

2aMU6. Acoustic reflectometry in the manufacture of reproductions of historical wind instruments.

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Abstract:

Acoustic reflectometry has become a well-established technique for investigating the internal bore profile of cylindrically symmetrical ducts. Although the method has previously been applied with some success to the study of musical wind instrument bores, there are practical problems which limit the accuracy of bore reconstruction of instruments which are long or widely flaring, or which have side finger holes. This paper reports on a collaboration with Christopher Monk Instruments Ltd., a London-based firm specializing in the reproduction of cornetts and serpents. These are lip-reed instruments with side finger holes, and a curved bore center line which inhibits the use of conventional bore measuring techniques. It is demonstrated that acoustic reflectometry can provide bore profiles of these instruments with sufficient precision to be a valuable guide in their construction or repair. The precautions necessary to achieve this level of accuracy are described, and prospects for further refinements are discussed. [The collaboration of Keith Rogers and Jeremy West of CMI Ltd. is gratefully acknowledged. Work supported by the Engineering and Physical Sciences Research Council, U.K.]