THE APPLICATION OF CHARGE COUPLED DEVICES TO DOCUMENT SCANNING

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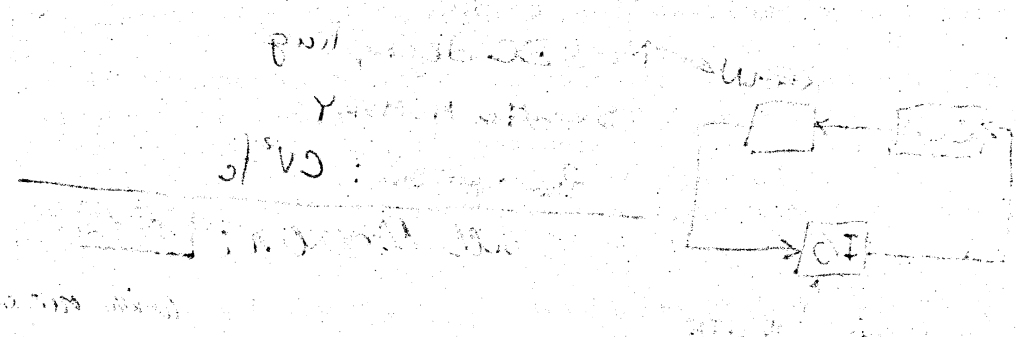
ABSTRACT

Facsimile communications have been in use for many years and have considerable utility in many general purpose and business applications. Its introduction on a large scale has been limited, in part, by the bi-directional mechanical movement employed in "first generation" machines. In addition to document scanners for conventional facsimile applications, new requirements are evident with the advent of new communication services of a visual nature.

Scanners suitable for scanning business documents ($8\frac{1}{2}$ x 11 inches) require resolution of about 1000 picture elements per line and 1000 lines per page. Charge coupled imagers now offer a means of reducing the mechanical movement in one (line imagers) or both (area imagers) directions. Line imagers at least as long as 1000 elements are now commercially available at costs which make it possible to build compact document scanners with no movement of the paper (i.e. pages can be scanned from books). Area imagers approaching 1000 x 1000 elements are not yet available.

The paper describes an experimental scanner in which neither the paper nor the imager move. The purpose of the project is to demonstrate the feasibility of using CCD line imagers along with simple optics and a minimum of mechanical movement in a document scanner of compact size and modest cost. Design details of the scanner will be presented along with any experimental results obtained.

The application of such a scanner as an input port to a visual communication system will be described and the signal processing necessary to interface the scanner with a facsimile communication system will be outlined.



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