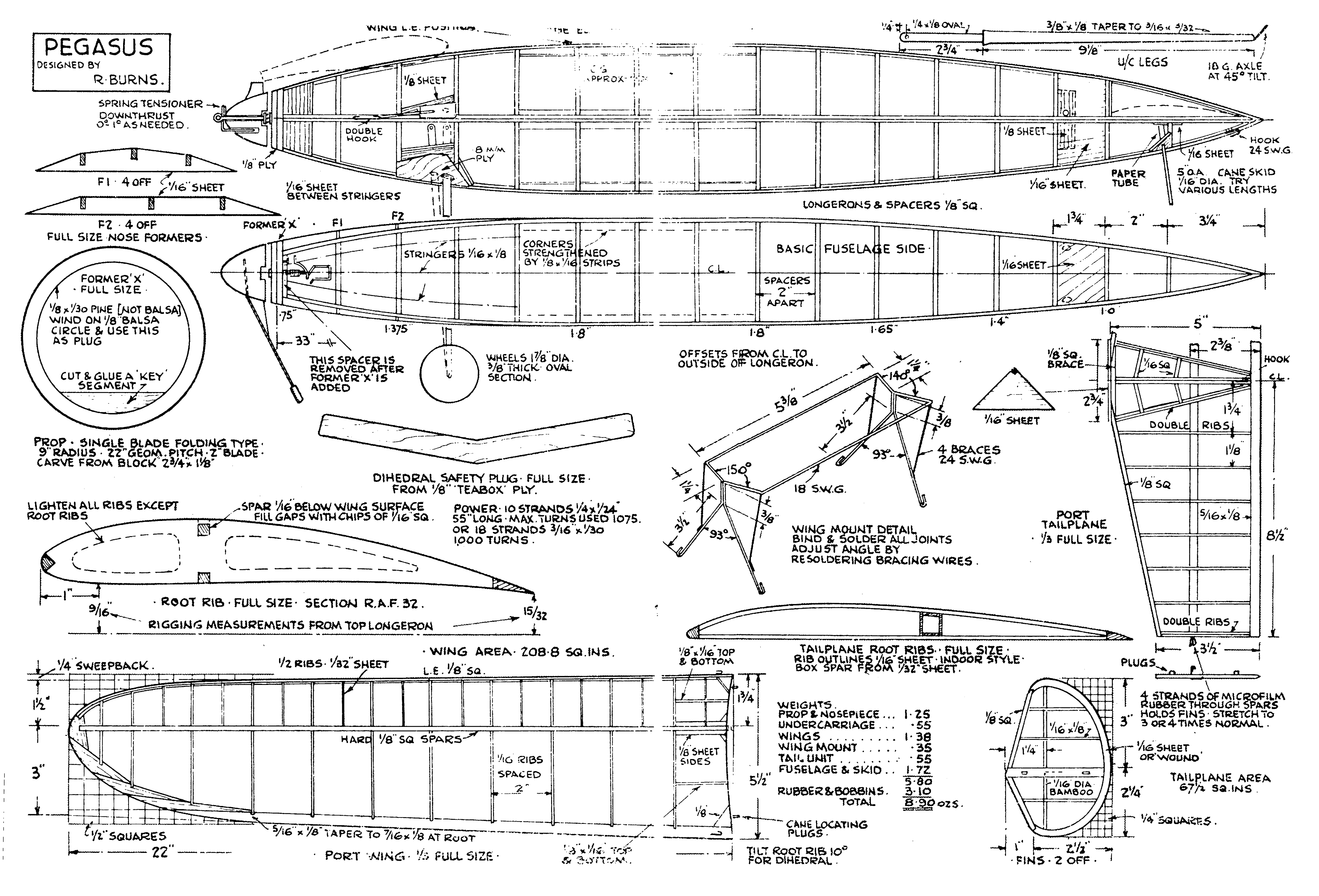
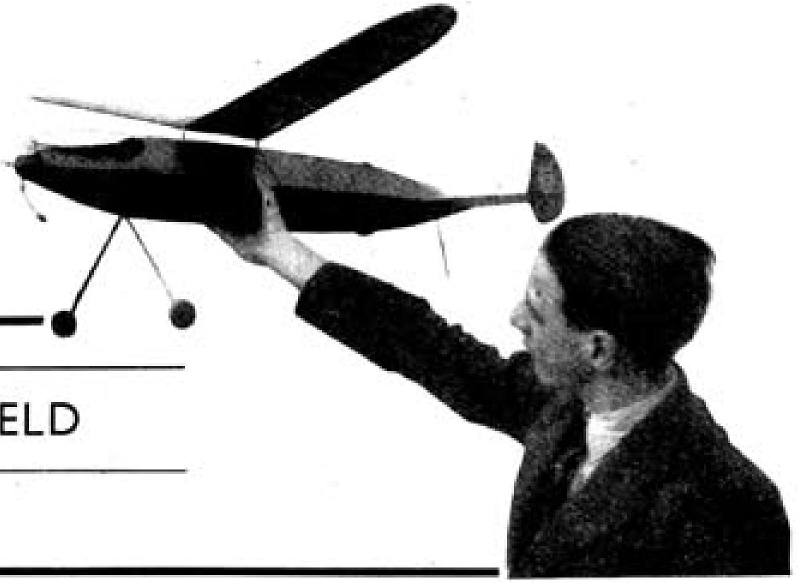

PEGASUS
DESIGNED BY
R. BURNS.
SPRING TENSIONER
DOWNTHRUST 0° 1° AS NEEDED.
1/8" PLY
1/8 SHEET
DOUBLE HOOK
8 M/M PLY
C.G. APPROX.
1/8 SHEET
1/16 SHEET
1/16 SHEET
PAPER TUBE
5 O.A. CANE SKID 1/16 DIA. TRY VARIOUS LENGTHS
HOOK 24 S.W.G.
1/4 x 1/8 OVAL
3/8" x 1/8 TAPER TO 3/16 x 3/32
2 3/4"
9 1/8"
U/C LEGS
18 G. AXLE AT 45° TILT.
F1 · 4 OFF
1/16" SHEET
F2 · 4 OFF
FULL SIZE NOSE FORMERS
1/16 SHEET BETWEEN STRINGERS
LONGERONS & SPACERS 1/8" SQ.
FORMER 'X'
F1
F2
STRINGERS 1/16 x 1/8
CORNERS STRENGTHENED BY 1/8 x 1/16 STRIPS
BASIC FUSELAGE SIDE
C.L.
SPACERS 2" APART
1/16 SHEET
1 3/4"
2"
3 1/4"
.75"
1.375"
1.8"
1.8"
1.65"
1.4"
1.0"
33"
OFFSETS FROM C.L. TO OUTSIDE OF LONGERON.
FORMER 'X' · FULL SIZE ·
1/8 x 1/30 PINE [NOT BALSA] WIND ON 1/8" BALSA CIRCLE & USE THIS AS PLUG
CUT & GLUE A 'KEY' SEGMENT
THIS SPACER IS REMOVED AFTER FORMER 'X' IS ADDED
WHEELS 1 7/8" DIA. 3/8" THICK OVAL SECTION.
PROP · SINGLE BLADE FOLDING TYPE · 9" RADIUS · 22" GEOM. PITCH · 2" BLADE · CARVE FROM BLOCK 2 3/4 x 1 1/8"
DIHEDRAL SAFETY PLUG · FULL SIZE · FROM 1/8" 'TEABOX' PLY.
5 3/8
140°
3 1/2
3/8
93°
4 BRACES 24 S.W.G.
150°
18 S.W.G.
3 1/2
93°
3/8
WING MOUNT DETAIL
BIND & SOLDER ALL JOINTS
ADJUST ANGLE BY RESOLDERING BRACING WIRES.
1/16" SHEET
5"
2 3/8"
1/8" SQ. BRACE
1/16 SQ.
HOOK
C.L.
2 3/4"
1 3/4
DOUBLE RIBS
1 1/8
1/8 SQ
5/16 x 1/8
PORT TAILPLANE 1/3 FULL SIZE
8 1/2"
DOUBLE RIBS
3 1/2"
LIGHTEN ALL RIBS EXCEPT ROOT RIBS
SPAR 1/16 BELOW WING SURFACE FILL GAPS WITH CHIPS OF 1/16 SQ.
POWER · 10 STRANDS 1/4 x 1/24" 55" LONG · MAX. TURNS USED 1075. OR 18 STRANDS 3/16 x 1/30 1,000 TURNS.
1"
ROOT RIB · FULL SIZE · SECTION R.A.F. 32.
9/16"
15/32
RIGGING MEASUREMENTS FROM TOP LONGERON
TAILPLANE ROOT RIBS · FULL SIZE · RIB OUTLINES 1/16" SHEET · INDOOR STYLE · BOX SPAR FROM 1/32" SHEET.
· WING AREA · 208.8 SQ. INS.
1/4 SWEEPBACK.
1/2 RIBS · 1/32" SHEET
L.E. 1/8" SQ.
1 1/2"
HARD 1/8" SQ SPARS
1/16 RIBS SPACED 2"
3"
5/16 x 1/8 TAPER TO 7/16 x 1/8 AT ROOT
1/2" SQUARES
22"
PORT WING · 1/5 FULL SIZE ·
1/8" x 1/16 TOP & BOTTOM
1 3/4
1/8 SHEET SIDES
5 1/2"
1/8"
1/8" x 1/16 TOP & BOTTOM.
CANE LOCATING PLUGS.
TILT ROOT RIB 10° FOR DIHEDRAL.
WEIGHTS.
PROP & NOSEPIECE ... 1.25
UNDERCARRIAGE ... .55
WINGS ... 1.38
WING MOUNT ... .35
TAIL UNIT ... .55
FUSELAGE & SKID ... 1.72
5.80
RUBBER & BOBBINS. 3.10
TOTAL 8.90 OZS.
PLUGS
4 STRANDS OF MICROFILM RUBBER THROUGH SPARS HOLDS FINS · STRETCH TO 3 OR 4 TIMES NORMAL.
1/8 SQ.
1/16 x 1/8
3"
1 1/4
1/16 SHEET OR WOUND
1/16 DIA BAMBOO
2 1/4"
TAILPLANE AREA 67 1/2 SQ. INS.
1/4" SQUARES.
1"
2 1/2"
· FINS · 2 OFF ·



PEGASUS

A UTILITY WAKEFIELD

By A. BURNS

Although not a pretty model, "Pegasus" more than makes up for its appearance by turning in consistent flights of $3\frac{1}{2}$ minutes. This class of performance from a "flying horse-box," is the best recommendation we could give our readers. Also, the construction involved is very economical with regard to balsa—which is another good reason why the prospective Wakefield builder should make this model his choice for the coming season.

When we came to decide what to build for the 1942 season, the author and some of the members of the Stewarton M.A.C. had a talk in the clubroom, and decided that we would have to go in for a type of model which would entail the minimum of work in building, and be easy to keep in flying condition. We had less time to spend on the construction than ever before, and the bottom of the balsa boxes was well in sight, so we had reluctantly to agree that we could not go in for streamlining and would have to concentrate on making the best of a square type. We had a few ideas on the "crash-proofing" of models, and the snags we had struck in flying our former jobs were all reviewed and cures decided on. These are detailed later.

When the rough outline had been settled and the plans were drawn, we were horrified at the shape of the fuselage, and it was only when we saw the first one in the air that the club stopped heaping insults on the designer. Such remarks as "Flying Horsebox" and "Streamlined like a tramcar" were all too common; but the performance of the model belies them. In fact the one built by the author has flown all through the season in weather worse than anything we have experienced yet, and over all the timed flights it has an average of 3 minutes 30 secs., on our own ground. The best flights were two of 8 minutes 3 secs. and 10 minutes 14 secs. in the Weston Cup, the only day of good conditions we had, but the flight of 3.55 in the National Cup in a gale, was the most convincing proof of the worth of our attempts at "Crash-proofing." On that occasion two of the other models were destroyed completely by the wind, but the two Peggies both were undamaged, although the wind broke the safety device in my wings three times, and Charley Ewart's twice. We took a liking to the models after that.

The peculiar thing about these models is that they glide nose into wind in gusty weather, and are in sight much longer than normal as a result. We think this is due to the fuselage shape and the side area at the nose being small when the prop is folded.

The wings are built with a spar of hard $\frac{1}{8}$" square top and bottom, and in the centre bay these are made into boxes by adding sides of balsa or thin ply. When these are hard, the centre rib is cut to allow a Vee-piece of $\frac{1}{8}$" ply to be plugged into each half, to join them and set the dihedral. If hard stuff is used for the spars and the ply is of ordinary tea-box quality the wings will be a little stronger than the Vee-piece, and when the model is struck by a gust, when in your hand, or if it turns over on landing, the Vee-piece will break with a bang, and can be drawn out and replaced in a few seconds. These Vee-pieces are used up quite fast, so make a dozen at a time. The wings are easy to build and call for no other comment, except that if you must use softer wood for the spars, it would be advisable to add a web of $\frac{1}{32}$" sheet from the centre half-way to the tips. To keep the top true to the section, the upper spar is set below the surface $\frac{1}{16}$" and the small spaces in the ribs filled up with scraps.

The fuselage is a simple box, faired to a round nose, and to allow ampe room for the rubber this front former is wound from pine, and after it is in place the front spacers are cut away. The under-carriage parts must be added before the other formers are put in place, and as this is an unusual type, care is needed to get it right. The idea was that the spring type, as used in Pete, was liable to spread under the weight of a Wakefield, so we put it in at the bottom corner instead of at the side, and allowed the top of the leg to rest against the side of the fuselage, where there is a plate of sheet for the other leg. Thus the legs can move backwards easily, but cannot spread. The snag is that the legs must cross, and that means that one goes into the fuselage well ahead of the other, so that they would be raked in opposite directions if the holes for the rubber bands were in the same place. To get the wheels level with one another, the band which springs the forward leg must come through a hole much further ahead of the corresponding one for the rear leg. This sounds very complicated, but a glance at the plan will make it clear. To prevent the legs jamming in the holes, these must be wider at the inside than in the outside, and it is a good idea to make them a firm fit for width, but an easy fit for length. The fit for width is needed to keep the legs from turning, thus allowing the wheels to be out of track. The tail skid is a very important member of the undercart. By careful experiment with the length of this we succeeded in reducing the take-off run from 3 feet to 2 inches in a flat calm.

Apart from the under-carriage fixings and their facings of thin ply, the fuselage calls for little comment. The tail peg runs through two pieces of $\frac{1}{8}$" sheet near the centre of the fuselage, which serve to centre the bobbin in the wide space, and also to stiffen the rear of the fuselage against collapse from torque. These must be well fitted and cemented. The sheet in the way of the wing mount is important, so do not omit it.

The tail unit uses an arrangement published in *Gadget Review*, and consisting of a box spar through which a band of four strands of microfilm rubber is stretched, with the fins hooked on to each end. The fins do not wobble in flight, if they have their area fairly divided above and below the hooks. These hooks must not be too long or they will break the spar when knocked out. The tailplane is built of outlines for ribs, the flat lower parts being assembled with the L.E. and T.E., then the spar cemented in place, and the tops added last. The end ribs are double to resist the pull of doped tissue.

The prop is a single blader of normal folding type. Take care that the pitch is not any greater than the amount stated, as the performance depends on this, and any increase will cut down the climb. The amount of downthrust needed will depend on the weight of the folding blade, and is none with a normal one and about 2 degrees with a very light type. A heavy blade is to be avoided, and holes may be cut in the blade, and then covered with tissue, if hard balsa is to be used.

The original model was doped on a scale suitable for our weather in these parts, and is heavy in consequence, being close on 9 ounces, but it should be possible to come down to $8\frac{1}{4}$ with care, when the performance will be better than the original, which in still air has a time of $2\frac{3}{4}$ minutes on 90% turns. The motor of ten strands of $\frac{1}{4}$ by 1/24th, or 18 of $\frac{1}{16}$ by $\frac{1}{32}$, should not be exceeded. If your model will not climb on that power then the prop is probably wrong.

Some experiments were made with this model to get the best rigging angles, and these are shown on the plan. The measurement of the distance between the lower surface of the centre rib and the top longeron is $\frac{1}{32}$ more than the same distance at the trailing edge. The first is best found by putting a thin ruler through the space between the wing halves which can be slightly parted for this purpose. If the glide is rather inclined to a dive, the tail can be given a very slight negative angle. The climb is adjusted by the thrust line, and probably no downthrust will be needed. The power run on 1,075 turns is 75 seconds, and takes the model well up. Circle to the right is obtained by very slight packings between the fins and the tailplane ends, and by slight offset of the thrust, but it is very easy to overdo this, so do not build in these adjustments, but make them in your flight tests.

The folding airscrew of "Pegasus" is shown to advantage in this view.