" A SECOND ORDER THEORY FOR SUPERSONIC FLOW OVER THREE-DIMENSIONAL WINGS. "

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Summary

This thesis presents a critical review of the second order theory proposed by Sugo for supersonic flow over three-dimensional wings It has been found that Sugo's theory is not exact, but is based on an approximation to a particular integral of the governing differential equation. Also, a number of important errors have been discovered. By eliminating these errors and using a more general approximate particular integral a modified theory is evolved. This is then used to find the pressure distribution over arbitrary wings in a supersonic flow.

The problem of flow over supersonic-edged delta wings is treated in detail and numerical results are obtained for one particular case of a flat plate delta wing at incidence. The results approach those of an exact theory and are clearly superior to those of Sugo for the same wing. It is thought that the modified theory will be equally satisfactory for other supersonic-edged wings and probably also for subsonic-edged wings, although the latter have not been investigated here.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any University and, to the best of the candidate's knowledge and belief, the thesis contains no material previously published or written by any other person, except where due reference is made in the text of the thesis.