

HIGHER TECHNICAL INSTITUTE

ELECTRICAL ENGINEERING
DEPARTMENT

DIPLOMA PROJECT

STABILITY CONTROL SYSTEM
USING ROOT LOCUS METHOD

E. 1305

MARTAS MARIOS

JUNE 2002

HIGHER TECHNICAL INSTITUTE	PROJECT NO. 3352
----------------------------------	---------------------

3 Summary:

In chapter one the importance of stability will be explained for an engineering system. Also the methods for finding the stability will be mentioned and some very important definitions will be provided. These methods are the polar plot, the bode plot, the Routh Hurwitz and the root locus method.

In chapter two the root locus method will be explained fully with examples and some special cases. Also here there are some important definitions in order to be able to understand the method.

In chapter three the matlab software will be introduced, it will be explained the operation of matlab in order to obtain the graph of the root locus method with its benefits.

In this chapter the use of power point will be introduced. The power point is very useful in presentations and can be used in many fields. However in this chapter only how it was used in our project will be shown

Table of contents

1	Acknowledgements	4
2	Introduction:	5
3	Summury:	6
4	Stability of engineering systems - control systems:	7
4.1	Control system:	7
4.2	Open loop system:	7
4.3	Closed loop system:	7
4.4	Forward loop path:	8
4.5	Transfer function:	8
4.6	Order of a control system:	8
4.7	Poles:	9
4.8	Zeros:	9
4.9	Stability:	9
4.10	The concept of stability:	9
4.11	Complex plane –s plane:	9
4.12	Phase and magnitude as expressed in the s plane – complex plane.....	10
4.13	Characteristic equation:	10
4.14	Second order system:	11
4.15	Methods for the study of the stability for different systems.....	12
4.16	Frequency response:	13
4.17	The routh array method:	13
4.18	The root locus method:	15
5	Chapter 2 Analysis of the root locus method	16
5.1	Introduction:	16
5.2	Root locus gain:	16
5.3	Root locus method:	16
5.4	Breakaway point-break point:	17
5.5	Angles of departure and angles of arrival:	18
5.6	Asymptotes on the root locus:	19
5.7	Example 1	20
5.8	Example 2	21

6	Chapter 3 The root locus method graphs with Matlab	23
6.1	Matlab and root locus method:.....	23
6.2	Example 1	23
6.3	Example 2	26
6.4	Example 3	28
6.5	Conclusion:	29
7	Power point presentation	30
7.1	What is power point?.....	30
7.2	Getting started with power point:.....	30
7.3	Custom animation	32
7.4	Slide Show	33
7.5	Design template	34
7.6	Conclusion:	34
	Conclusion:	35
8	References	36