LIST OF TABLES

1.1 PROPERTIES OF CONDUCTIVE FILMS
1.2 PROPERTIES OF RESISTIVE FILMS
1.3 PROPERTIES OF DIELECTRIC FILMS

2.1 COMBINATION OF SENSITIZER AND ACTIVATOR

3.1 LIST OF CHEMICALS USED IN THE PRESENT INVESTIGATION
3.2 COMPOSITION OF ELECTROLESS BATH
3.3 DETAILS OF BONDSTRENGTH
3.4 VARIATIONS OF FRONT AND BACK THICKNESS OF FILMS DEPOSITED BY ION PLATING ON DIFFERENT SUBSTRATES

4.1 ETCHANTS FOR COPPER AND GOLD
4.2 COPPER ELECTROPLATING PROCESS PARAMETERS

LIST OF FIGURES

1.1 a) MICROSTRIP TRANSMISSION LINE INDICATING NATURE OF ELECTRIC-FILED LINES AND TYPICAL PARAMETERS
           b) SUSPENDED SUBSTRATE LINE

2.1 ELECTROPLATING SYSTEM
2.2 EVAPORATION SYSTEM
2.3 SCHEMATIC OF SPUTTERING EQUIPMENT
2.4 ION PLATING EQUIPMENT
2.5 SCHEMATIC STAGES OF FILM GROWTH
2.6 COALESCENCE SEQUENCE OF TWO NUCLEI
3.1 SCHEMATIC OF THE ION PLATING SYSTEM
3.2 BOND STRENGTH TEST SET-UP
3.3 X-RAY DIFRACTOGRAM OF COPPER
3.4 FREQUENCY DISPERSION OF LOSS FOR ION PLATED AND SPUTTERED SUBSTRATE
3.5 ATTENUATION VS FREQUENCY
3.6 VARIATION OF LOSS WITH FREQUENCY
4.1 CHEMICAL STRUCTURE OF PTFE
4.2 FLOW CHART FOR PRETREATMENT
4.3 FLOW CHART FOR ELECTROLESS DEPOSITION
4.4 FREQUENCY DISPERSION OF INSERTION LOSS IN DUROID SAMPLES

LIST OF PHOTOGRAPHS

PLATE 3.1 PHOTOGRAPH OF SPUTTERING EQUIPMENT
PLATE 3.2 PHOTOGRAPH OF ION PLATING EQUIPMENT
PLATE 3.3 MICROGRAPH OF SEM
PLATE 4.1 PHOTOGRAPH OF LOG SPIRAL ANTENNA
PREFACE

The development of state-of-the-art defence systems is usually fraught with several problems such as non-availability of published literatures on the subject, difficulties in the procurement of some of the advanced strategic components, long delivery times in respect of several critical components etc. The drive for self sufficiency in defence coupled with strong urge for military and economic superiority, necessitates the development of an indigenous technological base for taking up challenges thrown up as a result of afore-mentioned factors.

In line with this approach, an attempt has been made in this dissertation to identify the most suitable technique to metallise substrate materials which are used in the development of Microwave components for defence applications. These metallised substrates are extremely vital and most of the requirements of metallised substrates are met through imports. This dissertation has thrown up an indigenous method of producing metallised substrates towards meeting the defence demand.

Most of the work pertaining to this dissertation is of academic interest and therefore presented in great detail. At few places some of the working details have been deliberately omitted in order to preserve the confidentiality arising out of their application in defence. However, the author has taken every care to present all the information of academic interest and which support the present work.