Dear Sir:

Progress on the contract for the month of March has been as follows:

1. Traversals of a molecular beam reflected from a steel surface are continuing. Glass and single-crystal specimens are being mounted preparatory to further tests. Previously collected data are being reduced and analysed concurrent with the present tests.

2. During the month of March two programs made use of the No. 3 Wind Tunnel. The first portion of the month was devoted to a program of developing and testing free-molecule flow hot wire probes designed for this flow system. These probes will be used in an investigation of the structure of a shock wave, a program sponsored by the National Advisory Committee for Aeronautics. The remainder of the month was devoted to an investigation of drag forces on conical bodies in a low density supersonic air stream. The forces were measured with a single component drag balance utilizing a Wehnelt force sensitive element. These tests will continue using various cone lengths and angular configurations.

During the month of March it was noted that the No. 3 Wind Tunnel had now been used for 400 runs. Examination of the history of this equipment reveals that the number of runs per year has increased from approximately 70 to 125. An analysis based on the number of working days in the year minus time for maintenance and repair indicates that the project completes a run every other day. Considering the growing complexity and diversity of programs now under way, it is difficult to see where this performance can be improved. The time required for model mounting, nozzle and instrument changes, calibration, etc., becomes an increasingly important factor in a rapidly changing program. Parallel with this increased tunnel activity it should be noted that the project...
is also producing an increased number of reports. At the present time, approximately 18 reports are being issued each year compared to 12 per year issued in the early days of this program.

3. Shop work on the new rotating cylinder balance is virtually complete. Components of this system are partially assembled and vacuum testing of the structure is under way.

4. The following reports are in various stages of preparation:

(a) A report describing the design and operational tests of the rotating cylinder equipment for use in low density gas dynamics research has been completed and is being reproduced.

(b) A report describing base pressure studies using cone-cylinder models is being prepared.


Abstract: This report describes the aerodynamic test equipment designed by this project to simulate high altitude flight conditions. Emphasis is placed upon the vacuum techniques that have permitted the construction and operation of large-scale low density flow systems. The problems of achieving precise pressure measurements in these vacuum conditions are also discussed.

Very truly yours,

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