NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

1724 F Street, N.W. Washington 25, D.C.

FOR RELEASE:

10:00 AM, Tuesday
SEPTEMBER 28, 1948

NACA PROPULSION LABORATORY RE-NAMED IN HONOR OF THE LATE DR. LEWIS

Cleveland, Ohio, September 28, 1948:--In an impressive ceremony the Flight Propulsion Research Laboratory of the National Advisory Committee for Aeronautics was re-named the Lewis Flight Propulsion Laboratory today in honor of the late Doctor George William Lewis, for 27 years Director of Aeronautical Research for the NACA.

Following the opening remarks of NACA Chairman, Dr. Jerome C. Hunsaker, a commemoration address reviewing Dr. Lewis' life and his contributions to aeronautics was made by Vice Admiral Emory S. Land, U.S.N. (Ret.), now President of the Air Transport Association and past Member of the NACA.

J. F. Victory, Executive Secretary of the NACA read the resolution adopted by the Committee re-naming the vast Laboratory after Dr. Lewis. Mr. Victory also paid tribute to the former Director on behalf of the NACA employees.

Dr. Lewis came to the NACA in 1919, when the Committee had one wind tunnel and 43 employees. He dedicated his life to developing aeronautical research in this country, and by the time of his death in July 1948, he had helped build the NACA to the stature of the world's outstanding aeronautical research organization with three major laboratories and 6,700 employees.

September 24, 1948.

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

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FOR RELEASE:

10 AM, TUESDAY,
SEPTEMBER 28, 1948

NACA REVEALS RAM-JET FLIGHT RESEARCH AT SUPERSONIC SPEEDS

Cleveland, Ohio, September 28, 1948:--A 16-inch diameter ram-jet engine, enclosed in a configuration that may be used for supersonic flight, has provided performance information in free fall at speeds up to 2.4 times the speed of sound. The test engine is carried up to 30,000 feet by an F-82 Twin Mustang to be dropped. Ram jet thrust plus the force of gravity accelerate the vehicle, while radio-telemeter apparatus beams temperature and pressure data to the ground. The tests are carried out as a joint project of the Lewis Flight Propulsion and the Langley Aeronautical Laboratories of the NACA, the government's aeronautical research agency.

The engine used has a combustion chamber diameter of 16 inches and is 14 feet long, including the telemeter antenna. A central body located inside the inlet section houses the radio transmitter, fuel and all controls. Four fins are attached to the jet exit at the rear to provide aerodynamic stability.

With exception of the rocket, the ram-jet is probably the simplest conceivable engine. It has no large moving parts and consists principally of three elements; and inlet to slow down and compress the incoming air, a combustion chamber where fuel is injected and burned, and an exhaust nozzle where the gases are accelerated to provide thrust.

Operation of the ram-jet depends on forward velocity. At zero air-speed, no useful thrust is obtained. However, as forward speed increases, the ram air compression increases, giving increasing thrust and efficiency of operation. This relationship of increasing efficiency at higher speeds makes the ram-jet attractive for flight at supersonic speeds in the neighborhood of M 2.0 or more.

By conducting combustion and performance studies in free flight, an evaluation of engine performance is made over a wide range of speed. Moreover, investigation is made on an engine configuration as it may actually be used in supersonic flight. Results obtained indicate a critical relationship between combustion chamber performance and efficiency of the air inlet. Research will be continued both in flight and in supersonic tunnels to provide detailed information on this interaction and on control of the shock wave formation at the inlet. Shock waves that occur ahead of the inlet cause large losses in compression. Research so far has shown that these losses can be minimized by appropriate design and that pressure recoveries within a few per cent of the theoretical maximum are possible.

September 23, 1948

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NACA ANNOUNCES NEW GIANT SUPERSONIC TUNNEL

Cleveland, Ohio, September 28, 1948:--At its annual inspection of the Lewis Flight Propulsion Laboratory, the National Advisory Committee for Aeronautics, the government's aeronautical research agency, unveiled the largest supersonic wind tunnel in the world, to be placed in operation soon. The test section is 8 feet high and 6 feet wide, providing the first opportunity to study large models of turbo-jet and ram-jet engines in operation at speeds up to twice the speed of sound, under conditions of temperature and pressure simulating flight conditions near 35,000 feet of altitude.

The 8- by 6-foot supersonic tunnel draws its air through the largest air dryer built in this country which is capable of drying 2,200,000 cubic feet of air per minute down to a dew point of -10° F. by passing the air through beds of activated alumina. Reactivation of the alumina is accomplished by passing heated air through the drying beds for several hours.

The dry air is then forced through the tunnel by an 18-foot diameter axial-flow compressor having seven rotor stages and nine rows of stationary blading with a total of approximately 1,000 blades. Three large electric motors coupled together on a single shaft provide a total of 87,000 rated horsepower to drive the compressor at speeds that can be controlled from 770 to 880 rpm.

The speed of the air in the tunnel test section is controlled by means of an adjustable throat built of two flexible side walls of stainless steel 35 feet long and 8 feet high, which are automatically flexed to the desired wall profile by means of hydraulic jack screws.

Air from the test section is discharged to the atmosphere through a large conical diffuser surrounded by a heavy concrete enclosure and fitted at its discharge end with an exhaust muffler to hold the noise within acceptable limits. The operation of jet engines within the tunnel will so contaminate the air and increase its water content that it was considered unfeasible to recirculate the air within the tunnel.

Flow around the models will be observed by a schlieren apparatus through windows in the test-section side walls. The optical equipment for this purpose is so designed that photographic records can be made or the images can be transmitted from the test chamber through periscope or television apparatus to the remote control room where engineers control the tunnel speed and operating conditions and record research data. Aerodynamic forces on the model are recorded by means of a large balance system located in the test chamber.

When the tunnel is complete, an extensive program of research on flight propulsive systems to be used in supersonic aircraft will be initiated to augment and extend the research already completed at the NACA Cleveland laboratory in the altitude wind tunnel, in flight, and in smaller supersonic wind tunnels.

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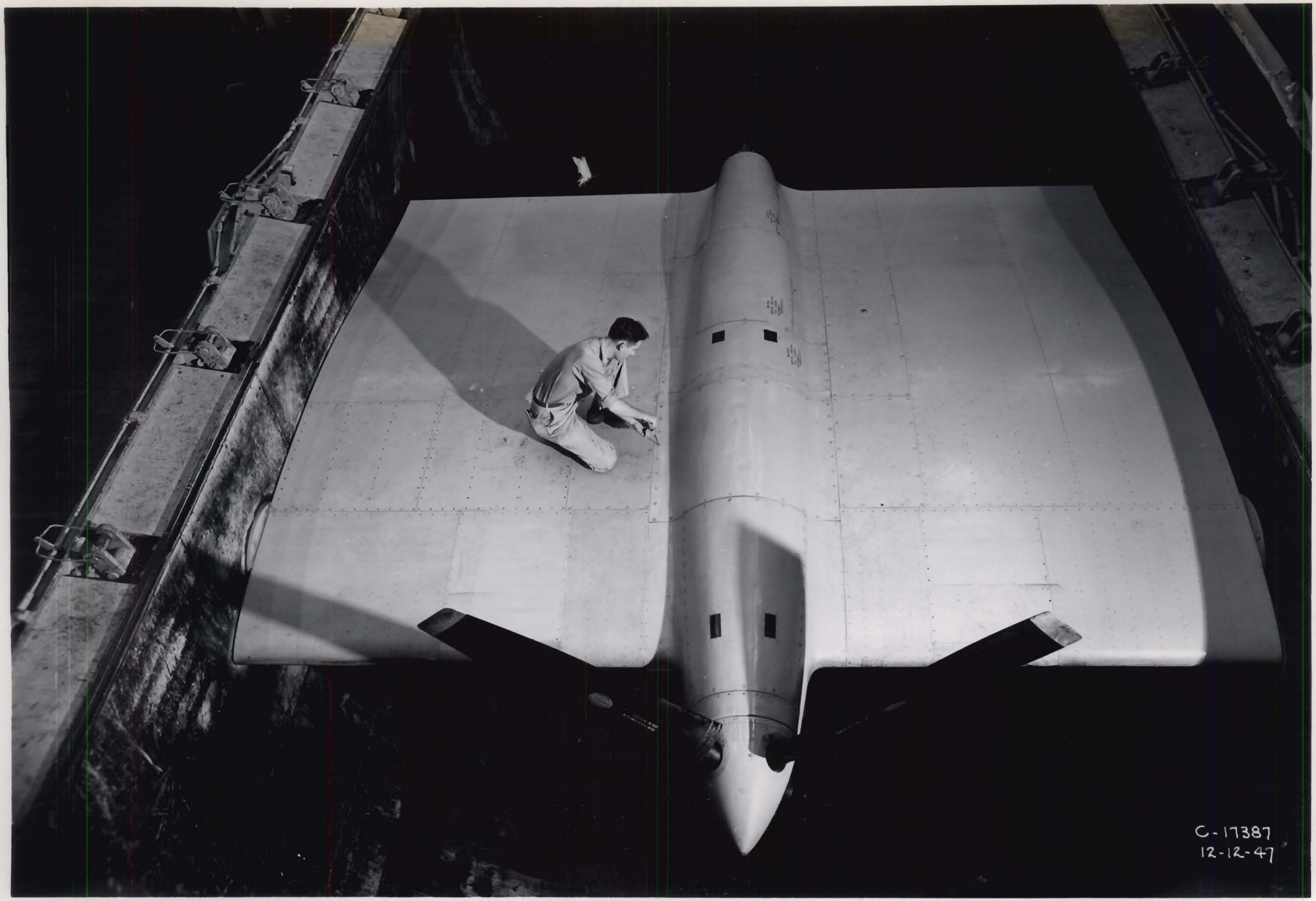
FIVEFOLD INCREASE IN COMPRESSOR OUTPUT SEEN IN NEW NACA SUPERSONIC COMPRESSOR

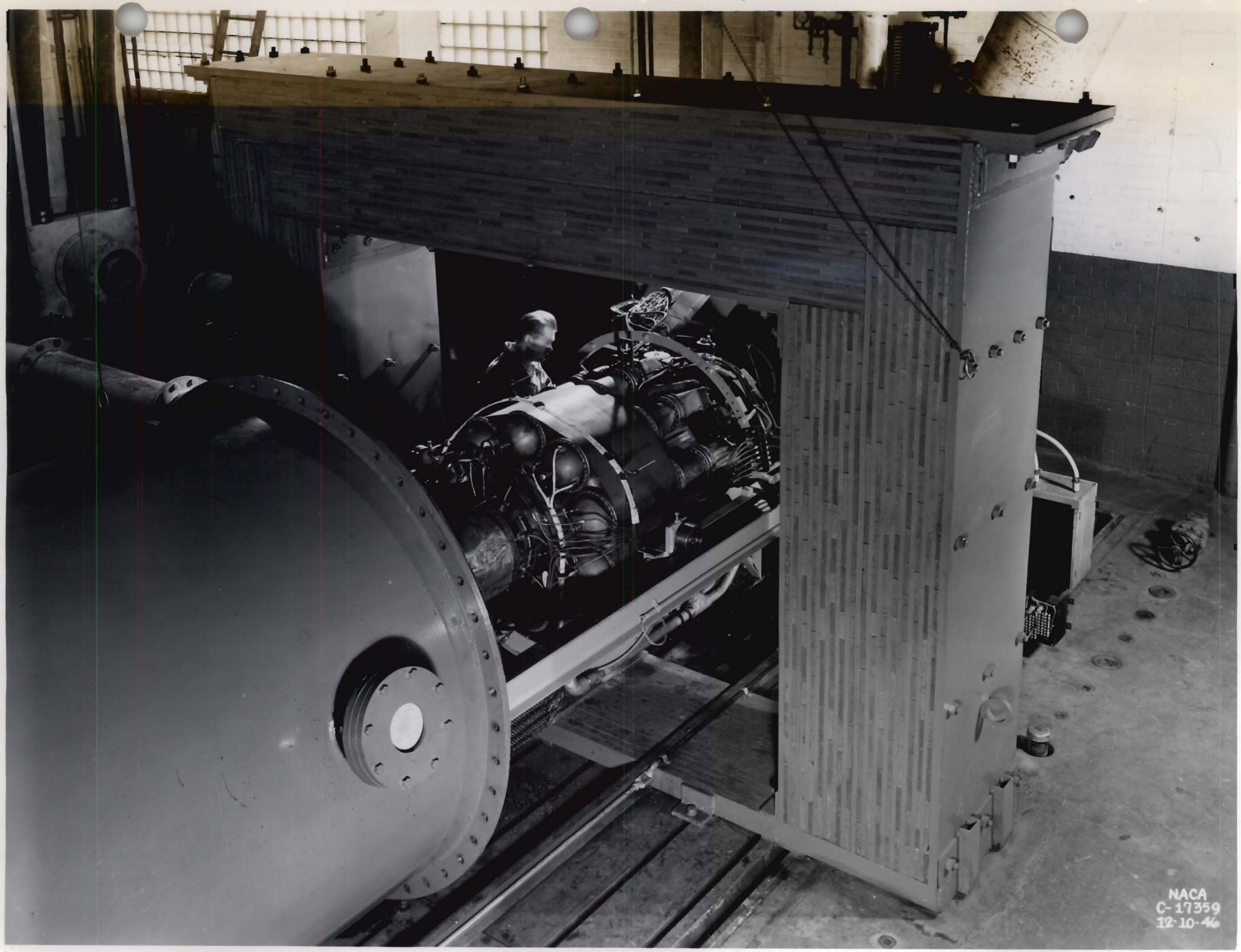
Cleveland, Ohio, September 28, 1948:--Results obtained on an experimental compressor have indicated that a single rotating blade row of the new NACA supersonic compressor may accomplish the work of five rows of the ordinary axial-flow compressor. This means either that the output of present jet engines might be achieved with a smaller, lighter compressor, or that using present sizes, the power may be greatly increased.

When conventional blades are rotated at supersonic speeds, a piling up of pressure impulses on the leading edges of the blades creates a "dam" to the flow of air. This "dam", generally referred to as a shock wave, has been an obstacle in the way of attaining supersonic speeds in compressors, as it was with supersonic flight.

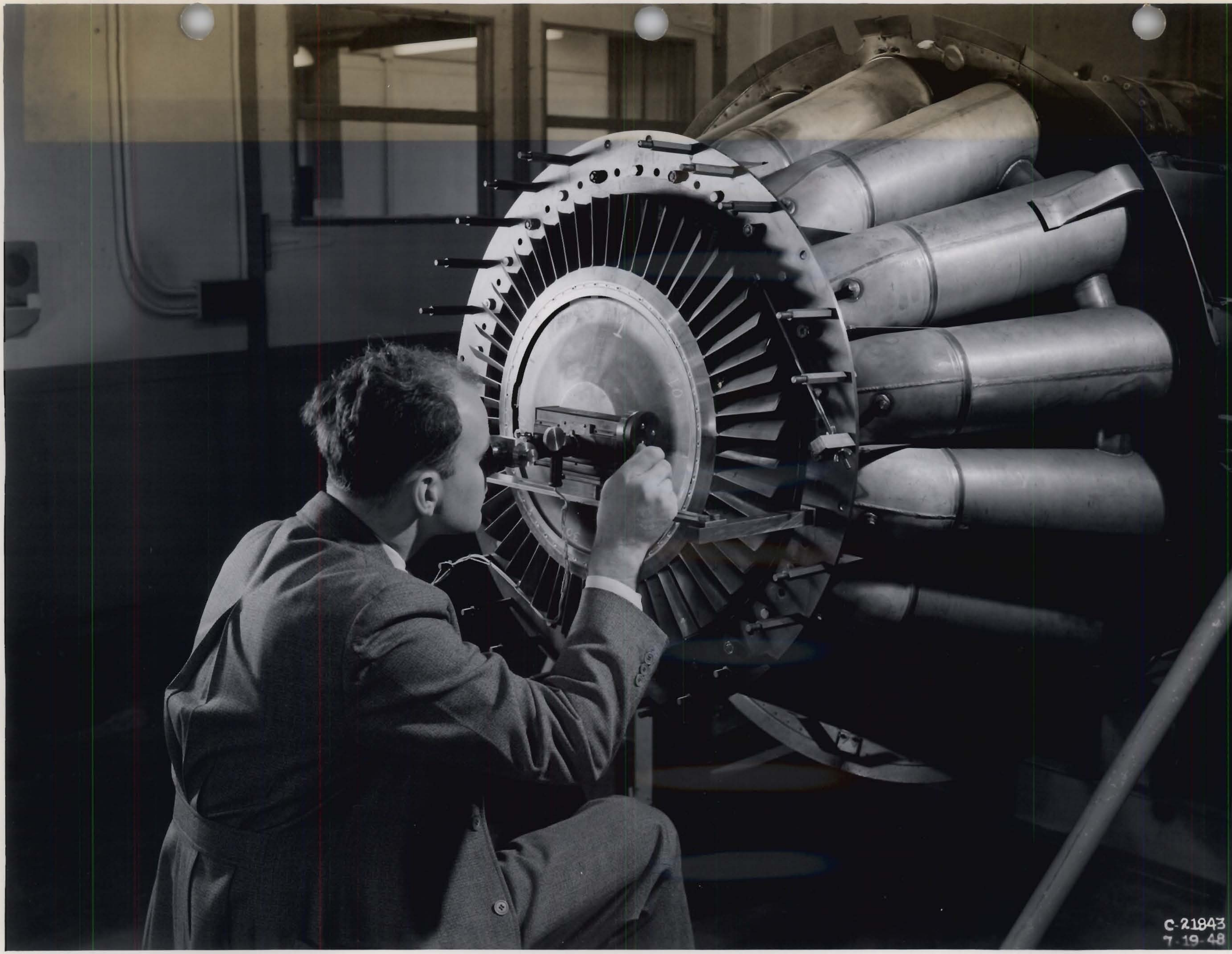
Intensive study by the NACA in the field of supersonic aerodynamics has resulted in a compressor designed to operate at supersonic speeds. The compressor rotates so fast that the balde tips travel in excess of 1,000 mph. It is so designed that the shock waves occur not at the leading edge of the blades but well inside the compressor. The energy absorbed by the shock wave, instead of being lost to the process, is used to compress the air to the desired high pressure. By using this energy, the size of a compressor to produce a given pressure increase is greatly reduced. Substantially greater gains are expected to result from the research now being conducted by the NACA. The reduction in compressor size which can be realized by use of this new compressor type will mean a substantial saving in time, cost, and material required for making jet engines. It will result in large saving in length and weight of jet engines.


C-17387
12-12-47

C-17387 - Complete engine and propeller installations are studied in the Altitude Wind Tunnel at the NACA's Lewis [illegible]ight Propulsion Laboratory. The turbo pro[illegible]ller installation shown here illustrat[illegible] the sleek low drag contour possible with engines of this type.

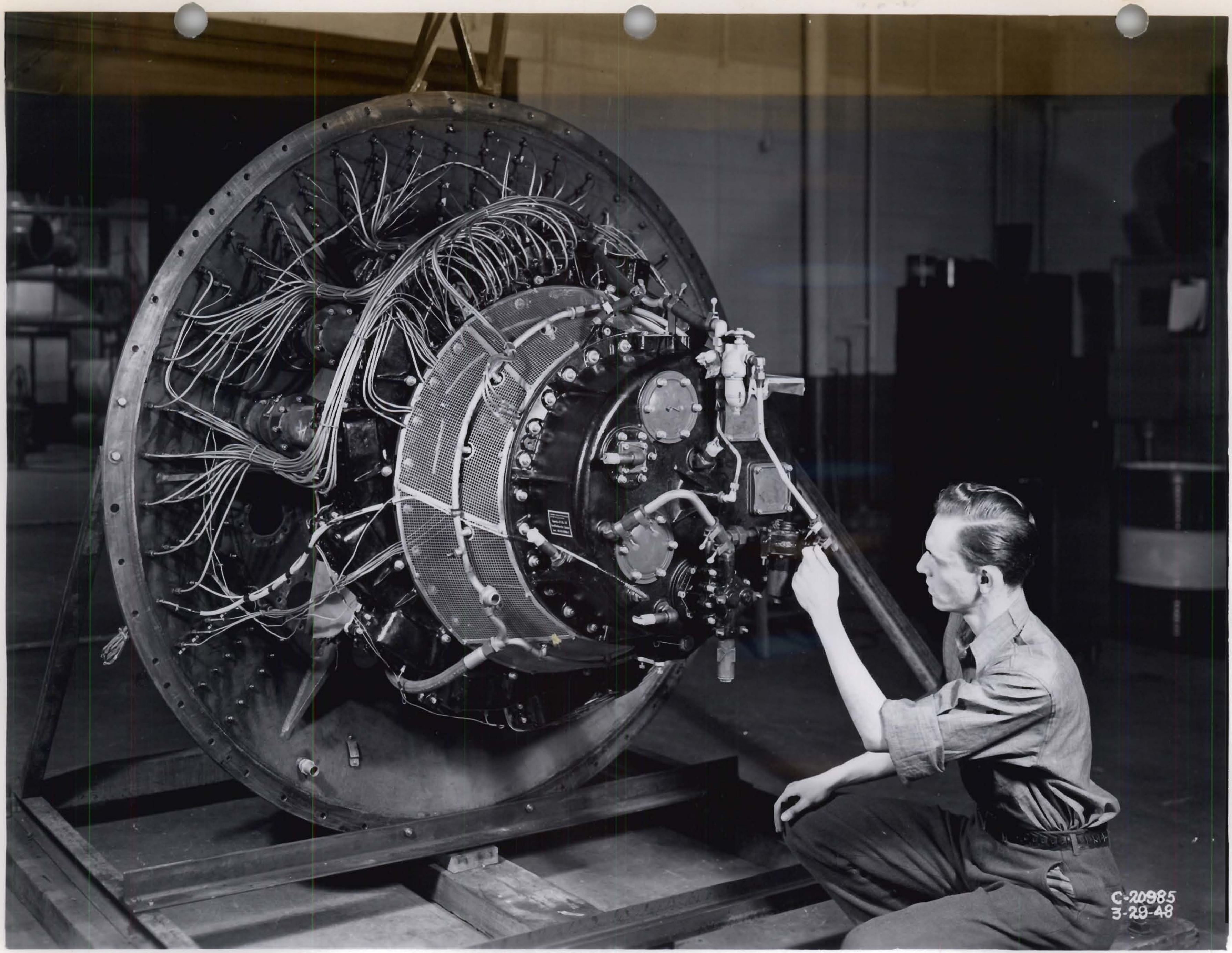

NACA
C-17359
12-10-46

C-17359 - A turbo jet engine is prepared for investigation under simulated altitude conditions up to 50,000 feet in one of the NACA's altitude chambers at the Lewis Flight Propulsion Laboratory. A heavy barricade of alternate layers of steel and wood is placed in line with the turbine to reduce hazard in case of failure of the turbine wheel.



NACA

C-21843 - A jet engine turbine undergoing a periodic check for blade stretch during a service life test at the NACA's Lewis Flight Propulsion Laboratory.

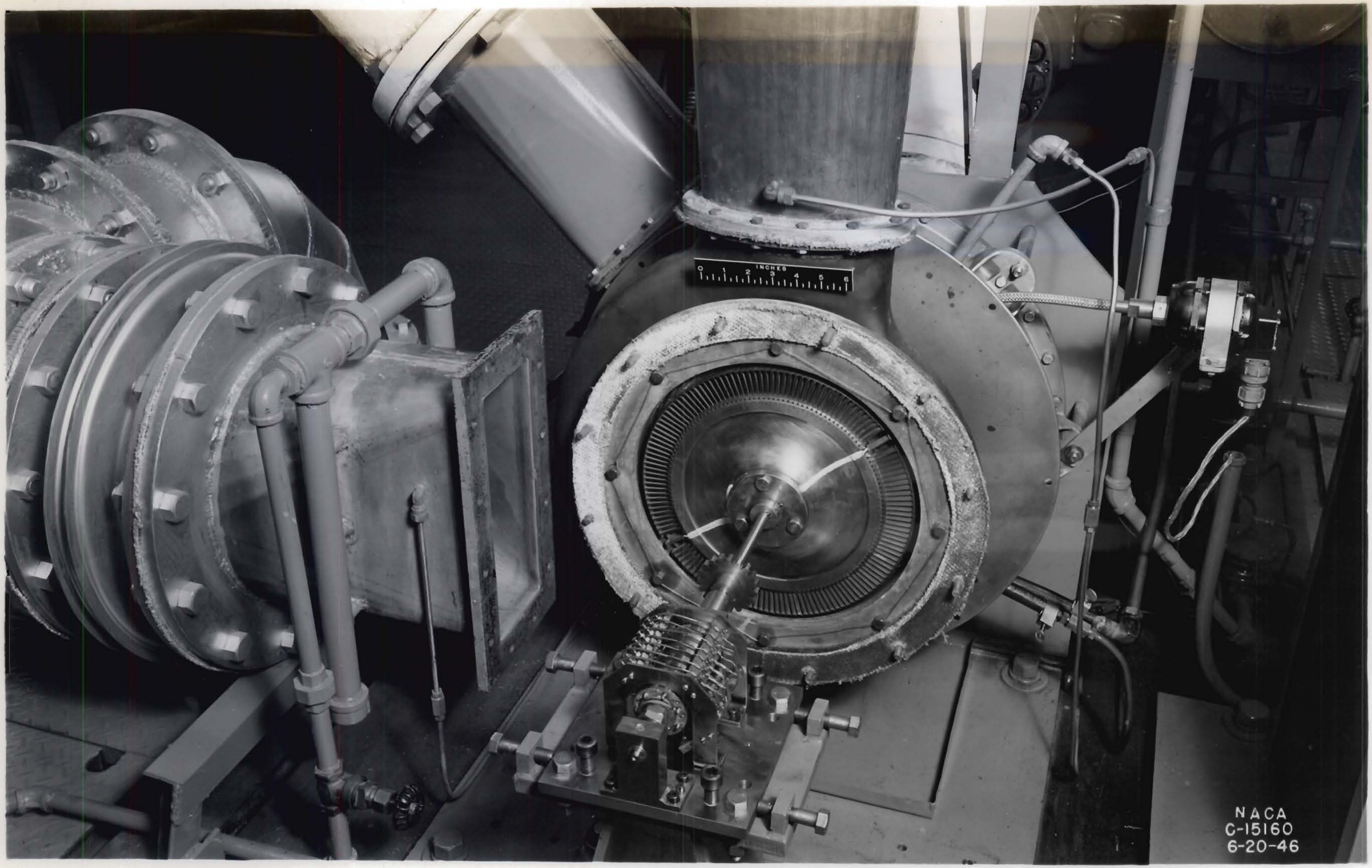


NACA

C-2098[illegible] The maze of pressure recording tubes from [illegible]is turbo jet compressor indicates the [illegible]tensive instrumentation required for detailed investigations at the NACA's Lewis Flight Propulsion Laboratory.


16-A-1
NACA
C-19063
7-1-47

C-19063 [illegible]he 16" diameter ram jet drop model used in [illegible]ACA flight research to obtain ram jet p[illegible]formance information at speeds up to 2.4 times the speed of sound.

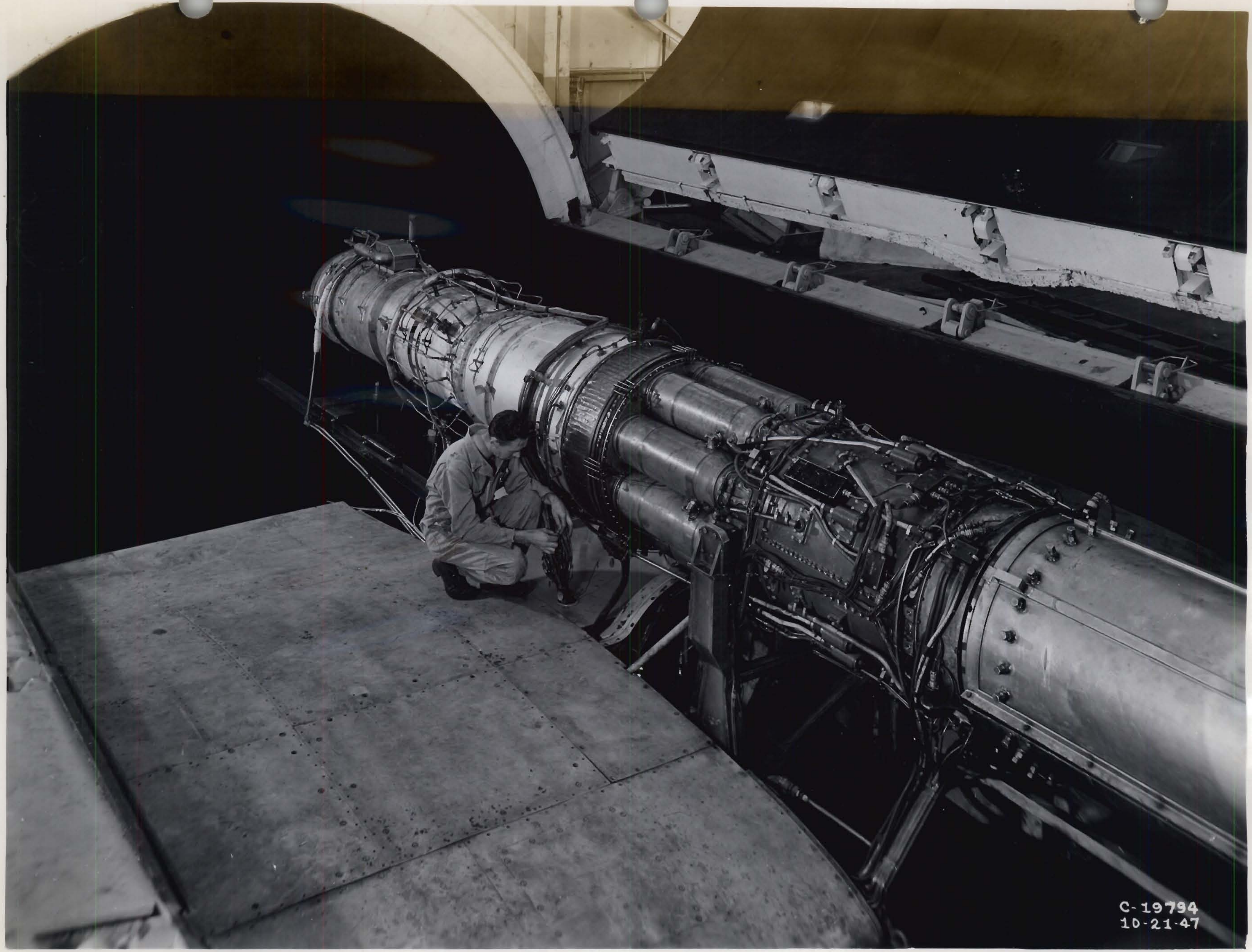


NACA

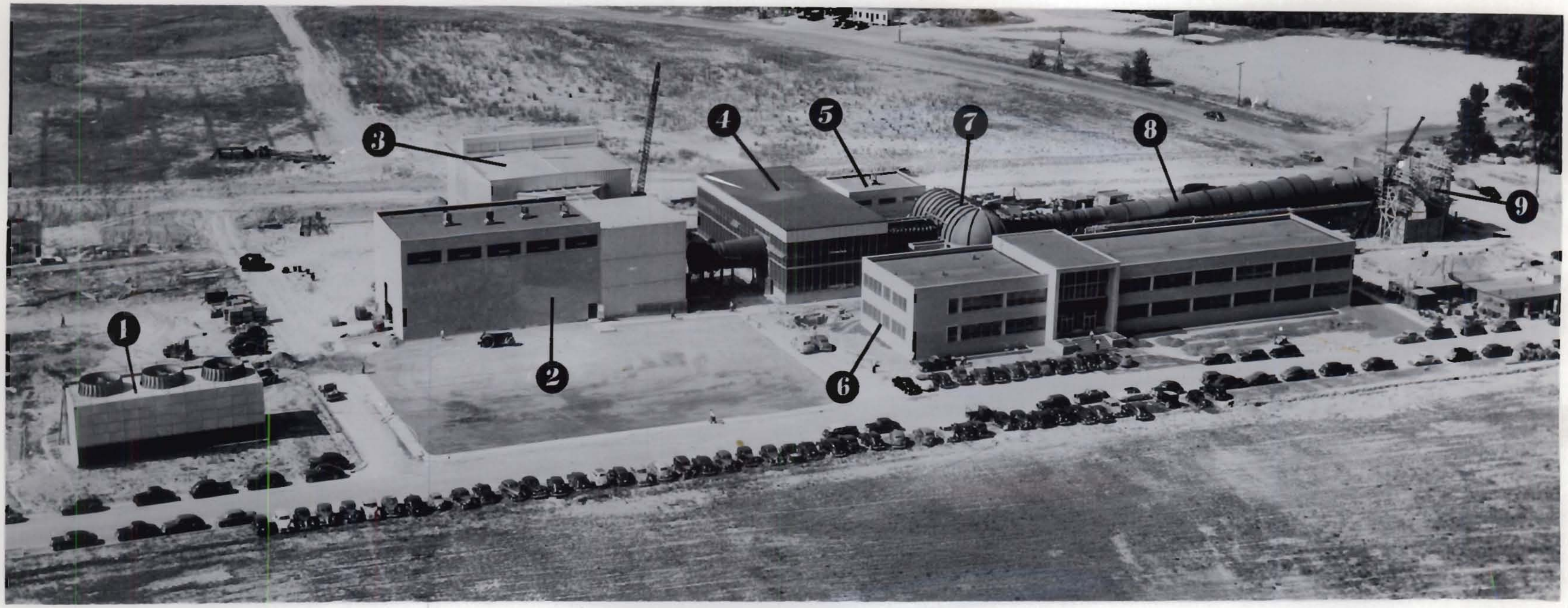
C-15160 - Vibrational stresses of turbine blades are measured at rated speed and temperature on the supercharger turbine shown here at the NACA Lewis Flight Propulsion Laboratory. Accurate measurement of such stresses in turbine blades rotating at high speeds under elevated temperature conditions is an unusually difficult test problem.

NACA

C-21990 A turbo jet engine carried beneath a B-29 [illegible] flight research conducted at the Lewis Flight Propulsion Laboratory of the NACA to determine effects of icing on axial flow turbo jet engines under actual operating conditions.


C-19794
10-21-47

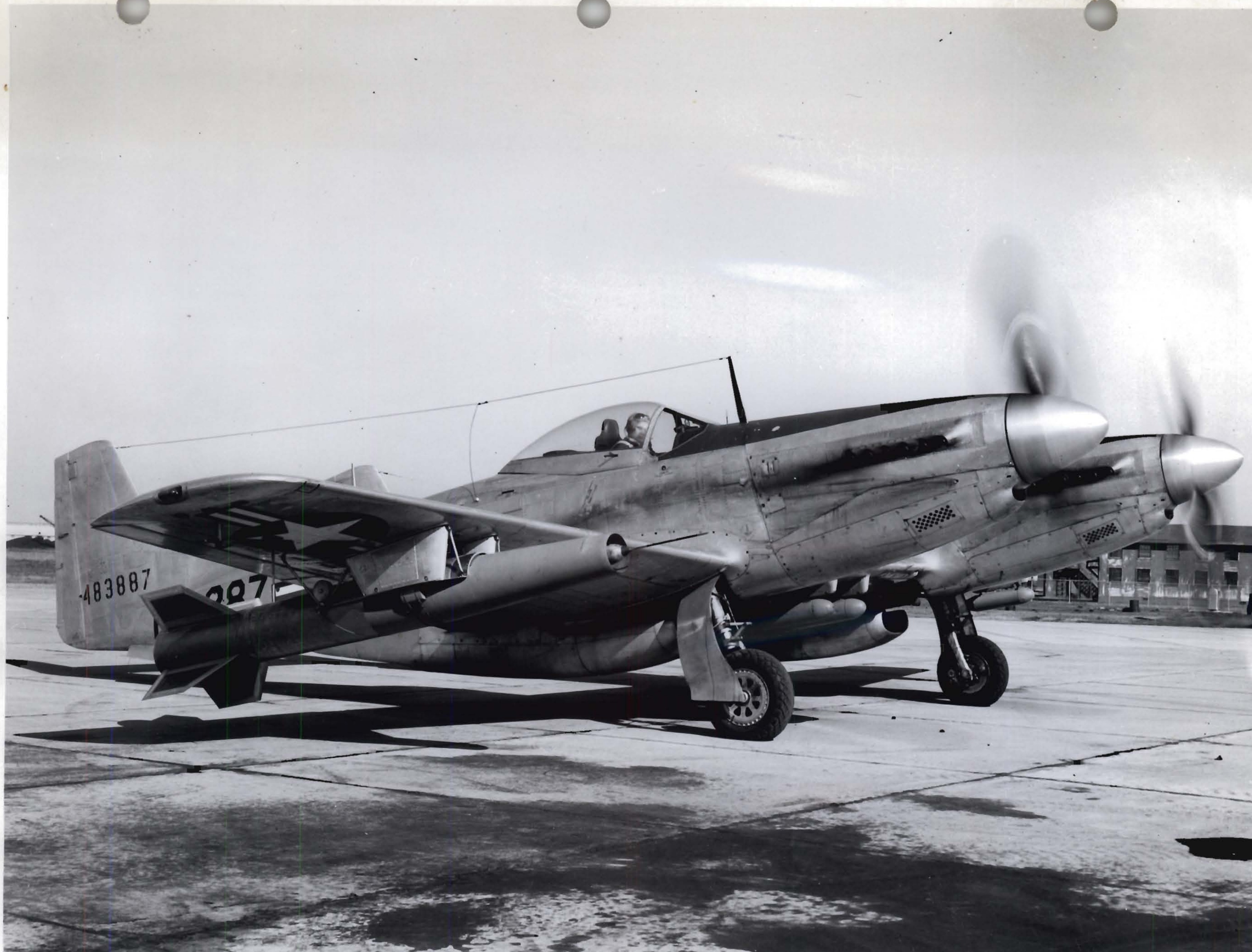
C-1979 Full sized turbo jet engines are studied in the Altitude Wind Tunnel of the Lewis Flight Propulsion Laboratory. Here a heavily instrumented axial flow engine is installed in the tunnel test section.



1. Cooling Tower
2. Drive Equipment Building
3. Air Dryer Building
4. Models Preparation Building
5. Exhauster Building
6. Tunnel Control Building
7. Test Section
8. Tunnel
9. Acoustic Treatment

NACA
C-22288
9-24-48

C-22288 - The Eight- By Six-Foot Supersonic Wind Tunnel now under Construction at NACA's Lewis Flight Propulsion Laboratory.

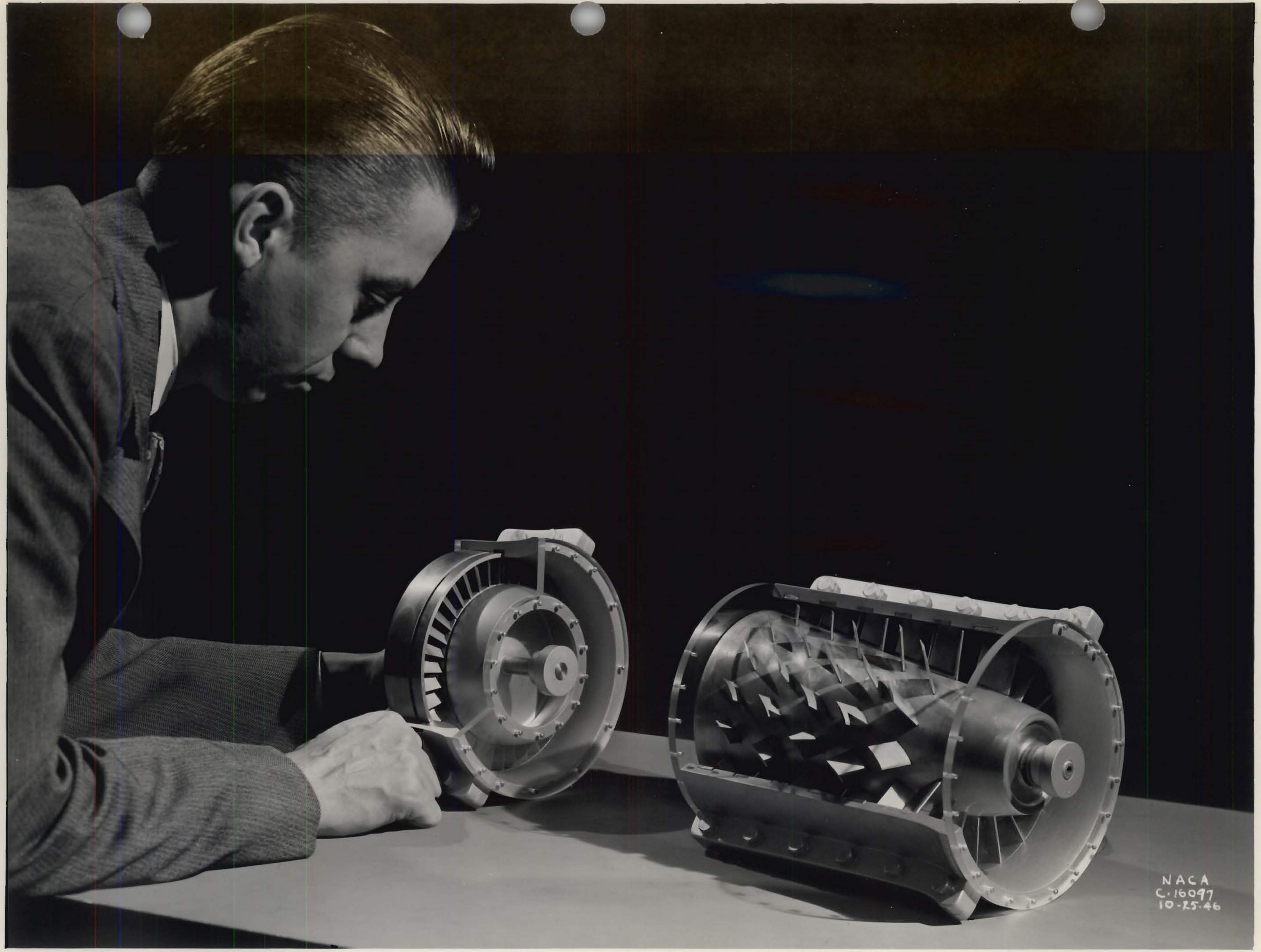


NACA

LMAL 55807

LMAL
55807

Ram jet drop model mounted under wing of F-82 fighter plane ready to be taken up to altitude and released. With thrust of ram jet plus acceleration of gravity, the vehicle reaches speeds up to 2.4 times the speed of sound. Information on engine performance is transmitted to the ground by radio.



NACA

C-16097 - Co[illegible]rison of compressor model shows smaller si[illegible] of NACA Supersonic compressor at left [illegible]ich achieves same degree of compression as five stage axial flow unit at right.