

**INVESTIGATION AND MODIFICATION OF DOMESTIC
FM RADIO TO RECEIVE WEATHER
SATELLITE SIGNALS**

**Thesis presented in partial fulfilment for the award of the
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ABSTRACT

This thesis describes the investigation and modification of a domestic FM radio system to be used as a weather satellite receiver. The objective is to produce a reliable and simple unit with emphasis place on economy.

Such investigation is aimed at schools and pre tertiary institution which wish to build up equipment in order to operate a weather satellite station or to start a satellite tracking activity.

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1.0 INTRODUCTION

1.1 Satellite Types

There are two major groups of spacecraft orbiting the earth. The ones nearest to us are mainly used for observing the earth through various instruments, for scientific, meteorological, geophysical, military and other such purposes. They are at altitudes about 200 to 300 kilometres and travel right round the Earth in about 90 minutes in what are called Low Earth Orbit (LEO). This works out to a speed of about 8 km per second and thus covering the entire surface in 16 orbits. Because these LEO spacecraft appear and disappear quite rapidly that is travelling from one part of the horizon to another in about 30 minutes, they are not suitable for communications or broadcasting work.

The second major group of satellites is at an altitude of about 36,000 km, travelling at about 3km per second in the plane of the equator. They take 24 hours to complete one orbit of the Earth, in other words they have the same angular velocity as the Earth spin. This satellite appears to be stationary above a particular point on the equator. For this reason they are called geostationary satellites. Being stationary relative to the surface of the Earth, these spacecraft in Geostationary Earth Orbit (GEO) have a most valuable property. They can be used as platforms in space to carry radio relay stations (transponders). In addition these geostationary satellites are used for broadcasting to particular areas, and for