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CF 352.
RDR
LOW PRESSURES RESEARCH
College Avenue Pool
October 15, 1952

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Director
Office of Naval Research
1000 Geary Street
San Francisco 9, California

MONTHLY STATUS REPORT - SEPTEMBER 1952

Contract N7-onr-295-Task 3
Project Number ER 661-003

Dear Sir:

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

1. Final additions to, and modifications of, the instrumentation of the molecular beam are continuing. Reflected signal to background noise level is being improved prior to full-scale traverses of the reflected beam.
2. During the month of September, several test programs made use of the No. 3 wind tunnel. The initial tests to determine base pressures of cone-cylinder models in a supersonic low density flow were completed. Analysis of the data indicates that the next phase of this program can begin. Static probe tests were carried out for a separate N.A.C.A. sponsored program. Final tests of the semi-adjustable diffuser were also concluded; see item 3 below.
3. The evaluation tests of a central body diffuser were concluded, and analysis of the data begun. Preliminary indications are that such a diffuser is unsatisfactory for supersonic low density flow systems. A report describing this program will be prepared.
4. The cone-drag single component balance design was completed and fabrication is well under way.
5. The modification of the rotating cylinder drag balance is continuing.
6. The following reports are in various phases of preparation:
 - a) A report describing the design analysis of a free molecule flow hot wire probe for wind tunnel use is being prepared, and will be issued shortly.
 - b) A report describing the design and operational tests of a rotating cylinder apparatus for use in low density gas dynamics research is being written.

c) See item 7 below.

d) A report describing the results of a subsonic heat transfer program using spherical models is being written.

7. The following report was issued in September: HE-150-104, "Design and Testing of a Mach 4 Axially Symmetric Nozzle for Rarefied Gas Flows", by J. H. Owen and F. S. Sherman.

Abstract: The report presents an improved method of design for low density supersonic nozzles. Design data for a $M = 4.0$ nozzle is included together with a description of an experimental evaluation program performed to determine the static pressure and Mach number profiles for this nozzle. The design method appears successful and future applications should be possible with a minimum of calculation effort.

8. Visitors: The following persons visited the project during the month:

W. Jost	- Techn. Hochschule, Darmstadt, Germany
H. M. Smith, USN	- Office of Naval Research, San Francisco, Calif.
B. A. Ritzmann	- I.N.M., San Francisco, Calif.
A. C. Morrison, Lt. USN	- Dist. Security F.O.B., San Francisco, Calif.
Ernst Schmidt	- Braunschweig, Germany
Pierre Danel	- Grenoble, France
R. M. Fincher	- Office of Naval Research, San Francisco, Calif.
E. G. Kieth	- Office of Naval Research, San Francisco, Calif.
A. C. Meyer	- Office of Naval Research, San Francisco, Calif.

Very truly yours,

S. A. Schaaf
S. A. Schaaf
Faculty Investigator

SAS:ds

cc: ONR S.F.(1)
ONR WASH.(3)
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Fluid Mechanics Branch
Research and Development Command
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Dr. Morton Alperin, Western
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