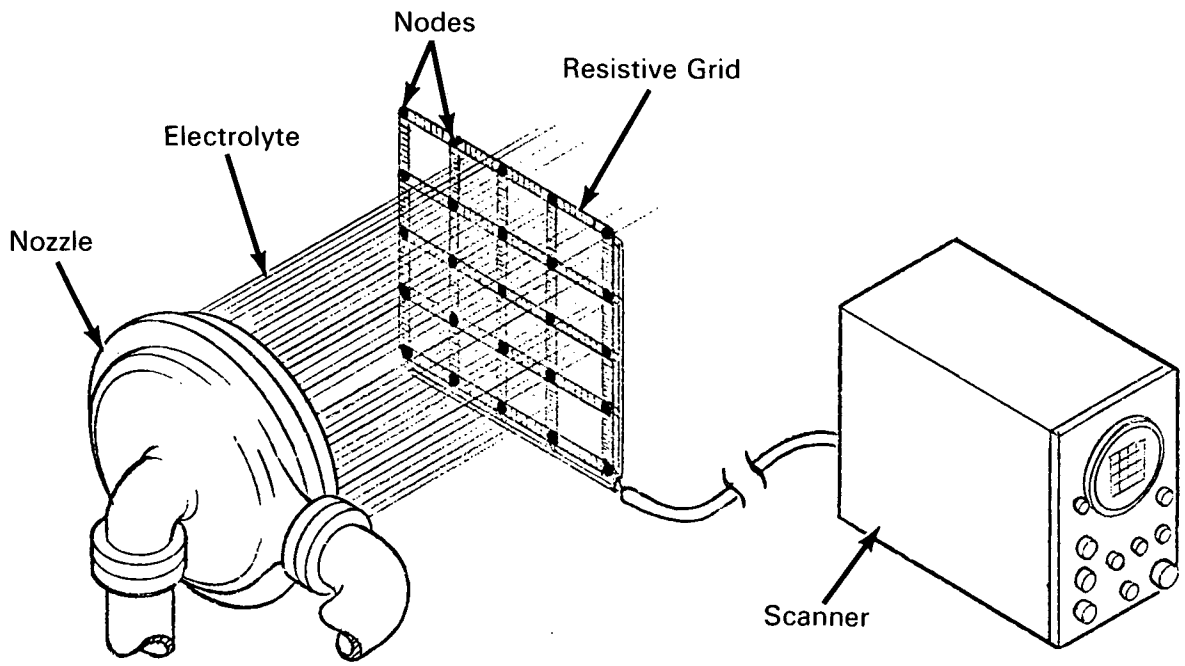
November 1968 Brief 68-10402

NASA TECH BRIEF

System for Measuring Spatial Distribution of Ejected Droplets, a Concept



A concept is presented for the design of a system to ascertain the spatial distribution of high-velocity droplets ejected from a nozzle or spray gun.

An electrically resistive grid would be employed as the sensing screen of the system. The grid, illustrated in the schematic, consists of a screen of high-resistance, low cross-sectional elements. These thin elements are symmetrically arranged in the form of a rectangular grid and electrically insulated from one another as well as from the supporting structure. Electrical leads are connected to the ends (nodes) of each element. The leads are connected (preferably through a commutator for tape recording or computer processing) to a signal scanner such as a cathode ray tube.

To perform a measurement, the grid is positioned downstream parallel to the discharge plane of the nozzle to be scanned. An electrolyte having viscosity and density characteristics similar to those of the operational fluid is used as a spray simulant. A valve, upstream of the nozzle, is then opened for a brief period to eject the spray towards the grid. The output signals would correspond to the voltage drop variations between nodes of the grid due to changes in

(continued overleaf)

resistivity of the grid segments. Spatial distribution of the electrolyte spray droplets would be determined from the output signal pattern. This pattern would then represent the distribution of the droplets that would result from ejection of the operating fluid through the same injector.

Note:

This system is presented only as a concept; neither a prototype nor a model has been constructed as of the date of this Tech Brief.

Patent status:

This invention is owned by NASA, and a patent application has been filed. Royalty-free, nonexclusive licenses for its commercial use will be granted by NASA. Inquiries concerning license rights should be made to NASA, Code GP, Washington, D.C. 20546.

Source: R. A. Ayvazian
of North American Rockwell Corporation
under contract to
NASA Pasadena Office
(NPO-10185)