

Case Study

Ground - braking carbon fibre composite musical instrument

Project established the viability of manufacturing a musical instrument from carbon fibre composite materials.

Bryan Maynard - a master musical instrument maker and orchestral musician - has developed, over a two year period the 'Celtic Bass'.

This instrument combines the power of an electric bass guitar with the versatility of the orchestral Double Bass, but without the cumbersome weight and size of either.

A prototype instrument has been exhibited at the Frankfurt World Music Fair, receiving considerable interest and enthusiastic comment from players and dealers alike.

Not wishing to have these instruments manufactured in the Far East and being interested in exploring the possibility of manufacturing the instrument from composite materials here in the UK, Bryan turned to [Composite Engineering](#), a design consultancy specialising in the design and development of advanced composite structures.

The company is assisting Bryan with the project and helped secure DTI support for both a Product and Process review and a Feasibility Study.

Product and process review

Composite Engineering worked alongside Bryan to further develop the design of the instrument to enable it to be produced from carbon fiber composites as efficiently as possible and to enable volume production at relatively low cost.

As Bryan was based some distance away from Composites Engineering, they developed an interactive 3D CAD model of the instrument for Bryan, to enable real-time dialogue.

A concept instrument was developed empirically from carbon fibre composites and various manufacturing technologies were investigated, along with costings to assess both design and manufacturing iterations.

A final report was presented to Bryan illustrating that his instrument could benefit substantially from the application of composite materials and that this manufacturing route presented a commercially-sound proposition.



Fig 1. Celtic Bass 3D CAD Rendering

Feasibility Study

Following on, Composites Engineering then helped Brian to establish the final design of the instrument and carried out detailed research into the various practical and commercial steps necessary to put the instrument into production.

The scope of work carried out during this phase of the project included:

- A low-cost prototype instrument was constructed
- The design was refined further in 3D CAD
- Material specifications and construction of the instrument was finalized
- A suitable manufacturing process was designed and developed conceptually
- Potential subcontractors were found and asked to supply costings for various component parts of the manufacturing process
- Costings were developed for a production run of instruments
- Subsequently, analysis of quotations and costings was carried out



Fig 2. Close-up of the head of the instrument illustrating the woven carbon fibre finish.

Conclusion

The project is now working towards bringing this ground-breaking instrument to the musical instrument market, and to achieve this goal Bryan is currently discussing the project with interested investors who can help to put the instrument into mass production.