

**VHF PREAMPLIFIER DESIGN AND FABRICATION FOR
WEATHER SATELLITE RECEIVER SYSTEM**

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ABSTRACT

The function of the preamplifier is to amplify a low-level signal to higher level before further processing. The required amplification is achieved by increasing the signal voltage. Besides amplifying the low-level signal, it is used to overcome other losses especially those due to long coaxial transmission between the antenna and the receiver.

This paper presents the design and performance results of a dual stage preamplifier for weather satellite receiver station. The preamplifier is based on dual gate MOSFET, BF 981. The preamplifier operates at centre frequency of 137.5 MHz. The results show a gain of about 33 dB with a bandwidth of 40 kHz. The overall noise figure indicator gives a SINAD value more than 10 dB and distortion factor less than 10% at input level -105 dBm (about 1.26 μ V).

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TABLE OF CONTENTS

	Page
ABSTRACT	i
ACKNOWLEDGEMENT	ii
CONTENTS	iii
1 INTRODUCTION	1
1.1 Weather satellite system	1
1.2 Types of weather satellite	2
1.2.1 Polar orbiting Weather Satellites	2
1.2.2 Geostationary Weather Satellites	4
1.3 Weather satellite receiver system	4
1.3.1 The aerial	5
1.3.2 Preamplifier	5
1.3.3 FM receiver	5
1.3.4 The decoder	6
1.3.5 The display unit	6
1.4 Overall sensitivity	6
1.5 Expected signal received	7
1.6 Low noise amplifier	8
2 THEORY ON PREAMPLIFIER	9
2.1 Function of a Preamplifier	9
2.2 Amplification concept - signal path	10
2.3 Tuned circuit	11
2.3.1 Sensitivity	12
2.3.2 Selectivity - Q factor	12
2.3.3 Input tuned circuit	13
2.3.4 Output tuned circuit	14
2.4 Noise	15
2.4.1 Signal to noise ratio	16
2.4.2 Noise factor	17
2.5 Interference	18
2.6 Optimising Receiver Signal Handling	19

CHAPTER 1

INTRODUCTION

1.1 Weather Satellite System

A satellite orbiting the earth stays in position because of the centripetal force on the satellite balances the gravitational attractive force of the earth. In addition atmospheric drag must be negligible, and this requires the satellite to be at a height greater than 600 km.

A weather satellite is a spacecraft placed in orbit around the earth which carries capturing and transmitting equipments, capable of taking the image of the earth and transmits back to the earth.

The device that captures the image is called multipetral radiometer which will provide four separates images. Two in visible band and two in infrared band. From infrared band, one channel will give a thermal image of the earth and the other one will respond to the water vapour absorption band and giving an indication of the levels of atmospheric humidity.

A weather satellite and its receiving system, able to receive and display cloud information, weather information like upper atmosphere wind directions, rain fall, thunder storm, geographical and land masses.