

Thesis Title	Low Intensity X-Ray Imaging System
Thesis Credits	12
Candidate	Mr. Krecthaphol Punthawangkul
Supervisor	Assoc. Prof. Weerapong Chewpraditkul
Degree of Study	Master of Engineering
Department	Instrumentation and Control System Engineering
Academic Year	2001

Abstract

X-rays has currently been used widely in industrial and medical application. However, this method has some limitation. In X-ray diagnosis, the operators and patients have high risk from radiation effects due to high intensity beam. Additionally, the X-ray image cannot be immediately analyzed because it depends on chemical process. To overcome these problem, the low intensity X-ray imaging system was developed in this research. This system consists of three parts:- the low power X-ray generator (60 kV,120 μ A) , the X-ray imaging camera, and a personal computer. The major part of this system is the X-ray image camera, which consists of an image intensifier (Microchannel plate (MCP) type) and a CCD camera. The X-ray image from the image intensifier was captured by the CCD camera and then send to display on the monitor in the real time mode via an image interfacing card. The spatial resolution of this system obtained from the resolution test pattern is approximately 5 lp/mm when the X-ray generator is operated at 58 kV and 115 μ A. Furthermore, the system was also tested with various real objects, such as human finger bones, an integrated circuit, a needle in a bar of cheese, a connector, an regulator IC, a variable capacitor, and a variable resistor. It was found that the images were good quality with high contrast.