

Case Study

Development Process of New Design Pole Antenna Clamp

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1. Summary

An engineering manager of a Cambridgeshire Military contractor got in touch with Lynar to discuss a new design he had come up with.

2. Introduction

The company fits and maintains satellite aerials for UK military amongst other various communication functions.

The engineering manager in question is a very hands on person who goes out in the field overseeing fitting and adjustment of satellite aerials, hence the reason for his intricate design knowledge of the component in question.

Example of Customers product:



3. Product Detail

The Old Product Design was rather agricultural in structure and very outdated. The old brackets for connecting two antenna poles required a team of personnel and a crane (with Driver) to be able to fit. The design only enabled the antenna tilt to be 5 degree increments also.

Examples of Old Products



4. Initial Design Methodology

A new design had been sketched by the customer and sent to a subcontract design engineer. This engineer had drawn a new 3d model and had the model tested for structural and durability purposes. This was a requirement of the military to ensure that the product functioned properly and would be reliable.

The new design changes improved the bracket as follows:

1. The fitting of the bracket could be reduced to two team members
2. A crane would not be required at installation
3. 1 Degree adjustment would now be possible aiding alignment of aerial to satellite – although this was a bonus feature added later on in the process after Lynar got involved

5. New Design

Although the new design had been tested within a 3d CAD model, the product had not been thought about with respect to manufacture.

This is where Lynar really got involved in developing prototypes and ensuring the product could be manufactured to the exacting standards expected of the UK armed forces. We took the 3d CAD and used it within our own Solidworks system which is kept up to date as the latest 3d designing technology. This enabled swift extracting of geometry to our machining and wire erosion centres.

6. Sample Manufacture

A one off sample was produced at first to prove the part. The pole mounting required accurate machining of the main clamp to ensure good fitting on the pole. Lynar used high precision wire erosion technique to make sure this happened utilising our Sodick VL600Q wire machine. We also had to develop the shape of the pole clamp cut out in order to maintain adequate clamping force.

Other features were added including locking mechanisms to help further durability – as recommended by Lynar Manufacturing.

7. Production

Then an initial first run of ten off was completed utilising the following operations:

1. Full Machining and Turning of Aluminium bodies
2. Engraving end of bar to show angle increments
3. Wire Erosion of clamp area in main blocks
4. Anodising and Painting of Component – Note: High aspect paint was applied, and the parts had to be masked off to ensure correct assembly.
5. Assembling of main bodies and other items such as Heli coils, stainless steel bolts, special stainless threaded inserts. Again, the special inserts were recommended and sourced by Lynar whilst being approved by customer. This was another big development factor applied by Lynar that the customer had not considered in their initial design.
6. Packing – specialist packing was used so that the antenna clamps could be shipped all over the world.

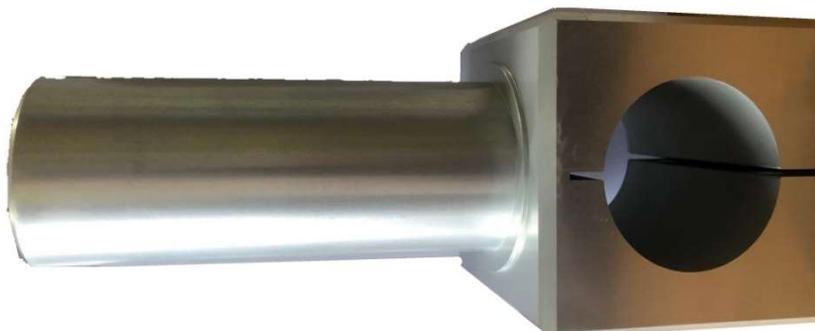
Lynar were initially chosen as we are able to offer many different operations such as drilling and tapping, making us a one stop shop!



Engraving



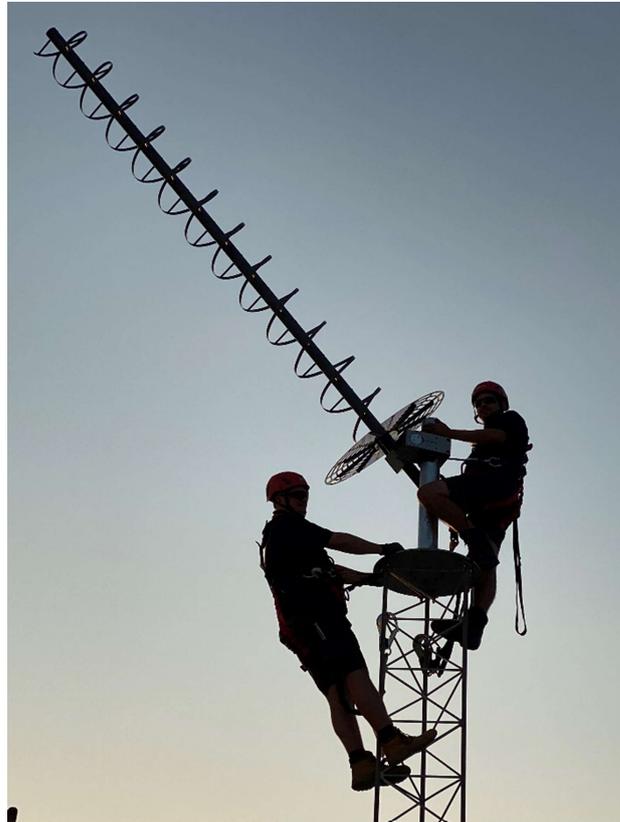
Main Clamp Block part assembled and Anodized



Freshly Turned and Wire Eroded

8. Conclusion

The final product was successfully fitted and tested at an undisclosed UK air base (not situated in the British Isles). Both the subcontractor and military were very pleased with the new design.



9. Costs Implications

The Cost comparisons of the old design and new were substantially different. The old design costing between £50 - £100 pounds whereas the new design cost just over £1000.00.

The actual cost saving was very high though as the new design clamp negated the need to hire a crane and a driver for the day. Also, other added features meant that the clamp could be installed with two men rather than a team of people. Bearing in mind too, that some of this equipment would be installed all over the world by British engineers.

All this equated to a major saving in both cost and time running into thousands of pounds and tens of man hours.

A very successful project re-engineered and manufactured at Lynar Manufacturing.

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