Malmuth and Cole [118] use these expansion procedures to obtain to the extension of our transonic area rule for wall interference (TARWI) from $H \to \infty$* to $H = O(1)$. From this generalisation, more practical situations than those for $H \to \infty$ can be considered in which the model distance from the walls is of the order of its length. These are typical of transonic testing. It should be noted that angle of attack effects are higher order for this $A = O(1)$ case as contrasted to $A \to \infty$ cases where they will interact with the near field in the dominant orders through line doublet-wall-imaging/reflection-induced downwash.

5.4.9 Validations of Theoretical and Computational Simulations for Moderate Wall Height Case

Experiments in TsAGI's T-128 wind tunnel in Moscow, Russia, described in Malmuth, Neyland and Neyland [124], have been performed to validate the previous theoretical developments. Figure 5.73 and Figure 5.74 show one of the wing-body configurations tested. Results for pressures over the equivalent body of revolution (EBR) for this wing body are shown in Figure 5.75 which compares the combined asymptotic and numerical method exemplified by Malmuth *et al.* [123], [125], and Malmuth and Cole [118], with the TsAGI experiments for the $H = O(1)$ case discussed in the previous section.

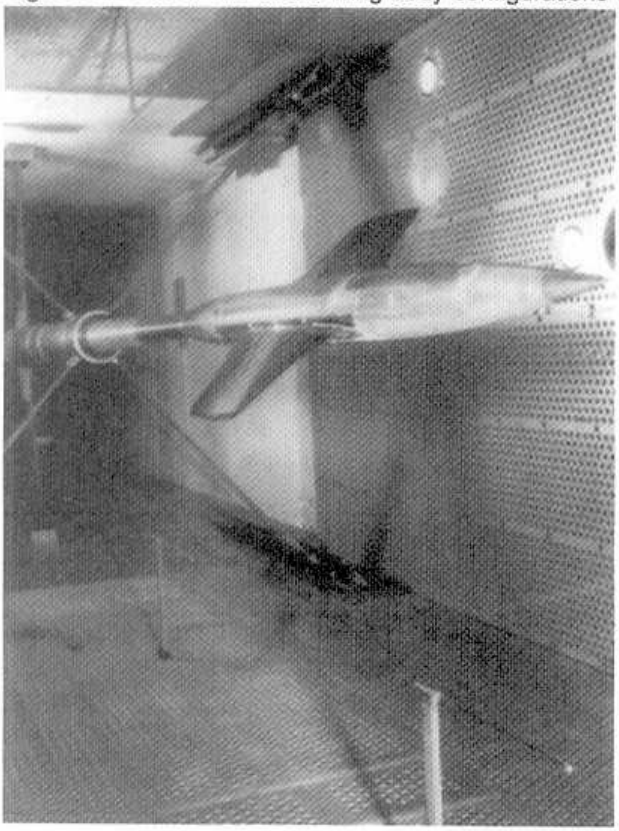

Figure 5.73 : Wing-body WB1 tested in TsAGI T-128 wind tunnel

The code is quite efficient, requiring only a minute of execution time on a VAX 3100 work station and only 100 iterations to obtain the 2000 iteration fully converged solution. Figure 5.75 shows excellent agreement between the theory and experiment. To achieve this fidelity, it was important to accurately simulate the sting model support. This element was necessary to capture the proper recompression process to ambient levels. Additional validations discussed in Malmuth, Neyland and Neyland [124] are that the shock position estimates from Wu [186], Cole and Malmuth [38], and Malmuth [120], agree well with the TsAGI measurements. Work continues on specially designed experiments to adjust the level of interference by altering the wall porosity. This will provide a useful database for comparison with the $H = O(1)$ theory.

* Enunciated in [125]