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OPERATIONAL EXPERIENCE IN THE LANGLEY EXPANSION TUBE
WITH VARIOUS TEST GASES

By

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May 13, 1977

(NASA-TM-X-74945) OPERATIONAL EXPERIENCE IN
THE LANGLEY EXPANSION TUBE WITH VARIOUS TEST
GASES (NASA) 3 F HC A02/MF AC1 CSCL 14E

N79-12105

63/09 Unclass
53547

Backup Document for AIAA Synoptic Scheduled for
Publication in the AIAA Journal, February 1978

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OPERATIONAL EXPERIENCE IN THE LANGLEY EXPANSION TUBE
WITH VARIOUS TEST GASES

EDITORIAL
DEPARTMENT

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A resume' of operating experiences with the Langley Expansion Tube is presented. The driver gas was unheated helium at a nominal pressure of 5000 psi (34.5 MN/m^2) and the majority of the data presented herein are for air and carbon dioxide test gases. The primary purpose of these data is to illustrate the effects of various parameters on quasi-steady test flow duration, as well as free stream and post-normal shock flow conditions. The present discussion shows that the Langley Expansion Tube is an operational facility capable of producing good quality, highly repeatable, quasi-steady flow for test times sufficient to establish flow about blunt axisymmetric and two-dimensional models. Due to the capability of testing with arbitrary test gases, a wide range of real-gas, hypersonic-hypervelocity flow conditions may be generated. However, for a given test gas, the range of operating conditions producing useful flow is shown to be rather limited; hence, the facility yields a given flow condition for a given test gas, and variation in flow conditions comes about by using different test gases.

Index Category: Nozzle and Channel Flow, Supersonic and Hypersonic Flow
Presented as paper at the AIAA Ninth Aerodynamic Testing Conference,
Arlington, Texas, June 7-9, 1976.

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