EXPERIMENTAL PROCEDURE

Sample Preparation

The tantalum crystal used in this experiment was generously loaned by Dr. J. R. Neighbours, and came from the same lot of specimens as that used by Featherston and Neighbours in their work on the temperature dependence of the elastic constants[2]. The roughly cylindrical crystal, when obtained, was about 0.8 in. long and 1/4 in. diameter. Because of the small diameter, no attempt was made to orient the sample.

Acoustic surfaces were prepared by mounting the specimen in a lapping ring with a shim and lapping the faces plain and parallel with metallographic papers ranging from No. 1 to No. 2/0. The resulting surfaces were parallel to better than one part in 5000, with a length at room temperature of 1.9540 cm.

Orientation was found by the back-reflection Laue method to deviate from [110] by about 6°. Direction cosines are: $\ell = .7752 \pm .0001$; $m = .6279 \pm .0008$; $n = .0697 \pm .0017$.

Transducer electrodes were made by platinizing the faces of 10 mc 3/8 in. X- and Y-cut quartz transducers. The transducers were then sanded "edge on" with No. 3 metallographic paper to less than 1/4 in. diameter. The bonding material used for all measurements was Nonaq Stopcock Grease.