'Le Vibrant'

The wakefield which nearly beat the record of France in the 1948 championship

- Two-bladed folding propeller ⌀ 440
- main dimensions of the wakefield built in Oct. 1947:
  - + wing span : 1140
    - · chord : 135
    - · edge : 35
  - + wing surface : 13,48 cm²
  - + angle of incidence : 2°
  - + stabilizer spread (stabilo) : 450
    - · chord : 115 ou 110 (maybe 105 because 4,44 cm² for the surface)
  - + rudder unit : 110 ??
  - + stabilizer surface : 4,45 cm²
  - + stabilo angle of incidence : 0° 30'
  - + fuselage length : 920 + 60 (hole + propeller)
  - + motor length : 1100
  - + rubber weight : 36 grammes (g)
  - + total weight : 240 g.
- Advice for building the wakefield with the enclosed scheme (slightly changed / 1947) :
  - + mm : wings → stabilo distance : 430 mm

o Achievements :

1st in Morat Sur Loing : 2 mn 36 s.

1st in Orleans : ?

3rd : France Championship 1948 : 27 mn 38 s.

5th : Eaton Bray August 1948 : the plane was knocked about & crashed in a dive during the 2nd flight.

o Scheme :

- Capot amovible 3x3 b + 8/10 balsa latéral
  removable bonnet with sides made of 8/10 balsa wood (covering cap)
  + 3 x 3 rods

- Dériveur 12/10 balsa enduit et peint :
  rudder unit made of 12/10 coated & painted balsa

- 3 10/10 contrecollés : laminated 3 10/10 b (balsa ?)

- Hélice ϕ 440 P 790 Balsa roulé moulé ? 3 10/10 ou pales taillées :
  Propeller ϕ 440 Pitch 790 made of moulded rolled ? balsa
  or cut bladed

- Nervures : ribs
- demi-capot enlevé : removed half bonnet
- envergure stabilo masquée : hidden stabilo spread

o Scheme : Side view and section of the removable bonnet

entoilage au dessus du fuselage :

Paper covering above the fuselage

Capot amovible construit en 3×3 balsa + 2 jouel en balsa 8/10

Removable bonnet made of 3×3 balsa wood + 2 8/10 balsa cheeks

2 baguettes 3×3 collées sur le dessus du fuselage après entoilage

2 3×3 rods sticked on top of the fuselage after paper covering

Les ailes reposent sur ces 2 baguettes.

The wings lie on these 2 rods

2 tiges bambou ϕ 1,5 ou 2, à position variable, pour bracelets élastiqués.

2 bamboo rods (ϕ 1,5 or 2), with variable position, for rubber bands

- Propeller of the e.02 . Two-bladed - ∅ 420 x 840

To get a correct blade to be cut, follow the dimension line of the drawing. The edge roundings to be sanded are shown. The longitudinal angles which will become the leading (entering) and trailing edges of the blade must be sharp. If you respect the angles exactly, the pale of the propeller will work properly. It is safe to mark these 2 edges before cutting the lower wing face, in order to avoid mistakes.

- largeur maxi de la pale finie : Maximum width of the finished blade
- arrondir ici : round off here
- soigner le perçage de l'axe : Drill the axle hole carefully
- Dégrossir une forme avant de tailler l'extrados : roughly cut the shape before cutting the top side of the wing (suction face)

bord d'attaque en haut : upper leading edge

(1 bis)

+ Take a rubber hank of 85 g. in order not to exceed the minimum authorized mass.

+ Remember : 16 plies 6.35 x 0.8 (in 1947) correspond to about
14 plies 6 x 1 (today)
85 g. gives a one-meter hank

+ Take the rear part lighter (fuselage tail, stabilo, rudder) and for the stability, lighten the wing ends too.

+ Colours : fuselage & rudder : black or dark navy blue
wings & stabilo : red
(propeller not painted because of its weight : 7 g)

(2 bis)

- diedral 345 mm a plat : dihedral angle 345 mm in a horizontal position

- drillage 2' en bt à 6 : twist 2'. end at 6.

0 Features

wing span :	1140 mm
overall length :	980 mm
wing surface :	13, 48 cm²
stabilo surface :	4, 44 cm²
total weight :	240 g
rubber motor weight :	95 g
16 plies 6.35 x 0.8	L = 1100 mm

Two-bladed propeller :
diameter 440 mm - pitch 730 m

Paper covering :
fuselage : Kraft paper
rest : Japan paper
nitrocellulosed coat
2 layers of cellulosed paint

o Text

Fuselage

The top of the fuselage is designed with an oblique flexure (height : 21 mm) beginning around 35 mm behind the trailing edge of the wings. The paper covering of the fuselage is built with this flexure and respects the slanted part (1° 40') which will be the back of the wings, after sticking the 2 3×3 rods on the top of this part's paper cover.

Please note that the 2 3×3 balsa rods (see end section drawing) are fixed a bit back from the spars (longerons of fuselage), in order to attach laterally the removable bonnet when this bonnet has its 2 balsa cheeks (8/10 balsa) indented (scalloped) close to the best wing place. (On the section drawing, the indentation is at its maximum to allow the biggest wing variation).

When the cheek casing (forming) is realized after final assembly and good centering, it is possible to reduce the indentation; this reduction insures the lateral centering of the bonnet on the 2 3×3 rods before & behind the wings.

Fix the bonnet on the fuselage with clips & not with cello tape. (See enclosed drawing).

Wings

Assemble the 2 wings with a CAP 15/10 pin (spindle), slid in the 2 aluminium tubes sticked in the wing roots, coated on top. Put 2 other dog points to keep the same angle of incidence for the 2 wings.

Details

At that time, there was no dethermaliser. You can design a stabilo angle from 45 to 48°, the cap of the stabilo center (40 mm in front, 30 mm in the back) being embedded on top of the fuselage. (When you build the fuselage, put 2 10/10 balsa cheeks in front of the stab, instead of the 2 4×4 oblique rods).

- Take-off & landing gear made of CAP 15 & 12/10
- wheels : 2 ∅ mm balsa wheel disk sticked on a 8/10 plywood core.
- Two-bladed folding propeller, cut blades, axle : CAP 20/10.
- Z-shaped hook fixing the motor (to limit the vibrations).
- Pre-wound motor (with 14 6×1 plied) pbm : either take 28 plied 3×1 or 16 plied 6×1, double loop of 8 plied, the knots will be better distributed.
- Adjustment : if adjusted on the right, the rudder units & the propeller axle will make the plane slightly glide on the right.
  Be careful during the 1st motor flights. To stabilize the plane, adjust negatively the left wing (-2° → -3,5° max)

- Two-bladed folding propeller - pitch 790

The oblique lines show the study of the pitch design. note the voluntary choice made by myself to reduce the pitch of the less active blade parts, in order to increase the overall output (efficiency).

- Autre dessin possible donnant le même pas :
  Other possible drawing giving the same pitch

- Position future du tube de repliement :
  Future place of the tube used for folding the propeller

- dégrossir la forme avant de tailler l'extrados :
  Rough-form the wood before cutting the suction face

- variable suivant fuselage : variable, depending on the fuselage

- largeur maxi de la pale finie 65 mm :
  Maximum width of the finished blade : 65 mm.