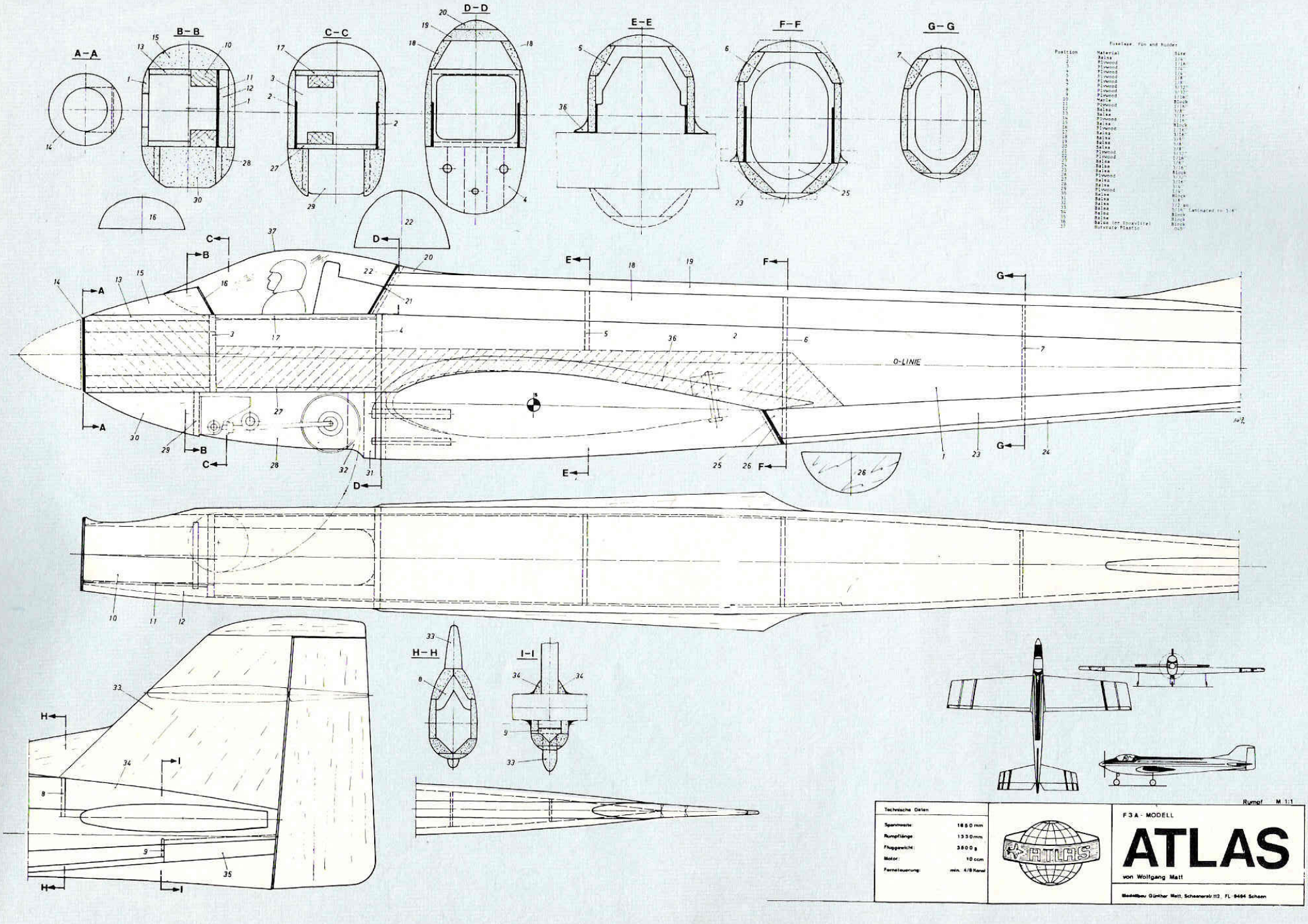


Fuselage, Fin and Rudder

Position	Material	Size
1	Balsa	1/16"
2	Plywood	1/16"
3	Plywood	1/16"
4	Plywood	1/16"
5	Plywood	1/8"
6	Plywood	1/8"
7	Plywood	1/32"
8	Plywood	1/32"
9	Plywood	1/16"
10	Maple	Block
11	Plywood	1/16"
12	Balsa	1/16"
13	Balsa	1/16"
14	Plywood	1/16"
15	Balsa	Block
16	Plywood	1/16"
17	Balsa	1/16"
18	Balsa	1/16"
19	Balsa	1/8"
20	Balsa	1/8"
21	Plywood	1/32"
22	Plywood	1/16"
23	Balsa	1/16"
24	Balsa	1/16"
25	Plywood	1/32"
26	Balsa	1/8"
27	Balsa	1/8"
28	Plywood	1/16"
29	Balsa	Block
30	Balsa	1/8"
31	Balsa	1/8"
32	Balsa	1/2 mm
33	Balsa	1/16" laminated to 1/8"
34	Balsa	Block
35	Balsa	Block
36	Balsa (for Elevator)	Block
37	Butyrate Plastic	Cut

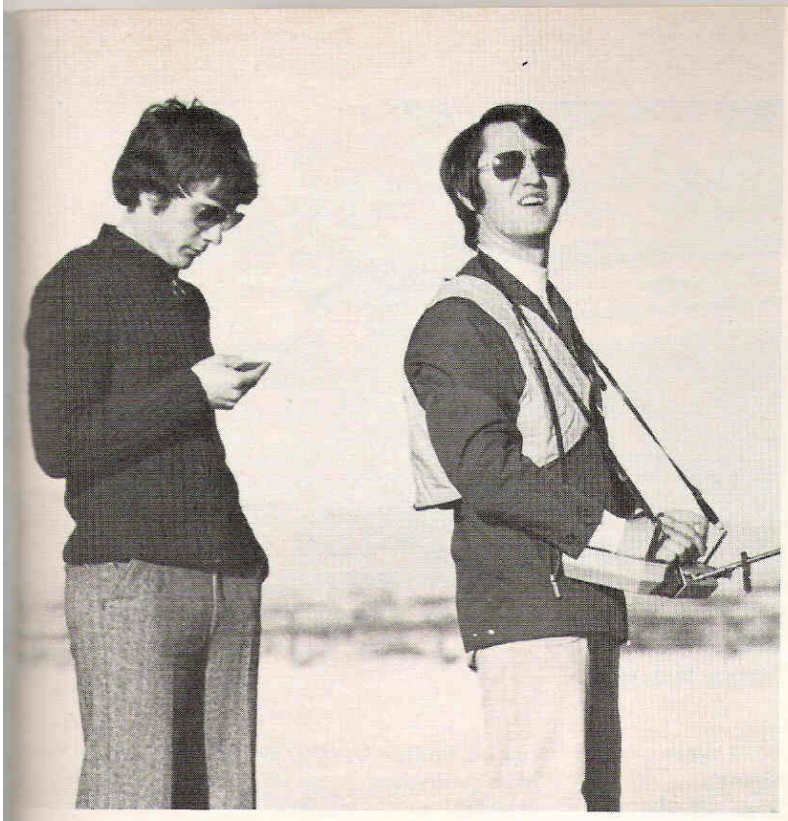
Technische Daten	
Spannweite:	1850 mm
Rumpflänge:	1330 mm
Fluggewicht:	3800 g
Motor:	10 ccm
Fernsteuerung:	min. 4/8 Kanal

F3A - MODELL

ATLAS

von Wolfgang Matt

Modellbau Günther Matt, Schaanerstr 112, FL-9494 Schaan



This photo shows the neck strap and cradle mentioned in the text.

And here at Bern the wave of the victor with all of the trimmings!

THE ATLAS

BY WOLFGANG MATT; TEXT BY RON CHIDGEY . . . continuing M.A.N.'s long-established tradition of publishing the World Champion aircraft; herewith we present the 1975 Pattern Champion plane.

• The Atlas is not an airplane that just reaches out and grabs you at first glance. Rather, it's one of those very functional designs that grow on you over a period of time. I believe it's destined to be a classic like the Taurus, Citron and KWIK-FLI. If you are a competitor, you grow to admire the Atlas fairly quickly as you watch it perform, probably in the process of beating the socks off your own airplane.

I personally developed a deep respect for it at the 1974 Las Vegas meet where Wolfgang placed 2nd, just missing 1st by a slip of the tongue. I'm sure most of the competitors at the 1975 World Championships in Bern share my feelings, after Wolfgang's convincing win there. The more you study the Atlas, the more really outstanding features you discover.

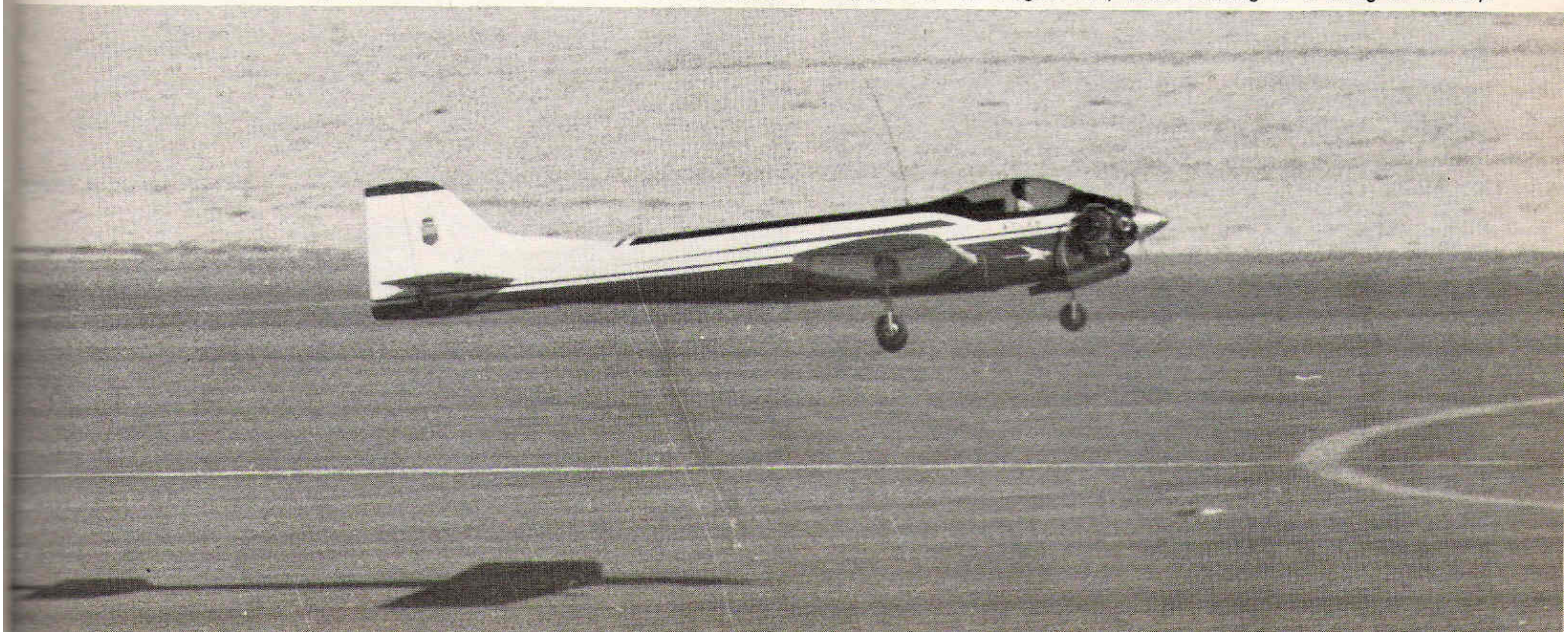
In order to give you the straight scoop concerning these advanced design concepts I asked Wolfgang some pointed questions. Here are the questions along with Wolfgang's answers:

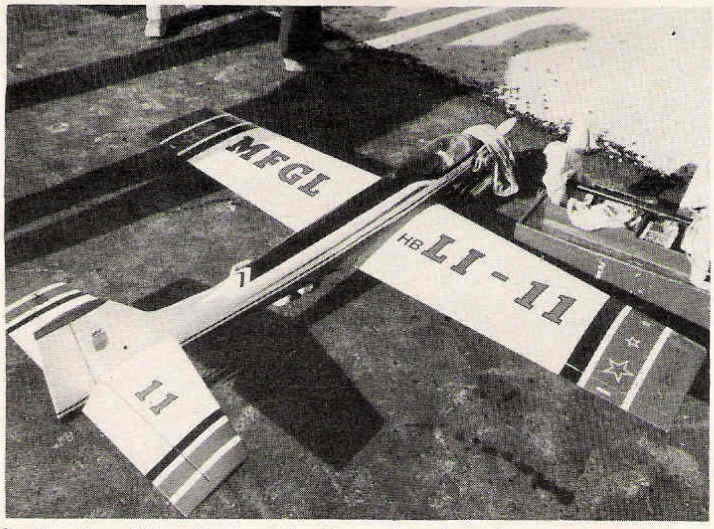
Question: The Super Star design that you flew last year was a good airplane for you. What characteristics of the Super Star did you hope to improve when you started the Atlas design? **Answer:** To get a more even, smoother flying style. Also, better performance in the roll figures due to the new FAI Pattern program which contains more roll maneuvers.

Question: How many design variations did you go through in the Atlas development? **Answer:** The third prototype of this design proved to be what I expected. This prototype was used as my "A" model in the

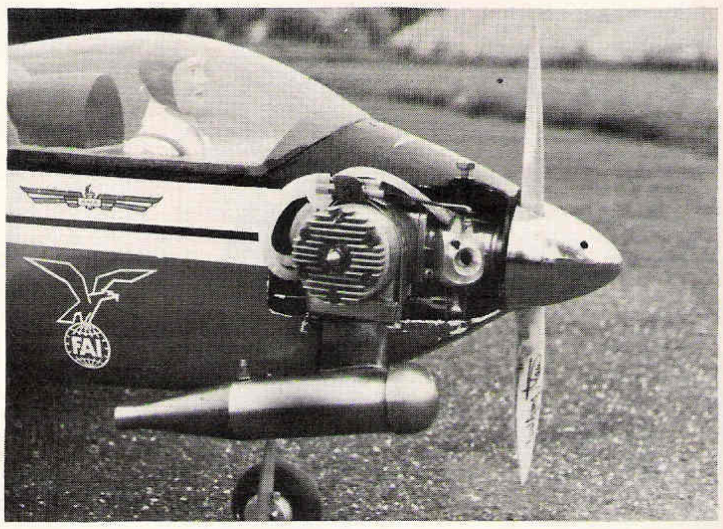
(Continued on next page)

Slow, nose-high landing approach as seen at the 1975 Tournament of Champions at Las Vegas. Any Matt landing is a thing of beauty.





On the line, Atlas displays the lines of a champion, sleek and clean.



Matt does not use pressure; simply heads fuel vent lines forward!

THE ATLAS . . . CONTINUED

World Championships.

Question: Is the Atlas everything you hoped it would be? Are there any particular characteristics you would like to improve? **Answer:** I am satisfied with it, and at the moment no additional improvements are necessary.

Question: Is the airfoil of your design? If not, where did it originate? **Answer:** It is my own design.

Question: You obviously like strip ailerons. Do you feel that they are easier to build? **Answer:** The mechanical part (linkage) of the conventional ailerons is more difficult to build in order to get precise movements. In addition, in my experience the strip ailerons do not have any aerodynamic disadvantages.

Question: Swept wings are becoming more popular in the U.S. You seem to prefer a straight taper configuration. Any reason for this: **Answer:** I tried swept wings, but this design needs more speed which requires a faster flying style. I do not like a fast flying style that much.

Question: The elevators on the Atlas seem to be a little larger than most. Any particular reason for this? **Answer:** Yes, I wanted to get softer reactions.

Question: Any advantage to the side-mounted engine other than to clean up the profile? **Answer:** You get a better distribution of the motor vibrations with a side-mounted engine. The side mounting brings the vibration more directly through the wing and fuselage, thus dampening vibrations to the receiver and servos.

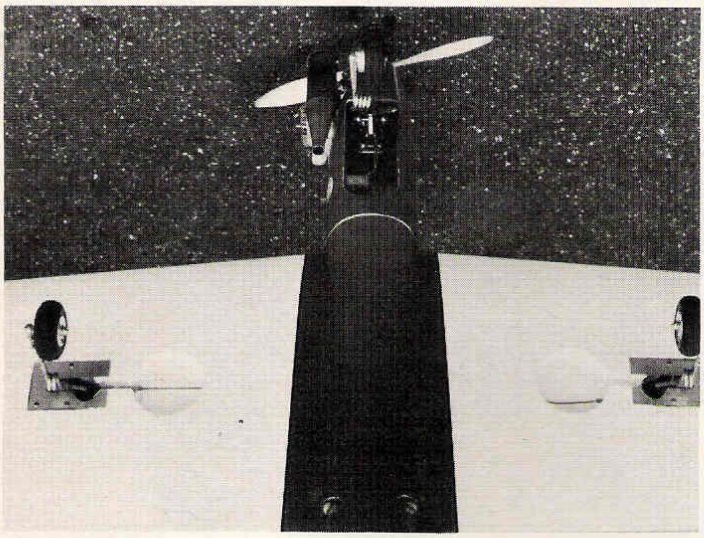
The Atlas has already established quite a record on the world contest circuit including of course a 2nd place at the 1974 Las Vegas Tournament of Champions and a 1st place in the 1975 World Championships. The entire Liechtenstein team flew the Atlas in Bern and finished 2nd in team placing. This is an outstanding accomplishment when you consider that the population of that little, magic kingdom is only 35,000. I'm sure the superior performance of the Atlas helped the team immeasurably.

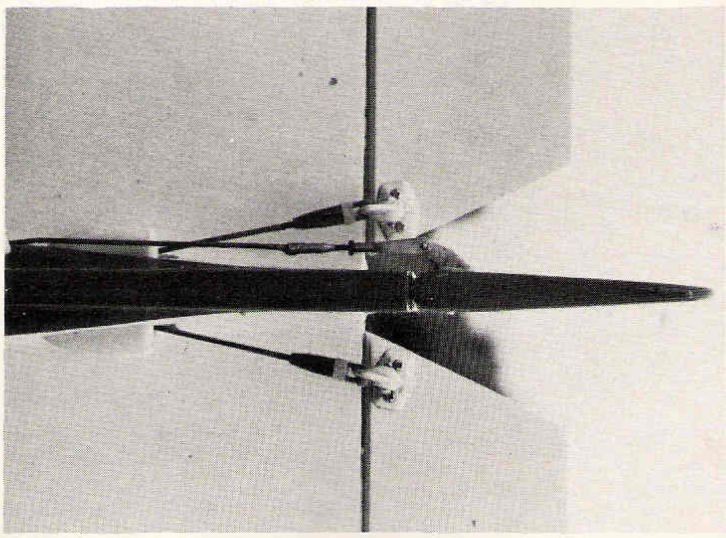
CONSTRUCTION. The Atlas is not an easy airplane to build and is not a project for the inexperienced builder. Wolfgang and his brother Gunther designed into the Atlas everything necessary for a championship model, but ease of construction definitely was not on their list of requirements. The plans are good and well detailed, so step-by-step building instructions are not required for experienced builders, but a short discussion of the major components should help most builders.

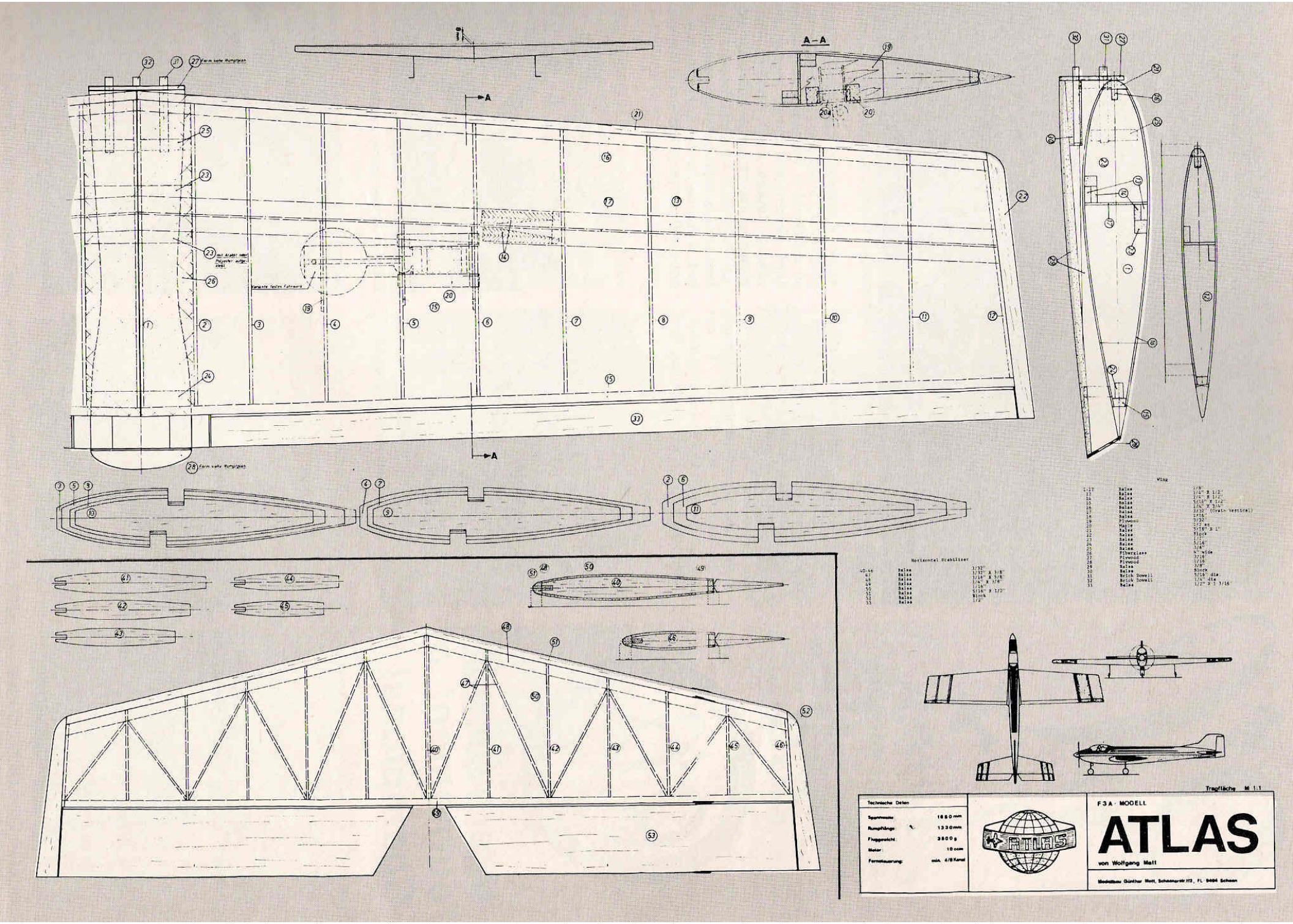
The stock list describes all the various wooden parts. Bear in mind the model was designed for metric balsa. The nearest equivalent wood size available in your local shop is shown in the table.

FUSELAGE. Actually, the Atlas fuselage is a beautiful subject for fiberglass, so much so, I believe that Wolfgang must have had this in mind when he designed it. At any rate the wooden version, as shown in the drawings, requires a simple building jig for assembly. The jig should support the bottom of the 2" balsa fuselage sides to hold them in alignment. At the same time, jig stations should be located to support each former in its proper location. Keep the area

(Continued on page 66)


Conventional retract gear system displayed here with KDH gears.


Single, not coupled, elevator; double push rod extends from fuse.


A – A
Tragfläche M 1:1
F3A - MODELL
ATLAS
von Wolfgang Matt
Technische Daten
Spannweite: 1850 mm
Rumpflänge: 1330 mm
Fluggewicht: 3800 g
Motor: 10 ccm
Fernsteuerung: min. 4/8 Kanal
Modellbau Günther Matt, Schoenaustr. 172, FL 9494 Schaan

VTO

(Continued from page 62)

that it never gives trouble with unwanted turn coming in as mentioned above! However catapult height gain can be obtained utilizing the high line tension necessary to effect a release. This does necessitate careful biasing of the straight tow trim and adopting the right launching technique—indeed, just as catapult height gain can be obtained with a conventional straight tow model.

"The units are available in the U.S. at $8.50 postpaid from NFFS Supplies, c/o Joanne Meuser, 4200 Gregory, Oakland, California 94619, and from Peter Allnutt RR 20, Orangeville, Ontario, Canada."

BYE-BYE TO VTO. As of January 1, VTO launch of AMA gas models will no longer be legal, according to a recent vote of the AMA F/F Contest Board. Therefore this column will undergo a change of name, with the new masthead title to be selected from submissions by readers. Look for full details of this big contest in next month's "VTO" column. Start thinking of names today! ■

The Atlas

(Continued from page 32)

above the fuselage sides clear because you will want to install the top planking and rough-shape it before removing the fuselage from the jig. When you get this far, you are home free.

Make left and right fuselage sides complete with the plywood doublers. Mark the O-line on the outside of the sides as this reference line will help in lining up the wing and stab. Assemble the sides and formers in the jig. Install the engine mounts and blocks in the nose area carefully to maintain the 1° downthrust and 2° right thrust. Install the tank compartment, top and bottom; the engine compartment, top and bottom; and all of the top planking, before removing the fuselage from the jig. It should be fairly rigid at this point. Installation of the bottom nose blocks and bottom planking will just about complete the fuselage.

WING. Wing construction is straightforward and is simplified greatly with the use of a good wing jig. If you don't own a wing jig, the plans show how the leading edge and rib trailing edges can be blocked up for assembly. Note that the 3/8" thick trailing edge support must taper, getting progressively wider toward the tip. This is necessary to allow for the tapered airfoil.

Assemble the ¼" x ¾" leading edge brace, the ribs, the trailing edge and top spars in the jig. When this is dry, sheet the top. Let this dry overnight; then flip the wing over and block up again. Add the bottom spars, spar webbing, landing gear braces, landing gear mounting blocks and wing dowel blocks, etc. Now sheet the bottom. Remove the wing from the jig and trim the leading edge brace flush with the front of the ribs. Then glue on the leading edge. Shape the leading edge carefully after everything is dry.

Join the wing halves upside down on a flat surface with the center section blocked up 5/16" (8 mm.) as shown. Fiberglass the center section for additional strength. Add tips and ailerons to complete the wing.

HORIZONTAL STABILIZER. The stab is built much like the wing. Block up the leading edge brace and trailing edge as shown. Add the ribs and cross bracing. Don't leave out the cross bracing as this greatly stiffens the stab. Sheet the top; then flip the stab over, block up again and sheet the bottom. Trim the leading edge brace back flush with the ribs and glue on the leading edge and tips. Shape the leading edge and tips to complete the stab.

FIN AND RUDDER The fin is simply glued up from soft sheet, then carved to shape. Carving will be much easier and the fin less apt to warp if it is laminated by gluing together two thicknesses of 5/16" balsa. The same holds true for the rudder and elevators. *(Continued on page 70)*

The Atlas

(Continued from page 66)

TRIMMING FOR FLIGHT. In my discussions with Wolfgang we went into a fair amount of detail on the proper way to flight trim the Atlas. To me, it was a very interesting session. Many of the ideas presented here can, of course, be applied to other designs as well. If you follow this method, you will end up with a fine performing airplane.

Bear in mind that these adjustments are mostly interrelated so you may have to go through the sequence many times to get all adjustments right. Don't rush things, and it will be well worth the effort. It might be a good idea, too, to go through the sequence frequently, say every few weeks during the contest season, to make sure something hasn't moved out of the correct adjustment. Here is Wolfgang's step-by-step procedure.

1. During a few initial flights, set the correct control surface movement. The ailerons should be adjusted to give the right roll rate (5 sec. for three rolls), and the elevators should be adjusted to give the correct loop diameters, both inside and outside. The correct rudder throw is 35°.

2. After the control surfaces have been adjusted, pull the model vertical to make sure that engine offset is correct. If the model pulls off, heading left or right, then engine offset is not correct.

3. If the wing is free of warps and the engine offset is correct, then the airplane will track through the loops. If it doesn't, then use wing weights to correct for left or right deviations. If this doesn't work, then discard the model!

4. Check for proper center of gravity location by making a level, high-speed run and chopping the throttle. The model should continue flying level for a few hundred feet; then the nose should drop very slightly.

5. The rolls will be okay if the CG is located properly.

6. Check for correct decalage by pulling the model vertical as in a Figure M or Top Hat. Neutralize the controls, and the model should continue vertical. If the nose deviates forward or backwards, then decalage is not correct.

7. Adjust for *slightly* more "up" aileron travel than "down" by bending the aileron horn forward. Experiment here to get rolls dead axial.

8. Adjust elevator differential to give slightly more "down" elevator. This provides a measure of insurance for the Rolling Eight.

SIDELIGHTS. I then quizzed Wolfgang about his equipment, practice habits and other items of interest and got honest, straightforward answers. If you are interested in some real tidbits from the World Champ, read on.

ENGINE. Wolfgang uses the very popular Webra Speed to power his Atlas. He does not use muffler pressure. If you will notice in the photos, he brings his tank vents out and faces them forward into the wind stream. This gives him a positive pressure in his tank that varies with air speed. This has a slightly stabilizing effect on the Atlas's air speed. As the air speed increases, the mixture gets a little richer, slowing the engine and, in turn, the airplane. This works well in loops. As the nose comes up, the engine leans out slightly and pulls the airplane through the top. As the nose drops and air speed increases, the mixture richens slightly and slows the airplane down.

The fuel Wolfgang uses is a mixture containing 10% nitro, 18% castor oil and the remainder methanol. He sets his needle valve to give a steady 2-cycle run. He uses a mixture control on his Webra, operated from the sixth channel of his radio, so he doesn't worry about getting a lean run.

PROP. Wolfgang uses a special epoxy-fiberglass 11"-diameter prop made by Gunther Hoppe of West Germany.

RADIO. Wolfgang uses the German Simprop contest radio. It is a 2-stick radio, and Wolfgang uses the cradle and neck strap that are so popular in Europe. Both sticks are grasped between the thumb and the first two fingers. His radio incorporates both dual rate aileron control and dual rate elevator control. He uses high rate aileron for the Figure-M, the Three Rolls, the Eight-Point and Four-Point Roll, the Rolling Eight and the Double Immelmann. He uses high rate elevator for the Rolling Eight, the Spin and landing. He flew the same radio in the World Champs that he flew at Las Vegas almost a year before. No maintenance was required on any of the servos during this period which included heavy practice for the World Champs. How's that for reliability!

LANDING GEAR. Wolfgang uses Pro Line retracts in the Atlas. He uses two retract servos. A simple DuBro spring brake is used on the nose wheel.

AIRPLANE WEIGHT. Wolfgang prefers a medium weight range at 3700 Kg. (8 lb., 2 oz.) for his Atlas.

PRACTICE HABITS. Wolfgang practices a lot, and he feels that mental attitude is important both in practice and in competition. If his mental state at the practice field is such that he can't concentrate on his flying, he feels he is wasting his time, so he packs up and goes home! He generally practices only on weekends except when a contest is coming up. Then, two weeks before the contest, he practices daily for one full week putting in three flights a day. The second week he then practices only twice, but not later than the Thursday before the contest. He then rests until the contest and prepares mentally.

Well, there you have it—all the information you need to become World Champ. The first step is to build the Atlas. The final step is to fly it as well as Wolfgang. All that comes in between is practice, practice, practice—so get busy.

[Editor's note: Ron Chidgey, one of the principals in Southern R/C Products, Inc., is too

restrained in his presentation of the Atlas and should have noted in this article that Southern R/C is making a fiberglass kit for this fine plane which should be ready about the time that this article appears. So for those of you who don't favor the scratch-built routine, let us point you in the right direction for a fine kit.] ■

Foreign Notes

(Continued from page 4)

Fuselage shells are molded in natural, non-pigmented fiberglass-reinforced resin, and wings are of obechi-veneered expanded-polystyrene. Clear molded canopies are supplied, plus most of the hardware necessary to complete the models, such as motor mounts, fuel tanks, wheels, etc. The largest, overall, of the three is the Hunter with its 61″ length and 56″ wingspan. Like the Hawk (59″ span; 53″ long) it is designed for a front-mounted engine. The more compact Cutlass, with its low aspect ratio wing spanning 46″ and a 46″ length, has a pusher engine installation.

Also available as Multilife kits are a 58″-span Cessna 172H for .29 - .40 engines and a 113″ soarer, this latter having a fiberglass fuselage but using conventional, built-up balsa construction for its 936 sq. in. wing. Multilife is also introducing fiberglass boat kits. These include a 30″ day cruiser, a 37″ flying-bridge express cruiser and a 41″ offshore power boat.

INTERESTING RUSSIAN RACING DIESEL. In the past we have had some uncomplimentary remarks to make about Soviet *production* engines (as distinct from their tool room specials), but, in the new KMD-2.5 diesel, the Russians clearly have something of an altogether higher standard. It is apparent that the engine is made in relatively small numbers and is not a mass-produced item for the ordinary fly-for-fun modeler, but it is a genuine production motor. It comes in a printed box together with a proper instruction leaflet, although the latter is in Russian only, so it does not appear that the Soviet authorities are intending to offer it for export at the moment.

The KMD-2.5 is a variable compression diesel featuring rear rotary drum valve induction and Schnuerle scavenging. Its specification and general design suggest that it is aimed mainly at Control Line Team-Racing circles, an area in which the Russians have been particularly successful in recent years.

As the photos show, the engine is of quite distinctive design and appearance. It has a long frontal overhang (good for fitting into a team-racer cowl) and a compression screw that has a ratchet device and terminates in a 4 x 4 mm. square section at the top. Instead of having a fixed lever or tommy-bar, the engine is supplied with a separate key for adjusting the compression setting.

The key consists of a 6 mm. o.d. steel tube, squared at its lower end to fit the compression screw and firmly fixed, at its upper end, to a large, machined-aluminum wheel. This has a diameter of 38 mm. (1½″), a depth of 10 mm. and is knurled on its periphery. It is much more comfortable to use than the usual rather short, sharp and hot compression lever and allows quicker and more positive control over the contra-piston.

The KMD's main casting is a sturdy, well proportioned unit comprising the crankcase and front housing. The latter contains an 8 x 18 mm. 8-ball brass-caged ball journal bearing at the rear and a 6 x 15 mm. 8-ball brass-caged bearing at the front to support the counter-balanced crankshaft which has a 6 mm. threaded front end and a 5 mm. o.d. crankpin with 3 mm. spigot for driving the rotary valve. The rotor, of hardened steel with an 8.5 mm. o.d., a 7.0 mm. i.d. and a large parallel-sided valve port, is housed in a very deep backplate.

The valve is of the reverse-drum pattern, i.e.,