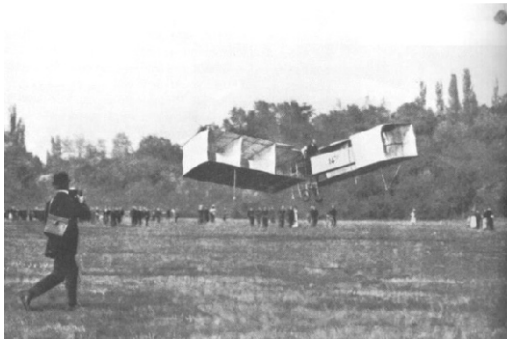




Historic Wings

1:72 Metal Kit of the



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1906 Santos Dumont 14 bis

History, Notes and
Assembly Instructions

History

Alberto Santos Dumont (July 20, 1873 – July 23, 1932) was an early pioneer of aviation. He was born in, and died in, Brazil. Heir of a prosperous coffee producer family, Santos Dumont dedicated himself to science studies in Paris.

Santos Dumont designed, built, and flew the first practical dirigible balloons. In doing so he became the first person to demonstrate that routine, controlled flight was possible. This "conquest of the air", in particular winning the Deutsch de la Meurthe prize on October 19, 1901 on a flight that rounded the Eiffel Tower,[1] made him one of the most famous people in the world during the early 20th century.

In addition to his pioneering work in airships, Santos Dumont made the first public flight of an airplane on October 23, 1906. Designated 14-bis or Oiseau de proie (French for "bird of prey"), the flying machine was the first fixed-wing aircraft witnessed by the European press and French aviation authorities to take off and successfully fly. Santos Dumont is considered the "Father of Aviation" in Brazil, his native country.[2] His flight is the first to have been certified by the Aéro Club de France and the Fédération Aéronautique Internationale (FAI).

Specifications - 14-bis

General characteristics

Wingspan: 36 ft 9 in (11.20 m)

Length: 31 ft 10 in (9.70 m)

Height: 11 ft 2 in (3.40 m)

Wing area: 560 ft² (52 m²)

Empty weight: approximately 340 lb (155 kg)

Loaded weight: 462 lb (210 kg)

Power plant: 1×Antoinette V-8, 50 hp (37 kW), driving a pusher propeller

Performance

Maximum speed: 25 mph (32 km/h to 43 km/s)

Range: >720 ft (demonstrated) (>220 m)

Wing loading: 1.2 lb/ft² (5.7 kg/m²)

Introduction

This Historic Wings kit is made from etched brass for the main structure, with cast metal detail parts. The flying surfaces can be covered with the tissue paper supplied, although many modellers may prefer to leave the structure uncovered to show the details.

Brass components can be soldered together, or joined with cyanoacrylate (SuperGlue) or 5-minute epoxy. If you have the skills and equipment we recommend soldering.

To remove parts from the etched fret, you can use a pair of side cutters, or put the fret on a ceramic tile, and press down on each attaching tab with a sharp knife. If you use the 'knife & tile' option, put the attaching tab with the half-etched side of the tab face down. Whichever method is used, it may necessary to remove the burr of the attachment tab with a needle file afterwards.

CAUTION - MAKE SURE THE ORIENTATION OF THE WING IS CORRECT BEFORE YOU TWIST EACH RIB.

The wings and elevators are etched with integral ribs. Hold the leading or trailing edge in a vice or clamp, and then hold each rib in turn with a pair of fine flat-nosed pliers, and twist that rib through 90 degrees. When all the ribs have been turned, clamp the trailing edge, and do the process again.

Where etched parts are joined with two inter-locking slots it may be necessary to enlarge a slot with a needle file. This is because photo-etching is not an exact process, and sometimes the etching is slightly uneven across a sheet.

Parts List

Cast Metal

Ballast tank - left	1 off
Ballast tank - right	1 off
Form tool - female, large & small	1 off
Form tool - male, large	1 off
Form tool - male, small	1 off
Engine	1 off
Figure - Santos Dumont	1 off
Fuel tank	1 off
Oil tank	1 off
Propeller	1 off
Tyre - main wheel	2 off
Tyre - tail wheel	1 off

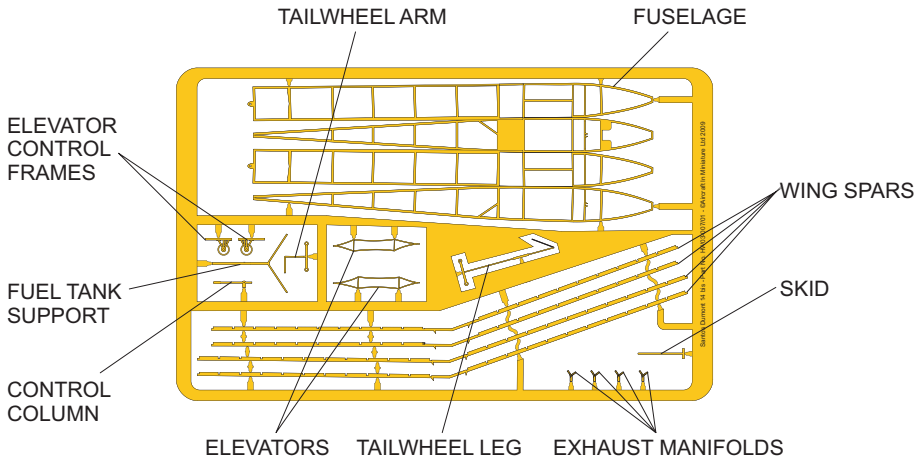
Etched metal

Fret 1 - brass	1 off
Fret 2 - brass	1 off
Fret 3 - brass	1 off
Fret 4 - nickel silver	1 off

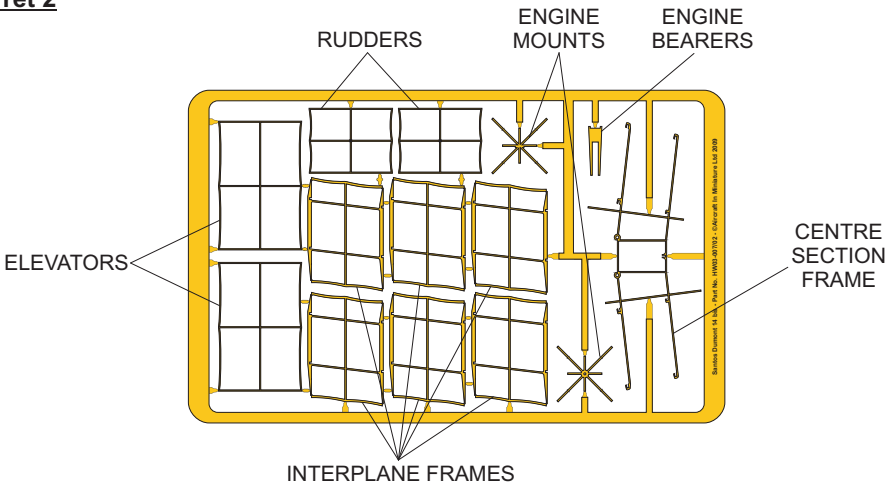
Miscellaneous

Instructions	1 set
Stainless steel wire	1 length
Cream Litespan film	1 sheet

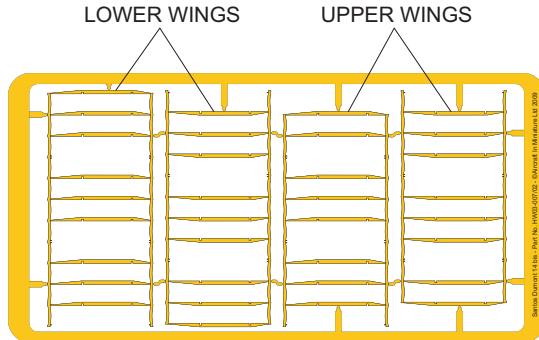
Fret 1



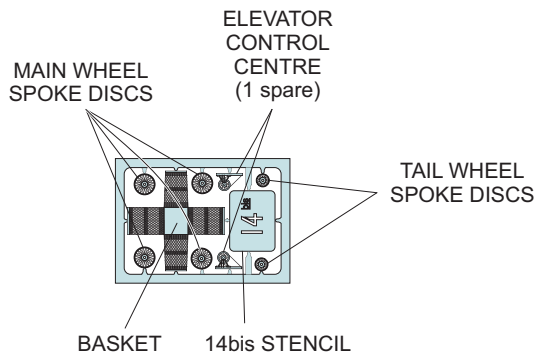
Fret 2



Fret 3



Fret 4



1 ASSEMBLE THE SPOKED WHEELS

- A Drill a 1/16"/1.5mm diameter hole through the centre of the female form tool as shown in Figure 1 below. This is to let you push the discs of spokes out of the form tool after they have been formed into a cone.

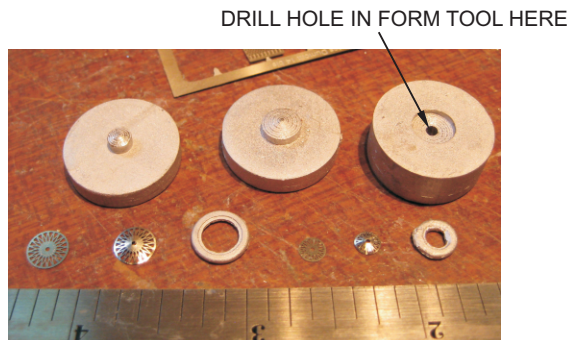


Figure 1

- B Remove the six spoke discs from the fret and remove any burrs from the attachment tabs.

- C Form each spoke disc.
- (1) Put each disc into the appropriate cavity (large or small diameter) in the female form tool.
 - (2) Put the appropriate male form tool into the cavity and press the disc into a cone. Figure 2 shows a vice being used to compress the form tool.



Figure 2

- (3) Remove the form tool from the vice and remove the formed disc of spokes.
 - (4) Do steps 1 C (1) thru 1 C (3) again for each of the spoke discs.
- D Assemble the three wheels.
- (1) Paint the appropriate tyre areas of the three cast metal tyres matt black. Do not paint the recesses where the spoke discs will be attached.
 - (2) Apply your preferred adhesive in the recess on one side of a cast metal tyre, then attach the conical spoke disc as shown in Figure 3.



Figure 3

- (3) When the adhesive is dry/cured, turn the wheel assembly over and attach the spoked disc to the other side. Leave this adhesive to dry/cure.
- (4) Do steps 1 D (2) and 1 D (3) again for the other two wheels.

2 FUSELAGE ASSEMBLY

- A Remove the fuselage from the fret and remove any burrs from the attachment tags.
- B Fold the fuselage to a square section, then bond the joint to give a strong joint.
- C Bend each side to the tapered shape and bond all joints to give a strong structure.
- D Remove the centre section frame from the fret and remove any burrs from the attachment tags.

- E Fold the centre section frame to a square section, then bond the joint to give a strong joint.
- F Fold the four locating lugs on each of the forward and rear engine mounts.
- G Attach the engine mounts and engine bearers in position.
- H Attach the centre section frame to the fuselage as shown in Figure 4. The verticals of the centre section frame fit into recesses etched in the outside of the fuselage longerons (longitudinal members).

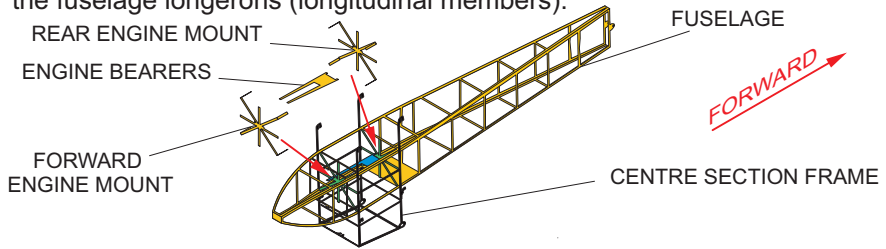


Figure 4

3 WING ASSEMBLY

- A Remove the upper and lower wings, wing spars, interplane frames and ailerons from the frets and remove any burrs from the attachment tags.
- B Fold all the ribs on each wing through 90°.
- C Engage the slots in the wing spars in the slots in the verticals of the centre section frame. Make sure that they are symmetrical in position and the wing spars are in place.

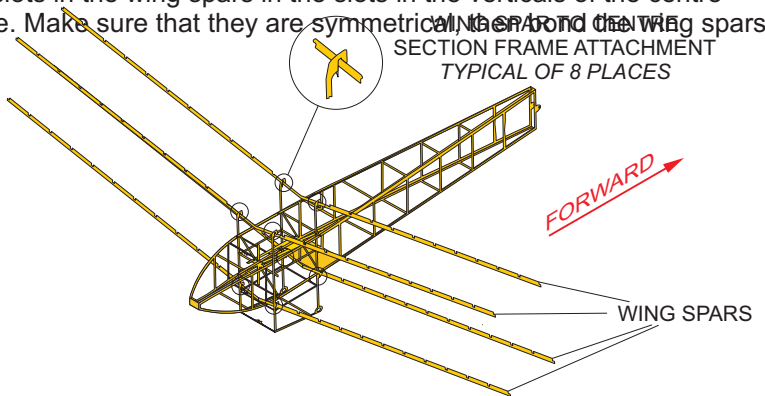
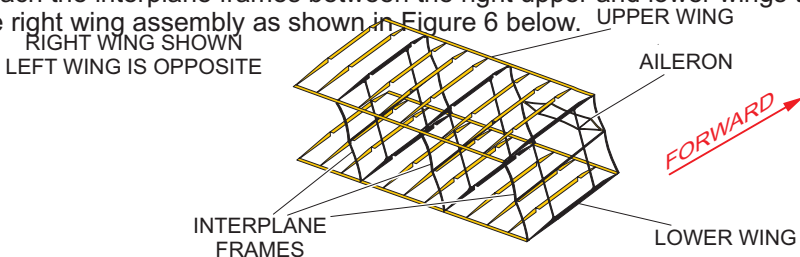


Figure 5

- D Attach the interplane frames between the right upper and lower wings to form the right wing assembly as shown in Figure 6 below.



- E Attach the aileron to the forward edge of the two interplane frames.
- F Do steps 3 D and 3 E again, and assemble the left wing assembly.

4 EMPENNAGE ASSEMBLY

- A Remove the elevators and rudders from the fret and remove any burrs from the attachment tags.
- B Butt join the elevators and rudders as shown in Figure 7 below and bond them.

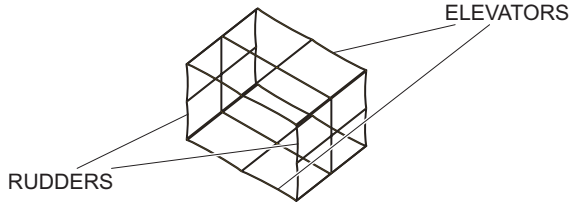


Figure 7

5 AIRFRAME ASSEMBLY

A Basket assembly

- (1) Remove the basket from the fret and remove any burrs from the attachment tags.
- (2) Fold the basket as shown below in Figure 8 below, then bond the edges to give strong joints. Leave the basket until the adhesive has cured.
- (3) Apply the preferred adhesive, then put the basket in position in the fuselage and leave it until the adhesive has cured.

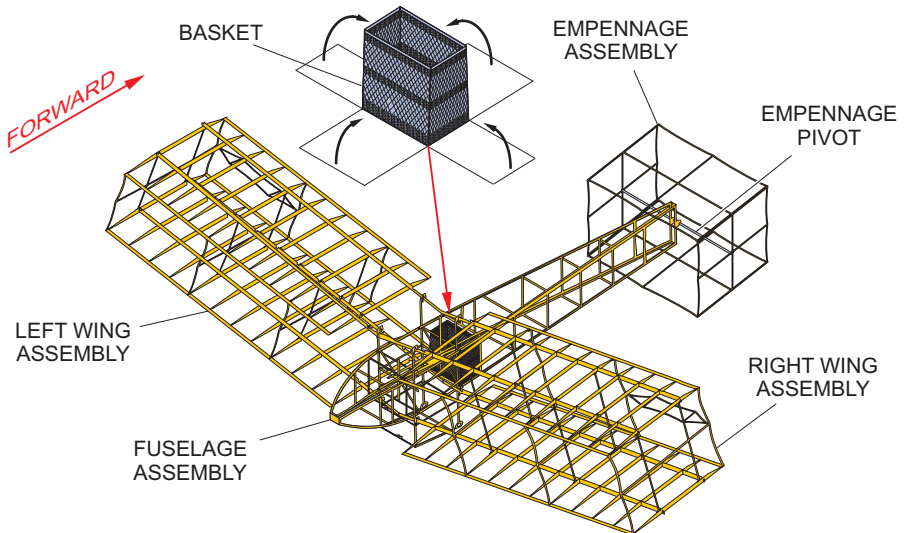


Figure 8

- B Put the right wing assembly in position. Engage the slots in the wing spars with those in the wing ribs and attach the right wing assembly. Bond the joints and leave the assembly until the adhesive has cured.

- C Put the left wing assembly in position. Engage the slots in the wing spars with those in the wing ribs and attach the right wing assembly. Bond the joints and leave the assembly until the adhesive has cured.
- D Make sure it is straight, then cut a length of stainless steel wire to make the elevator pivot. Put it through the holes in the centre of the rudders and the lugs on the forward edge of the fuselage structure.

6 LANDING GEAR AND DETAIL PARTS ASSEMBLY (See Figure 9)

- A Remove these components from the frets and remove any burrs from the attachment tags:
 - Control column
 - Elevator control centre
 - Four exhaust manifolds
 - Fuel tank support
 - Tailwheel arm
 - Tailwheel leg
 - Two elevator control frames.

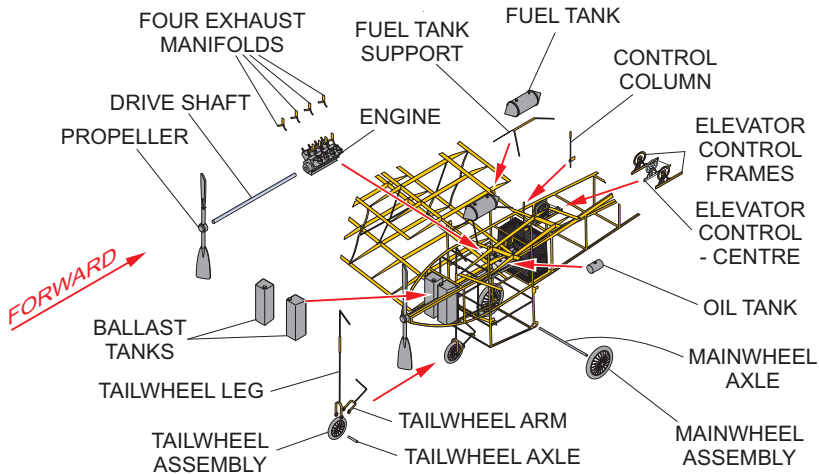


Figure 9

- B Engine, drive shaft and propeller
 - (1) Drill 0.75mm/.03" diameter holes in the rear face of the propeller hub and the aft face of the engine for the ends of the drive shaft.
 - (2) Attach the four exhaust manifolds to the top of the engine.
 - (3) Attach the engine to the engine bearers.
 - (4) Make sure the wire is straight, then cut a length to make the drive shaft. Use the distance from the installed engine to the end of the fuselage as a guide for the length.
 - (5) Attach the drive shaft and propeller.
- C Attach the two ballast tanks adjacent in the fuselage.
- D Main wheels.
 - (1) Cut a piece of wire for the main wheel axle, or use a dressmakers pin (not supplied in this kit).

- (2) Put the axle through one main wheel assembly, then put it through the holes in the centre section frame. Put the other main wheel assembly on the axle and bond it in place.
- E Tail wheel and leg.
- (1) Fold the tail wheel arm and leg as shown in Figure 9.
 - (2) Cut a piece of wire for the tail wheel axle.
 - (3) Assemble the tail wheel assembly, axle, leg and arm as shown in Figure 9.
 - (4) Attach the complete assembly to the fuselage structure.
- F Fuel tank support.
- (1) Fold the fuel tank support as shown in Figure 9.
 - (2) Attach the fuel tank support above the centre section of the upper wing.
 - (3) Attach the fuel tank to the fuel tank support.
- G Elevator control and control column.
- (1) Attach an elevator control frame to each side of the elevator control centre as shown in Figure 9, to make the elevator control assembly.
 - (2) Attach the elevator control assembly to the top of the fuselage structure, forward of the cockpit.
 - (3) Attach the control column inside the basket.
- H A Remove the skid from the fret and remove any burrs from the attachment tags. Fold the end to give at attachment area, then bond the skid below the forward fuselage as shown on the 3-view drawing.

5 AIRFRAME COVERING AND PAINTING

- A If the airframe is to be painted, do it at this stage in the assembly. Paint the structure to resemble a light to medium brown wood. If the model is to be covered with Litespan film, do not paint those areas where adhesive will be applied.
- B If the model is to be covered with Litespan film (the film), cover the flying surfaces now. For each flying surface:
- (1) Cut a piece of the film which is larger than the panel.
 - (2) Apply a continuous layer of cyanoacrylate adhesive (superglue) to the structures where the film will be attached.
 - (3) Attach the edge of the piece of film to one long edge of the bay and press it down so that it is smooth, and without creases.
 - (4) When the superglue has attached the film securely, apply more superglue to the other three sides of that bay.
 - (5) Pull the film smooth and attach the other three sides of the panel of film, so that it is smooth and not slack.
 - (6) When the film is securely attached, use a sharp blade to trim off the excess film.
 - (7) Do this procedure again for all the other panels to be covered.
 - (8) Use a hair drier of similar appliance to blow warm air over the film to tighten it.
 - (9) If you do cover the aircraft, a stencil is supplied to apply the '14 bis' markings. Use this stencil, with an airbrush and black paint.

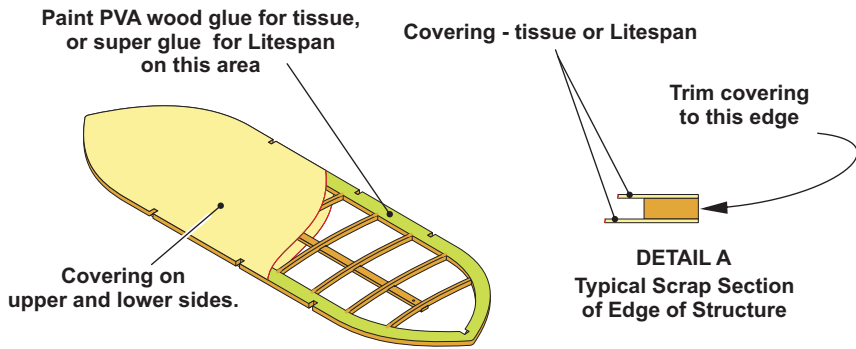


Figure 10

NOTES

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This kit is manufactured in the United Kingdom by

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