## HIGHER TECHNICAL INSTITUTE

## MECHANICAL ENGINEERING COURSE

## **DIPLOMA PROJECT**

# CUSTOMISING AUTOCAD FOR PIPING SYSTEMS

Design by

CONSTANTINOS PAPAICOVOU

**JUNE 1991** 



#### AKNOWLEDGEMENTS

For the completion of this project special thanks must first go to my supervisor Mr. Peris Dimitriou for teaching the relevant subjects in class as well for sharing willingly his knowledge in computers with my.

Also special thanks must go to Mr. Christos Pagdatis for helping me with the menus of the program.

I must also thank Mr. Charalambos Tsouris for helping me to my first steps in computing. I can never forget that when I had my first contact with a CPC 464 was with me and gave me the first lesson in basic programming.

Thanks must also go to all lecturers and staff of the H.T.I.

Mechanical Engineering Department.

Also I thank all my friends for their support in completing this project.

#### Getting Started !!!

#### Basic Settings

Before anyone run or even write an Autolisp program like the one in this project he has to make some settings in order to be able to run the program. First one must set <u>lispheap</u> and <u>lispstack</u>. These settings are readable by Autocad and they are used to reserve enough memory for Autolisp.

SET LISPHEAP= allocates memory for Autolisp functions and variables (nodes). If you use many Autolisp programs or if you use large Autolisp programs like the particular case you need to increase this value. More heap space increases Autolisp speed by reducing the swapping (paging) of functions. If you have extended memory, using extended Autolisp gives Unlimited Heap Space. For the particular case a value of lispheap=40000 is enough.

<u>SET LISPSTACK=</u> defines Autolisp's temporary working data area during execution. Complex Autolisp programs using many arguments, recursive or nested routines, or large amounts of data may require more stack space. For the particular program a value of lispstack=5000 is enough.

Another setting that must be done is to set the <u>acad-freeram=24</u>. This setting allows you to set as much free RAM area as available for Autocad. For the particular case a value of 24 for a 640K machine is adequate.

Since .LSP files are not really program files we use another set command the  $\frac{\text{acad}=\langle \text{lisp} \rangle}{\text{look}}$  which tells the computer where to look to find the .LSP programs.

Construct a .BAT file containing the following lines to take care of the above settings.

cd \acad
set lispheap=40000
set lispstack=5000
set acadfreeram=24
set acad=\lisp
acad

#### The (vmon) function.

(vmon) is a virtual memory pager. For all practical purposes, it eliminates all insufficient node space errors. When run out of memory (vmon) will first page you out to the extended or expanded memory and then if necessary to disk. Simply include (vmon) in the ACAD.LSP file.

### CONTENTS

Basic Settings	(1)
How to load the program	(3)
Pipes	(8)
Drawing a pipe in the main system	(9)
Pumps	(13)
Pipe layout for heating systems	(21)
Selection of pumps in piping systems	(22)
Table 1 Values of C	(31)
Table 2 equivalent lengths	(32)
Drawing a bend or elbow in the system	(33)
Drawing a T-Joint in the main system	(37)
Indexing a component in the main system	(41)
Indicators catalogue	(43)
Drawing an accessory to the main piping system	(45)
Mechanically driven irrigation plant	(46)
Electrically driven irrigation plant	(58)
Project lsp Listings	(69)
Piping mnu listing	(80)
References	(81)