

THE DEVELOPMENT OF INFRARED VIEWER

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ABSTRACT

This report describes the development of an infrared viewer. An infrared viewer is an electro-optical instrument used for direct viewing of infrared. Among the numerous applications are discerning infrared emissions, revealing invisible marking and seeing in the dark.

It consists of power supply, Cockcroft-Walton and image converter tube. A 6 V d.c supply is used to activate the HV transformer in the power section. Besides, divider circuit was employed to stabilise the output from Cockcroft-Walton. The major components of an infrared viewer are built-in invisible infrared source, 'T' mounts lens for viewing the infrared, a 6032 image converter tube for transforming invisible picture to visible picture and an eye piece for viewing the visible picture

Various testing has been conducted at various critical points to ensure the required performance and output such as testing on each of the Cockrof-Walton stage, flyback transformer and variable resistors. Due to unavailability of single exact value component a number of components were connected in series or parallel, wherever appropriate, in order to achieve the highest possible output.

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CHAPTER 1

1.0 INTRODUCTION

Optics often defined as being concerned with radiation visible to the human eye. The visible portion of infrared viewer spectrum ranges between ultra violet and near infrared region. The infrared viewer is sensitive to areas in the 1.2 micron as shown in Figure 1.0. It will convert mechanical energy to electrical signal.

The most popular infrared viewer is called 'Infrared Night Viewer', project by Oatley Electronic, published in Electronic Australia in May 1990. This instrument is called 'first generation' where a tube was made in Russia. It needs a high voltage power supply with very small current. This viewer is actually half a binocular, so there is no mechanical construction required. Then, comes the 'second generation' called monocular. The second generation has a gain many times higher than the first generation. The only electronics circuit additional is that a 3V and a switch. Both of them have different lenses. The lens of the Russian viewer is focused to infinity but any closer gives a blurred image. Whilst, the second generation viewer is more sensitive and the picture is sharper than the first generation[7].

Image converter tube is the heart of infrared viewer. It is used to view infrared to visible picture. Unfortunately, in this project image converter tube can not be assembled because it was not available at the local market. The source of image