

**Title:**

Prediction and reduction of supersonic aircraft noise

**Abstract**

Currently there are no commercial supersonic aircraft flying. The main reason is the loud noise, or “sonic boom”, which occurs under the flight path. Serious efforts to produce a new supersonic transport are now underway and rely on efforts to reduce the boom or to shape it to be less objectionable. A procedure is developed to predict the sound pressure and the perceived annoyance for any aircraft configuration and is used to examine various changes in aircraft configuration to find one that meets the noise limits. Shape parameters that are changed include overall length, volume distribution, and the use of large inlets to reduce the effective displaced volume. Since there are no recent published aircraft sound measurements, the procedure is compared to older measurements published in the 1960s, and also to sound prediction software (PCBoom) available from NASA. The final objective of this work is to produce a number of optimized aircraft shapes, that are quieter, and to provide a series of guidelines to adapt the shapes to real world supersonic aircraft.