

ΨΗΦΙΑΚΗ ΚΑΘΟΔΗΓΗΣΗ ΕΡΓΑΛΕΙΟΜΗΧΑΝΩΝ ΜΕ CONTROL HAAS & ΧΡΗΣΗ ΜΑΚΡΟΕΝΤΟΛΩΝ



Haas Mini mill HE:

- Κάθετο τριαξονικό κέντρο κατεργασίας
- Ισχύς 7,5 hp
- Σταθμός 10 εργαλείων
- Μέγιστες στροφές ατράκτου 6000 rpm
- Μνήμη 1MB



- Σύνταξη κώδικα προγράμματος
- Αντιγραφή κώδικα από Υ/Η
- Προσομοίωση κατεργασίας
- Έλεγχος παραμέτρων κατεργασίας
- Επίβλεψη κατεργασίας
- Έλεγχος σε real time



Control

<http://www.m3.tuc.gr>

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Micromachining & Manufacturing Modeling Lab
Assoc. Prof. Aristomenis Antoniadis

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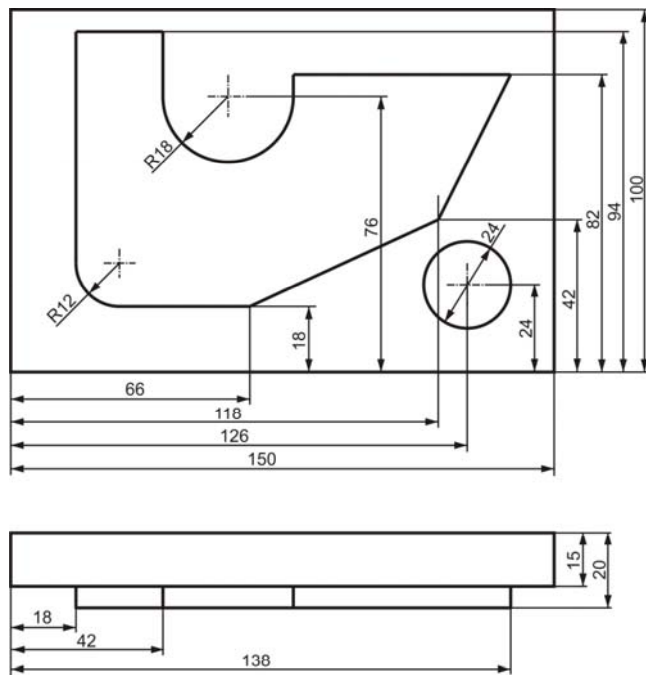


Κατεργασμένα Τεμάχια

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%
O03001
G17
G54
M03 S1000
T3 M06
G43 H03
G21
G94
G90
G00 X-50. Y-50.
...

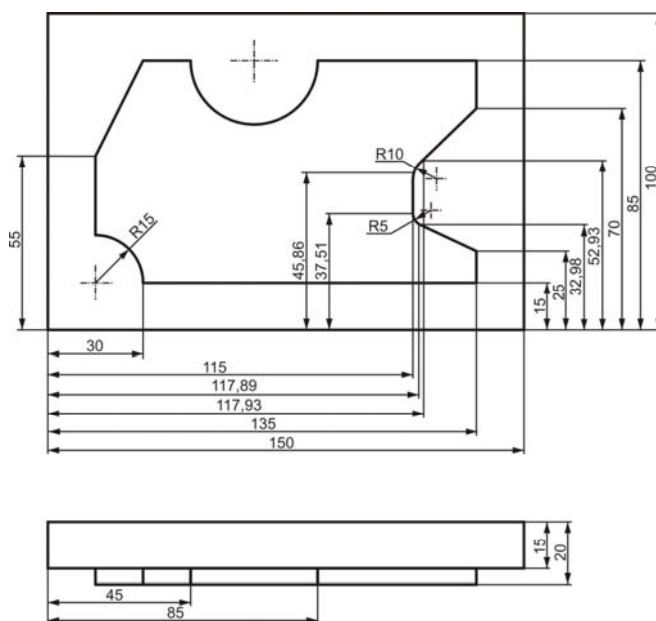


Τεμάχιο 1

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...
G00 X-50. Y-50.
G01 Z-5. F500.
G41 D03
G01 X10. Y-15. F500.
G01 Y61.
G01 X25. Y90.
G01 X140.
G01 Y10.
..

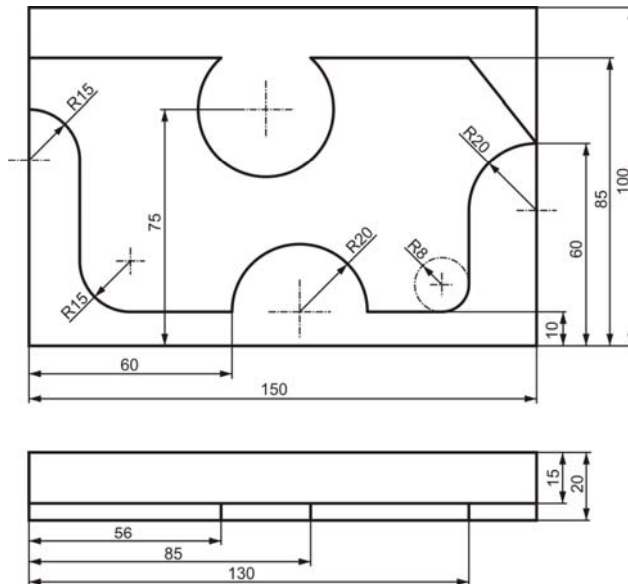


Τεμάχιο 2

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...
G01 X0. Y85.
G01 X56.
G03 X86. Y85. I15. J-15. F150.
G01 X130. F500.
G01 X150. Y60.
G03 X130. Y40. R20. F150.
G01 Y18. F500.
...



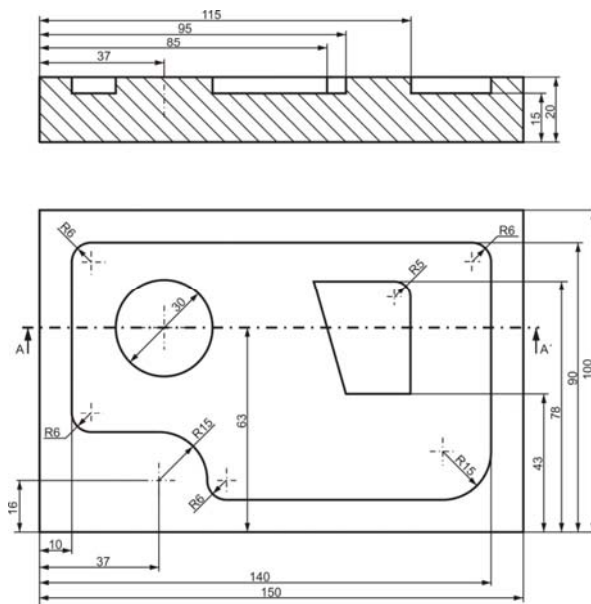
Τεμάχιο 3

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...
G00 X80. Y25.
G01 Z-5. F500.
G150 P3104 X80. Y25. Z-5. Q5. R5. I5.
K1. G41 D02 F300.
G40 G01 X80. Y25.
G00 Z30.
M30
%



Τεμάχιο 4

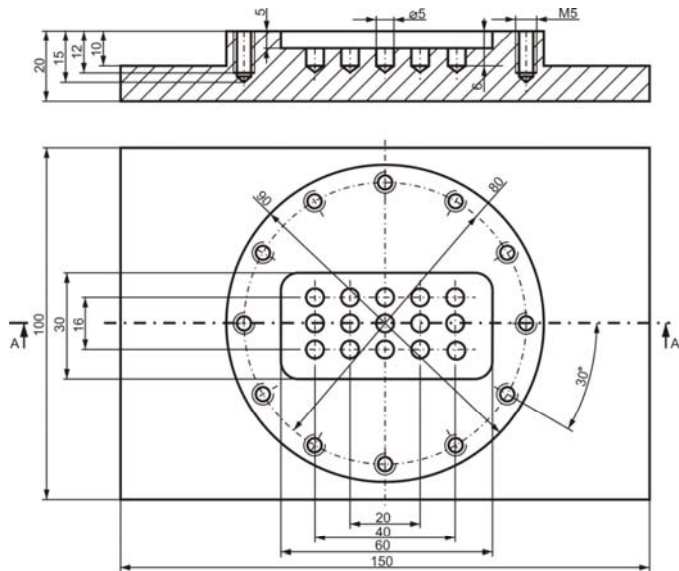
<http://www.m3.tuc.gr>



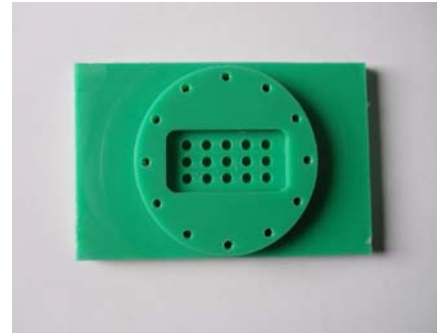
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2010



...
T6 M06
M03 S1000
G43 H06
G00 Z10.
G81 G99 Z-15. R10. F200. L0
G70 I40. J30. L12
...



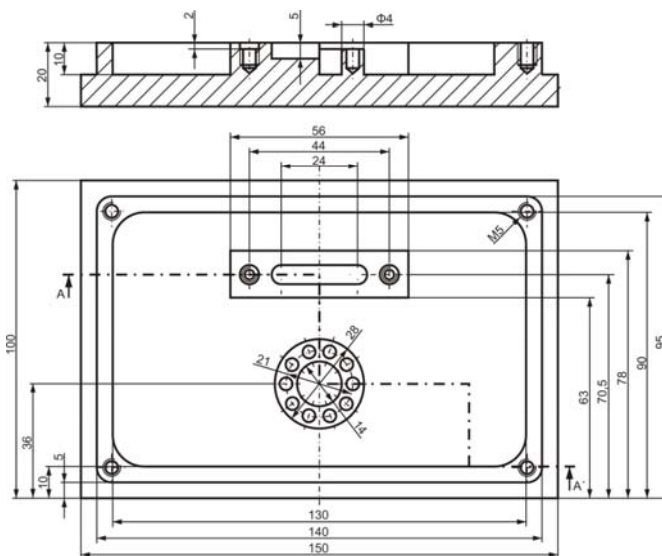
Τεμάχιο 5

<http://www.m3.tuc.gr>

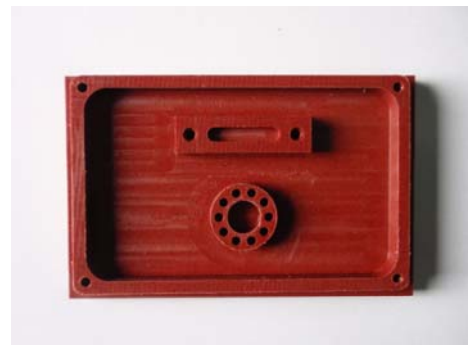

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2010



...
G40 G01 X40. Y36. F500.
G01 X75.
G13 Z-2. I6. K16. Q6. D02 F200.
G90
...



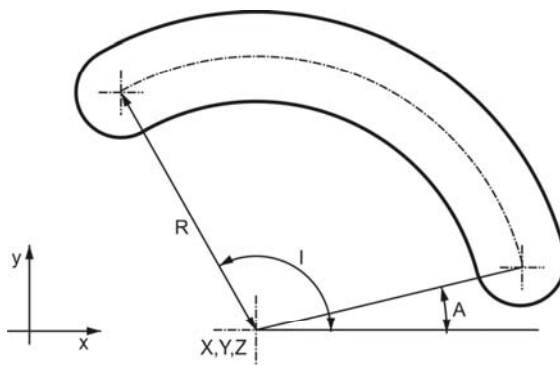
Τεμάχιο 6

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Νικηφόρος Χριστοφόρου



```
%
O02001
IF [[ #11 - #6 ] LT #17 ] GOTO1
#101= #11
...
...
G01 Z#26 F [ #9 / 3 ]
G01 X#24 Y#25 F#9
GOTO2
N1
#3000= 999 (WRONG VALUES H K Q)
N2
M99
%
```

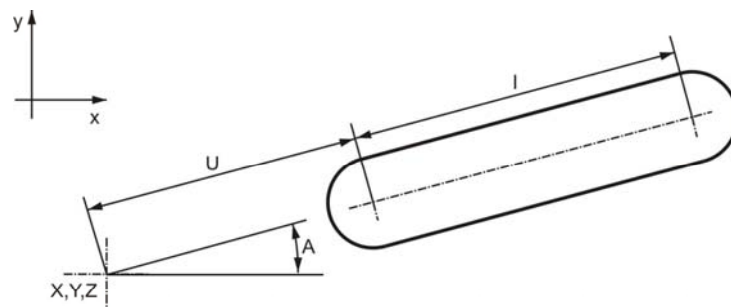


Μακροεντολή κυκλικού τόξου P2001

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```
%
O02002
IF [[ #11 - #6 ] LT #17 ] GOTO1
#102= #11 - #17
WH [ #102 GT #6 ] DO1
G01 X [ #24 + #21 * COS[ #1 ] ] Y [ #25 + #21 * SIN[ #1 ] ] F#9
G01 Z [ #102 - #17 ] F [ #9 / 10 ]
#102= #102 - #17
...
...
```

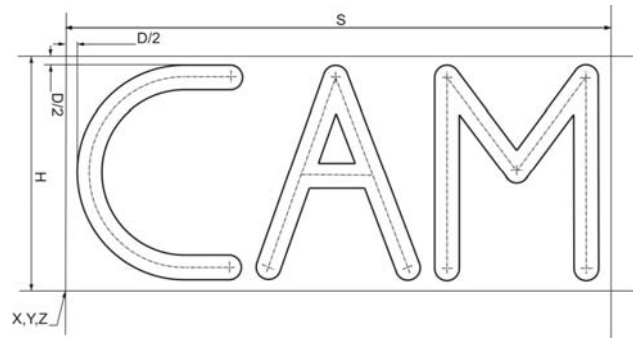


Μακροεντολή ευθύγραμμου τμήματος υπό κλίση P2002

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```
%
O02004
#101=#19 / 3
#102=#7 / 2
#103=#11 / 2
IF [[ #103 - #102 ] GT [ #101 - 3 * #102 ] ] GOTO1
G01 X [ #24 + [ #101 - #102 ] ] Y [ #25 + #102 ] F#9
G01 Z#17 F [ #9 / 5 ]
...
```

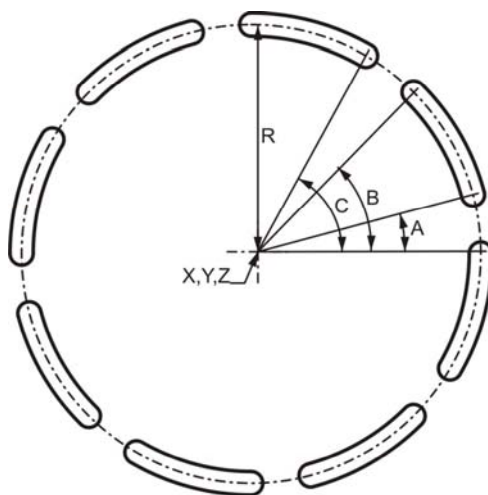


Μακροεντολή λέξης CAM P2004

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```
...
G01 Z#26 F [ #9 ]
#102= #102 + #3
END3
G01 X#24 Y#25 F#9
GOTO2
N1
#3000= 999 (WRONG VALUES H K Q)
N2
M99
%
```

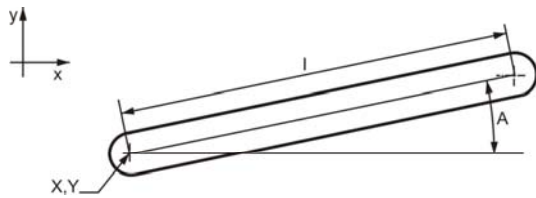


Μακροεντολή διαδοχικών κυκλικών τόξων ίδιας ακτίνας και κέντρου P2005

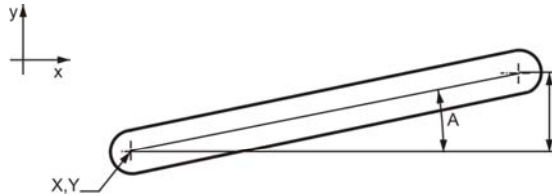
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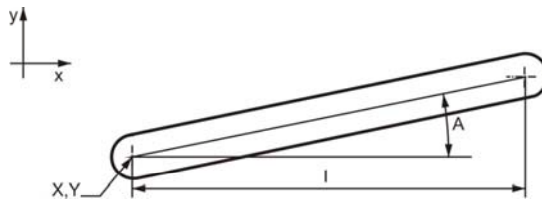
Νίκηφόρος Χριστοφόρου



```
%
O02006
G01 X [ #24 + #4 * COS[ #1 ] ] Y [ #25 + #4 *
SIN[ #1 ] ] F#9
M99
%
```



```
%
O02007
G01 X [ #24 + #4 / TAN[ #1 ] ] Y [ #25 + #4 ]
F#9
M99
%
```



```
%
O02008
G01 X[#24+#4] Y[#25+#4*TAN[#1]] F#9
M99
%
```



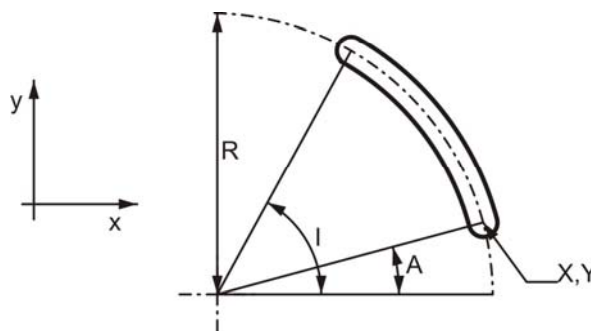
Μακροεντολές ευθύγραμμης κίνησης υπό κλίση αγνώστου τελικού σημείου P2006, P2007, P2008

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```
%
O02009
#101=#18*SIN[90-#1]
#102=#18*COS[90-#1]
#103=#101+#18*COS[180-#4]
#104=#102+#18*SIN[108-#4]
G03X[#24+#103]Y[#25+#104]R#18F#9
M99
%
```



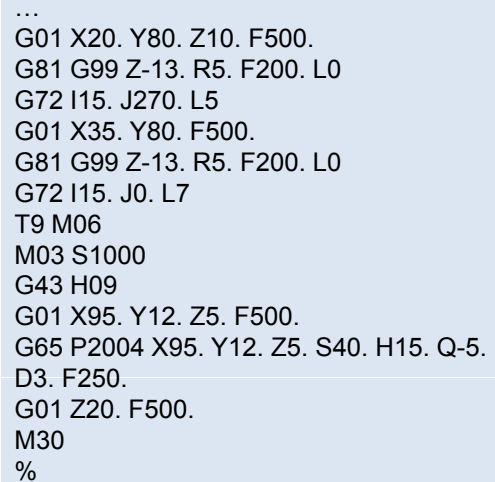
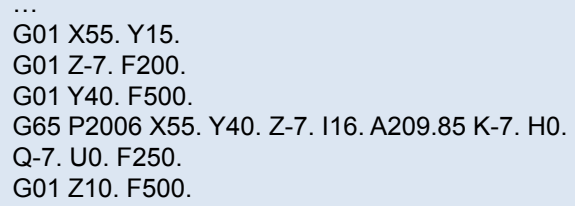
Μακροεντολή κυκλικού τόξου γνωστής αρχικής και τελικής γωνίας P2009

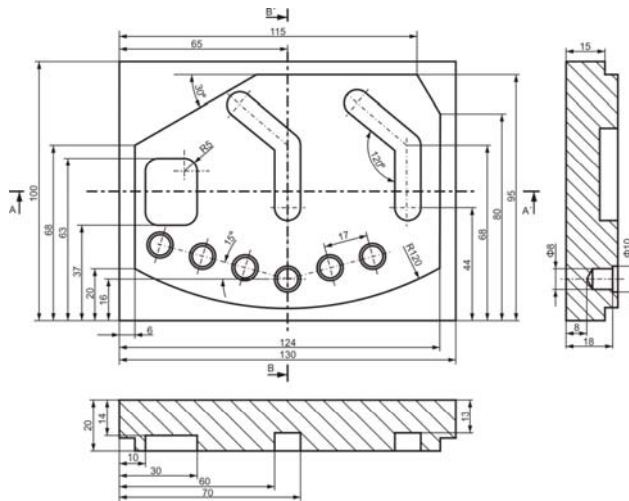
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...
G41 D03
G01 X6. Y0.
G01 Y68.
G65 P2007 X6. Y68. I27. A30. F500.
G01 X115.
...



Τεμάχιο 9

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Σας ευχαριστώ!



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