NASA TECH BRIEF

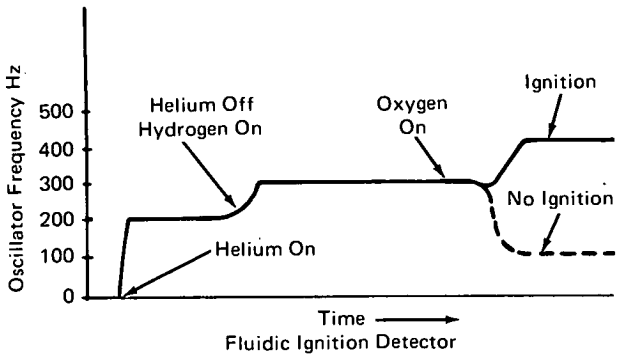
Marshall Space Flight Center

Fluidic Ignition Detection

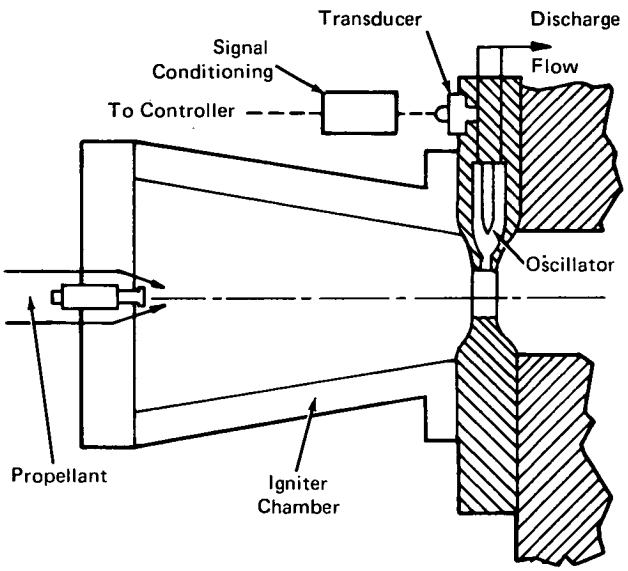
A unique ignition sensor, utilizing a fluidic oscillator device and its ability to react to a flow system's molecular weight and temperature changes, can be used to detect propellant ignition. It may be applied commercially in the fields of fire protection equipment and fluidics. The oscillator distinguishes various flow phases (as shown in Figure 1), which the ignitor experiences during a start transient period and presents the ignition-no-ignition frequency output characteristics as a go-no-go signal. The frequency is monitored electronically with a high-frequency pressure sensor with the predetermined reactions occurring as a result of the specific frequency level or counter state produced.

The sensor is incorporated into the igniter system, as shown in Figure 2. The detector itself may be a separate or integral assembly mounted between the igniter body and preburner. Since the oscillator is a continuous flow device, requiring a finite pressure drop, the sensor system would have a discharge flow that must be routed to some lower pressure sink.

The sensor has no moving parts, is ruggedly constructed, and appears to be highly reliable. Detection is by means of direct measurement, and the system can be checked by monitoring the output during a surge flow. The output of the detector is readily converted to a digital pulse code.



Fluidic Ignition Detector
Figure 1.



Ignition Sensor Assembly Schematic
Figure 2.

Note:

Requests for further information may be directed to:
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Reference: B72-10158

Patent status:

No patent action is contemplated by NASA.

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Category 06