1002-20-4821 January 29, 1954 3093

Seventh
Progress Report
on

Fire Detection in Aircraft Engine Nacelles

by

C. S. McCamy and Wm. F. Roeser

Covering period 25 October 1953 to 25 January 1954

for

Headquarters
Wright Air Development Center
Wright-Patterson Air Force Base
Dayton, Ohio
Project No. 52-660A45

WCLEM-3

Fire Detection in Aircraft Engine Nacelles

by

C. S. McCamy and Wm. F. Roeser

1. Summary

During the past quarter measurements were made of the rate at which energy was radiated in various parts of the spectrum from high velocity jet flames. Measurements were also made of the rate of increase in the radiation as the rate of combustion increased from the instant of ignition. Some measurements were made of the relative amounts of energy received from flames with and without a heated background.

2. Measurements on High Velocity Jet Flames

A series of measurements have been made on high velocity flames produced by a ram-jet type burner in which the fuel and air could be premixed and preheated. Gasoline was the fuel used. For one series of flames, both the fuel and air were premixed and preheated and the fuel-air ratio was varied over wide limits. For another series, only the air was preheated and the fuel was injected into the air stream just ahead of the flame holder. The maximum velocity of the burning gas ranged from 670 to 2570 feet per second. Measurements were made of the rate of energy radiated in selected wavelength bands and the flicker frequency distribution.

3. Hot Background Studies

A series of measurements have been made of the relative amounts of energy received from flames with and without a heated background. A black body radiator was used as the background source and its temperature was varied from 70° to 1000°F.

4. Rate of Increase of Emission

The rate of increase of energy emitted by gasoline and hydraulic fluid flames was measured under different conditions.

The results of these experiments are being analyzed and summarized for inclusion in the final report.

5. Financial Condition

Expenditures and commitments on this project:

April 25, 1952 through Sept. 30, 1953	$28,632.36
Oct. 1, 1953 through Dec. 31, 1953	9,001.60
Total through December 31, 1953	$37,633.96