

**Higher Technical Institute
ELECTRICAL ENGINEERING DEPARTMENT**

**DIPLOMA PROJECT
POINT TO POINT LASER
COMMUNICATIONS**

**BY
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POINT TO POINT LASER COMMUNICATIONS

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SUMMARY

The objective is to study a freespace laser communication system. The components studied include the basic principles which are applied in the project. Other topics which are also studied include the commercial versions of the project. There are also sections dealing with the design and construction of the devices involved. The final part involves the study of the completed devices and the various tests conducted on them.

INTRODUCTION

Light has long been used to convey information. An example is three millennia ago when the Greek victory in the Trojan War was telegraphed by lighting fires on the hilltops. Another example was heliographs where a mirror flashed the sun's rays in one direction, sending coded information. With a few exceptions light communications began to be phased out in the 1840's with the invention of the electric telegraph. But the idea of using light for communication was never entirely extinct.

Jacob Berzelius discovered Selenium in 1818. The grey metallic form is photosensitive. This was the beginning. Alexander Graham Bell and his assistant Sumner Tainter tried using light to produce and reproduce sound, they produced a fairly simple working model.



The idea of the photophone was a mirror mounted on a tightly stretched canvas diaphragm. A light beam, focused on the mirror was bounced back to a waiting listening post. The picture above shows Bell experimenting on the photophone. The receiver was made up of a Selenium cell with a battery and a receiver. When the light changed so did the resistance of the Selenium causing a variable current. Thus was the first example of light communications.

The laser wasn't invented until 40 years ago. When it was demonstrated using a ruby rod. Since that time not only has the term laser been adopted into everyday speech but it has grown from being an object of scientific curiosity to a very important invention of our time. It is now a vital tool for areas as diverse as the manufacturing industry and medicine, an essential component of communications and the fundamental device for scientific measurements and research programs.