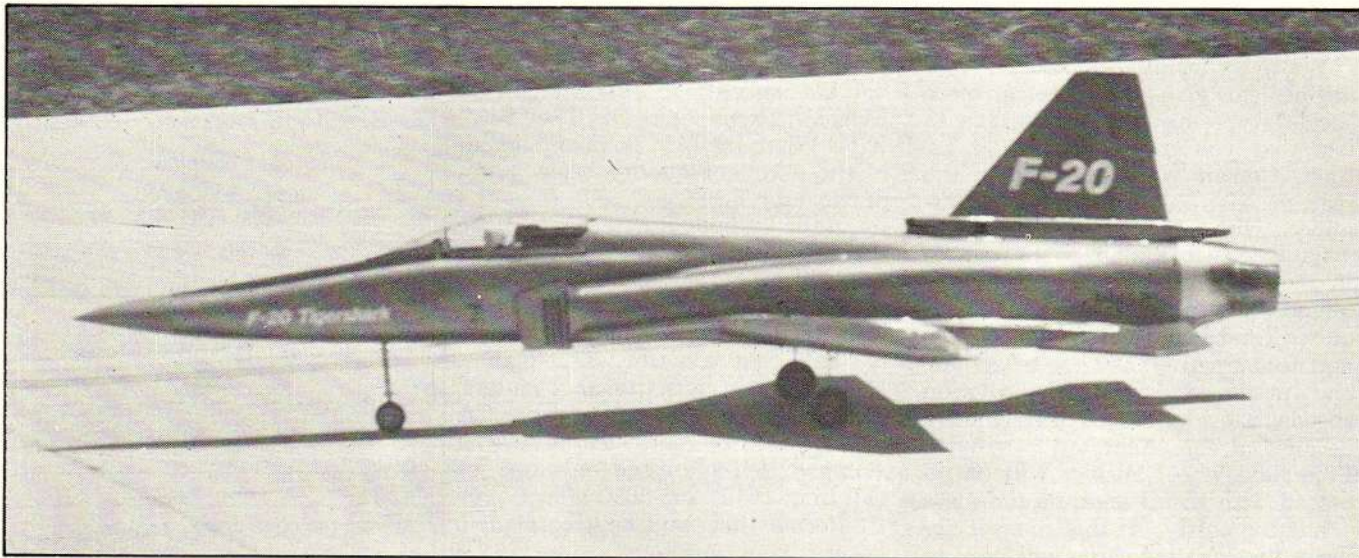


Tom Cook and Bob Violett, two of the country's best jet men, watching and helping each other fly Tom's plane.



This BD-5J from Austin, Texas, was built using a Kaos wing and simplified construction to make a fast-building Sunday-flying-type ducted fan model. All parts are readily accessible. ►

Byron's new F-20 taxis out for takeoff. This is a very appealing scale rendering because of its long nose and nicely-shaped surfaces. Also flies great!

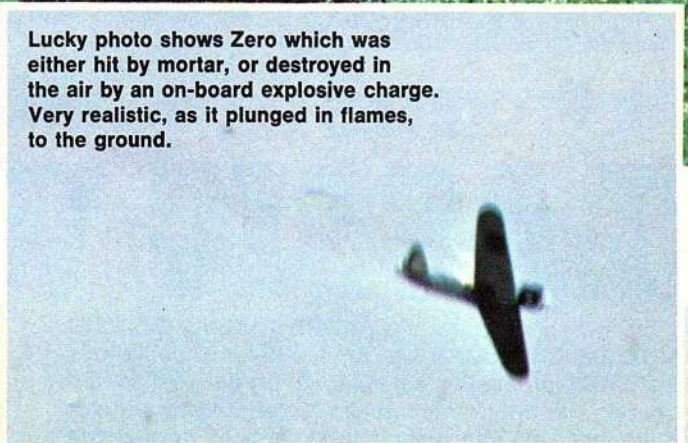






Byron's newly-updated KFIR made many flights all weekend long. It shows great promise in the aerobatic department.

Lucky photo shows Zero which was either hit by mortar, or destroyed in the air by an on-board explosive charge. Very realistic, as it plunged in flames, to the ground.



When Byron sets off a blast . . . the ground really rocks! This one, on the 1/5 scale Japanese refinery rivals the best of Hollywood's special effects. Just previous to this blast, Byron's 14-foot B-25 had made a "bombing run" on the installation.

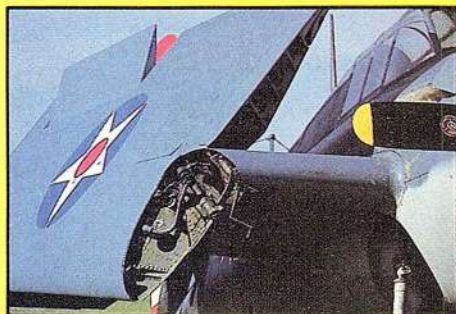




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# GRUMMAN

(Continued from page 33)

craft was eliminated from the competition for fighter contracts.

Meanwhile, the Brewster suffered from slow speed as well, but extensive wind-tunnel tests, in the new full-size wind tunnel at Langley Field, Virginia, indicated that, by simple changes in the fairings around the fuselage guns and landing gear fairings, about 20 mph could be added. So, these changes by Brewster, and the elimination of Seversky, plus the troubles suffered by Grumman, prompted the Navy to order fifty-four of the Brewster Buffalo. This proved to be a big mistake because, as they were severely out-classed by other fighters, they were extremely unpopular.

As the Navy had done business with Grumman before, they knew that that company could produce a good airplane, and that they were a dependable, well-financed factory with good production capabilities, so, in October of 1938, they awarded Grumman a development contract for a more advanced version of their basic design under the designation XF4-3. Encouraged, Grumman scrapped most of the other prototypes except the fuselage and undercarriage, and built a practically all-new airplane. First, they removed the powerplant and installed a Twin-Wasp engine with a two-stage supercharger, driving a Curtiss electric prop. This combination offered 1200 horsepower for takeoff; 1050 hp at 11,000 feet, and 1000 hp at 19,000 feet. This new power combination developed a few cooling problems at first, but these were quickly resolved. And (as is often done with model aircraft), in order to increase the stability, Grumman increased the tail areas, surfaces were balanced, dihedral angle was increased, and the ailerons decreased in area. Also, parts of the fuselage around the engine were cut out in order to improve cooling.

After the Navy was convinced that Grumman had finally got their act together, they ordered fifty-four F4F-3 fighters, matching the order given to Brewster. Even though the final speed of the Wildcat was only 330 mph (not the 350 mph originally guaranteed by Grumman), the Navy was satisfied that they finally had a modern, well-designed, well-built monoplane fighter.

In the meantime, the French gov-

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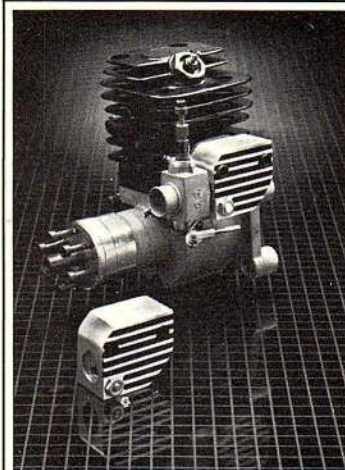
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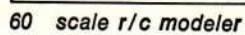
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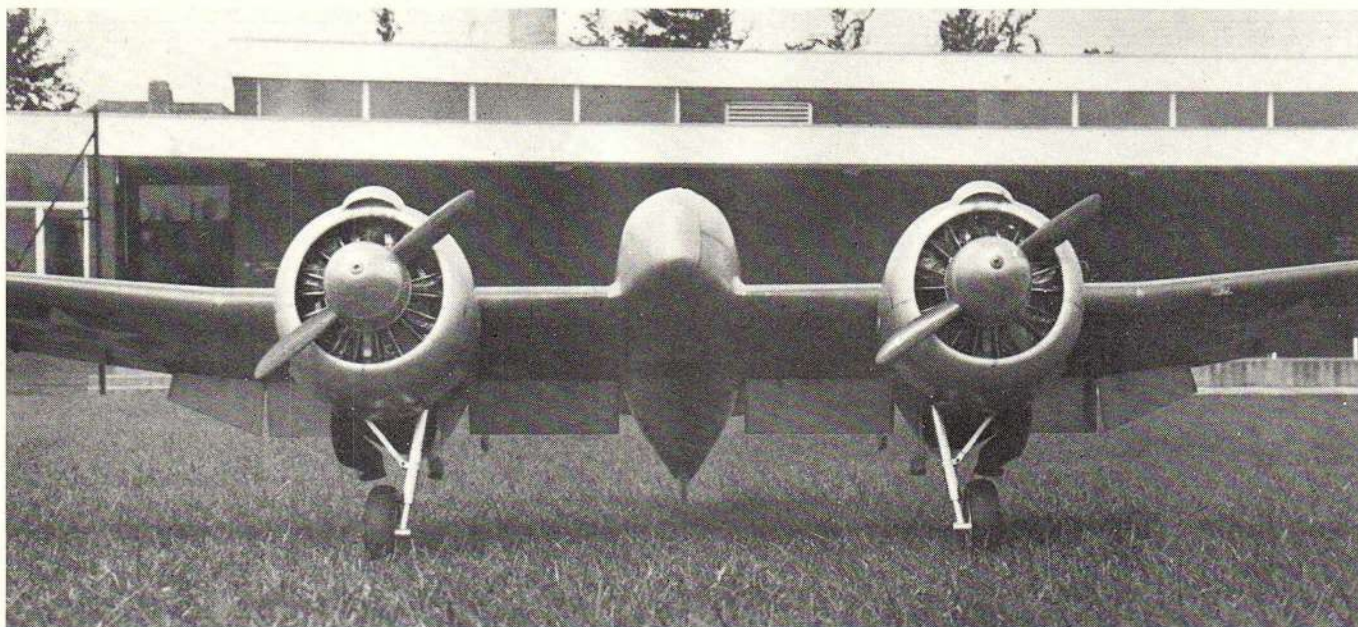
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Front view of the Coulson "Skyrocket," showing the very complex, multiple-flap arrangement, and the oddly-canted gear legs.

ernment ordered a similar Wildcat from Grumman, but they specified a Wright R-1820 engine with a two-stage supercharger. The usual changes to instruments and controls were denoted, and included six 7.5 machine guns. When Germany opened their campaign to dominate France on May 10, 1940, the day before the first Grumman was destined for delivery to France, the contract was quickly switched to England, with all necessary changes in guns (four 0.5-inch wing guns), and the throttle modified to operate in conventional British fashion, the first aircraft being delivered on July 27, 1940, with the English designation "Martlet."

Back in the States, the F4F-3 was still suffering from supercharger problems in the twin Wasp, so the engine was switched to a Wright with a single-stage supercharger, similar to the British version. De-

(Text continues on page 64)

This F-4 belongs to Eldon Wilson, of San Angelo, Texas. Mr. Wilson has been flying early naval fighters for many years. He scratchbuilds everything himself, including the complex gear systems. Eldon also FLIES his fighters extremely well.



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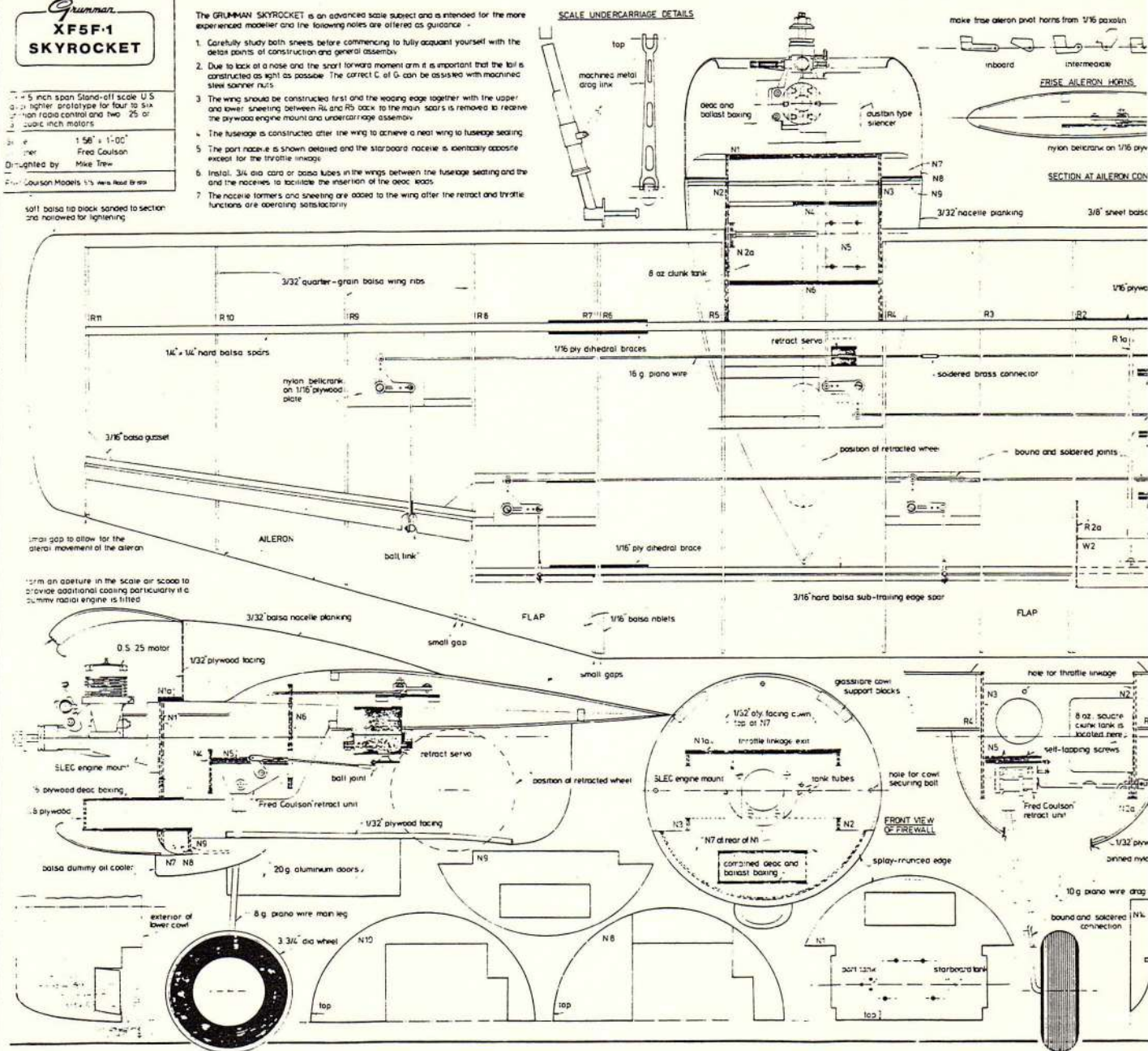
# Grumman XF5F-1 SKYROCKET

5 inch span Stand-off scale U.S.  
lighter prototype for four to six  
radio control and two 25 or  
30 inch motors  
1 5/8" x 1-00"  
Fred Coulson  
Designed by Mike New  
Coulson Models 1 1/2 inch fusel  
sail, balsa tip black sand to section  
and narrowed for lightening

The GRUMMAN SKYROCKET is an advanced scale subject and is intended for the more experienced modeler and the following notes are offered as guidance:

1. Carefully study both sheets before commencing to fully acquaint yourself with the detail points of construction and general assembly.
2. Due to lack of a nose and the short forward moment arm it is important that the tail is constructed as light as possible. The correct C of G can be assisted with machined steel spinner nuts.
3. The wing should be constructed first and the wing edge together with the upper and lower sheeting between RL and RS back to the main spar is removed to receive the plywood engine mount and undercarriage assembly.
4. The fuselage is constructed after the wing to achieve a neat wing to fuselage sealing.
5. The port nacelle is shown detailed and the starboard nacelle is identically opposite except for the throttle linkage.
6. Install 3/16 dia card or balsa tubes in the wings between the fuselage seating and the nacelles to facilitate the insertion of the deac rods.
7. The nacelle formers and sheeting are added to the wing after the retract and throttle functions are operating satisfactorily.

## SCALE UNDERCARRIAGE DETAILS



(The Plans). Plans for the Fred Coulson "Skyrocket" are available from Bob Holman Plans, P.O. Box 741, San Bernardino, California 92402 Price is \$30 plus \$2.00 for shipping and handling. Plans come rolled and are shipped via UPS. Epoxy cowlings and canopy are available for \$25.

development of the Wildcat by Grumman continued until August of 1942, when production was turned over to General Motors so that Grumman could concentrate work on the F6F Hellcat (which was later destined to dominate air warfare in the Pacific).

Excluding prototypes, 7,898 Wildcats were produced (including the 5,927 manufactured by General Motors), and this ungainly-looking fight-

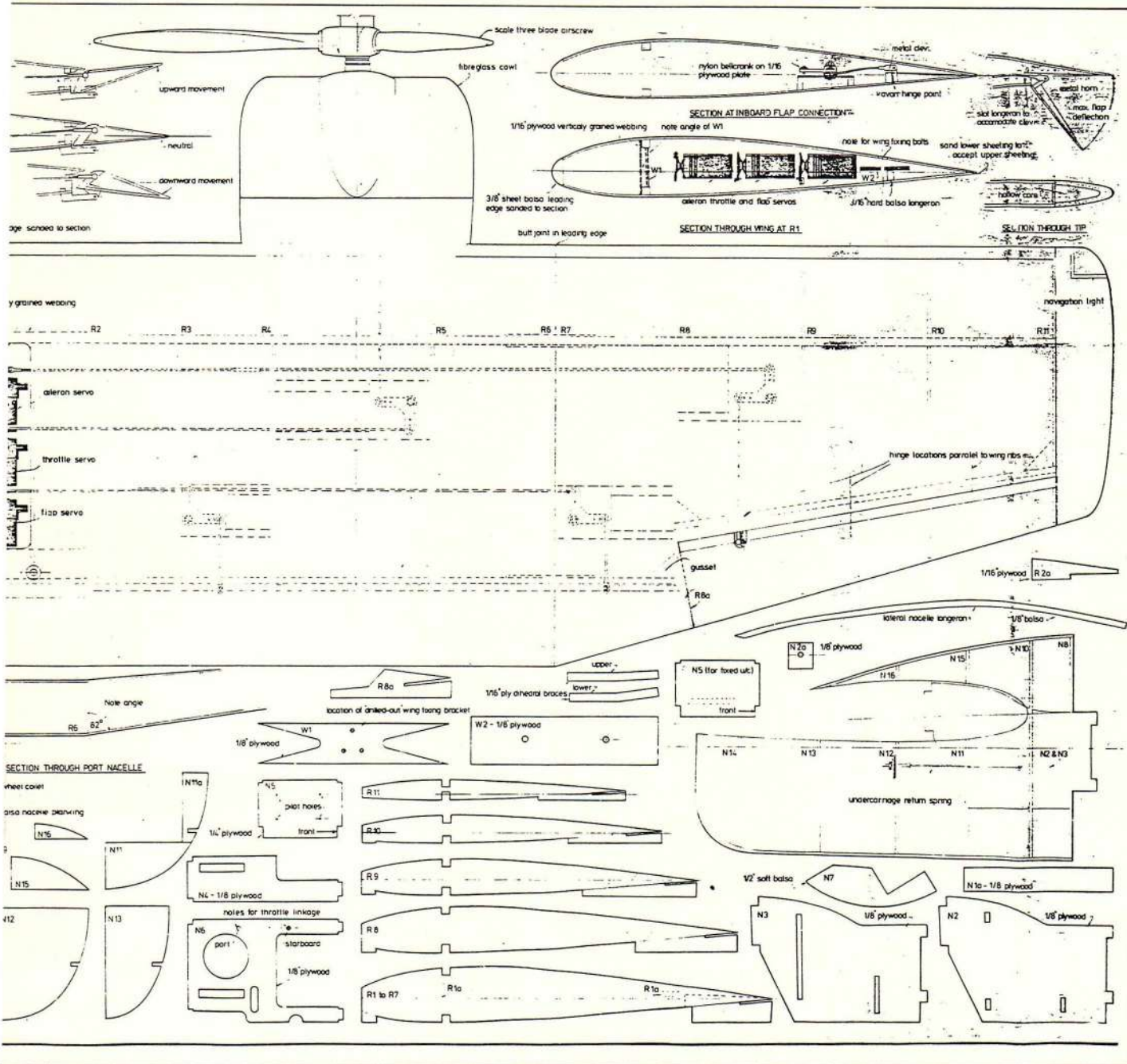
er was credited with the destruction of 905 enemy aircraft in the fighting between 1941 and 1943, with losses of only 178 Wildcats; a ratio of 6.9 to 1; not too bad for a relatively obsolete design which was usually completely out-classed and out-powered by its enemies. The Wildcat participated in all of the major battles of the Pacific War, including Wake, Midway, Guadalcanal, Coral Sea and The Solomons. This pugnacious little fighter established an enviable operational record, flying from shore bases and carriers, large and small alike, and making a significant contribution to Allied victory. It is claimed that no other fighter made a greater effort in World War Two.

## Reporter's Notes:

"Most of the Wildcats seen at today's Warbird Airshows are the FM-2 type, manufactured by General Motors. Anyone who has ever flown a Wildcat remembers the hand-crank, chain-driven landing gear, and the delightful way in which the barrel-shaped fighter would do its graceful rolls (because of its mid-wing configuration design).

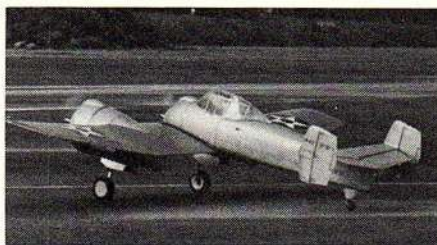
As a modeling subject, the Wildcat never achieved a great popularity, probably because no commercial model of its unusual landing gear configuration has ever been attempted."



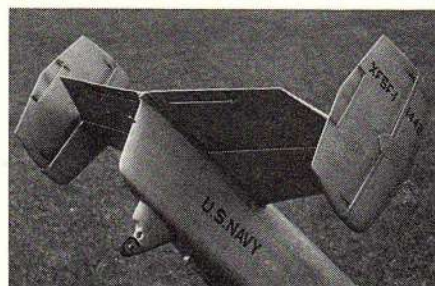


While Grumman was having its share of troubles with the little Wildcat back in 1938, the Navy added to their woes by inviting bids for a *twin-engine Navy shipboard single-place fighter*.

Utilizing some of the technology gained in the development of the Wildcat, Grumman designed a stubby, twin-radial-powered model, with a fuselage which stopped at the leading edge of the wing. And the tail had dihedral, and twin rudders. Unfortunately, Grumman used the same engine and cowlings combination of the Wildcat, so the new design, called the "Skyrocket," inherited the same cooling and supercharger problems. This Navy model was designed



**Short-nose model, as featured on the plans, about to lift off. This model has always appealed to hobbyists, but the full-scale aircraft was never accepted by the military services for many reasons.**

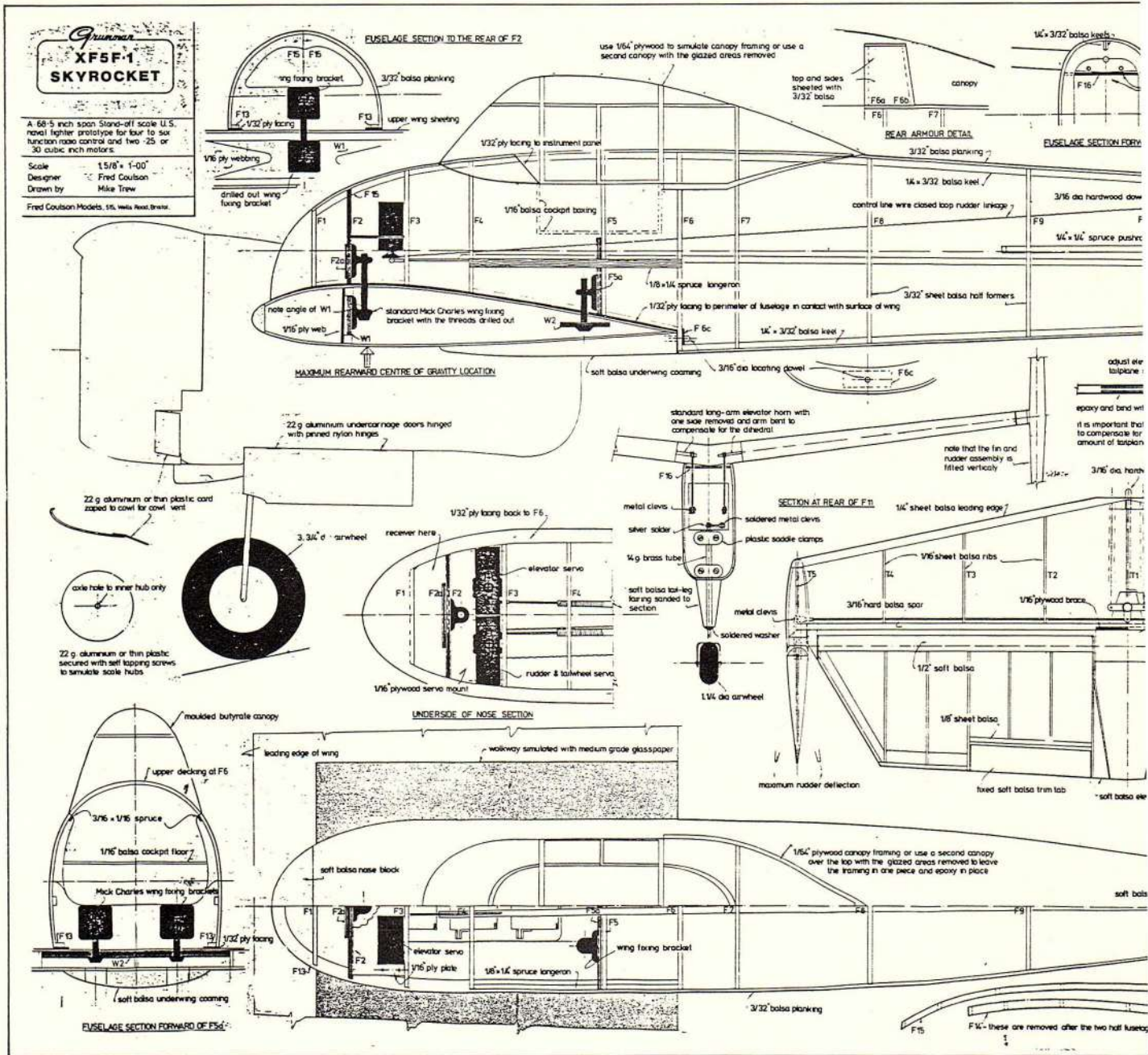


**Tail detail shows stabilizer with dihedral and twin rudders. Tail hook and tail wheel are also detailed.**

nated the XF5-1, but as it was being tested, pilots on carrier approaches found that their cockpit position at the trailing edge of the large wing,

with the two large radial cowlings on each side, made *seeing* the carrier beneath them on a standard approach almost impossible. Landing





on a carrier is difficult enough, but landing on one you can't see underneath you is almost impossible. The Navy's XF5-1 made its test flight, prophetically, on April Fool's Day, 1940, and they were never quite satisfied with it.

The Army had also been interested in a twin-engine, single-place fighter from Grumman, having received delivery of many of Lockheed's P-38 Lightnings. So the Army's version was designated the XP-50, but the test model crashed soon after its initial flight, and the design was scrapped.

At the end of World War Two, the very successful successor to the Skyrocket, the F7F Tigercat, was taken into the Navy inventory. Used

extensively in Korea, it also served for many years in fighting forest fires. It still retained the two massive radial engines, but sensibly, the fuselage was moved way forward for better visibility, and the twin tails were replaced with a massive vertical fin.

I believe that the entire free world owes those Grumman engineers of 1938 to 1940 a great debt of gratitude for having had the perseverance and tenacity to keep going back to their drawing boards until they got it right. Had they given up, we might never have had not only the Wildcats, but also the Hellcats, the Tigercats, the Bearcats; the Panthers of Korea, and the Tomcats of the '80s. Modeling-wise, the Hellcat makes

a great-flying aircraft, as do the Tigercat and the Skyrocket. The Bearcat, with its short-coupled fuselage, is slightly harder to fly, but, with enough power, it makes a great project for an alert model pilot.

We were lucky to obtain permission from Fred Coulson, World Champion, International Scale of Bristol, England, to run the plans for his "Skyrocket" model, through Bob Holman Plans, P.O. Box 741, San Bernardino, CA 92402. Cost of the plans is \$30.00 plus \$2.00 shipping. If you wish the cowl and canopy, they're \$25.00; with plans coming UPS, rolled.

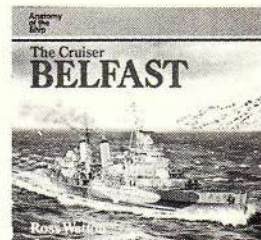
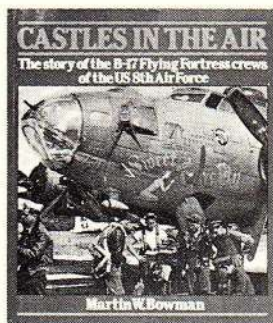






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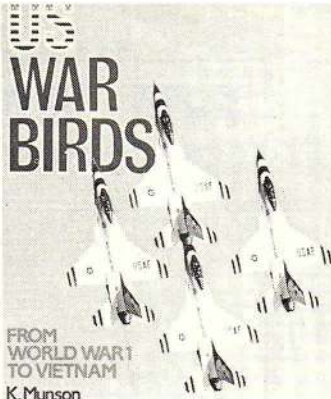
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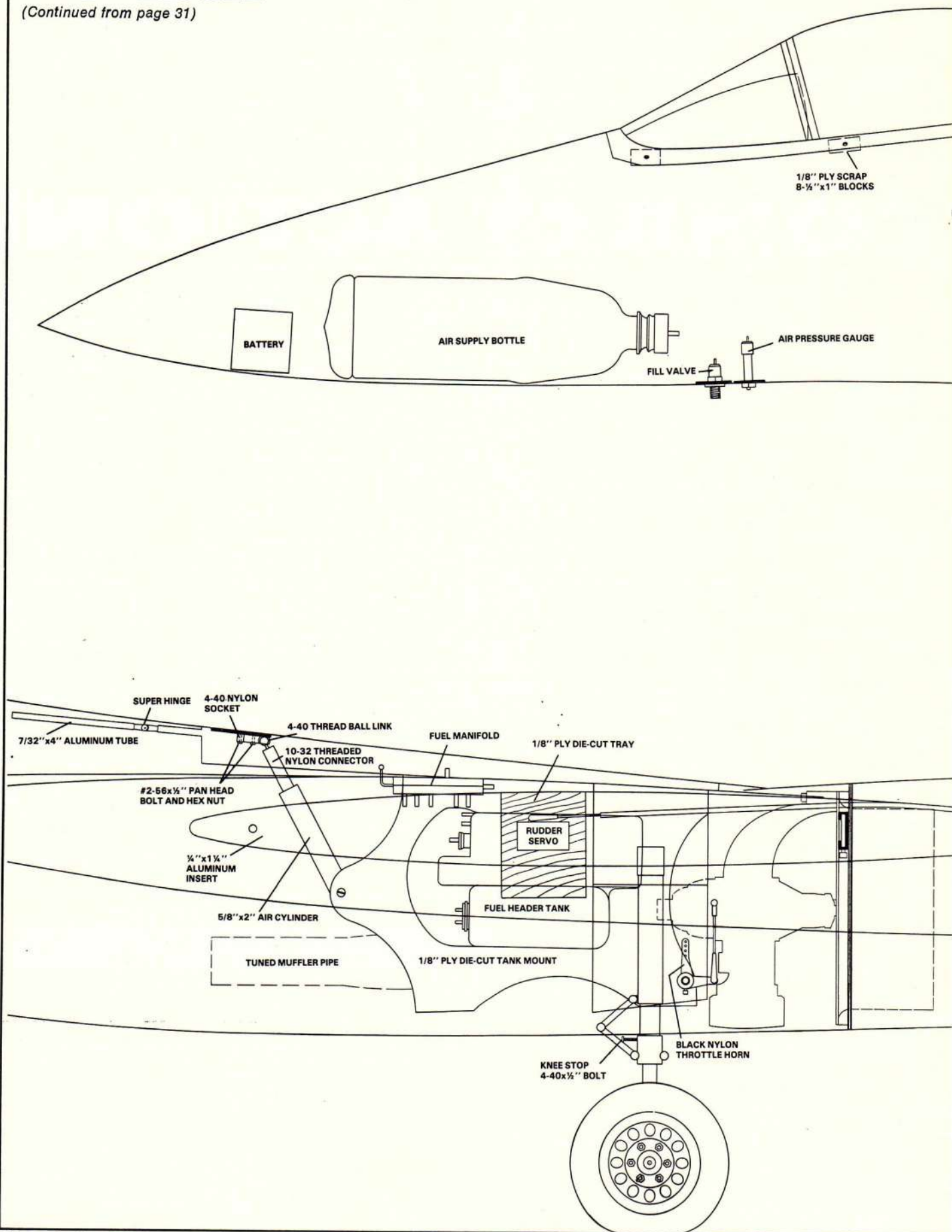
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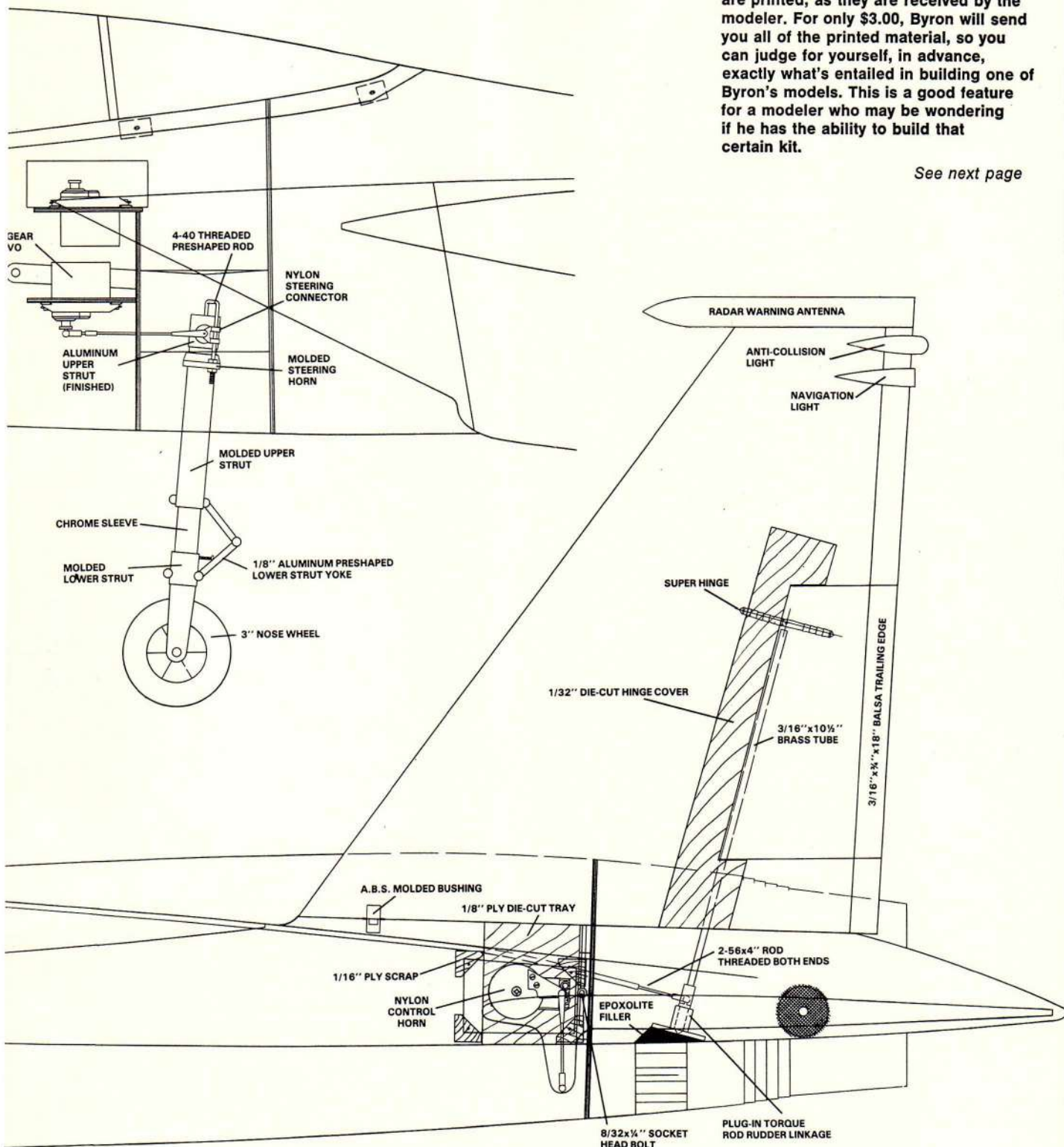
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See next page

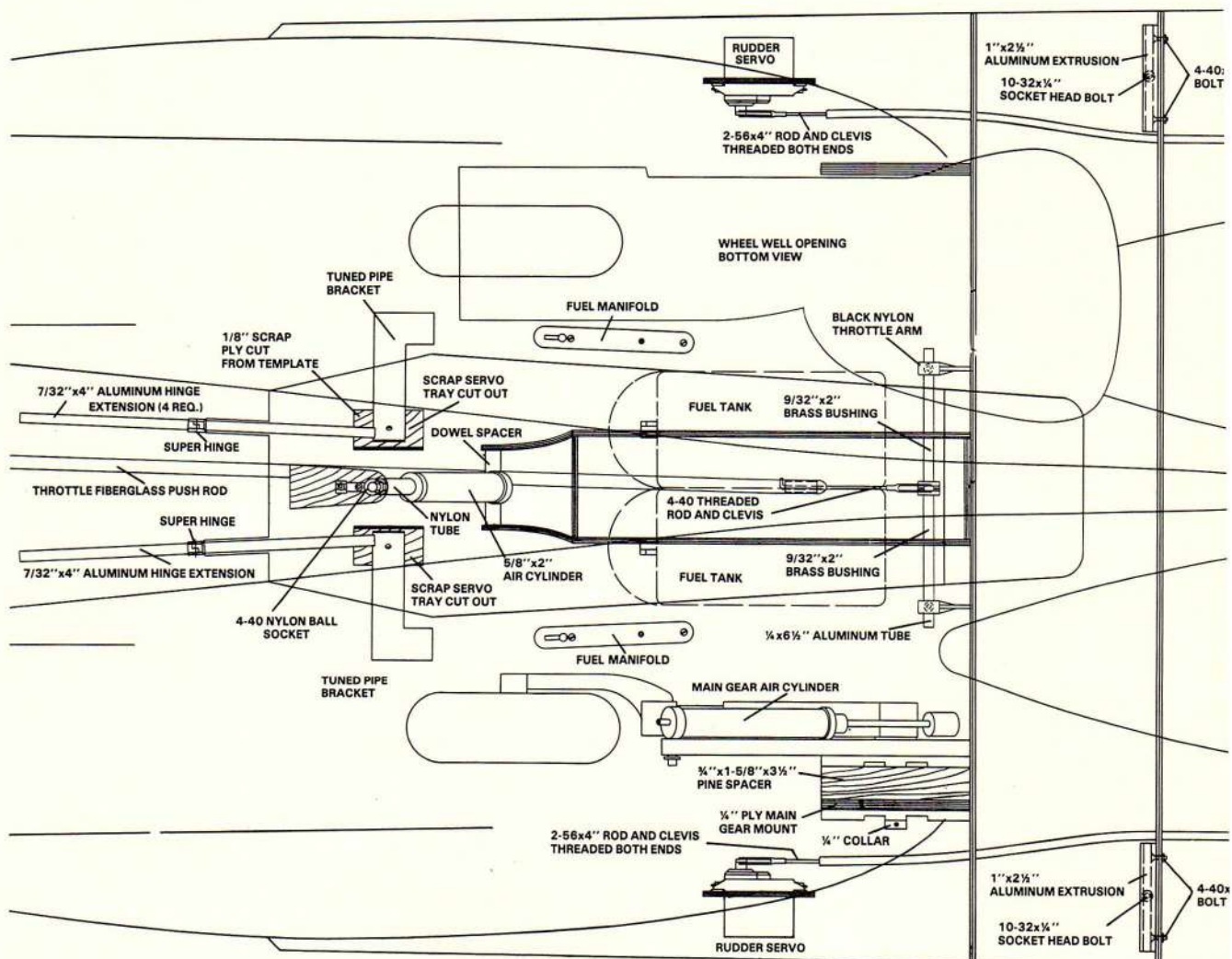
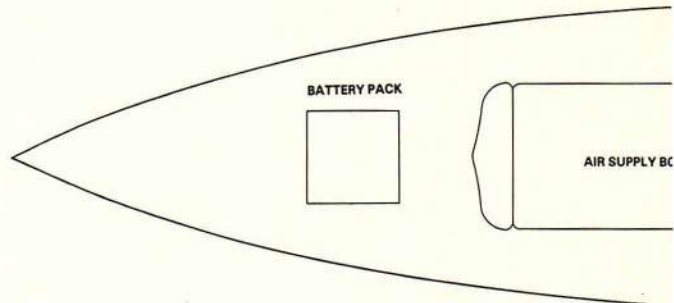


**F-15 EAGLE**  
**FUSELAGE SIDE VIEW**  
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 EQUAL FULL SCALE MODEL)

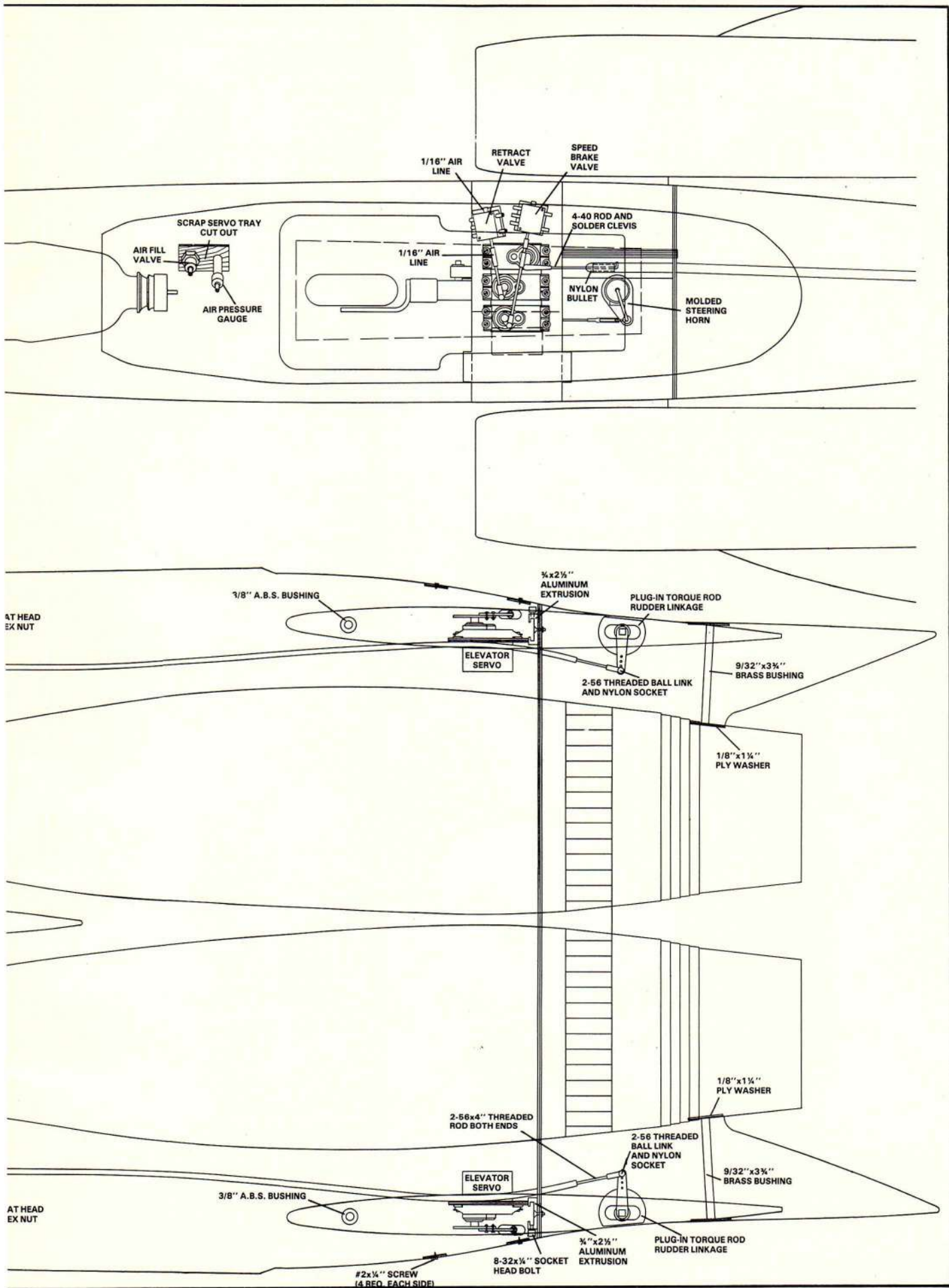




**F-15 EAGLE  
FUSELAGE TOP VIEW**  
(2 1/2 TIMES REDUCED DRAWINGS  
EQUAL FULL SCALE MODEL)









# WHO'S WHO IN SCALE



## **ELDON WILSON**

The "Gray Eagle" himself, Eldon is very active in scale competition. He scratchbuilds everything on his aircraft himself, including the very complicated retracts on the early naval fighters which he favors. Eldon's "Wildcat" is in this issue, and his Brewster "Buffalo" is scheduled for future release here. Eldon hails from San Angelo, Texas, and they should be proud to have him.



## **JOHN ELLIOT**

John is one of the guiding lights of the Scale Squadron of Southern California. One of the top honchos at Cox Hobbies, John is also much sought after for his expertise in test-flying complex, multi-engine model aircraft. A big man, he's easy to spot at model contests, as he stands out head-and-shoulders above everybody else.



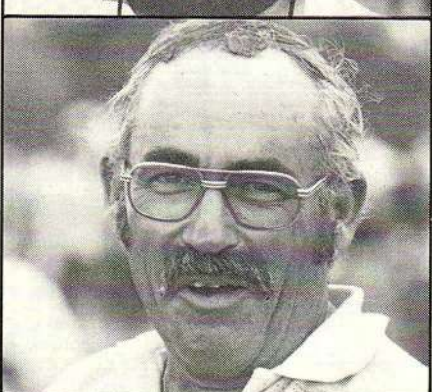
## **DAN PARSONS**

Dan lives in Albuquerque, New Mexico, and is known for the quality of the light-weight glass cloth which covers so many of the award-winning scale models in this country. Dan delights the crowd with his expert pilotage of his very fast Hornet, featured last month in Scale R/C Modeler. Dan started in scale modeling back in the 60s with a ME 110, controlled with an FM 8-Channel reed. Dan Parsons is a pleasure to know.



## **JERRY KITCHEN**

Jerry is one of the best young scale pilots in the southwest. He has an inspired touch with the controls of some of the most difficult and demanding airplanes to fly, so at any scale fly-in or contest where he is, there's usually a line-up of planes for Jerry to put through their paces. It was Jerry who wowed the troops at the 1/8 Scale Fly In with his expert flying of the Staggerwing Beech, and the Byron "Dago Red." Jerry is from the Southern California area.



## **FRANK REYES**

Frank is from Miami, Florida, and flies a Nosen P-51 Mustang which was featured on Scale R/C Modeler's cover last month. Frank has been involved in scale modeling for over thirty years, and is one of our expert flyers.



# JODEL F12

(Continued from page 47)

rons through a short pushrod. This method works very well but the aileron servos may be mounted in the wing tips if you prefer.

## VERTICAL AND HORIZONTAL STABILIZERS

The horizontal and vertical stabilizers are built over the plans. Construction is straightforward. Note that the shape is somewhat elliptical looking forward from the hingeline. Begin by cutting out the ribs and shaping the 1/4-inch balsa hingeline pieces. Shim the assemblies so that the centerlines of the leading and trailing edges are parallel to the building board during construction to prevent building in a twist. The elevator and rudder ribs are triangular and no pattern is required. Balsa capstrips are used over all ribs to provide a smooth broad surface for covering.

The stabilizer assembly is removable for access to the pushrods and the tail wheel mounting area. It is held in place by a 1/4-inch hardwood dowel and two 6-32 bolts. The two lower rudder hinges must come apart to remove the stabilizer assembly so it is important to use removable hinge pins.

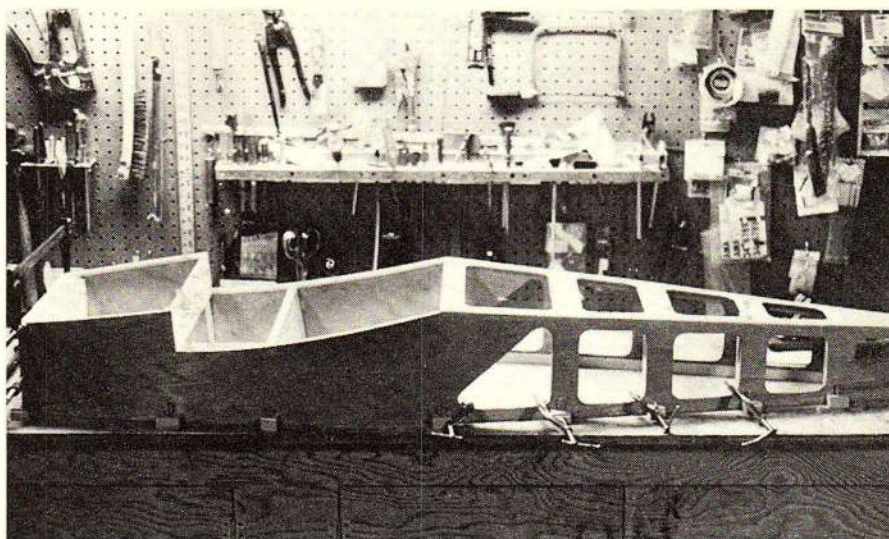
## LANDING GEAR

The landing gear is made from two layers of 1/8-inch T6 aluminum. Form the gear to the shape shown on the plans and bolt the two layers together using 6-32 screws. Clamp the gear legs to the wing and drill the mounting holes. After the mounting holes are drilled, the "T"-nuts and the remaining shear web can be installed. The gear should be formed so that there is 1 to 2 degrees of toe-in to assure good ground handling.

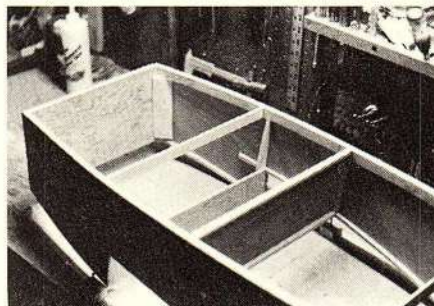
The axles are made from 4-inch 1/4-20 bolts with the heads cut off. The threaded portion is used to bolt the axle to the gear leg with a nut on each side. The wheel rides on the unthreaded portion and is held in place by 1/4-inch wheel collars. Du-Bro 6-inch treaded wheels are the proper scale, fit well inside of the wheel pants, and are very realistic in appearance.

## COWLING AND WHEEL PANTS

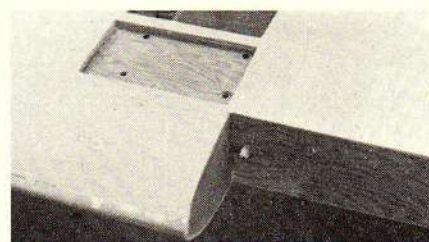
The wheel pants are made by carving and sanding Styrofoam blocks to



Basic fuselage assembly clamped to jig.



Fuselage is turned upright when dry for installation of the bulkhead tops. All strip wood in this photo is spruce.



Bottom view of wings shows 5/16 inch aluminum mounting rod and cutout for landing gear mount.

the proper shape, coating with several coats of latex paint, and laying up two layers of 6-oz. glass cloth over the mold using fiberglass (polyester) resin. The latex paint seals the foam and prevents it from being attacked by the resin. Make absolutely certain that it is sealed. I prefer to use Styrofoam because it is inexpensive, readily obtainable, and can be easily removed. When the resin is fully cured, acetone can be poured into the mold to dissolve the foam.

The wheel pants are supported on the axle by pieces of plywood glued to each side of the pant with polyester resin. The inboard side (1/8-inch) holds the "T"-nuts for the screws to mount the pant to the gear and the outboard side (1/4-inch) has a 1/4-inch hole drilled through the plywood to accept the end of the axle.

The cowling is made just like the wheel pants except that the foam blocks are tack glued directly to the firewall and sanded to shape. Protect

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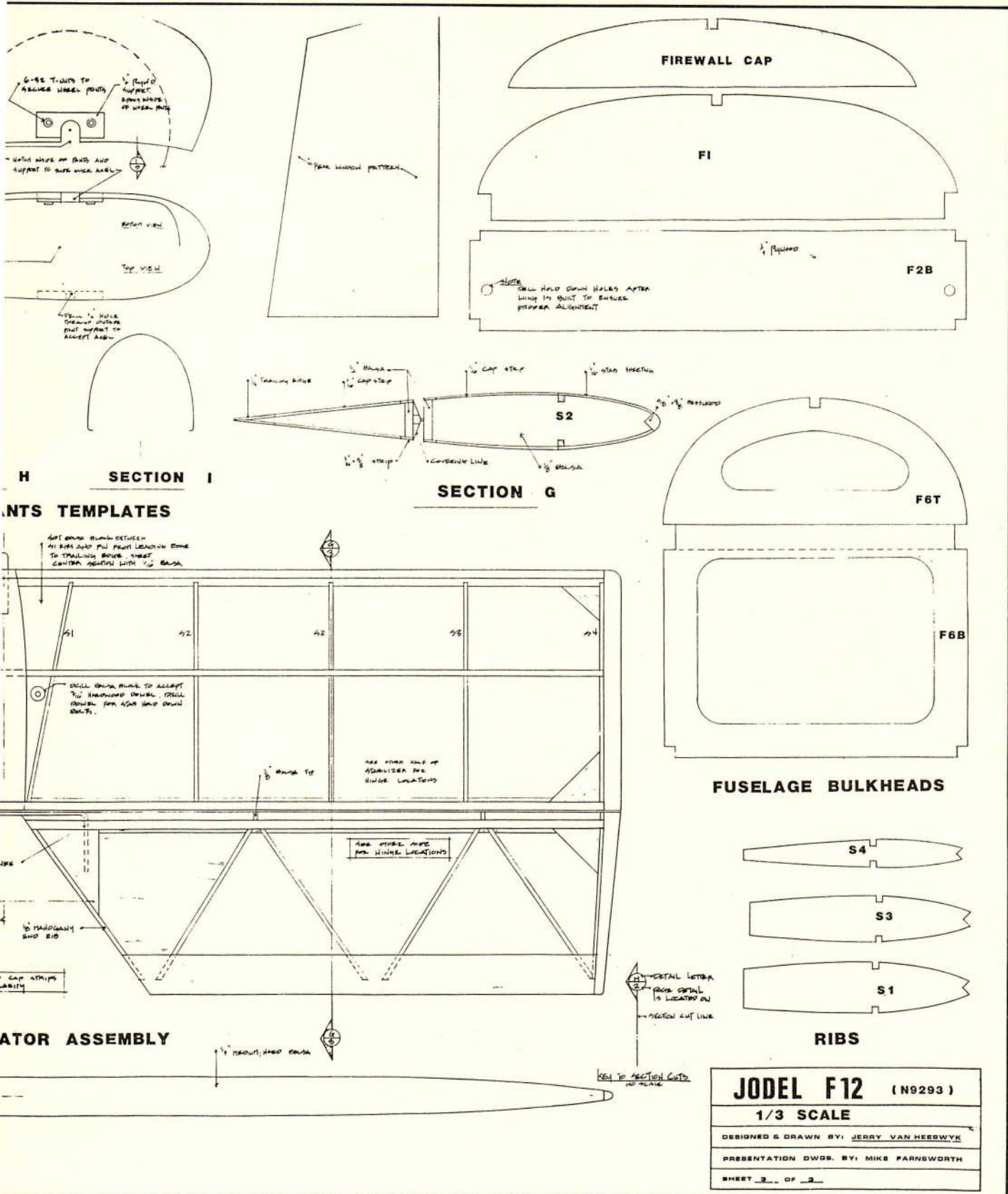
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76 scale r/c modeler





The model's gas cap is removable to provide access to the fuel filler tube. It was made by cutting the top off of a plastic Pactra paint bottle, gluing the plastic portion to the fuselage and building the gas cap around the metal lid. Plastic tubing was used to make the handholds on the

top of the fuselage (3/32-inch) and the radio antenna shaft (1/8-inch). The radio antenna base was carved from balsa and mounted on 1/16-inch plywood.

### SETUP AND ALIGNMENT

Before covering, the alignment

should be checked against the following specifications:

Wing incidence (root)—+4 degrees  
Wing incidence (tip)—+3 degrees  
Stab incidence—+1 degree  
Engine offset—0 degrees downthrust  
1-2 degrees right thrust

scale r/c modeler 77



Landing gear—1-2 degrees toe-in  
(each wheel)

## COVERING AND FINISHING

Solartex was selected for the covering material both for its ease of application and the fact that the texture closely duplicates the fabric used on the full scale aircraft. Acrylic enamel paint, with a plasticizer, was used to duplicate the yellow, white, and black paint scheme of the full scale aircraft. No primer was required over the fabric. Paint should be used sparingly to keep the gloss down and to prevent too much filling of the fabric texture. The red lines on the wing walks were made from trim Monokote and the anti-skid material was purchased from a hardware store and cut to proper widths.

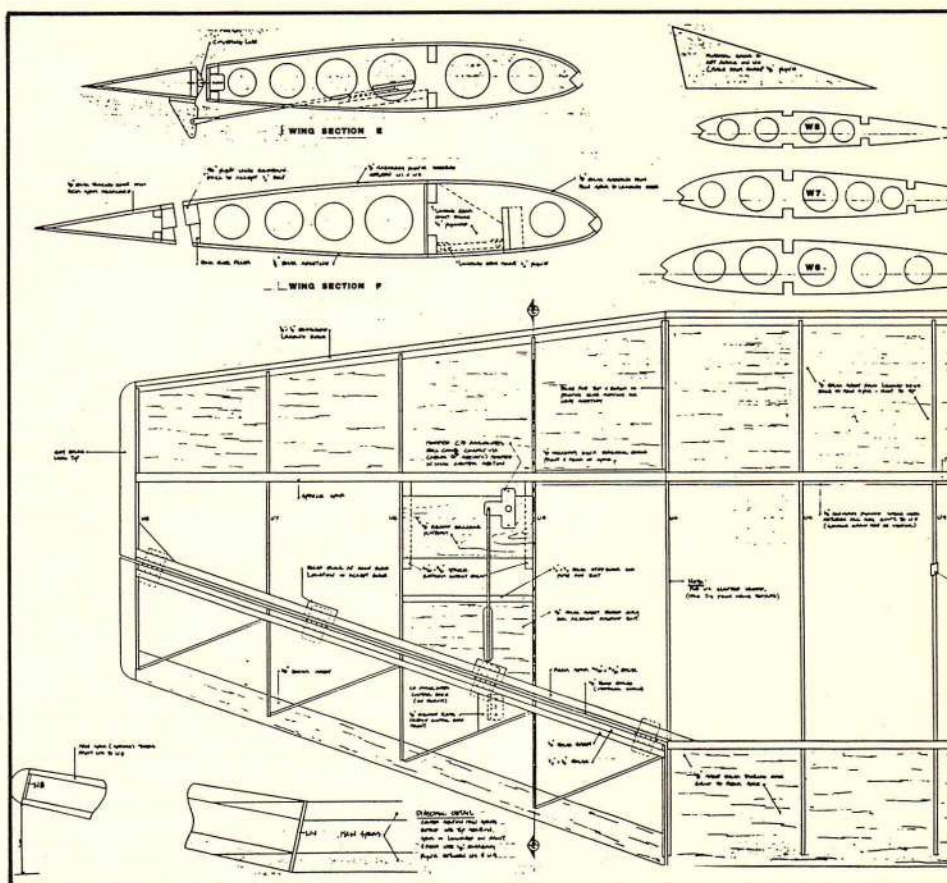
## TRANSPORTATION

If you have gotten this far and you do not own a truck or a van you are probably starting to wonder how you are going to transport this giant to the local flying field. The Jodel is large, even by Giant Scale standards. I contemplated building it with removable wing tip sections but the fuselage is still too long for either of my cars.

Here is how I solved the transportation problem for the Jodel and also for an even larger 1/2 scale Druine Turbulent. I decided to build a cartop carrier from a wooden ski rack which I purchased at a garage sale. The fuselage rests on top of the rack and is secured by cloth straps. The wing sits upside down in a cradle made of fir and is sandwiched in by a fir cap. The cap is held to the cradle by a hinge on the inside and a hasp on the outside. The airfoil shape is cut into the cradle and cap 1/2-inch oversize all the way around. Rubber weather stripping fills the extra half inch and protects the wing from scratches. A bungee cord hooked through the hasps ensures that they do not open on the road. In addition to the brackets which secure the rack to the roof gutters I also tie the rack to the car roof with a nylon safety rope.

This carrier is very easy to put on the car and prevents me from having to assemble an aircraft at the field from many small sub-assemblies. Simply plug in the aileron servo and bolt on the wing. I have used this carrier for over three years and hundreds of miles with no problems even at speeds of up to 60 mph.

78 scale r/c modeler



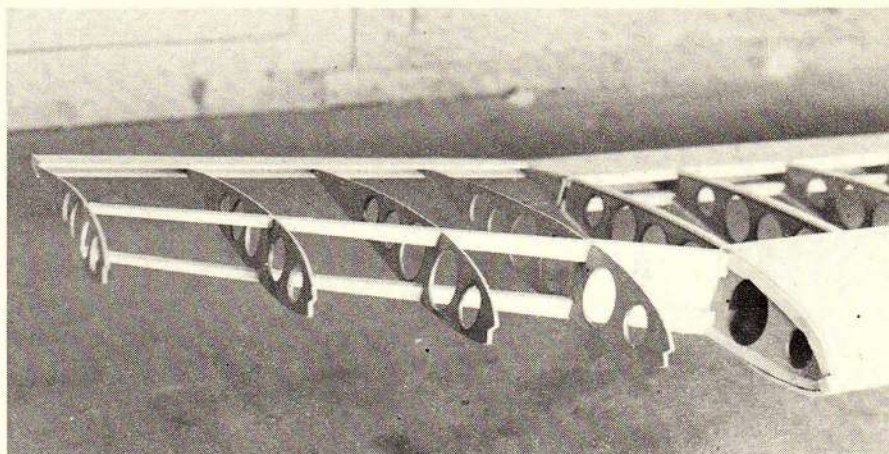
## TRIMMING AND FLYING

Now for the fun part. Naturally, the Jodel should be thoroughly checked out and preflighted before attempting the first flights, preferably by someone other than the builder. It's amazing how easy it is for us to overlook our own mistakes.

If built according to plans, the first flight should be exciting but uneventful. Of course, full power should be used on takeoff and a little right rudder will be required to keep the nose pointed in the right direction. The Jodel will stay on the runway until a touch of up elevator is applied. The right rudder should

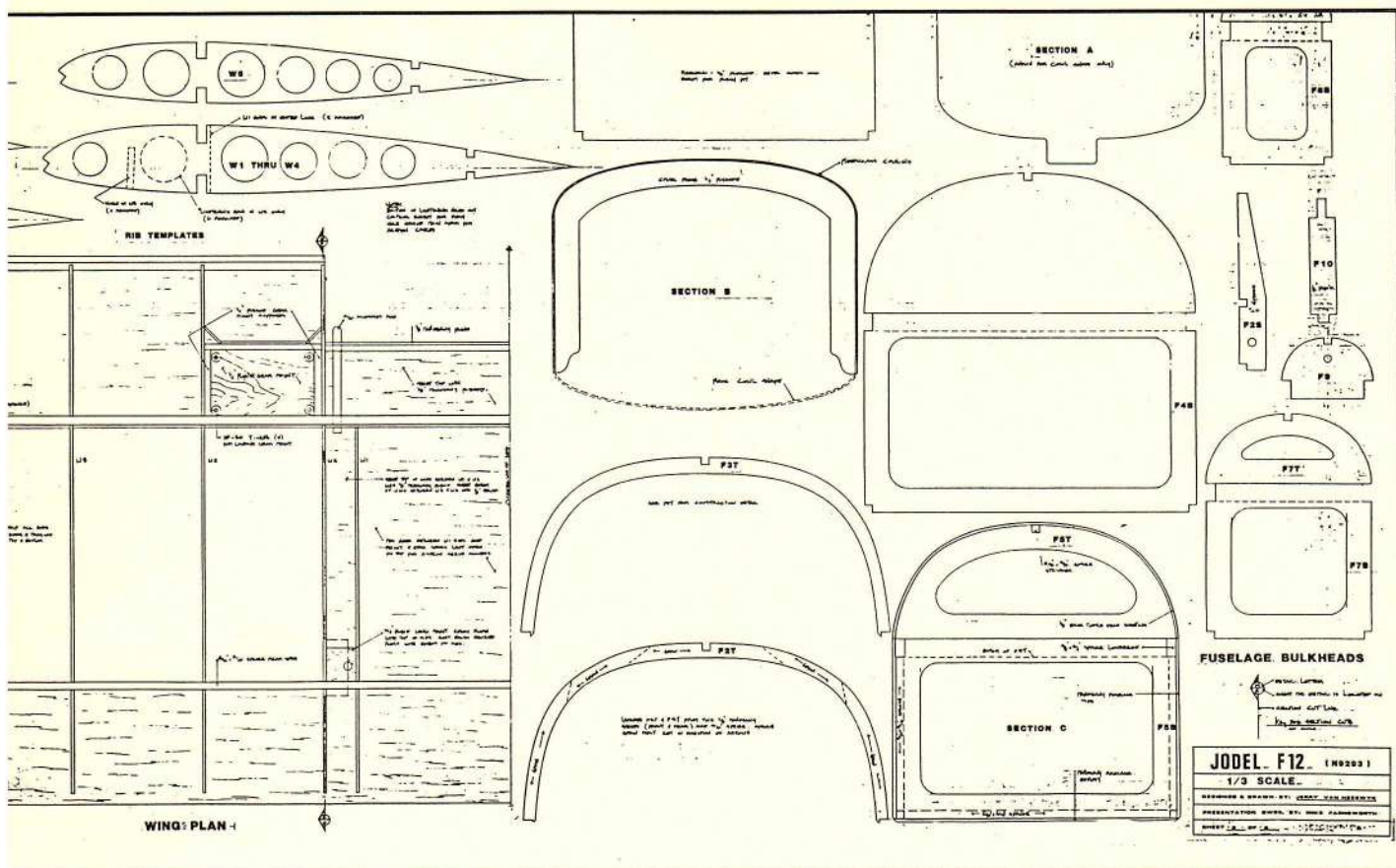
be held on climbout and gradually relaxed as speed is gained and the angle of attack is reduced. I normally take a new ship up to a safe altitude and experiment with each of the controls to feel the plane out and let us get used to each other.

The most important tests for me on the first flight are stall tests. The elevator should be eased back at varying rates and at different throttle settings until the stall and any tendency to fall off on one wing are entirely predictable. The model Jodel, like its full scale counterpart, displays excellent characteristics in this area. Stalls are very gentle and predictable with no tendency to fall



Wing tip construction proceeding with addition of ribs and trailing edge.





off to either side. At the prototype weight of 32 lbs., slow flight is so good that I have been unable to land at full idle with a 12-inch pitch prop and was forced to kill the engine on final in order for the Jodel to settle in. Consequently, I would recommend nothing larger than a 20-10 prop.

Wheel landings and full stall landings can be performed with equal ease. Just be prepared for a slow stall speed.

The 1/3 scale Jodel F12 has been a true pleasure to build and fly. I hope that you will find it an equally satisfying project. If you have any questions about the building or fly-

ing of your Jodel or would just like to swap stories please don't hesitate to write or call:

Jerry Van Heeswyk  
231 Sunland St.  
Louisville, Colorado 80027  
(303) 666-9523

**EDITOR'S NOTE:** Dear Readers: We thought you'd enjoy reading this short autobiography by the talented author of the JODEL F12 article.

I began modeling in 1954 at the age of nine in order to earn a Cub Scout merit badge. My first plane was a 25-cent Comet kit of a rubber powered J3 Cub. I built several similar stick models after that Cub.

It didn't fly and neither did they.

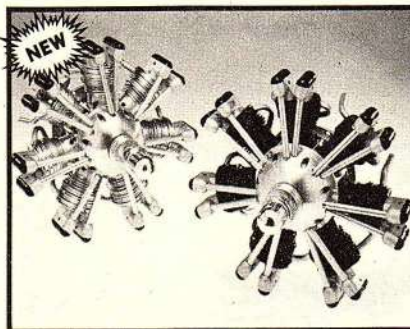
I got into power with one of the prebuilt control line planes a year or so later and began building free flights to utilize the WEN-MAC .049 engine which was all that was left after my numerous crashes. After several unsuccessful free flight models I finally got one to fly. No one was more surprised than I.

I should have left well enough alone but could not resist the urge to move into R/C. So, at the wise old age of 13 I saved a whole summer to purchase a primitive radio.

(Continued on page 82)

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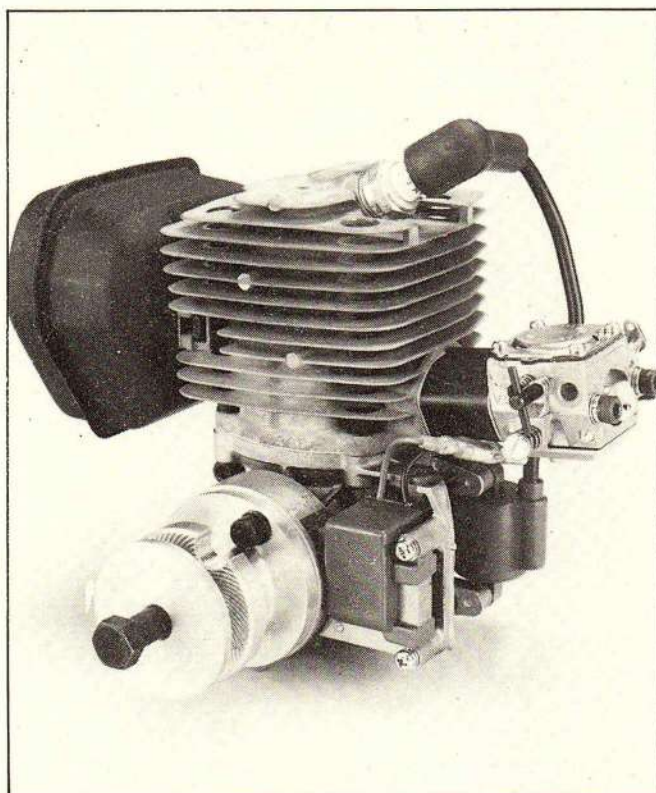


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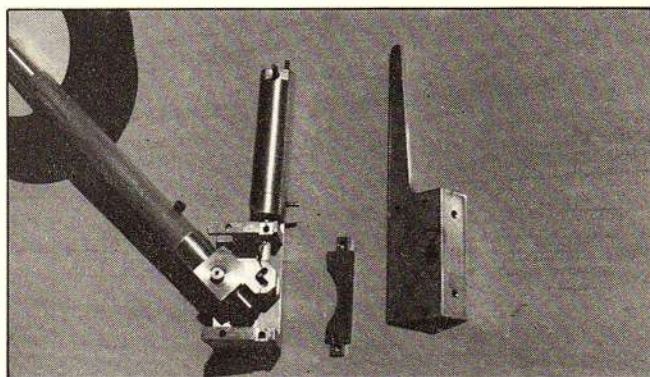
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Zenoah G-62 retail price is \$299.95.



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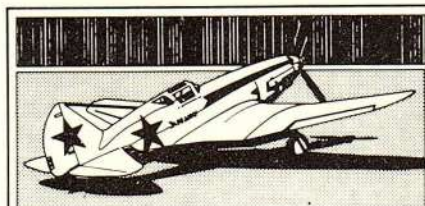
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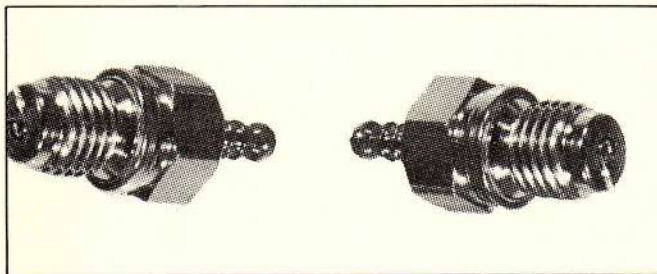
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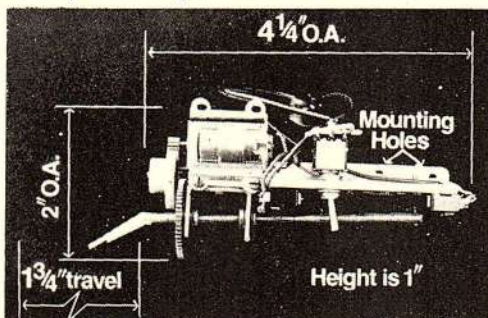
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## JODEL F12

(Continued from page 79)

Needless to say, it didn't work and I was back where I had started. If I had thrown that radio in a lake it would have sunk, intermittently. Kids in those days seemed to have a lot more persistence or a lot less brains than kids today (I'm still not sure which). So I continued to build and crash in the hopes that one day I would become a real R/C pilot. As is so often the case, it was not until a good friend, who was also an electronics engineer, took me under his wing that I was able to achieve that first successful flight.

I was really hooked now. Kits were relatively expensive in 1959 so I designed and built many planes from scratch. You could spend up to \$15 on a kit but could buy the materials to build a comparable plane for about a third of that amount. I never lost the satisfaction of scratch-building and have designed and built about twenty planes in the last thirty years.

It occurred to me that there might be interest in some of these planes when a fellow club member asked if he could obtain a copy of the plans for one of my ships. That event led to my decision to market plans for the Jodel and hopefully a couple of other planes.

I am one of those modelers who believes that the definition of the word AIRPLANE extends far beyond "any manmade object that moves through the air." I have an appreciation for models that are held in the air by their wings, rather than their engines and bear some resemblance to real airplanes. It makes me just a little ill to see J3 Cubs doing vertical rolls and no model has ever been more appropriately named than the Ugly Stik. I realize that my personal bias places me firmly in the minority but I sense that I may have some company in that small group from the readers of your publication.

I have now been involved in this hobby for about 30 years and have loved just about every minute of it. I hope that I can share some of my experience with your readers through this construction article.

Plans for the JODEL F12 are available for \$35.00. Also available is a 30-photograph documentation package for \$12.00 additional. Write to: Jerry Van Heeswyk, 231 Sunland Street, Louisville, CO 80027. Phone: (303) 666-9527.

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The only company offering the "total adhesive system" which includes slow-cure and gap-filling formulas, accelerators, debonders and foam primers.

*The first choice of professional and amateur hobbyists!*

It's no mystery. Zap outperforms all others. Just ask any modeler. We know what you need because we're modelers ourselves. We have **every** adhesive for **every** hobby material—the total system. No other company can say

that. With Zap, you'll just be amazed at what you can do.

**ZAP** THE TOTAL ADHESIVE SYSTEM

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Bob and Dolly Wischer, modeling journalists, master scale designers and builders.

Bob is a former World Champion, an eight-time National Champion and a six-time member of the U.S. International Team.

If you're the kind of builder who won't settle for anything less than Jet™ Professional Grade CAs, we thought you'd like to meet a couple of fellow modelers who feel the same way.

**CARL GOLDBERG  
MODELS INC.**