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PROGRESS - REPORT

August 1, 1951 to September 30, 1951.

Contract No : N7 onr - 35805

Division of Engineering
Brown - University
Providence Rhode Island

ILLEGIBLE

Sponsored jointly by:

Office of Naval Research

Office of Air Research

PROGRESS REPORT: August 1, 1951, to September 30, 1951

CONTRACT NUMBER: N7-onr-35805

1. Investigation of Losses in Transonic Model Sections

Complete velocity and pressure surveys have been carried out behind a transonic model section. These tests will be repeated for other transonic configuration as well as for the conventional closed wall sections. The results are being compared on an energy and momentum basis so as to evaluate the amount of unavailable energy due to the transonic configuration (regardless of diffuser).

It is expected that this experimental investigation will be concluded by November 30, 1951, and a final report on the findings will be submitted by January 31, 1952.

2. Air-Drying Equipment

The air-drying equipment with the exception of the generator is completed. The generator rotor has been finished, and the stator will be built as soon as the necessary materials are available. According to our last information, delivery of the stator laminations should be made within six weeks. The equipment will then be installed and tested.

3. Temperature Boundary Layers

The investigation into temperature boundary layers has been temporarily interrupted, partly because of a shortage in personnel; partly because it became evident that the investigation described under (1) above had to be extended in the interest of large wind tunnels to be built in this country.

4. Upper Transonic Range

Preparation has been made to take up experimental investigations in the upper transonic range as soon as the air-drying equipment is installed. These investigations can be speeded up greatly when the balance-system will be available (anticipated date for completion of balance: spring, 1952).

5. Supersonic Cascades

Preliminary theoretical investigations into the field of supersonic cascades (with application to supersonic compressors) are being carried out. The main object of this work is: first, to determine which flow conditions

are stable and can be realized; second, to design and test cascades that have been found, in the theoretical analysis, to be desirable. For the second part of this investigation, a new two-dimensional cascade test section will have to be designed and built.

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