reflection. Because of the low density of air there is no such inversion upon reflection at the silver-air interface, and from the acoustic impedances of quartz and silver associated with the waves propagated in this experiment (see Table III) there are no inversions upon reflection at the silver-transducer interface. Therefore transit time determinations were made by measuring from peak to peak of corresponding cycles in succeeding echoes. Had there been an inversion, the measurements would have been from peak to dip of corresponding cycles. The next step was to determine corresponding cycles (or peaks) in consecutive echoes. Pictures of each echo were taken and the peaks of three cycles of the first echo were chosen as starting or reference points. Then remembering the cycles at the begining of an echo are attenuated and cycles are built up at the end of an echo by reflections within the transducer, the peaks in the succeeding echoes corresponding to the reference peaks in the first echo were located by comparing the photographs of the echoes. Figure 1 is a drawing of a typical series of echoes ([110] , longitudinal wave) to show how the echo shape changes and the leading cycles are attenuated. Three peaks in each echo were measured so data would still be useful even if an error had been made in choosing corresponding peaks. An error