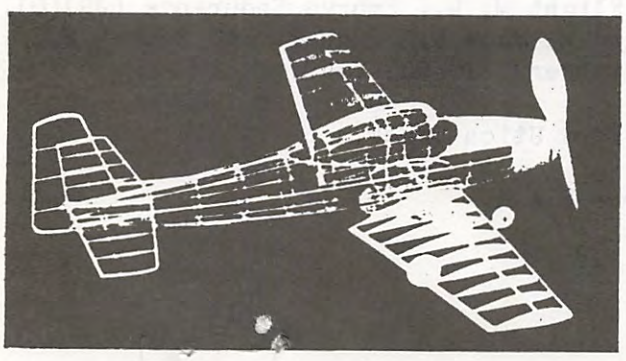
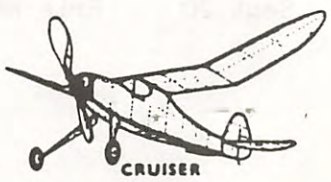
CLEVELAND FREE FLIGHT SOCIETY

CROSSWINDS 76

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CLEVELAND, OH 44117





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1987 CENTRAL SECTOR- NORTH COAST CONTEST CALENDAR

May 24 ERIE FAC at Prangmore Field

June 5- 7 U.S. Indoor Champs at Johnson City, TN.
June 6-7 WPAFB, Dayton, OH. C.I.A. O. T. & Nostalgia

June 7 ERIE FAC at Prangmore. Joe Barna 814-833-4985.

June 14 Lorain, OH. SAM O. T. R/C.

June 21 CFFS FAC SCALE at L.C.C.C. 10AM- 5PM. I-90 exit 48, RT. 301.
FAC Peanut, High Wing & Parasol Peanut, O.T. Golden Age Scale, FAC Rub. Scale, Comet Kit Rubber Scale, FAC CO_2 or Elect. Power Scale Precision, O. T. Replica CO_2 Precision, WW II Peanut Mass Launch, WW II FAC Combat M.L., Embryo Endurance (JS)(O), Unofficial WW I Biplane M.L. Jim Hyka 216-481-6525.

June 25-26 WACO AIRCRAFT FLY-IN at Hamilton, OH Airport.

June 28 Detroit, MI Cloudbusters Large Field Meet at Ford Utica Track. 10AM-4PM. Embryo Endurance, Peanut Scale, FAC Scale, Jumbo Scale, WW 2 at 11am, Golden Age Mass Launch at 3PM, Coupe d'H, P-30, Mulvihill, .020 Replica, ½A, ABCD, A1/A2 Tow, HLG. R'SOX Kuenz 313-835-7141.

July 4- 5 Cleveland Bud 500 Indy Car Race. CFFS Ushers to attend.

July 3- 6 Seguin TX. SAM Champs & Tri-City FF Meet.
July 12-18 AMA Nats at Lincoln, NB.

July 19 CFFS ALL SMALL FF at L.C.C.C. 10AM-5PM.
FAC Peanut, Hi-Wing & Parasol Peanut, O.T. 10 Cent & Hi-Flier Kit Scale, FAC 18 In. Walnut, No. Cal. Profile, WW II No. Cal 1 Flight M.L., Embryo Endurance (JS)(O), WWI Peanut Dogfight M.L., WW II Peanut Combat M.L., H.L. Glider (J)(SO), Unofficial GHQ Peanut added event. Gordon Roberts 749-4817.

Aug. 1- 2 Grand Island, NY at Bedell Rd. SAM 48 O.T. AMA FF SCALE & JUMBO on Sat.

Aug. 9 CFFS FAC at L.C.C.C. 10AM- 5PM. Russ Brown (216) 382-4821.
FAC GHQ Peanut, FAC, O.T. Golden Age Kit Scale, FAC CO_2 or Elect. Precision Sc., O.T. Replica CO_2 or Elect. Precision, WWI Peanut Dogfight M.L., Greve Inline Race M.L., Thompson Radial Race M.L., WW II FAC Combat M.L., Unofficial WW I.

Aug, 16 ERIE FAC at Prangmore Field. Annual Flying Picnic.

Sept 5- 7 Cleveland Air Show. Possible Coors Air Races.

Sept 13 CFFS at L.C.C.C. 10AM- 5PM.
FAC Peanut, FAC, O.T. 10 Cent & Hi-Flier Kit Sc., Comet Kit Sc., No. Cal Profile, WW II No. Cal Profile 1 Flight M. L., Embryo Endurance (JS)(O), Greve Inline Race M.L., Thompson Trophy Radial Race M.L., WW II FAC Combat M.L., Unofficial WWI Bipe Dogfight. CD Dave Pishnery 216-943-2640.

Sept 13 Detroit Cloudbusters Large Field Meet at Ford Utica Track.

Sept 20 Erie FAC 17th Annual Fall Meet at Prangmore Field.

EDITOR:
Michael C. Zand
7055 Seven Hills Blvd.
Seven Hills, Ohio 44131
(216) 524-3480

CROSSWINDS

THE JOURNAL OF THE CLEVELAND FREE FLIGHT SOCIETY

NO. 76 MARCH 1987--RANDALL AND ESTABROOK

EDITORIAL COMMENT.

The 36th National Model Airplane Show, at the Randall Park Mall, was held on the weekend of March 13,14, and 15.

The display by the Cleveland Free Flight Society attracted large crowds and it looks like we have rekindled some interest in club activities, as several inquiries have come as a direct result of our presentation.

Several CFFS members collected some awards. Winning trophies were: Andy Medovitch first place in Mass Launch Rubber Scale with his Ole Tiger, and second place in FAC Scale with his B-26. Winning a first place in FAC Scale was the Vari Viggen built by your editor. My Golden Age kit P-51D received a second place trophy in Mass Launch Rubber Scale. The mall show will continue to be an important club activity especially if CFFS begins to gain membership from this exposure to the public. President Dennis Norman's four engine models, the B-17 and Lancaster were most impressive, and the total free flight display was outstanding.

We also wish to thank Lin Reichel, Vic Didelot, and Ross Mayo for coming from Erie, PA to assist with the judging.

The Annual CFFS Indoor Contest was held on March 29th at the Estabrook Recreation Center. There were 17 contestants and some interested spectators. Three James Ford Rhodes High School students were most helpful with the smooth running of this contest. Aspiring percussionist, Tracie Peck, handled the registration table and was ably assisted by new Rhodes Ramette, Stacy Beilis. Rhodes Senior, Don Gajewski flew his first model, a peanut Lacey, placing 4th in Hi-Wing Peanut. Don also assisted with timing.

This contest had some very memorable and amusing sidelights. In no particular order please note the following:

High schooler, Don Slusarczyk wins his first Kanone.

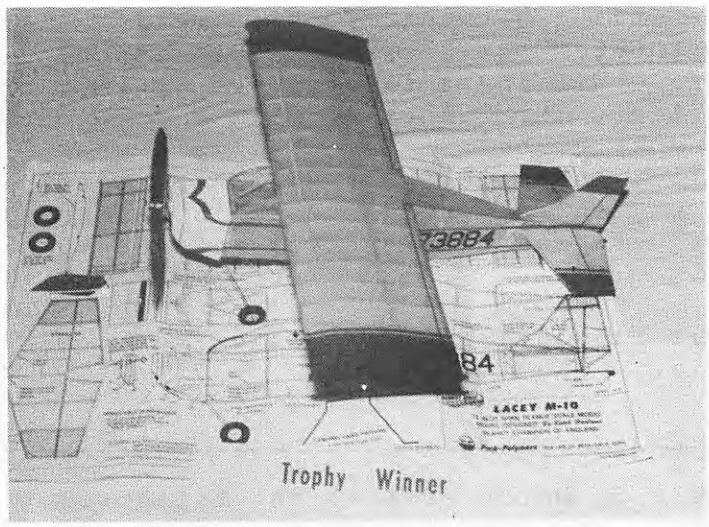
FOCUS ON THE RANDALL MALL 36th MODEL PLANE SHOW AND CFFS INDOOR MEET AT ESTABROOK RECREATION CENTER.



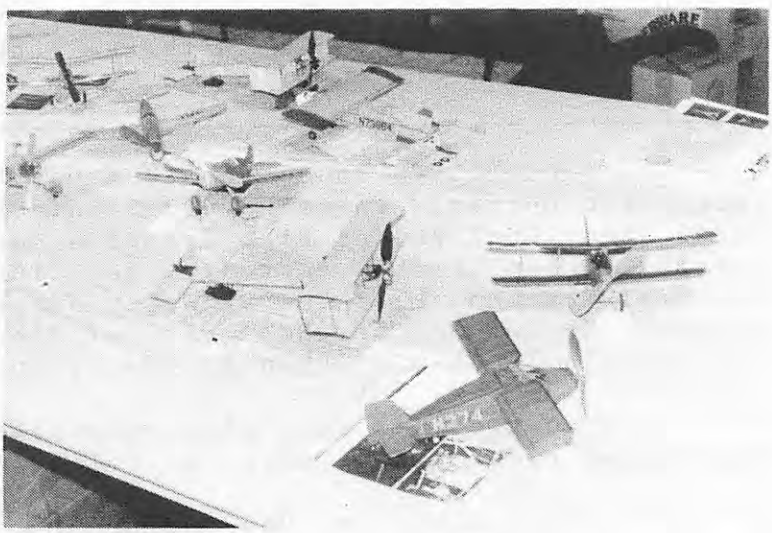
Kris Flandera helps Don Gajewski tissue trim the Lacey.



Rhodes High School Senior Don Gajewski at Randall Mall with his first model.



2nd Place 11th & 12th Grade- Flying Model by Don Gajewski.



Peanut Scale Models at the 1987 Randall Mall Show.

Norm Taggert donated some excellent prizes.*

Don Gajewski flew in his first contest.

Eight-year-old, Paul Golownia was the youngest contestent and was very competitive in ROG and flew a P-40 in WW II NO-CAL.

Jack McGillivray and Ken Groves finished in a tie in WW II combat as both models touched down simultaniously.

Andy Medovitch scored two points in the west basket with his Waco Biplane.

Richard Miller serenaded all with his minature harmonica and even played the Air Force song during the WW I mass launch.

John Marett impaled Warren Weisenbach's EZB with a steering pole.

And finally, Mike Zand's DH-6 flew out of sight as it disappeared behind the curtain on the stage and landed on top of the hay stack used for archery practice. The first peanut scale model to be lost in a haystack, indoors.

Now that these events are history and I have successfully involved a new model builder I would like to use this column to offer a solution that will develop interest among some of our youth. This is an appeal to those of us that are in a position to do this, in particular the teaching profession. If your hobby is model aviation than by all means share it with a few interested students.

At Rhodes High School, where I teach music, I went one on one with Don Gajewski and he produced a fine Lacey from a Peck kit. The project was begun at school, then the structure was completed at home and we finished the model in my workshop. Don was ably assisted by his friend, Kris Flandera, another of my band students.

The model was completed one day before the Randall Mall Show where it received a 2nd place trophy in 11-12th grade free flight.

Don plans to attend Case Western Reserve University on an academic scholarship. He is one of the top students in the 1987 graduating class and he was delighted with the results of his model. He assured me he will build another and will share his newly gained knowledge with his brother and friends. This future engineer, will not forget his model building experience, expecially the art of tissue trimming under the pressure of time.

Another project at our school is the building of AMA Delta Darts. This involves students in the Physical Science classes. For the majority, this will be their very first experience with a flying model airplane.

* Norm stocked up on WESTERN MODEL ENGINEERS WORLD WAR ONE SERIES Kits. These 3/4 inch / ft. SPAD 13, Nieuport 17, S.E. 5A, and Fokker D-VII Kits were re-issued as California Models. CFFS purchased Norm's entire stock of a hundred total kits! You bet, these will be available as contest prizes, for sale at $5, or exchange. Yes we will keep flying WW I Biplane M.L.!

Norman A. Taggart passed on to golden skys Wednesday May 13 just as he was recovering from a lung congestion problem. Wife Barbara, son and daughters; all of us will miss his presence.



AT ESTABROOK AND RANDALL.

Dennis Norman's B-17. This was a CFFS group project and it was a highlight of the CFFS display at Randall.



Andy Medovitch preparing for a RTP flight. This was the usual crowd pleaser at the Randall Mall Show.



Russ Brown at the judge's table. CFFS indoor contest.



Tracie Peck and Stacey Beilis, Rhodes sophmores, handled the registration table at Estabrook.

The project is tied into the goals of the class by the study of aerodynamics and the parts of an airplane, and in physics by the laws of flight. Lloyd Bunn, the classroom teacher, has a degree in physics and is completing masters work in education and physics. He feels that this hands on experience is a case of "Tell me, I'll forget, show me, I'll remember, and involve me I'll learn".

Later on in the semester we plan to have flying sessions in the school gym, where the students will earn part of their grade by the degree of success they achieve in flying their Delta Darts.

This issues featured model is a Navion in Peanut size by Earl Stahl. Allen Hunt's plan service has this plane at 24" (#81--$3.00) and 33" (#82 --$3.50).

To complete this issue I have taken the liberty of re-issuing a plane published an old Flying Aces Newsletter. Since Hi-wing Peanut is a popular event I thought the Texan by Tom Nallen Jr. to be a most most worthwhile subject. Also, thanks to Allen Hunt for the Crusair plan, and also the little known GeeBee biplane. If anyone has scale data for the latter please send it for our archives.

To complete this issue I have tabulated the results of the March 29th contest at Estabrook, included this summer's contest calendar and included pictures from both Randall Mall and Estabrook.

KIT REVIEW

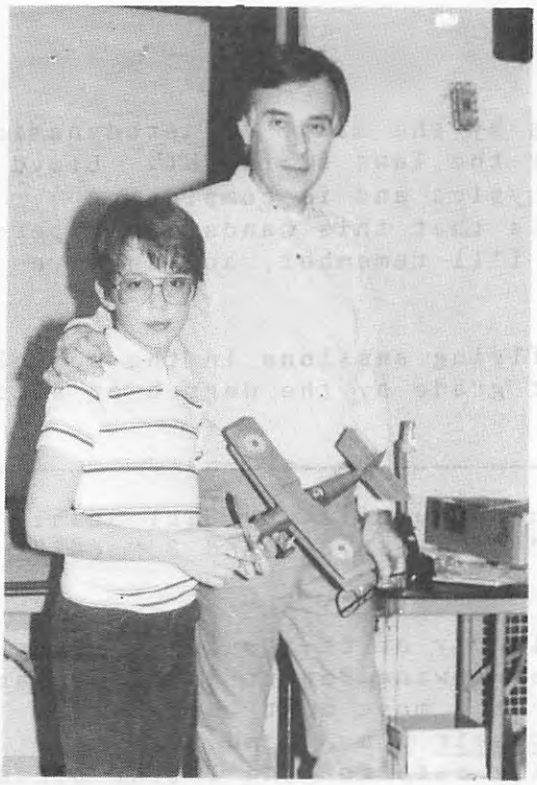
WITTMAN TAILWIND

Andrew Moorhouse, of Bath, England has produced four peanut scale kits. The Tailwind offers the builder a different choice for the Hi-Wing peanut event. I found the model to be a delightful subject, with pleasing lines. However, for the price, the kit is not as outstanding as one would expect. In order to produce a competitive model, the builder must sutstitute 1/20 strip instead of the heavy 1/16 supplied. Also, red Jap tissue should be used to cover the model rather than the heavy domestic tissue provided. Pressure sensitive decals, in correct light blue, are a convenience item. My model weighs 8.9 grams, less rubber and ballast. It required a fair amount of nose weight to achieve trim. At this writing it hs not been flown under full power.

BOSTONIAN PUP

Mike Zand called to brag on two new kits from Sandy and Bob Peck. Bob drew up the Bostonian Pup at 16 inch wingspan and got it in a kit box for $7.95.

FLYING ACES F. A. MOTH - just 8.95 $ for this old timer rubber power model from the good book. Sandy will give you a buck off if you order before Bob finds out! Haw-aw-aw-w.



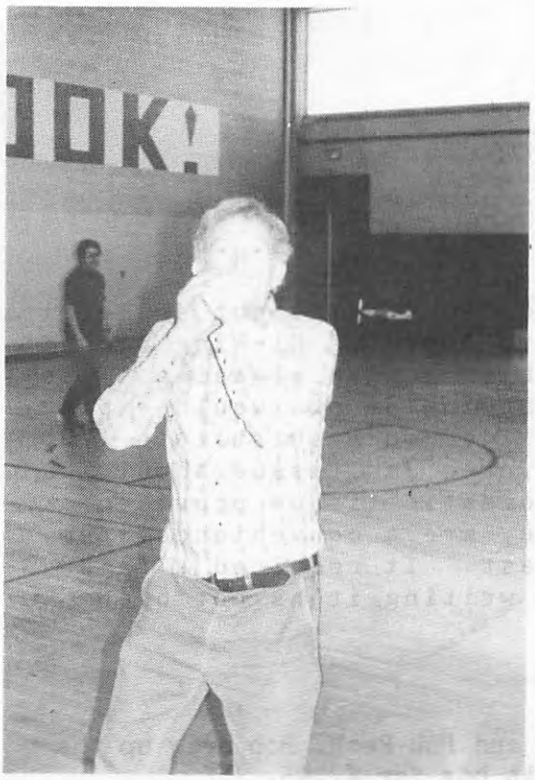
Junior contestant, Paul Golownia, with his dad, Robert. Estabrook indoor contest.



The master at work, Jack McGillivray adjusts his winning SE-5A at Estabrook.



Ken Groves studies his EZB near the end of a successful flight.



Richard Miller serenades spectators with his Peanut harmonica.



Don Slusarczyk's NO-CAL Spitfire wins W.W. II combat.

CONTEST RESULTS

Sunday, March 29, 1987 Estabrook Recreation Center

EZB

Flyer	Best Flight
Larry Loucka	9:32
Jack McGillivray	8:57
Chuck Slusarczyk	8:02
Don Slusarczyk	7:59
George Jensen	6:55
Larry Mzik	6:52
Richard Miller	6:50
Ken Groves	6:04
John Marett	4:32
Warren Weisenbach	1:34

JETCO R.O.G.

Flyer	Best Flight in Seconds
Don Slusarczyk*	86
Warren Weisenbach	81
Paul Golownia*	77
Michael Zand	50
Dan McDonald	49

* Junior Contestants

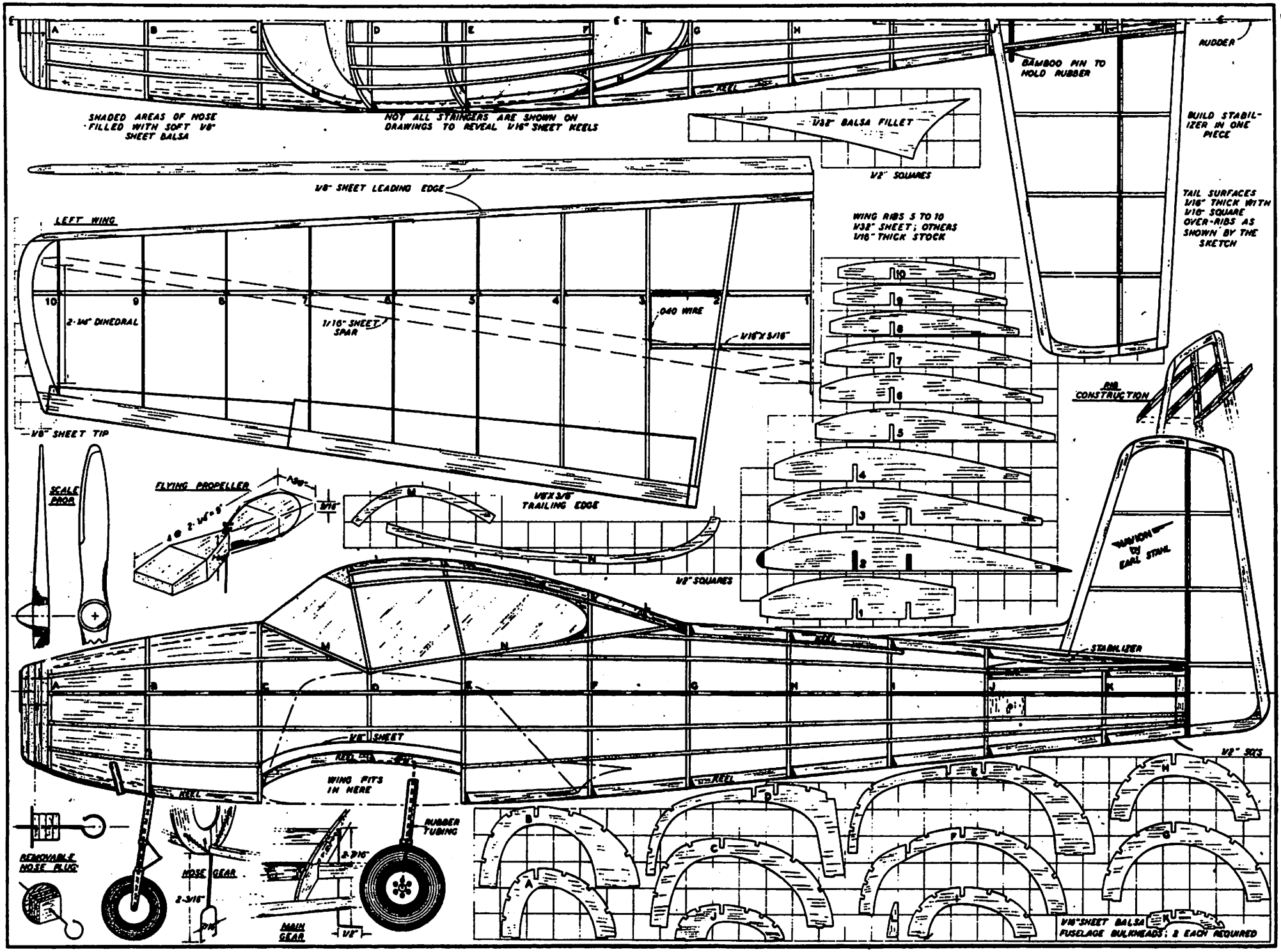
HI-WING CABIN AND PARASOL WING PEANUT SCALE

Flyer	Aircraft	Flying Points	Scale Points	Total Points	Place
Gordon Roberts	Lacey	59	54	113	1
Warren Weisenbach	Ramsey Bathtub	52	57	109	2
Bill Anderson	Paper Vagabond	51	54	105	3
Don Gajewski*	Lacey	33	54	88	4

* Junior

W.W.I PEANUT BIPLANE COMBAT

Flyer	Model	Round 1	2	3	4	5	6
Paul Golownia	SE-5a	X					
Ken Groves	Bristol Scout					Tie	X
Larry Loucka	DH-6		X				
Jack McGillivray	SE-5					Tie	Winner
Andy Medovitch	Halberstadt		X				
Gordon Roberts	SE-5	X					
Don Slusarczyk	DH-6			X			
Warren Weisenbach	SE-5a				X		
Michael Zand	DH-6		X				


SHADED AREAS OF NOSE FILLED WITH SOFT 1/8" SHEET BALSA
NOT ALL STRINGERS ARE SHOWN ON DRAWINGS TO REVEAL 1/16" SHEET KEELS
REEL
1/32" BALSA FILLET
1/2" SQUARES
BAMBOO PIN TO HOLD RUBBER
RUDDER
BUILD STABILIZER IN ONE PIECE
TAIL SURFACES 1/16" THICK WITH 1/16" SQUARE OVER-RIBS AS SHOWN BY THE SKETCH
1/8" SHEET LEADING EDGE
LEFT WING
WING RIBS 5 TO 10 1/32" SHEET; OTHERS 1/16" THICK STOCK
2-1/4" DIHEDRAL
1/16" SHEET SPAR
.040 WIRE
1/16" X 5/16"
1/8" SHEET TIP
1/8" X 3/8" TRAILING EDGE
1/8" SQUARES
SCALE PROP
FLYING PROPELLER
4 @ 2-1/4" X 8"
3/16"
FIN CONSTRUCTION
"MAVICON" BY EARL STAHL
STABILIZER
1/8" SHEET
WING FITS IN HERE
REMOVABLE NOSE PLUG
NOSE GEAR
2-3/16"
MAIN GEAR
RUBBER TUBING
1/2" SQ'S
1/16" SHEET BALSA FUSELAGE BULKHEADS; 2 EACH REQUIRED

NO CAL SCALE

Flyer	Model	Flight Times	Total
Jack McGillivray	FW190 D	149+158+188	495
Don Slusarczyk*	Spitfire	119+173+191	483
Chuck Slusarczyk	IL-2	141+153+170	464
John Marett	Citabria	56+224+113	393
Ken Groves	Corben Ace	80+70+120	277
Dan McDonald	Ord-Hume	53+87+63	203
Richard Miller	J3	59+82+45	186
Dan Briehl*	Cessna Turbo	55+69+51	175
Bill Anderson	J-3	31+38+35	104
Jeff Briehl	Turbo Porter	45+28+28	101
Bill Anderson	Lear Fan	46+39--	85
Larry Loucka	Lacey	42--	42

* Juniors

F.A.C. PEANUT SCALE

Flyer	Aircraft	Flying Points	Scale Points	Total Points	Place
Jack McGillivray	SE-5	74	74	135.5	1
Don Slusarczyk*	1911 Bleriot Canard	63	67	130	2
Ken Groves	Bristol Scout	58	68	126	3T
Dan McDonald	1911 Voisin Hydroplane	32	94	126	3T
Don Slusarczyk	DH-6	52	66	118	-
Bill Anderson	V Wittman	34	63	97	4
Michael Zand	DH-6	20	75	95	5
Gordon Roberts	Gannet	DNQ	69	69	-

* Junior

W.W. II NO-CAL MASS LAUNCH --9 ENTRIES

Flyer	Model	Place
Don Slusarczyk*	Spitfire XIV	1
Chuck Slusarczyk	IL-2	2
Jack McGillivray	FW190D-9	3
Larry Loucka	Spitfire XIV	4

* Junior

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FLYING SCALE NAVION

by EARL STAHL
Member, A.M.A.

NORTH AMERICAN'S NAVION IN FLYING SCALE MODEL FORM HAS WHAT IT TAKES

IN the belief that the currently popular small, light aircraft are not the answer to the much talked about "family plane" problem, a number of manufacturers are bending their efforts towards the production of larger, speedier craft that are not too tricky for the non-professional pilot to fly. Such a plane is the Mustang-like Navion now rolling off the assembly lines of North American Aviation's factory.

With seats for four and a range of more than six hundred miles, it more nearly approaches the utility of an automobile. Further to bring it more nearly on a par with a car, appearance and comfort of the cabin have been carefully considered. The similarity ends, though, when speed enters the picture, for the Navion's effortless cruising straight to its destination at 150 miles per hour outdistances the tortoise-like car slowed by hills, curves, and traffic beyond fair comparison.

Those who have flown the ship say it handles well and is safe in the hands of the average sportsman pilot. Sturdy all-metal construction, based on experience gleaned from fabrication of the AT-6 Texan and the P-51 Mustang is featured. A tricycle, retracting landing gear is employed for better take-offs and landings and to improve the taxiing characteristics on airports. All in all, the Navion marks a forward step in safety for planes of this class.

With all these desirable characteristics it would seem that every family should have on order a Navion or a competitive Beech Bonanza, Stinson Voyager, or Republic Seabee. Yet the fact remains that the prices of these craft, ranging from more than five thousand dollars for the Voyager to nearly eight thousand for the Bonanza, are equal to that of a modest home and is simply beyond the reach of all but a comparative few. So until such time as efficiency of production dips the costs to the level of a good car, most of the planes will go to airport operators, companies that can employ them in the conduct of their business, and a few of moderate means. The rest of us will continue to wedge ourselves into the small, noisy, drafty cabins of our "putt-putts" to bob along the airways at a hundred miles per—or less—if, indeed, we are flying at all.

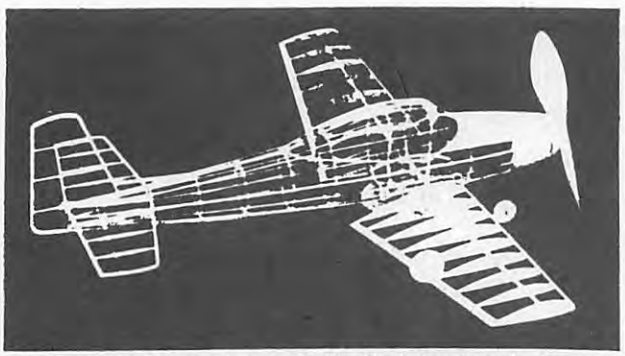
From the standpoint of a model, however, the financial angle is not so discouraging, since for a dollar or so and a few hours of labor (or fun?), a snappy appearing, high flying replica can be had. We have been building flying scale models of all kinds for nearly a decade and can say that the Navion is one of the best we have ever had. Designed from drawings supplied by North American, the model captures the eye appeal of the prototype, yet it is a real flyer showing remarkable power and stability as it climbs in wide circles and then floats back to earth in a smooth glide. Generally, the craft is scale (proportions, dihedral, etc.); however, our experience has shown that adjustment of incidence of the flying surfaces is required to get really good results; we have made these minor changes in the interests of top performance.

The construction sequence is outlined briefly and no difficulty should be experienced if drawings are studied and text is read before starting. Balsa wood is used throughout and colorless model plane cement is the adhesive. Work carefully to reap the reward of keener appearance and finer flights.

Construction is logically begun with the fuselage. The structure featured is light and strong, yet easily made. It consists of four keels (top, bottom, and two side) cut to the outline shapes shown; to these bulkheads and stringers are attached. To accomplish the job, first cut all parts from medium grade sheet stock. Then pin the top and bottom keels to place over the side view and cement half of the bulkheads and one of the keels to place. Now lift the structure from the jig and place the remaining parts. Stringers are hard 1/16" sq. strips added to respective positions on each side at the same time to preserve the alignment.

Numerous details must be completed before the job is done. Between bulkheads C and E, where the wing fits in, attach curved pieces to make the wing's top surface fit to the fuselage as shown. The nose block is laminated sections cut to the shape of bulkhead A and then later finished as shown. To simulate the metal cowl, and for added strength, too, the shaded areas of the nose are filled in with rectangles of soft grade 1/8" sheet balsa, which are then cut and sanded smooth. The small section of cabin roof forward of D is carved from soft balsa and pieces of balsa are fitted to the rear of the cabin to attain the shape shown. Aft of bulkhead J sections of very hard 1/8" balsa are inserted to retain the removable bamboo pin.

Since only the left wing is shown on the drawings, a right wing plan must be made so parts can be assembled over it. Once all parts are cut, ribs as shown, leading edges from 1/8" sheet, spars from 1/16" sheet, and tips from 1/8" sheet, assemble the



● Designed directly from plans supplied by North American, the framework of this scale model can be relied upon for accuracy and sound construction.



Flying Scale Navion

parts to form two halves. Then join the halves with 2¼" dihedral at the tips. Finally, trim the leading and trailing edges to the cross-sectional shape indicated.

Tail surfaces are light and strong and both are built similarly. Cut the outlines from ⅛" sheet and pin them over full-size drawings. Add spars of ⅛" sq. strips and then ribs of the same stock. Lift these frames from the jigs and add the over-rib sections as shown by the sketch. To complete the structures, cut and sand the leading and trailing edges to conform to the streamline cross-section.

The landing gear is usually a problem to builders of flying scale models, but if one of the type shown is incorporated on your model, it will prove to be nearly indestructible, yet most realistic. Bend the struts for the rear gear from .040 music wire. Some dimensions are given and the ones missing are simply made to fit to parts already made. With thread, bind and sew these to the spars and ribs as shown. The nose gear is made in two parts from .030 music wire and the two halves are then soldered together. Sew this nose strut directly to bulkhead B and glue firmly. Pieces of rubber tubing of various diameters are slipped over struts for realism; it will be necessary to split the tubing for the nose gear to get it in place.

For good flights a flying-type propeller must be carved. Dimensions and shape of the block are given and white pine is the suggested wood for use. Carve a right-hand prop, rounding the blade shape nicely. The shaft for the propeller is .040 music wire and it is bent to the shape shown. The front end may be bent to fit to a "free-wheel" gadget that will permit the blades to spin freely in the glide and thus lengthen the time of descent.

The removable nose plug to which the prop is attached by the shaft is made from a disk of ⅛" plywood (birch) which has a cross-grained cube of balsa at the back. This plug fits into the nose block and is removable to facilitate installation of the rubber motor; it also allows it to be stretched before winding. Incidentally, be sure to put several washers between prop and nose plug to minimize friction.

A scale prop is shown, too, and on our model we used one featuring light and dark laminations for added realism. The prop shown on the drawing is the fixed-pitch type used on the first Navions; later ships have adjustable wood ones of slightly different shape.

Before frames are covered they should be sanded to allow a neat job to be made. Install the thin celluloid windows before covering, but do not assemble the various parts at this time. We used colored tissue on our test job because it is both light and attractive. Cover parts carefully, using as many small sections of tissue as are needed to avoid wrinkles. Banana oil or thinned clear dope is the adhesive used to stick the paper to the frames. When the covering job is done, lightly spray with water to tighten it, but do not apply any dope until later when the model is assembled.

This assembly job is next and is done in this manner: fit the wing into the slot and cement it fast. Approximate shape of the fillets is given and they may require slight altering for individual ships to span the gap from wing to fuselage neatly. Cover the fillets with colored tissue as well as the openings at the fuselage bottom. Slip the stabilizer into the slot provided for it and cement it fast. Offset the rudder about ⅛" for a right turn and be sure it is properly aligned when installing. The whole model may now be given two light coats of dope.

Trimming and details complete the construction task. Colored tissue was used for stripes and numerals on the model shown but decals may be substituted. The balsa wheels, exhaust stacks, etc., should all be painted before being attached. Check pictures of the real ship for added minor details that may be added to the extent of the builders' ability and initiative.

Now that the ship is about ready for flights, a rubber motor is needed. Get ⅛" flat brown rubber if possible and make an eight-strand motor of it. Incidentally, it should be lightly lubricated with a mixture of tincture of green soap and glycerine. Hook one end of the motor to the prop shaft and drop the other ends through the opening in the nose. The removable bamboo pin is slipped across the back of the fuselage to hold them.

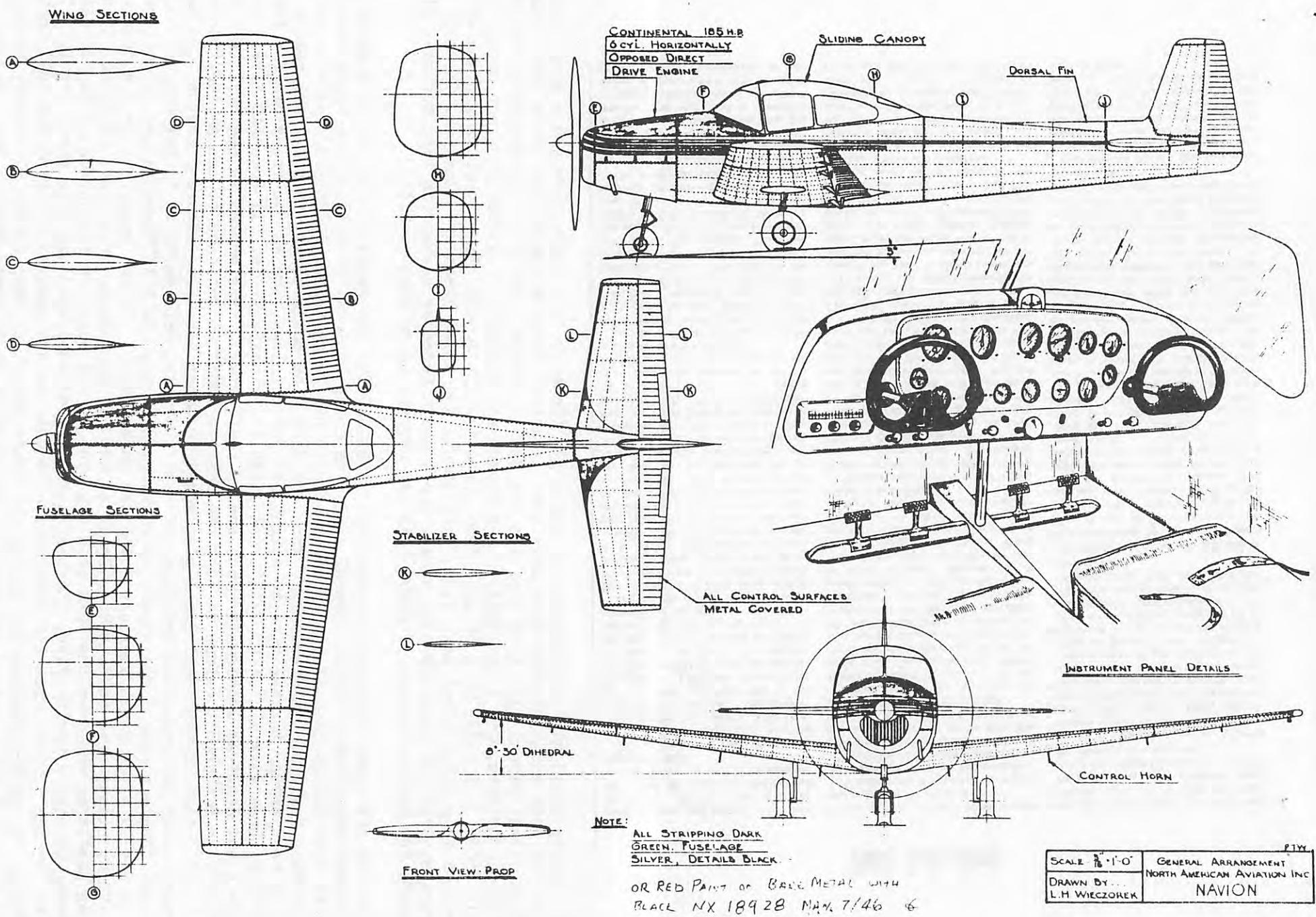
Just as important as the careful construction of the model is its adjustment to fly properly. Every experienced builder knows that it is rare indeed that a ship will fly perfectly upon completion but rather it requires minor readjustments of the location of the center of gravity, slight relocation of the thrust line, or even a little warping of the flying surfaces to squeeze all of the potential performance from it. With this in mind strive to make your "Navion" a real flyer rather than just another model.

Of course, no model will last long if it is confronted by trees and houses at every turn of the prop, so get out in a nice grassy field on a calm day to test-hop your Navion. Hand glides come first to check the balance. If it stalls, add weight within the nose, and should it dive (which is unlikely) a small weight is needed at the tail. With the glide reasonably good, try short power flights—observing both power-on and gliding attitudes. Make any gliding readjustments with weight (or if it turns too sharply in the glide, warp the rudder a bit) and then correct any unstable power tendencies by offsetting the thrust line. This is done by placing a sliver of wood between the nose plug and nose at the top to get down thrust which will iron out a tendency to stall while under power. Right thrust achieved in the same way will control the size of circle. As flights improve, increase the number of winds until a mechanical winder is employed and the rubber is stretched out through the nose about 2½ times normal length before maximum power is stored up.

Our original Navion flew best when it was adjusted to climb steply in a shallow left bank and then as power diminished it slowly veered right to glide down in sweeping right spirals. Treat your Navion right and it will treat you to countless hours of enjoyment in flying.

The three civil aircraft chosen for the scale theme in this issue inspired a romp through the Fox hole archives. Jim Hyka adds the attractive trim on Tom Nallen Jr.'s TEXAN plan. This little rascal flys good too! The Gee Bee A biplane N 901 K in the museum at Bradley Field, Hartford, Ct. (New England Air Museum at Bradley Int. Airport,Windsor Locks, CT zip 06096). A color 4" X 6" post card photo is only about$.35. Colors are red and white with a thin black ofset edge line. Wing struts and wheel discs are aluminum. The tips are more squared off than the plan shows, and I don't remember seeing the wing tip rear clip. Maybe Tom Nallen or other X-WINDS Pals can correct us on this detail?

And not the least inspiring is the Earl Stahl NAVION. Two weeks of the joy of looking back through magazines provides several appealing color choices. We will follow maybe next X-W with more NAVION data if Dennis saves room in his Twins theme CROSSWINDS. Yes we know of the Twin Navions. Len Wieczorek , who drew many fine scale views, is a X-WINDS reader also. I've been trying to take time to wright Len for too long. Now we can thank him for the NAVION three view in M.A.N. 7/'46. Len lives in Bridgeport, Ct. All true FAC fliers know the area! Len,I am looking for Russ Hosler FURY detail. Russ worked on the FURY in a shop window in Bridgeport before he took the FURY to Indiana. But back to the NAVION. Square up the tail tips on your Earl Stahl plan model to match the three view and photos. The main wheels fold in toward the fuselage, so move the wheel well marks in to the wing root and under fuselage area for a wheels up marking. RYAN and RANGEMASTER continued production of the NAVION after North American found the market soft. If any readers have the Comet Kit NAVION, please send word to Russ Brown at 4909 N. Sedgewick, Lyndhurst, OH 44124. Thanks! Ken Hamilton, who drew the FLEA plan may want to add words on the NAVION. I'll bet NAA never painted a Navion Pink. The bright red on polished aluminum sure was a beauty! Thanks Ken for the letter. Just too informative to cut, we are pleased to print the full letter. Thanks too to Ron Moulton for taking the extra effort to keep in touch. A small world 'Nes Paw? Gosh I hateto break off here, but we need to go to press while I go to Naples, FL.



NOTE:
ALL STRIPPING DARK
GREEN. FUSELAGE
SILVER, DETAILS BLACK.
OR RED PAINT OR BARE METAL WITH
BLACK NX 18928 MAY 7/46 &
COVER FLYING MAY 1946.

SCALE 3/16"-1'-0"	GENERAL ARRANGEMENT
DRAWN BY... L.H WIECZOREK	NORTH AMERICAN AVIATION INC
	NAVION

P1YY

Navion and Navion Rangemaster

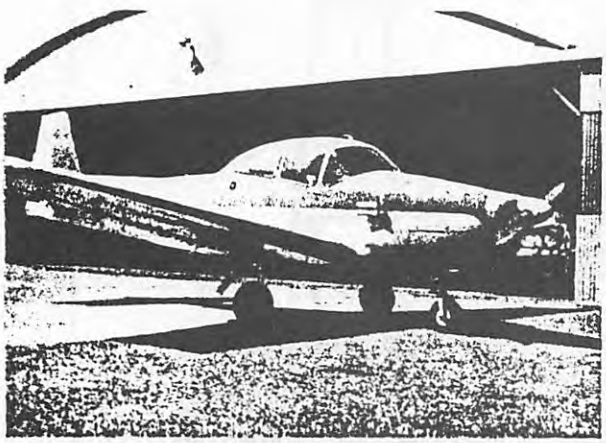
The Navion, powered with the Continental E-185-3 of 185 hp, was originally produced by North American Aviation (now a division of Rockwell International) in 1946 in anticipation of a postwar lightplane boom that never materialized. North American built 1,109 Navions before selling the design to Ryan Aeronautical Corporation. Ryan turned out 1,240 Navions, A and B models, fitted with E-185-9 Continentals (205 hp for takeoff) and GO-435-C2 Continentals (240 hp continuous, 260 hp for takeoff), respectively, from 1949 through 1951.

No Navions were built between 1951 and 1961. Then, the Navion Aircraft Corporation was formed in Seguin, Texas, to put this craft back into production. They reengined some of the earlier Navions with Continental O-470 and IO-470 series engines of 240 hp, 250 hp, and 260 hp. This company then marketed a brand-new Navion Rangemaster, powered with the Continental IO-470-H of 260 hp. Something over 120 Rangemasters were built, the last ones fitted with the Continental IO-520-B of 285 hp.

Finally, the Navion Rangemaster Aircraft Corporation of Wharton, Texas, resumed production with the Model H Rangemaster late in 1974; this airplane is fitted with the IO-520-13A engine of 285 hp.

Many of the older Navions have been reengined and otherwise modified, so that model or age means little. But a number of AD notes have been issued over the years on these craft's props, landing-gear linkage, fuel cells, and so on; therefore, if you are considering the purchase of a Navion, make sure that you have a mechanic familiar with Navions to check it out before you buy.

Navions are excellent short-field machines, are stable, and possess no unpleasant flight characteristics; but it is difficult to describe them in much detail, because performance varies with the many different engines to be found in them. Speeds range from 139 mph (121 kt) for the 185-hp versions to 157 mph (137 kt) for the fuel-injected 260-hp models to 191 mph (166 kt) for the 285-hp Rangemaster. An empty Navion will weigh anywhere from 1,700 to 2,100 lb, while the gross weight will vary from 2,750 to 3,315 lb.

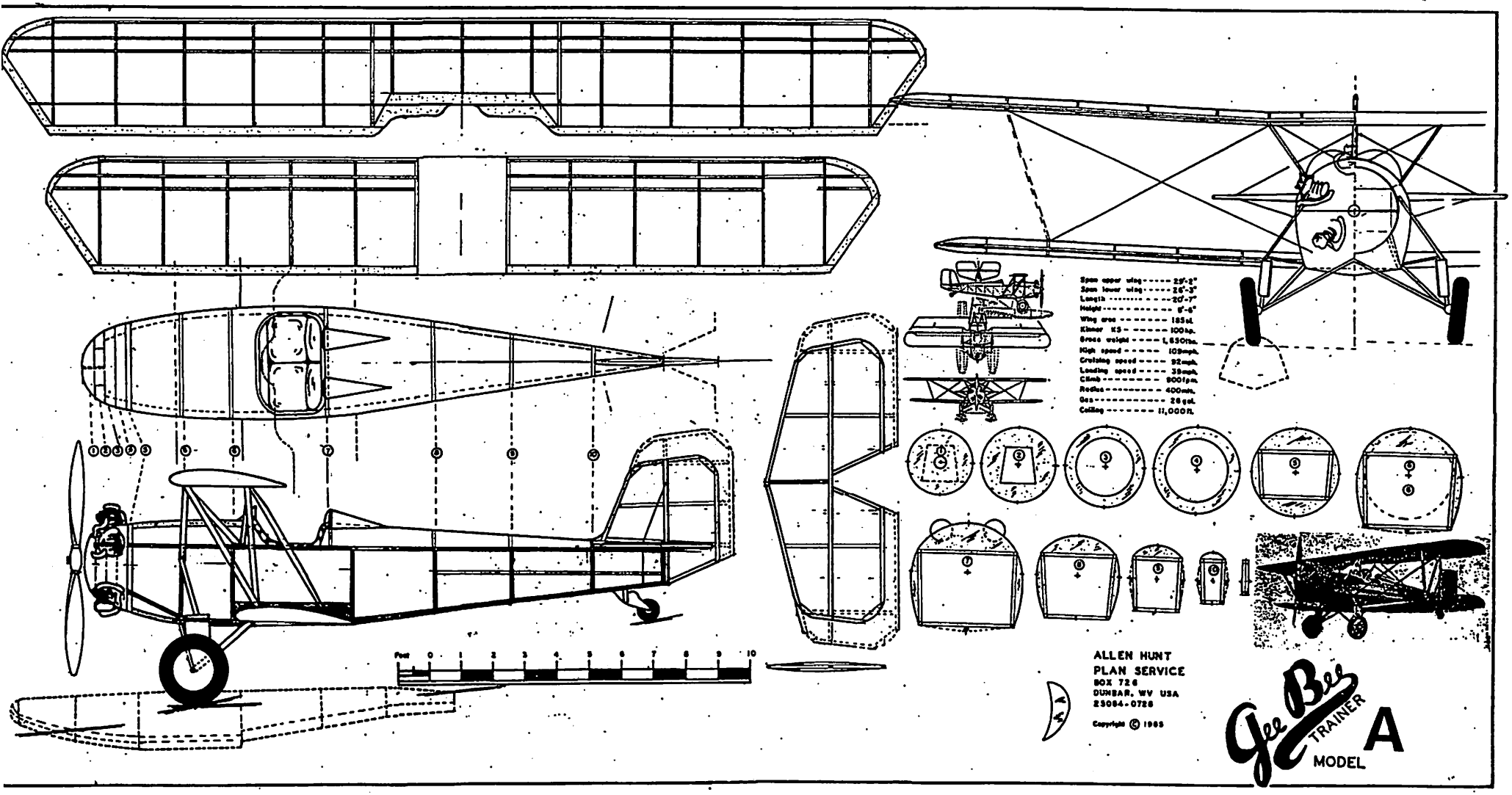


Navions are equipped with a number of different engines, from 185 hp to 285 hp, and performance varies accordingly.

Navion B (1948) and Rangemaster (1970)

	Navion B (185–205 hp)	Rangemaster (285 hp)
Wing span	33 ft, 5 in	34 ft, 9 in
Length	27 ft, 8 in	27 ft, 5 in
Height	8 ft, 8 in	8 ft, 6 in
Empty weight	1,730 lb	2,000 lb
Gross weight	2,750 lb	3,315 lb
Useful load	1,020 lb	1,315 lb
Wing loading	14.6 lb/sq ft	17.6 lb/sq ft
Power loading	13.4 lb/hp	11.6 lb/hp
Baggage capacity	80 lb	190 lb
Maximum speed	157 mph (137 kt)	206 mph (179 kt)
Cruising speed	150 mph (130 kt)	191 mph (166 kt)
Stalling speed	54 mph (43 kt)	55 mph (44 kt)
Initial climb	900 ft/min	1,375 ft/min
Service ceiling	15,600 ft	21,500 ft
Range	500 sm (60 gal)	1,200 sm (108 gal)

This article from the book USED AIRCRAFT GUIDE by Jeffrey Echell
published by Charles Scribner's Sons, New York


Span upper wing ----- 25'-2"
Span lower wing ----- 25'-3"
Length ----- 20'-7"
Height ----- 8'-6"
Wing area ----- 185sq.
Kinner K5 ----- 100hp.
Gross weight ----- 1,650lbs.
High speed ----- 109mph.
Cruising speed ----- 92mph.
Landing speed ----- 35mph.
Climb ----- 900fpm.
Radius ----- 400mls.
Gas ----- 26 gal.
Ceiling ----- 11,000ft.
Feet 0 1 2 3 4 5 6 7 8 9 10
ALLEN HUNT
PLAN SERVICE
BOX 726
DUNBAR, WV USA
25064-0726
Copyright © 1985
Gee Bee
TRAINER
MODEL
A

29432 Quailwood Drive
Rancho Palos Verdes, CA 90274
3 March 1987

Dear Mr. Brown:

Yesterday I received a package from Ron Moulton of ASP, Aeromodeller Editorial Director, Etc. Ron and I have been in touch since the '50s.

Among several items it contained was a copy of CROSSWINDS No. 74 in which is featured the Scientific "The Flea" rubber powered model, and the complete article for a 1/12 scale rubber powered model of the British Pou as it appeared in FLYING ACES for October 1936.

Reading through Crosswinds, I noted a reference to rotation of Editors. If by chance you are no longer Editor, perhaps you will pass this on to the current Editor. (Issue No. 74 was postmarked to Ron in England on Jan 27, '86.)

I am writing with the thought it might be of some interest to you to know that the author of that Flying Aces article, Ken Hamilton, is still around, is still active (barely is the word, I guess) in modeling. I should know; that is who I am.

It was nice to see the British Pou once again in print. It is going to outlast me I think. Bill Northrop called, we got together, he ran it in Model Builder magazine in the April 1981 issue. I furnished some new comments for his text. And Flightmasters News & Views ran the plans from Flying Aces in the March 1965 issue.

Ron wrote asking if I still had my source information. I sent my Abbott-Baynes material, assisting Ron in the preparation of the Aeromodeller page you reproduce from the September 1963 issue. Although I told Ron to keep the reference material, he kindly returned it.

Oh, one more thing that may be of interest: the original model is on the wall above me in my den as I type this. It has been rerigged, the original silk having given up. And a scale propeller has replaced the wide bladed flying propeller. The nose plug is cemented in place, a precaution against being tempted to make one more flight. The original paper is intact, the only patches being a couple of small ones where punctures occurred when flown.

I enjoyed seeing your newsletter, an excellent production. And it was nice to see the continuing interest in the British Pou.

I must take issue with one statement in the newsletter. On page 5 is the statement that: Desert pink aircraft were an artifact of olive drab weathered by the desert sun, not the piddy tink PR Spitfire pink paint." NOT SO! I was at the Kansas City plant (Fairfax Field, Kansas City, Kans.) of North American Aviation during WW II as the Power Plant Engineer. We configured production B-25D and B-25J Mitchell bombers for their various destination theatres, right there. We painted those for North Africa a pale pink all over. I clearly recall my surprise at first seeing pink airplanes lined up awaiting ferry crews, going home, asking my wife, "Guess what color they are painting the airplanes today!" She simply took a wild guess, said, "Pink?" Correct! I have no doubt the sun did fade olive drab, but we delivered the B-25s painted pink at the factory.

I am now retired 10 years last month from 40 yrs, 10 months in engineering with North American Aviation/Rockwell International. My model building directly led to that involvement. And I think it helped make me a better engineer, gave me a better understanding of aircraft behavior from flying free flight models.

over

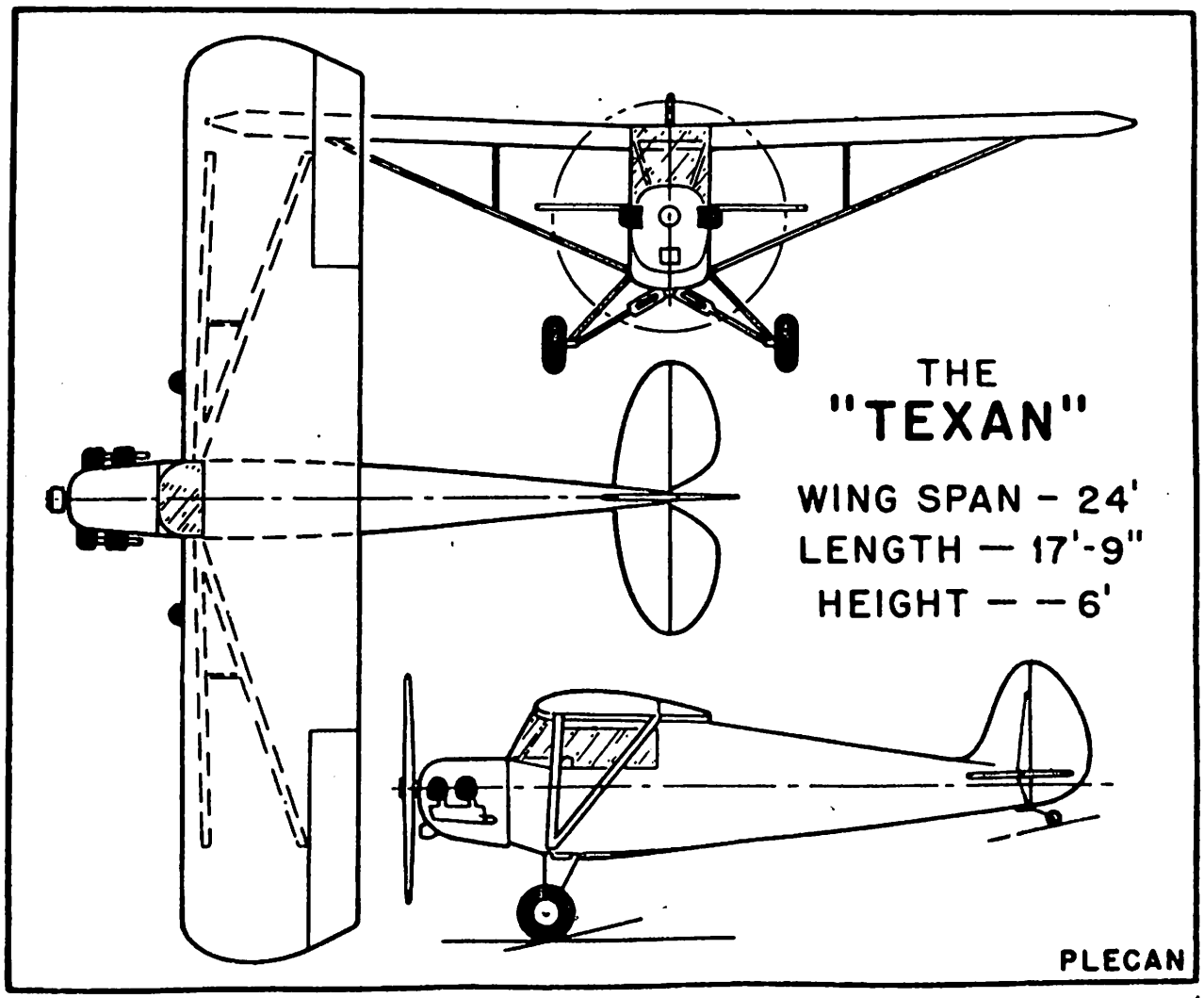
Two Texans, Sim, and his faithful steed. In color it looks like a million bucks. Cream, red.

Home Built Parade

► Designed and built by Sim Paine, Booker, Tex., the Texan is a rugged machine which its owner uses like a horse. It takes him places. To a modeler, the Texan appears an ideal free flight or scale RC. It is simple, straight edged, boxy, but cute.

The Texan is a small job, spanning only 24 ft., for a length of 17 ft., 9 in. Gross weight is 900 pounds, empty 550. A Continental A65-8 engine (65 horse), and Beech-Roby controllable prop provide a top speed of 115 mph, cruise of 95 at 2200 rpm, and a stall of 50 mph. The take-off run is 200 ft., and the landing roll 125 ft. Baggage? All you can get in.

Color scheme is Piper Pacer cream, and Insignia red with black pinstripes. If you scale up the three-view, the airfoil is a Clark Y, and the wings have two degrees of dihedral.



13 CM = 13"

F.A.C. GOES METRIC!

SCALE ONE CM = ONE INCH,

PLAN · MODEL

You mention Allen Hunt and his plans service in the newsletter. I was pleased to be able to send him some Joe Ott and Whitman Publishing plans which he copied and returned, sending me a number of others I did not have as a generous thank you.

You probably know there have been articles and plans derived from that Flying Aces article other than the Aeromodeller issue mentioned earlier. A 44" span, double mine, free flight gas model was featured on the cover and inside the Aeromodeller for Dec. 1963. And Randy Wrisley built a beautiful 66" (3 times blowup of my dwg.) span R/C four cycle gas powered model, presented in RC Modeler for November 1981!

Currently on the model bench is a 3/4" to the foot balsa and tissue model of the Vickers Vildebeest single engined biplane torpedo plane of the RAF, a '29-'30 airplane of clean appearance for its time. The Vickers company kindly sent me a beautifully drawn 1/24 general arrangement dwg. of the Vildebeest in response to my request back in 1935. My interest has never fallen, and I finally decided if I was ever going to build one, I had better get at it...after all, I have only had the dwg. for 52 yrs.! Other bits of data have been accumulated along the way. It is being builtas a rubber power free flight model, no attempt at max. duration, this sacrificed to incorporating detail in the model, a "sport" flyer.

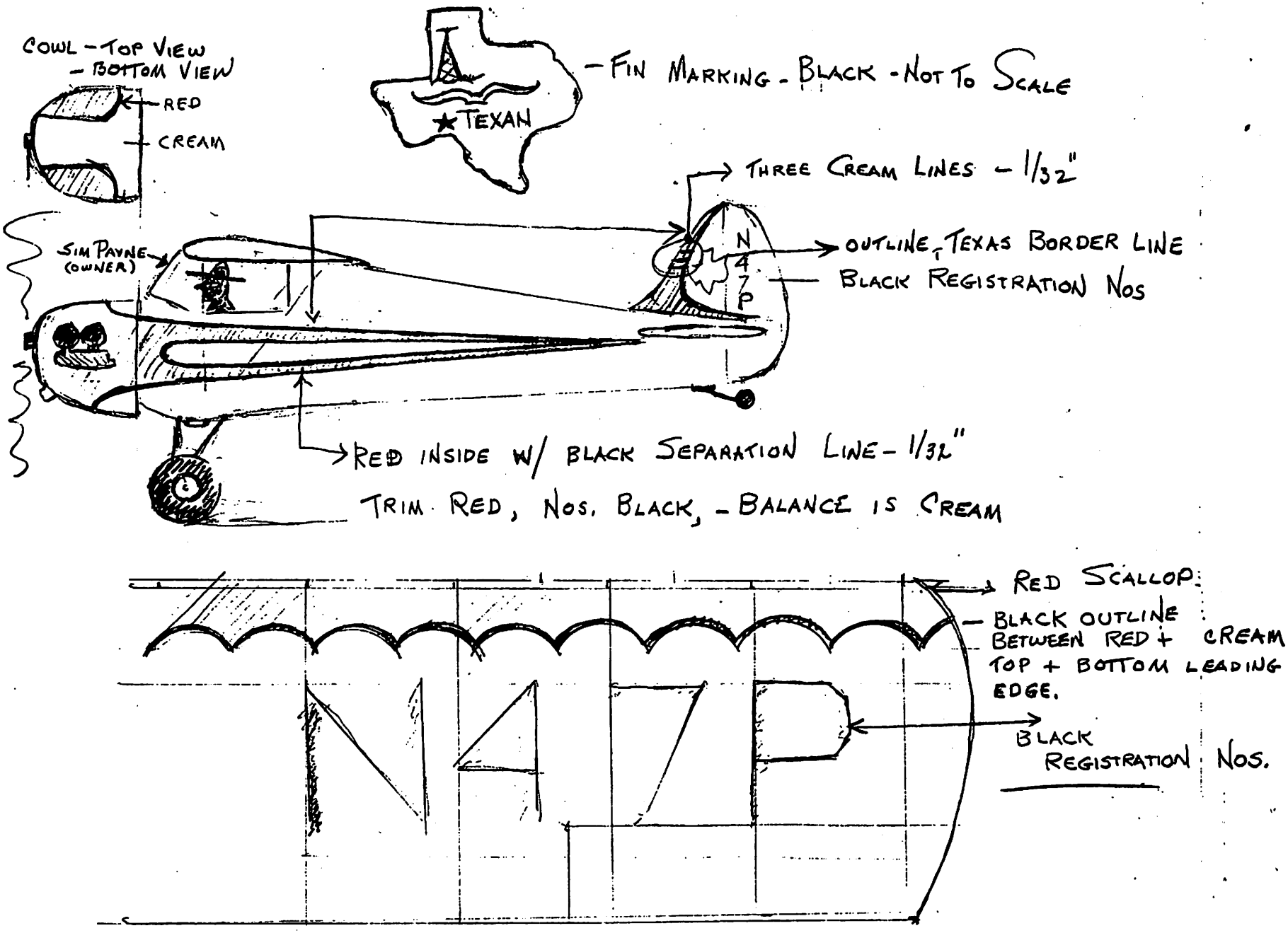
Crosswinds seems to be TRW sponsored, from several things in it. For the many years that the Flightmasters Club was sponsored by North American Aviation and Rockwell International, I was the point of coordination between the club and the company. I saw that News and Views issues got printed and to the member who addressed and mailed the copies, arranged for use of company recreation buildings, etc. Net result was that in helping the club, I never entered a club event!

This is getting to be too long, so will close here. It is a great hobby, isn't it! Crosswinds suggests you have a fine and active club. Here's wishing you and all the members All the Best and a long and happy association with model airplanes! And thanks again for running the British Pou for more to enjoy. Hope some models get built from the plan!

Sincerely,

Ken Hamilton

P.S.: Have you seen Paul Matt's new Aviation Historical Album No. 18? I think it is a great issue, maintaining his high standards of excellence. It covers the Curtiss B-2 Condor Bomber, the B-20 transport derived from it, the F9C-2 Sparrowhawk, and the Taylor/Piper Cubs, four two page dwgs. in this article, one two page dwg. in each of the others. Also a history of Fred V. Verville and his planes, no dwgs. Scads of fine photos throughout. I was privileged to provide the scale data to Paul for the B-2 bomber dwg, a pleasure to meet and work with him. Look for it; you will want it!



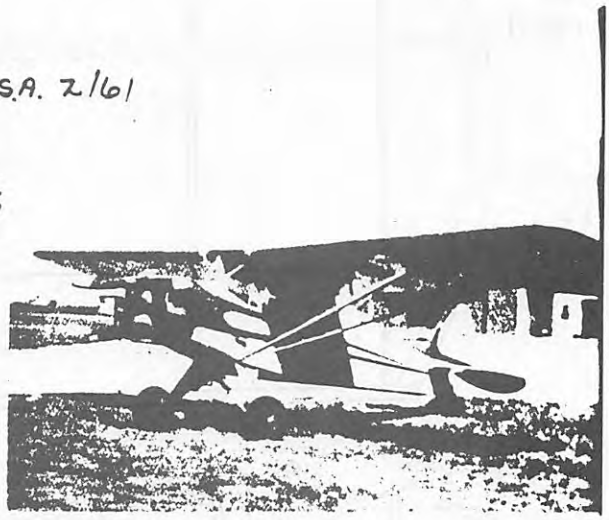
REFERENCE – AMERICAN AIRMAN – TULSA FLY-IN 1958

r. Dick Wood
P.O. Box 395
Clay Center,
Kansas

S.A. 2/61

Profit - One "Texan" Loss - One Monocoupe

By Dick Wood, EAA 8713



I own a "Texan". Live, snappy and cute! Not flesh and blood, (although there was a considerable amount put into it) but pretty fabric with a flashy color combination.

While attending the Tulsa Fly-In, Sim Paine and I agreed to trade my uncompleted Monocupe 90-A for his "Texan" homebuilt. I decided to put the Coupe on my trailer and deliver it to Booker, Tex., five hundred miles away and Dad would fly the "Texan" back home to Clay Center.

We left Clay Center on Friday morning the 24th of June — Dad and I and my little Falcon station wagon with the 'Coupe and trailer towed behind. (High power loading too — approximately 7000 pounds on 90 tiny horsepower). After many stops, some necessary — some unnecessary, we arrived in Oklahoma City at dark-thirty. We stayed all night with Tony and Dorothy Spezio and departed the next morning with an additional 400 pounds of cargo, namely fellow members Tony Spezio and Mickey Eaves.

Eight hours later we arrived at Sim Paine's ranch southeast of Booker, Tex. (We would have arrived a little sooner, but we stopped along the way somewhere in Texas so that Tony and Mickey could run back down the highway to try and shoot a rattlesnake they had seen. (They didn't get it — and me — I stayed in the car along with Pop!)

After unloading the 'Coupe and flying the Texan we all retired to the house for the evening meal. And guess what we ate — thick, juicy, mouthwatering, [illegible] broiled steaks. Mrs. Paine certainly fixed a del[illegible] meal and we certainly appreciated it. Boy those [illegible] sure can eat — why Sim ate two and maybe three bo[illegible] of ice cream alone! Along about mid-evening [illegible] decided to do a little hunting. We hunted rabbits, sn[illegible] rats and even birds till after midnight out in Sim's fi[illegible]

Sunday morning found us saying good-byes and h[illegible] ing for Borger, Tex. and left for home flying the 'Tex[illegible] A quick look at Lawrence Flaherty's cute little H[illegible] ford Parakeet in the hangar at Borger and we he[illegible] for Pampa, Tex.

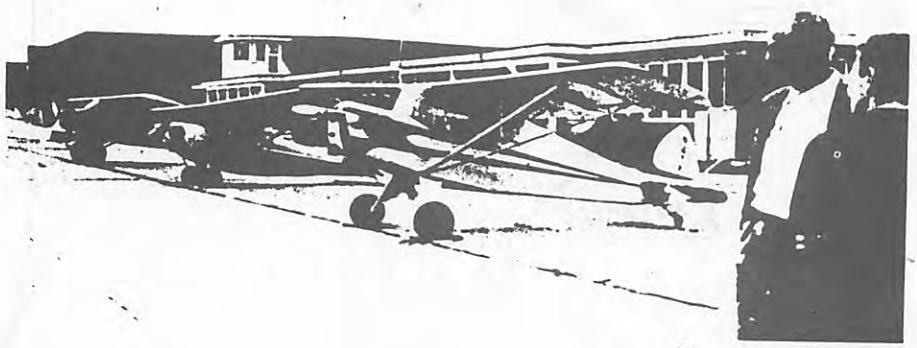
South of Pampa we inspected the beautiful H[illegible] Stits two-place Playboy under construction by [illegible] Anderson.

We arrived in Oklahoma City just at dusk Sun[illegible] night. After spending the night with the Spezio's a[illegible] and inspecting the "Spezio Special" I headed for ho[illegible]

During the trip we found a considerable numbe[illegible] antique airplanes and homebuilts under construction [illegible] all felt it was a week-end well spent (and spend we d[illegible] Mickey Eaves was a little disappointed to find that he[illegible] lost a pair of good socks and his straw hats thro[illegible] Out the window of course!

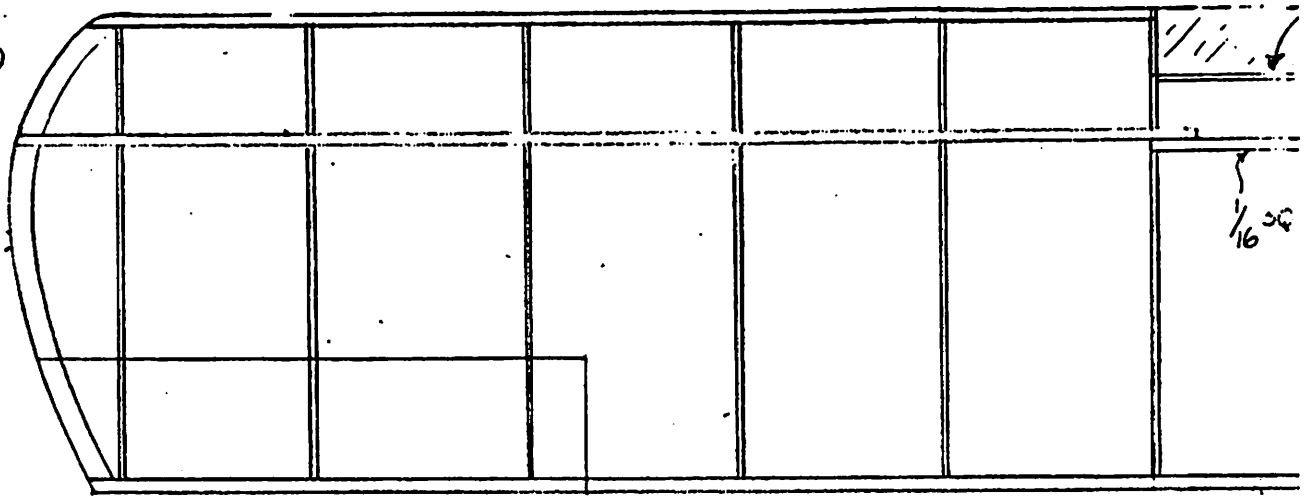
The welcome mat is always out for EAA'ers dri[illegible] or flying through this area. We're located on our [illegible] airport three and one half miles north of Clay Cen[illegible] Kans. Hope to see you soon.

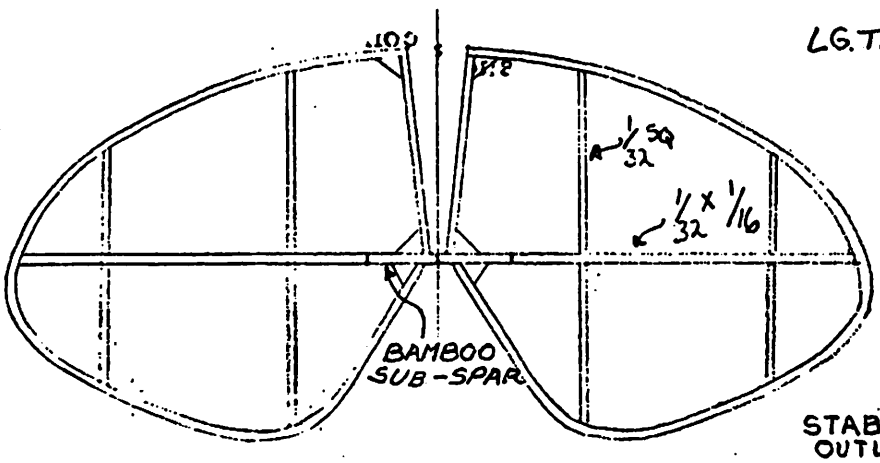
Oklahoma 11/57

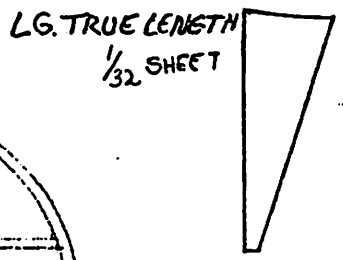


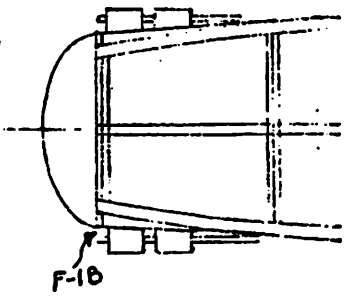
WINGTIPS RAISED TO MEET SPAR (SEE FRONT VIEW)

½" Dihedral each tip.

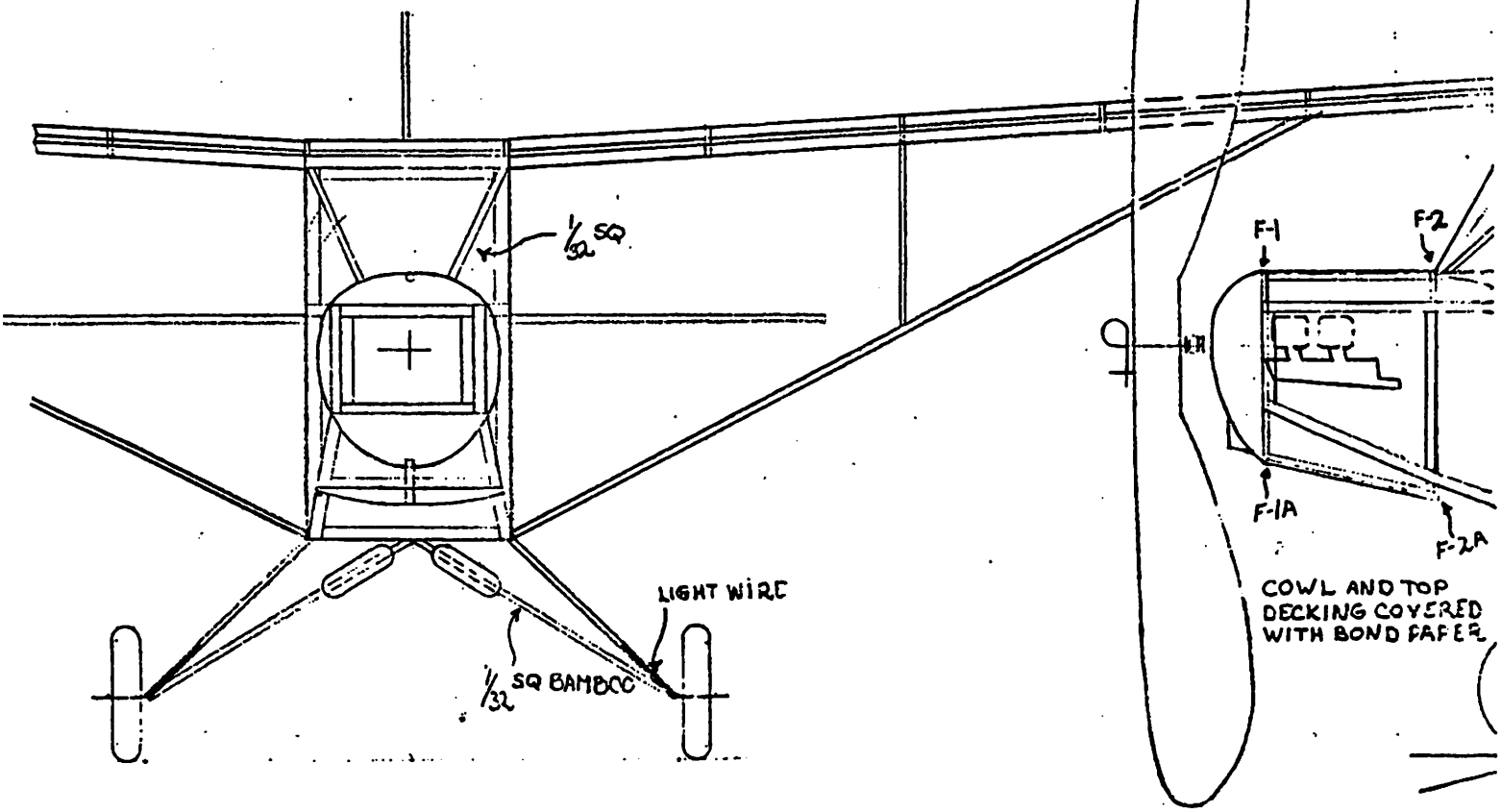




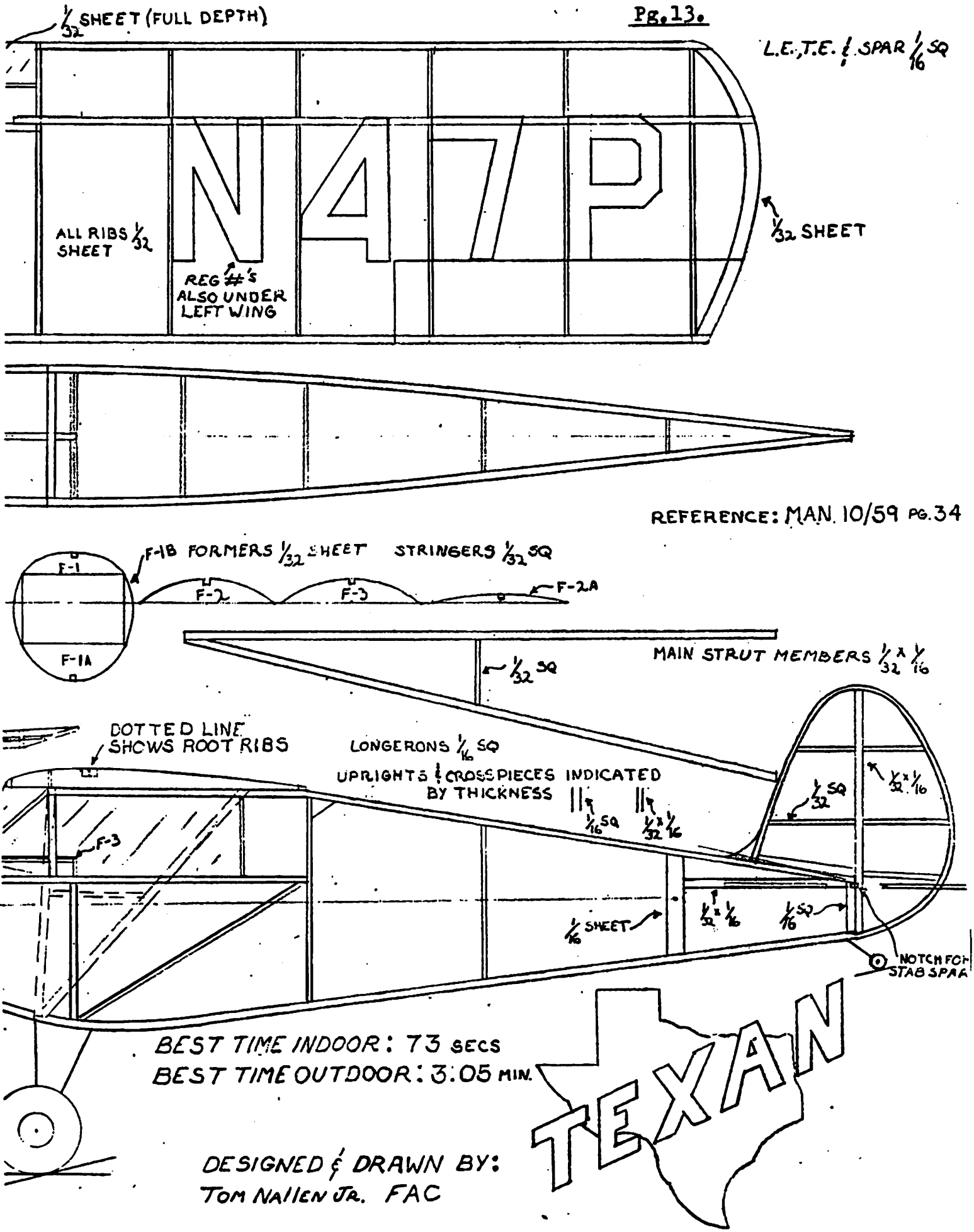




STAB AND RUDDER OUTLINES 1/32 SQ

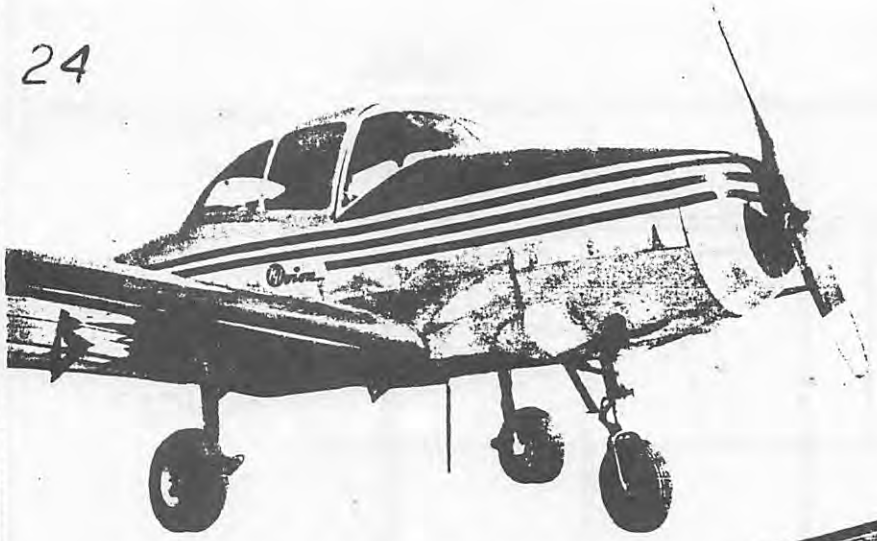


Pg. 13.


1/32 SHEET (FULL DEPTH)
L.E., T.E. & SPAR 1/16 SQ
N47P
ALL RIBS 1/32 SHEET
REG #'s ALSO UNDER LEFT WING
1/32 SHEET
REFERENCE: MAN. 10/59 PG. 34
F-1B FORMERS 1/32 SHEET
STRINGERS 1/32 SQ
F-1
F-2
F-3
F-2A
F-1A
MAIN STRUT MEMBERS 1/32 x 1/16
1/32 SQ
DOTTED LINE SHOWS ROOT RIBS
LONGERONS 1/16 SQ
UPRIGHTS & CROSSPIECES INDICATED BY THICKNESS
1/16 SQ
1/32 x 1/16
1/32 SQ
1/32 x 1/16
F-3
1/16 SHEET
1/32 x 1/16
1/16 SQ
NOTCH FOR STAB SPAR
BEST TIME INDOOR: 73 SECS
BEST TIME OUTDOOR: 3:05 MIN.
TEXAN
DESIGNED & DRAWN BY:
TOM NALLEN JR. FAC

by ROBERT McLARREN

Lines of the P-51 Mustang are evident in this sleek all metal private plane



PLANE ON THE COVER



Navion

WITH minor variations, questionnaires during the past year have asked the prospective private plane owner: "Would you pay as high as $5,000 for a postwar lightplane?" And the crescendo of "no's" has thundered back through the mails so loudly that the price bracket has virtually been removed from the lightplane category. Yet, from all appearances, hundreds of lightplane buyers are going to pay not only $5,000 but $6,100 for their postwar lightplane and gladly. The reason: North American's sleek new *Navion*.

Last August, James Howard ("Dutch") Kindelberger, NAA president, philosophically watched the last AT-6 *Texan* roll off the company's Dallas production line and, simultaneously, saw the last B-25 *Mitchell* speed down the runway of the big Kansas City plant. He was stoic about it because he had realized all along that it had to come sooner or later, and for four months he had known with reasonable accuracy the date it would happen. But when, on November 15 last, he watched the final P-51 *Mustang* creep slowly along the production line, its cradle being disassembled after it, he wasn't so philosophical: for the *Mustang* had been Dutch's baby for more than five years!

When the bottom dropped out of his business on V-J Day, "Dutch" was not alone; all the 20 "big" plants shared his tears. These big company presidents had a lot of decisions to make last fall, but overshadowing the complex panorama of cancellations, work-in-progress disposal, etc., was the one frightening decision: "What next?"

Boeing had its bombers and the postwar *Stratocruiser* on the list; Douglas had three commercial airliner models for sale; Curtiss was talking of merger with Lockheed, who had more *Constellation* orders than two years of hard work could complete; Consolidated-Vultee had the works: all the way from the Stinson *Voyager* to the brobdingnagian Model 37 on the books; and so down the list. Through "Dutch's" eyes their problems looked far simpler than his own; what does a manufacturer of military aircraft exclusively for 12 years do when the war is over?

One solution was the design of more advanced military aircraft and NAA engineers had produced a full stable of them, half still classified by the Army and Navy. But in Washington, "economy" was becoming the order of the day, and this made bleak the outlook for military aircraft.

So "Dutch" made his decision and became the second major military aircraft producer in the nation to embrace the personal airplane (following Republic's *Seabee* lead). With an untold fortune in aircraft design know-how tucked away in his engineering department, "Dutch" quickly visualized the insanity of tossing it overboard by producing the all-too-prevalent "welded-steel-tubing-fabric-covered" lightplane design. If NAA was to build a personal airplane it had to be the fastest, neatest, most modern in the world. And the men who had produced the war-winning *Mustang* could meet this rigid specification quickly and easily.

From a standing V-J Day start, the NAA design-production team took off against a Christmas 1945 deadline. And when the holiday rolled around "Dutch's" Christmas present took to the sky—it became the first truly postwar personal airplane, and its lines were of the type that make buyers forget the price tag.

The uninitiated might describe the *Navion* as a "conventional" low wing monoplane, but "Dutch's" know-how has seen to it that the new product is anything but that—it is bursting with new ideas. Salient point of the *Navion* is its four place accommodations enclosed in a huge bubble canopy, which has created the impression that it is predominately the *Mustang's* new colt. Although the layman's chronic decision is that anything with a wing, fuselage and tail "looks just like" some other airplane of their acquaintance, even an engineer will recognize the square wing tips, square fin and stabilizer tips and the severe polygon of the wing planform of the *Mustang*. Close observers will even detect a tiny dorsal

(*Turn to page*)

Plane on the Cover

(*Continued from page* 23)

fin extending forward of the vertical stabilizer.

While the *Navion* is a straightforward approach to the design of a personal airplane, with none of the tricky frills of the "spinproof" variety, its wing design does incorporate exceptionally good stall characteristics. While the stall is a dangerous lift-loosing maneuver, its greatest danger is in loss of aileron control which results in an inability on the part of the pilot to pick up a dropping wing. The *Navion's* wing is twisted, root to tip, in such a manner that the root section stalls first, the aileron regions last. Thus, when the plane begins to stall, loss of lift in the root area gently lowers the nose while the ailerons are still operating in an adequate airflow for lateral control. The twist is 3°, resulting in the root flying at an angle of attack much higher than the tips at all times.

Additionally, the tip makes use of a high lift section (large camber) which multiplies this difference to a degree making tip stall impossible without more than adequate warning. NAA engineers point out that this tip section produces the benefits of slots without their complexity, drag and sudden loss of lift. The flaps are of hinged trailing edge type and are a special slotted type operating from link posts extending below the wing. They are hydraulically operated and may be locked in several positions. The flaps and ailerons are metal covered with corrugated aluminum alloy, although the "corrugations" are created by stiffener beads in the formed skin panels.

The tail surfaces are full cantilever design with squared tips. Elevator and rudder are of beaded skin. The elevator has a controllable trim tab in the trailing edge of each half. The rudder trim tab extends the entire length of the trailing edge.

The landing gear is a tricycle type. The main wheels are supported on full cantilever struts which are connected to the spar by a heavy forged hinge fitting. The main gear retracts inward and lies flush with the wing lower surface. The nose wheel is supported by a yoke bolted to the strut; it retracts rearward into the nose. The landing gear is hydraulically operated. The main gear is fitted with hydraulic brakes. The nosewheel, which extends slightly from the fuselage in the retracted position, is steerable 20° and is of large diameter to simplify *Navion* operation from rough, weed grown fields when required.

The cabin is 43 in. wide and seats are arranged side by side. Dual controls are provided for the front two seats. The interior is sumptuously arranged and compares more favorably with a medium-priced automobile interior than any other lightplane. The perplexing problem of entrance and exit, which in the past has required tricky doors, folding or sliding seats, has been solved neatly and simply in the *Navion* through use of a sliding bubble canopy. This slides to the rear, after the design of the *Mustang*, thereby permitting passengers to step into their seats from the wing and eliminating the embarrassment of women passengers frequently noticed when entering or leaving other popular lightplane designs.

The four individual seats are fitted with innerspring seat cushions of *Airfoam* rubber. Each seat has an individual ash tray. The front seat floor is covered by a rubber floormat; the rear seat floor is carpeted. The luggage compartment is located behind the rear seats but well inside the cabin, another drawback of other designs. The compartment lid is lifted and up to 82 lbs. of baggage inserted and secured with tie-down straps. After closing, the lid serves as a shelf for hats, coats or small packages. The front seats are adjustable longitudinally. The right front seat and the rear seats are removable when the occasion demands. For example, 435 lbs. of cargo in a total area of 46 cu. ft. can be carried with such an arrangement. An infinite number of special arrangements can be made: the installation of photographic equipment for aerial survey work, small animal compartments, crop spraying chemical equipment, etc.

The instrument panel is attractively laid out and its provisions indicate the "cruiser" type of lightplane the *Navion* represents. Basic instruments in the rubber mounted panel are: an altimeter, airspeed indicator, tachometer, oil pressure gage, fuel pressure gage, magnetic compass, remote indicating fuel quantity gage, ammeter and oil temperature gage.

The *Navion* is powered by the new Continental six cylinder, horizontally-opposed, aircooled engine developing 185 hp. It is supported by a monocoque engine mount which is an integral part of the fuselage structure. Particular attention has been paid to ease of service and maintenance illustrated by the engine cowl which is mounted on two large hinges and swings open as in an automobile hood.

The electrical equipment includes a Delco-Remy starter, generator, 12 volt battery, position indicator for each of the landing gear wheels and a special warning light and horn which operate when the throttle is closed with the landing gear retracted. Complete navigation lights are carried. Although this is the basic model, provisions have been made for additional instruments, landing lights, flares, cockpit heating equipment and complete two-way radio equipment.

The *Navion* has a 33 ft. 4-9/16 in. wingspan. It is 27 ft. 4-13/16 in. long and stands 8 ft. 9 in. high. It weighs 1551 lbs. empty and can accommodate a gross weight of 2570 lbs. Although actual performance figures have not yet been verified, preliminary figures indicate a top speed of 160 mph and cruising speed at 70% power of 150 mph. With flaps extended 40% of full-down position, it lands at 54 mph and rolls only 605 ft. With 20% flaps it takes off in a distance of 695 ft. It climbs at 830 ft./min. after taking off at sea level. Its range, at 51% full power, is 700 miles. Fuel capacity is 40 gallons and 10 quarts of oil are carried.

As this is being written the *Navion* is undergoing CAA test flights and the data recorded from these tests will, of course, represent the official performance figures of the plane. Meanwhile, the first few demonstration planes are being assembled in preparation for various "announcement" parties to be held around the nation. North American is already hard at work assembling a sales and distributor system, something entirely new to a firm whose 12 year old sales office at Wright Field has been its only one.

Tooling has already been designed and much of it fabricated in anticipation of a 10-a-day production schedule, which shouldn't be too difficult for a firm who used to produce 25 *Mustang* fighter planes each day of the month!

The external appearance and performance of a new lightplane is hardly the whole story and the operator will eventually grow far more interested in the economy and simplicity of maintenance. With all the speed of its design, NAA engineers were not too hurried to incorporate all the lessons of the *Mustang* into the *Navion*. The internal arrangement has been designed first for cleanliness, and second for roominess. For example, the radio equipment is located forward of the instrument panel; the battery is mounted aft of the cabin in the lower fuselage; the brakes are operated by a hand lever permitting simple rudder pedals replacing the complex swinging mechanical marvels of the military fighter; the exhaust manifold exits out underneath the fuselage and there is plenty of room between the instrument panel and the firewall for the technician to repair and or replace an instrument or its system. The two 20 gallon fuel tanks are of pressed steel construction, thereby virtually eliminating leaks.

There have been few examples in recent years of major military aircraft manufacturers entering the personal aircraft field and it is a challenging prospect. But the North American *Navion* is a worthy entry into the race.

Mustang Fighter

(*Continued from page* 29)

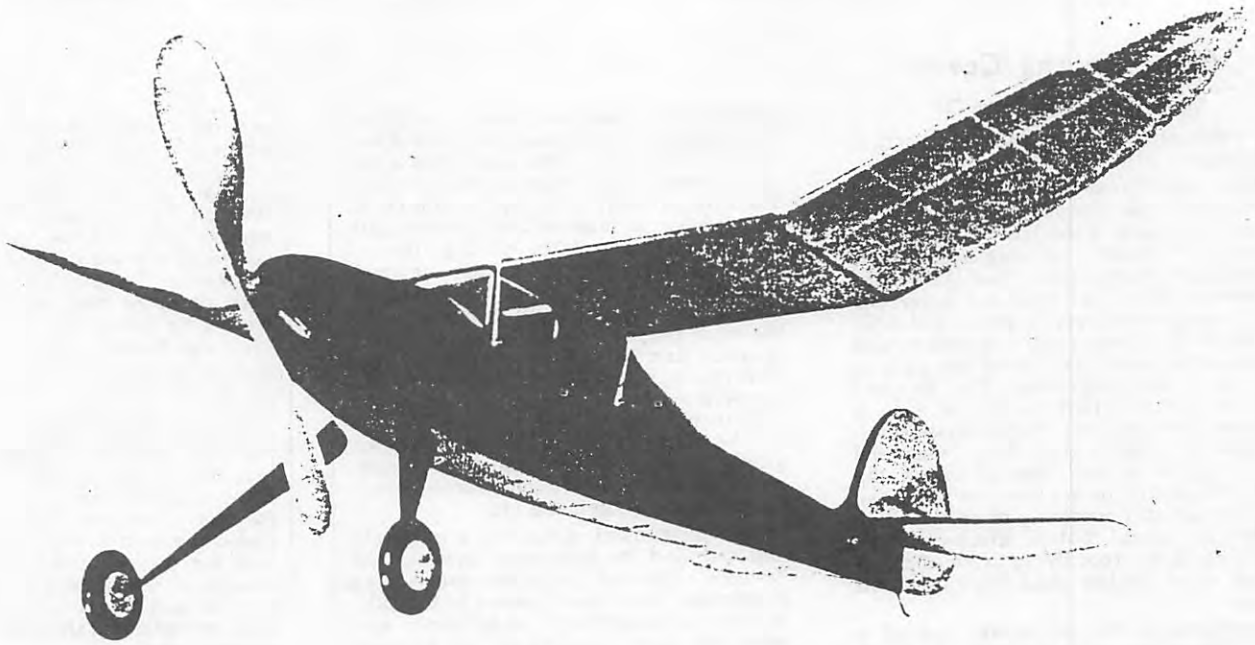
has its own springy music wire gimmick to attach it to the wing frame, and further, that the gimmicks are glued firmly to the thickest part of the wing frame and touch the frame at no other spot. This means that shocks of landings and crashes into fences are absorbed by the music wire, instead of being transmitted to the wing by a solid joint. This sort of precaution adds months to the life of a model. A good pair of small-nosed pliers is required to do the wire bending; it's pretty much a cut and fit job. The wheel panels of 1/16" sheet balsa will be insured against splitting if you coat them with clear dope, then sand them smooth.

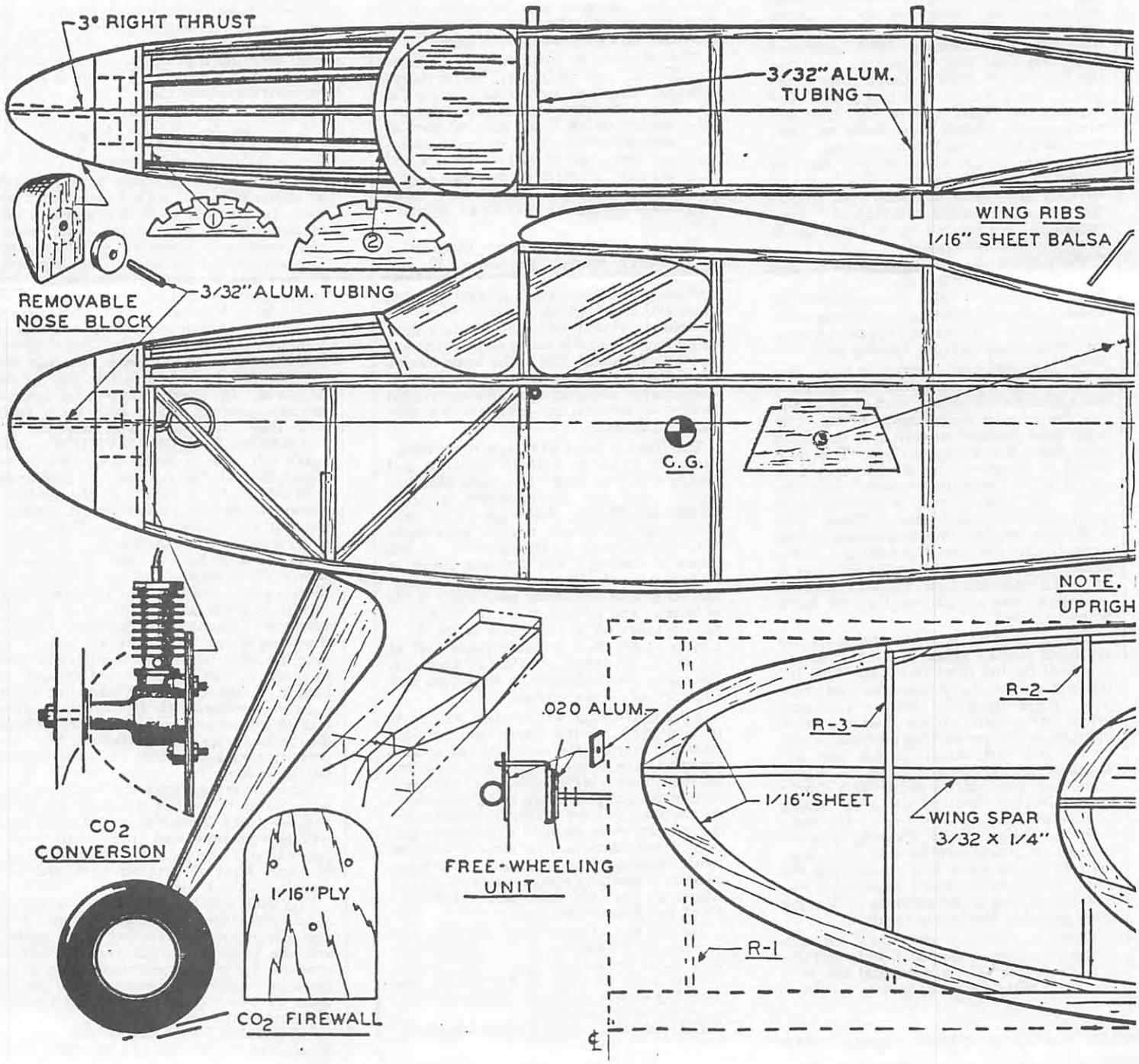
ASSEMBLY AND COVERING — All that's left now to finish the frame is to install the tail. Slit tail post and bulkhead J to admit the stabilizer in the position shown on the plan, and cement it in place. Cement the rudder in place. Then start covering the rest of the frame with tissue. You'll find it best to use small pieces where the curves are sharp. We covered the wing first and then the fuselage, being careful to get a good job at the wing root where we cemented the fuselage tissue to the wing tissue. Of course we had to be sure the wing tissue was firmly cemented in place too, and so we used cement to hold it at the innermost ribs, but clear dope everywhere else. By working a few ribs at a time you can be sure of getting the tissue properly attached to the important members, such as leading and trailing edge.

After covering, spray the model lightly with water to get rid of small wrinkles, and let it dry. Trim the frayed ends that will appear here and there with sandpaper. If you like you can add a thin coat of clear dope, gaining strength and increasing weight slightly.

FLYING PROP—The flying prop is hard balsa; the harder the better. It is also low pitch. This is a fast flying model, and the prop has to be able to take a head-on crash into anything. The prop rides on a hardwood bearing block and is spun by two strands of 1/8" flat rubber or equivalent.

FINISHING DETAILS—There are any number of details that can be added with




3° RIGHT THRUST
3/32" ALUM. TUBING
WING RIBS
1/16" SHEET BALSA
REMOVABLE NOSE BLOCK
3/32" ALUM. TUBING
C.G.
NOTE.
UPRIGH
R-2
R-3
.020 ALUM.
1/16" SHEET
WING SPAR 3/32 X 1/4"
R-1
CO2 CONVERSION
1/16" PLY
FREE-WHEELING UNIT
CO2 FIREWALL

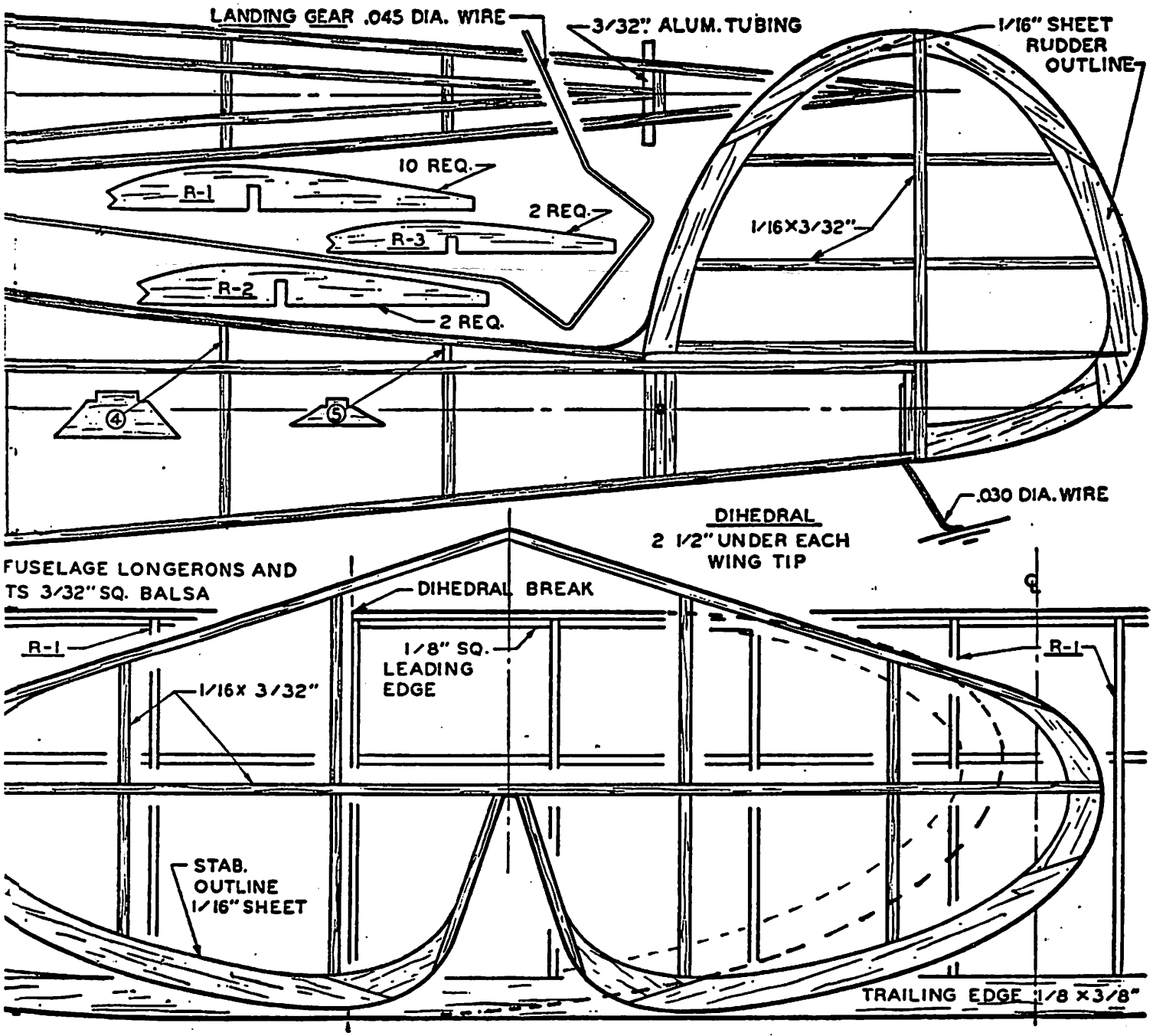
CRUISER

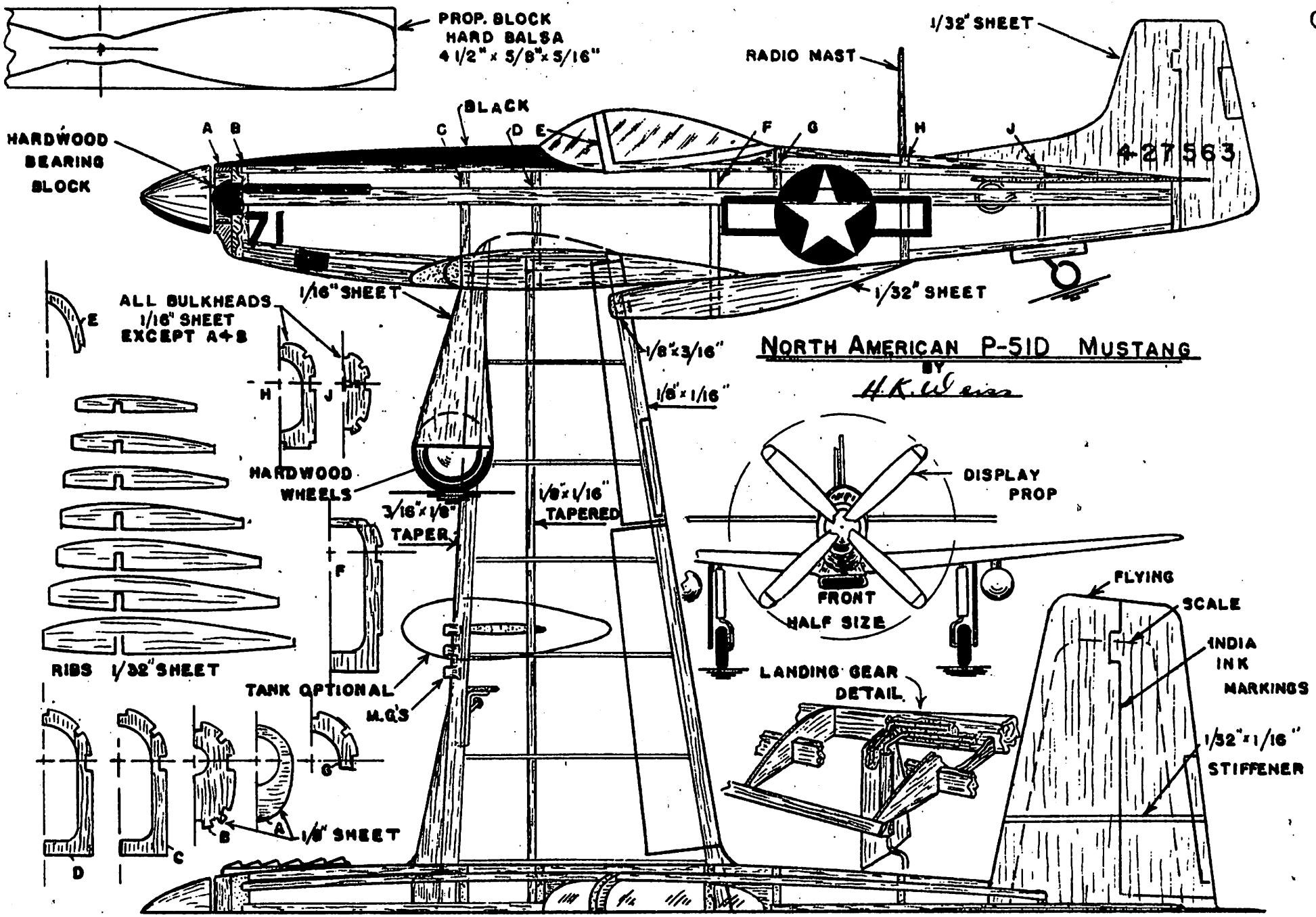
This slick free-flighter takes either rubber or carbon dioxide engine. Has flown 21 minutes

By CHARLES HOLLINGER

AIR TRAILS PLAN May,1949

Plan has been reducded to 20½" wing span.
Please reduce material sizes according.
Prepared by, Allen Hunt, Dunbar, WV





Courtesy MODEL AIRPLANE NEWS - July, 1946