

Portable Mass Spectrometer System for *in-situ* Environmental Gas Monitoring

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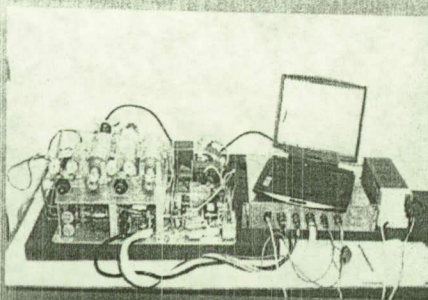


Figure 1 – AVEMS

Introduction

A system developed by NASA has been used for monitoring air quality around different locations. The system was designed for aircraft applications but has proven to be very useful as a portable gas analyzer. The system has been used to monitor air quality around volcanoes, cities, and the surrounding areas. The transport of the system has been via aircraft, car, and hand carried.

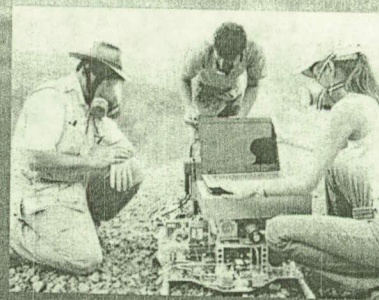


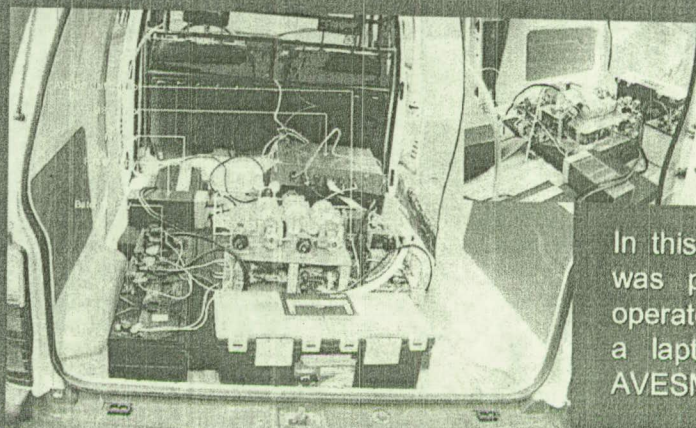
Figure 2 – AVEMS being used in the field at Turrialba Volcano



Figure 3 – AVEMS being used and transported in the field in a car.

System Attributes

The small system used has a total weight of 104 pounds, a volume of 92,000 cm³, requires 350 W of power at steady state, can operate at a temperature range of 25°C to -65°C and a pressure range of 760 torr to 50 torr. The system can operate in aircraft up to an altitude of 41,000 feet above seal level, the system can also be operated in a moving car or carried by two people to remote locations. The system is capable of monitoring and quantifying 16 gases simultaneously. Common components monitored include helium, carbon dioxide, sulfur dioxide, hydrogen sulfide, nitrogen, oxygen, argon and acetone.



In this application the AVEMS System was placed inside a car where an operator had control of the system with a laptop. Figure 3 shows how the AVESM System inside the car.