

**An Experimental Design for Producing Holograms**

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## ABSTRACT

The challenge of how to differentiate authentic documents from counterfeit supplies has recently increased. The rapid growth and development of modern technology in our markets has made fake currency notes, fake bank credit cards, fake University certificates, and other fake government documents to find their way into our markets. Holography is proposed as a way of countering these forgeries. An experimental set-up to implement holography for both laboratory and commercial use has since been designed and fabricated. Using this setup, holograms of tailor made objects can now be made and attached onto documents to help any user verify the authenticity of the documents.

For the success of this research, local custom made setup was designed and fabricated. A successful advance was the designing and setting up of a tailor made optical table that perfectly suits holographic applications as well as other future experiments in the laboratories. The optical table is made purely from steel and weighs about 325 Kg. It is specially designed with good static rigidity and excellent stiffness. The table has a well damped structure with relatively low mass so that no low frequency resonances ( $<100$  Hz) are present. Preliminary running of holographic set-up was done and from these, the best exposure times for efficient bright hologram was determined.

An intense study of holographic recording is thus presented here. A complete holographic setup has since been made and tested within this region. However, in general the genuine holographic technique documented in this thesis is very promising and can readily be applied in numerous scientific areas like holographic interferometry and holographic data storage as well as for commercial purposes