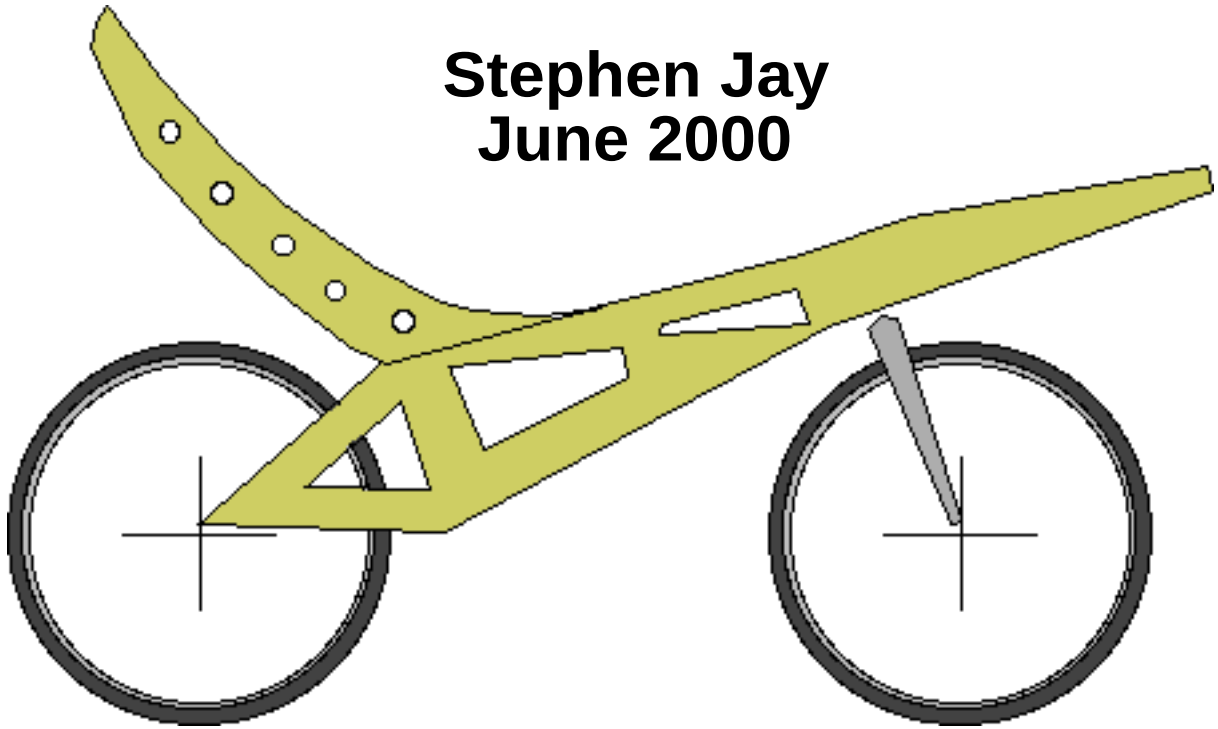
WoodBike v1.5

Stephen Jay
June 2000



Last revised10:41 AM, 16/6/00

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Overview - scale: 1/10 approx

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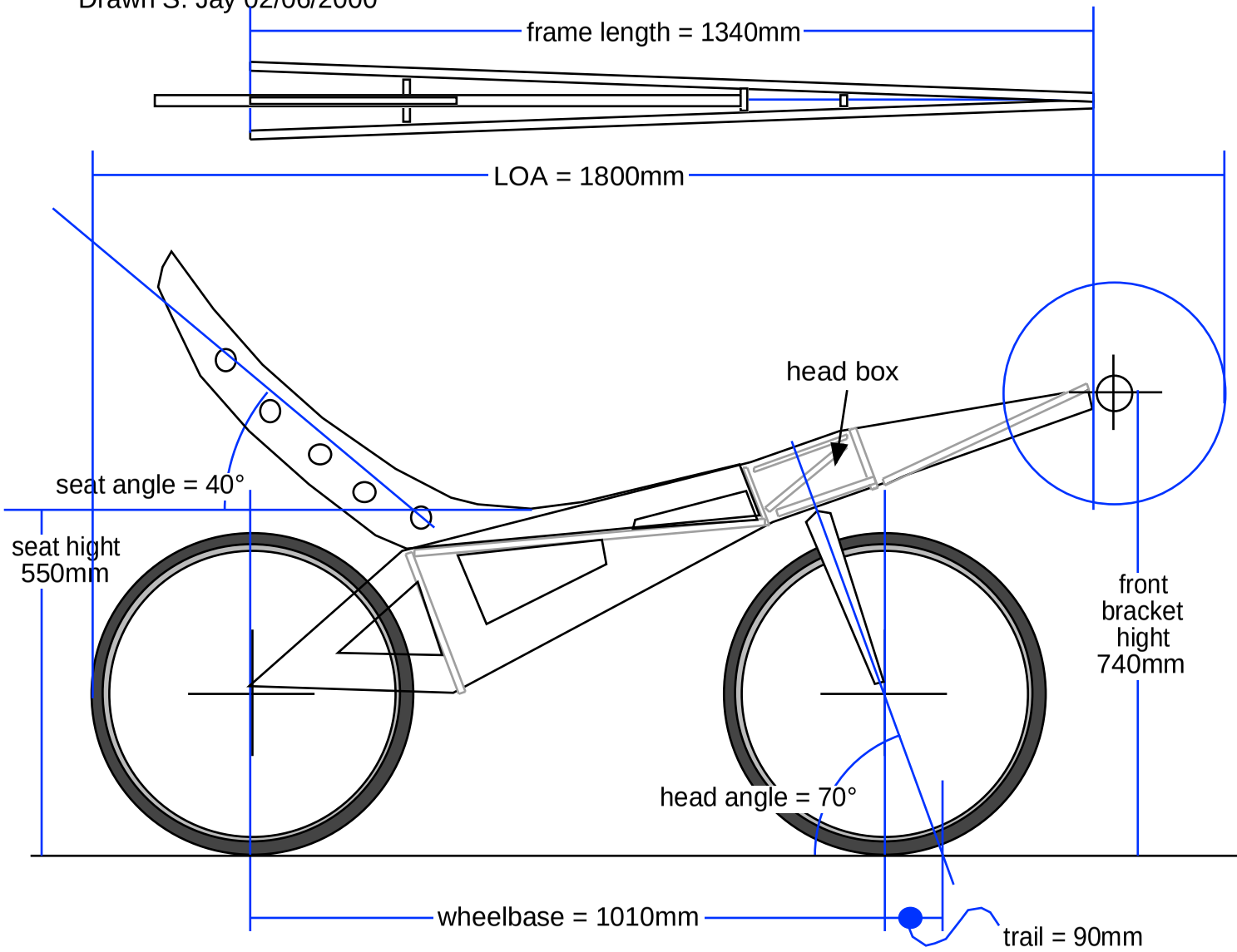

Revisons:
OK, a triangular prism is stronger than a sheet (you don't have to hit me with a brick), and are therefore lighter for the same strength. As a result, the tailbox (heavy, complicated structure) and triple laminated seat and front spars (heavy!) are gone and have been replaced with a triangulated box of 12mm sheet and a simplified seat spar.

This has made the head simpler, as the 2 sides of the box form a triangle with the rear axle, leaving enough room for the head tube between them. The end result is hopefully going to be much stronger and lighter than v1.2.

I'm glad I had this brainstorm before constructing 1.2! Using this design, with the parts precision cut and assembled using stitch-and-glue construction, I should be able to keep the steel parts to rear axle brackets, head tube, fork and front bracket, plus a few nuts, bolts and pulleys here and there.

I still hope to do a wooden fork (Son of WoodBike?) but I want to prove the main concept first. To that end, I'll probably use a BMX fork.

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Main parts - scale: 1/10 approx

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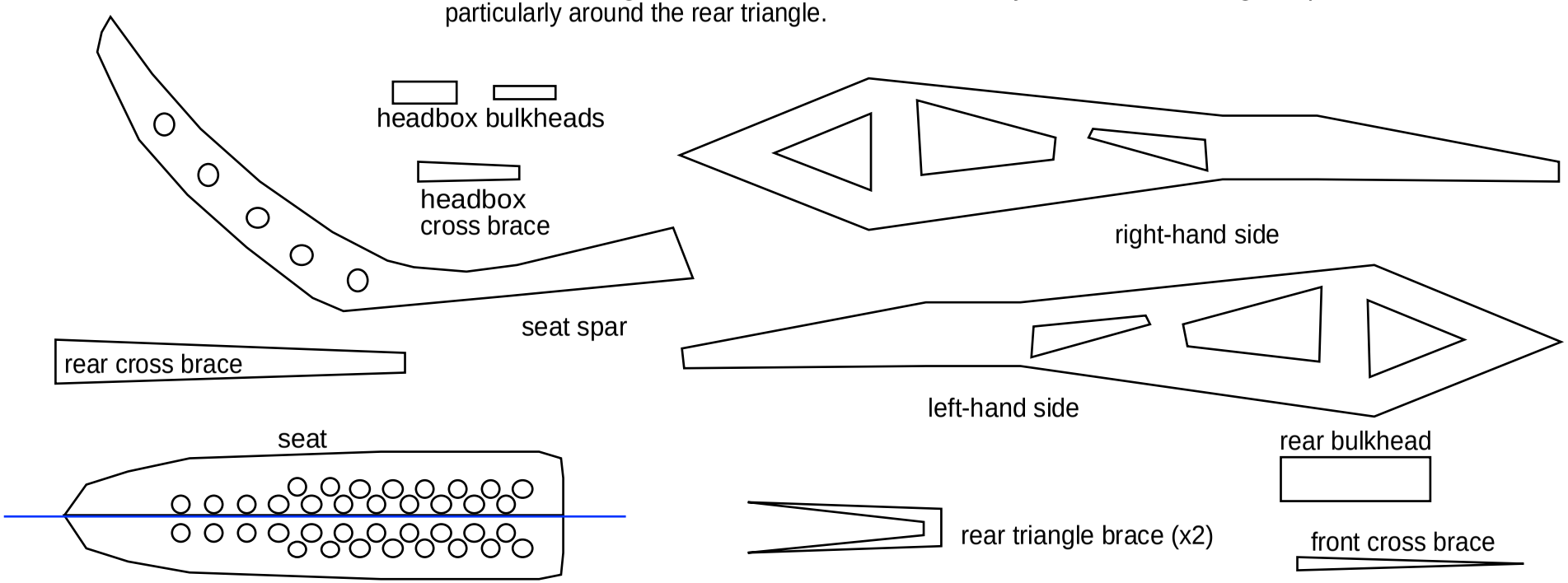
The main frame parts are cut from 12mm aircraft or marine grade plywood. Cross pieces and bulkheads need to be precision cut to fit as per dotted lines in drawings on page 1. I suspect the best method of construction will be to fasten the 2 side together at the “nose” with the tail ends spaced at 135mm apart. (The standard rear axle width.)

From here, the bulkheads and triangulars will be cut to fit, stitched and glued into place, whereupon the seat spar will be fitted (on top of the main triangular, as per page 1.) Once the frame is built, some flex testing should be carried out to see if any additional stiffening components will be needed, particularly around the rear triangle.



The steerer (or head) tube assembly (see detail) will need holes drilled, top and bottom (VERY ACCURATELY!!!), in the closed-in head-box area. It is VERY important that the steerer tube is precisely aligned, and as it’s the holes in the stop and bottom fillets at this point which hold this component they must be perfectly centred on the steering axis.

The seat itself is cut from 6mm aviation or marine ply and glued and screwed into place, centred on the seat spar. More holes could be drilled in the seat than are shown, actual hole sizes and drilling patterns depend on the ventilation required and the weight of the rider. (More holes, weaker seat.)

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Head tube detail - scale: 1/1

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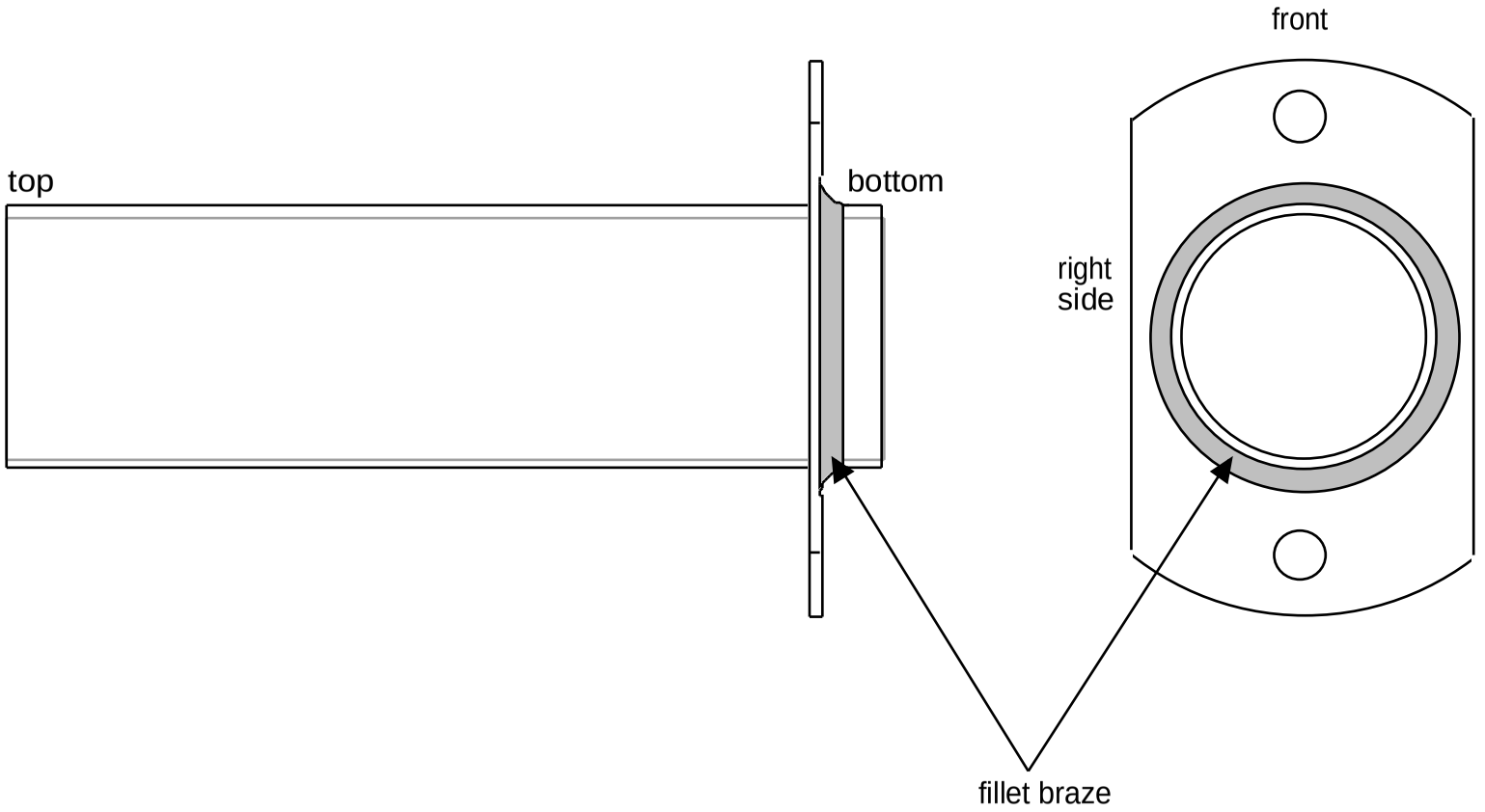
The steerer tube is a 120mm length of 33mm ID chromoly with a collar flange fillet welded around the bottom to allow 10mm of the steerer to protrude from top and bottom of the frame. The assembly is held in place in the frame by 36mm holes drilled in the top and bottom of the frame's head box and 2 cheese-head screws through the flange.

This component needs to be cut, shaped and assembled to the highest precision possible.



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Head box detail - scale: 1/2

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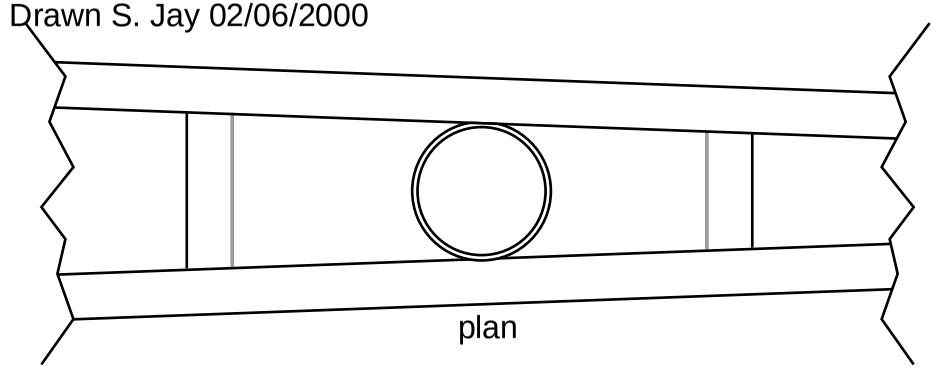
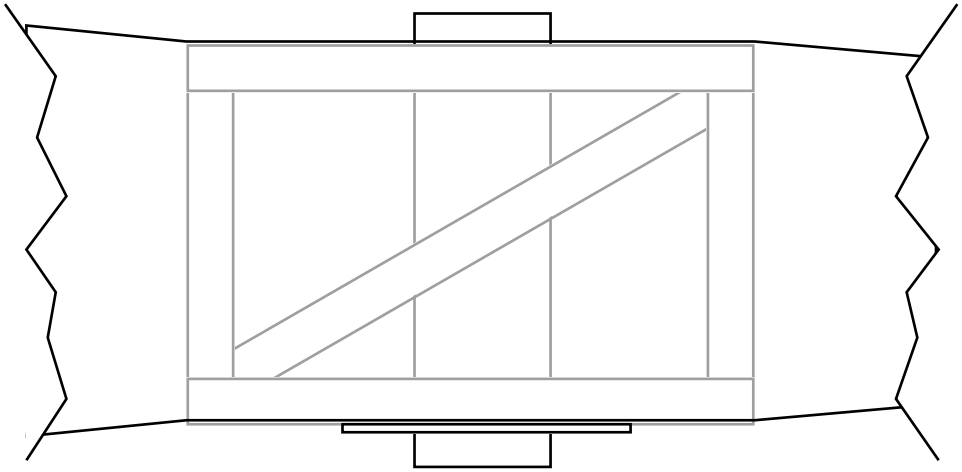


plan



right side elevation

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Front bracket detail - scale: 1/1

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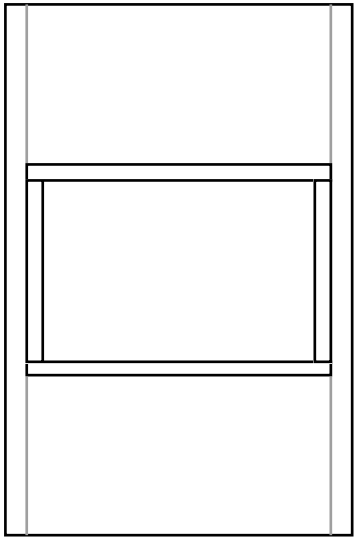
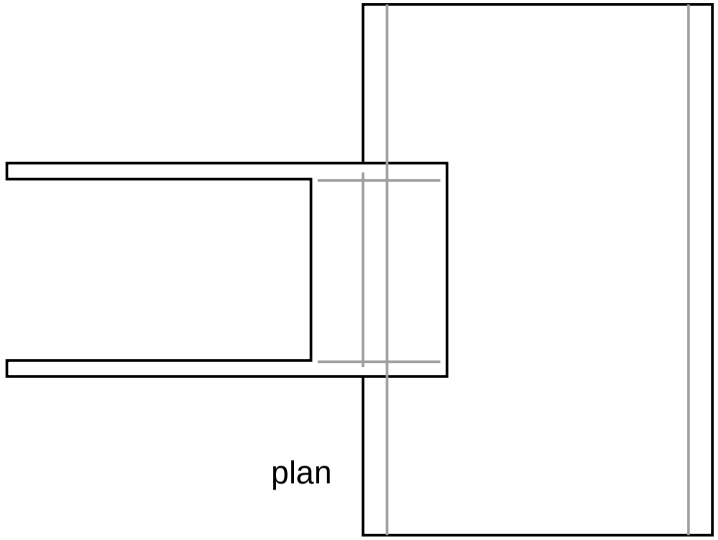


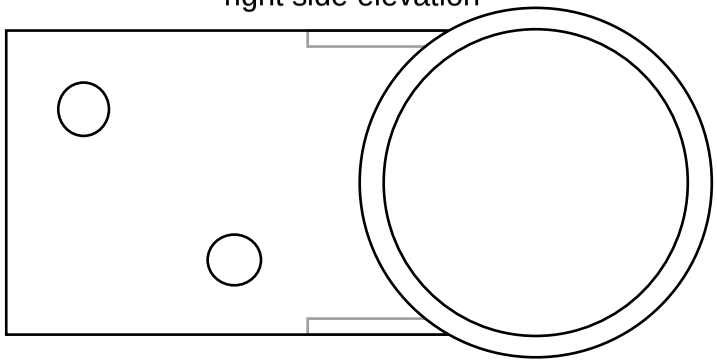
rear elevation



plan

The bottom bracket is a standard shell fillet welded to a clamping bracket which is fastened to the front of the frame by 2 bolts.

right side elevation



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Tail droput detail - scale: 1/1

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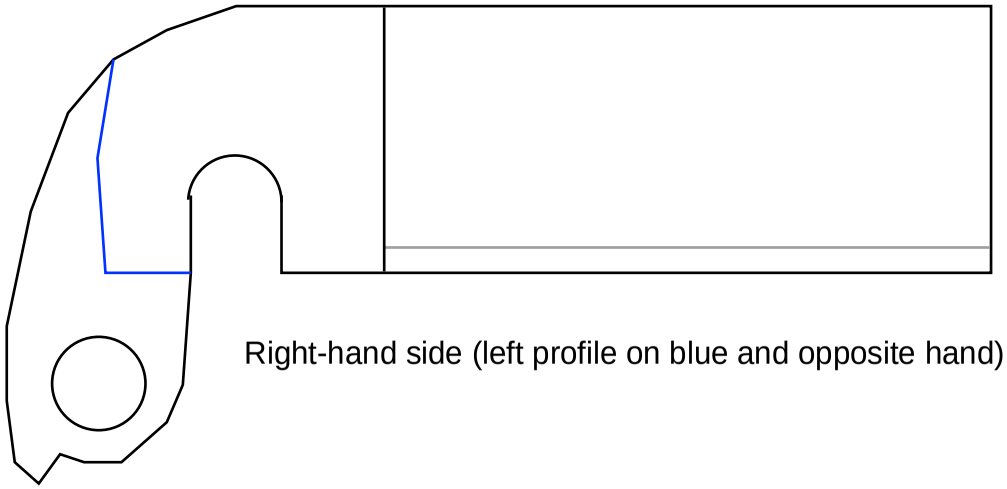
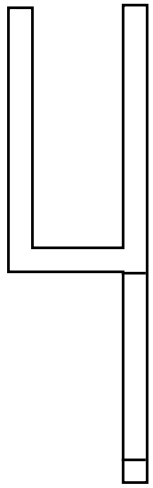


Right-hand side (left profile on blue and opposite hand)



Right-hand side
(left bracket is opposite hand)