

Introduction. - Mr. chairman and members.

605<sup>th</sup> meeting  
Mr BYRNES  
Leeds.

HOW DO YOU START TO BUILD AN ALL WOOD LIGHT AIRCRAFT.

Mr Dennis Wall

1) FORMATION

I attended Bingley Secondary Modern School for 2 years on a night school class taking , Air Law, Navigation, Metrology. Out of this class developed the idea of building an aircraft. A meeting was held and the Bingley Aircraft Construction Group was formed - with 16 members.

2) FACILITIES

We were very lucky in having Ted Fenton who was the Shipley and Bingley further education officer. ~~We~~<sup>He</sup> provided the wood worksoon at Bingley Modern School. We were to operate as a Night School Class. 7pm - 9pm every Wednesday evening.

3) PLANS AND MATERIALS

Here we were very fortunate in having Mike Rockcliff who owns Yorkshire Light Aircraft - the Company that repairs the light aircraft at Yeadon. He was in an ideal position to obtain the plans and more important, understand them. Materials for building are not bought at the do - it yourself shop. The Spruce and ~~Beech~~<sup>ASH</sup> has to have the corfect grain, not warped or twisted and be made to certain tolerance; You can only buy it from registered suppliers. We bought ours from Slingsby's the glider people. Batches of the wood have to be inspected and then have the Air Registration Board stamp of approval on.

BIRCH  
PLYWOOD  
AIRCRAFT  
GRADE

4) FINANCE

It was agreed to pay £3 per month towards the cost of materials plus a Night School Class Charge of £2 per term. An insurance cover was arranged to cover any damage during construction.

## 5) TYPE OF AIRCRAFT

We looked at a few designs. The simplest to build was a Volksplane - or flying orange box. But this was a two seater fore and aft and we thought it better to have a 2 seater side by side with a closed cockpit. The aircraft we finally chose was a French designed JODEL D11. There are hundreds of these flying in France today. Both amateur built and factory built. It did mean all the plans, drawings and wood sizes were in metric - and we had problems translating the technical french.

The wings had a dihedral tip for stability. This means that the wings are upswept at the ends 19°. They were also tapered which meant each rib was a different size. The fuselage was also tapered which meant more accuracy in building.

These features do make a very stable and efficient aircraft although the construction time is increased.

## 6) AIRCRAFT DETAILS

WING SPAN	27'
LENGTH	20'
ENGINE	100 H.P. ROLLS ROYCE
WEIGHT	Less than a mini car on all up weight.
SPEED	120 M.P.H.
RANGE	560 miles
FUEL	4 gallons per hour.

## 7) CONSTRUCTION

As you will see in the film everything is jointed, tacked and glued except for the wings and engine which are of course bolted on. Every piece is hand made - (none of this *KIT RUBBISH*) and has to be within fine tolerances - last week we had to work to  $\frac{1}{8}$ " in 7 feet.

The wing ribs are fixed to the main spar which is a box formation made from lengths of <sup>SPRUCE</sup> ~~bass~~ with plywood covering. The wing is then covered with Irish Linen sewn on by hand with large 12" needles and special waxed string.

cont.

Tape is then put over the stitches and held with dope. The whole wing is then doped 8 times to shrink the fabric and give a tight finish. Finally it is painted.

The fuselage is covered with plywood and then fabric is glued on for weather proofing. Finally it is painted.

*WE HAVE USED 10 GALLONS OF DOPE TO DATE.*

GLUE - special aircraft glues have to be used - they are of the resin type. All joints and scarfings have to be checked and inspected periodically by an Air Registration Board Inspector.

#### 8) CONSTRUCTION TIME

A plane of this type takes 2,000 man hours to build. If you work out 1 night per week for 2 hours 7pm - 9pm (then 9pm - 11pm in the Fisherman's) it will take five years. That is as long as the last war to me that seemed an awful long time.

However it will be flying by August this year and will be unique in that it will be the only light aircraft ever built by a group to have flown.

#### 9) TYPE OF PEOPLE

To give you an idea of who is involved in this it may be an idea to mention their jobs. The age range is 25 to 50. There is a doctor, chemist, pilot for Bass Charrington - who is to be our test pilot but doesn't know it yet, a boat kit maker - useful for joinery, an engineer from an iron foundry, a drapery salesman, christmas cards salesman, painter and decorator, college lecturer, chemical technician and myself - a woolcomber.

We've had many people come and go. One I remember was a stress expert. He was tall <sup>thin</sup> and had a stoop and very large glasses. Professional Boffin would be the best description. The type of man who comes into a room like and says ah yes - built in 1870. In those days they didnt have the building techniques or proper materials, it will probably fall down shortly. He came along and for three weeks studied every drawing and plan, looked at the construction, made hundreds of calculations.

cont.

On the 4th week he kindly informed us that he wouldn't be joining the group, as the aircraft would not be able to fly. We thanked him profusely and asked him about the bumble bee who theoretically shouldn't be able to take off. But the bee doesn't know that. We never saw him again.

Fisher and partner were two other characters who arrived and paid one months subs. At the time they were selling Stratford on Avon foot by foot to the Americans. They were very *Good* *with* ~~at~~ tacks and glue and probably very good at avoiding tax in their own business. They bought a new aircraft after leaving us.

Another character who occasionally comes along is a joiner. Derek is all hell-fire and no water. He gets the job done with enthusiasm and in half the normal time. We have one golden rule and that is :- MEASURE TWICE CUT ONCE. Derek believes in cutting only. We enjoy his company and don't mind some slight alterations or re-sloping.

We were going to call the aircraft NOT CRITICAL but after 5 years we have a lot of affection for it and couldn't use such a name. *FOR OUR FLYING MACHINE. THIS IS STILL SECRET AS WE ARE LOOKING FOR A SPONSOR.*

#### 10) OWNERSHIP

On completion, the group will be called the Bingley Flying Group. The plane will be jointly owned by 12 members. Anyone wishing to sell out can do so. Firstly to the existing group, ~~each~~ or with their approval, to a new member. We each have £120 in the group but new membership would be £200, the difference is the 5 years of building.

11) COST OF FLYING

Estimated flying hours 200 per year

Hangerage £150

Insurance £140

Some maintenance is allowed by group members as it is on a Permit to Fly.

Inspection and overhaul by qualified engineers and inspectors £100.

We will pay a standing charge of £2 per month to cover some overheads to allow for bad weather, maintenance and repairs.

Flying cost will be £3.50 per hour which is less than half the normal flying rate.

12) EXHIBITS

I have here a few bits and pieces which we can have a look at afterwards and some photographs taken <sup>DEVELOPED & PRINTED</sup> by my son who is 12 years old.

Now I will hand over to <sup>RON</sup> ~~RO~~ Normington who is going to show the film.

In the past five years I have been taught a lot about wood working technique, glueing, scarfing, wood formation. It has also been an exercise in human relations for we have developed a special kinship within the group. This will continue as we fly the aircraft.

I hope you have <sup>FOUND</sup> ~~enjoyed~~ this talk <sup>INTERESTING</sup> and <sup>have</sup> gained some ideas for building Bingley Round Table ~~aircraft~~. <sup>FLYING MACHINE</sup>

I must thank Ron Normington for his excellent film and Peter Crediton for his advise, also yourselves for being such an attentive audience.