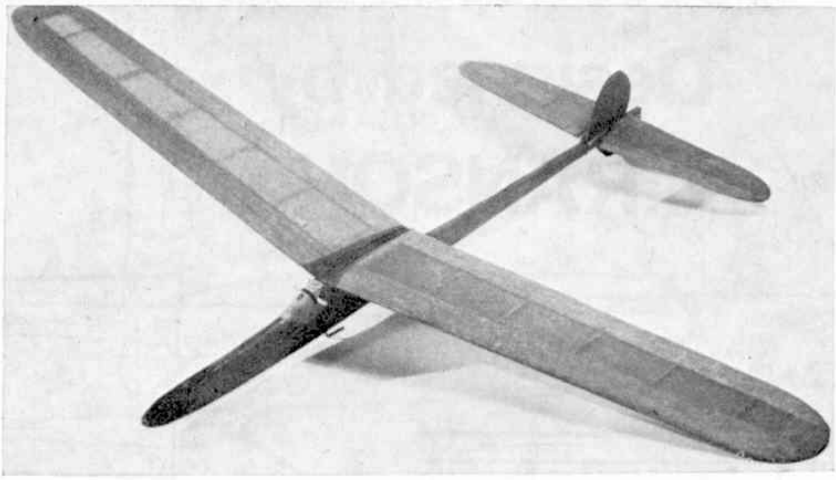
MINIMOD



Full-size plans for a tough, high performance 25 in. wing-span glider

By LEN RANSON

MINIMOD is exactly what its name implies: a true model aircraft in miniature, both in appearance and style of construction. The idea behind its design was to present a model that even the rawest beginner could produce, but yet not look too typically a beginners' model. In fact, I personally do not believe in beginners' models as such; any model design, in my opinion, should be capable of a performance of interest to the experienced modeller just as much as to the beginner, and here *Minimod* is every bit up to model club standard, giving a fast, soaring type of flight which everyone will admire, even the expert. It should be good to look at, too, if built and finished correctly, with its sleek, modern sailplane lines and realistic flight pattern.

You can construct *Minimod* in a few evenings, using only the very basic tools: a balsa knife and a few grades of fine glasspaper, plus, of course, model pins and drawing pins. You will, however, need some sort of building board, and here any flat piece of softwood, not less than 30 in. × 6 in. in size, will suffice. A piece of floorboard will do admirably, although it is advised that you buy this rather than prise it up from the living room floor. And, I almost forgot, you will need some grease-proof paper.

Regarding materials, the sheet balsa is perhaps a bit expensive, particularly the thick stuff, but the durability of this type of construction over that of strip balsa and tissue is well worth the extra outlay, Moreover, the tough sheeting makes *Minimod* an ideal rough weather model, allowing it to be thrown about without mishap. See, though, that the sheet is soft. Not pappy soft, but definitely the lighter balsa wood grade. Here your model shop should help. Most balsa sold is now graded into soft and harder categories, and you should not have too much trouble in getting the type of wood you require. Hard balsa will make for tough carving and disastrously over-weight your model.

As you can see, the fuselage is a three ply lamination: two pieces of $\frac{1}{8}$ in. sheet sandwiching a centrepiece of $\frac{3}{16}$ in. sheet. The difficulty is to shape these as per plan. One way is to take a tracing on greaseproof paper, cutting this out and lightly pasting on to the sheet balsa. The shape can then be readily cut with a sharp balsa knife. Do not forget the ballast well in the centre piece, nor the cut outs for wing and tail platforms and the towhook slot. The towhook assembly, that is, the 18 s.w.g. wire looped and bent as shown held between two slivers of plywood, must be cemented in before assembling the fuselage. Prepare the fuselage sections by smearing a thin layer of cement over each of the facings. Allow to dry, repeat the process, press the sections together and hold firm with a light cellotape binding. Leave to set for at least 24 hours, then carve and sand to shape. Do ensure that you pare down to the right dimensions; nothing looks worse than a lumpy half finished fuselage.

Now cut out the sheet wing sections, preferably using a steel edged rule. Shape these roughly to the aerofoil shape indicated on plan before pinning down. When you have constructed the two wing halves slightly cant back the dihedral break ends to ensure a good V fit and cement the two halves together. This is best done by pinning down one wing half and propping up the other with a $3\frac{1}{2}$ in. support at the tip. When thoroughly set, sand down smoothly to the aerofoil shape, finishing off with the finer grade of paper. Again ensure against lumpiness, particularly at the tips and along the trailing edge. The tailplane is similarly constructed, but without dihedral.

The fin is cut from $\frac{1}{16}$ in. sheet. The edges should be sanded round.

Having completed the various components they should be given a coat of dope, and when thoroughly dry lightly sanded to a satin finish.

The model is covered in Modelspan tissue, using a model tissue paste as an adhesive (I use thick Polycell). The paste should not be spread on too thickly, nor over the whole of the balsa areas. Paste along edges only, pulling the tissue with an even tension. Allow a slight overlap when trimming off, and paste this smoothly down. Lightly water spray the components, though not the fin sections as this may cause warpage. Leave to dry for at least 24 hours.

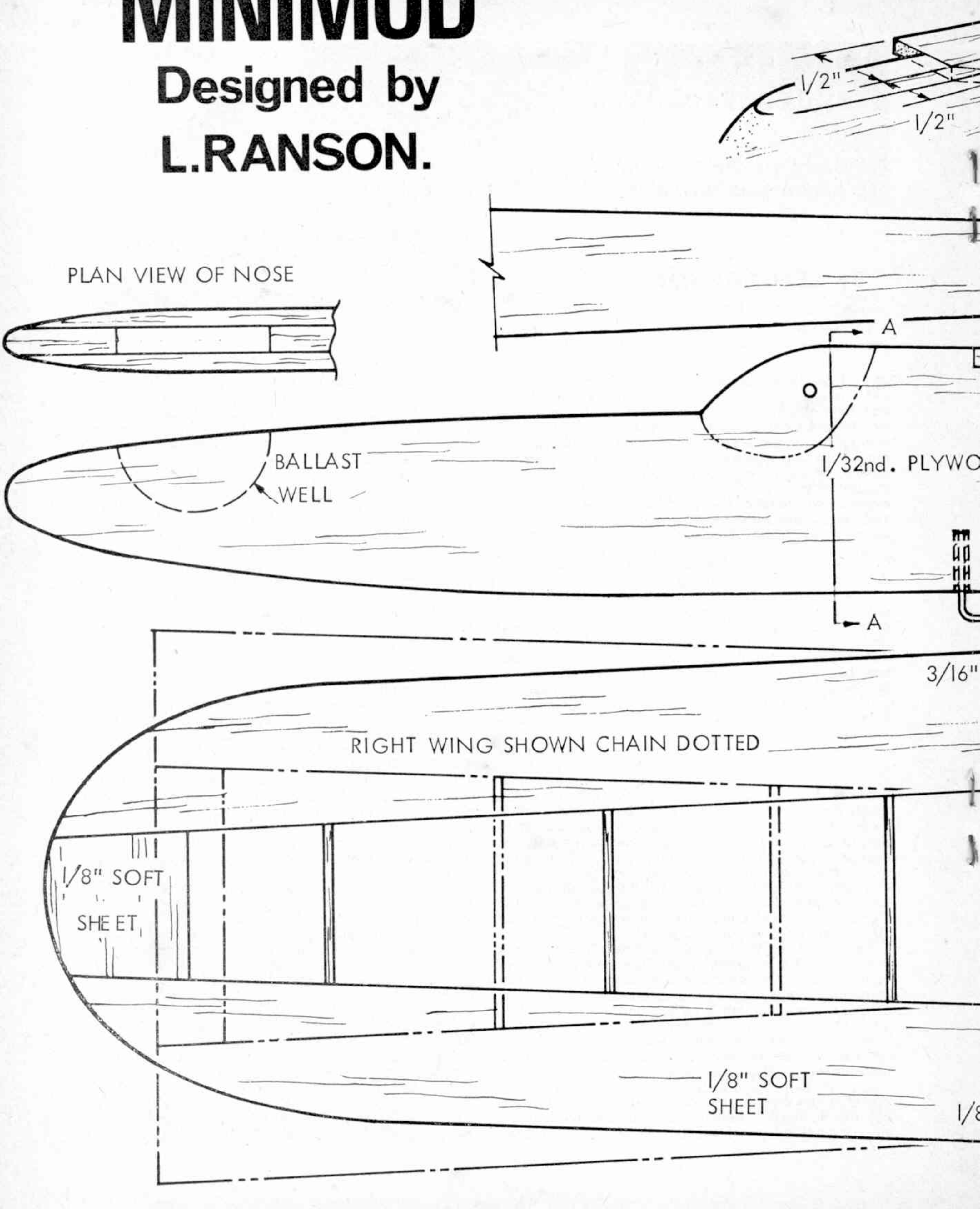
You can now cement the fin sections to the tailplane and fuselage. You will notice that the upper fin needs to be shaped to fit the tailplane section.

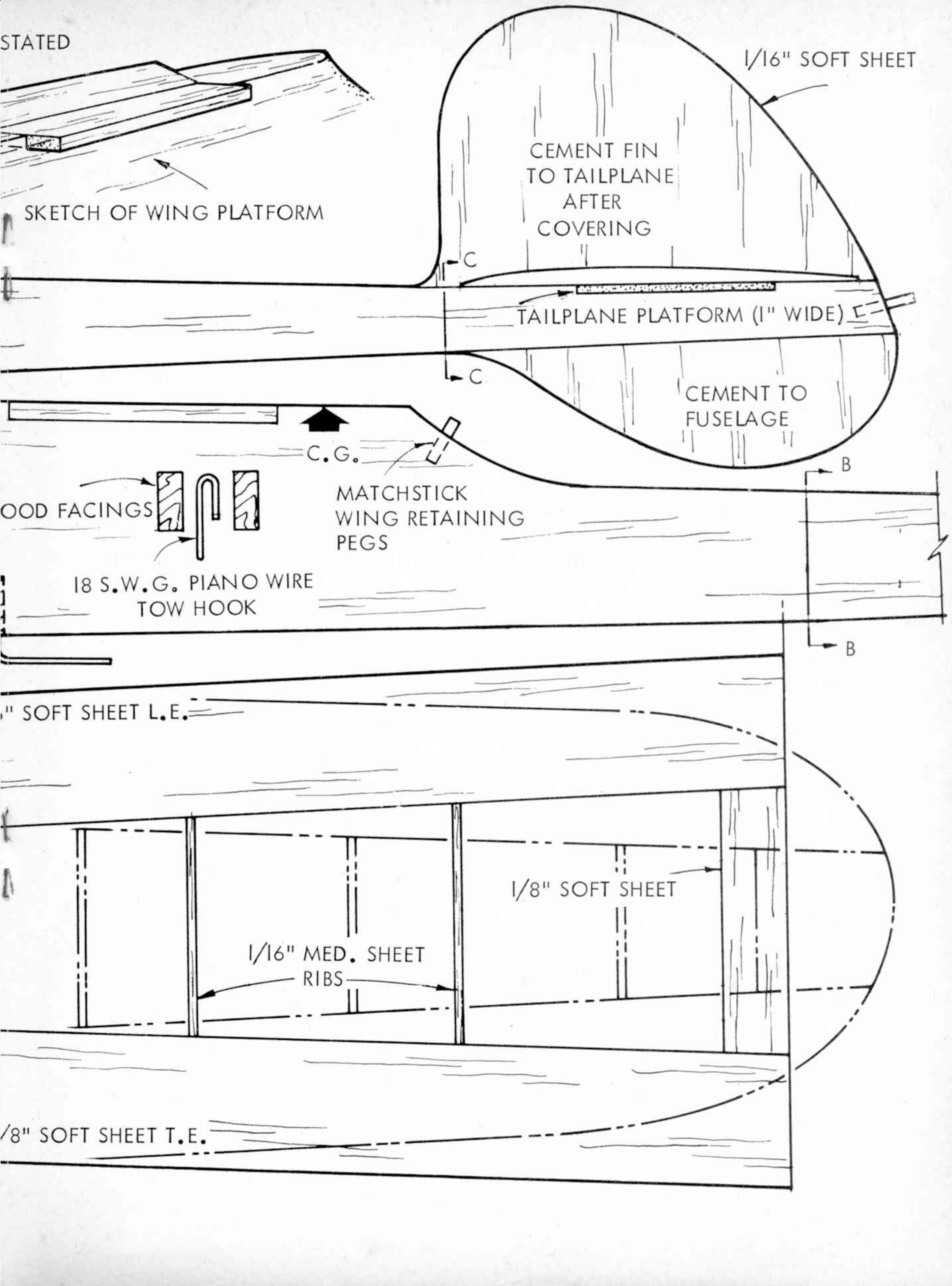
Give the whole model a coat of dope, and an extra coat to the fuselage if required. For a high finish use banana oil or even fuel proofer, though apply same sparingly. The cabin can be denoted by two layers of a lighter coloured paper.

Ensure that the wing is a good fit on the platform, which should be vee-ed to take the wing dihedral. Next, pierce the fuselage where shown to take the matchstick retaining pegs. Fill the forward ballast well with lead shot or lead scrapings, using Plasticine to seal it in. Use not one, but two, rubber bands to hold the wing on to the retaining pegs—same for tailplane. It is important that the surfaces are attached firmly, without wobble, particularly as the model tows up fast. Do not

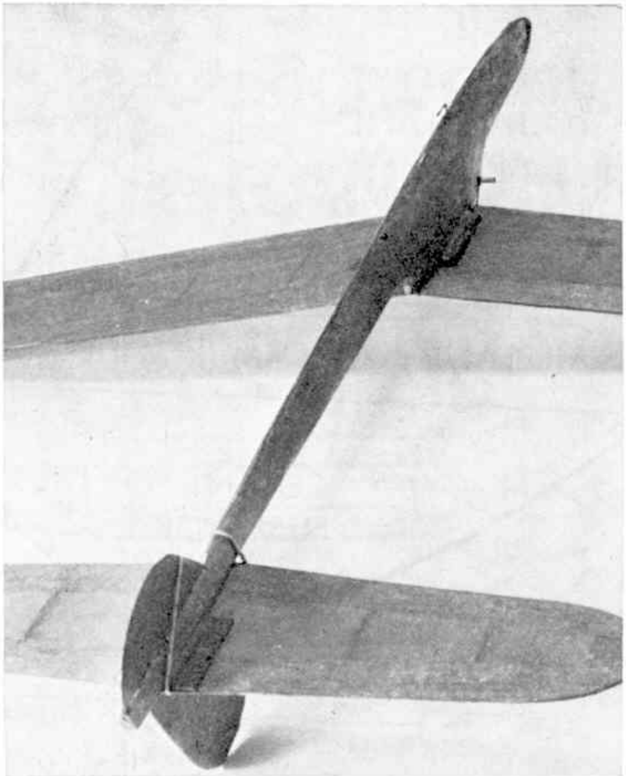
MINIMOD
Designed by L.RANSON.

ALL WOODS BALSA UNLESS OTHERWISE ST





STATED
SKETCH OF WING PLATFORM
1/16" SOFT SHEET
CEMENT FIN TO TAILPLANE AFTER COVERING
C
TAILPLANE PLATFORM (1" WIDE)
C
CEMENT TO FUSELAGE
C.G.
MATCHSTICK WING RETAINING PEGS
OOD FACINGS
18 S.W.G. PIANO WIRE TOW HOOK
B
B
" SOFT SHEET L.E.
1/8" SOFT SHEET
1/16" MED. SHEET RIBS
/8" SOFT SHEET T.E.



overtension, though, as in the event of a mishap, the wing should spring off.

With the model assembled and balanced at the point given on the plan, try a hand launch over a soft patch of grass. If all is correct it should travel quite a few yards from a gentle, shoulder height throw. However, it might well dive in, and if it does this and you are satisfied that it is not due to faulty launching, remove some of the nose lead and try again. On the other hand it may rear up into a stall. It may do this anyway, if the weather is windy or your throwing too energetic, but if it persists in doing this from the gentlest of launches then more nose weight is indicated. Again if the model veers to the right or left you should correct this tendency by bending the rear part of the upper fin.

The towing line is a length of terylene or nylon about a hundred feet long, and this can be obtained from a model or angling shop. The launching ring can be a curtain ring, about ½ in. diameter, or bent from paino wire, and is securely tied to the end of the line. Attach a drogue of tissue paper about a foot back from the ring—it's easier to find that way. Use only about twenty feet or so of line for your initial flights. Get your helper to hold the model level into wind, head high, and run forward with you until sufficient airspeed is obtained for the line to take it up. The amount of run of both tower and helper will depend on the strength of the wind. Do not carry out initial tests in anything but a slight breeze.

You will find the model will tend to pull up very quickly on the line and swoop off quite suddenly. The amount of control you achieve over the model is a matter of practice. It is, of course, very unlikely that the model will be in correct trim. It might well stall, or go into a spiral dive. This is where the robustness of *Minimod* pays off. The sort of crash which would severely damage the balsa and tissue type of model will leave *Minimod* unscathed. Even so, test fly your model over fairly high grass, and see that there are no people standing just down wind.

Once you get the hang of flying *Minimod* you should have many interesting flights.

Materials

1 sheet of Soft $\frac{3}{16}$ in. × 4 in. × 36 in. Sheet Balsa.
1 sheet of Soft $\frac{1}{8}$ in. × 3 in. × 36 in. Sheet Balsa.
1 Strip $\frac{3}{16}$ in. × $\frac{1}{16}$ in. medium balsa.
1 short length $\frac{1}{8}$ in. × $\frac{1}{16}$ in. balsa.
Scrap of $\frac{1}{16}$ in. sheet balsa (for fin sections and tail-plane platform).
Slivers of 1/32 in. plywood.
Short piece of 18 s.w.g. piano wire.
2 sheets of Modelspan tissue (variously coloured).
1 tube of cement, medium.
1 tube of tissue paste.

CLEAR AS A BELL

(*continued from page 334*)

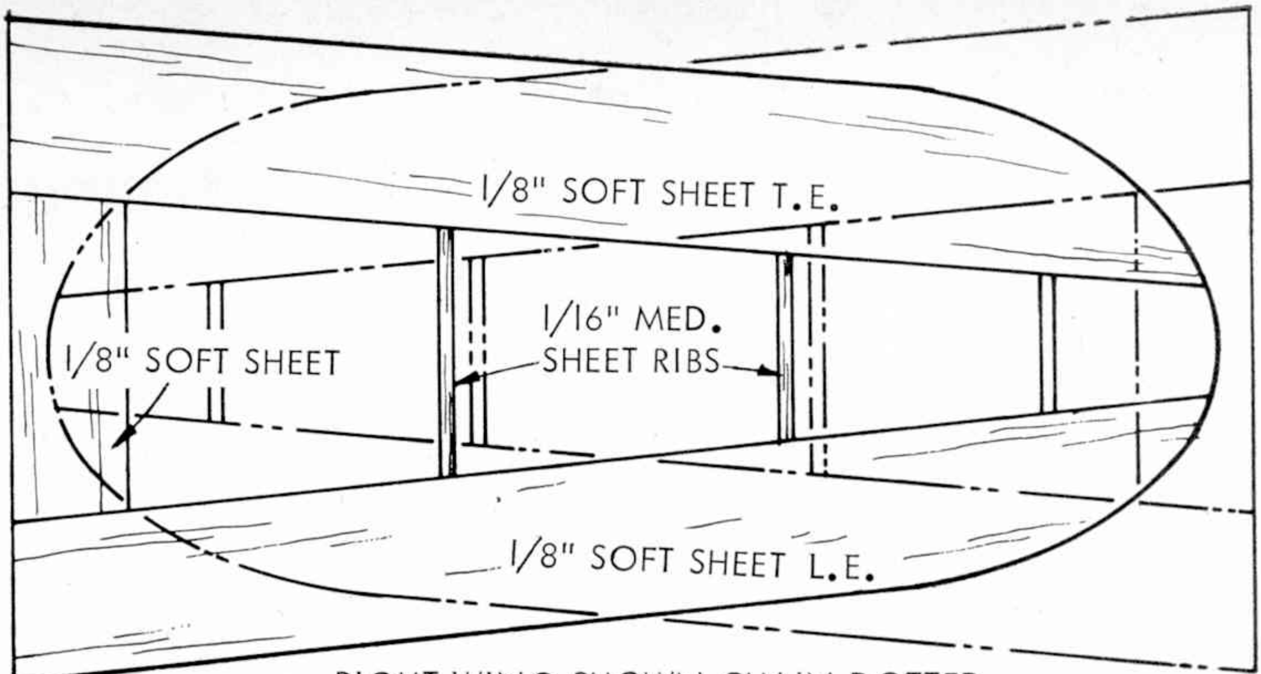
colour and has to be cleaned, then set up ready for tuning.

The quality of a bell's tone depends on the shape, size, thickness and material of the metal and experience is the main guide as there is very little written as textbook on the subject. To the expert a bell has five distinct notes—the strike note, the hum, which is an octave lower, the nominal, which is an octave higher, the tierce, a third above the strike, and the quint which is a fifth above the strike. A bell is always cast slightly sharper than the note required so that it can be gradually flattened to the correct note by turning metal from the inside using a large vertical lathe to do so. By removing metal from different areas inside the bell each of these notes is at its correct position in the musical scale. This is a task that requires true craftsmanship and experience, involving hands, ears and eyes, working together. If a mistake is made it cannot be rectified. Incidentally, the bell metal is so valuable that a special machine is used in the foundry to separate the fragments of metal from other sweepings.

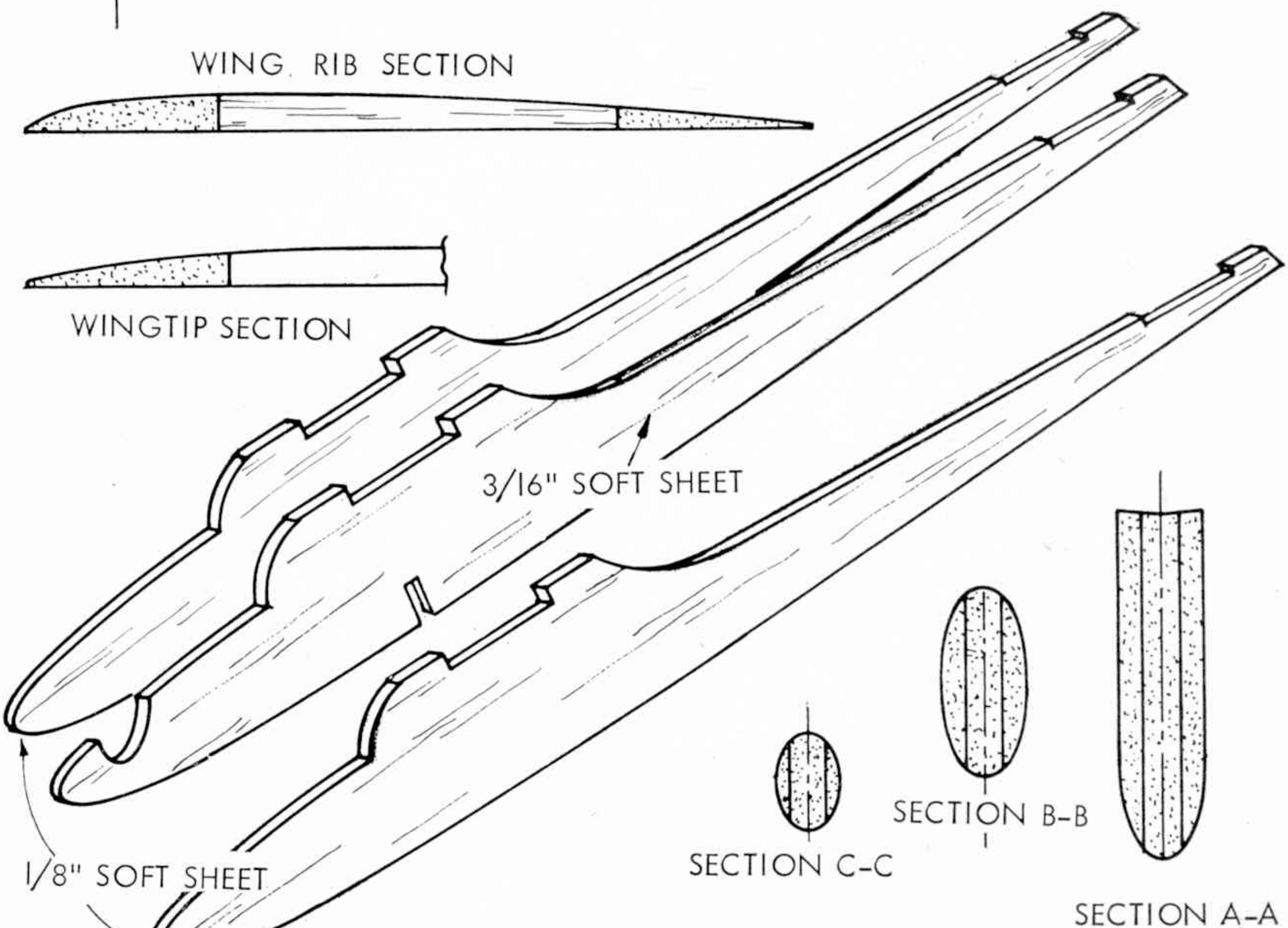
When a new " ring " or set of bells is being tuned they are placed in a semi-circle and the tuner walks by, hitting each one in turn with a wooden mallet to ensure that they make a pleasant harmony. During testing the room is filled with their deep, sonorous sounds. After tuning each bell is lagged with material to protect it during transportation, particularly the lip from chipping which would affect the sound of the bell.

The hanging of the bell is also very important because it can affect the ringing sound and the safety of the tower so the bell-foundries employ specialists to do the job. The bell foundries have metal-working and carpentry departments where specialists make the various parts of the bell frame, even the keyboards for carillons. A wheelwright makes the bell wheel over which the bell ropes run, the spokes being of oak, and the rim of elm. Another expert sets the ball bearings in the wooden guides for the ropes. The " striker " and other metal parts are also made at the bell foundry, with the girders which support the frame in the belfry.

Automation, however, is creeping into the act of bell ringing itself. In its simplest form this consists of an outfit that will stop or start a bell ringing at the push of a button, while it is possible now to obtain a time switch which can be set to ring a bell at the appropriate time for the services during the whole of a week.



RIGHT WING SHOWN CHAIN DOTTED



DIHEDRAL LAYOUT