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A design strategy for brass instruments

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This paper describes the processes being used to design a C trumpet. Since "one size fits all" is not a good approach for high-quality brass instruments, one of the goals is to create a basic design that, with minor variations, can be tailored to meet the needs of a variety of players. There are other goals, secondary to playing quality but nonetheless desirable. These include appearance and mechanical reliability ("fit and finish"), ease of manufacture (consistent quality at minimal possible cost), and ease of repair (accidents will happen, alas!). Existing instruments provide input data to the design process by way of physical dimensions, acoustic input impedance, and players' judgements. Computer modeling helps to predict the effect on intonation of changes of bore contour. Feedback from top professional players is essential to refine the design, especially the "black magic" aspects like brace placement and even the type of solder used to assemble the instrument.