For immediate release -- October 11, 1951

GREAT PROGRESS IN ENGINES FOR AIRPLANES
AND MISSILES REPORTED AT NACA LABORATORY

Cleveland, October 11 ---- Great progress in the creation of more powerful and efficient turbojet, ram-jet and rocket engines for America's airplanes and supersonic missiles was reported today at the Lewis Flight Propulsion Laboratory of the National Advisory Committee for Aeronautics.

The report was made to more than 1200 visitors attending the laboratory's 1951 inspection by Abe Silverstein, Chief of Research at the NACA's big Cleveland research center. The visitors, who included leaders of the airplane and power plant industries, the armed services, the government, and various scientific institutions, heard the speaker trace the significant steps made in propulsion research since Lewis Laboratory was founded 10 years ago.

"In the same period," Mr. Silverstein said, "industry has made great progress in the design and construction of turbine engines, ram-jet engines, and rocket engines, some of which are in the skies over Korea, some on the production lines and still others of greater power and advanced design in the experimental shops and test facilities of industry and the Lewis Laboratory."

"But," he warned, "now is not the time to rest on these accomplishments. Rather it is the time for renewed and accelerated efforts. America has made great progress, but more remains to be done. In this new work research must lead the way. Research experience and advanced analysis have revealed many new directions for continued development."

Recent advances listed by Mr. Silverstein included:

Icing: This problem has been intensified because the high speed of jet

--- MORE ---

airplanes causes the interception of ice-forming cloud droplets at a rate many times the rate for conventional aircraft. Research in the Lewis icing tunnel has provided the key to possible reduction of the heat required for de-icing to one-tenth that used under present-day techniques.

Fuels: New fuels of higher heat content and improved combustion characteristics are "definitely to be looked for in the future."

Materials: Mr. Silverstein declared that new materials of superior strength and durability, capable of successful operation at the very high temperatures generated in jet engines, and fabricated from raw materials plentiful in this country, are on their way. Their application, he added, awaits only continued research and development.

Cooling: Techniques in this field, which will enable the thrust of turbojet and the power of turboprop engines to be more than doubled, have been brought to an advanced research stage, but further effort is required before they can be fully utilized in production engines.

Afterburning: The Lewis Laboratory has been largely responsible for research that has led to the development of this device, which, when added to the tailpipe of the turbojet engine, "converts a normally subsonic propulsion device into one adequate for speeds of 1500 miles per hour." But much still remains to be done to increase economy and reliability of afterburners and to utilize most fully their potentialities for supersonic propulsion.

Three types of research are being carried on at NACA laboratories, Mr. Silverstein concluded. These he listed as long-range programs which will bear fruit in future years, shorter-range programs the results of which will be applied in the next few years to production airplanes, and immediate research aimed at the urgent problems of the moment.

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October 11, 1951

MEMBERS OF THE PRESS!

Welcome to the Lewis Flight Propulsion Laboratory!

This week the doors of the Lewis Flight Propulsion Laboratory have been opened to more than a thousand representatives from the Department of Defense, other branches of the government, the aircraft and engine industry, and our educational institutions. The purpose of the Inspection is to present material about propulsion research trends and new techniques being used.

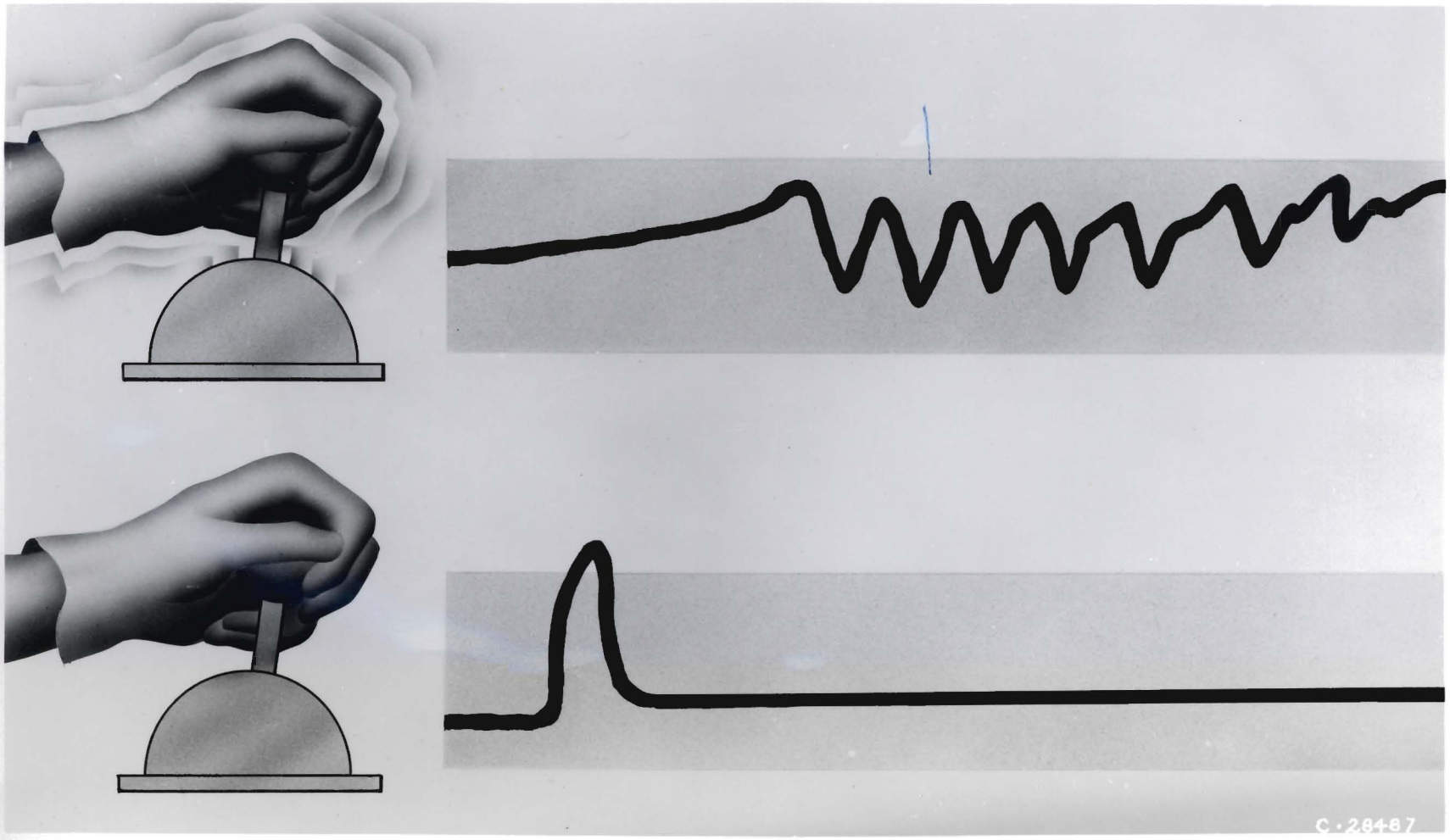
In 1951 when the United States is engaged in a tremendous effort to rearm in the interests of global peace, it seems especially important that the American people know something of the work which is being done here to provide the research information which will help our country to build the best engines and fastest aircraft.

We hope that in what you see and hear you will find matters which are newsworthy. Enclosed are several releases and photographs. Should you want or need other material, every effort will be made to provide it quickly. Press room facilities have been provided in the Laboratory Administration Building.

Cordially,

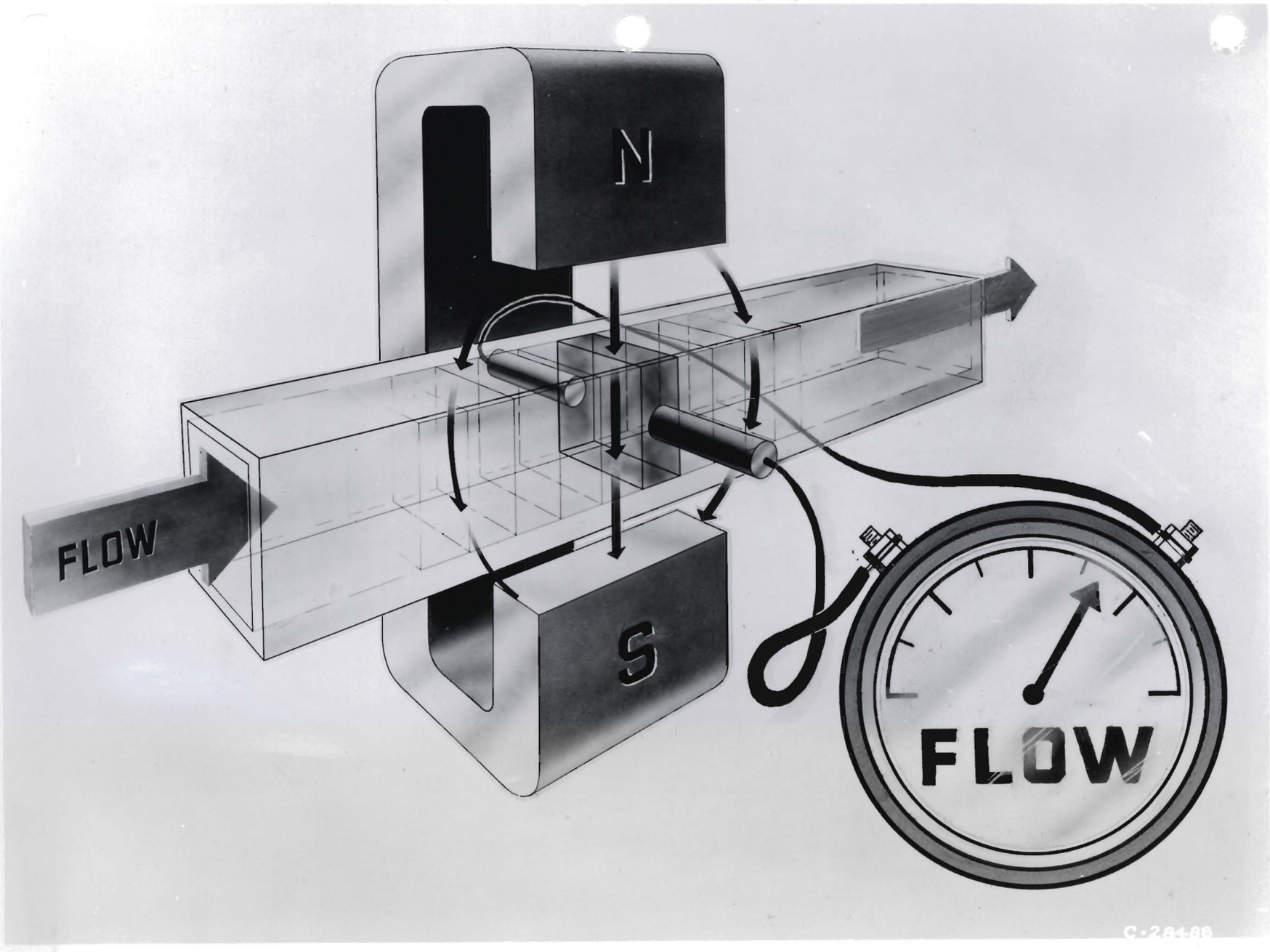
Edward R. Sharp

Edward R. Sharp,
Director.



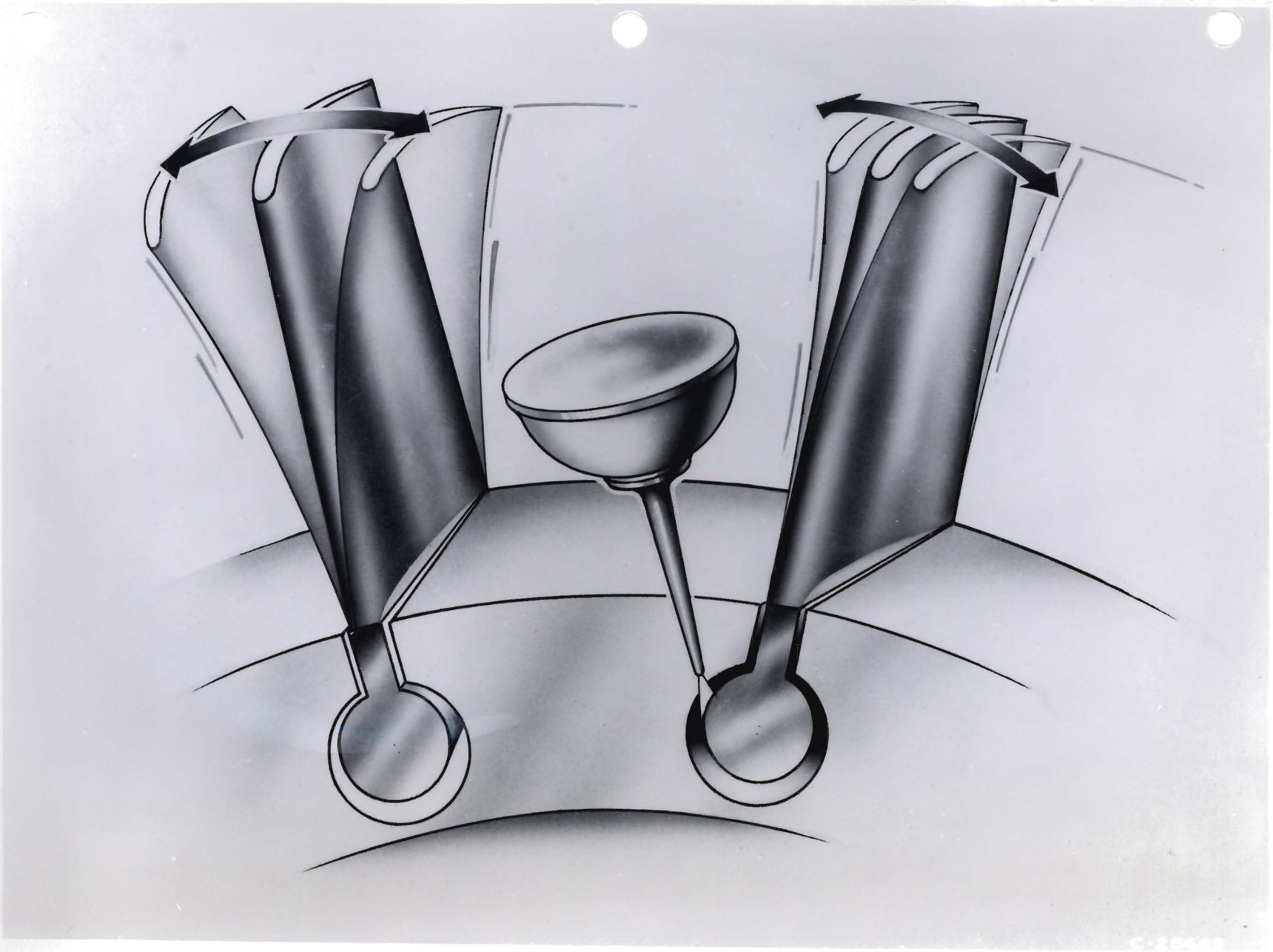
C-28487

Research at the NACA's Lewis Flight Propulsion Laboratory is directed toward providing current and future high-speed military aircraft with automatic control (bottom) of turbojet engines to eliminate difficulties encountered by the pilot in purely manual control (top).



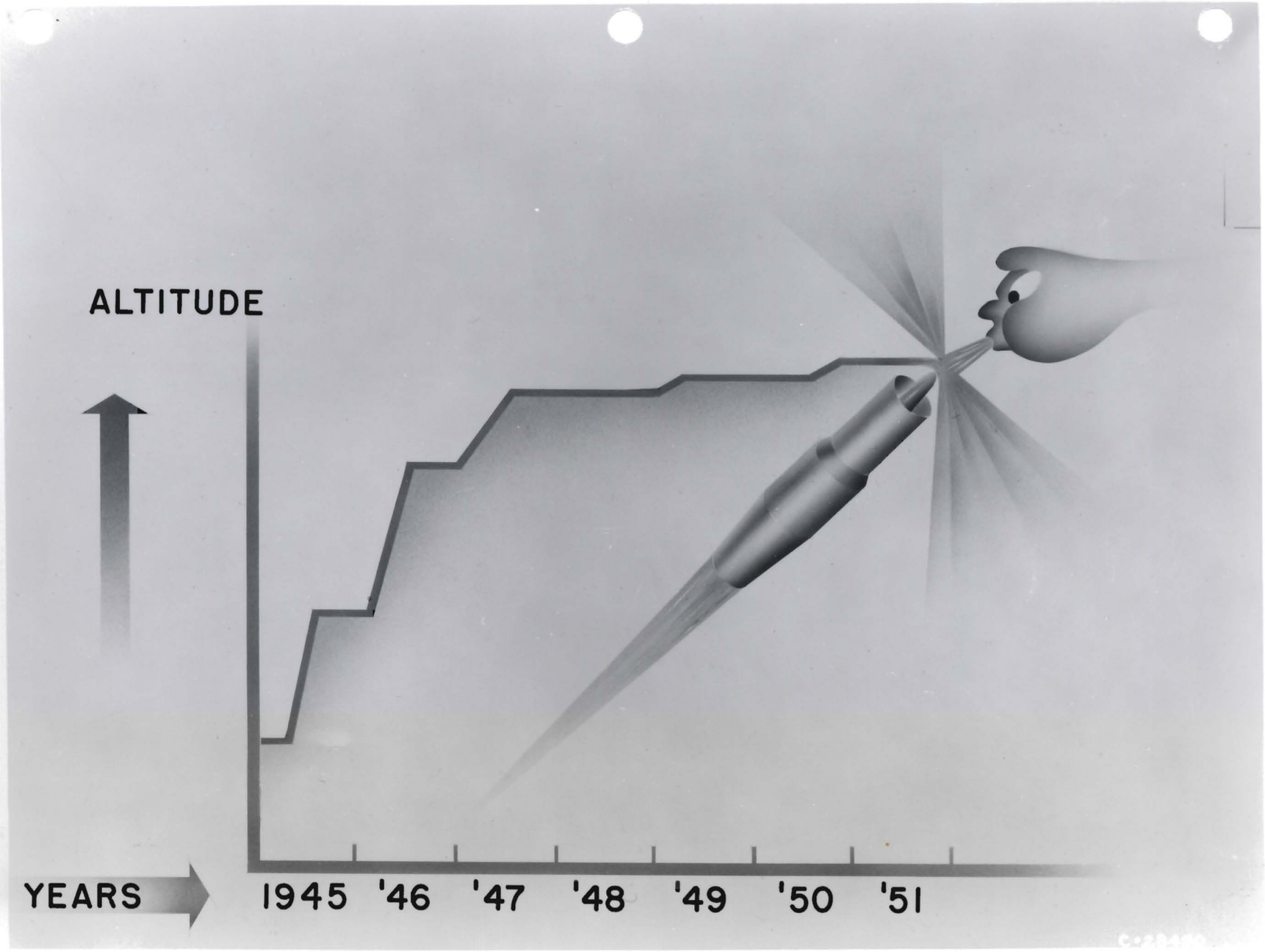
C-28488

Scientists at the Lewis Flight Propulsion Laboratory have evolved an electromagnetic flow meter (shown schematically) that measures, from outside the conduit, rapidly changing rates of fluid flow within the conduit.



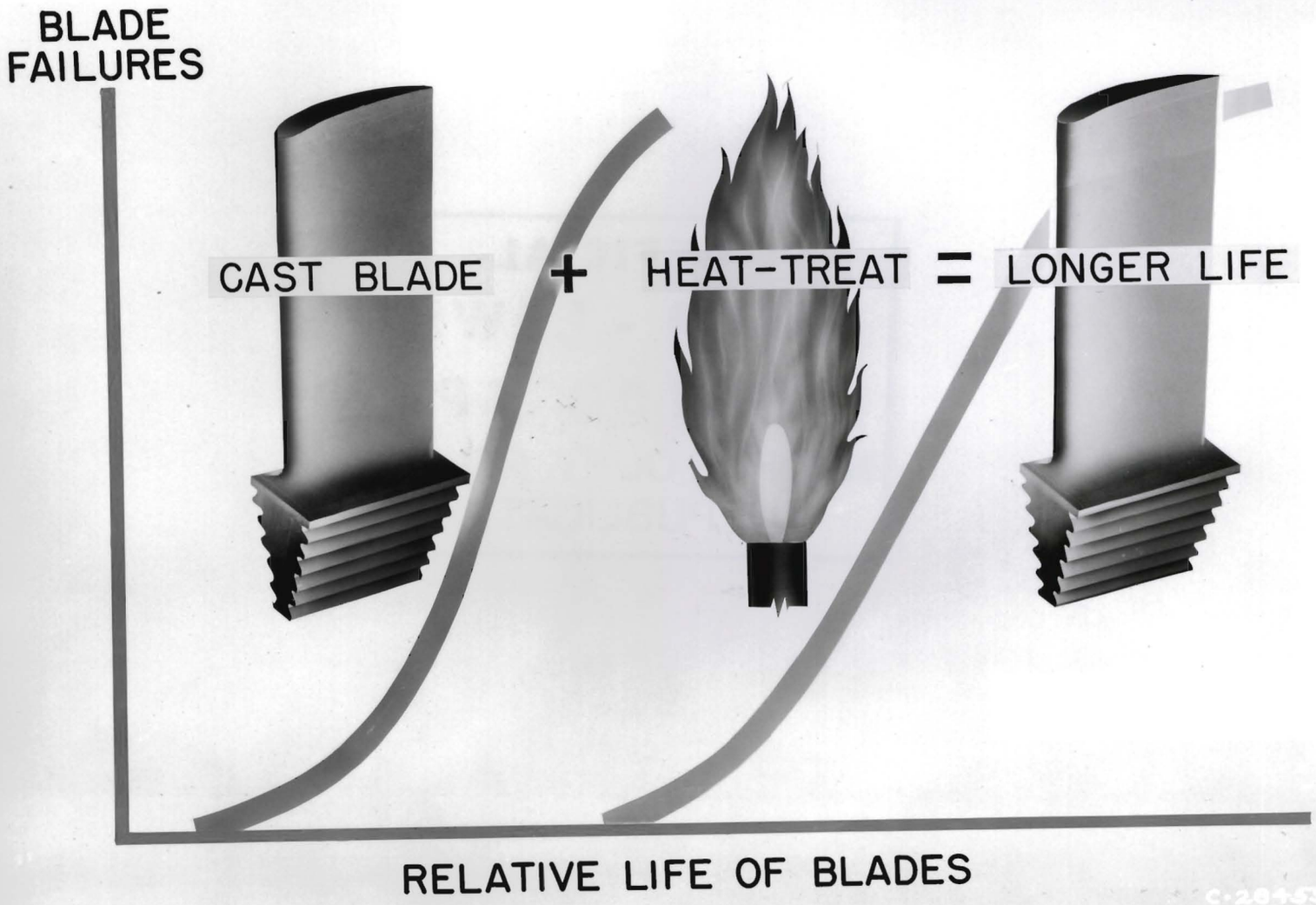
C-28489

Research at the NACA, Lewis Flight Propulsion Laboratory, has shown that the fatigue-producing vibration inherent in jet-engine blades can be reduced by use of a dry lubricant in the blade mounting.



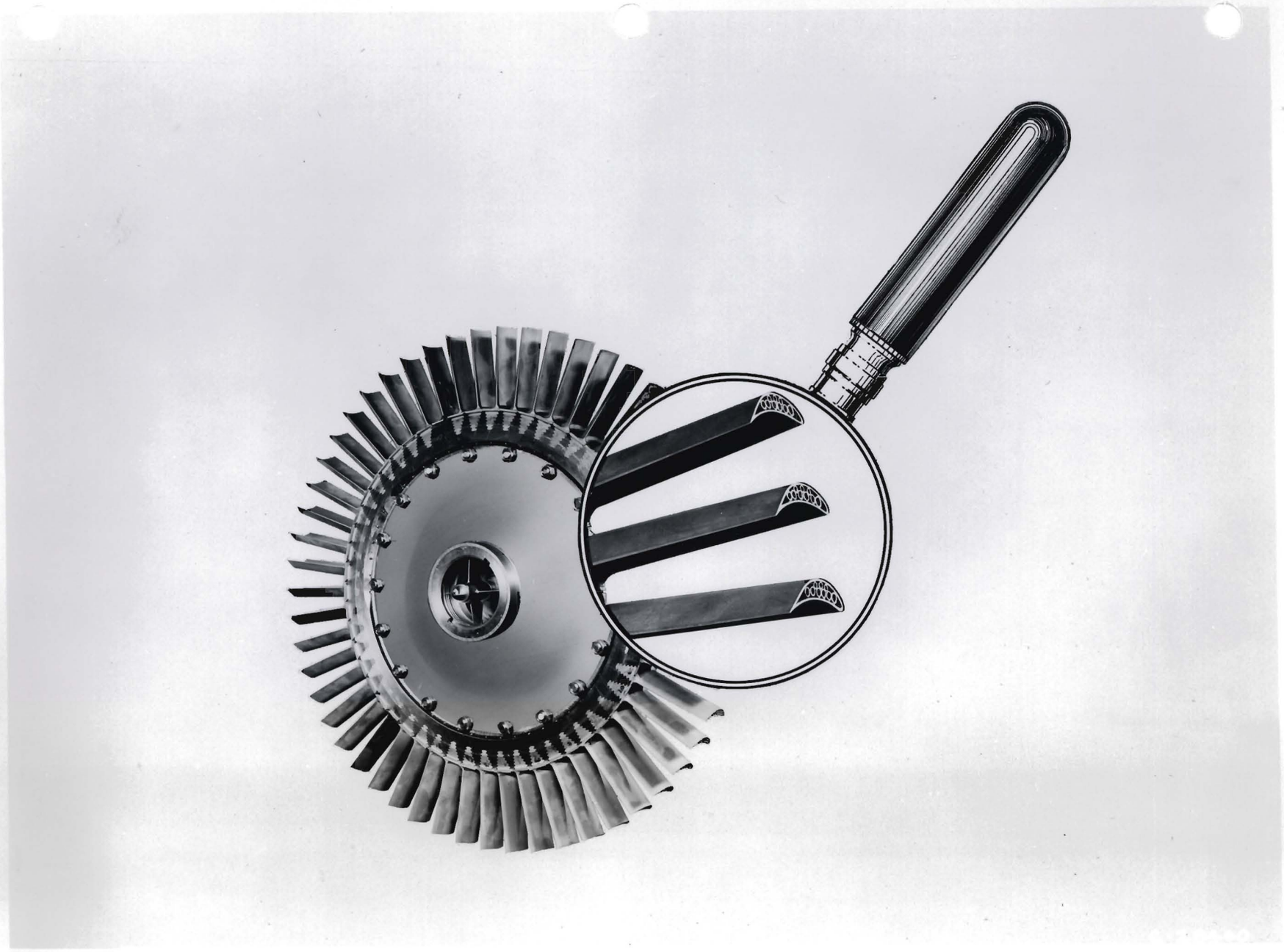
C-28490

Early simulated-altitude tests at the NACA, Lewis Flight Propulsion Laboratory, showed that altitude blowout is one of the basic criterions of jet-engine performance. Continuing research has progressively raised the altitude-blowout limitation for satisfactory operation.



C-28459

Significant gains in the operating life of cast blades for engine turbines have been made at the NACA's Lewis Flight Propulsion Laboratory through the technique of heat-treatment after casting.

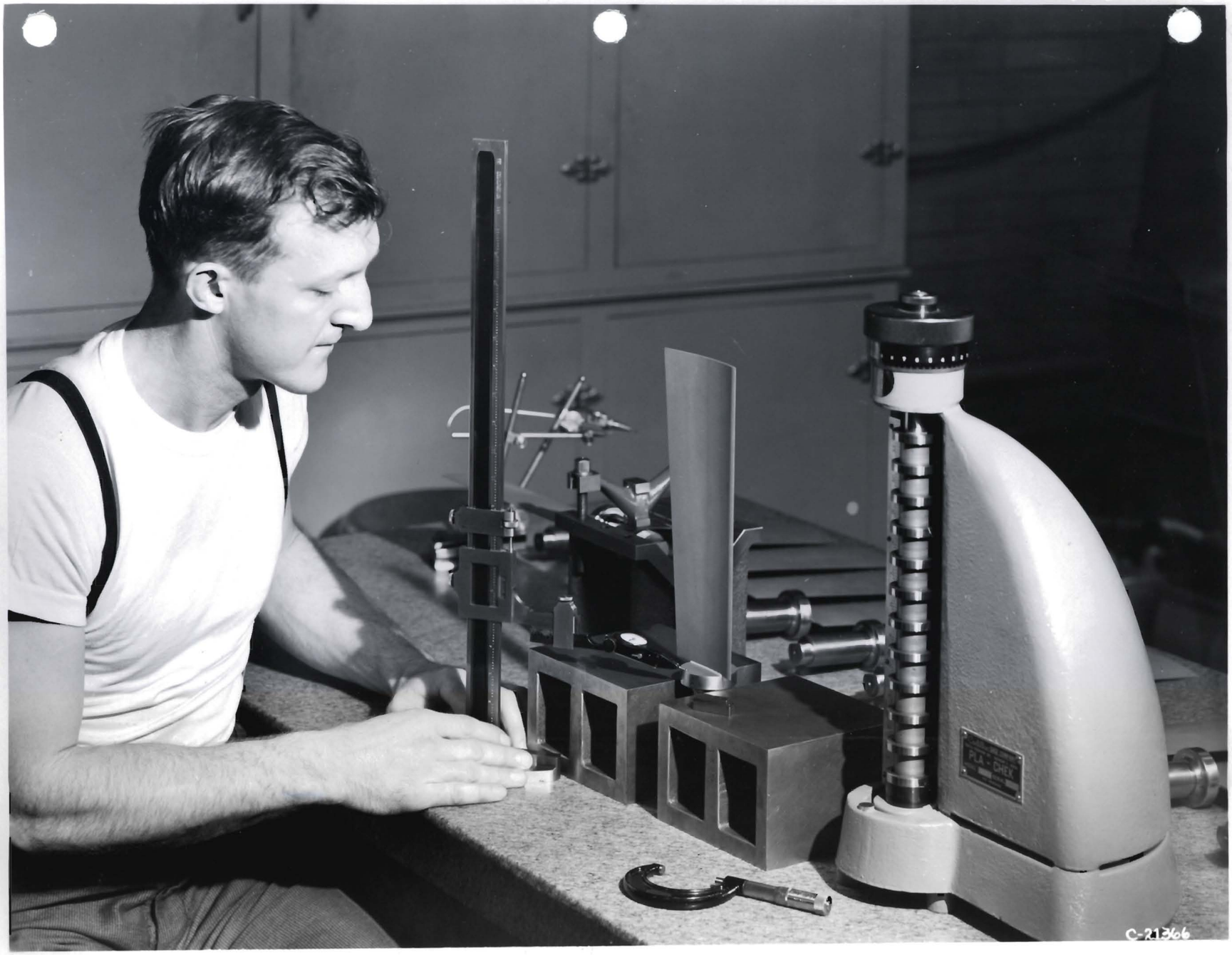


C-28460

Cooling of turbine blades is the subject of continuing research at the NACA's Lewis Flight Propulsion Laboratory. The blades shown are cooled by air that flows radially outward through the tubular passages.

C-21873

New central control room in Exhauster Wing Addition of Engine Research Building at NACA's Lewis Flight Propulsion Laboratory, Cleveland, Ohio.

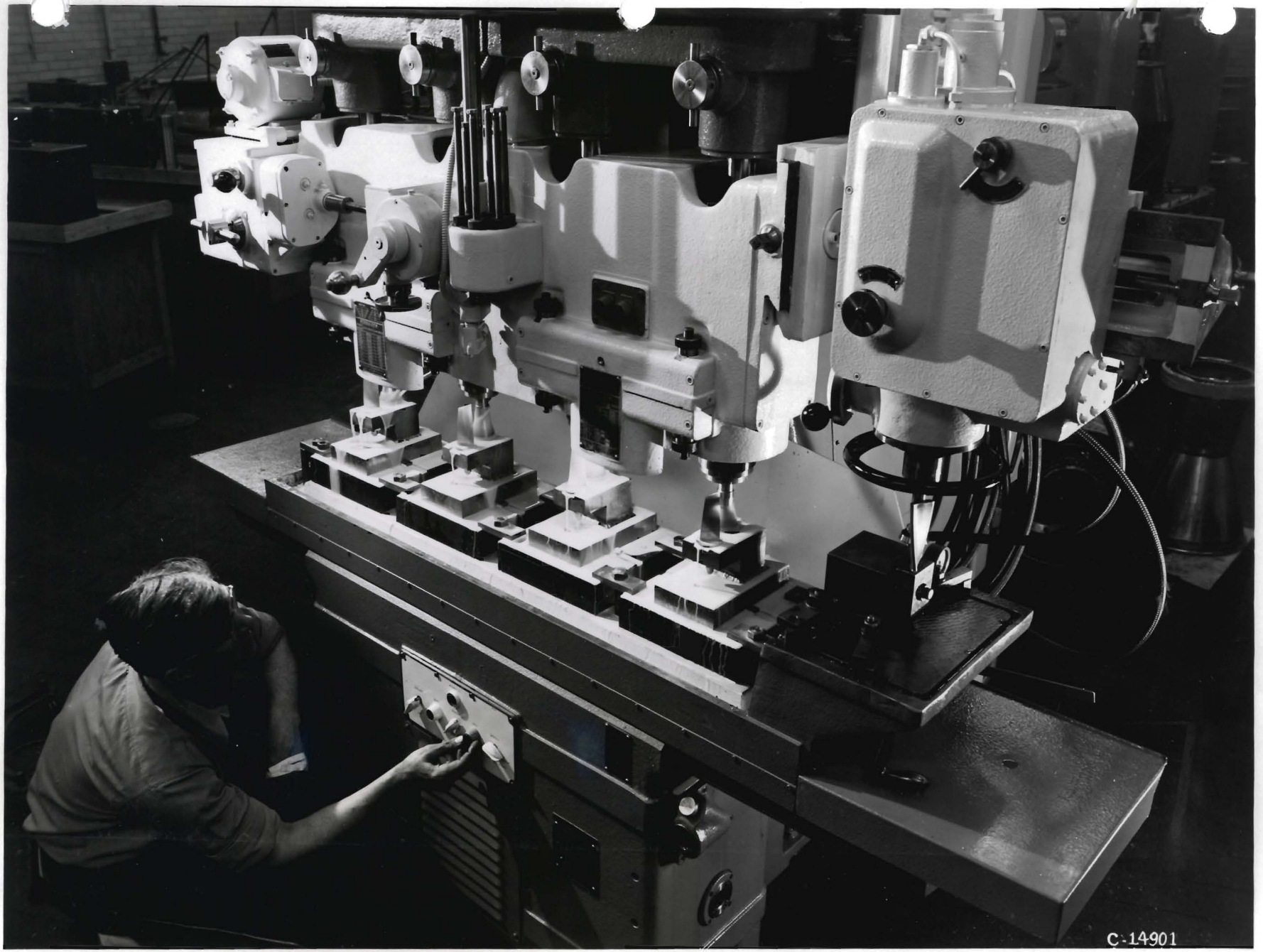


C-21366

Craftsman at NACA, Lewis Flight Propulsion Laboratory, constructing an over-size model of an experimental blade. The model will be used in fabricating full-scale test specimens of the blade.

C-16086

Taking high-speed movies of thrust augmentor in a jet engine in the Static Laboratory at NACA's Lewis Flight Propulsion Laboratory, Cleveland, Ohio.



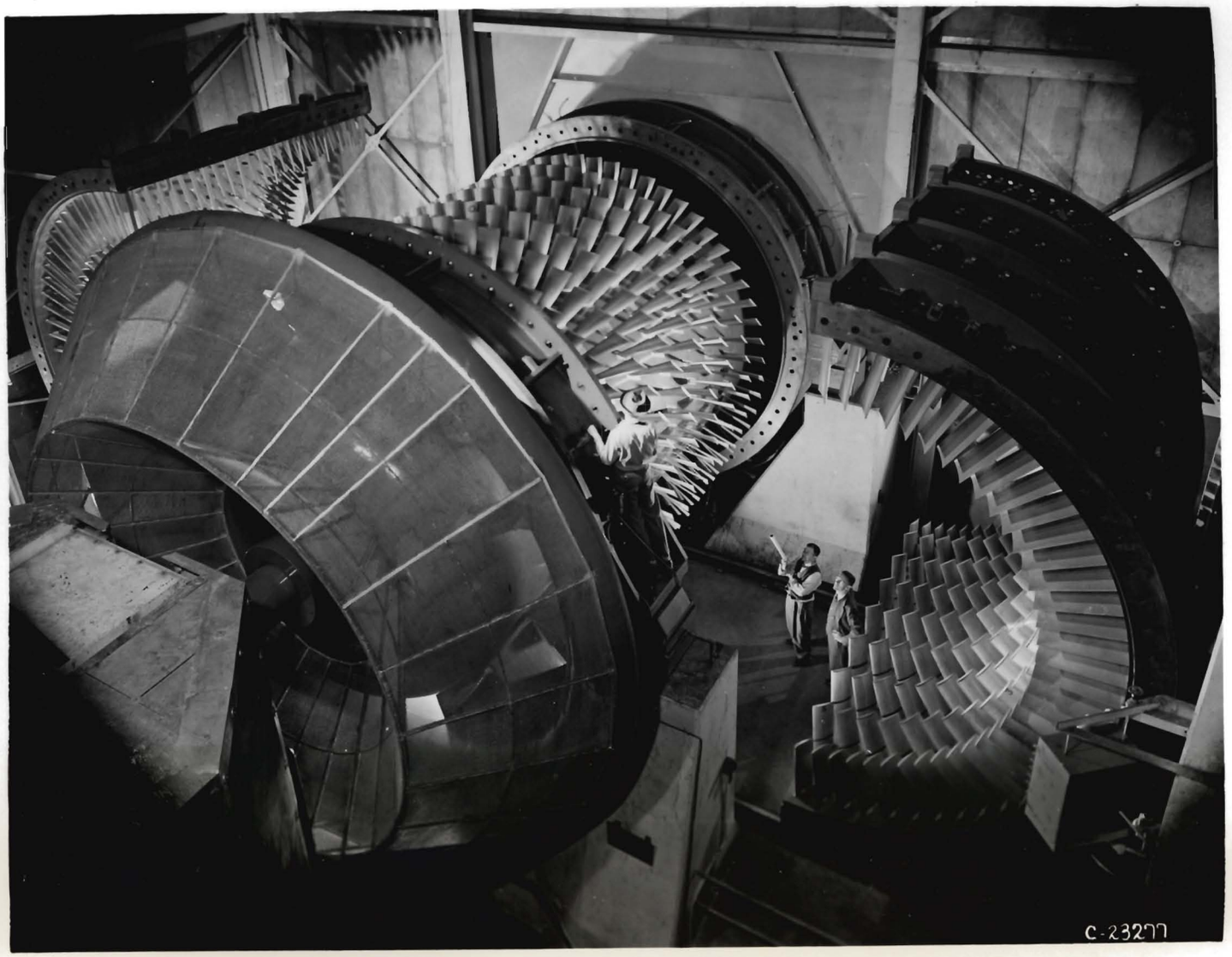
NACA

C-23281

View showing blades of seven-stage rotor and nine rows of stator blades of the axial-flow air compressor which drives air through the 8- x 6-foot Supersonic Wind Tunnel at the National Advisory Committee for Aeronautics, Lewis Flight Propulsion Laboratory, Cleveland, Ohio.

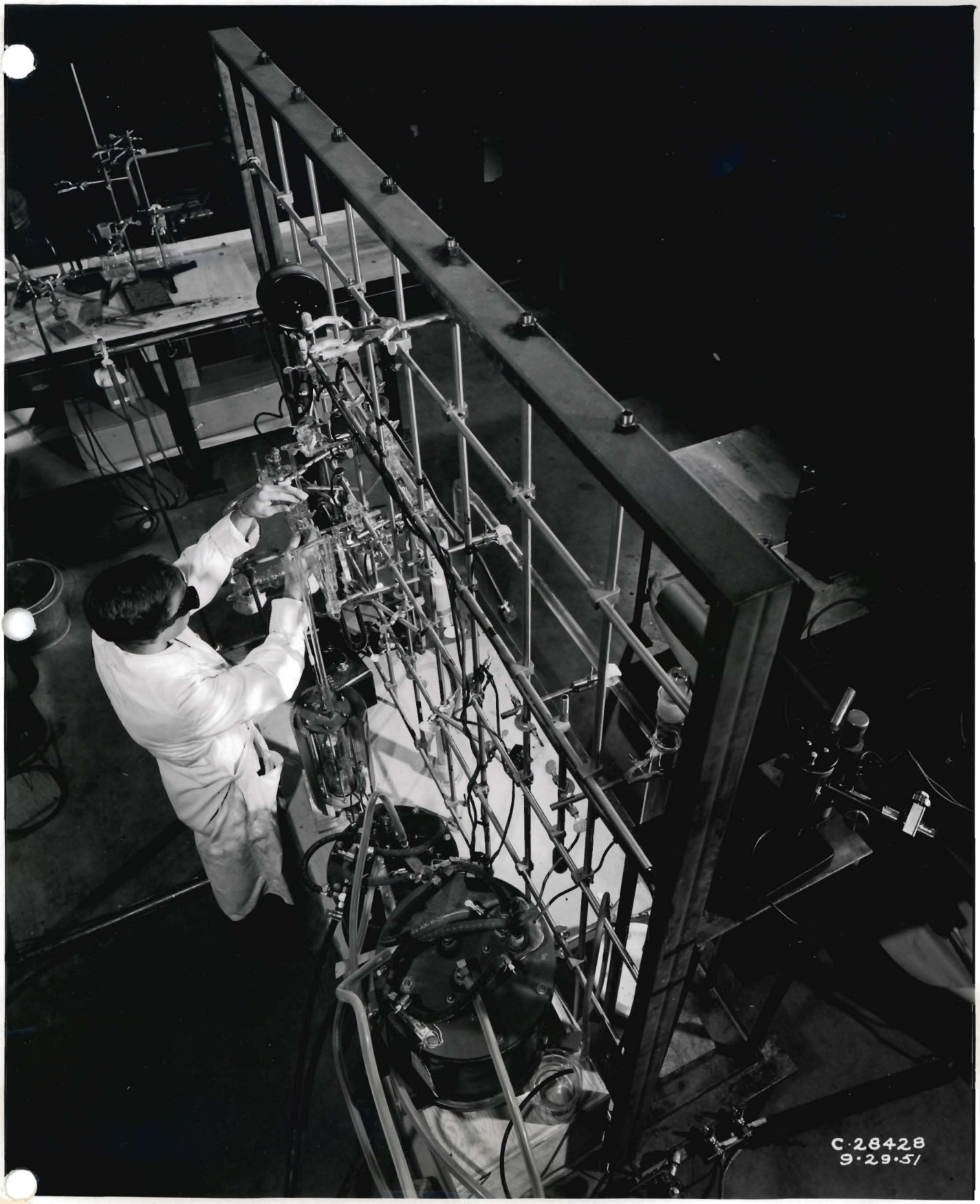
C-23283

Axial Flow Compressor in the 8- x 6-foot Supersonic Wind Tunnel at NACA's Lewis Flight Propulsion Laboratory, Cleveland, Ohio.



C-23277

The 956-blade, seven-stage, 87,000 h.p. compressor of the 8- x 6-foot Supersonic Tunnel, NACA's Lewis Flight Propulsion Laboratory, Cleveland, Ohio.



C-28428

A scientist at NACA's Lewis Flight Propulsion Laboratory engaged in an experimental study of the factors that influence the behavior of materials at temperatures up to 5000° F.

C-23744

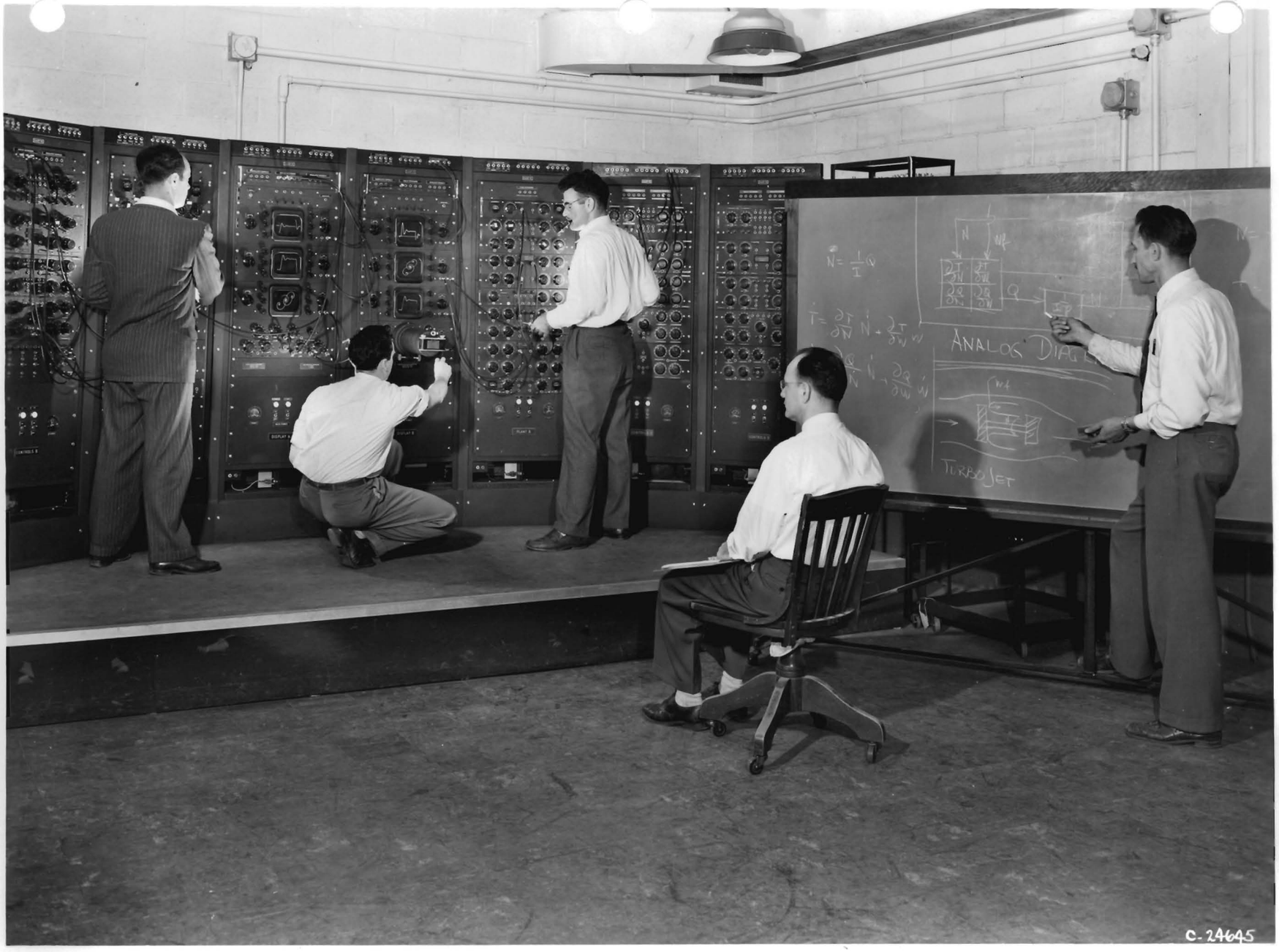
Interaction of twin-jet exhausts inclined toward the ground in simulation of take-off conditions for certain engine installations is one of many problems of operation under study at NACA's Lewis Flight Propulsion Laboratory, Cleveland, Ohio.

C-26416

Outlet end of Acoustical House addition, 8- x 6-foot Supersonic Tunnel, showing installation of fiber glass panels in passages for sound treatment ranges from 20 cycles up.

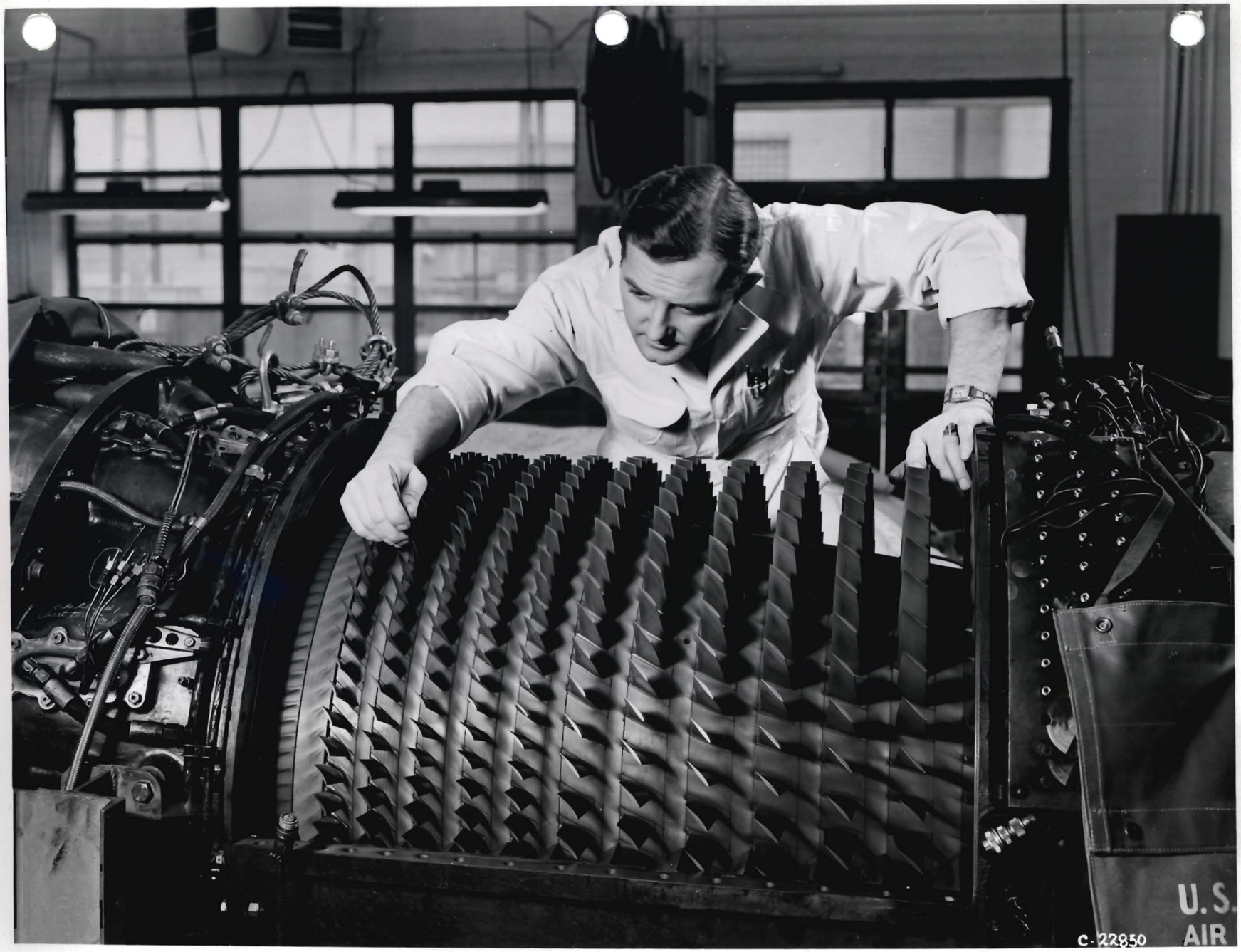
C-26414

Intake end of Acoustical House addition, 8- x 6-foot Supersonic Tunnel, showing six passages and arrangement of Helmholtz Resonator parts. Discharge end of subsonic diffuser at left.



C-24645

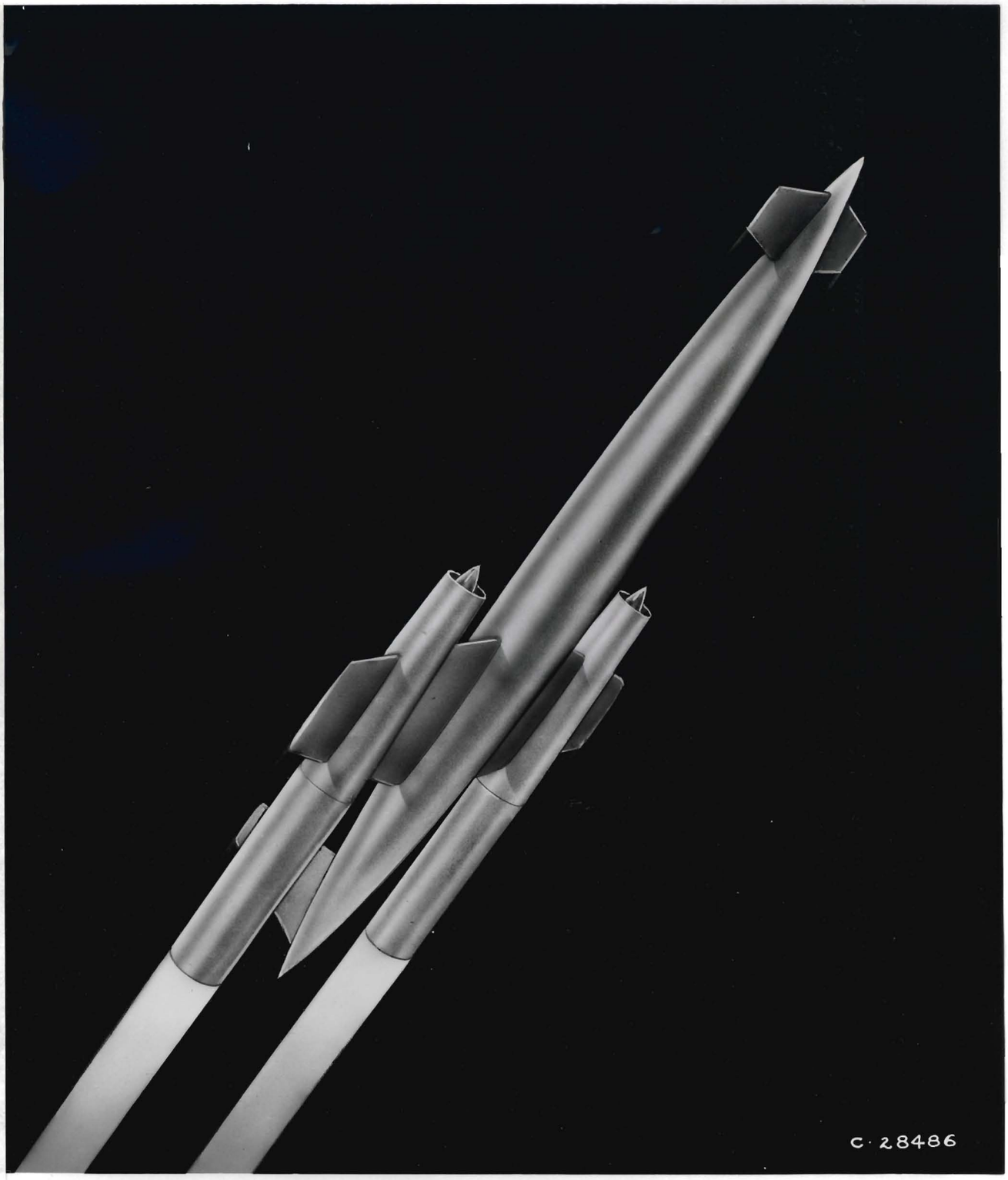
Scientists at NACA, Lewis Flight Propulsion Laboratory, analyzing data from an analog computer, which calculates electronically the interactions of jet-engine variables such as fuel flow, engine speed, and gas temperature.



NACA

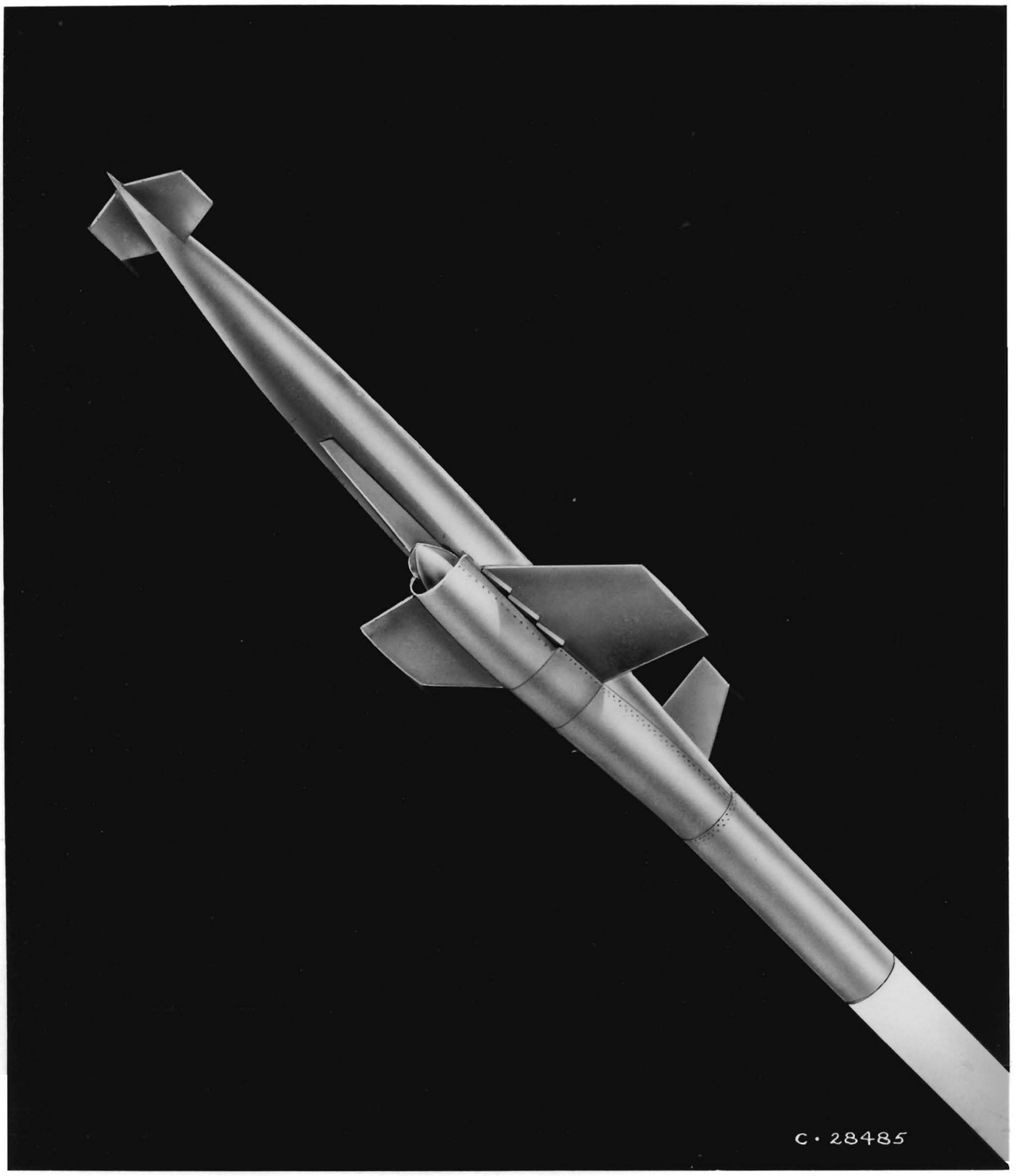
C-22850

Technician at NACA, Lewis Flight Propulsion Laboratory, inspecting blades of the axial-flow compressor used in the General Electric J-47 engine.



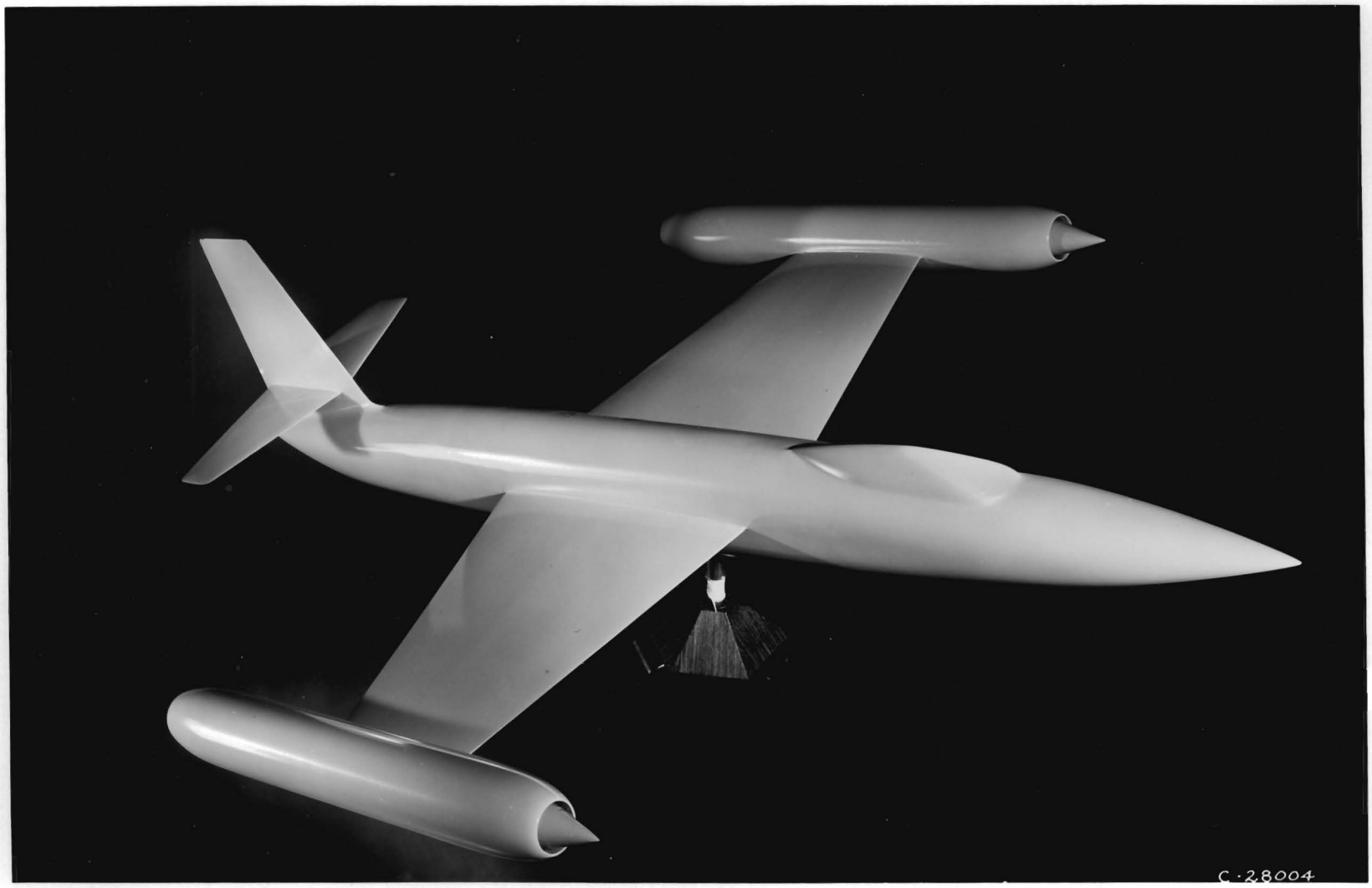
C-28486

Experimental model of a supersonic guided missile which is being tested in the 8- by 6-foot supersonic wind tunnel of NACA's Lewis Flight Propulsion Laboratory. Twin ram-jet power plants are mounted in nacelles in the wing. The most efficient location of nacelles on missiles of this type is the subject of intensive NACA research.



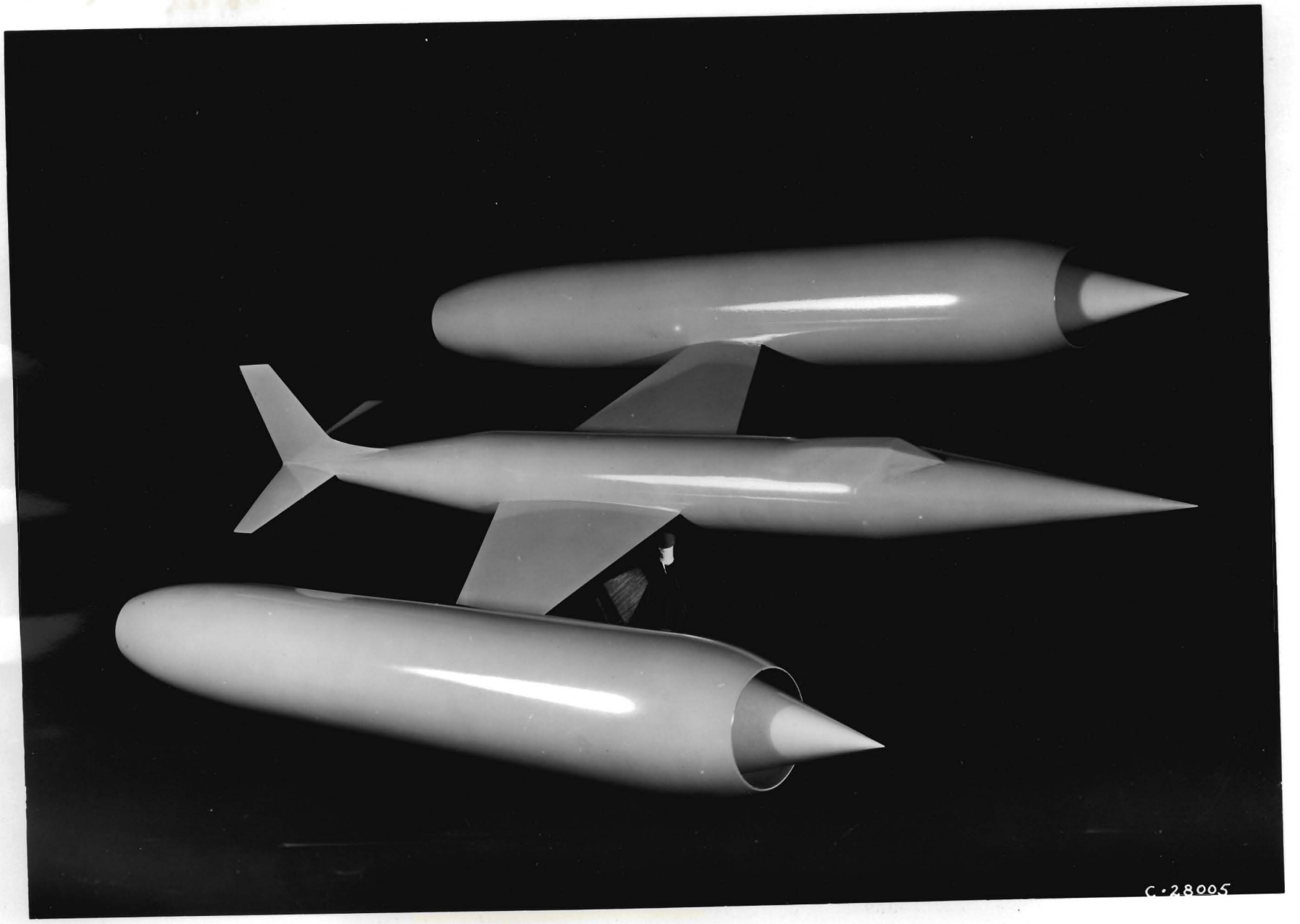
C-28485

Constructed for research in the world's largest supersonic wind tunnel at the NACA's Lewis Flight Propulsion Laboratory, this research model of a guided missile incorporates a ram-jet engine buried in the fuselage. Note the "tail first" design, with the horizontal control surfaces located on the nose instead of behind the wing.



C-28004

The use of afterburners on turbojet engines will make it possible to double the useful thrust of such power plants at supersonic speeds. This is a model of a hypothetical airplane of the future designed to fly at 1350 miles per hour with the use of afterburners. Note the relatively small size of the power plant installations. For a contrast see C-28005 which shows the same type of airplane with engines not equipped with afterburners.

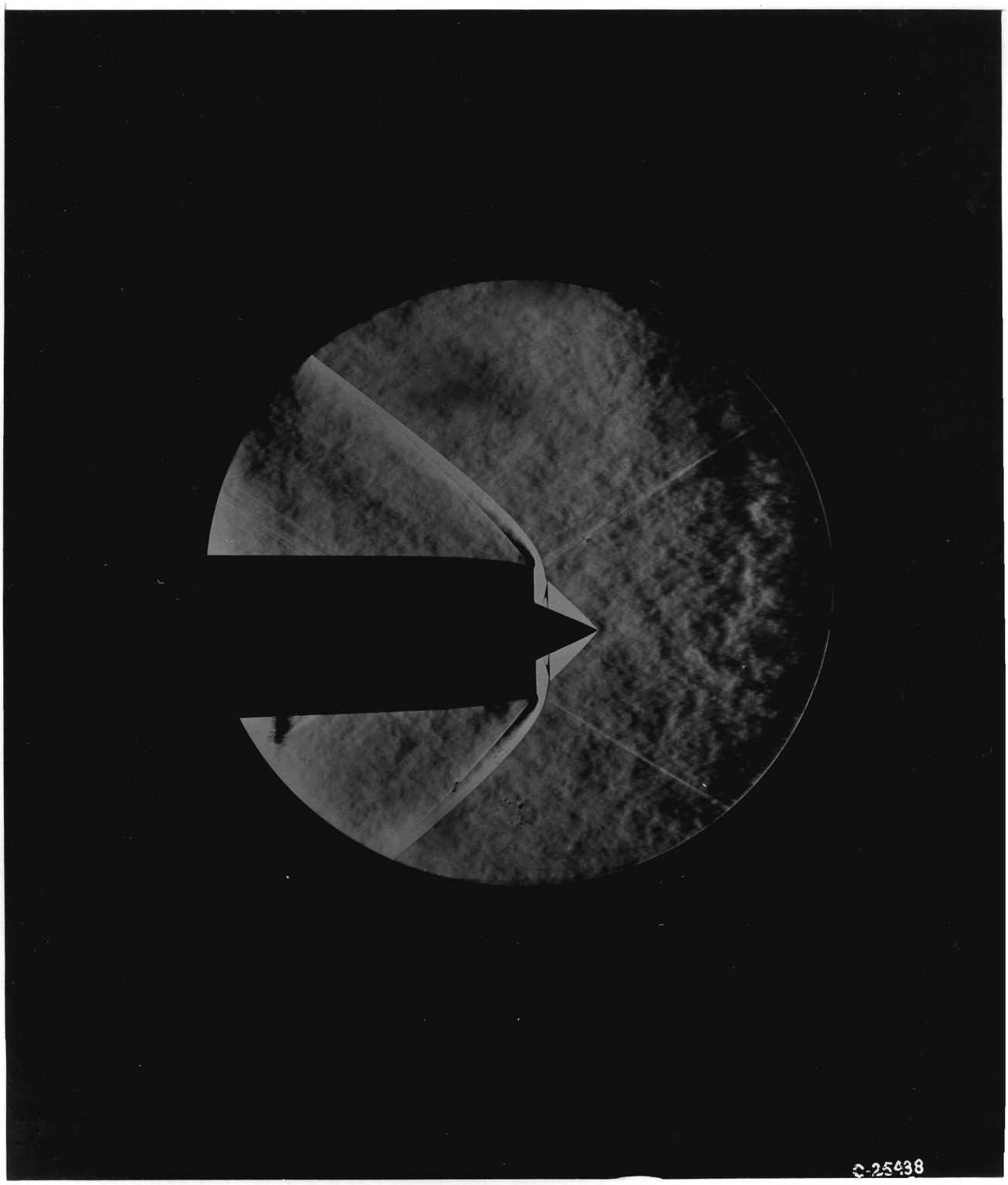


C-28005

The use of afterburners on turbojet engines will make it possible to double the useful thrust of aircraft power plants at supersonic speeds. This is a model of a hypothetical airplane of the future, designed to fly at 1350 miles per hour, but not equipped with afterburners. Note the huge nacelles which would be required to house turbojet engines (minus afterburners) sufficiently powerful to attain the desired speed. In fact, the design is so unrealistic and impractical as to be worthless. For a contrast see C-28004 which shows the same type of airplane equipped with engines having afterburners.

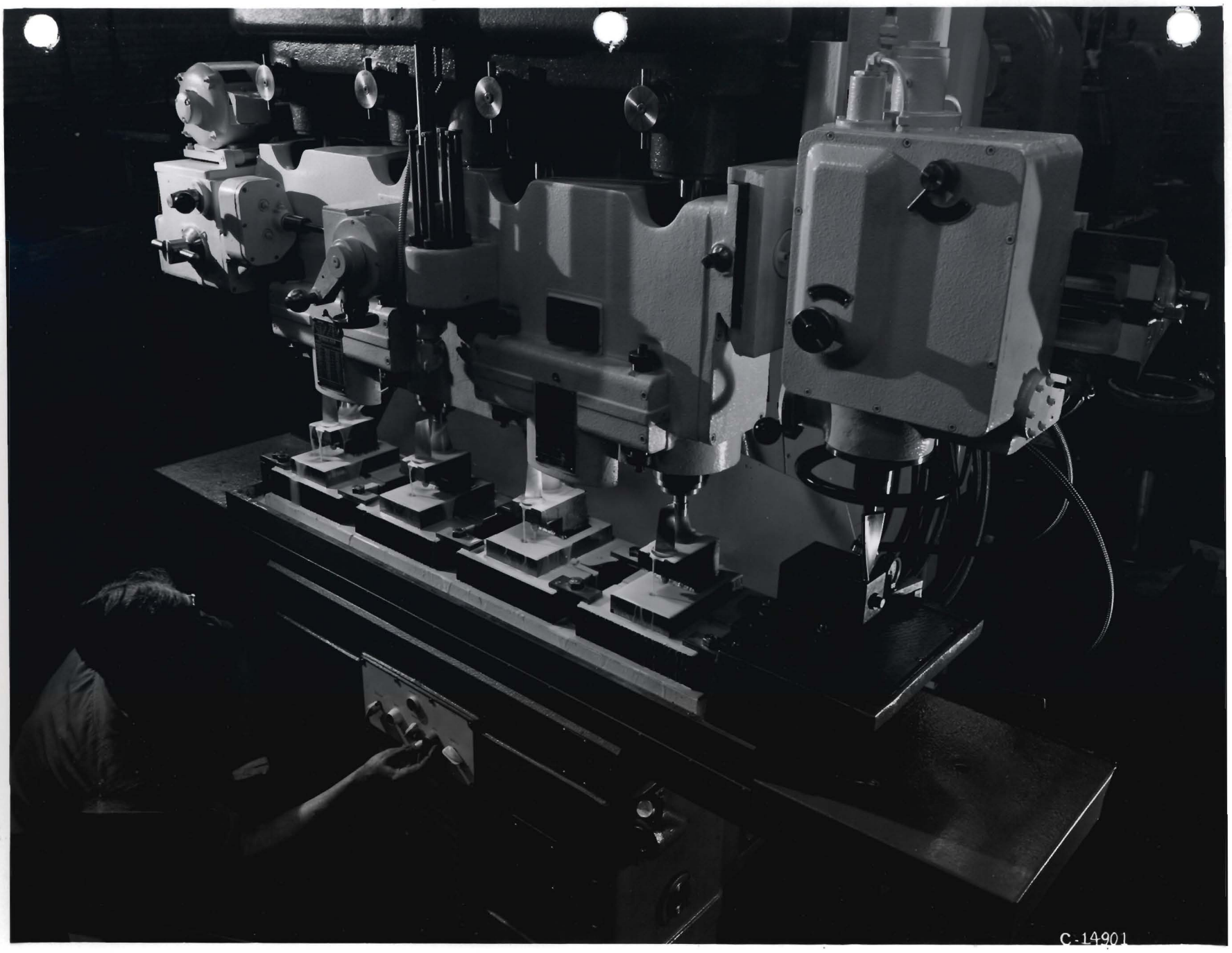
C-28473

Technicians at the NACA's Lewis Flight Propulsion Laboratory making final adjustments on a full-scale ram-jet engine for a guided missile in the 8- by 6-foot test section of the world's largest supersonic wind tunnel. Note the absence of distortion of the images reflected in the highly polished stainless steel walls of the tunnel. Performance of this power plant at a speed of 1100 miles per hour was demonstrated at the laboratory's 1951 inspection.



C-25438

Supersonic shock waves forming around the air inlet of a ram-jet engine under test in the 8- x 6-foot supersonic wind tunnel of the NACA's Lewis Flight Propulsion Laboratory. This supersonic air flow pattern is made visible by an optical device known as a schlieren apparatus. The ram-jet is of a type designed to drive guided missiles faster than the speed of sound.



C-14901

Craftsman at NACA, Lewis Flight Propulsion Laboratory, milling turbine blades in a four-spindle duplicator.