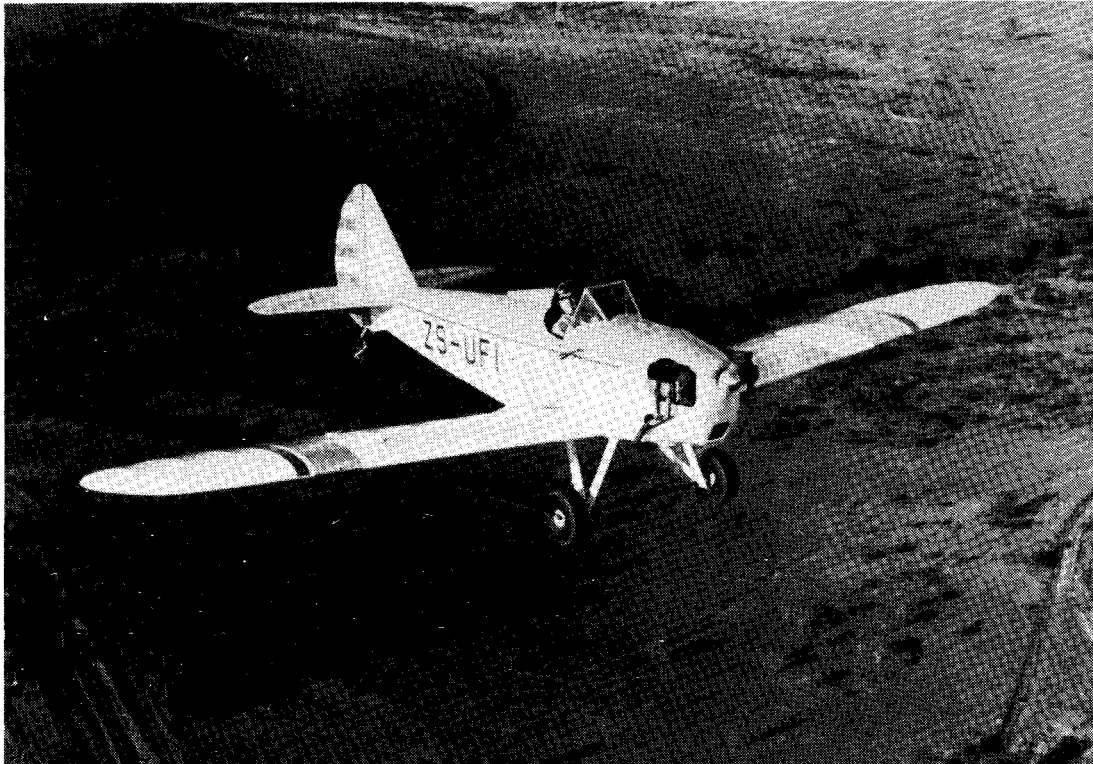


HOMEBUILT

JOURNAL OF THE EXPERIMENTAL AIRCRAFT ASSOCIATION OF SOUTHERN AFRICA



VOLUME 1 - NUMBER 2

DECEMBER 1972

ON THE COVER

After more than four years of work Mr. Tony Wills is now enjoying the fruits of his labours. His Fly-Baby flew for the first time at the end of September and is now rapidly accumulating flight time prior to application for a Permit To Fly. Colour scheme is white with blue trim on the wings and fuselage and red pursuit-ship stripes on the rudder.

"Homebuilt" is the official publication of the Experimental Aircraft Association of Southern Africa. The views expressed are those of the contributors and not necessarily those of the Association.

STATEMENT OF POLICY

The Experimental Aircraft Association of Southern Africa is a body representing individuals involved in the construction and operation of homebuilt aircraft and the restoration and operation of antique aircraft.

Subscriptions of R4,00 per year include affiliated membership of the Aero Club of South Africa and quarterly issues of "Homebuilt".

Editor: S. CRUTCHLEY
Photographic adviser T. WILLS

CORRESPONDENCE

All correspondence to the Association should be addressed as follows:-

The Secretary, E.A.A. of S.A.,
21 Charles Boniface Rd.,
Bisley,
PIETERMARITZBURG.
Natal.

EDITORIAL

The response to the first issue of Homebuilt was most pleasing and letters of encouragement have been received from all parts of the country. The majority of questionnaires sent out with the first magazine have now been returned and it is astounding to see how many projects are in progress. It is also evident that a number of members have acquired plans but are

having difficulty in obtaining the necessary building materials.

A directory of homebuilders has been compiled and is available to all members. It should prove useful in facilitating contact between members building similar aircraft and it is hoped that the difficulties experienced in obtaining building materials will be somewhat eased.

Financing the news magazine remains one of the major worries of the committee and it will be seen that the call for advertising has been very disappointing. Members are once again enjoined to assist by approaching prospective advertisers. The fee of R30 per quarter page for four issues is very reasonable when compared with other means of advertising.

The proposed regulations governing amateur-built aircraft were recently forwarded to the committee by D.C.A. for perusal and comment. They were thoroughly examined and Mr. Murray Cohoe, our representative on the Aero Club of South Africa, has conveyed the feelings of the committee to the Commissioner for Civil Aviation. It is hoped that the regulations will be available for distribution early in the new year.

In general the new regulations show a relaxation of some former hard and fast rules and it is up to the individual to ensure that these concessions are not abused. Until the regulations are published they cannot be considered as anything more than proposals but there is every indication that the previous all-up weight limit of 1 500 pounds for amateur-built aircraft will be waived completely. Furthermore the homebuilder will be permitted to carry out all maintenance on his aircraft and also the annual inspections.

One of the most noteworthy changes in the regulations concerns the approval by the Commissioner for certain sufficiently qualified homebuilders to act as inspectors within the movement. These approved persons will be considered qualified in the field of their own particular experience such as wood and fabric, or perhaps sheet-metal work, and they will be authorised to sign the necessary inspection forms required by the Commissioner for issue of the authority to fly.

This is indeed a significant step forward for the homebuilding movement and we can be thankful that we have a regulating body that is prepared to adopt a broad-minded approach to a contentious issue.

A PLACE IN THE SUN FOR AEROBATICS

Aerobatics in Southern Africa has never received the attention from national organising bodies that it deserves. With this in mind, a number of members of the aerobatic team which recently represented South Africa at the World Aerobatic Championships approached the committee with the proposal that an aerobatic section of the E.A.A. of S.A. be formed.

This proposal was accepted and the group has been named the Aerobatic Club of Southern Africa. An interim sub-committee has been elected to serve until the next E.A.A. of S.A. annual general meeting to be held at the Oribi Fly-In in July 1973.

The aims of the new group are to further the interests of aerobatics as a sport, to build up an organisational framework to permit entry in world competition, and to produce aircraft suitable for this purpose.

Professor Maitland Reed, designer of the Rooivalk which took part in the championships in France, has undertaken to design an improved competition aerobatic aircraft.

Observations in France showed that South African pilots compare favourably with the world's best and given the necessary organisational backing and aircraft

suitable for unlimited aerobatics they can expect to place well in international competition.

Members interested in learning more about the Aerobatic Club are invited to write to The President, Aerobatic Club of Southern Africa, Box 6022, Durban North, Natal.

THE REED ROOIVALK

Low compression on all six cylinders of the Continental 210 h.p. motor hamstrung this fine aircraft during the world championships. It was nevertheless able to out perform many highly-thought-of aerobatic aircraft such as the Acrostar, the CAP 20, the Zlin, the KZ-8 and the Klemm.

It was seen, however, that the Rooivalk is too heavy with its reversible pitch propeller, exhaust muffler, spring steel undercarriage, starter and generator. The low wing loading also adversely affects the maximum speed attainable for entering vertical manoeuvres.

The new Reed Special is being designed with particular attention to lowest possible weight and high maximum speed. The successful NACA 0012 aerofoil section of the Rooivalk is being retained.

FLY BABY ZS UFI

by Tony Wills

Well, it's flown at last, "that controversial clunk — that box — that latter day antique" — Fly Baby ZS UFI lifted its main wheels from the runway at Oribi airfield Maritzburg for the first time on Friday, September 29 after four years, seven months and twenty days of building — and was found to be worth it.

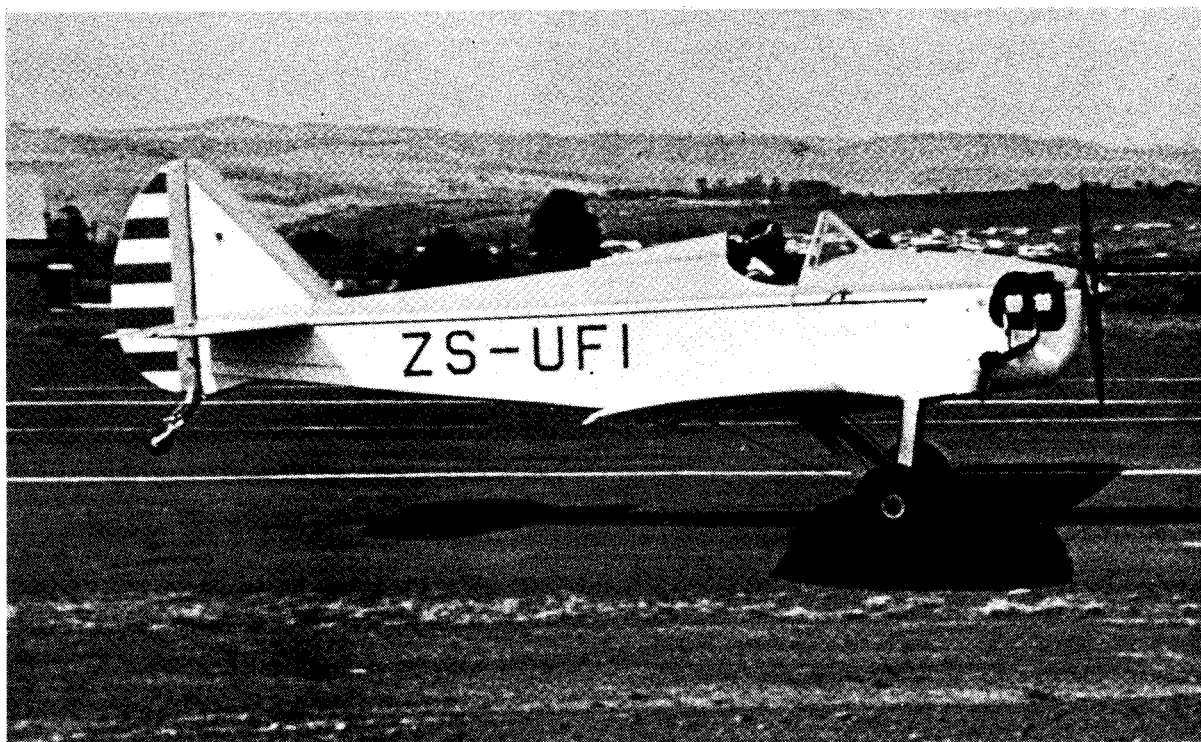
Building an aeroplane is such a very personal thing. The fateful first decision to go ahead and build — the agony of the choice of design — the first appalled look through the plans — the struggle to obtain supplies and parts — the inward battle to keep going week after week, month after month, year after year — moments of joy and despair — the support and enthusiasm of fellow builders throughout the world — all these things make up the crazy business of home building.

For me it all started sometime in 1967 when my old friend Ian Lewis showed me a photograph of the Fly Baby and told me of his decision to build. His enthusiasm was infectious and the seed was planted. The plans arrived early in 1968 and by the time the shock had worn off it was March. The first saw cut

was made and I was committed. Pete Bowers, the designer, decided on a book of step-by-step instructions with dimensioned sketches and oblique views rather than the traditional "roll of blueprints" approach. This method certainly helps as a guide to systematic construction as his instructions are very full and helpful and for the most part accurate. Little is left to the builder's imagination. Complete bills of material for each section are provided as well as a valuable section of advice on work practices. As an example of this, under the heading: Obstacles to progress, Pete Bowers lists three major causes of wasted time in homebuilt projects:—

1. The eager but ignorant friend — a real time waster.
2. The "expert" who suggests improvements whilst sitting around drinking your coffee and keeping you from working.
3. As the plane begins to go together it is entirely too easy to gaze dreamily at it by the hour and engage in all sorts of flights of fancy while sitting in the cockpit.

In the States there are now, I believe, over one hundred completed Fly Babies so the design has a



The 'Fly Baby', powered by a Continental 85 h.p. motor, about to lift off on the maiden flight

strong following with an impressive monthly bulletin put out by Haydn Ferguson of New Albany. I found the "Fly Baby Bulletin" indispensable and almost as useful as the plans.

When at last the aeroplane stood there, on the apron at Oribi, finished and ready for its first flight I estimated that I had spent just over 2000 hours on it and about R2000 in cash. But at least I had an aeroplane, and, what is more, one that was paid for!

The weight and balance calculations showed that the aeroplane had come out slightly heavy — about 50-pounds heavier than the prototype — but the C. of G. position was almost exactly correct at 12,3-ins. aft of the leading edge. Of course, the big question mark ever present in the mind of the homebuilder is "How will it fly?" Well, in the case of ZS UFI the first tentative taxi tests showed that all was normal — a few fast taxi runs down the runway — a few more venturesome lift-offs and finally a completely routine first flight. The transition from homebuilder to aircraft owner was complete.

I have not done any serious calibrating or testing yet, but am simply enjoying flying the aeroplane around. It seems that the rate of climb will work out

to be a pleasing 800–1000fpm at this altitude, the cruise about 95mph at 2300rpm and the top speed about 110mph. Stalls are gentle and straightforward and the spin and recovery perfectly normal. Fly Baby ZS UFI is no ball of fire but is proving to be what it was designed to be — a fun aeroplane in the tradition of the Tiger Moth and J3 Cub.

Major Alec Quinn, the Natal Regional Airworthiness Inspector, went out of his way to be helpful and co-operative and is altogether very sympathetic to the whole homebuilding movement so that the procedure of obtaining flight authorisation for proving flights went off without a hitch.

It pays to have an understanding wife and a helpful family when building an aeroplane. In fact the support and help given to me by the local builders as well as other members of the A.B.A. and E.A.A. has restored my faith in human nature.

They say that building an aeroplane is rather like climbing a very high mountain. The route is steep and very long, the going rough and tortuous most of the way but once at the top the view is breathtaking. Believe me, it is.

E.A.A. PERSONALITY

Owen Pilcher — Natal Representative



Mr. Owen Pilcher

Owen needs little introduction to regular members because of an association with the homebuilding movement going back to the days of his friend the late Ian Lewis.

Owen's flying career commenced with wartime service in the S.A.A.F., logging time on Tiger Moths, Harvards, Fairchilds, Ansons and Hurricanes.

After a long period away from aviation, Owen joined up with the homebuilding movement shortly after its inception. Work on his Smith Termite has been interrupted at intervals because of transfers but Owen is now settled in Pietermaritzburg. Here he renewed his pilot's licence in 1969 after having not flown since 1945.

For Owen, the long hours in the workshop will soon be rewarded. His project is now all but completed and UDY will be in the line up at the next fly-in for all to see for themselves the meticulous workmanship that has gone into the project.

FLIGHT RISKS INSURANCE

Insurers in South Africa have been reluctant to provide FLIGHT risks insurance for ultra light aircraft at a price members can afford. It is true that a few cases have been arranged but in general the cost has been unrealistic.

Enquiries for cover have always been based on a "Full Hull Value" sum insured, this being the combined cost of materials and labour. This "total value" and the imposition of a high premium rate has put the cost of cover beyond the reach of almost all of us and some basic thinking has been necessary.

Most members will agree that there are two absorbing interests in a "home built", namely the pleasure in the construction with one's own hands, and ultimately the flights. The time spent in construction is a "labour of love" and is not a thing upon which one can or even wants to put a price, it is a pleasure for its own sake. Furthermore, if there is damage, the owner will repair it himself.

Thinking along these lines our friends at AVIATION INSURANCE BROKERS have searched for and found a scheme which provides cover for full flight and ground risks at a price which is within reach, the indemnity being for MATERIALS ONLY. There is a scheme of this nature in being for the United Kingdom Light Aircraft Association and a similar scheme has been arranged for ourselves.

It is available to members of our Association ONLY and if the business is profitable to Underwriters, a share of such profit will be returned to our Association.

An informative leaflet has been sent to each member and the scheme is available to any Fixed Wing Powered Aircraft owned by a Member of Experimental Aircraft Association. Enquiries may be addressed to the Secretary or to the Brokers direct at Box 1603, Durban.

USEFUL TIP:

Self-locking nuts and check-nuts that are beginning to work loose will be readily identified if a spot of brittle paint is dabbed across the protruding threads of the bolt and the back of the nut. Any loosening of the nut will be indicated by a crack in the paint.

Bright red ladies' nail varnish is ideal for this purpose as it is easily seen and is very brittle. It dries quickly and comes in a bottle complete with a suitable brush.

PLANS

One set of Jodel D9 plans in French and one set of Druine Turbulent plans are available from the editor in exchange for a donation to the Association funds.



A 1944 Model Fairchild-Ranger

A CLASSIC AIRCRAFT

THE FAIRCHILD-RANGER

Few aircraft could be mistaken for a Fairchild. With its humped back and maze of wing struts and undercarriage hardware it stands apart. The wheels too, look like nothing found on any other aircraft.

Despite these apparent handicaps the Fairchild has become a popular and valuable classic. It is a full four-seater having a wing span of 36 feet and an all-up weight of 2 560 pounds. The one shown above was built in 1944 and has recently been fitted with a new 200 h.p. Ranger inverted in-line six cylinder motor. The propeller is an electrically operated variable pitch Beechcraft unit.

Fuel consumption is 7 gallons per hour and the oil consumption is approximately 4 pints per hour. An indicated cruising speed of 100 m.p.h. is achieved at 1950 r.p.m. The stall with power off and no flap occurs at 60 m.p.h.

The flaps have two settings, twenty degrees and ninety degrees. The latter setting permits a precipitous descent without gaining excessive speed. Flap settings in between can also be used but must be held by hand as there is no lock in these positions.

The Fairchild is a real fun aeroplane, with the additional advantage of having four seats and a good range.

The above aircraft is offered for sale complete with V.H.F. radio and spare motor for R2 000. The next annual inspection is due in July, 1973.

DIRECTORY OF HOMEBUILDERS

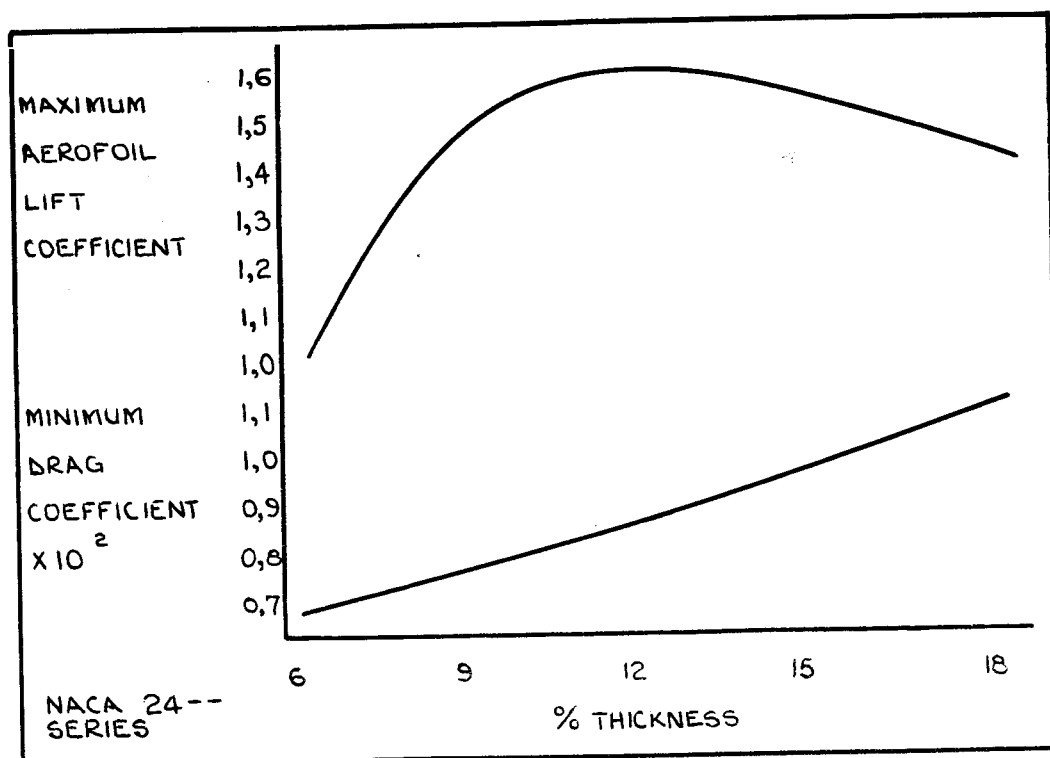
Ruth Hobbs has been leading a busy life. In between obtaining her Instrument Rating, moving from the Cape to the Transvaal and producing a daughter (congratulations, Ruth!) she has also prepared a directory of homebuilders.

These directories are available from Ruth for the sum of 50 cents payable by cheque, postal-order, or equal value in postage stamps. Proceeds will go to the Association.

With this directory members can contact others building similar aircraft, and those who travel will be able to meet fellow members in almost every town in South Africa.

Ruth's address is:

77 Rautenbach Street,
Carletonville,
Transvaal.



Graph showing maximum lift coefficient and minimum drag coefficient of aerofoils of various thicknesses

AEROFOIL THICKNESS

Aerofoil sections are coded by the National Aeronautics and Space Administration by means of a number consisting of either four or five digits. The last two digits of the series indicate the thickness of aerofoil at the deepest point expressed as a percentage of the chord (i.e. length) of the aerofoil. The NASA 4412 aerofoil, for example, has a maximum thickness of twelve per cent of the chord. In other words a wing using this aerofoil and having a chord of 50 inches will be 6 inches thick at the thickest point. Similarly, the same wing using a NASA 4418 aerofoil will have a maximum depth of 9 inches.

The sketch above shows the effect of thickness upon the maximum lift and minimum drag of aerofoils of the NASA 24 — series. The curves of other aerofoil series are, in general, very similar.

It will be seen that the aerofoil of twelve per cent thickness offers the greatest lift. As one would expect, the drag of the aerofoils increases with thickness.

The selection of aerofoil thickness at the design stage depends on the purpose of the aircraft. For instance, in the case of a midget racer where lowest possible drag is required a thin aerofoil of six or nine per cent thickness would be used at the expense of lower maximum lift and a consequently higher landing speed. The Cassutt Special uses a NASA 13106 aerofoil.

For a general purpose light aircraft where low landing speed is more important than ultimate high speed performance the natural choice would be a twelve per cent thick aerofoil. The Cessna 150 and 172 series of aircraft utilize the NASA 2412 aerofoil.

In the case of an aircraft which has cantilever wings (i.e. no struts or bracing wires) an aerofoil of fifteen per cent thickness might be used in order to permit the use of a deeper wing spar. A typical example of this is the Piper Cherokee which uses the NASA 65415 aerofoil.

Aircraft having extremely long cantilever wings often employ aerofoils of eighteen per cent thickness to provide additional depth for the wing spar. The Slingsby Swallow sailplane uses the NASA 63618 aerofoil.

For the average homebuilt a wing section of twelve per cent thickness is probably the most suitable. However, a weight saving can be realised by using a fifteen per cent thick aerofoil since the wing spar will be lighter for the same strength due to its greater depth. This weight saving can be quite significant in the case of a cantilever wing as the spar weight is normally quite high. In addition there is the advantage of greater space available for fuel tanks in the wings and, where applicable, for stowage of a retractable undercarriage.



1972 winner of the Ian Lewis Trophy, Carel van der Merwe's LUTON BETA

PROVINCIAL NEWS

NATAL by OWEN PILCHER

The first Pietermaritzburg homebuilt is now flying. This is the Wills Fly-Baby. The event has generated renewed enthusiasm in the Pietermaritzburg area and John Buchan and I are making sure that we don't get left too far behind. John has the engine cowl of his Jodel almost completed and the rest of his airframe is already inspected and covered. I have still to cover the wings of the Termite but the rest of the airframe is complete and the engine is installed and has been test-run. Len Cormac is working at his usual furious rate on the Jodel D9 and it must be about seventy per cent complete. Ian Parker and Dave Hocking are both hard at work on their Taylor Monoplanes and between them they could probably muster a complete aircraft. Steve Crutchley is making slow but steady progress with his all-metal original design and has the wings and tailplane completed. Frank de Jongh has been transferred to Cape Town so work on his half-completed Currie-Wot has been temporarily halted while he is looking for suitable accommodation.

In the Durban area Carel van der Merwe is carrying out some modifications to his Beta which has already flown, while Pikkie Rautenbach and Marie Godwin are not far behind with their Beta's. Clive Rautenbach is busy with his Cassutt-Renegade and Peter Wehrley has started work on a Jodel F11. In Westville Dr. Fanucci has started work on his Aerosport Quail.

ORANGE FREE STATE

by TOY VAN RENSBURG

Flying Officer Peter Booth who flies Alouette helicopters at Bloemfontein Air Force Station has ordered a BD-5 kit. The BD-5 is still in the development stage and he does not know when the kit will arrive. He has permission to build the BD-5 in one corner of the Air Force hangar, and will be flying it out of J.B.M. Hertzog airport at Bloemfontein. We envy him his position and we expect he will have expert advice on tap from the Air Force mechanics. We hear that the spring steel landing gear of Doc. von Moltke's Fly Baby has come loose and he is busy fixing it. He and Toy van Rensburg are planning a trip to Oranjemund but the date for the safari has not been set. Would any flying homebuilder like to join the safari? John Aurret of Oranjemund is busy building a CA-61 and he plans to use a VW motor. He has completed various parts and is waiting for some wood to arrive. We hope that by this time the wood has arrived and his project is well under way. Eddie Kritzing of the University of the Free State in Bloemfontein is also contemplating starting a homebuilt but he has not decided what plane he will build. Bucky King of Warden is talking about building a Pazmany and we understand that he has made some parts and has material on order. Toy van Rensburg has not started on his CA-65A. He

is still trying to contact a supplier of material in the States. The big aluminium companies are not interested in selling small quantities of extrusion. They will sell only twenty foot lengths and some of these extrusions cost \$ 300 to \$ 400 per length which is a bit expensive if you need only a couple of feet.

TRANSVAAL by BARRIE WALKER

Woody Woods has his Pitts going great guns. The aircraft is all they say about it and even more. The 200 h.p. Lycoming gives it lots of power. Woody soloed the machine himself. Fanie van Rensburg's Taylor Titch is almost ready for action and with the 100 h.p. Lycoming it should prove to be quite a performer. Godfrey Knight has the wings of his original design two-seater completed and is now looking for a suitable engine. Horst Fischer's Jodel had a slight mishap in a cross wind and the gear collapsed on both sides causing some wing damage. This has now been repaired. Fortunately the propeller did not hit the ground or the damage would have been a lot worse. Ron Johnson has now received all the spares for the Nord he is rebuilding and the machine should be in the air soon. Dennis Lee is busy with his Sirocco but he has been held up badly by the British dock strike and is still waiting for some more wood.

Local members of the E.A.A. of S.A. are now meeting regularly at the Quondam Club in Bedfordview at 7.30 p.m. on the first Thursday of each month.

CAPE by RUTH HOBBS

It would surprise many members to know how much building activity is in progress in the Cape. There has been little organised communication among members, however, and discovery of other homebuilders in the vicinity is usually accidental.

Our first encounter with another builder was of this nature. My parents, who live in Somerset West, knowing of our interest in flying but not of our Pazmany project, mentioned that there was "a young lad down the road building an aeroplane in his father's garage." That was the start of a good friendship with Michael Mullis and his cousin Oliver Morton. The aircraft was a Jodel F11. They later took over and completed Heinz Seitz's Nipper which is now flying as ZS-UEO. They are now restoring a wind damaged Aeronca 7AC. The Jodel, partly finished, is still in the garage!

Another whose car has lost its shelter is Dr. Bergamasco of Rondebosch. He and Kevin Powell are well on the way towards completion of their BD-4. Ed Browning, too, has almost finished his project — a beautiful Jodel F12 with a bench seat at the back for his two small daughters. The workmanship is superb and he has been able to give many of us good advice on details of construction.

Viv James, Geoff Ritchie and Avron Bane are all building Volksplanes and we should have a formation team in the near future. Andries van Dijk is rebuilding Turbulent ZS-UAA, the first homebuilt registered in the country. Boet Groenewald of Swellendam has a Midget Mustang project in his basement and Ben Viljoen of Klaarvoogs is suffering much frustration with his Smyth Sidewinder project.

The names and addresses of these and other builders appear in the directory. Look some of them up when you come this way. It can only be mutually beneficial and you may even get a flip over our glorious mountains.

(Editors note, In spite of her recent transfer to the Transvaal Ruth has kindly undertaken to continue supplying items of Cape news.)

MAYDAY! MAYDAY! MAYDAY!

Articles are urgently required for the next issue of Homebuilt.

Black and white photographs of about post card size are also needed desperately.

This news magazine cannot exist without your support.