

TOWERS of HANOI

[towers2.zip](#)

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This program plays the game of Towers of Hanoi for you. It is a programming exercise in recursion, that is, where a subroutine, in this case "TOWER", calls itself.

It plays on a MicroMite using a VT100 terminal .eg Tera Term. It does NOT play in the chat window of MMEdit prior to V3.4.18

TOWERS.BAS

```

.....
.....'TOWERS of HANOI'.....
.....
.....'By H W Holmes'.....
.....
.....'July 31, 2014'.....
.....

'This program plays the game of Towers of Hanoi for you.
'It is a programing exercise in recursion, that is,
'where a subroutine, in this case "TOWER", calls itself.

'It plays on a MicroMite using a VT100 terminal .eg Tera Term.
'It does NOT play in the chat window of MMEdit prior to V3.4.18

INFO:
.....
'''Display Constants'''
.....

Delay = 500 ' Change for speed of play
TopRow = 8 ' CHANGE THIS TO MOVE Game UP OR DOWN THE SCREEN!

.....

'Tower Pieces'
.....

Dim TP$(9)
TP$(0) = "      M      " ' Empty Peg
TP$(1) = "      1M1      " ' Level 1
TP$(2) = "      22M22      "
TP$(3) = "      333M333      "
TP$(4) = "      4444M4444      "
TP$(5) = "      55555M55555      "
```

```
TP$(6) = " 666666M666666 "
TP$(7) = "7777777M7777777" ' level 7
TP$(8) = "TTTTTTTTTTTTTTTT" ' Base
TP$(9) = " " ' ERASE disk

Dim PL(3) 'Pin Level

HMD: 'How many disks?

ClearScreen
HOME
' c 1.1

Print "This program plays the game of Towers of Hanoi for you."
Print "Object: To Move Disks from 1 Pin To Another, 1 pin at a time,"
Print "          never putting a larger Disk on a smaller one."

.....
'''Display'''
.....

D=0:S=0:E=0

ScreenBuild
Print

DK:
Print "How many Disks (1-7) " ; : GetDig D : Print D
If D<1 Or D>7 Then Print "Disk Count Out of Range! -> "; : GoTo DK
SP:
Print "Starting on Pin (1-3)"; : GetDig S : Print S
If S<1 Or S>3 Then Print "Pin # Out of Range! -> "; : GoTo SP
EP:
cnt = 0
Print "Move to Pin (";
If S<>1 Then Print "1";: cnt = 1: Print" OR "; ' 1 was not chosen to start
If S<>2 Then ' 2 was not chosen to start
Print "2"; : cnt = cnt + 1
If cnt = 1 Then Print " OR ";: Print "3"; 'must be the other not chosen
Else
Print "3"; 'must be the other not chosen
EndIf
Print ") "; : GetDig E : Print E' get end destination pin
If E<1 Or E>3 Then Print "Pin # Out of Range! -> "; : GoTo EP
If E=S Then Print "Pin # Same as Start Pin! -> "; : GoTo EP

Print
SUMMARY:
Print "Move" D " Disks From Pin" S " TO Pin" E " " ;
Print "Correct? (Y,N) ";: GetKey A$ ' Did you type your choices
correctly?
```

```

Print A$; : If (A$ = "N") Or (A$ = "n") Then GoTo HMD
If (A$ <> "Y") And (A$ <> "y") Then
Print : Print "Press Y or N - "; : GoTo Sumary : EndIf

```

SETUP: 'c y,x notes below indicate cursor position for calulating page layout

```

ClearScreen
HOME
Print "          T O W E R S   O F   H A N O I"
' c 2,1
Print "Object: To Move" D " Disks from Pin" S " To Pin" E
' c 3,1
Print "1 pin at a time, never puting a larger Disk on "
Print "a smaller one."
Print
' c 6,1          1          2          3
'          123456789012345678901234567890123
Print "Moving Disk _ From Pin _ To Pin _."
' c 6,1
SHOW_MOVE

```

```

Sub SHOW_MOVE d,s,e 'fills in the above blanks for disk and pins
yx 6,13: dS d: cr 10: dS s: cr 8: dS e
Pause Delay
End Sub

```

```
' c 5,33
```

PLAY:

```
ScreenBuild
```

```
Sub ScreenBuild
```

```

yx (toprow + 2,1)
For I = 0 To 7 ' 8 peg levels - 0-7
Level = MAX(0,(I+D-7)) ' negative disk levels use empty peg (0)
For J = 1 To 3 ' 3 pegs
If Not (J = S) Then
Print TP$(0); ' empty peg
Else
Print TP$(Level); ' Empty peg if Level = 0
EndIf
Next J
Print
Next I
For iI = 1 To 3: Print TP$(8);: Next: Print ' 3 wide base
Print "          PIN 1          PIN 2          PIN 3" ' ID labeling

```

```
End Sub
```

```

.....
.....'THE GAME'.....

```

```

. . . . .
'set pin current relative levels of top disk down from top of pin
INIT:
  PL(s) = 7-d
  PL(e) = 7
  PL(6-e-s) = 7

  TOWER d,s,e

  yx TopRow+12, 1
FINI:
  Print "Play Again (Y,N)  "; : GetKey A$ : Print A$
  If (A$ = "N") Or (A$ = "n") Then
    Print " I Hope you liked challenging me to play the game!": End : EndIf
  If (A$ <> "Y") And (A$ <> "y") Then
    Print "Press Y or N - "; : GoTo FINI : EndIf
  Pause 1000: GoTo HMD
End

Sub TOWER d,s,e
  Local Nd,Ns,Ne      'Next values for d,s,e
  If d <> 1 Then
    Nd = d-1: Ns = s: Ne = 6-s-e
    TOWER Nd,Ns,Ne
  EndIf
  MOVE d,s,e
  If d <> 1 Then
    Ns = Ne: Ne = e
    TOWER Nd,Ns,Ne
  EndIf
End Sub

Sub MOVE d,s,e
  SHOW_MOVE d,s,e ' Update the header line describing the current move

  'Empty Current Pin Level & Move Up
  yx (toprow + 3 + PL(s),15*(S-1)+1): Print TP$(0); 'clear old pin position
  PL(s) = PL(s)+1      ' Adjust Pin Level
  yx (toprow,15*(S-1)+1): Print TP$(d); 'place pin above to move sideways
  Pause Delay

  'Clear Position & move Across
  yx (toprow,15*(s-1)+1): Print TP$(9); 'erase current disk position

  ' Do long move in two steps; comment out the whole if structure to speed
up
  If Abs(s-e)=2 Then ' is this a long move?
    dir = Sgn(e-s) 'which way?
```

```

    'place disk in intermediate position
    yx (toprow,15*(e-dir-1)+1): Print TP$(d);
    Pause Delay ' let disk settle
    'erase disk from intermediate position
    yx (toprow,15*(s+dir-1)+1): Print TP$(9);
EndIf

' Place Disk above destination pin
yx (toprow,15*(e-1)+1): Print TP$(d);
Pause Delay

'Clear position and Place Disk
yx (toprow,15*(e-1)+1): Print TP$(9); 'Clear disk from top
yx (toprow + 2 + PL(e),15*(e-1)+1): Print TP$(d); 'Place disk at end
PL(e) = PL(e)-1 ' Adjuist Pin Level  compensate pin level for new disk
Pause Delay

```

End Sub

```

.....
''''''Cursor Control Subrouines''''''
.....

```

Sub CU n ' UP

```
Print Chr$(27)+"["+Str$(n)+"A";
```

End Sub

Sub CD n ' Down

```
Print Chr$(27)+"["+Str$(n)+"B";
```

End Sub

Sub CR n ' Right (This is the only one I used once I wrote Sub YX)

```
Print Chr$(27)+"["+Str$(n)+"C";
```

End Sub

Sub CL n ' Left

```
Print Chr$(27)+"["+Str$(n)+"D";
```

End Sub

Sub YX n, m ' Move cursor to Y,X - (VT100 is 1,1 based

```
Local s$
```

```
Print Chr$(27)+"["+Str$(n)+";"+Str$(m)+"H";
```

End Sub

Sub HOME ' Equivalent to YX 1,1

```
Print Chr$(27)+"[1;1H";
```

End Sub

Sub ClearScreen

```
Print Chr$(27)+"[2J";
```

End Sub

```
.....  
' 'SIMPLE FUNCTIONS'  
.....
```

```
Sub dS S 'Display Numeric String and leave cursor where it stops.  
Print Str$(S); 'Print Char Data - don't use automatic space padding  
End Sub
```

```
Sub GetDig D  
GD:  
D$ = Inkey$  
If (d$<"0") Or (d$>"9") Then GoTo GD  
D = Asc(d$)-48  
End Sub
```

```
Sub GetKey A$  
GK:  
A$ = Inkey$  
If (A$ >= " ") And (A$ <= "z") Then Exit Sub  
'If (a$ = "Y") Or (a$ = "y") Or (a$ = "N") Or (a$ = "n") Then Exit Sub  
GoTo GK  
End Sub
```

```
Function MAX(a,b) 'self explained  
If a>= b Then: MAX=a:Else: MAX=b: EndIf  
End Function
```

TOWERS1.BAS

```
.....  
.....'TOWERS of HANOI'  
.....  
.....'By H W Holmes - Modified by Hugh Buckle'  
.....  
.....'Aug 9, 2014'  
.....  
' TOWERS1.BAS  
  
'This program plays the game of Towers of Hanoi for you.  
'It is a programing exercise in recursion, that is,  
'where a subroutine, in this case "TOWER", calls itself.  
  
'It plays on a MaxiMite with PC keyboard and VGA screen  
'It does NOT play in the chat window of MMEdit (I think)
```

INFO:

```

.....
'''Display Constants'''
.....

Delay = 500 ' Change for speed of play - Not used a user is asked for
speed
TopRow = 8 ' CHANGE THIS TO MOVE Game UP OR DOWN THE SCREEN!

.....

'Tower Pieces'
.....

Dim TP$(9)
TP$(0) = "      M      " ' Empty Peg
TP$(1) = "      1M1      " ' Level 1
TP$(2) = "      22M22      "
TP$(3) = "      333M333      "
TP$(4) = "      4444M4444      "
TP$(5) = "      55555M55555      "
TP$(6) = "      666666M666666      "
TP$(7) = "7777777M7777777" ' level 7
TP$(8) = "TTTTTTTTTTTTTTTT" ' Base
TP$(9) = "      " ' ERASE disk

Dim PL(3) 'Pin Level

```

HMD: 'How many disks?

ClearScreen

HOME

' c 1.1

Print "This program plays the game of Towers of Hanoi for you."

Print "Object: To Move Disks from 1 Pin To Another, 1 pin at a time,"

Print " never puting a larger Disk on a smaller one."

.....

'''Display'''

.....

D=0:S=0:E=0

ScreenBuild

Print

DL:

Print "Game speed (1-5 1=fast) ?" ; : GetDig P : Print P

If P<1 Or P>5 Then Print " Speed out of range! -> "; : GoTo DL

Delay = p*100

DK:

Print "How many Disks (1-7) ?" ; : GetDig D : Print D

If D<1 Or D>7 Then Print "Disk Count Out of Range! -> "; : GoTo DK

SP:

Print "Starting on Pin (1-3) ?"; : GetDig S : Print S

```
If S<1 Or S>3 Then Print "Pin # Out of Range! -> "; : GoTo SP
EP:
  cnt = 0
  Print "Move to Pin (";
  If S<>1 Then Print "1";: cnt = 1: Print" OR "; ' 1 was not chosen to start
  If S<>2 Then ' 2 was not chosen to start
    Print "2"; : cnt = cnt + 1
    If cnt = 1 Then Print " OR ";: Print "3"; 'must be the other not chosen
  Else
    Print "3"; 'must be the other not chosen
  EndIf
  Print ") "; : GetDig E : Print E' get end destination pin
  If E<1 Or E>3 Then Print "Pin # Out of Range! -> "; : GoTo EP
  If E=S Then Print "Pin # Same as Start Pin! -> "; : GoTo EP

  Print
SUMMARY:
  Print "Move" D " Disks From Pin" S " TO Pin" E " " ;
  Print "Correct? (Y,N) ";: GetKey A$ ' Did you type your choices
correctly?
  Print A$; : If (A$ = "N") Or (A$ = "n") Then GoTo HMD
  If (A$ <> "Y") And (A$ <> "y") Then
  Print : Print "Press Y or N - "; : GoTo Sumary : EndIf

SETUP: 'c y,x notes below indicate cursor position for calulating page
layout
  ClearScreen
  HOME
  Print "          T O W E R S   O F   H A N O I"
  ' c 2,1
  Print "Object: To Move" D " Disks from Pin" S " To Pin" E
  ' c 3,1
  Print "1 pin at a time, never puting a larger Disk on "
  Print "a smaller one."
  Print
  ' c 6,1          1          2          3
  '          123456789012345678901234567890123
  Print "Moving Disk _ From Pin _ To Pin _."
  ' c 6,1
  SHOW_MOVE

Sub SHOW_MOVE d,s,e 'fills in the above blanks for disk and pins
  yx 5,12: dS d: cr 10: dS s: cr 8: dS e
  Pause Delay
End Sub

' c 5,33

PLAY:
  ScreenBuild
```



```

Sub ScreenBuild
  yx (toprow + 2,0)
  For I = 0 To 7      ' 8 peg levels - 0-7
    Level = MAX(0,(I+D-7)) ' negative disk levels use empty peg (0)
    For J = 1 To 3    ' 3 pegs
      If Not (J = S) Then
        Print TP$(0);      ' empty peg
      Else
        Print TP$(Level);  ' Empty peg if Level = 0
      EndIf
    Next J
  Next I
  Print
  For iI = 1 To 3: Print TP$(8);: Next: Print ' 3 wide base
  Print "      PIN 1      PIN 2      PIN 3" ' ID labeling
End Sub

.....
.....'THE GAME'.....
.....

'set pin current relative levels of top disk down from top of pin
INIT:
  PL(s) = 7-d
  PL(e) = 7
  PL(6-e-s) = 7

  TOWER d,s,e

  yx TopRow+12, 1
FINI:
  Print: Print "Play Again (Y,N)  "; : GetKey A$ : Print A$
  If (A$ = "N") Or (A$ = "n") Then
    Print " I Hope you liked challenging me to play the game!": End : EndIf
  If (A$ <> "Y") And (A$ <> "y") Then
    Print "Press Y or N - "; : GoTo FINI : EndIf
  Pause 1000: GoTo HMD
End

Sub TOWER d,s,e
  Local Nd,Ns,Ne      'Next values for d,s,e
  If d <> 1 Then
    Nd = d-1: Ns = s: Ne = 6-s-e
    TOWER Nd,Ns,Ne
  EndIf
  MOVE d,s,e
  If d <> 1 Then
    Ns = Ne: Ne = e
    TOWER Nd,Ns,Ne
  EndIf

```

End Sub

Sub MOVE d,s,e

SHOW_MOVE d,s,e ' Update the header line describing the current move

'Empty Current Pin Level & Move Up

yx (toprow + 3 + PL(s),15*(S-1)): Print TP\$(0); 'clear old pin position

PL(s) = PL(s)+1 ' Adjust Pin Level

yx (toprow,15*(S-1)): Print TP\$(d); 'place pin above to move sideways

Pause Delay

'Clear Position & move Across

yx (toprow,15*(s-1)): Print TP\$(9); 'erase current disk position

' Do long move in two steps; comment out the whole if structure to speed up

If Abs(s-e)=2 Then ' is this a long move?

dir = Sgn(e-s) 'which way?

'place disk in intermediate position

yx (toprow,15*(e-dir-1)): Print TP\$(d);

Pause Delay ' let disk settle

'erase disk from intermediate position

yx (toprow,15*(s+dir-1)): Print TP\$(9);

EndIf

' Place Disk above destination pin

yx (toprow,15*(e-1)): Print TP\$(d);

Pause Delay

'Clear position and Place Disk

yx (toprow,15*(e-1)): Print TP\$(9); 'Clear disk from top

yx (toprow + 2 + PL(e),15*(e-1)): Print TP\$(d); 'Place disk at end

PL(e) = PL(e)-1 ' Adjust Pin Level compensate pin level for new disk

Pause Delay

End Sub

```
.....  
''''''Cursor Control Subrouines''''''  
.....
```

Sub CU n ' UP

Print Chr\$(27)+"["+Str\$(n)+"A";

End Sub

Sub CD n ' Down

Print Chr\$(27)+"["+Str\$(n)+"B";

End Sub

```
Sub CR n ' Right (This is the only one I used once I wrote Sub YX)
  Print @(MM.HPos+n*6,MM.VPos) "";
End Sub
```

```
Sub CL n ' Left
  Print Chr$(27)+"["+Str$(n)+"D";
End Sub
```

```
Sub YX n, m ' Move cursor to Y,X - (VT100 is 1,1 based
  'Multipliers (6 & 12) are for the standard font
  Print @(m*6,n*12);
End Sub
```

```
Sub HOME ' Equivalent to YX 1,1
  Print @(0,0);
End Sub
```

```
Sub ClearScreen
  Cls
End Sub
```

```
.....
'''SIMPLE FUNCTIONS'''
.....
```

```
Sub dS S 'Display Numeric String and leave cursor where it stops.
  Print Str$(S); 'Print Char Data - don't use automatic space padding
End Sub
```

```
Sub GetDig D
GD:
  D$ = Inkey$
  If (d$<"0") Or (d$>"9") Then GoTo GD
  D = Asc(d$)-48
End Sub
```

```
Sub GetKey A$
GK:
  A$ = Inkey$
  If (A$ >= " ") And (A$ <= "z") Then Exit Sub
  'If (a$ = "Y") Or (a$ = "y") Or (a$ = "N") Or (a$ = "n") Then Exit Sub
  GoTo GK
End Sub
```

```
Function MAX(a,b) 'self explained
  If a>= b Then: MAX=a:Else: MAX=b: EndIf
End Function
```

TOWERS2.BAS

```
.....
''''TOWERS of HANOI''''
.....
''''By H W Holmes - Modified by Hugh Buckle''''
.....
''''Aug 9, 2014''''
.....
' TOWERS2.BAS

'This program plays the game of Towers of Hanoi for you.
'It is a programing exercise in recursion, that is,
'where a subroutine, in this case "TOWER", calls itself.

'It plays on a MaxiMite with PC keyboard and VGA screen
'It does NOT play in the chat window of MMEdit (I think)
'It is the same as TOWER1.BAS except that it uses
'Towers.fnt to display pins and disks as graphics.

INFO:
.....
'''Display Constants'''
.....
Delay = 500 ' Change for speed of play
TopRow = 8 ' CHANGE THIS TO MOVE Game UP OR DOWN THE SCREEN!
Font Load "Towers2.fnt" As 4
.....
''Tower Pieces''
.....
Dim TP$(9)
TP$(0) = "zzzzzzz|zzzzzzz" ' Empty Peg
TP$(1) = "zzzzzz{|}zzzzzz" ' Level 1
TP$(2) = "zzzzz{~|~}zzzzz"
TP$(3) = "zzzz{~~|~~}zzzz"
TP$(4) = "zzz{~~~|~~~}zzz"
TP$(5) = "zz{$$$ (admin,2016/12/17 18:39:15)$$|$$ (admin,2016/12/17
18:39:15)$$}zz"
TP$(6) = "z{$$$ (admin,2016/12/17 18:39:15)$$~|$$ (admin,2016/12/17
18:39:15)$$~}z"
TP$(7) = "{$$$ (admin,2016/12/17 18:39:15)$$~~|$$ (admin,2016/12/17
18:39:15)$$~~}" ' level 7
TP$(8) = "$$(admin,2016/12/17 18:39:15)$$$$ (admin,2016/12/17
18:39:15)$$$$ (admin,2016/12/17 18:39:15)$$~~~" ' Base
TP$(9) = "zzzzzzzzzzzzzzzz" ' ERASE disk

Dim PL(3) 'Pin Level
```

```

HMD:  'How many disks?

ClearScreen
HOME
' c 1.1

Print "This program plays the game of Towers of Hanoi for you."
Print "Object: To Move Disks from 1 Pin To Another, 1 pin at a time,"
Print "          never putting a larger Disk on a smaller one."

.....
'''Display'''
.....

D=0:S=0:E=0

ScreenBuild
Print
DL:
Print "Game speed (1-5 1=fast) ?" ; : GetDig P : Print P
If P<1 Or P>5 Then Print " Speed out of range! -> "; : GoTo DL
Delay = p*100
DK:
Print "How many Disks (1-7)      ?" ; : GetDig D : Print D
If D<1 Or D>7 Then Print "Disk Count Out of Range! -> "; : GoTo DK
SP:
Print "Starting on Pin (1-3)    ?"; : GetDig S : Print S
If S<1 Or S>3 Then Print "Pin # Out of Range! -> "; : GoTo SP
EP:
cnt = 0
Print "Move to Pin (";
If S<>1 Then Print "1";: cnt = 1: Print" OR "; ' 1 was not chosen to start
If S<>2 Then ' 2 was not chosen to start
Print "2"; : cnt = cnt + 1
If cnt = 1 Then Print " OR ";: Print "3"; 'must be the other not chosen
Else
Print "3"; 'must be the other not chosen
EndIf
Print ") "; : GetDig E : Print E' get end destination pin
If E<1 Or E>3 Then Print "Pin # Out of Range! -> "; : GoTo EP
If E=S Then Print "Pin # Same as Start Pin! -> "; : GoTo EP

Print
SUMARY:
Print "Move" D " Disks From Pin" S " TO Pin" E " " ;
Print "Correct? (Y,N) ";: GetKey A$ ' Did you type your choices
correctly?
Print A$; : If (A$ = "N") Or (A$ = "n") Then GoTo HMD
If (A$ <> "Y") And (A$ <> "y") Then
Print : Print "Press Y or N - "; : GoTo Sumary : EndIf

SETUP:  'c y,x notes below indicate cursor position for calulating page

```

```
layout
  ClearScreen
  HOME
  Print "          T O W E R S   O F   H A N O I"
  ' c 2,1
  Print "Object: To Move" D " Disks from Pin" S " To Pin" E
  ' c 3,1
  Print "1 pin at a time, never puting a larger Disk on "
  Print "a smaller one."
  Print
  ' c 6,1          1          2          3
  '          123456789012345678901234567890123
  Print "Moving Disk _ From Pin _ To Pin _."
  ' c 6,1
  SHOW_MOVE

Sub SHOW_MOVE d,s,e  'fills in the above blanks for disk and pins
  yx 5,12: dS d: cr 10: dS s: cr 8: dS e
  Pause Delay
End Sub

' c 5,33

PLAY:
  ScreenBuild

Sub ScreenBuild
  Font 4
  yx (toprow + 2,0)
  For I = 0 To 7          ' 8 peg levels - 0-7
    Level = MAX(0,(I+D-7)) ' negative disk levels use empty peg (0)
    For J = 1 To 3        ' 3 pegs
      If Not (J = S) Then
        Print TP$(0);      ' empty peg
      Else
        Print TP$(Level);  ' Empty peg if Level = 0
      EndIf
    Next J
    Print
  Next I
  For iI = 1 To 3: Print TP$(8);: Next: Print ' 3 wide base
  Font 1
  Print "          PIN 1          PIN 2          PIN 3" ' ID labeling
End Sub

.....
.....'THE GAME'.....
.....

'set pin current relative levels of top disk down from top of pin
```

INIT:

```
PL(s) = 7-d
PL(e) = 7
PL(6-e-s) = 7
```

```
TOWER d,s,e
```

```
yx TopRow+12, 1
```

FINI:

```
Print: Print "Play Again (Y,N) "; : GetKey A$ : Print A$
If (A$ = "N") Or (A$ = "n") Then
    Print " I Hope you liked challenging me to play the game!": End : EndIf
If (A$ <> "Y") And (A$ <> "y") Then
    Print "Press Y or N - "; : GoTo FINI : EndIf
Pause 1000: GoTo HMD
```

End

Sub TOWER d,s,e

```
Local Nd,Ns,Ne      'Next values for d,s,e
```

```
If d <> 1 Then
```

```
    Nd = d-1: Ns = s: Ne = 6-s-e
```

```
    TOWER Nd,Ns,Ne
```

```
EndIf
```

```
MOVE d,s,e
```

```
If d <> 1 Then
```

```
    Ns = Ne: Ne = e
```

```
    TOWER Nd,Ns,Ne
```

```
EndIf
```

End Sub

Sub MOVE d,s,e

```
SHOW_MOVE d,s,e ' Update the header line describing the current move
Font 4
```

```
'Empty Current Pin Level & Move Up
```

```
yx (toprow + 3 + PL(s),15*(S-1)): Print TP$(0); 'clear old pin position
```

```
PL(s) = PL(s)+1      ' Adjust Pin Level
```

```
yx (toprow,15*(S-1)): Print TP$(d); 'place pin above to move sideways
```

```
Pause Delay
```

```
'Clear Position & move Across
```

```
yx (toprow,15*(s-1)): Print TP$(9); 'erase current disk position
```

' Do long move in two steps; comment out the whole if structure to speed up

```
If Abs(s-e)=2 Then ' is this a long move?
```

```
    dir = Sgn(e-s) 'which way?
```

```
    'place disk in intermediate position
```

```
    yx (toprow,15*(e-dir-1)): Print TP$(d);
```

```
    Pause Delay ' let disk settle
    'erase disk from intermediate position
    yx (toprow,15*(s+dir-1)): Print TP$(9);
EndIf

' Place Disk above destination pin
yx (toprow,15*(e-1)): Print TP$(d);
Pause Delay

'Clear position and Place Disk
yx (toprow,15*(e-1)): Print TP$(9); 'Clear disk from top
yx (toprow + 2 + PL(e),15*(e-1)): Print TP$(d); 'Place disk at end
PL(e) = PL(e)-1 ' Adjuist Pin Level  compensate pin level for new disk
Pause Delay
Font 1
```

End Sub

```
.....
''''''Cursor Control Subrouines''''''
.....
```

Sub CU n ' UP

```
    Print Chr$(27)+"["+Str$(n)+"A";
```

End Sub

Sub CD n ' Down

```
    Print Chr$(27)+"["+Str$(n)+"B";
```

End Sub

Sub CR n ' Right (This is the only one I used once I wrote Sub YX)

```
    Print @(MM.HPos+n*6,MM.VPos) "";
```

End Sub

Sub CL n ' Left

```
    Print Chr$(27)+"["+Str$(n)+"D";
```

End Sub

Sub YX n, m ' Move cursor to Y,X - (VT100 is 1,1 based

```
    'Multipliers (6 & 12) are for the standard font
```

```
    Print @(m*6,n*12);
```

End Sub

Sub HOME ' Equivalent to YX 1,1

```
    Print @(0,0);
```

End Sub

Sub ClearScreen

```
    Cls
```


End Sub

```
.....  
' 'SIMPLE FUNCTIONS'  
.....
```

```
Sub dS S 'Display Numeric String and leave cursor where it stops.  
  Print Str$(S); 'Print Char Data - don't use automatic space padding  
End Sub
```

```
Sub GetDig D  
GD:  
  D$ = Inkey$  
  If (d$<"0") Or (d$>"9") Then GoTo GD  
  D = Asc(d$)-48  
End Sub
```

```
Sub GetKey A$  
GK:  
  A$ = Inkey$  
  If (A$ >= " ") And (A$ <= "z") Then Exit Sub  
  'If (a$ = "Y") Or (a$ = "y") Or (a$ = "N") Or (a$ = "n") Then Exit Sub  
  GoTo GK  
End Sub
```

```
Function MAX(a,b) 'self explained  
  If a>= b Then: MAX=a:Else: MAX=b: EndIf  
End Function
```

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