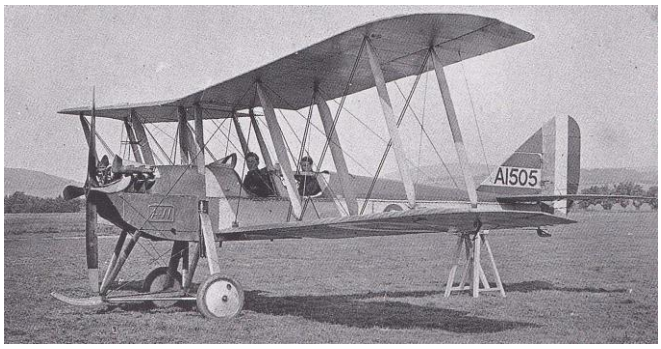
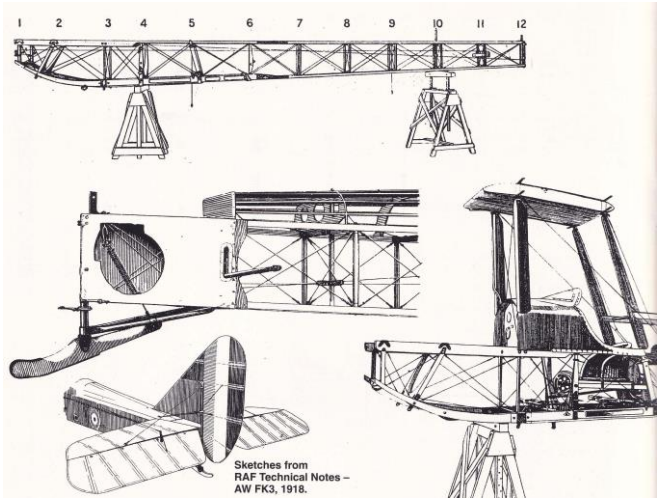
Armstrong Whitworth FK.3 Little Ack Hobartville Hobbies[1] 3D printed kit

Biplane reconnaissance/training

Scale 1:72



The Armstrong Whitworth F.K.3 was the first commercially successful design of Frits Koolhoven. It started as a private venture of the factory, which was more easy to be produced than the Royal Aircraft Factory BE2c reconnaissance and training aircraft, which was license produced by Armstrong Whitworth at the time. The F.K.2 aircraft, as it was called, was ordered by the War Ministry and produced in small numbers, but was rapidly succeeded by the improved F.K.3. The first flight of the F.K.3 took place shortly after the start of the production in August 1915. 344 copies have been built, of which 94 built by Armstrong Whitworth, the remaining 250 by Hewlett & Blondeau. After the war four F.K.3's have been flown during a brief period with civil registrations.



The F.K.3 was a two bay biplane of wooden construction with dihedral of both the upper and lower wing and ailerons in both. The pilot was in the front seat, the observer in the rear seat; the cockpits were not separated. The undercarriage had oleo struts and a long central skid to prevent overturn. The observer had also primitive means to control the aircraft, something to keep in mind when modeling the rather complex control cable routing.

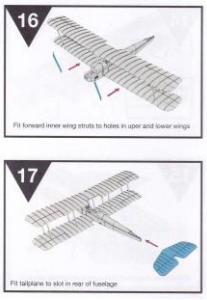
The aircraft was mainly used for training and saw operational use in the Balkan as a reconnaissance airplane, sometimes even as a fighter. Ref. 1 contains a nice drawing showing the fuselage and tail structure.

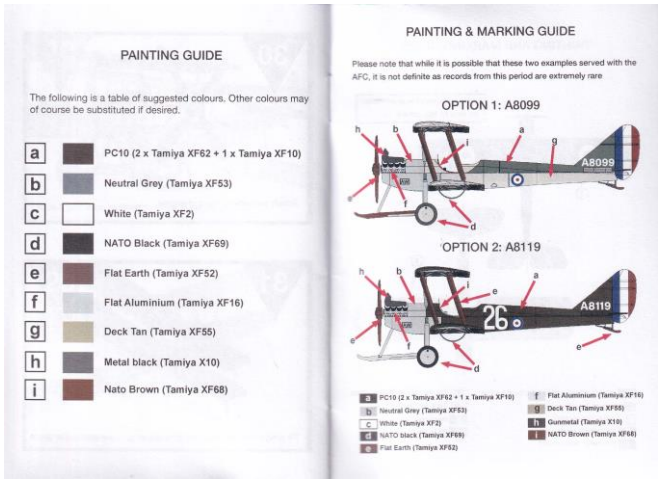
The aircraft had an air cooled 90 hp V6 RAF 1a engine, driving a four blade propeller. It has also been tested with the 120 hp liquid cooled Beardmore and the 105 hp air cooled RAF 1b engine, but the slight performance improvement did not warrant an engine change.

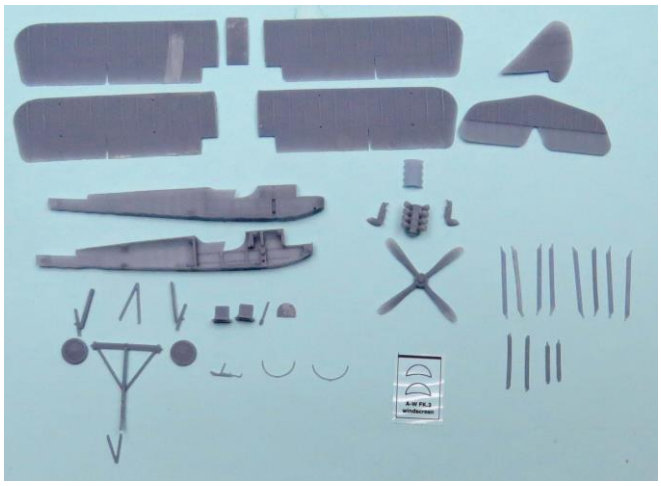
The kit is 3D printed resin, produced and issued by Hobartville Hobbies in Australia, and has been made available to me by Erwin Stam of the Aviation Megastore. It comes in a small sturdy carton box containing the resin parts packed in separate small bags listing the contents, a piece of transparent sheet with the wind-

[1] https://www.hobartvillehobbies.com.au/

screens printed on it, decals for two different versions, which both served with the Australian Flying Corps, and an instruction booklet.

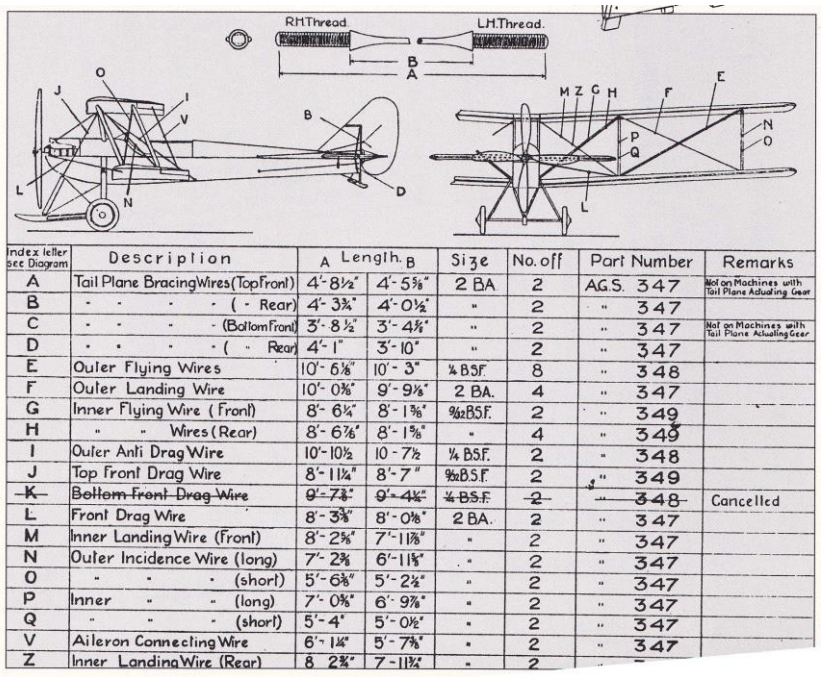






The instruction booklet illustrates the build in XX steps with drawing showing the assembly method and giving details to position and align the parts correctly. It also contains paint instructions for the two versions (A8099 and A8119) that can be built. These aircraft and the A1488 shown in Bruce (ref. 1) have been produced by Hewlett & Blondeau.

The resin parts themselves are well detailed and very nicely printed; hardly any surface roughness is present and almost all 3D construction stubs have been removed. Parts are very fine and in my kit I found only one strut which was missing one of the wing attachment stubs.



Index letter see Diagram	Description	A Length	B	Size	No. off	Part Number	Remarks
A	Tail Plane Bracing Wires (Top Front)	4'-8½"	4'-5⅝"	2 BA	2	AGS. 347	Not on Machines with Tail Plane Adjusting Gear
B	" " " " (" Rear)	4'-3¾"	4'-0½"	"	2	" 347	
C	" " " " (Bottom Front)	3'-8½"	3'-4⅞"	"	2	" 347	Not on Machines with Tail Plane Adjusting Gear
D	" " " " (" Rear)	4'-1"	3'-10"	"	2	" 347	
E	Outer Flying Wires	10'-6⅛"	10'-3"	¼ B.S.F.	8	" 348	
F	Outer Landing Wire	10'-0⅜"	9'-9⅛"	2 BA.	4	" 347	
G	Inner Flying Wire (Front)	8'-6¼"	8'-1⅝"	5/16 B.S.F.	2	" 349	
H	" " Wires (Rear)	8'-6⅞"	8'-1⅝"	"	4	" 349	
I	Outer Anti Drag Wire	10'-10½	10'-7½	¼ B.S.F.	2	" 348	
J	Top Front Drag Wire	8'-11¼"	8'-7"	5/16 B.S.F.	2	" 349	
~~K~~	~~Bottom Front Drag Wire~~	~~9'-7⅜"~~	~~9'-4½"~~	~~¼ B.S.F.~~	~~2~~	~~" 348~~	Cancelled
L	Front Drag Wire	8'-3⅝"	8'-0⅛"	2 BA.	2	" 347	
M	Inner Landing Wire (Front)	8'-2⅝"	7'-11⅞"	"	2	" 347	
N	Outer Incidence Wire (long)	7'-2⅜	6'-11⅝"	"	2	" 347	
O	" " " (short)	5'-6⅜"	5'-2⅛"	"	2	" 347	
P	Inner " " (long)	7'-0⅝"	6'-9⅞"	"	2	" 347	
Q	" " " (short)	5'-4"	5'-0⅛"	"	2	" 347	
V	Aileron Connecting Wire	6'-1¼"	5'-7⅞"	"	2	" 347	
Z	Inner Landing Wire (Rear)	8'-2⅝"	7'-11⅞"	"	2	"	

Printed references are limited. Bruce (ref. 1), Tapper (ref. 2) and Wesselink (ref. 4 and 5) give the dimensions of the F.K. 3, while Bruce also present detailed dimensioned 1/72 scale five view drawings of the aircraft (reproduced at the end of this report) and Tapper a simple three view drawing.

I have used the Windsock Mini Datafile 13, AW FK.3 (Little Ack) by J.M. Bruce (ref. 1) as my main reference. It contains many photographs, the fuselage construction details shown above, a schematic for the routing of the rather complex bracing lines shown at the right and a paint scheme for the A1488.

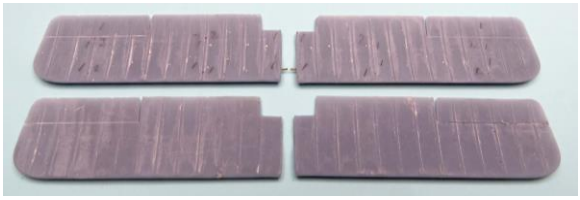
	Ref.	*1:72*	*model*
Span	12.59 m	174.9 mm	mm
Length	8.84 m	122.8 mm	mm
Height	3.44 m	47.8 mm	mm
Engine	RAF 1a 90 hp		
Crew	2		
Armament	1 Lewis movable machine gun		

The kit is excellent to scale.

On the Internet I have found a building report of the kit on Britmodeller dated January 2022, which gave a number of good tips.

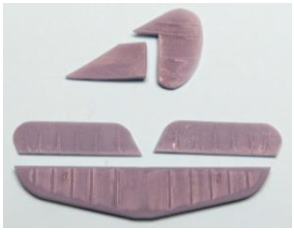
Parts

Although the parts looked really good, there were some traces of the 3D printing process, on some places more apparent than others. Also, the bottom surface of the wings showed some “air bubbles”, at least I would have called them such if it would have been a resin casted kit. I have filled these with Revell Plasto and have sanded the surface between the wing ribs. At the same time I have also sanded the ribs a bit down, especially at the leading and trailing edges, as they are very pronounced. I have also attempted to separate the ailerons from the wings, as I wanted to mount them in deflected position. Usually I do that by



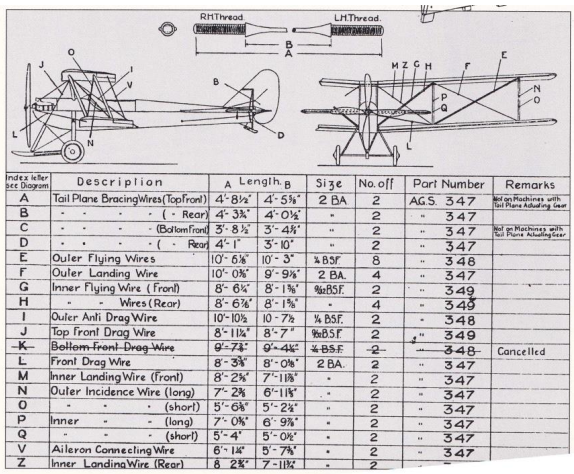
deepening the hinge line with a panel line scriber, but that did not work. The material is rather hard and inflexible, and worse, it is very brittle. So when one of the ailerons spontaneously broke half way, I gave up and have the broken parts glued together with cyanoacrylate glue. I have provided the upper wings with 0.5 mm brass pins to reenforce the connection with the wing center section.

The tail control surfaces were easier to handle. The hinge line of the elevator is straight and is well fit for sawing with a razor saw. This worked well. I managed even to separate the rudder from the fin with the razor saw. When the cut was almost complete, the rudder snapped off and jumped away, but after a slight attack of panic I found it on the floor about from the work bench. Again, I sanded the ribs in the tail planes a bit down as they were too pronounced.



Next I have started to drill the holes for the rigging lines in the wings, and there are quite a lot. Usually I feed the fishing line I use as rigging wire though the wing and fix it at the reverse side by dropping a bit of glue in the hole.

The instruction booklet does not contain information on the rigging scheme, but in ref. 1 there is a list of all the rigging wires and a sketch showing their location. Three of the flying wires at each side are even double, which is not unusual for aircraft of this time. The routing of the rigging wires of the upper wing center section is not very clear on this drawing, but the cover picture of ref. 1 helps a lot in this respect. I have marked the holes on the wings with a pencil according to the list. In total 60 holes of 0.4 mm have to be drilled and that excludes the holes for the control cables.



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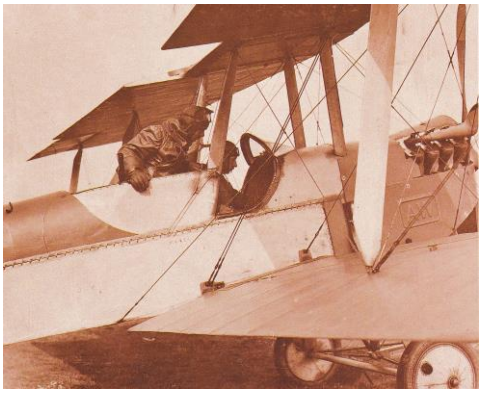
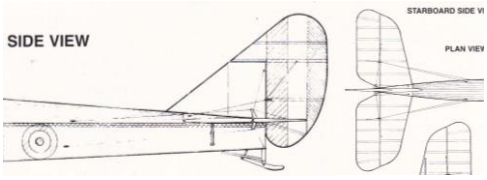
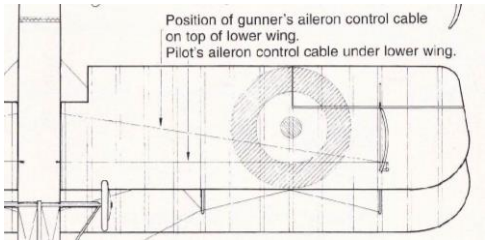


The build of the model on Britmodeller, shown on the left, did not pay much attention to the actual rigging, which is far more complex than represented on the model. It did not include at all the control cables for ailerons, rudder and elevator.



The drawings in the booklet of Bruce are a great help here. The control cables for rudder and elevator are rather simple, but there are also cables running from the control horns to the middle of the control surfaces, apparently to distribute the control forces better over the structure. The aileron control cables are more complicated. From the fuselage they run under the lower wing (the pilot's controls) to 90 degree levers and on top of the lower wing (the observer's controls) to single levers. I could not find on the photographs of F.K.3's any evidence of the return line between the ailerons on top of the upper wing, but I am not sure the line and the 90 degree levers were accommodated inside the wing.



Wing

After drilling the holes for the rigging wires and control cables I have glued the upper wing halves to the wing center section with the 2 mm dihedral at the wing tips as prescribed in the building instructions.

Cockpit and fuselage

I have

Bracing

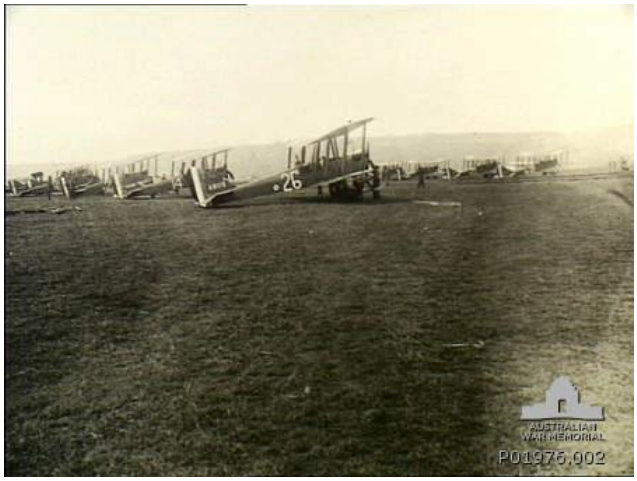
Undercarriage

Control cables

References

1. J.M. Bruce, *Windsock Mini Datafile 13, AW FK.3 (Little Ack)*, ISBN 1 902207 08 4, Albatros Productions Ltd., Berkhamstead, UK, 1998
2. O. Tapper, *Armstrong Whitworth Aircraft since 1913*, pp.6-7, 9, 52-58, ISBN 0 370 10004 2, Putnam, London, 1973
3. D. Top, *Frits Koolhoven en zijn Vliegtuigproduktie*, p. 23, 1996
4. T. Wesselink & T. Postma, *Koolhoven, Nederlands vliegtuigbouwer in de schaduw van Fokker*, pp. 15, 17-18, ISBN 90 228 3890 0, 1981
5. T. Wesselink, *Koolhoven Vliegtuigen*, pp. 21-26, ISBN 978 90 818510 2 2, Dutch Aviation Publications/Theo Wesselink, 2012
6. S. van der Zee, *Vergeten legende, Frits Koolhoven 1886-1946*, pp. 34-35, ISBN 90-234-7057-5, 2001

Source: Armstrong-whitworth-fk.3-aeropedia-the-encyclopedia-of-aircrafts-australia



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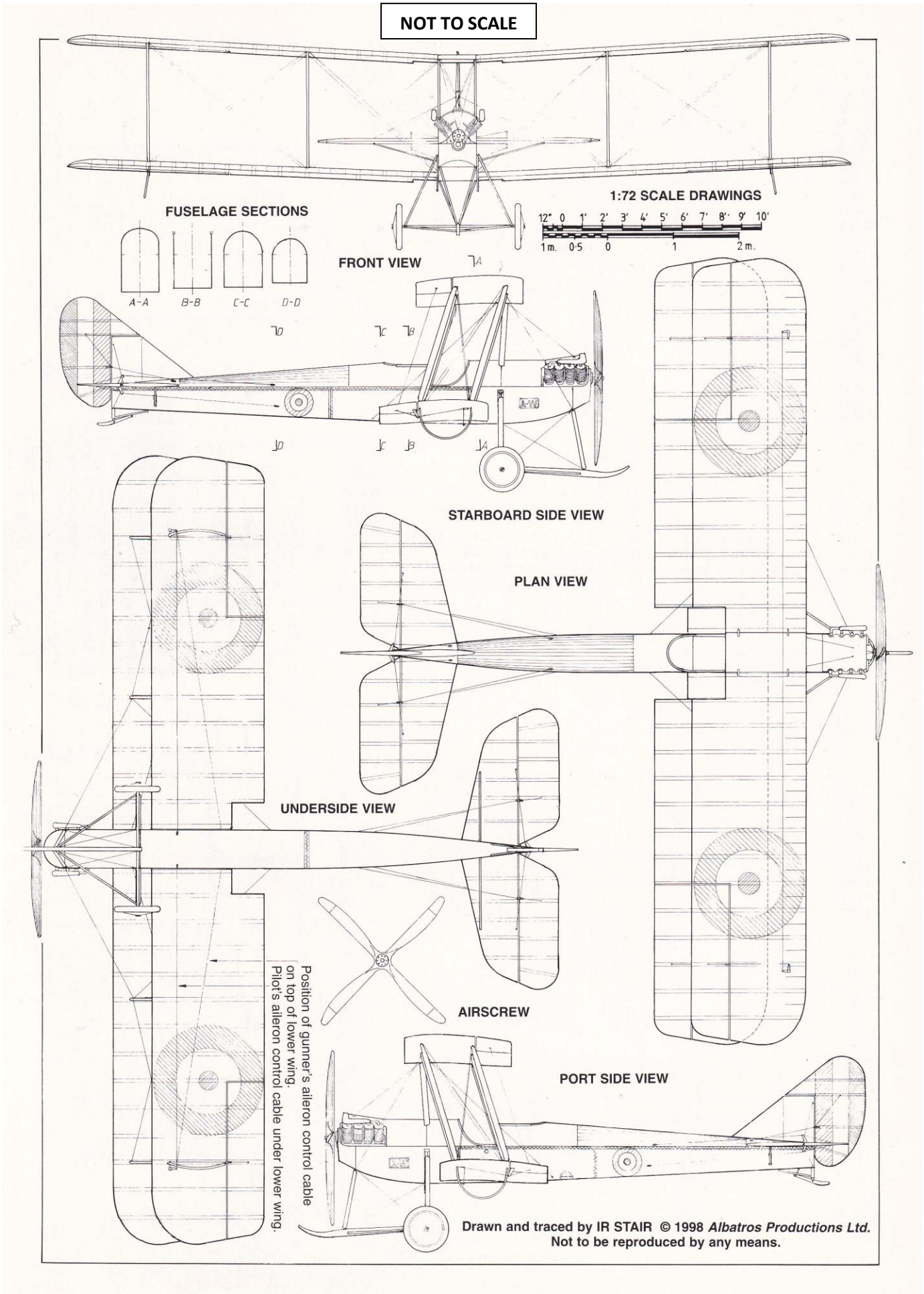
NOT TO SCALE
1:72 SCALE DRAWINGS
12" 0 1' 2' 3' 4' 5' 6' 7' 8' 9' 10'
1 m. 0·5 0 1 2 m.
FUSELAGE SECTIONS
A-A
B-B
C-C
D-D
FRONT VIEW
STARBOARD SIDE VIEW
PLAN VIEW
UNDERSIDE VIEW
AIRSCREW
PORT SIDE VIEW
Position of gunner's aileron control cable on top of lower wing.
Pilot's aileron control cable under lower wing.
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