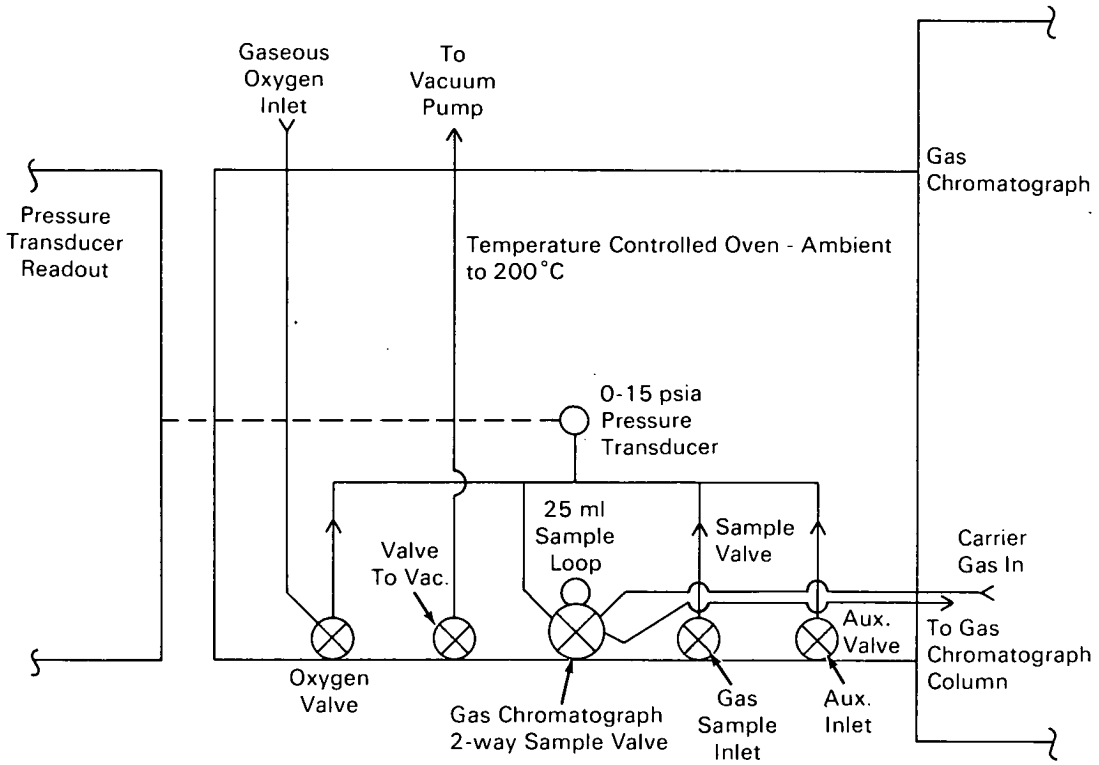
NASA TECH BRIEF

Economic Gas Chromatograph System for Subambient Pressure Gas Sampling



A new gas chromatograph (GC) sampling system consisting of a manifold with a GC gas-sample valve, a minimum-volume pressure transducer with a readout device, a vacuum-source valve, and a sample-inlet valve has been developed (see figure). This system is useful in the analysis of subambient pressure gas samples, particularly those from propulsion units. Three prototypes of this system have been constructed and are currently in use.

Previous GC sampling systems consisted of a manifold with a GC two-way sample valve, a pressure gauge, a vacuum-source valve, and a sample-inlet valve. In these systems the manifold was traced with externally controlled heating tapes and insulated with glass wool batting. In the new sampling system, however, a low-volume pressure transducer with a portable monitor replaces the pressure gauge, and the manifold and its components are enclosed in a controlled air-

(continued overleaf)

circulating, constant-temperature oven that is attached to the GC cabinet. This arrangement of the manifold eliminates such objectionable features as the necessity for tracing all the sharp bends of the system lines with heating tapes to abolish cold spots where condensation might take place, and the possibility of electrical short circuits that frequently cause irreparable damage to the tapes and valves, decompose the sample at the resultant "hot spot," and create a safety hazard. In the old system, the pressure gauge required a relatively large volume of gas to obtain a sample pressure reading; and the face of the gauge was an unwanted cold trap for condensation of sample components as well as being subject to shattering. These shortcomings, however, were eliminated by the pressure transducer in the new system, and the accuracy of pressure measurements increased.

Notes:

1. This GC sampling system has time-saving and safety features that are not commercially available. The increased accuracy of analysis is brought about by better control of the sample size.
2. No additional documentation is available. Specific questions, however, may be directed to:
   Technology Utilization Officer
   Marshall Space Flight Center
   Huntsville, Alabama 35812
   Reference: B70-10220

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: S. M. Mitchell of
North American Rockwell Corp.
under contract to
Marshall Space Flight Center
(MFS-16298)