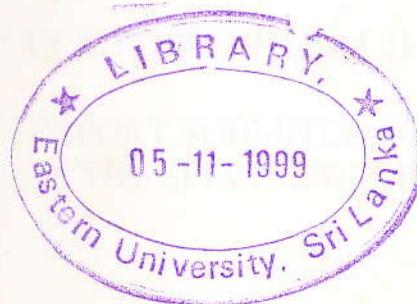


PERMANENT BOOKING

CONSTRUCTION AND VERIFICATION  
OF  
PERFORMANCE OF TV RECEIVER



BY

*VELAUTHAMPILLAI JEYANTHIRAN*



FACULTY OF SCIENCE,  
EASTERN UNIVERSITY, SRI LANKA.

PROCESSED  
Main Library, EUSL

JULY 1998

# CONTENTS

## Chapter 1:

### Introduction

1

## Chapter 2:

### Background Theory

2.1.	Television technology	4
2.1.1.	Black and White TV	4
2.1.2.	Colour television	4
2.1.3.	Broadcast format details for colour TV	5
2.1.4.	Standard 625 line PAL video and audio format	5
2.2.	Electromagnetic wave	6
2.2.1.	The electromagnetic spectrum	6
2.2.2.	The uses of Radio waves	8
2.2.3.	Medium of electromagnetic waves	9
2.2.4.	Line Of sight waves	9
2.2.5.	Space waves	10
2.3	Modulation	10
2.3.1.	Amplitude modulation	10
2.3.2.	Frequency modulation	11
2.3.3.	Bandwidth	11
2.4.	Polarization	12
2.4.1.	Linear polarization	12
2.4.2.	Elliptical polarization	12
2.5.	Transmissions lines	13
2.5.1.	Coaxial cable transmission line	13
2.5.2.	Characteristic impedance of transmission line	13
2.5.3.	Capacitance of a coaxial cable	14
2.5.4.	Inductance of a coaxial cable	15
2.5.5.	Impedance matching	16
2.6.	Dipole aerial	16
2.6.1.	The half wave dipole	17
2.6.2.	Find the impedance of the half wave dipole	17
2.6.3.	The folded dipole	18
2.6.4.	Dipole bandwidth	19

2.7.	Directivity	19
2.8.	Space communication	21
2.8.1.	Satellite system	21
2.8.2.	Geostationary orbit	21
2.8.3.	Position of satellite	21
2.8.4.	Satellite link with ground	22
2.8.5.	Uplink and downlink signals	22
2.8.6.	Transponders	22
2.8.7.	Telemetry and remote control	23
2.8.8.	Control of altitude and orbit	23
2.8.9	Transmitting earth station	23
2.8.10.	Satellite power	23
2.8.11.	Effective isotropic radiated power	24
2.9.	The foot print	24
2.9.1.	Geostationary orbit and beam patterns	24
2.10.	The satellite receiving antenna	25
2.10.1.	Antenna designs	25
2.10.2.	Prime focus parabolic antenna	26
2.10.3.	Size of dishes or gain	26
2.10.4.	Highest frequency operation	27
2.10.5.	Steerability	27
2.10.6.	Feeds	28
2.10.7.	Other environmental consideration in designing dishes	28
2.10.8	Antenna performance	28
2.10.9.	Beamwidth and side lobes	28
2.10.10	Antenna noise	29
2.10.11.	Focal length to antenna diameter ratio	29
2.11.	Feedhorns	30
2.12.	Low noise block converter	30
2.13.	Satellite receiver	33
<b>Chapter 3:</b>		
	Types of antennas and its reception	35
3.1.	Field strength of the signal	35
3.2.	Booster amplifier	35
3.3.	Telecasting in Srilanka	36
3.4.	Different types of antennas used in Batticaloa region	36
3.5.	Different types of antennas used in Eravur	38
3.6.	Quality of the reception	41

## **Chapter 4**

Construction of a parabolic dish antenna	42
4.1. Sections of a dish antenna	42
4.2. Construction of antenna mounting plate	43
4.3. Construction of parabolic reflector	44
4.3.1. Construction of aluminum parabolic ribs	44
4.3.2. Fixing the ribs on the antenna mounting plate	44
4.3.3. Joining the adjacent ribs	45
4.3.4. Construction of parabolic reflector	45
4.4. Construction of feedhorn and LNB mounting strut	46
4.5. Construction of stand	47
4.5.1. Construction of main rotating section	48
4.5.2. Fine tuning section	48
4.5.3. Construction of base section	49
4.5.4. Construction of the pump	49
4.6. Cost of satellite receiving system	50

## **Chapter 5:**

Discussion	51
Reference	55
Appendix A	56
Appendix B	57