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COMPACT PORTABLE AIR SAMPLER FOR EMERGENCY USE

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A compact, versatile air sampler has been designed and built by the Health Chemistry Department of LRL-Berkeley.

The sampler was designed to fit into a suitcase of emergency equipment which could be picked up at a moment's notice and carried to any remote area. Of prime importance were minimum weight and size; however, an adequate sampling rate was necessary to justify the unit.

Our sampler operates from any 12-volt (or, in a pinch, 6-volt) source. Since air sampling would be of use primarily in the vicinity of inhabited areas, we assume that some kind of automotive equipment will be available to power the unit. The complete unit weighs only 1.9 pounds, takes up no more space than a survey meter, and samples at 4 cfm, using our standard 4×9-in. HV-70 filter papers. These are the same sampling conditions we use throughout the Laboratory, so the interpretation of results is exactly the same as we are accustomed to. This is an important advantage under emergency conditions, since it allows the application of direct experience and the usual rules of thumb. Technical workers are able to make quick, intelligent evaluations of possible hazards.

The basis for the sampler is an inexpensive automobile vacuum cleaner marketed as the "Car Clean 12-Volt Valet Vac, Model MCC," which comes with an adapter for plugging into a cigarette lighter receptacle. The dust bag and its housing are removed and replaced with a cylindrical screen to support the 4×9-in. filter paper, which is wrapped around it.

Although designed for a 12-volt supply, the unit will also operate at reduced volume with a 6-volt source. A flowmeter, consisting of a pitot tube and inexpensive air-flow measuring device, is provided. This would be particularly useful if something other than a 12-volt car battery were used.

In spite of the low cost, the unit holds up remarkably well in service. We have operated the unit continuously for 9 hours without any problems.

Lawrence Radiation Laboratory
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RLB, HPC, RPG, JTH, WTP, JY

FIGURE CAPTIONS

Fig. 1. Performance with standard 4×9-in. HV-70 paper.

Fig. 2. Static suction versus flow rate at constant voltage.

Fig. 3. Air sampler dismantled for storage or transportation.

Fig. 4. Air sampler assembled for use.

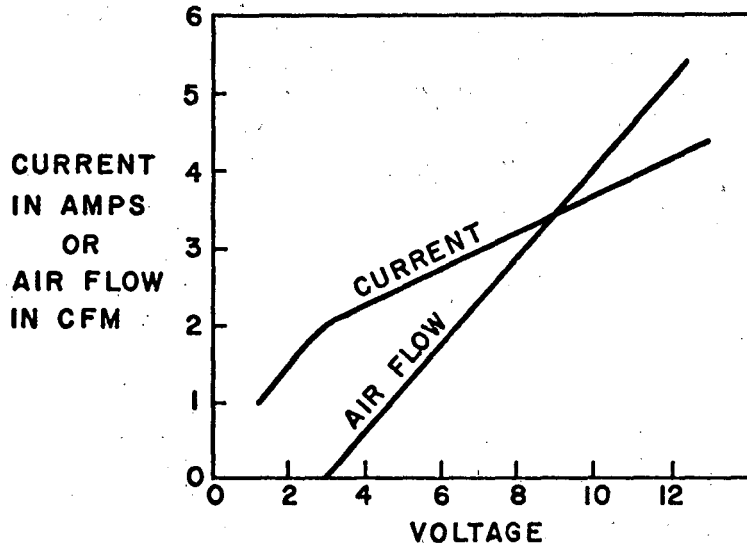
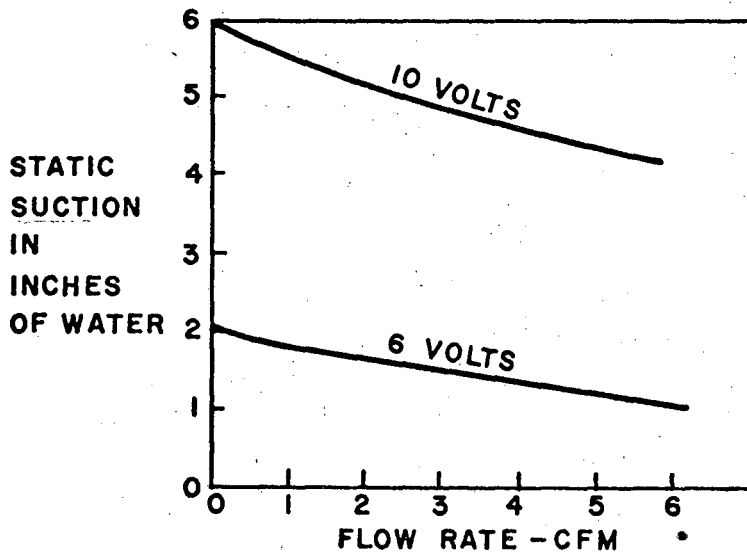
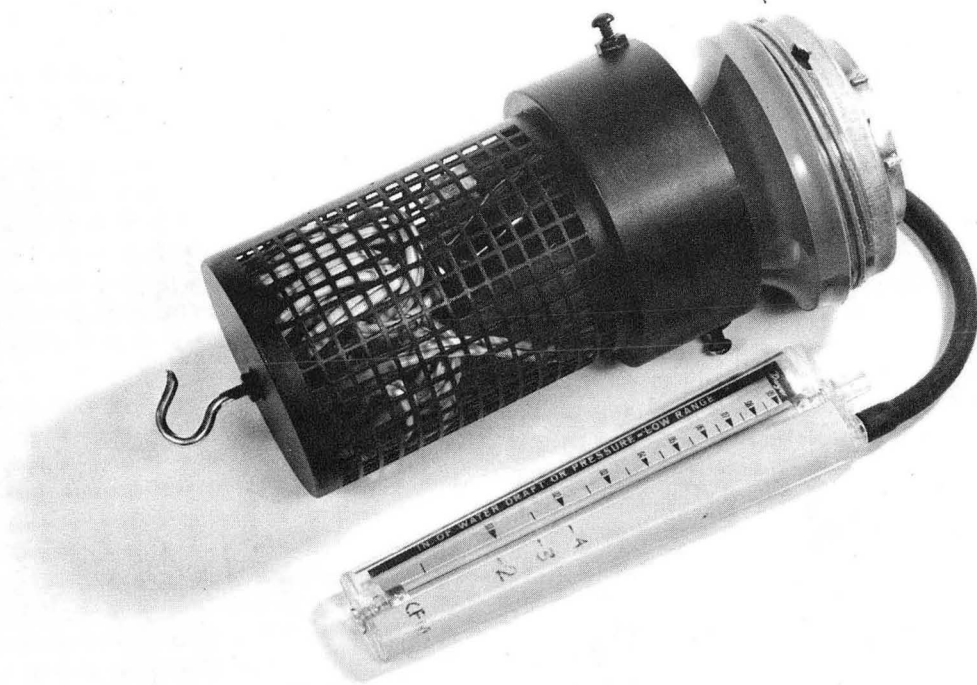


Fig. 1



XBL 679-4889

Fig. 2



XBB 677-4315

Fig. 3



XBB 677-4316

Fig. 4

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